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NSB NEW LONDON
5090.3a

Basewide Groundwater Operable Unit Remedial Investigation Report

For

Naval Submarine Base New London

Groton, Connecticut

VOLUME IV - APPENDICES B THROUGH F

Northern Division Naval Facilities Engineering Command

Contract Number N62472-90-D-1298

Contract Task Order 0312

February 2001

TETRA TECH NUS, INC.

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SITE 2 - AREA A WETLAND AND LANDFILL GROUNDWATER DATA

SUMMARY OF SITE 2 GROUNDWATER DATA
AREA WETLANDS AND LANDFILL
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	2WMW38DS	2WMW39DS	2WMW39DS	2WMW40DS	2WMW40DS	2WMW41DS	2WMW41DS	2WMW42DS	2WMW42DS	2WMW43DS	2WMW43DS	2WMW44DS
matrix	GW	GW	GF	GW	GF	GW	GF	GW	GF	GW	GF	GW
sample	2WGW38DS-04	2WGW39DS04	2WGW39DS-04-F	2WGW40DS-04	2WGW40DS-04-F	2WGW41DS-04	2WGW41DS-04-F	2WGW42DS-04	2WGW42DS-04-F	2WGW43DS-04	2WGW43DS-04-F	2WGW44DS-04
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
qc_type	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
sample_dat	7/20/00	7/19/00	7/19/00	7/20/00	7/20/00	7/20/00	7/20/00	7/20/00	7/20/00	7/21/00	7/21/00	7/20/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
Volatile Organics (ug/L)												
1,1,1-TRICHLOROETHANE	1 U	1 U		1 U		1 U		1 U		1 U		1 U
1,1,2,2-TETRACHLOROETHANE	1 U	1 U		1 U		1 U		1 U		1 U		1 U
1,1,2-TRICHLOROETHANE	1 U	1 U		1 U		1 U		1 U		1 U		1 U
1,1-DICHLOROETHANE	1 U	1 U		1 U		1 U		1 U		1 U		1 U
1,1-DICHLOROETHENE	1 U	1 U		1 U		1 U		1 U		1 U		1 U
1,2,4-TRICHLOROBENZENE	1 U			1 U		1 U		1 U		1 U		1 U
1,2-DIBROMO-3-CHLOROPROPANE	1 U	1 U		1 U		1 U		1 U		1 U		1 U
1,2-DIBROMOETHANE	1 U	1 U		1 U		1 U		1 U		1 U		1 U
1,2-DICHLOROBENZENE	1 U	1 U		1 U		1 U		1 U		1 U		1 U
1,2-DICHLOROETHANE	1 U	1 U		1 U		1 U		1 U		1 U		1 U
1,2-DICHLOROPROPANE	1 U	1 U		1 U		1 U		1 U		1 U		1 U
1,3-DICHLOROBENZENE	1 U	1 U		1 U		1 U		1 U		1 U		1 U
1,4-DICHLOROBENZENE	1 U	1 U		1 U		1 U		1 U		1 U		1 U
2-BUTANONE	5 U	26		5 U		3 J		2 J		3 J		5 U
2-HEXANONE	5 U	5 U		5 U		5 U		5 U		5 U		5 U
4-METHYL-2-PENTANONE	5 U	5 U		5 U		5 U		5 U		5 U		5 U
ACETONE	4 J	120		3 J		8		5		10		7
BENZENE	1 U	1 U		1 U		1 U		1 U		1 U		1 U
BROMOCHLOROMETHANE	1 U	1 U		1 U		1 U		1 U		1 U		1 U
BROMODICHLOROMETHANE	1 U	1 U		1 U		1 U		1 U		1 U		1 U
BROMOFORM	1 UJ	1 U		1 UJ		1 UJ		1 UJ		1 UJ		1 UJ
BROMOMETHANE	1 U	1 U		1 U		1 U		1 U		1 UJ		1 U
CARBON DISULFIDE	1 U	2		3 U		4 U		4 U		6		1 U
CARBON TETRACHLORIDE	1 U	1 U		1 U		1 U		1 U		1 U		1 U
CHLOROBENZENE	1 U	1 U		1 U		1 U		1 U		1 U		1 U
CHLOROETHANE	1 U	1 U		1 U		1 U		1 U		1 U		1 U
CHLOROFORM	1 U	1 U		1 U		1 U		1 U		1 U		1 U
CHLOROMETHANE	1 U	1 U		1 U		1 U		1 U		1 U		1 U
CIS-1,2-DICHLOROETHENE	1 U	1 U		1 U		1 U		1 U		1 U		1 U
CIS-1,3-DICHLOROPROPENE	1 U	1 U		1 U		1 U		1 U		1 U		1 U
DIBROMOCHLOROMETHANE	1 U	1 U		1 U		1 U		1 U		1 U		1 U
ETHYLBENZENE	1 U	0.3 J		1 U		1 U		1 U		1 U		1 U
METHYLENE CHLORIDE	2 U	2 U		2 U		2 U		2 U		2 U		2 U
STYRENE	1 U	1 U		1 U		1 U		1 U		1 U		1 U
TETRACHLOROETHENE	1 U	1 U		1 U		1 U		1 U		1 U		1 U
TOLUENE	1 U	0.6 J		1 U		1 U		1 U		0.4 J		1 U
TRANS-1,2-DICHLOROETHENE	1 U	1 U		1 U		1 U		1 U		1 U		1 U

SUMMARY OF SITE 2 GROUNDWATER DATA
AREA WETLANDS AND LANDFILL
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	2WMW38DS	2WMW39DS	2WMW39DS	2WMW40DS	2WMW40DS	2WMW41DS	2WMW41DS	2WMW42DS	2WMW42DS	2WMW43DS	2WMW43DS	2WMW44DS
matrix	GW	GW	GF	GW	GF	GW	GF	GW	GF	GW	GF	GW
sample	2WGW38DS-04	2WGW39DS04	2WGW39DS-04-F	2WGW40DS-04	2WGW40DS-04-F	2WGW41DS-04	2WGW41DS-04-F	2WGW42DS-04	2WGW42DS-04-F	2WGW43DS-04	2WGW43DS-04-F	2WGW44DS-04
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
qc_type	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
sample_dat	7/20/00	7/19/00	7/19/00	7/20/00	7/20/00	7/20/00	7/20/00	7/20/00	7/20/00	7/21/00	7/21/00	7/20/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
TRANS-1,3-DICHLOROPROPENE	1 U	1 U		1 U		1 U		1 U		1 U		1 U
TRICHLOROETHENE	1 U	1 U		1 U		1 U		1 U		1 U		1 U
VINYL CHLORIDE	1 U	1 U		1 U		1 U		1 U		1 U		1 U
XYLENES, TOTAL	1 U	1 U		1 U		1 U		1 U		1 U		1 U
Semivolatile Organics (ug/L)												
1,2,4-TRICHLOROBENZENE	2.1 U	2 U		2.5 U		2.1 U		2 U		2 U		2 U
1,2-DICHLOROBENZENE	2.1 U	2 U		2.5 U		2.1 U		2 U		2 U		2 U
1,3-DICHLOROBENZENE	2.1 U	2 U		2.5 U		2.1 U		2 U		2 U		2 U
1,4-DICHLOROBENZENE	2.1 U	2 U		2.5 U		2.1 U		2 U		2 U		2 U
1-METHYLNAPHTHALENE				1 U		1 U		1 U				1 U
2,4,5-TRICHLOROPHENOL	5.2 U	5.1 U		6.2 U		5.2 U		5.1 U		5.1 U		5 U
2,4,6-TRICHLOROPHENOL	5.2 U	5.1 U		6.2 U		5.2 U		5.1 U		5.1 U		5 U
2,4-DICHLOROPHENOL	5.2 U	5.1 U		6.2 U		5.2 U		5.1 U		5.1 U		5 U
2,4-DIMETHYLPHENOL	5.2 U	5.1 U		6.2 U		5.2 U		5.1 U		5.1 U		5 U
2,4-DINITROPHENOL	21 UJ	20 UR		25 UJ		21 UJ		20 UJ		20 U		20 UJ
2,4-DINITROTOLUENE	2.1 U	2 U		2.5 U		2.1 U		2 U		2 U		2 U
2,6-DINITROTOLUENE	2.1 U	2 U		2.5 U		2.1 U		2 U		2 U		2 U
2-CHLORONAPHTHALENE	5.2 U	5.1 U		6.2 U		5.2 U		5.1 U		5.1 U		5 U
2-CHLOROPHENOL	5.2 U	5.1 U		6.2 U		5.2 U		5.1 U		5.1 U		5 U
2-METHYLNAPHTHALENE	2.1 U	2 U		2.5 U		2.1 U		2 U		2 U		2 U
2-METHYLNAPHTHALENE				1 U		1 U		1 U				1 U
2-METHYLPHENOL	5.2 U	5.1 U		6.2 U		5.2 U		5.1 U		5.1 U		5 U
2-NITROANILINE	5.2 U	5.1 U		6.2 U		5.2 U		5.1 U		5.1 U		5 U
2-NITROPHENOL	5.2 U	5.1 U		6.2 U		5.2 U		5.1 U		5.1 U		5 U
3&4-METHYLPHENOL	5.2 U	3.5 J		6.2 U		5.2 U		5.1 U		5.1 U		0.75 J
3,3'-DICHLOROBENZIDINE	5.2 U	5.1 U		6.2 U		5.2 U		5.1 U		5.1 U		5 U
3-NITROANILINE	5.2 U	5.1 U		6.2 U		5.2 U		5.1 U		5.1 U		5 U
4,6-DINITRO-2-METHYLPHENOL	21 U	20 UR		25 U		21 U		20 U		20 U		20 U
4-BROMOPHENYL PHENYL ETHER	2.1 U	2 U		2.5 U		2.1 U		2 U		2 U		2 U
4-CHLORO-3-METHYLPHENOL	5.2 U	5.1 U		6.2 U		5.2 U		5.1 U		5.1 U		5 U
4-CHLOROANILINE	5.2 U	5.1 U		6.2 U		5.2 U		5.1 U		5.1 U		5 U
4-CHLOROPHENYL PHENYL ETHER	2.1 U	2 U		2.5 U		2.1 U		2 U		2 U		2 U
4-NITROANILINE	5.2 U	5.1 U		6.2 U		5.2 U		5.1 U		5.1 U		5 U
4-NITROPHENOL	21 U	20 U		25 U		21 U		20 U		20 U		20 U
ACENAPHTHENE	2 U									2 U		
ACENAPHTHENE		0.2 UJ		1 U		1 U		1 U				1 U
ACENAPHTHYLENE	2 U									2 U		
ACENAPHTHYLENE		0.2 UJ		1 U		1 U		1 U				1 U

SUMMARY OF SITE 2 GROUNDWATER DATA
AREA WETLANDS AND LANDFILL
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	2WMW38DS	2WMW39DS	2WMW39DS	2WMW40DS	2WMW40DS	2WMW41DS	2WMW41DS	2WMW42DS	2WMW42DS	2WMW43DS	2WMW43DS	2WMW44DS
matrix	GW	GW	GF	GW	GF	GW	GF	GW	GF	GW	GF	GW
sample	2WGW38DS-04	2WGW39DS04	2WGW39DS-04-F	2WGW40DS-04	2WGW40DS-04-F	2WGW41DS-04	2WGW41DS-04-F	2WGW42DS-04	2WGW42DS-04-F	2WGW43DS-04	2WGW43DS-04-F	2WGW44DS-04
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
qc_type	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
sample_dat	7/20/00	7/19/00	7/19/00	7/20/00	7/20/00	7/20/00	7/20/00	7/20/00	7/20/00	7/21/00	7/21/00	7/20/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
ANTHRACENE	2 U									2 U		
ANTHRACENE		0.2 UJ		1 U		1 U		1 U				1 U
BENZO(A)ANTHRACENE	2 U									2 U		
BENZO(A)ANTHRACENE		0.2 UJ		0.15 U		0.15 U		0.15 U				0.15 U
BENZO(A)PYRENE	2 U									2 U		
BENZO(A)PYRENE		0.2 UJ		0.15 U		0.15 U		0.15 U				0.15 U
BENZO(B)FLUORANTHENE	2 U									2 U		
BENZO(B)FLUORANTHENE		0.2 UJ		0.15 U		0.15 U		0.15 U				0.15 U
BENZO(G,H,I)PERYLENE	2 U									2 U		
BENZO(G,H,I)PERYLENE		0.2 UJ		0.15 U		0.15 U		0.15 U				0.15 U
BENZO(K)FLUORANTHENE	2 U									2 U		
BENZO(K)FLUORANTHENE		0.2 UJ		0.15 U		0.15 U		0.15 U				0.15 U
BENZOIC ACID	21 U	2.3 J		25 U		21 U		20 U		20 UJ		20 U
BIS(2-CHLOROETHOXY)METHANE	2.1 U	2 U		2.5 U		2.1 U		2 U		2 U		2 U
BIS(2-CHLOROETHYL)ETHER	2.1 U	2 U		2.5 U		2.1 U		2 U		2 U		2 U
BIS(2-CHLOROISOPROPYL)ETHER	2.1 U	2 U		2.5 U		2.1 U		2 U		2 U		2 U
BIS(2-ETHYLHEXYL)PHTHALATE	2.1 U	2 U		2.5 U		2.1 U		2 U		2 U		2 U
BUTYLBENZYL PHTHALATE	2.1 U	2 U		2.5 U		2.1 U		2 U		2 U		2 U
CARBAZOLE	2.1 U	2 U		2.5 U		2.1 U		2 U		2 U		2 U
CHRYSENE	2 U									2 U		
CHRYSENE		0.2 UJ		0.15 U		0.15 U		0.15 U				0.15 U
DIBENZO(A,H)ANTHRACENE	2 U									2 U		
DIBENZO(A,H)ANTHRACENE		0.2 UJ		0.15 U		0.15 U		0.15 U				0.15 U
DIBENZOFURAN	5.2 U	5.1 U		6.2 U		5.2 U		5.1 U		5.1 U		5 U
DIETHYL PHTHALATE	2.1 U	2 U		2.5 U		2.1 U		2 U		2 U		2 U
DIMETHYL PHTHALATE	2.1 U	2 U		2.5 U		2.1 U		2 U		2 U		2 U
DI-N-BUTYL PHTHALATE	2.1 U	2 U		2.5 U		2.1 U		2 U		2 U		2 U
DI-N-OCTYL PHTHALATE	2.1 U	2 U		2.5 U		2.1 U		2 U		2 U		2 U
FLUORANTHENE	2 U									2 U		
FLUORANTHENE		0.2 UJ		1 U		1 U		1 U				1 U
FLUORENE	2 U									2 U		
FLUORENE		0.2 UJ		1 U		1 U		1 U				1 U
HEXACHLOROBENZENE	2.1 U	2 U		2.5 U		2.1 U		2 U		2 U		2 U
HEXACHLOROBUTADIENE	2.1 U	2 U		2.5 U		2.1 U		2 U		2 U		2 U
HEXACHLOROCYCLOPENTADIENE	21 UJ	20 U		25 U		21 U		20 U		20 U		20 U
HEXACHLOROETHANE	5.2 U	5.1 UJ		6.2 U		5.2 U		5.1 U		5.1 U		5 U
INDENO(1,2,3-CD)PYRENE	2 U									2 U		
INDENO(1,2,3-CD)PYRENE		0.2 UJ		0.15 U		0.15 U		0.15 U				0.15 U

SUMMARY OF SITE 2 GROUNDWATER DATA
AREA WETLANDS AND LANDFILL
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	2WMW38DS	2WMW39DS	2WMW39DS	2WMW40DS	2WMW40DS	2WMW41DS	2WMW41DS	2WMW42DS	2WMW42DS	2WMW43DS	2WMW43DS	2WMW44DS
matrix	GW	GW	GF	GW	GF	GW	GF	GW	GF	GW	GF	GW
sample	2WGW38DS-04	2WGW39DS04	2WGW39DS-04-F	2WGW40DS-04	2WGW40DS-04-F	2WGW41DS-04	2WGW41DS-04-F	2WGW42DS-04	2WGW42DS-04-F	2WGW43DS-04	2WGW43DS-04-F	2WGW44DS-04
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
qc_type	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
sample_dat	7/20/00	7/19/00	7/19/00	7/20/00	7/20/00	7/20/00	7/20/00	7/20/00	7/20/00	7/21/00	7/21/00	7/20/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
ISOPHORONE	2.1 U	2 U		2.5 U		2.1 U		2 U		2 U		2 U
NAPHTHALENE	2 U									2 U		
NAPHTHALENE		0.2 UJ		1 U		1 U		1 U				1 U
NITROBENZENE	2.1 U	2 U		2.5 U		2.1 U		2 U		2 U		2 U
N-NITROSO-DI-N-PROPYLAMINE	2.1 U	2 U		2.5 U		2.1 U		2 U		2 U		2 U
N-NITROSODIPHENYLAMINE	5.2 U	5.1 U		6.2 U		5.2 U		5.1 U		5.1 U		5 U
PENTACHLOROPHENOL	21 U	20 UJ		25 U		21 U		20 U		20 U		20 U
PHENANTHRENE	2 U									2 U		
PHENANTHRENE		0.2 UJ		1 U		1 U		1 U				1 U
PHENOL	5.2 U	2.5 J		6.2 U		5.2 U		5.1 U		5.1 UJ		5 U
PYRENE	2 U									2 U		
PYRENE		0.2 UJ		1 U		1 U		1 U				1 U
Pesticides/PCBs (ug/L)												
4,4'-DDD	0.021 U	0.02 U		0.029 U		0.022 U		0.02 U		0.02 U		0.022 U
4,4'-DDE	0.021 U	0.02 U		0.029 U		0.022 U		0.02 U		0.02 U		0.022 U
4,4'-DDT	0.021 U	0.02 U		0.029 U		0.022 U		0.02 U		0.02 U		0.022 U
ALDRIN	0.01 U	0.01 U		0.014 U		0.011 U		0.01 U		0.01 U		0.011 U
ALPHA-BHC	0.01 U	0.01 U		0.014 U		0.011 U		0.01 U		0.01 U		0.011 U
ALPHA-CHLORDANE	0.01 U	0.01 U		0.014 U		0.011 U		0.01 U		0.01 U		0.011 U
AROCLOR-1016	0.21 U	0.2 U		0.29 U		0.22 U		0.2 U		0.2 U		0.22 U
AROCLOR-1221	0.42 U	0.4 U		0.58 U		0.44 U		0.4 U		0.4 U		0.44 U
AROCLOR-1232	0.21 U	0.2 U		0.29 U		0.22 U		0.2 U		0.2 U		0.22 U
AROCLOR-1242	0.21 U	0.2 U		0.29 U		0.22 U		0.2 U		0.2 U		0.22 U
AROCLOR-1248	0.21 U	0.2 U		0.29 U		0.22 U		0.2 U		0.2 U		0.22 U
AROCLOR-1254	0.21 U	0.2 U		0.29 U		0.22 U		0.2 U		0.2 U		0.22 U
AROCLOR-1260	0.21 U	0.2 U		0.29 U		0.22 U		0.2 U		0.2 U		0.22 U
BETA-BHC	0.01 U	0.01 U		0.014 U		0.011 U		0.01 U		0.01 U		0.011 U
DELTA-BHC	0.01 U	0.01 U		0.014 U		0.011 U		0.01 U		0.01 U		0.011 U
DIELDRIN	0.021 U	0.02 U		0.029 U		0.022 U		0.02 U		0.02 U		0.022 U
ENDOSULFAN I	0.01 U	0.01 U		0.014 U		0.011 U		0.01 U		0.01 U		0.011 U
ENDOSULFAN II	0.021 U	0.02 U		0.029 U		0.022 U		0.02 U		0.02 U		0.022 U
ENDOSULFAN SULFATE	0.021 U	0.02 U		0.029 U		0.022 U		0.02 U		0.02 U		0.022 U
ENDRIN	0.021 U	0.02 U		0.029 U		0.022 U		0.02 U		0.02 U		0.022 U
ENDRIN ALDEHYDE	0.021 U	0.02 U		0.029 U		0.022 U		0.02 U		0.02 U		0.022 U
ENDRIN KETONE	0.021 U	0.02 U		0.029 U		0.022 U		0.02 U		0.02 U		0.022 U
GAMMA-BHC (LINDANE)	0.01 U	0.01 U		0.014 U		0.011 U		0.01 U		0.01 U		0.011 U
GAMMA-CHLORDANE	0.01 U	0.01 U		0.014 U		0.011 U		0.01 U		0.01 U		0.011 U
HEPTACHLOR	0.01 U	0.01 U		0.014 U		0.011 U		0.01 U		0.01 U		0.011 U

SUMMARY OF SITE 2 GROUNDWATER DATA
AREA WETLANDS AND LANDFILL
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	2WMW38DS	2WMW39DS	2WMW39DS	2WMW40DS	2WMW40DS	2WMW41DS	2WMW41DS	2WMW42DS	2WMW42DS	2WMW43DS	2WMW43DS	2WMW44DS
matrix	GW	GW	GF	GW	GF	GW	GF	GW	GF	GW	GF	GW
sample	2WGW38DS-04	2WGW39DS04	2WGW39DS-04-F	2WGW40DS-04	2WGW40DS-04-F	2WGW41DS-04	2WGW41DS-04-F	2WGW42DS-04	2WGW42DS-04-F	2WGW43DS-04	2WGW43DS-04-F	2WGW44DS-04
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
qc_type	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
sample_dat	7/20/00	7/19/00	7/19/00	7/20/00	7/20/00	7/20/00	7/20/00	7/20/00	7/20/00	7/21/00	7/21/00	7/20/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
HEPTACHLOR EPOXIDE	0.01 U	0.01 U		0.014 U		0.011 U		0.01 U		0.01 U		0.011 U
METHOXYCHLOR	0.1 U	0.1 U		0.14 U		0.11 U		0.1 U		0.1 U		0.11 U
TOXAPHENE	1 U	1 U		1.4 U		1.1 U		1 U		1 U		1.1 U
Total Metals (ug/L)												
ALUMINUM	115 U	69.1 U		69.1 U		69.1 U		97.4 U		69.1 U		69.1 U
ANTIMONY	2.6 U	2.6 U		2.6 UJ		2.6 UJ		2.6 UJ		2.6 UJ		2.6 U
ARSENIC	2.7 U	2.7 U		25.9 J		6 U		10.1 U		16.1 J		3 U
BARIUM	28.4 J	59.6		108		37.4		80.2		161		57.9
BERYLLIUM	0.22 U	0.1 U		0.12 U		0.1 U		0.1 U		0.26 U		0.27 U
CADMIUM	0.32 U	0.32 U		0.32 U		0.32 U		0.32 U		0.32 U		0.32 U
CALCIUM	48500	30700		230000		155000		129000		301000		101000
CHROMIUM	4.8 J	1.3 U		5 J		3.9 J		3.3 J		8.3 J		1.3 U
COBALT	0.94 U	0.94 U		0.94 U		0.95 J		0.94 U		0.94 U		0.94 U
COPPER	4.9 U	0.87 U		0.87 U		0.87 U		0.87 U		0.87 U		0.87 U
IRON	112 U	5580		1410		2310		15400		2830		19200
LEAD	1.9 U	1.9 U		1.9 U		1.9 U		1.9 U		1.9 U		1.9 U
MAGNESIUM	19400	8270		772000		477000		258000		942000		116000
MANGANESE	36.6	758		353		770		655		490		919
MERCURY	0.1 U	0.1 U		0.1 U		0.12 J		0.1 U		0.1 U		0.1 U
NICKEL	7.4	1.8 U		1.8 U		3.5 U		4.7 U		3.4 U		1.9 U
POTASSIUM	19900 J	9950		302000 J		185000 J		124000 J		355000 J		57900 J
SELENIUM	3.4 U	3.4 UJ		3.4 UJ		3.4 UJ		3.4 UJ		3.4 UJ		3.4 U
SILVER	1.1 U	1.1 U		1.1 U		1.1 U		1.1 U		1.1 U		1.1 U
SODIUM	193000	229000		6170000		3660000		2150000		7260000		950000
THALLIUM	5 U	5 U		5.9 U		5 U		5 U		8.6 U		5 U
VANADIUM	13.9	0.91 U		7 U		2.7 U		4.9 U		9.5 J		2.8 U
ZINC	6.8 U	6.1 J		4.7 U		6.8 U		11 J		5.3 U		6.7 U
Dissolved Metals (ug/L)												
ALUMINUM, FILTERED			69.1 U		69.1 U		69.1 U		69.1 U		69.1 U	
ANTIMONY, FILTERED			2.6 U		2.6 UJ		2.6 UJ		2.6 UJ		2.6 UJ	
ARSENIC, FILTERED			2.7 U		13.8 U		8.4 U		12.6 U		10.9 U	
BARIUM, FILTERED			46.4		79.3		58.3		69.7		127	
BERYLLIUM, FILTERED			0.1 U		0.1 U		0.1 U		0.1 U		0.1 U	
CADMIUM, FILTERED			0.32 U		0.32 U		0.34 U		0.32 U		0.32 U	
CALCIUM, FILTERED			32000		221000		181000		163000		288000	
CHROMIUM, FILTERED			1.3 U		1.8 J		4.8 J		2 J		5.5 J	
COBALT, FILTERED			1.1 U		0.94 U		1.3 J		0.94 U		0.99 J	
COPPER, FILTERED			0.87 U		0.87 U		0.87 U		1 U		0.87 U	

SUMMARY OF SITE 2 GROUNDWATER DATA
AREA WETLANDS AND LANDFILL
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	2WMW38DS	2WMW39DS	2WMW39DS	2WMW40DS	2WMW40DS	2WMW41DS	2WMW41DS	2WMW42DS	2WMW42DS	2WMW43DS	2WMW43DS	2WMW44DS
matrix	GW	GW	GF	GW	GF	GW	GF	GW	GF	GW	GF	GW
sample	2WGW38DS-04	2WGW39DS04	2WGW39DS-04-F	2WGW40DS-04	2WGW40DS-04-F	2WGW41DS-04	2WGW41DS-04-F	2WGW42DS-04	2WGW42DS-04-F	2WGW43DS-04	2WGW43DS-04-F	2WGW44DS-04
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
qc_type	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
sample_dat	7/20/00	7/19/00	7/19/00	7/20/00	7/20/00	7/20/00	7/20/00	7/20/00	7/20/00	7/21/00	7/21/00	7/20/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
IRON, FILTERED			5760		2260		13400		1030		481	
LEAD, FILTERED			1.9 U		1.9 U		1.9 U		1.9 U		1.9 U	
MAGNESIUM, FILTERED			11700		748000		553000		404000		980000	
MANGANESE, FILTERED			685		383		759		593		558	
MERCURY, FILTERED			0.1 U		0.1 U		0.1 U		0.12 J		0.1 U	
NICKEL, FILTERED			1.4 U		1.7 U		3.4 U		3.1 U		2.6 U	
POTASSIUM, FILTERED			14300		318000 J		216000 J		168000 J		325000 J	
SELENIUM, FILTERED			3.4 UJ		3.4 UJ		3.4 UJ		3.4 UJ		3.4 UJ	
SILVER, FILTERED			1.1 U		1.1 U		1.1 U		1.1 U		1.1 U	
SODIUM, FILTERED			271000		6590000		4240000		3320000		6970000	
THALLIUM, FILTERED			5 U		5 U		5 U		5 U		5 U	
VANADIUM, FILTERED			1.2 U		6.4 U		6.8 U		4.5 U		9.3 J	
ZINC, FILTERED			17.2		3.2 U		4 U		7.6 U		4.9 U	
Miscellaneous Parameters (ug/L)												
ALKALINITY	303	159		996		752		467		1200		547
CHEMICAL OXYGEN DEMAND	41.6	65.8		1040		651		362		1930		54.6
CHLORIDE	198 J	329 J		10500 J		7690 J		5140 J		13900 J		1980 J
HARDNESS as CaCO3	201	110		3750		2350		1380		4630		730
SULFATE	55.7	20 U		989		212		152		375		20 U
TOTAL DISSOLVED SOLIDS	813	782 J		16700		13600		9310		24800		3440
TOTAL ORGANIC CARBON	15.1	21		24		65.2		29.2		48.5		10.3
TOTAL SUSPENDED SOLIDS	4 U	22 J		78		123		67		34		45

U - Not Detected
J - Estimated
R - Rejected

SUMMARY OF SITE 2 GROUNDWATER DATA
AREA WETLANDS AND LANDFILL
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	2WMW44DS	2WMW45DS	2WMW45DS	2WMW46DS	2WMW46DS	2WMW47DS	2WMW47DS	2WMW47DS	2WMW47DS	3MW37S	3MW37S
matrix	GF	GW	GF	GW	GF	GW	GW	GF	GF	GW	GF
sample	2WGW44DS-04-F	2WGW45DS-04	2WGW45DS-04-F	2WGW46DS-04	2WGW46DS-04-F	2WGW47DS04	GWFD071800-04	2WGW47DS-04-F	GWFD071800-04-F	3GW37S-04	3GW37S-04-F
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	DUP	DUP	DUP	DUP	NORMAL	NORMAL
qc_type	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
sample_dat	7/20/00	7/20/00	7/20/00	7/20/00	7/20/00	7/18/00	7/18/00	7/18/00	7/18/00	7/20/00	7/20/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
Volatile Organics (ug/L)											
1,1,1-TRICHLOROETHANE		1 U		1 U		1 U	1 U			1 U	
1,1,2,2-TETRACHLOROETHANE		1 U		1 U		1 U	1 U			1 U	
1,1,2-TRICHLOROETHANE		1 U		1 U		1 U	1 U			1 U	
1,1-DICHLOROETHANE		1 U		1 U		1 U	1 U			1 U	
1,1-DICHLOROETHENE		1 U		1 U		1 U	1 U			1 U	
1,2,4-TRICHLOROBENZENE		1 U		1 U						1 U	
1,2-DIBROMO-3-CHLOROPROPANE		1 U		1 U		1 U	1 U			1 U	
1,2-DIBROMOETHANE		1 U		1 U		1 U	1 U			1 U	
1,2-DICHLOROBENZENE		1 U		1 U		1 U	1 U			1 U	
1,2-DICHLOROETHANE		1 U		1 U		1 U	1 U			1 U	
1,2-DICHLOROPROPANE		1 U		1 U		1 U	1 U			1 U	
1,3-DICHLOROBENZENE		1 U		1 U		1 U	1 U			1 U	
1,4-DICHLOROBENZENE		1 U		1 U		1 U	1 U			1 U	
2-BUTANONE		10		5 U		5 U	5 U			5 U	
2-HEXANONE		5 U		5 U		5 U	5 U			5 U	
4-METHYL-2-PENTANONE		5 U		5 U		5 U	5 U			5 U	
ACETONE		38		5 U		5 U	5 U			5 U	
BENZENE		1 U		1 U		1 U	1 U			1 U	
BROMOCHLOROMETHANE		1 U		1 U		1 U	1 U			1 U	
BROMODICHLOROMETHANE		1 U		1 U		1 U	1 U			1 U	
BROMOFORM		1 UJ		1 UJ		1 U	1 U			1 UJ	
BROMOMETHANE		1 U		1 UJ		1 U	1 U			1 U	
CARBON DISULFIDE		7		4 U		1 U	1 U			1 U	
CARBON TETRACHLORIDE		1 U		1 U		1 U	1 U			1 U	
CHLOROBENZENE		1 U		1 U		1 U	1 U			1 U	
CHLOROETHANE		1 U		1 U		1 U	1 U			1 U	
CHLOROFORM		1 U		1 U		1 U	1 U			1 U	
CHLOROMETHANE		1 U		1 U		1 U	1 U			1 U	
CIS-1,2-DICHLOROETHENE		1 U		1 U		1 U	1 U			1 U	
CIS-1,3-DICHLOROPROPENE		1 U		1 U		1 U	1 U			1 U	
DIBROMOCHLOROMETHANE		1 U		1 U		1 U	1 U			1 U	
ETHYLBENZENE		1 U		1 U		1 U	1 U			1 U	
METHYLENE CHLORIDE		2 U		2 U		2 U	2 U			2 U	
STYRENE		1 U		1 U		1 U	1 U			1 U	
TETRACHLOROETHENE		1 U		1 U		1 U	1 U			1 U	
TOLUENE		1 U		1 U		1 U	1 U			1 U	
TRANS-1,2-DICHLOROETHENE		1 U		1 U		1 U	1 U			1 U	

SUMMARY OF SITE 2 GROUNDWATER DATA
AREA WETLANDS AND LANDFILL
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	2WMW44DS	2WMW45DS	2WMW45DS	2WMW46DS	2WMW46DS	2WMW47DS	2WMW47DS	2WMW47DS	2WMW47DS	3MW37S	3MW37S
matrix	GF	GW	GF	GW	GF	GW	GW	GF	GF	GW	GF
sample	2WGW44DS-04-F	2WGW45DS-04	2WGW45DS-04-F	2WGW46DS-04	2WGW46DS-04-F	2WGW47DS04	GWFD071800-04	2WGW47DS-04-F	GWFD071800-04-F	3GW37S-04	3GW37S-04-F
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	DUP	DUP	DUP	DUP	NORMAL	NORMAL
qc_type	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
sample_dat	7/20/00	7/20/00	7/20/00	7/20/00	7/20/00	7/18/00	7/18/00	7/18/00	7/18/00	7/20/00	7/20/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
TRANS-1,3-DICHLOROPROPENE		1 U		1 U		1 U	1 U			1 U	
TRICHLOROETHENE		1 U		1 U		1 U	1 U			1 J	
VINYL CHLORIDE		1 U		1 U		1 U	1 U			1 U	
XYLENES, TOTAL		1 U		1 U		1 U	1 U			1 U	
Semivolatile Organics (ug/L)											
1,2,4-TRICHLOROBENZENE		2.1 U		2.1 U		2.1 U	2 U			2 U	
1,2-DICHLOROBENZENE		2.1 U		2.1 U		2.1 U	2 U			2 U	
1,3-DICHLOROBENZENE		2.1 U		2.1 U		2.1 U	2 U			2 U	
1,4-DICHLOROBENZENE		2.1 U		2.1 U		2.1 U	2 U			2 U	
1-METHYLNAPHTHALENE		1 U		1 U						1 U	
2,4,5-TRICHLOROPHENOL		5.2 U		5.2 U		5.2 U	5.1 U			5.1 U	
2,4,6-TRICHLOROPHENOL		5.2 U		5.2 U		5.2 U	5.1 U			5.1 U	
2,4-DICHLOROPHENOL		5.2 U		5.2 U		5.2 U	5.1 U			5.1 U	
2,4-DIMETHYLPHENOL		5.2 U		5.2 U		5.2 U	5.1 U			5.1 U	
2,4-DINITROPHENOL		21 UJ		21 UJ		21 UR	20 UR			20 UJ	
2,4-DINITROTOLUENE		2.1 U		2.1 U		2.1 U	2 U			2 U	
2,6-DINITROTOLUENE		2.1 U		2.1 U		2.1 U	2 U			2 U	
2-CHLORONAPHTHALENE		5.2 U		5.2 U		5.2 U	5.1 U			5.1 U	
2-CHLOROPHENOL		5.2 U		5.2 U		5.2 U	5.1 U			5.1 U	
2-METHYLNAPHTHALENE		2.1 U		2.1 U		2.1 U	2 U			2 U	
2-METHYLNAPHTHALENE		1 U		1 U						1 U	
2-METHYLPHENOL		5.2 U		5.2 U		5.2 U	5.1 U			5.1 U	
2-NITROANILINE		5.2 U		5.2 U		5.2 U	5.1 U			5.1 U	
2-NITROPHENOL		5.2 U		5.2 U		5.2 U	5.1 U			5.1 U	
3&4-METHYLPHENOL		5.2 U		1.2 J		5.2 U	5.1 U			5.1 U	
3,3'-DICHLOROBENZIDINE		5.2 U		5.2 U		5.2 U	5.1 U			5.1 U	
3-NITROANILINE		5.2 U		5.2 U		5.2 U	5.1 U			5.1 U	
4,6-DINITRO-2-METHYLPHENOL		21 U		21 U		21 UR	20 UR			20 U	
4-BROMOPHENYL PHENYL ETHER		2.1 U		2.1 U		2.1 U	2 U			2 U	
4-CHLORO-3-METHYLPHENOL		5.2 U		5.2 U		5.2 U	5.1 U			5.1 U	
4-CHLOROANILINE		5.2 U		5.2 U		5.2 U	5.1 U			5.1 U	
4-CHLOROPHENYL PHENYL ETHER		2.1 U		2.1 U		2.1 U	2 U			2 U	
4-NITROANILINE		5.2 U		5.2 U		5.2 U	5.1 U			5.1 U	
4-NITROPHENOL		21 U		21 U		21 U	20 U			20 U	
ACENAPHTHENE											
ACENAPHTHENE		1 U		1 U		0.21 UJ	0.2 UJ			1 U	
ACENAPHTHYLENE											
ACENAPHTHYLENE		1 U		1 U		0.21 UJ	0.2 UJ			1 U	

SUMMARY OF SITE 2 GROUNDWATER DATA
AREA WETLANDS AND LANDFILL
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	2WMW44DS	2WMW45DS	2WMW45DS	2WMW46DS	2WMW46DS	2WMW47DS	2WMW47DS	2WMW47DS	2WMW47DS	3MW37S	3MW37S
matrix	GF	GW	GF	GW	GF	GW	GW	GF	GF	GW	GF
sample	2WGW44DS-04-F	2WGW45DS-04	2WGW45DS-04-F	2WGW46DS-04	2WGW46DS-04-F	2WGW47DS04	GWFD071800-04	2WGW47DS-04-F	GWFD071800-04-F	3GW37S-04	3GW37S-04-F
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	DUP	DUP	DUP	DUP	NORMAL	NORMAL
qc_type	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
sample_dat	7/20/00	7/20/00	7/20/00	7/20/00	7/20/00	7/18/00	7/18/00	7/18/00	7/18/00	7/20/00	7/20/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
ANTHRACENE											
ANTHRACENE		1 U		1 U		0.21 UJ	0.2 UJ			1 U	
BENZO(A)ANTHRACENE											
BENZO(A)ANTHRACENE		0.15 U		0.15 U		0.21 UJ	0.2 UJ			0.15 U	
BENZO(A)PYRENE											
BENZO(A)PYRENE		0.15 U		0.15 U		0.21 UJ	0.2 UJ			0.15 U	
BENZO(B)FLUORANTHENE											
BENZO(B)FLUORANTHENE		0.15 U		0.15 U		0.21 UJ	0.2 UJ			0.15 U	
BENZO(G,H,I)PERYLENE											
BENZO(G,H,I)PERYLENE		0.15 U		0.15 U		0.21 UJ	0.2 UJ			0.15 U	
BENZO(K)FLUORANTHENE											
BENZO(K)FLUORANTHENE		0.15 U		0.15 U		0.21 UJ	0.2 UJ			0.15 U	
BENZOIC ACID		21 U		21 U		21 UR	20 UR			20 U	
BIS(2-CHLOROETHOXY)METHANE		2.1 U		2.1 U		2.1 U	2 U			2 U	
BIS(2-CHLOROETHYL)ETHER		2.1 U		2.1 U		2.1 U	2 U			2 U	
BIS(2-CHLOROISOPROPYL)ETHER		2.1 U		2.1 U		2.1 U	2 U			2 U	
BIS(2-ETHYLHEXYL)PHTHALATE		2.1 U		2.1 U		2.1 U	2 U			2 U	
BUTYLBENZYL PHTHALATE		2.1 U		2.1 U		2.1 U	2 U			2 U	
CARBAZOLE		2.1 U		2.1 U		2.1 U	2 U			2 U	
CHRYSENE											
CHRYSENE		0.15 U		0.15 U		0.21 UJ	0.2 UJ			0.15 U	
DIBENZO(A,H)ANTHRACENE											
DIBENZO(A,H)ANTHRACENE		0.15 U		0.15 U		0.21 UJ	0.2 UJ			0.15 U	
DIBENZOFURAN		5.2 U		5.2 U		5.2 U	5.1 U			5.1 U	
DIETHYL PHTHALATE		2.1 U		2.1 U		2.1 U	2 U			2 U	
DIMETHYL PHTHALATE		2.1 U		2.1 U		2.1 U	2 U			2 U	
DI-N-BUTYL PHTHALATE		2.1 U		2.1 U		2.1 U	2 U			2 U	
DI-N-OCTYL PHTHALATE		2.1 U		2.1 U		2.1 U	2 U			2 U	
FLUORANTHENE											
FLUORANTHENE		1 U		1 U		0.21 UJ	0.2 UJ			1 U	
FLUORENE											
FLUORENE		1 U		1 U		0.21 UJ	0.2 UJ			1 U	
HEXACHLOROBENZENE		2.1 U		2.1 U		2.1 U	2 U			2 U	
HEXACHLOROBUTADIENE		2.1 U		2.1 U		2.1 U	2 U			2 U	
HEXACHLOROCYCLOPENTADIENE		21 U		21 U		21 U	20 UJ			20 U	
HEXACHLOROETHANE		5.2 U		5.2 U		5.2 UJ	5.1 U			5.1 U	
INDENO(1,2,3-CD)PYRENE											
INDENO(1,2,3-CD)PYRENE		0.15 U		0.15 U		0.21 UJ	0.2 UJ			0.15 U	

SUMMARY OF SITE 2 GROUNDWATER DATA
AREA WETLANDS AND LANDFILL
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	2WMW44DS	2WMW45DS	2WMW45DS	2WMW46DS	2WMW46DS	2WMW47DS	2WMW47DS	2WMW47DS	2WMW47DS	3MW37S	3MW37S
matrix	GF	GW	GF	GW	GF	GW	GW	GF	GF	GW	GF
sample	2WGW44DS-04-F	2WGW45DS-04	2WGW45DS-04-F	2WGW46DS-04	2WGW46DS-04-F	2WGW47DS04	GWFD071800-04	2WGW47DS-04-F	GWFD071800-04-F	3GW37S-04	3GW37S-04-F
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	DUP	DUP	DUP	DUP	NORMAL	NORMAL
qc_type	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
sample_dat	7/20/00	7/20/00	7/20/00	7/20/00	7/20/00	7/18/00	7/18/00	7/18/00	7/18/00	7/20/00	7/20/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
ISOPHORONE		2.1 U		2.1 U		2.1 U	2 U			2 U	
NAPHTHALENE											
NAPHTHALENE		1 U		1 U		0.21 UJ	0.2 UJ			1 U	
NITROBENZENE		2.1 U		2.1 U		2.1 U	2 U			2 U	
N-NITROSO-DI-N-PROPYLAMINE		2.1 U		2.1 U		2.1 U	2 U			2 U	
N-NITROSODIPHENYLAMINE		5.2 U		5.2 U		5.2 U	5.1 U			5.1 U	
PENTACHLOROPHENOL		21 U		21 U		21 UJ	20 UJ			20 U	
PHENANTHRENE											
PHENANTHRENE		1 U		1 U		0.21 UJ	0.2 UJ			1 U	
PHENOL		5.2 U		5.2 U		5.2 UJ	5.1 UJ			5.1 U	
PYRENE											
PYRENE		1 U		1 U		0.21 UJ	0.2 UJ			1 U	
Pesticides/PCBs (ug/L)											
4,4'-DDD		0.022 U		0.022 U		0.058 J	0.042 J			0.021 U	
4,4'-DDE		0.022 U		0.022 U		0.02 U	0.02 U			0.021 U	
4,4'-DDT		0.022 U		0.022 U		0.02 U	0.02 U			0.021 U	
ALDRIN		0.011 U		0.011 U		0.01 U	0.01 U			0.01 U	
ALPHA-BHC		0.011 U		0.011 U		0.01 U	0.01 U			0.01 U	
ALPHA-CHLORDANE		0.011 U		0.011 U		0.01 U	0.01 U			0.01 U	
AROCLOR-1016		0.22 U		0.22 U		0.2 U	0.2 U			0.21 U	
AROCLOR-1221		0.44 U		0.44 U		0.4 U	0.4 U			0.42 U	
AROCLOR-1232		0.22 U		0.22 U		0.2 U	0.2 U			0.21 U	
AROCLOR-1242		0.22 U		0.22 U		0.2 U	0.2 U			0.21 U	
AROCLOR-1248		0.22 U		0.22 U		0.2 U	0.2 U			0.21 U	
AROCLOR-1254		0.22 U		0.22 U		0.2 U	0.2 U			0.21 U	
AROCLOR-1260		0.22 U		0.22 U		0.2 U	0.2 U			0.21 U	
BETA-BHC		0.011 U		0.011 U		0.01 U	0.01 U			0.01 U	
DELTA-BHC		0.011 U		0.011 U		0.01 U	0.01 U			0.01 U	
DIELDRIN		0.022 U		0.022 U		0.02 U	0.02 U			0.021 U	
ENDOSULFAN I		0.011 U		0.011 U		0.01 U	0.01 U			0.01 U	
ENDOSULFAN II		0.022 U		0.022 U		0.02 U	0.02 U			0.021 U	
ENDOSULFAN SULFATE		0.022 U		0.022 U		0.02 U	0.02 U			0.021 U	
ENDRIN		0.022 U		0.022 U		0.02 U	0.02 U			0.021 U	
ENDRIN ALDEHYDE		0.022 U		0.022 U		0.02 U	0.02 U			0.021 U	
ENDRIN KETONE		0.022 U		0.022 U		0.02 U	0.02 U			0.021 U	
GAMMA-BHC (LINDANE)		0.011 U		0.011 U		0.01 U	0.01 U			0.01 U	
GAMMA-CHLORDANE		0.011 U		0.011 U		0.01 U	0.01 U			0.01 U	
HEPTACHLOR		0.011 U		0.011 U		0.01 U	0.01 U			0.01 U	

SUMMARY OF SITE 2 GROUNDWATER DATA
AREA WETLANDS AND LANDFILL
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	2WMW44DS	2WMW45DS	2WMW45DS	2WMW46DS	2WMW46DS	2WMW47DS	2WMW47DS	2WMW47DS	2WMW47DS	3MW37S	3MW37S
matrix	GF	GW	GF	GW	GF	GW	GW	GF	GF	GW	GF
sample	2WGW44DS-04-F	2WGW45DS-04	2WGW45DS-04-F	2WGW46DS-04	2WGW46DS-04-F	2WGW47DS04	GWFD071800-04	2WGW47DS-04-F	GWFD071800-04-F	3GW37S-04	3GW37S-04-F
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	DUP	DUP	DUP	DUP	NORMAL	NORMAL
qc_type	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
sample_dat	7/20/00	7/20/00	7/20/00	7/20/00	7/20/00	7/18/00	7/18/00	7/18/00	7/18/00	7/20/00	7/20/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
HEPTACHLOR EPOXIDE		0.011 U		0.011 U		0.01 U	0.01 U			0.01 U	
METHOXYCHLOR		0.11 U		0.11 U		0.1 U	0.1 U			0.1 U	
TOXAPHENE		1.1 U		1.1 U		1 U	1 U			1 U	
Total Metals (ug/L)											
ALUMINUM		69.1 U		138 U		220	292			69.1 U	
ANTIMONY		2.6 UJ		5.2 UJ		2.6 UJ	2.6 UJ			2.6 U	
ARSENIC		4.2 U		28.4 J		29.6 J	30.4 J			2.7 U	
BARIUM		47.3		144		920	875			64.1	
BERYLLIUM		0.1 U		0.13 U		0.1 U	0.1 U			0.21 U	
CADMIUM		0.32 U		0.32 U		0.89 U	1 U			0.32 U	
CALCIUM		141000		334000		97900	94400			37500	
CHROMIUM		1.4 J		11.9 J		1.3 UJ	1.3 UJ			1.3 U	
COBALT		0.94 U		0.94 U		13.4	13.4			2.4 J	
COPPER		0.87 U		0.87 U		0.87 U	0.87 U			0.87 U	
IRON		615		429		234000	221000			188	
LEAD		1.9 U		3.8 U		1.9 U	1.9 U			1.9 U	
MAGNESIUM		514000		1020000		151000	150000			5530	
MANGANESE		189		224		8960	8450			269	
MERCURY		0.1 U		0.1 U		1.4	1.5			0.1 U	
NICKEL		1.4 U		4 U		4.2 U	5.7 U			1.2 U	
POTASSIUM		239000 J		361000 J		95600	96300			5790 J	
SELENIUM		3.4 UJ		6.8 UJ		3.4 UJ	3.4 UJ			3.4 U	
SILVER		1.1 U		1.1 U		1.1 U	3.4 U			1.1 U	
SODIUM		4220000		7930000		1400000	1400000			67000	
THALLIUM		5 U		9.9 U		5 U	5 U			5 U	
VANADIUM		14.6 J		4.1 U		0.71 UJ	0.71 UJ			0.71 U	
ZINC		3.1 U		11.1 J		8.2 J	9.9 J			3.2 U	
Dissolved Metals (ug/L)											
ALUMINUM, FILTERED	69.1 U		69.1 U		138 U			69.1 U	69.1 U		69.1 U
ANTIMONY, FILTERED	2.6 U		2.6 UJ		5.2 UJ			2.6 UJ	2.6 UJ		2.8 U
ARSENIC, FILTERED	2.7 U		4.6 U		29.3 J			35.5 J	32.4 J		2.7 U
BARIUM, FILTERED	54.9		28.2 J		123			1070	1030		52.9
BERYLLIUM, FILTERED	0.1 U		0.1 U		0.1 U			0.1 U	0.1 U		0.1 U
CADMIUM, FILTERED	0.32 U		0.32 U		0.32 U			1.8 U	1.3 U		0.32 U
CALCIUM, FILTERED	103000		114000		327000			99700	98900		37300
CHROMIUM, FILTERED	1.3 U		1.3 U		13.6 J			1.3 UJ	1.3 UJ		1.3 U
COBALT, FILTERED	0.94 U		0.94 U		0.94 U			14.5	13.9		2.6 J
COPPER, FILTERED	0.87 U		0.87 U		1.5 U			1 U	0.87 U		1.6 U

SUMMARY OF SITE 2 GROUNDWATER DATA
AREA WETLANDS AND LANDFILL
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	2WMW44DS	2WMW45DS	2WMW45DS	2WMW46DS	2WMW46DS	2WMW47DS	2WMW47DS	2WMW47DS	2WMW47DS	3MW37S	3MW37S
matrix	GF	GW	GF	GW	GF	GW	GW	GF	GF	GW	GF
sample	2WGW44DS-04-F	2WGW45DS-04	2WGW45DS-04-F	2WGW46DS-04	2WGW46DS-04-F	2WGW47DS04	GWFD071800-04	2WGW47DS-04-F	GWFD071800-04-F	3GW37S-04	3GW37S-04-F
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	DUP	DUP	DUP	DUP	NORMAL	NORMAL
qc_type	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
sample_dat	7/20/00	7/20/00	7/20/00	7/20/00	7/20/00	7/18/00	7/18/00	7/18/00	7/18/00	7/20/00	7/20/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
IRON, FILTERED	11900		649		167 U			263000	258000		219
LEAD, FILTERED	1.9 U		1.9 U		3.8 U			1.9 U	1.9 U		1.9 U
MAGNESIUM, FILTERED	125000		362000		1060000			142000	142000		5530
MANGANESE, FILTERED	959		230		228			10100	9850		264
MERCURY, FILTERED	0.1 U		0.1 U		0.1 U			0.82	1.3		0.1 U
NICKEL, FILTERED	1.3 U		1.5 U		3.5 U			2 U	3.7 U		1.2 U
POTASSIUM, FILTERED	57400 J		173000 J		360000 J			96100	94800		5090 J
SELENIUM, FILTERED	3.4 U		3.4 UJ		6.8 UJ			3.4 UJ	3.4 UJ		3.4 U
SILVER, FILTERED	1.1 U		1.1 U		1.1 U			1.1 U	1.1 U		1.1 U
SODIUM, FILTERED	983000		3250000		7940000			1380000	1370000		67300
THALLIUM, FILTERED	5 U		5 U		5 U			5 U	5 U		5 U
VANADIUM, FILTERED	2.5 U		4.1 U		4.3 U			0.71 UJ	0.71 UJ		0.71 U
ZINC, FILTERED	6.4 U		4.7 U		6.5 U			13.6 J	18.7 J		3.9 U
Miscellaneous Parameters (ug/L)											
ALKALINITY		870		2420		323	384			120	
CHEMICAL OXYGEN DEMAND		146		2410		106	109			20 U	
CHLORIDE		4270 J		16800 J		3170 J	3570 J			107 J	
HARDNESS as CaCO3		2470		5030		870	850			116	
SULFATE		51.7		255		20 U	20 U			20	
TOTAL DISSOLVED SOLIDS		7430		29400		5680 J	6020 J			336	
TOTAL ORGANIC CARBON		16.4		63.2		10.3	13.8			4	
TOTAL SUSPENDED SOLIDS		31		66		181 J	165 J			4 U	

U - Not Detected
J - Estimated
R - Rejected

APPENDIX B.2

SITE 3 - AREA A DOWNSTREAM SOIL DATA

SUMMARY OF SITE 3 SOIL DATA -AREA A DOWNSTREAM
BASEWIDE GROUDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GRORON, CONNECTICUT

location	3SB14S3	3SB29D0	3SB29D1
matrix	SB	SB	SB
sample	S3SB14S3234	S3SB29D0911	S3SB29D1012
depth	32-34	09-11	10-12
sample_date	6/22/00	6/13/00	6/23/00
validated	TRUE	TRUE	TRUE
cto_proj	312	312	312
proj_manager	CERCONE, D.	CERCONE, D.	CERCONE, D.
Grain Size (%)			
SIEVE # 10		100	
SIEVE # 100		94.44	
SIEVE # 200		66.05	
SIEVE # 4		100	
SIEVE # 40		99.07	
SIEVE # 50		98.61	
SIEVE 1-1/2"		100	
SIEVE 1/2"		100	
SIEVE 3"		100	
SIEVE 3/4"		100	
SIEVE 3/8"		100	
Miscellaneous Parameters			
BULK DENSITY (LB/CU FT)		112.22	
PH		6.96	
POROSITY (N)		0.3306	
SPECIFIC GRAVITY		2.69	
TOTAL ORGANIC CARBON (MG/KG)	109 U		123 U

APPENDIX B.3

SITE 3 - AREA A DOWNSTREAM GROUNDWATER DATA TEMPORARY WELLS

SUMMARY OF SITE 3 GROUNDWATER DATA
TEMPORARY WELLS - AREA A DOWNSTREAM
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	3TW01	3TW4	3TW10	3TW15	3TW17	3TW22	3TW22	3TW25
matrix	GW	GW	GW	GW	GW	GW	GW	GW
sample	S3TW0101	S3TW0401	S3TW1001	S3TW1501	S3TW1701	S3TW2201	FD0609001	S3TW2501
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	DUP	DUP	NORMAL
sample_dat	6/10/00	6/10/00	6/10/00	6/9/00	6/9/00	6/9/00	6/9/00	6/11/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
Volatile Organics (ug/L)								
1,1,1-TRICHLOROETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2,2-TETRACHLOROETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2-TRICHLOROETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-DICHLOROETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-DICHLOROETHENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,4-TRICHLOROBENZENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-DIBROMO-3-CHLOROPROPANE	1 UR	1 UR	1 UR	1 UR	1 UR	1 UR	1 UR	1 UR
1,2-DIBROMOETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-DICHLOROBENZENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-DICHLOROETHANE	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
1,2-DICHLOROPROPANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,3-DICHLOROBENZENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,4-DICHLOROBENZENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2-BUTANONE	1 UR	1 UR	1 UR	1 UR	1 UR	1 UR	1 UR	1 UR
2-HEXANONE	1 UR	1 UR	1 UR	1 UR	1 UR	1 UR	1 UR	1 UR
4-METHYL-2-PENTANONE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
ACETONE	1 UR	1 UR	1 UR	1 UR	1 UR	28.9 J	27.8 J	1 UR
BENZENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
BROMOCHLOROMETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
BROMODICHLOROMETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
BROMOFORM	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
BROMOMETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
CARBON DISULFIDE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
CARBON TETRACHLORIDE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
CHLOROBENZENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
CHLOROETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
CHLOROFORM	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
CHLOROMETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
CIS-1,2-DICHLOROETHENE	1.71	1 U	1 U	1 U	1 U	1 U	1 U	1 U

SUMMARY OF SITE 3 GROUNDWATER DATA
TEMPORARY WELLS - AREA A DOWNSTREAM
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	3TW01	3TW4	3TW10	3TW15	3TW17	3TW22	3TW22	3TW25
matrix	GW	GW	GW	GW	GW	GW	GW	GW
sample	S3TW0101	S3TW0401	S3TW1001	S3TW1501	S3TW1701	S3TW2201	FD0609001	S3TW2501
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	DUP	DUP	NORMAL
sample_dat	6/10/00	6/10/00	6/10/00	6/9/00	6/9/00	6/9/00	6/9/00	6/11/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
CIS-1,3-DICHLOROPROPENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
DIBROMOCHLOROMETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
METHYLENE CHLORIDE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
STYRENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TETRACHLOROETHENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TRANS-1,2-DICHLOROETHENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TRANS-1,3-DICHLOROPROPENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TRICHLOROETHENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
VINYL CHLORIDE	4.65	1 U	1 U	1 U	1 U	1 U	1 U	1 U
XYLENES, TOTAL	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U

U - Not Detected
J - Estimated
R - Rejected

APPENDIX B.4

SITE 3 - AREA A DOWNSTREAM GROUNDWATER DATA PERMANENT WELLS

SUMMARY OF SITE 3 GROUNDWATER DATA - PERMANENT WELLS - AREA A DOWNSTREAM
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	2DMW10D	2DMW10D	2DMW11S	2DMW15D	2DMW16D	2DMW16S	2DMW16S	2DMW23D	2DMW24D	2DMW24D	2DMW24S	2DMW25D
nsample	S32DMW10D01	S32DMW10D01-F	S32DMW11S01	S32DMW15D01	S32DMW16D01	S32DMW16S01	S32DMW16S01-F	S32DMW23D01	S32DMW24D01	S32DMW24D01-D	S32DMW24S01	S32DMW25D01
sample	S32DMW10D01	S32DMW10D01-F	S32DMW11S01	S32DMW15D01	S32DMW16D01	S32DMW16S01	S32DMW16S01-F	S32DMW23D01	S32DMW24D01	FD0802001	S32DMW24S01	S32DMW25D01
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	DUP	DUP	NORMAL	NORMAL
sample_dat	8/2/00	8/2/00	8/3/00	8/2/00	7/31/00	7/31/00	7/31/00	7/25/00	8/2/00	8/2/00	8/2/00	7/22/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
Volatile Organics (ug/L)												
1,1,1-TRICHLOROETHANE	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U
1,1,2,2-TETRACHLOROETHANE	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U
1,1,2-TRICHLOROETHANE	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U
1,1-DICHLOROETHANE	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U
1,1-DICHLOROETHENE	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U
1,2,4-TRICHLOROBENZENE	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U
1,2-DIBROMO-3-CHLOROPROPANE	1 U		1 UR	1 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U
1,2-DIBROMOETHANE	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U
1,2-DICHLOROBENZENE	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U
1,2-DICHLOROETHANE	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U
1,2-DICHLOROPROPANE	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U
1,3-DICHLOROBENZENE	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U
1,4-DICHLOROBENZENE	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U
2-BUTANONE	5 UR		5 UR	5 UR	5 UR	5 UR		5 UR	5 UR	5 UR	5 UR	5 UR
2-HEXANONE	5 UR		5 UR	5 UR	5 UR	5 UR		5 UR	5 UR	5 UR	5 UR	5 UR
4-METHYL-2-PENTANONE	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U	5 U
ACETONE	5 UR		5 UR	5 UR	5 UR	5 UR		6.91 U	5 UR	5 UR	5 UR	5 UR
BENZENE	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U
BROMOCHLOROMETHANE	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U
BROMODICHLOROMETHANE	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U
BROMOFORM	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U
BROMOMETHANE	1 U		1 UJ	1 U	1 U	1 U		1 UJ	1 U	1 U	1 U	1 U
CARBON DISULFIDE	1 U		1 U	1 U	1 U	1 U		1 UJ	1 U	1 U	1 U	1 UJ
CARBON TETRACHLORIDE	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U
CHLOROBENZENE	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U
CHLOROETHANE	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U
CHLOROFORM	1 U		1 U	1 U	1 U	1 U		2.11	1 U	1 U	1 U	3.53
CHLOROMETHANE	1 U		1 U	1 U	1 U	1 U		1 UJ	1 U	1 U	1 U	1 U
CIS-1,2-DICHLOROETHENE	1 U		1 U	1 U	3.3	1 U		1 U	1 U	1 U	1 U	1 U
CIS-1,3-DICHLOROPROPENE	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U
DIBROMOCHLOROMETHANE	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U
M+P-XYLENES	2 U		2 U	2 U	2 U	2 U		2 U	2 U	2 U	2 U	2 U
METHYLENE CHLORIDE	2 U		2.79 U	2 U	2 U	2 U		4.41 U	2 U	2 U	2 U	2 UJ
O-XYLENE	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U

SUMMARY OF SITE 3 GROUNDWATER DATA - PERMANENT WELLS - AREA A DOWNSTREAM
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	2DMW10D	2DMW10D	2DMW11S	2DMW15D	2DMW16D	2DMW16S	2DMW16S	2DMW23D	2DMW24D	2DMW24D	2DMW24S	2DMW25D
nsample	S32DMW10D01	S32DMW10D01-F	S32DMW11S01	S32DMW15D01	S32DMW16D01	S32DMW16S01	S32DMW16S01-F	S32DMW23D01	S32DMW24D01	S32DMW24D01-D	S32DMW24S01	S32DMW25D01
sample	S32DMW10D01	S32DMW10D01-F	S32DMW11S01	S32DMW15D01	S32DMW16D01	S32DMW16S01	S32DMW16S01-F	S32DMW23D01	S32DMW24D01	FD0802001	S32DMW24S01	S32DMW25D01
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	DUP	DUP	NORMAL	NORMAL
sample_dat	8/2/00	8/2/00	8/3/00	8/2/00	7/31/00	7/31/00	7/31/00	7/25/00	8/2/00	8/2/00	8/2/00	7/22/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
STYRENE	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U
TETRACHLOROETHENE	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U
TOLUENE	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U
TRANS-1,2-DICHLOROETHENE	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U
TRANS-1,3-DICHLOROPROPENE	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U
TRICHLOROETHENE	1.88		1 U	1 U	3.17	3.88		2.2	1 U	1 U	1 U	1 U
VINYL CHLORIDE	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U
XYLENES, TOTAL	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U
Dissolved Gases (ug/L)												
ETHANE	2 UJ		2 UJ	2 UJ	2 UJ	2 UJ		2 UJ	2 UJ	2 UJ	2 UJ	2 UJ
ETHENE	3 UJ		3 UJ	3 UJ	3 UJ	3 UJ		3 UJ	3 UJ	3 UJ	3 UJ	3 UJ
METHANE	1 U		1 U	30	21	98		1 U	63 J	46 J	260	95
Semivolatile Organics (ug/L)												
1,2,4-TRICHLOROBENZENE												5 U
1,2-DICHLOROBENZENE												5 U
1,3-DICHLOROBENZENE												5 U
1,4-DICHLOROBENZENE												5 U
1-METHYLNAPHTHALENE	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U		0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U
2,2'-OXYBIS(1-CHLOROPROPANE)	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U	5 U
2,4,5-TRICHLOROPHENOL	20 U		20 U	20 U	20 U	20 U		20 U	20 U	20 U	20 U	20 U
2,4,6-TRICHLOROPHENOL	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U	5 U
2,4-DICHLOROPHENOL	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U	5 U
2,4-DIMETHYLPHENOL	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U	5 U
2,4-DINITROPHENOL	20 UJ		20 UJ	20 UJ	20 UJ	20 UJ		20 UJ	20 UJ	20 UJ	20 UJ	20 U
2,4-DINITROTOLUENE	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U	5 U
2,6-DINITROTOLUENE	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U	5 U
2-CHLORONAPHTHALENE	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U	5 U
2-CHLOROPHENOL	5 U		5 U	5 U	5 UJ	5 UJ		5 UJ	5 UJ	5 U	5 U	5 UJ
2-METHYLNAPHTHALENE	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U		0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U
2-METHYLPHENOL	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U	5 U
2-NITROANILINE	20 U		20 U	20 U	20 U	20 U		20 U	20 U	20 U	20 U	20 U
2-NITROPHENOL	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U	5 U
3,3'-DICHLOROBENZIDINE	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U	5 U
3-NITROANILINE	20 U		20 U	20 U	20 U	20 U		20 U	20 U	20 U	20 U	20 U
4,6-DINITRO-2-METHYLPHENOL	20 U		20 U	20 U	20 U	20 U		20 U	20 U	20 U	20 U	20 U
4-BROMOPHENYL PHENYL ETHER	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U	5 U

SUMMARY OF SITE 3 GROUNDWATER DATA - PERMANENT WELLS - AREA A DOWNSTREAM
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	2DMW10D	2DMW10D	2DMW11S	2DMW15D	2DMW16D	2DMW16S	2DMW16S	2DMW23D	2DMW24D	2DMW24D	2DMW24S	2DMW25D
nsample	S32DMW10D01	S32DMW10D01-F	S32DMW11S01	S32DMW15D01	S32DMW16D01	S32DMW16S01	S32DMW16S01-F	S32DMW23D01	S32DMW24D01	S32DMW24D01-D	S32DMW24S01	S32DMW25D01
sample	S32DMW10D01	S32DMW10D01-F	S32DMW11S01	S32DMW15D01	S32DMW16D01	S32DMW16S01	S32DMW16S01-F	S32DMW23D01	S32DMW24D01	FD0802001	S32DMW24S01	S32DMW25D01
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	DUP	DUP	NORMAL	NORMAL
sample_dat	8/2/00	8/2/00	8/3/00	8/2/00	7/31/00	7/31/00	7/31/00	7/25/00	8/2/00	8/2/00	8/2/00	7/22/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
4-CHLORO-3-METHYLPHENOL	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U	5 U
4-CHLOROANILINE	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U	5 U
4-CHLOROPHENYL PHENYL ETHER	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U	5 U
4-METHYLPHENOL	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U	5 U
4-NITROANILINE	20 U		20 U	20 U	20 U	20 U		20 U	20 U	20 U	20 U	20 U
4-NITROPHENOL	20 U		20 U	20 U	20 U	20 U		20 U	20 U	20 U	20 U	20 U
ACENAPHTHENE	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U		0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U
ACENAPHTHYLENE	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 UJ	1 U	1 U
ANTHRACENE	0.05 U		0.05 U	0.05 U	0.05 U	0.04 J		0.05 U	0.05 U	0.05 UJ	0.05 U	0.05 U
BENZO(A)ANTHRACENE	0.05 U		0.05 U	0.05 U	0.05 U	0.05 U		0.05 U	0.05 U	0.05 UJ	0.05 U	0.05 U
BENZO(A)PYRENE	0.05 U		0.05 U	0.05 U	0.05 U	0.05 U		0.05 U	0.05 U	0.05 UJ	0.05 U	0.05 U
BENZO(B)FLUORANTHENE	0.1 U		0.1 U	0.1 U	0.1 U	0.1 U		0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U
BENZO(G,H,I)PERYLENE	0.1 U		0.1 U	0.1 U	0.1 U	0.1 U		0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U
BENZO(K)FLUORANTHENE	0.05 U		0.05 U	0.05 U	0.05 U	0.05 U		0.05 U	0.05 U	0.05 UJ	0.05 U	0.05 U
BIS(2-CHLOROETHOXY)METHANE	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U	5 U
BIS(2-CHLOROETHYL)ETHER	5 U		5 U	5 U	5 U	5 U		5 UJ	5 UJ	5 U	5 U	5 U
BIS(2-ETHYLHEXYL)PHTHALATE	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U	5 U
BUTYLBENZYL PHTHALATE	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U	5 U
CARBAZOLE												5 U
CHRYSENE	0.05 U		0.05 U	0.05 U	0.05 U	0.05 U		0.05 U	0.05 U	0.05 UJ	0.05 U	0.05 U
DIBENZO(A,H)ANTHRACENE	0.1 U		0.1 U	0.1 U	0.1 U	0.1 U		0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U
DIBENZOFURAN	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U	5 U
DIETHYL PHTHALATE	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U	5 U
DIMETHYL PHTHALATE	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U	5 U
DI-N-BUTYL PHTHALATE	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U	5 U
DI-N-OCTYL PHTHALATE	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U	5 U
FLUORANTHENE	0.1 U		0.1 U	0.1 U	0.1 U	0.04 J		0.1 U	0.1 U	0.1 UJ	0.06 J	0.1 U
FLUORENE	0.1 U		0.1 U	0.1 U	0.1 U	0.04 J		0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U
HEXACHLOROBENZENE	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U	5 U
HEXACHLOROBUTADIENE	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U	5 U
HEXACHLOROCYCLOPENTADIENE	5 UJ		5 UJ	5 UJ	5 UJ	5 UJ		5 UJ	5 UJ	5 UJ	5 UJ	5 U
HEXACHLOROETHANE	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U	5 U
INDENO(1,2,3-CD)PYRENE	0.05 U		0.05 U	0.05 U	0.05 U	0.05 U		0.05 U	0.05 U	0.05 UJ	0.05 U	0.05 U
ISOPHORONE	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U	5 U
NAPHTHALENE	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U		0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U
NITROBENZENE	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U	5 U

SUMMARY OF SITE 3 GROUNDWATER DATA - PERMANENT WELLS - AREA A DOWNSTREAM
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	2DMW10D	2DMW10D	2DMW11S	2DMW15D	2DMW16D	2DMW16S	2DMW16S	2DMW23D	2DMW24D	2DMW24D	2DMW24S	2DMW25D
nsample	S32DMW10D01	S32DMW10D01-F	S32DMW11S01	S32DMW15D01	S32DMW16D01	S32DMW16S01	S32DMW16S01-F	S32DMW23D01	S32DMW24D01	S32DMW24D01-D	S32DMW24S01	S32DMW25D01
sample	S32DMW10D01	S32DMW10D01-F	S32DMW11S01	S32DMW15D01	S32DMW16D01	S32DMW16S01	S32DMW16S01-F	S32DMW23D01	S32DMW24D01	FD0802001	S32DMW24S01	S32DMW25D01
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	DUP	DUP	NORMAL	NORMAL
sample_dat	8/2/00	8/2/00	8/3/00	8/2/00	7/31/00	7/31/00	7/31/00	7/25/00	8/2/00	8/2/00	8/2/00	7/22/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
N-NITROSO-DI-N-PROPYLAMINE	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U	5 U
N-NITROSODIPHENYLAMINE	5 U		5 U	5 U	5 UJ	5 UJ		5 U	5 U	5 U	5 U	5 U
PENTACHLOROPHENOL	20 U		20 U	20 U	20 U	20 U		20 U	20 U	20 U	20 U	20 U
PHENANTHRENE	0.05 U		0.05 U	0.05 U	0.05 U	0.05 U		0.05 U	0.05 U	0.05 UJ	0.05 U	0.05 U
PHENOL	5 U		5 U	5 U	5 U	5 U		5 UJ	5 U	5 U	5 U	5 U
PYRENE	0.05 U		0.05 U	0.05 U	0.05 U	0.05 U		0.05 U	0.05 U	0.05 UJ	0.06	0.05 U
Pesticides/PCBs (ug/L)												
4,4'-DDD	0.02 U		0.02 U	0.02 U	0.02 U	0.02 U		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
4,4'-DDE	0.02 U		0.02 U	0.02 U	0.02 U	0.02 U		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
4,4'-DDT	0.02 U		0.02 U	0.02 U	0.02 U	0.02 U		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
ALDRIN	0.01 U		0.01 U	0.01 U	0.01 U	0.01 U		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
ALPHA-BHC	0.01 U		0.01 U	0.01 U	0.01 U	0.01 U		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
ALPHA-CHLORDANE	0.01 U		0.01 U	0.01 U	0.01 U	0.01 U		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
AROCLOR-1016												
AROCLOR-1221												
AROCLOR-1232												
AROCLOR-1242												
AROCLOR-1248												
AROCLOR-1254												
AROCLOR-1260												
BETA-BHC	0.01 U		0.01 U	0.01 U	0.01 U	0.01 U		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
DELTA-BHC	0.01 U		0.01 U	0.01 U	0.01 U	0.01 U		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
DIELDRIN	0.02 U		0.02 U	0.02 U	0.02 U	0.02 U		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
ENDOSULFAN I	0.01 U		0.01 U	0.01 U	0.01 U	0.01 U		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
ENDOSULFAN II	0.02 U		0.02 U	0.02 U	0.02 U	0.02 U		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
ENDOSULFAN SULFATE	0.02 U		0.02 U	0.02 U	0.02 U	0.02 U		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
ENDRIN	0.02 U		0.02 U	0.02 U	0.02 U	0.02 U		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
ENDRIN ALDEHYDE	0.02 U		0.02 U	0.02 U	0.02 U	0.02 U		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
ENDRIN KETONE	0.02 U		0.02 U	0.02 U	0.02 U	0.02 U		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
GAMMA-BHC (LINDANE)	0.01 U		0.01 U	0.01 U	0.01 U	0.01 U		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
GAMMA-CHLORDANE	0.01 U		0.01 U	0.01 U	0.01 U	0.01 U		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
HEPTACHLOR	0.01 U		0.01 U	0.01 U	0.01 U	0.01 U		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
HEPTACHLOR EPOXIDE	0.01 U		0.01 U	0.01 U	0.01 U	0.01 U		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
METHOXYCHLOR	0.1 U		0.1 U	0.1 U	0.1 U	0.1 U		0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
TOXAPHENE	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U
Total Metals (ug/L)												

SUMMARY OF SITE 3 GROUNDWATER DATA - PERMANENT WELLS - AREA A DOWNSTREAM
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	2DMW10D	2DMW10D	2DMW11S	2DMW15D	2DMW16D	2DMW16S	2DMW16S	2DMW23D	2DMW24D	2DMW24D	2DMW24S	2DMW25D
nsample	S32DMW10D01	S32DMW10D01-F	S32DMW11S01	S32DMW15D01	S32DMW16D01	S32DMW16S01	S32DMW16S01-F	S32DMW23D01	S32DMW24D01	S32DMW24D01-D	S32DMW24S01	S32DMW25D01
sample	S32DMW10D01	S32DMW10D01-F	S32DMW11S01	S32DMW15D01	S32DMW16D01	S32DMW16S01	S32DMW16S01-F	S32DMW23D01	S32DMW24D01	FD0802001	S32DMW24S01	S32DMW25D01
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	DUP	DUP	NORMAL	NORMAL
sample_dat	8/2/00	8/2/00	8/3/00	8/2/00	7/31/00	7/31/00	7/31/00	7/25/00	8/2/00	8/2/00	8/2/00	7/22/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
ANTIMONY	77.4 U		90.5 U	50.5 U	269 U	126 U		983	50.5 U	65.9 U	517	338 U
ALUMINUM	2.6 U		2.6 U	2.6 U	2.6 U	2.6 U		2.6 U	2.6 U	2.6 U	2.6 U	2.6 U
ARSENIC	2.3 U		2.3 U	2.3 U	2.3 U	2.3 U		2.3 U	2.3 U	2.3 U	2.3 U	2.3 U
BARIUM	26		21.1 U	36.8	75.9	22.7 U		19.4 U	58.3	59.3	38.9	37.9 U
BERYLLIUM	0.72 U		0.72 U	0.72 U	0.72 U	0.72 U		0.72 U	0.72 U	0.72 U	0.72 U	0.72 U
CADMIUM	0.25 U		0.25 U	0.25 U	0.25 U	0.25 U		0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
CALCIUM	14800		25600	9760	155000	31700		7040	21800	22800	18700	7450
CHROMIUM	25.3		6.2 U	6.2 U	6.2 U	6.2 U		6.2 U	6.2 U	6.2 U	6.2 U	6.2 U
COBALT	4.5 J		4.2 U	5.3 J	4.2 U	4.2 U		4.2 U	4.2 U	4.2 U	4.2 U	4.5 U
COPPER	6.8 U		6.8 U	6.8 U	6.8 U	6.8 U		6.8 U	6.8 U	6.8 U	6.8 U	6.8 U
IRON	16000		48.6 U	13300	34600	697		268	7990	8480	12800	12100
LEAD	1.8 U		1.8 U	1.8 U	2.2 J	1.8 U		1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
MAGNESIUM	2810		9740	3340	23000	6770		1240	5960	6130	4700	1910
MANGANESE	392		674	1370	1060	792		84.6	769	805	1130	213
MERCURY	0.09 U		0.09 U	0.09 U	0.09 U	0.09 U		0.09 U	0.09 U	0.1 U	0.1 U	0.09 U
NICKEL	26.4		9.2 U	9.2 U	9.2 U	9.2 U		9.2 U	9.2 U	9.2 U	9.2 U	9.2 U
POTASSIUM	3390		5840	4040	11600	3960		857	3730	3890	3930	2260
SELENIUM	2.8 U		2.8 U	2.8 U	2.8 U	2.8 U		2.8 U	2.8 U	2.8 U	2.8 U	2.8 U
SILVER	5.5 J		5.2 U	5.2 U	7.6 J	5.2 U		5.2 U	5.2 U	5.2 U	5.2 U	5.2 UR
SODIUM	30200 J		131000 J	59400 J	298000 J	49400 J		5700 J	75100 J	77900 J	85800 J	30800
THALLIUM	4.4 J		3 U	3 U	3 U	3 U		3 U	3 U	3 U	3 U	3 U
VANADIUM	6.3 U		6.3 U	6.3 U	6.3 U	6.3 U		6.3 U	6.3 U	6.3 U	6.3 U	6.3 U
ZINC	10.9 U		4.6 U	53.1	19 U	17.7 U		12.3 U	6.5 U	17.4	18.9 U	28.6 U
Dissolved Metals (ug/L)												
ALUMINUM, FILTERED		63.5 U					50.5 U					
ANTIMONY, FILTERED		2.6 U					2.6 U					
ARSENIC, FILTERED		2.3 U					2.3 U					
BARIUM, FILTERED		20 U					22.1 U					
BERYLLIUM, FILTERED		0.72 U					0.72 U					
CADMIUM, FILTERED		0.25 U					0.25 U					
CALCIUM, FILTERED		12200					32500					
CHROMIUM, FILTERED		6.2 U					8.3 J					
COBALT, FILTERED		4.2 U					4.5 J					
COPPER, FILTERED		12.1 J					6.8 U					
IRON, FILTERED		8990					430					
LEAD, FILTERED		1.8 U					1.8 U					

SUMMARY OF SITE 3 GROUNDWATER DATA - PERMANENT WELLS - AREA A DOWNSTREAM
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	2DMW10D	2DMW10D	2DMW11S	2DMW15D	2DMW16D	2DMW16S	2DMW16S	2DMW23D	2DMW24D	2DMW24D	2DMW24S	2DMW25D
nsample	S32DMW10D01	S32DMW10D01-F	S32DMW11S01	S32DMW15D01	S32DMW16D01	S32DMW16S01	S32DMW16S01-F	S32DMW23D01	S32DMW24D01	S32DMW24D01-D	S32DMW24S01	S32DMW25D01
sample	S32DMW10D01	S32DMW10D01-F	S32DMW11S01	S32DMW15D01	S32DMW16D01	S32DMW16S01	S32DMW16S01-F	S32DMW23D01	S32DMW24D01	FD0802001	S32DMW24S01	S32DMW25D01
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	DUP	DUP	NORMAL	NORMAL
sample_dat	8/2/00	8/2/00	8/3/00	8/2/00	7/31/00	7/31/00	7/31/00	7/25/00	8/2/00	8/2/00	8/2/00	7/22/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
MAGNESIUM, FILTERED		2320					6900					
MANGANESE, FILTERED		320					783					
MERCURY, FILTERED		0.09 U					0.09 U					
NICKEL, FILTERED		10.3 J					9.2 U					
POTASSIUM, FILTERED		2970					4000					
SELENIUM, FILTERED		2.8 U					2.8 U					
SILVER, FILTERED		5.2 U					5.2 U					
SODIUM, FILTERED		25500 J					50400 J					
THALLIUM, FILTERED		3 U					3.2 J					
VANADIUM, FILTERED		6.3 U					6.3 U					
ZINC, FILTERED		22.1 U					30.1 U					
Miscellaneous Parameters (mg/L)												
ALKALINITY	34		101	71	209	150		12 J	46	48.5	65.5	23.5 J
AMMONIA	0.12 J		0.27 J	0.12 J	0.2 J	0.26 J		0.15 J	0.15 J	0.15 J	1.04 J	0.4 J
CHLORIDE	50.9		159	53.8	495	47.1		6.17	126	126	170	52.4
HARDNESS as CaCO3	48.5		46.5	38.1	482	107		22.7	79	82.2	66	26.5
SULFATE	6.25		70.3	47.8	66.8	14.7		15.5	27.5	26.5	9.7	7.94
SULFIDE	2 U		2 U	2 UJ	2 UJ	2 UJ		2 UR	2 UJ	2 U	2 UJ	2 UR
TOTAL DISSOLVED SOLIDS	126 J		481 J	238 J	1688 J	374 J		55 J	311 J	332 J	328 J	132 J
TOTAL ORGANIC CARBON	1.3		1.9 J	3.6	3.5	4.1		1.8 J	1.5	1.7	4.2	1.2
TOTAL SUSPENDED SOLIDS	20 J		5 UJ	19 J	66 J	5 UJ		5 UJ	6 J	18 J	13 J	13 J

SUMMARY OF SITE 3 GROUNDWATER DATA - PERMANENT WELLS - AREA A DOWNSTREAM
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	2DMW25S	2DMW26D	2DMW26S	2DMW27D	2DMW28D	2DMW28S	2DMW29S	2DMW29S	2DMW30S	3MW14S
nsample	S32DMW25S01	S32DMW26D01	S32DMW26S01	S32DMW27D01	S32DMW28D01	S32DMW28S01	S3MW29S03	S32DMW29S04	S32DMW30S01	S3MW14S01
sample	S32DMW25S01	S32DMW26D01	S32DMW26S01	S32DMW27D01	S32DMW28D01	S32DMW28S01	S3MW29S03	S32DMW29S04	S32DMW30S01	S3MW14S01
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	7/22/00	7/22/00	7/22/00	8/3/00	7/23/00	7/23/00	6/23/00	7/12/00	7/12/00	7/25/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
Volatile Organics (ug/L)										
1,1,1-TRICHLOROETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2,2-TETRACHLOROETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2-TRICHLOROETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-DICHLOROETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-DICHLOROETHENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,4-TRICHLOROBENZENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-DIBROMO-3-CHLOROPROPANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-DIBROMOETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-DICHLOROBENZENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-DICHLOROETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-DICHLOROPROPANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,3-DICHLOROBENZENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,4-DICHLOROBENZENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2-BUTANONE	5 UR	5 UR	5 UR	5 UR	5 UR	5 UR	5 UR	5 UR	5 UR	5 UR
2-HEXANONE	5 UR	5 UR	5 UR	5 UR	5 UR	5 UR	5 UR	5 UR	5 UR	5 UR
4-METHYL-2-PENTANONE	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
ACETONE	5 UR	5 UR	5 UR	5 U	5 UR	5 UR	5 UR	5 UR	13.4 U	5 UR
BENZENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
BROMOCHLOROMETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
BROMODICHLOROMETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
BROMOFORM	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
BROMOMETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ	1 UJ	1 UJ	1 U
CARBON DISULFIDE	1 UJ	1 UJ	1 UJ	1 U	1 UJ	1 UJ	1 U	1 U	1 U	1 UJ
CARBON TETRACHLORIDE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
CHLOROBENZENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
CHLOROETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
CHLOROFORM	3.08	1 U	5.72	1 U	1 U	1 U	1 U	1 U	1 U	1 U
CHLOROMETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ
CIS-1,2-DICHLOROETHENE	1 U	1 U	1 U	1 U	1 U	1 U	6.79	12.2	1 U	1 U
CIS-1,3-DICHLOROPROPENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
DIBROMOCHLOROMETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
M+P-XYLENES	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
METHYLENE CHLORIDE	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2.12 U	2.11 U	3.8 U
O-XYLENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U

SUMMARY OF SITE 3 GROUNDWATER DATA - PERMANENT WELLS - AREA A DOWNSTREAM
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	2DMW25S	2DMW26D	2DMW26S	2DMW27D	2DMW28D	2DMW28S	2DMW29S	2DMW29S	2DMW30S	3MW14S
nsample	S32DMW25S01	S32DMW26D01	S32DMW26S01	S32DMW27D01	S32DMW28D01	S32DMW28S01	S3MW29S03	S32DMW29S04	S32DMW30S01	S3MW14S01
sample	S32DMW25S01	S32DMW26D01	S32DMW26S01	S32DMW27D01	S32DMW28D01	S32DMW28S01	S3MW29S03	S32DMW29S04	S32DMW30S01	S3MW14S01
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	7/22/00	7/22/00	7/22/00	8/3/00	7/23/00	7/23/00	6/23/00	7/12/00	7/12/00	7/25/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
STYRENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TETRACHLOROETHENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TRANS-1,2-DICHLOROETHENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TRANS-1,3-DICHLOROPROPENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TRICHLOROETHENE	3.45 J	1 U	2.41 J	1 U	8.76 J	1 U	1 U	5.47	1 U	6.22 J
VINYL CHLORIDE	1 U	1 U	1 U	1 U	1 U	1 U	3.67	31.3	1 U	1 U
XYLENES, TOTAL	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Dissolved Gases (ug/L)										
ETHANE	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ		12	2 U	2 UJ
ETHENE	3 UJ	3 UJ	3 UJ	3 UJ	3 UJ	3 UJ		13	3 U	3 UJ
METHANE	1 U	170	2 J	2 U	3	1 U		400 J	9 J	1
Semivolatile Organics (ug/L)										
1,2,4-TRICHLOROBENZENE	5 U	5 U	5 U		5 U	5 U				
1,2-DICHLOROBENZENE	5 U	5 U	5 U		5 U	5 U				
1,3-DICHLOROBENZENE	5 U	5 U	5 U		5 U	5 U				
1,4-DICHLOROBENZENE	5 U	5 U	5 U		5 U	5 U				
1-METHYLNAPHTHALENE	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U		0.5 U	0.5 U	
2,2'-OXYBIS(1-CHLOROPROPANE)	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	
2,4,5-TRICHLOROPHENOL	20 U	20 U	20 U	20 U	20 U	20 U		20 U	20 U	
2,4,6-TRICHLOROPHENOL	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	
2,4-DICHLOROPHENOL	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	
2,4-DIMETHYLPHENOL	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	
2,4-DINITROPHENOL	20 U	20 U	20 U	20 UJ	20 U	20 U		20 UJ	20 UJ	
2,4-DINITROTOLUENE	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U.	
2,6-DINITROTOLUENE	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	
2-CHLORONAPHTHALENE	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	
2-CHLOROPHENOL	5 UJ	5 UJ	5 UJ	5 U	5 UJ	5 UJ		5 UJ	5 UJ	
2-METHYLNAPHTHALENE	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U		0.5 U	0.5 U	
2-METHYLPHENOL	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	
2-NITROANILINE	20 U	20 U	20 U	20 U	20 U	20 U		20 U	20 U	
2-NITROPHENOL	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	
3,3'-DICHLOROBENZIDINE	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	
3-NITROANILINE	20 U	20 U	20 U	20 U	20 U	20 U		20 U	20 U	
4,6-DINITRO-2-METHYLPHENOL	20 U	20 U	20 U	20 U	20 U	20 U		20 U	20 U	
4-BROMOPHENYL PHENYL ETHER	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	

SUMMARY OF SITE 3 GROUNDWATER DATA - PERMANENT WELLS - AREA A DOWNSTREAM
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	2DMW25S	2DMW26D	2DMW26S	2DMW27D	2DMW28D	2DMW28S	2DMW29S	2DMW29S	2DMW30S	3MW14S
nsample	S32DMW25S01	S32DMW26D01	S32DMW26S01	S32DMW27D01	S32DMW28D01	S32DMW28S01	S3MW29S03	S32DMW29S04	S32DMW30S01	S3MW14S01
sample	S32DMW25S01	S32DMW26D01	S32DMW26S01	S32DMW27D01	S32DMW28D01	S32DMW28S01	S3MW29S03	S32DMW29S04	S32DMW30S01	S3MW14S01
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	7/22/00	7/22/00	7/22/00	8/3/00	7/23/00	7/23/00	6/23/00	7/12/00	7/12/00	7/25/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
4-CHLORO-3-METHYLPHENOL	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	
4-CHLOROANILINE	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	
4-CHLOROPHENYL PHENYL ETHER	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	
4-METHYLPHENOL	5 U	2 J	5 U	5 U	5 U	5 U		5 U	5 U	
4-NITROANILINE	20 U	20 U	20 U	20 U	20 U	20 U		20 U	20 U	
4-NITROPHENOL	20 U	20 U	20 U	20 U	20 U	20 U		20 U	20 U	
ACENAPHTHENE	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U		0.5 U	0.5 U	
ACENAPHTHYLENE	1 U	1 U	1 U	1 U	1 U	1 U		1 U	1 U	
ANTHRACENE	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U		0.05 U	0.05 U	
BENZO(A)ANTHRACENE	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U		0.05 U	0.06	
BENZO(A)PYRENE	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U		0.05 U	0.08	
BENZO(B)FLUORANTHENE	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U		0.1 U	0.05 J	
BENZO(G,H,I)PERYLENE	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U		0.1 U	0.09 J	
BENZO(K)FLUORANTHENE	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U		0.05 U	0.03 J	
BIS(2-CHLOROETHOXY)METHANE	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	
BIS(2-CHLOROETHYL)ETHER	5 U	5 U	5 U	5 U	5 U	5 U		5 UJ	5 UJ	
BIS(2-ETHYLHEXYL)PHTHALATE	5 U	5 U	0.9 U	5 U	5 U	5 U		5 U	5 U	
BUTYLBENZYL PHTHALATE	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	
CARBAZOLE	5 U	5 U	5 U		5 U	5 U				
CHRYSENE	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U		0.05 U	0.04 J	
DIBENZO(A,H)ANTHRACENE	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U		0.1 U	0.1 U	
DIBENZOFURAN	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	
DIETHYL PHTHALATE	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	
DIMETHYL PHTHALATE	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	
DI-N-BUTYL PHTHALATE	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	
DI-N-OCTYL PHTHALATE	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	
FLUORANTHENE	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U		0.1 U	0.1	
FLUORENE	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U		0.1 U	0.1 U	
HEXACHLOROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	
HEXACHLOROBUTADIENE	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	
HEXACHLOROCYCLOPENTADIENE	5 U	5 U	5 U	5 UJ	5 U	5 U		5 U	5 U	
HEXACHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	
INDENO(1,2,3-CD)PYRENE	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U		0.05 U	0.06	
ISOPHORONE	5 U	5 U	5 U	5 U	5 U	5 U		5 UJ	5 UJ	
NAPHTHALENE	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U		0.5 U	0.5 U	
NITROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	

SUMMARY OF SITE 3 GROUNDWATER DATA - PERMANENT WELLS - AREA A DOWNSTREAM
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	2DMW25S	2DMW26D	2DMW26S	2DMW27D	2DMW28D	2DMW28S	2DMW29S	2DMW29S	2DMW30S	3MW14S
nsample	S32DMW25S01	S32DMW26D01	S32DMW26S01	S32DMW27D01	S32DMW28D01	S32DMW28S01	S3MW29S03	S32DMW29S04	S32DMW30S01	S3MW14S01
sample	S32DMW25S01	S32DMW26D01	S32DMW26S01	S32DMW27D01	S32DMW28D01	S32DMW28S01	S3MW29S03	S32DMW29S04	S32DMW30S01	S3MW14S01
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	7/22/00	7/22/00	7/22/00	8/3/00	7/23/00	7/23/00	6/23/00	7/12/00	7/12/00	7/25/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
N-NITROSO-DI-N-PROPYLAMINE	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	
N-NITROSODIPHENYLAMINE	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	
PENTACHLOROPHENOL	20 U	20 U	20 U	20 U	20 U	20 U		20 U	20 U	
PHENANTHRENE	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U		0.05 U	0.03 J	
PHENOL	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	
PYRENE	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U		0.05 U	0.13	
Pesticides/PCBs (ug/L)										
4,4'-DDD	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U		0.02 U	0.019 J	
4,4'-DDE	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U		0.02 U	0.02 U	
4,4'-DDT	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U		0.02 U	0.034 J	
ALDRIN	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U		0.01 U	0.01 U	
ALPHA-BHC	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U		0.01 U	0.01 U	
ALPHA-CHLORDANE	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U		0.01 U	0.01 U	
AROCLOR-1016								0.2 U	0.2 U	
AROCLOR-1221								0.4 U	0.4 U	
AROCLOR-1232								0.2 U	0.2 U	
AROCLOR-1242								0.2 U	0.2 U	
AROCLOR-1248								0.2 U	0.2 U	
AROCLOR-1254								0.2 U	0.2 U	
AROCLOR-1260								0.2 U	0.2 U	
BETA-BHC	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U		0.01 U	0.01 U	
DELTA-BHC	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U		0.01 U	0.01 U	
DIELDRIN	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U		0.02 U	0.02 U	
ENDOSULFAN I	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U		0.01 U	0.01 U	
ENDOSULFAN II	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U		0.02 U	0.02 U	
ENDOSULFAN SULFATE	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U		0.02 U	0.02 U	
ENDRIN	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U		0.02 U	0.02 U	
ENDRIN ALDEHYDE	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U		0.02 U	0.02 U	
ENDRIN KETONE	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U		0.02 U	0.02 U	
GAMMA-BHC (LINDANE)	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U		0.01 U	0.01 U	
GAMMA-CHLORDANE	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U		0.01 U	0.01 U	
HEPTACHLOR	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U		0.01 U	0.01 U	
HEPTACHLOR EPOXIDE	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U		0.01 U	0.01 U	
METHOXYCHLOR	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U		0.1 U	0.1 U	
TOXAPHENE	1 U	1 U	1 U	1 U	1 U	1 U		1 U	1 U	
Total Metals (ug/L)										

SUMMARY OF SITE 3 GROUNDWATER DATA - PERMANENT WELLS - AREA A DOWNSTREAM
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	2DMW25S	2DMW26D	2DMW26S	2DMW27D	2DMW28D	2DMW28S	2DMW29S	2DMW29S	2DMW30S	3MW14S
nsample	S32DMW25S01	S32DMW26D01	S32DMW26S01	S32DMW27D01	S32DMW28D01	S32DMW28S01	S3MW29S03	S32DMW29S04	S32DMW30S01	S3MW14S01
sample	S32DMW25S01	S32DMW26D01	S32DMW26S01	S32DMW27D01	S32DMW28D01	S32DMW28S01	S3MW29S03	S32DMW29S04	S32DMW30S01	S3MW14S01
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	7/22/00	7/22/00	7/22/00	8/3/00	7/23/00	7/23/00	6/23/00	7/12/00	7/12/00	7/25/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
ANTIMONY	279 U	112 U	170 U	50.5 U	188 U	142 U		50.5 U	818	
ALUMINUM	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U		2.6 U	2.6 U	
ARSENIC	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U		6.1	2.3 U	
BARIUM	43.9 U	48.5 U	13.4 U	4.1 U	19.9 U	170		17.6 U	31.7	
BERYLLIUM	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U		0.72 U	1 U	
CADMIUM	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.71		0.25 U	0.25 U	
CALCIUM	6550	21000	8840	32300	53800	21300		12500	15100	
CHROMIUM	6.2 U	6.2 U	6.2 U	15.1	6.2 U	6.2 U		6.2 U	16.1	
COBALT	4.2 U	4.2 U	4.2 U	4.2 U	6 U	4.2 U		7.1 J	8.9	
COPPER	6.8 U	6.8 U	6.8 U	6.8 U	6.8 U	6.8 U		6.8 U	12 J	
IRON	159 U	7480	270 U	319	7930	37.2 U		6630	1920	
LEAD	6.5	1.8 U	1.8 U	1.8 U	1.9 J	1.8 U		4	4.9	
MAGNESIUM	1550	5050	1770	2710	5380	2610		3330	3630	
MANGANESE	50.9	496	5.6 U	97.5	2380	10.2 U		186	259	
MERCURY	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U		0.07 U	0.07 U	
NICKEL	9.2 U	9.2 U	9.2 U	16.1 J	9.2 U	9.2 U		9.2 U	20.4	
POTASSIUM	1980	4210	2540	2270	2960	3390		3480	3280	
SELENIUM	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U		2.8 U	2.8 U	
SILVER	5.2 UR	5.2 UR	5.2 UR	5.2 U	5.2 UR	5.2 UR		5.2 U	5.2 U	
SODIUM	28800	58100	45200	20000 J	18900	131000		59700	50200	
THALLIUM	3 U	3 U	3 U	3 U	3 U	3 U		3 U	3 U	
VANADIUM	6.3 U	6.3 U	6.3 U	6.3 U	6.9 U	6.3 U		6.3 U	6.3 U	
ZINC	15.8 U	20.1 U	17.3 U	73.9	18.5 U	10.5 U		29.2	28.8	
Dissolved Metals (ug/L)										
ALUMINUM, FILTERED										
ANTIMONY, FILTERED										
ARSENIC, FILTERED										
BARIUM, FILTERED										
BERYLLIUM, FILTERED										
CADMIUM, FILTERED										
CALCIUM, FILTERED										
CHROMIUM, FILTERED										
COBALT, FILTERED										
COPPER, FILTERED										
IRON, FILTERED										
LEAD, FILTERED										

SUMMARY OF SITE 3 GROUNDWATER DATA - PERMANENT WELLS - AREA A DOWNSTREAM
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	2DMW25S	2DMW26D	2DMW26S	2DMW27D	2DMW28D	2DMW28S	2DMW29S	2DMW29S	2DMW30S	3MW14S
nsample	S32DMW25S01	S32DMW26D01	S32DMW26S01	S32DMW27D01	S32DMW28D01	S32DMW28S01	S3MW29S03	S32DMW29S04	S32DMW30S01	S3MW14S01
sample	S32DMW25S01	S32DMW26D01	S32DMW26S01	S32DMW27D01	S32DMW28D01	S32DMW28S01	S3MW29S03	S32DMW29S04	S32DMW30S01	S3MW14S01
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	7/22/00	7/22/00	7/22/00	8/3/00	7/23/00	7/23/00	6/23/00	7/12/00	7/12/00	7/25/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
MAGNESIUM, FILTERED										
MANGANESE, FILTERED										
MERCURY, FILTERED										
NICKEL, FILTERED										
POTASSIUM, FILTERED										
SELENIUM, FILTERED										
SILVER, FILTERED										
SODIUM, FILTERED										
THALLIUM, FILTERED										
VANADIUM, FILTERED										
ZINC, FILTERED										
Miscellaneous Parameters (mg/L)										
ALKALINITY	10.5 J	65.5 J	33 J	72	94 J	18.5 J		21.5	29.8	26 J
AMMONIA	0.26 J	0.22 J	0.1 UJ	0.11 J	0.17 J	0.24 J		0.13	0.38	0.1 UJ
CHLORIDE	48.1	79.5	44.4	31.9	62.8	231		120	83.1	38.6
HARDNESS as CaCO3	22.7	73.2	29.4	91.8	156	63.9		44.9	52.6	2 U
SULFATE	14.2	21.9	26.3	14.4	16.5	21.6		24.6	29.1	27
SULFIDE	2 UR	2 UR	2 UR	2 UJ	2 UR	2 UR		2 UR	2 UR	2 UR
TOTAL DISSOLVED SOLIDS	121 J	246 J	164 J	161 J	332 J	525 J		229	249	
TOTAL ORGANIC CARBON	1.3	2.2	1.4	1.2	1.3	1.1		18	2.6	1.8
TOTAL SUSPENDED SOLIDS	5 UJ	8 J	5 UJ	5 UJ	7 J	5 J		5 U	751	

APPENDIX B.5

SITE 14 - OBDANE GROUNDWATER DATA

SUMMARY OF SITE 14 GROUNDWATER DATA
OBDANE
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON,GROTON, CONNECTICUT

location	S14MW01S
matrix	GW
nsample	S14MW01S-01
sample_dat	8/5/00
validated	TRUE
cto_proj	312
proj_manag	CERCONE, D.

Volatile Organics (ug/L)

1,1,1-TRICHLOROETHANE	1 U
1,1,2,2-TETRACHLOROETHANE	1 U
1,1,2-TRICHLOROETHANE	1 U
1,1-DICHLOROETHANE	1 U
1,1-DICHLOROETHENE	1 U
1,2,4-TRICHLOROBENZENE	1 U
1,2-DIBROMOETHANE	1 U
1,2-DICHLOROBENZENE	1 U
1,2-DICHLOROETHANE	1 U
1,2-DICHLOROPROPANE	1 U
1,3-DICHLOROBENZENE	1 U
1,4-DICHLOROBENZENE	1 U
2-BUTANONE	5 UR
4-METHYL-2-PENTANONE	5 U
ACETONE	5 UR
BENZENE	1 U
BROMOCHLOROMETHANE	1 U
BROMODICHLOROMETHANE	1 U
BROMOFORM	1 UJ
BROMOMETHANE	1 UJ
CARBON DISULFIDE	1 U
CARBON TETRACHLORIDE	1 U
CHLOROBENZENE	1 U
CHLOROETHANE	1 U
CHLOROFORM	1 U
CHLOROMETHANE	1 U
CIS-1,2-DICHLOROETHENE	1 U
CIS-1,3-DICHLOROPROPENE	1 U
DIBROMOCHLOROMETHANE	1 U
ETHYLBENZENE	1 U
METHYLENE CHLORIDE	3 U
STYRENE	1 U
TETRACHLOROETHENE	1 U
TOLUENE	1 U
TRANS-1,2-DICHLOROETHENE	1 U
TRANS-1,3-DICHLOROPROPENE	1 U
TRICHLOROETHENE	1 U
VINYL CHLORIDE	1 U
XYLENES, TOTAL	1 U

Total Metals (ug/L)

ALUMINUM	93.6 U
ANTIMONY	2.6 U
ARSENIC	2.3 U
BARIUM	48.8
BERYLLIUM	0.72 U
CADMIUM	0.25 U
CALCIUM	6890
CHROMIUM	6.2 U
COBALT	4.2 U
COPPER	6.8 U
IRON	1330
LEAD	1.8 U
MAGNESIUM	3060
MANGANESE	88.2
MERCURY	0.09 UJ
NICKEL	9.2 U
POTASSIUM	2780
SELENIUM	2.8 U
SILVER	5.2 U
SODIUM	31500
THALLIUM	3.0 U
VANADIUM	6.3 U
ZINC	20.0 U

Miscellaneous Parameters (ug/L)

TOTAL DISSOLVED SOLIDS	122 J
TOTAL SUSPENDED SOLIDS	5 UJ

APPENDIX B.6

SITE 7 - TORPEDO SHOPS SOIL DATA

SUMMARY OF SITE 7 SOIL DATA - TORPEDO SHOPS
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	7MW2S	7TB1	7TB1	7TB2	7TB5	7MW1D	7TB3	7MW3S	7TB4	7TB6	7TB10
matrix	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
nsample	080990-7MW2(2-4)	080990-7TB1(2-4)	080990-7TB1(2-4)-D	080990-7TB2(2-4)	081090-7TB5(6-8)	081390-7MW1(0-2)	081390-7TB3(4-6)	081490-7MW3(6-8)	081490-7TB4(4-6)	081490-7TB6(6-8)	7 SO 10 0103
sample	7MW2(2-4)	7TB1(2-4)	7TB7(2-4)	7TB2(2-4)	7TB5(6-8)	7MW1(0-2)	7TB3(4-6)	7MW3(6-8)	7TB4(4-6)	7TB6(6-8)	7 SO 10 0103
sacode	NORMAL	DUP	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
top_depth	2	2	2	2	6	0	4	6	4	6	1
bottom_dep	4	4	4	4	8	2	6	8	6	8	3
sample_dat	8/9/90	8/9/90	8/9/90	8/9/90	8/10/90	8/13/90	8/13/90	8/14/90	8/14/90	8/14/90	3/6/94
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
coll_meth	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
cto	129	129	129	129	129	129	129	129	129	129	129
proj_manag	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt
duplicate			080990-7TB1(2-4)								
Volatile Organics (ug/kg)											
1,1,1-TRICHLOROETHANE	6 U	6 U	6 U	6 U	8 U	7 U	6 U	6 U	6 U	7 U	11 U
1,1,2,2-TETRACHLOROETHANE	6 U	6 U	6 U	6 U	8 U	7 U	6 U	6 U	6 U	7 U	11 U
1,1,2-TRICHLOROETHANE	6 U	6 U	6 U	6 U	8 U	7 U	6 U	6 U	6 U	7 U	11 U
1,1-DICHLOROETHANE	6 U	6 U	6 U	6 U	8 U	7 U	6 U	6 U	6 U	7 U	11 U
1,1-DICHLOROETHENE	6 U	6 U	6 U	6 U	8 U	7 U	6 U	6 U	6 U	7 U	11 U
1,2-DICHLOROETHANE	6 U	6 U	6 U	6 U	8 U	7 U	6 U	6 U	6 U	7 U	11 U
1,2-DICHLOROETHENE (TOTAL)	6 U	6 U	6 U	6 U	8 U	7 U	6 U	6 U	6 U	7 U	11 U
1,2-DICHLOROPROPANE	6 U	6 U	6 U	6 U	8 U	7 U	6 U	6 U	6 U	7 U	11 U
2-BUTANONE	12 U	12 U	13 U	12 U	32	14 U	12 U	11 U	12 U	14 U	11 U
2-HEXANONE	12 U	12 U	13 U	12 U	15 U	14 U	12 U	11 U	12 U	14 U	11 U
4-METHYL-2-PENTANONE	12 U	12 U	13 U	12 U	15 U	14 U	12 U	11 U	12 U	14 U	11 U
ACETONE	12 U	12 U	13 U	12 U	170	41 U	12 U	11 U	12 U	77	11 U
BENZENE	6 U	6 U	6 U	6 U	4 J	7 U	6 U	6 U	6 U	7 U	11 U
BROMODICHLOROMETHANE	6 U	6 U	6 U	6 U	8 U	7 U	6 U	6 U	6 U	7 U	11 U
BROMOFORM	6 U	6 U	6 U	6 U	8 U	7 U	6 U	6 U	6 U	7 U	11 U
BROMOMETHANE	12 U	12 U	13 U	12 U	15 U	14 U	12 U	11 U	12 U	14 U	11 U
CARBON DISULFIDE	6 U	6 U	6 U	6 U	5 J	7 U	6 U	6 U	6 U	3 J	11 U
CARBON TETRACHLORIDE	6 U	6 U	6 U	6 U	8 U	7 U	6 U	6 U	6 U	7 U	11 U
CHLOROBENZENE	6 U	6 U	6 U	6 U	8 U	7 U	6 U	6 U	6 U	7 U	11 U
CHLOROETHANE	12 U	12 U	13 U	12 U	15 U	14 U	12 U	11 U	12 U	14 U	11 U
CHLOROFORM	6 U	6 U	6 U	6 U	8 U	7 U	6 U	6 U	6 U	7 U	11 U
CHLOROMETHANE	12 U	12 U	13 U	12 U	15 U	14 U	12 U	11 U	12 U	14 U	11 U
CIS-1,2-DICHLOROETHENE											
CIS-1,3-DICHLOROPROPENE	6 U	6 U	6 U	6 U	8 U	7 U	6 U	6 U	6 U	7 U	11 U
DIBROMOCHLOROMETHANE	6 U	6 U	6 U	6 U	8 U	7 U	6 U	6 U	6 U	7 U	11 U
ETHYLBENZENE	6 U	6 U	6 U	6 U	8 U	7 U	6 U	6 U	6 U	7 U	11 U
M+P-XYLENES											
METHYLENE CHLORIDE	4 J	6 U	3 J	3 J	3 J	7 U	6 U	6 U	6 U	7 U	11 U
O-XYLENE											
STYRENE	6 U	6 U	6 U	6 U	8 U	7 U	6 U	6 U	6 U	7 U	11 U
TETRACHLOROETHENE	6 U	6 U	6 U	6 U	8 U	7 U	6 U	6 U	6 U	7 U	11 U
TOLUENE	6 U	6 U	6 U	6 U	8 U	7 U	6 U	6 U	6 U	7 U	6 J
TRANS-1,2-DICHLOROETHENE											
TRANS-1,3-DICHLOROPROPENE	6 U	6 U	6 U	6 U	8 U	7 U	6 U	6 U	6 U	7 U	11 U

SUMMARY OF SITE 7 SOIL DATA - TORPEDO SHOPS
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	7MW2S	7TB1	7TB1	7TB2	7TB5	7MW1D	7TB3	7MW3S	7TB4	7TB6	7TB10
matrix	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
nsample	080990-7MW2(2-4)	080990-7TB1(2-4)	080990-7TB1(2-4)-D	080990-7TB2(2-4)	081090-7TB5(6-8)	081390-7MW1(0-2)	081390-7TB3(4-6)	081490-7MW3(6-8)	081490-7TB4(4-6)	081490-7TB6(6-8)	7 SO 10 0103
sample	7MW2(2-4)	7TB1(2-4)	7TB7(2-4)	7TB2(2-4)	7TB5(6-8)	7MW1(0-2)	7TB3(4-6)	7MW3(6-8)	7TB4(4-6)	7TB6(6-8)	7 SO 10 0103
sacode	NORMAL	DUP	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
top_depth	2	2	2	2	6	0	4	6	4	6	1
bottom_dep	4	4	4	4	8	2	6	8	6	8	3
sample_dat	8/9/90	8/9/90	8/9/90	8/9/90	8/10/90	8/13/90	8/13/90	8/14/90	8/14/90	8/14/90	3/6/94
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
coll_meth	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
cto	129	129	129	129	129	129	129	129	129	129	129
proj_manag	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt
duplicate			080990-7TB1(2-4)								
TRICHLOROETHENE	6 U	6 U	6 U	6 U	8 U	7 U	6 U	6 U	6 U	7 U	11 U
VINYL ACETATE	12 U	12 U	13 U	12 U	15 U	14 U	12 U	11 U	12 U	14 U	11 U
VINYL CHLORIDE	12 U	12 U	13 U	12 U	15 U	14 U	12 U	11 U	12 U	14 U	11 U
XYLENES, TOTAL	6 U	6 U	6 U	6 U	8 U	7 U	6 U	6 U	6 U	7 U	11 U
Semivolatile Organics (ug/kg)											
1,2,4-TRICHLOROBENZENE	400 U	410 U	420 U	400 U	500 U	450 U	390 U	370 U	410 U	480 U	360 U
1,2-DICHLOROBENZENE	400 U	410 U	420 U	400 U	500 U	450 U	390 U	370 U	410 U	480 U	360 U
1,3-DICHLOROBENZENE	400 U	410 U	420 U	400 U	500 U	450 U	390 U	370 U	410 U	480 U	360 U
1,4-DICHLOROBENZENE	400 U	410 U	420 U	400 U	500 U	450 U	390 U	370 U	410 U	480 U	360 U
2,2'-OXYBIS(1-CHLOROPROPANE)											
2,4,5-TRICHLOROPHENOL	2000 U	2000 U	2000 U	2000 U	2400 U	2200 U	1900 U	1800 U	2000 U	2300 U	870 U
2,4,6-TRICHLOROPHENOL	400 U	410 U	420 U	400 U	500 U	450 U	390 U	370 U	410 U	480 U	360 U
2,4-DICHLOROPHENOL	400 U	410 U	420 U	400 U	500 U	450 U	390 U	370 U	410 U	480 U	360 U
2,4-DIMETHYLPHENOL	400 U	410 U	420 U	400 U	500 U	450 U	390 U	370 U	410 U	480 U	360 U
2,4-DINITROPHENOL	2000 U	2000 U	2000 U	2000 U	2400 U	2200 U	1900 U	1800 U	2000 U	2300 U	870 U
2,4-DINITROTOLUENE	400 U	410 U	420 U	400 U	500 U	450 U	390 U	370 U	410 U	480 U	360 U
2,6-DINITROTOLUENE	400 U	410 U	420 U	400 U	500 U	450 U	390 U	370 U	410 U	480 U	360 U
2-CHLORONAPHTHALENE	400 U	410 U	420 U	400 U	500 U	450 U	390 U	370 U	410 U	480 U	360 U
2-CHLOROPHENOL	400 U	410 U	420 U	400 U	500 U	450 U	390 U	370 U	410 U	480 U	360 U
2-METHYLNAPHTHALENE	400 U	410 U	420 U	400 U	500 U	450 U	390 U	370 U	410 U	480 U	110 J
2-METHYLPHENOL	400 U	410 U	420 U	400 U	500 U	450 U	390 U	370 U	410 U	480 U	360 U
2-NITROANILINE	2000 U	2000 U	2000 U	2000 U	2400 U	2200 U	1900 U	1800 U	2000 U	2300 U	870 U
2-NITROPHENOL	400 U	410 U	420 U	400 U	500 U	450 U	390 U	370 U	410 U	480 U	360 U
3,3'-DICHLOROBENZIDINE	810 U	820 U	840 U	810 U	1000 U	900 U	790 U	750 U	820 U	960 U	360 U
3-NITROANILINE	2000 U	2000 U	2000 U	2000 U	2400 U	2200 U	1900 U	1800 U	2000 U	2300 U	870 U
4,6-DINITRO-2-METHYLPHENOL	2000 U	2000 U	2000 U	2000 U	2400 U	2200 U	1900 U	1800 U	2000 U	2300 U	870 U
4-BROMOPHENYL PHENYL ETHER	400 U	410 U	420 U	400 U	500 U	450 U	390 U	370 U	410 U	480 U	360 U
4-CHLORO-3-METHYLPHENOL	400 U	410 U	420 U	400 U	500 U	450 U	390 U	370 U	410 U	480 U	360 U
4-CHLOROANILINE	400 U	410 U	420 U	400 U	500 U	450 U	390 U	370 U	410 U	480 U	360 U
4-CHLOROPHENYL PHENYL ETHER	400 U	410 U	420 U	400 U	500 U	450 U	390 U	370 U	410 U	480 U	360 U
4-METHYLPHENOL	560	410 U	420 U	400 U	500 U	450 U	390 U	370 U	410 U	480 U	360 U
4-NITROANILINE	2000 U	2000 U	2000 U	2000 U	2400 U	2200 U	1900 U	1800 U	2000 U	2300 U	870 U
4-NITROPHENOL	2000 U	2000 U	2000 U	2000 U	2400 U	2200 U	1900 U	1800 U	2000 U	2300 U	870 U
ACENAPHTHENE	47 J	410 U	420 U	400 U	500 U	450 U	390 U	370 U	410 U	480 U	720
ACENAPHTHYLENE	400 U	410 U	420 U	400 U	500 U	450 U	390 U	370 U	410 U	480 U	55 J

SUMMARY OF SITE 7 SOIL DATA - TORPEDO SHOPS
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	7MW2S	7TB1	7TB1	7TB2	7TB5	7MW1D	7TB3	7MW3S	7TB4	7TB6	7TB10
matrix	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
nsample	080990-7MW2(2-4)	080990-7TB1(2-4)	080990-7TB1(2-4)-D	080990-7TB2(2-4)	081090-7TB5(6-8)	081390-7MW1(0-2)	081390-7TB3(4-6)	081490-7MW3(6-8)	081490-7TB4(4-6)	081490-7TB6(6-8)	7 SO 10 0103
sample	7MW2(2-4)	7TB1(2-4)	7TB7(2-4)	7TB2(2-4)	7TB5(6-8)	7MW1(0-2)	7TB3(4-6)	7MW3(6-8)	7TB4(4-6)	7TB6(6-8)	7 SO 10 0103
sacode	NORMAL	DUP	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
top_depth	2	2	2	2	6	0	4	6	4	6	1
bottom_dep	4	4	4	4	8	2	6	8	6	8	3
sample_dat	8/9/90	8/9/90	8/9/90	8/9/90	8/10/90	8/13/90	8/13/90	8/14/90	8/14/90	8/14/90	3/6/94
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
coll_meth	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
cto	129	129	129	129	129	129	129	129	129	129	129
proj_manag	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt
duplicate			080990-7TB1(2-4)								
ANTHRACENE	55 J	410 U	420 U	400 U	500 U	450 U	390 U	370 U	410 U	480 U	1300
BENZO(A)ANTHRACENE	210 J	410 U	420 U	400 U	500 U	270 J	390 U	370 U	410 U	480 U	2700
BENZO(A)PYRENE	290 J	410 U	420 U	400 U	500 U	570	40 J	370 U	410 U	480 U	1900
BENZO(B)FLUORANTHENE	270 J	410 U	420 U	400 U	500 U	610	61 J	370 U	410 U	480 U	3200 J
BENZO(G,H,I)PERYLENE	190 J	410 U	420 U	400 U	500 U	540	390 U	370 U	410 U	480 U	1200
BENZO(K)FLUORANTHENE	290 J	410 U	420 U	400 U	500 U	510	48 J	370 U	410 U	480 U	360 U
BENZOIC ACID	86 J	2000 U	2000 U	2000 U	2400 U	2200 U	90 J	1800 U	2000 U	2300 U	110 J
BENZYL ALCOHOL	400 U	410 U	420 U	400 U	500 U	450 U	390 U	370 U	410 U	480 U	360 U
BIS(2-CHLOROETHOXY)METHANE	400 U	410 U	420 U	400 U	500 U	450 U	390 U	370 U	410 U	480 U	360 U
BIS(2-CHLOROETHYL)ETHER	400 U	410 U	420 U	400 U	500 U	450 U	390 U	370 U	410 U	480 U	360 U
BIS(2-CHLOROISOPROPYL) ETHER	400 U	410 U	420 U	400 U	500 U	450 U	390 U	370 U	410 U	480 U	360 U
BIS(2-ETHYLHEXYL)PHTHALATE	130 J	180 J	140 J	190 J	500 U	170 U	740 J	370 U	410 U	480 U	360 U
BUTYLBENZYL PHTHALATE	400 U	410 U	420 U	400 U	500 U	450 U	390 U	370 U	410 U	480 U	360 U
CARBAZOLE											640
CHRYSENE	280 J	410 U	420 U	400 U	500 U	380 J	44 J	370 U	410 U	480 U	2400
DI-N-BUTYL PHTHALATE	60 J	100 J	420 U	400 U	65 J	450 U	130 J	370 U	170 J	88 J	360 U
DI-N-OCTYL PHTHALATE	400 U	410 U	420 U	400 U	500 U	450 U	390 U	370 U	410 U	480 U	360 U
DIBENZO(A,H)ANTHRACENE	400 U	410 U	420 U	400 U	500 U	63 J	390 U	370 U	410 U	480 U	360 U
DIBENZOFURAN	400 U	410 U	420 U	400 U	500 U	450 U	390 U	370 U	410 U	480 U	340 J
DIETHYL PHTHALATE	400 U	410 U	420 U	400 U	94 J	450 U	390 U	370 U	410 U	480 U	360 U
DIMETHYL PHTHALATE	400 U	410 U	420 U	400 U	500 U	450 U	390 U	370 U	410 U	480 U	360 U
FLUORANTHENE	580	410 U	420 U	43 J	500 U	390 J	60 J	370 U	410 U	480 U	3800 J
FLUORENE	43 J	410 U	420 U	400 U	500 U	450 U	390 U	370 U	410 U	480 U	660
HEXACHLOROBENZENE	400 U	410 U	420 U	400 U	500 U	450 U	390 U	370 U	410 U	480 U	360 U
HEXACHLOROBUTADIENE	400 U	410 U	420 U	400 U	500 U	450 U	390 U	370 U	410 U	480 U	360 U
HEXACHLOROCYCLOPENTADIENE	400 U	410 U	420 U	400 U	500 U	450 U	390 U	370 U	410 U	480 U	360 U
HEXACHLOROETHANE	400 U	410 U	420 U	400 U	500 U	450 U	390 U	370 U	410 U	480 U	360 U
INDENO(1,2,3-CD)PYRENE	230 J	410 U	420 U	400 U	500 U	540	390 U	370 U	410 U	480 U	1200
ISOPHORONE	400 U	410 U	420 U	400 U	500 U	450 U	390 U	370 U	410 U	480 U	360 U
N-NITROSO-DI-N-PROPYLAMINE	400 U	410 U	420 U	400 U	500 U	450 U	390 U	370 U	410 U	480 U	360 U
N-NITROSODIPHENYLAMINE	400 U	410 U	420 U	400 U	500 U	450 U	390 U	370 U	410 U	480 U	360 U
NAPHTHALENE	400 U	410 U	420 U	400 U	500 U	450 U	390 U	370 U	410 U	480 U	260 J
NITROBENZENE	400 U	410 U	420 U	400 U	500 U	450 U	390 U	370 U	410 U	480 U	360 U
PENTACHLOROPHENOL	2000 U	2000 U	2000 U	2000 U	2400 U	2200 U	1900 U	1800 U	2000 U	2300 U	870 U
PHENANTHRENE	560	410 U	420 U	400 U	500 U	170 J	390 U	370 U	410 U	480 U	4100 J

SUMMARY OF SITE 7 SOIL DATA - TORPEDO SHOPS
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	7MW2S	7TB1	7TB1	7TB2	7TB5	7MW1D	7TB3	7MW3S	7TB4	7TB6	7TB10
matrix	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
nsample	080990-7MW2(2-4)	080990-7TB1(2-4)	080990-7TB1(2-4)-D	080990-7TB2(2-4)	081090-7TB5(6-8)	081390-7MW1(0-2)	081390-7TB3(4-6)	081490-7MW3(6-8)	081490-7TB4(4-6)	081490-7TB6(6-8)	7 SO 10 0103
sample	7MW2(2-4)	7TB1(2-4)	7TB7(2-4)	7TB2(2-4)	7TB5(6-8)	7MW1(0-2)	7TB3(4-6)	7MW3(6-8)	7TB4(4-6)	7TB6(6-8)	7 SO 10 0103
sacode	NORMAL	DUP	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
top_depth	2	2	2	2	6	0	4	6	4	6	1
bottom_dep	4	4	4	4	8	2	6	8	6	8	3
sample_dat	8/9/90	8/9/90	8/9/90	8/9/90	8/10/90	8/13/90	8/13/90	8/14/90	8/14/90	8/14/90	3/6/94
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
coll_meth	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
cto	129	129	129	129	129	129	129	129	129	129	129
proj_manag	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt
duplicate			080990-7TB1(2-4)								
PHENOL	400 U	410 U	420 U	400 U	500 U	450 U	390 U	370 U	410 U	480 U	360 U
PYRENE	550	410 U	420 U	41 J	500 U	330 J	46 J	370 U	410 U	480 U	4200 J
Pesticides/PCBs (ug/kg)											
4,4'-DDD	20 U	20 U	20 U	20 U	24 U	21 U	21 U	20 U	22 U	26 U	36 U
4,4'-DDE	20 U	20 U	20 U	20 U	24 U	21 U	210	20 U	22 U	26 U	36 U
4,4'-DDT	20 U	20 U	20 U	20 U	24 U	21 U	21 U	20 U	22 U	26 U	36 U
ALDRIN	9.8 U	10 U	10 U	9.8 U	12 U	11 U	10 U	10 U	11 U	13 U	18 U
ALPHA-BHC	9.8 U	10 U	10 U	9.8 U	12 U	11 U	10 U	10 U	11 U	13 U	18 U
ALPHA-CHLORDANE	98 U	100 U	100 U	98 U	120 U	110 U	100 U	100 U	110 U	130 U	18 U
AROCLOR-1016	98 U	100 U	100 U	98 U	120 U	110 U	100 U	100 U	110 U	130 U	360 U
AROCLOR-1221	98 U	100 U	100 U	98 U	120 U	110 U	100 U	100 U	110 U	130 U	730 U
AROCLOR-1232	98 U	100 U	100 U	98 U	120 U	110 U	100 U	100 U	110 U	130 U	360 U
AROCLOR-1242	98 U	100 U	100 U	98 U	120 U	110 U	100 U	100 U	110 U	130 U	360 U
AROCLOR-1248	98 U	100 U	100 U	98 U	120 U	110 U	100 U	100 U	110 U	130 U	360 U
AROCLOR-1254	660	200 U	200 U	200 U	240 U	210 U	210 U	200 U	220 U	260 U	360 U
AROCLOR-1260	200 U	200 U	200 U	200 U	240 U	210 U	210 U	200 U	220 U	260 U	360 U
BETA-BHC	9.8 U	10 U	10 U	9.8 U	12 U	11 U	10 U	10 U	11 U	13 U	18 U
DELTA-BHC	9.8 U	10 U	10 U	9.8 U	12 U	11 U	10 U	10 U	11 U	13 U	18 U
DIELDRIN	20 U	20 U	20 U	20 U	24 U	21 U	21 U	20 U	22 U	26 U	36 U
ENDOSULFAN I	9.8 U	10 U	10 U	9.8 U	12 U	11 U	10 U	10 U	11 U	13 U	18 U
ENDOSULFAN II	20 U	20 U	20 U	20 U	24 U	21 U	21 U	20 U	22 U	26 U	36 U
ENDOSULFAN SULFATE	20 U	20 U	20 U	20 U	24 U	21 U	21 U	20 U	22 U	26 U	13 J
ENDRIN	20 U	20 U	20 U	20 U	24 U	21 U	21 U	20 U	22 U	26 U	36 U
ENDRIN ALDEHYDE											36 U
ENDRIN KETONE	20 U	20 U	20 U	20 U	24 U	21 U	21 U	20 U	22 U	26 U	36 U
GAMMA-BHC (LINDANE)	9.8 U	10 U	10 U	9.8 U	12 U	11 U	10 U	10 U	11 U	13 U	18 U
GAMMA-CHLORDANE	98 U	100 U	100 U	98 U	120 U	110 U	100 U	100 U	110 U	130 U	18 U
HEPTACHLOR	9.8 U	10 U	10 U	9.8 U	12 U	11 U	10 U	10 U	11 U	13 U	18 U
HEPTACHLOR EPOXIDE	9.8 U	10 U	10 U	9.8 U	12 U	11 U	10 U	10 U	11 U	13 U	18 U
METHOXYCHLOR	98 U	100 U	100 U	98 U	120 U	110 U	100 U	100 U	110 U	130 U	180 U
TOXAPHENE	200 U	200 U	200 U	200 U	240 U	210 U	210 U	200 U	220 U	260 U	1800 U
Inorganics (mg/kg)											
ALUMINUM	13100	16900	19700	13500	19800	13700	10200	8460	11000	12300	4450
ANTIMONY	14.5 UJ	15.2 UJ	15 UJ	19.4 J	18.2 UJ	19.4 J	17.9 J	14.2 J	17.3 J	16.6 J	3 U
ARSENIC	2.3 J	1.9 J	2.1 J	2.1 J	2.8	1.4	1.4	2.2	2.7	2.6	1.1 J

SUMMARY OF SITE 7 SOIL DATA - TORPEDO SHOPS
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	7MW2S	7TB1	7TB1	7TB2	7TB5	7MW1D	7TB3	7MW3S	7TB4	7TB6	7TB10
matrix	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
nsample	080990-7MW2(2-4)	080990-7TB1(2-4)	080990-7TB1(2-4)-D	080990-7TB2(2-4)	081090-7TB5(6-8)	081390-7MW1(0-2)	081390-7TB3(4-6)	081490-7MW3(6-8)	081490-7TB4(4-6)	081490-7TB6(6-8)	7 SO 10 0103
sample	7MW2(2-4)	7TB1(2-4)	7TB7(2-4)	7TB2(2-4)	7TB5(6-8)	7MW1(0-2)	7TB3(4-6)	7MW3(6-8)	7TB4(4-6)	7TB6(6-8)	7 SO 10 0103
sacode	NORMAL	DUP	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
top_depth	2	2	2	2	6	0	4	6	4	6	1
bottom_dep	4	4	4	4	8	2	6	8	6	8	3
sample_dat	8/9/90	8/9/90	8/9/90	8/9/90	8/10/90	8/13/90	8/13/90	8/14/90	8/14/90	8/14/90	3/6/94
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
coll_meth	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
cto	129	129	129	129	129	129	129	129	129	129	129
proj_manag	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt
duplicate			080990-7TB1(2-4)								
BARIUM	80.4	55.2	63.1	68.3	47.4	159	64.4	56.1	35.2	32.5	42.2
BERYLLIUM	0.61	0.75	1	0.68	0.87	0.58	0.52	0.46	0.57	0.54	0.2 U
BORON	50 R	50 R	56 R	50 R	130 R	110 R	45 R	45 R	49 R	82 R	10 U
CADMIUM	4.4	3.3	5.1	3.2	4.7	4.6	2.9	2.1	2.5	2.3	0.4 U
CALCIUM	1380 J	600 J	848 J	1100 J	1510 J	5830	1680	1540	909	1040	849 J
CHROMIUM	15.7	16.7	19.5	16.9	24.9	18.4 J	14 J	13.6 J	18	20.7 J	7
COBALT	6.7	7.6	6.3	8.1	7.5	14.8	7	6.6	5.5	6	2.9 U
COPPER	21 J	12.2 J	11.6	20 J	9.7 J	39.8 J	23.7 J	19 J	17.1	14.5 J	10.6
CYANIDE	1.5 U	1.6 U	1.6 U	1.5 U	1.9 U	1.6 U	1.4 U	1.4 U	1.5 U	1.6 U	
IRON	14500 J	16100 J	16200 J	13800 J	14000 J	21600	13600	10600	12100	10400	6950
LEAD	12.2 J	9.7 J	7.6 J	11.9 J	11.1 J	7.1 J	9.2 J	11.2 J	3.4 J	3.6 J	10.5 J
MAGNESIUM	4140 J	2610 J	2890 J	3240 J	3120 J	6440	4190	3590	3010	2740	2340
MANGANESE	277 J	239 J	289 J	273 J	138 J	300 J	364 J	229 J	141 J	103 J	184
MERCURY	0.11 U	0.11 U	0.13 U	0.11 U	0.14 U	0.12 U	0.11 U	0.11 U	0.12 U	0.11 U	0.1 UJ
NICKEL	12.9 J	15 J	12.3 J	14.4 J	13.8 J	14.4 J	8.4 J	10 J	11.2 J	8.2 J	5.1
POTASSIUM	2710	625	866	1940	793	5360 J	2600 J	2440 J	1080 J	575 J	2100 J
SELENIUM	0.48 U	0.5 U	0.51 U	0.47 U	0.77	0.5 U	0.44 U	0.45 U	0.48 U	0.5 U	0.6 U
SILVER	1.9 U	2 U	2 U	3	2.4 U	5.5 J	4.7 J	4.9 J	5.3 J	5.4 J	0.4 UJ
SODIUM	117 J	54.8 J	105	118 J	192 J	366 J	112 J	108 J	87.6 J	167 J	340 J
THALLIUM	0.97 U	0.99 U	1 U	0.94 U	1.2 U	1 U	0.87 U	0.91 U	0.95 U	1 U	0.2 U
VANADIUM	32.3	32.7	32.6	31	35.1	45.8	28.5	22.7	25.6	27.8	14.3 U
ZINC	48.4 J	43 J	37.3 J	46.9 J	33.7 J	62.9 J	46.9 J	35.2 J	26.8 J	28.6 J	48.7 J
Miscellaneous Parameters (mg/kg)											
TPH											
TOTAL ORGANIC CARBON											

U - Not Detected
J - Estimated
R - Rejected

SUMMARY OF SITE 7 SOIL DATA - TORPEDO SHOPS
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	7MW4S	7MW6S	7MW6S	7MW10S	7MW11S	7MW5S	7MW7S	7MW8S	7MW9S	7MW9S	7TB12	7TB13	7TB13
matrix	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
nsample	7 SO 4S 0103	7 SO 6S 0305	7 SO 6S 0507	7MW10S-0608	7MW11S-0507	7MW5S-1011	7MW7S-0103	7MW8S-0408	7MW9S-0608	7MW9S-0608-D	7TB12-0204	7TB13-0001	7TB1301.5 03.5
sample	7 SO 4S 0103	7 SO 6S 0305	7 SO 6S 0507	7MW10S-0608	7MW11S-0507	7MW5S-1011	7MW7S-0103	7MW8S-0408	7MW9S-0608	7MW9S-0608D	7TB12-0204	7TB13-0001	7TB1301.5 03.5
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	DUP	DUP	NORMAL	NORMAL	NORMAL
top_depth	1	3	5	6	5	10	1	4	6	6	2	0	1.5
bottom_dep	3	5	7	8	7	11	3	8	8	8	4	1	4
sample_dat	3/6/94	3/6/94	3/6/94	2/8/94	3/9/94	3/8/94	3/7/94	2/6/94	2/6/94	2/6/94	3/8/94	3/8/94	3/8/94
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
coll_meth	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
cto	129	129	129	129	129	129	129	129	129	129	129	129	129
proj_manag	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt
duplicate										7MW9S-0608			
Volatile Organics (ug/kg)													
1,1,1-TRICHLOROETHANE	11 U	12 U	11 U	12 U	24 U	11 U	11 U	61 U	12 U	12 U	11 U		11 U
1,1,2,2-TETRACHLOROETHANE	11 U	12 U	11 U	12 U	24 U	11 U	11 U	61 U	12 U	12 U	11 U		11 U
1,1,2-TRICHLOROETHANE	11 U	12 U	11 U	12 U	24 U	11 U	11 U	61 U	12 U	12 U	11 U		11 U
1,1-DICHLOROETHANE	11 U	12 U	11 U	12 U	24 U	11 U	11 U	61 U	12 U	12 U	11 U		11 U
1,1-DICHLOROETHENE	3 J	12 U	11 U	12 U	24 U	11 UJ	11 U	61 U	12 U	12 U	11 U		11 U
1,2-DICHLOROETHANE	11 U	12 U	11 U	12 U	24 U	11 U	11 U	61 U	12 U	12 U	11 U		11 U
1,2-DICHLOROETHENE (TOTAL)	11 U	12 U	11 U	12 U	24 U	11 U	11 U	61 U	12 U	12 U	11 U		11 U
1,2-DICHLOROPROPANE	11 U	12 U	11 U	12 U	24 U	11 U	11 U	61 U	12 U	12 U	11 U		11 U
2-BUTANONE	11 U	12 U	11 U	12 U	24 U	11 U	11 U	61 U	12 U	12 U	11 U		11 U
2-HEXANONE	11 U	12 U	11 U	12 U	24 U	11 U	11 U	61 U	12 U	12 U	11 U		11 U
4-METHYL-2-PENTANONE	11 U	12 U	11 U	12 U	24 U	11 U	11 U	61 U	12 U	12 U	11 U		11 U
ACETONE	11 J	12 U	11 U	12 U	24 U	11 UJ	11 U	270 U	28 U	43 U	11 U		27 J
BENZENE	11 U	12 U	11 U	12 U	24 U	11 U	11 U	61 U	12 U	12 U	11 U		11 U
BROMODICHLOROMETHANE	11 U	12 U	11 U	12 U	24 U	11 U	11 U	61 U	12 U	12 U	11 U		11 U
BROMOFORM	11 U	12 U	11 U	12 U	24 U	11 U	11 U	61 U	12 U	12 U	11 U		11 U
BROMOMETHANE	11 U	12 U	11 U	12 U	24 U	11 U	11 U	61 U	12 U	12 U	11 U		11 U
CARBON DISULFIDE	11 U	12 U	11 U	12 U	24 U	11 U	11 U	61 U	12 U	12 U	11 U		11 U
CARBON TETRACHLORIDE	11 U	12 U	11 U	12 U	24 U	11 U	11 U	61 U	12 U	12 U	11 U		11 U
CHLOROBENZENE	11 U	12 U	11 U	12 U	24 U	11 U	11 U	61 U	12 U	12 U	11 U		11 U
CHLOROETHANE	11 U	12 U	11 U	12 U	24 U	11 U	11 U	61 U	12 U	12 U	11 U		11 U
CHLOROFORM	11 U	12 U	11 U	12 U	24 U	11 U	11 U	61 U	12 U	12 U	11 U		11 U
CHLOROMETHANE	11 U	12 U	11 U	12 U	24 U	11 U	11 U	61 U	12 U	12 U	11 U		11 U
CIS-1,2-DICHLOROETHENE													
CIS-1,3-DICHLOROPROPENE	11 U	12 U	11 U	12 U	24 U	11 U	11 U	61 U	12 U	12 U	11 U		11 U
DIBROMOCHLOROMETHANE	11 U	12 U	11 U	12 U	24 U	11 U	11 U	61 U	12 U	12 U	11 U		11 U
ETHYLBENZENE	11 U	12 U	11 U	12 U	24 U	11 U	11 U	61 U	12 U	12 U	11 U		11 U
M+P-XYLENES													
METHYLENE CHLORIDE	11 J	12 U	11 U	12 U	10 J	14 J	11 U	420 J	62 J	60 J	8 J		8 J
O-XYLENE													
STYRENE	11 U	12 U	11 U	12 U	24 U	11 U	11 U	61 U	12 U	12 U	11 U		11 U
TETRACHLOROETHENE	11 J	12 U	11 U	12 U	24 U	11 UJ	11 U	18 J	5 J	6 J	11 U		11 U
TOLUENE	4 J	12 U	11 U	12 U	24 U	11 UJ	3 J	61 U	12 U	12 U	5 J		4 J
TRANS-1,2-DICHLOROETHENE													
TRANS-1,3-DICHLOROPROPENE	11 U	12 U	11 U	12 U	24 U	11 U	11 U	61 U	12 U	12 U	11 U		11 U

SUMMARY OF SITE 7 SOIL DATA - TORPEDO SHOPS
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	7MW4S	7MW6S	7MW6S	7MW10S	7MW11S	7MW5S	7MW7S	7MW8S	7MW9S	7MW9S	7TB12	7TB13	7TB13
matrix	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
nsample	7 SO 4S 0103	7 SO 6S 0305	7 SO 6S 0507	7MW10S-0608	7MW11S-0507	7MW5S-1011	7MW7S-0103	7MW8S-0408	7MW9S-0608	7MW9S-0608-D	7TB12-0204	7TB13-0001	7TB1301.5 03.5
sample	7 SO 4S 0103	7 SO 6S 0305	7 SO 6S 0507	7MW10S-0608	7MW11S-0507	7MW5S-1011	7MW7S-0103	7MW8S-0408	7MW9S-0608	7MW9S-0608D	7TB12-0204	7TB13-0001	7TB1301.5 03.5
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	DUP	DUP	NORMAL	NORMAL	NORMAL
top_depth	1	3	5	6	5	10	1	4	6	6	2	0	1.5
bottom_dep	3	5	7	8	7	11	3	8	8	8	4	1	4
sample_dat	3/6/94	3/6/94	3/6/94	2/8/94	3/9/94	3/8/94	3/7/94	2/6/94	2/6/94	2/6/94	3/8/94	3/8/94	3/8/94
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
coll_meth	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
cto	129	129	129	129	129	129	129	129	129	129	129	129	129
proj_manag	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt
duplicate										7MW9S-0608			
TRICHLOROETHENE	11 U	12 U	11 U	12 U	24 U	11 U	11 U	61 U	12 U	12 U	11 U		11 U
VINYL ACETATE	11 U	12 U	11 U	12 U	24 U	11 U	11 U	61 U	12 U	12 U	11 U		11 U
VINYL CHLORIDE	11 U	12 U	11 U	12 U	24 U	11 U	11 U	61 U	12 U	12 U	11 U		11 U
XYLENES, TOTAL	11 J	12 U	11 U	12 U	24 U	11 UJ	11 U	61 U	12 U	12 U	3 J		11 U
Semivolatile Organics (ug/kg)													
1,2,4-TRICHLOROBENZENE	350 U	410 U	380 U	380 U	470 U	370 U	350 U	400 U	400 U	400 U	380 U		380 U
1,2-DICHLOROBENZENE	350 U	410 U	380 U	380 U	470 U	370 U	350 U	400 U	400 U	400 U	380 U		380 U
1,3-DICHLOROBENZENE	350 U	410 U	380 U	380 U	470 U	370 U	350 U	400 U	400 U	400 U	380 U		380 U
1,4-DICHLOROBENZENE	350 U	410 U	380 U	380 U	470 U	370 U	350 U	400 U	400 U	400 U	380 U		380 U
2,2'-OXYBIS(1-CHLOROPROPANE)													
2,4,5-TRICHLOROPHENOL	860 U	990 U	910 U	930 U	1100 U	890 U	860 U	980 U	960 U	980 U	910 U		910 U
2,4,6-TRICHLOROPHENOL	350 U	410 U	380 U	380 U	470 U	370 U	350 U	400 U	400 U	400 U	380 U		380 U
2,4-DICHLOROPHENOL	350 U	410 U	380 U	380 U	470 U	370 U	350 U	400 U	400 U	400 U	380 U		380 U
2,4-DIMETHYLPHENOL	350 U	410 U	380 U	380 U	470 U	370 U	350 U	400 U	400 U	400 U	380 U		380 U
2,4-DINITROPHENOL	860 U	990 U	910 U	930 U	1100 U	890 U	860 U	980 U	960 U	980 U	910 U		910 U
2,4-DINITROTOLUENE	350 U	410 U	380 U	380 U	470 U	370 U	350 U	400 U	400 U	400 U	380 U		380 U
2,6-DINITROTOLUENE	350 U	410 U	380 U	380 U	470 U	370 U	350 U	400 U	400 U	400 U	380 U		380 U
2-CHLORONAPHTHALENE	350 U	410 U	380 U	380 U	470 U	370 U	350 U	400 U	400 U	400 U	380 U		380 U
2-CHLOROPHENOL	350 U	410 U	380 U	380 U	470 U	370 U	350 U	400 U	400 U	400 U	380 U		380 U
2-METHYLNAPHTHALENE	170 J	410 U	380 U	380 U	470 U	370 U	350 U	400 U	400 U	400 U	380 U		23 J
2-METHYLPHENOL	350 U	410 U	380 U	380 U	470 U	370 U	350 U	400 U	400 U	400 U	380 U		380 U
2-NITROANILINE	860 U	990 U	910 U	930 U	1100 U	890 U	860 U	980 U	960 U	980 U	910 U		910 U
2-NITROPHENOL	350 U	410 U	380 U	380 U	470 U	370 U	350 U	400 U	400 U	400 U	380 U		380 U
3,3'-DICHLOROBENZIDINE	350 U	410 U	380 U	380 U	470 U	370 U	350 U	400 U	400 U	400 U	380 U		380 U
3-NITROANILINE	860 U	990 U	910 U	930 U	1100 U	890 U	860 U	980 U	960 U	980 U	910 U		910 U
4,6-DINITRO-2-METHYLPHENOL	860 U	990 U	910 U	930 U	1100 U	890 U	860 U	980 U	960 U	980 U	910 U		910 U
4-BROMOPHENYL PHENYL ETHER	350 U	410 U	380 U	380 U	470 U	370 U	350 U	400 U	400 U	400 U	380 U		380 U
4-CHLORO-3-METHYLPHENOL	350 U	410 U	380 U	380 U	470 U	370 U	350 U	400 U	400 U	400 U	380 U		380 U
4-CHLOROANILINE	350 U	410 U	380 U	380 U	470 U	370 U	350 U	400 U	400 U	400 U	380 U		380 U
4-CHLOROPHENYL PHENYL ETHER	350 U	410 U	380 U	380 U	470 U	370 U	350 U	400 U	400 U	400 U	380 U		380 U
4-METHYLPHENOL	350 U	410 U	380 U	380 U	470 U	370 U	350 U	400 U	400 U	400 U	380 U		380 U
4-NITROANILINE	860 U	990 U	910 U	930 U	1100 U	890 U	860 U	980 U	960 U	980 U	910 U		910 U
4-NITROPHENOL	860 U	990 U	910 U	930 U	1100 U	890 U	860 U	980 U	960 U	980 U	910 U		910 U
ACENAPHTHENE	790	410 U	380 U	380 U	470 U	370 U	350 U	220 J	400 U	400 U	43 J		380 U
ACENAPHTHYLENE	28 J	410 U	380 U	380 U	470 U	370 U	350 U	400 U	400 U	400 U	20 J		380 U

SUMMARY OF SITE 7 SOIL DATA - TORPEDO SHOPS
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	7MW4S	7MW6S	7MW6S	7MW10S	7MW11S	7MW5S	7MW7S	7MW8S	7MW9S	7MW9S	7TB12	7TB13	7TB13
matrix	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
nsample	7 SO 4S 0103	7 SO 6S 0305	7 SO 6S 0507	7MW10S-0608	7MW11S-0507	7MW5S-1011	7MW7S-0103	7MW8S-0408	7MW9S-0608	7MW9S-0608-D	7TB12-0204	7TB13-0001	7TB1301.5 03.5
sample	7 SO 4S 0103	7 SO 6S 0305	7 SO 6S 0507	7MW10S-0608	7MW11S-0507	7MW5S-1011	7MW7S-0103	7MW8S-0408	7MW9S-0608	7MW9S-0608D	7TB12-0204	7TB13-0001	7TB1301.5 03.5
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	DUP	DUP	NORMAL	NORMAL	NORMAL
top_depth	1	3	5	6	5	10	1	4	6	6	2	0	1.5
bottom_dep	3	5	7	8	7	11	3	8	8	8	4	1	4
sample_dat	3/6/94	3/6/94	3/6/94	2/8/94	3/9/94	3/8/94	3/7/94	2/6/94	2/6/94	2/6/94	3/8/94	3/8/94	3/8/94
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
coll_meth	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
cto	129	129	129	129	129	129	129	129	129	129	129	129	129
proj_manag	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt
duplicate										7MW9S-0608			
ANTHRACENE	1100	410 U	380 U	380 U	470 U	21 J	350 U	220 J	400 U	400 U	180 J		380 U
BENZO(A)ANTHRACENE	2400	410 U	380 U	380 U	470 U	55 J	350 U	89 J	400 U	400 U	650		36 J
BENZO(A)PYRENE	1700	33 J	380 U	380 U	190 J	48 J	350 U	81 J	400 U	400 U	800		61 J
BENZO(B)FLUORANTHENE	2800	410 U	380 U	380 U	470 U	57 J	350 U	77 J	400 U	400 U	980		48 J
BENZO(G,H,I)PERYLENE	1300 J	21 J	380 U	380 U	470 U	20 J	350 U	56 J	400 U	400 U	590		57 J
BENZO(K)FLUORANTHENE	350 U	24 J	380 U	380 U	470 U	49 J	350 U	84 J	400 U	400 U	520		35 J
BENZOIC ACID	130 J	2000 U	1800 U	2000 U	51 J	28 J	1700 U	2000 U	2000 U	2000 U	44 J		57 J
BENZYL ALCOHOL	350 U	410 U	380 U	380 U	470 U	370 U	350 U	400 U	400 U	400 U	380 U		380 U
BIS(2-CHLOROETHOXY)METHANE	350 U	410 U	380 U	380 U	470 U	370 U	350 U	400 U	400 U	400 U	380 U		380 U
BIS(2-CHLOROETHYL)ETHER	350 U	410 U	380 U	380 U	470 U	370 U	350 U	400 U	400 U	400 U	380 U		380 U
BIS(2-CHLOROISOPROPYL) ETHER	350 U	410 U	380 U	380 U	470 U	370 U	350 U	400 U	400 U	400 U	380 U		380 U
BIS(2-ETHYLHEXYL)PHTHALATE	350 U	410 U	380 U	380 U	470 U	370 U	350 U	400 U	400 U	400 U	380 U		380 U
BUTYLBENZYL PHTHALATE	350 U	410 U	380 U	380 U	470 U	370 U	350 U	400 U	400 U	400 U	380 U		380 U
CARBAZOLE	660	410 U	380 U	380 U	470 U	370 U	350 U	400 U	400 U	400 U	92 J		380 U
CHRYSENE	2000	410 U	380 U	380 U	470 U	58 J	350 U	94 J	400 U	400 U	720		38 J
DI-N-BUTYL PHTHALATE	20 J	410 U	380 U	380 U	470 U	370 U	350 U	400 U	400 U	400 U	380 U		22 J
DI-N-OCTYL PHTHALATE	350 U	410 U	380 U	380 U	470 U	370 U	350 U	400 U	400 U	400 U	380 U		380 U
DIBENZO(A,H)ANTHRACENE	350 U	410 U	380 U	380 U	470 U	370 U	350 U	400 U	400 U	400 U	380 U		380 U
DIBENZOFURAN	350 J	410 U	380 U	380 U	470 U	370 U	350 U	400 U	400 U	400 U	27 J		380 U
DIETHYL PHTHALATE	350 U	410 U	380 U	380 U	470 U	370 U	14000	400 U	400 U	400 U	380 U		380 U
DIMETHYL PHTHALATE	350 U	410 U	380 U	380 U	470 U	370 U	350 U	400 U	400 U	400 U	380 U		380 U
FLUORANTHENE	3700 J	410 U	380 U	380 U	470 U	130 J	18 J	210 J	400 U	400 U	960		70 J
FLUORENE	710	410 U	380 U	380 U	470 U	370 U	350 U	600	400 U	400 U	66 J		380 U
HEXACHLOROBENZENE	350 U	410 U	380 U	380 U	470 U	370 U	350 U	400 U	400 U	400 U	380 U		380 U
HEXACHLOROBUTADIENE	350 U	410 U	380 U	380 U	470 U	370 U	350 U	400 U	400 U	400 U	380 U		380 U
HEXACHLOROCYCLOPENTADIENE	350 U	410 U	380 U	380 U	470 U	370 U	350 U	400 U	400 U	400 U	380 U		380 U
HEXACHLOROETHANE	350 U	410 U	380 U	380 U	470 U	370 U	350 U	400 U	400 U	400 U	380 U		380 U
INDENO(1,2,3-CD)PYRENE	1100 J	24 J	380 U	380 U	470 U	24 J	350 U	48 J	400 U	400 U	560		50 J
ISOPHORONE	350 U	410 U	380 U	380 U	470 U	370 U	350 U	400 U	400 U	400 U	380 U		380 U
N-NITROSO-DI-N-PROPYLAMINE	350 U	410 U	380 U	380 U	470 U	370 U	350 U	400 U	400 U	400 U	380 U		380 U
N-NITROSODIPHENYLAMINE	350 U	410 U	380 U	380 U	470 U	370 U	350 U	400 U	400 U	400 U	380 U		380 U
NAPHTHALENE	310 J	410 U	380 U	380 U	470 U	370 U	350 U	400 U	400 U	400 U	380 U		380 U
NITROBENZENE	350 U	410 U	380 U	380 U	470 U	370 U	350 U	400 U	400 U	400 U	380 U		380 U
PENTACHLOROPHENOL	860 U	990 U	910 U	930 U	1100 U	890 U	860 U	980 U	960 U	980 U	910 U		910 U
PHENANTHRENE	4300 J	410 U	380 U	380 U	470 U	97 J	350 U	1800	400 U	400 U	570		63 J

SUMMARY OF SITE 7 SOIL DATA - TORPEDO SHOPS
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	7MW4S	7MW6S	7MW6S	7MW10S	7MW11S	7MW5S	7MW7S	7MW8S	7MW9S	7MW9S	7TB12	7TB13	7TB13
matrix	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
nsample	7 SO 4S 0103	7 SO 6S 0305	7 SO 6S 0507	7MW10S-0608	7MW11S-0507	7MW5S-1011	7MW7S-0103	7MW8S-0408	7MW9S-0608	7MW9S-0608-D	7TB12-0204	7TB13-0001	7TB1301.5 03.5
sample	7 SO 4S 0103	7 SO 6S 0305	7 SO 6S 0507	7MW10S-0608	7MW11S-0507	7MW5S-1011	7MW7S-0103	7MW8S-0408	7MW9S-0608	7MW9S-0608D	7TB12-0204	7TB13-0001	7TB1301.5 03.5
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	DUP	DUP	NORMAL	NORMAL	NORMAL
top_depth	1	3	5	6	5	10	1	4	6	6	2	0	1.5
bottom_dep	3	5	7	8	7	11	3	8	8	8	4	1	4
sample_dat	3/6/94	3/6/94	3/6/94	2/8/94	3/9/94	3/8/94	3/7/94	2/6/94	2/6/94	2/6/94	3/8/94	3/8/94	3/8/94
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
coll_meth	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
cto	129	129	129	129	129	129	129	129	129	129	129	129	129
proj_manag	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt
duplicate										7MW9S-0608			
PHENOL	350 U	410 U	380 U	380 U	470 U	370 U	350 U	400 U	400 U	400 U	380 U		380 U
PYRENE	3900 J	410 U	380 U	380 U	470 U	110 J	23 J	230 J	400 U	400 U	860		64 J
Pesticides/PCBs (ug/kg)													
4,4'-DDD	35 U	41 UJ	37 U		47 U	37 U	25 J	40 U			14 J		6.1 J
4,4'-DDE	35 U	41 UJ	37 U		47 U	37 U	10 J	40 U			6.4 J		37 U
4,4'-DDT	6.7 J	41 UJ	37 U		47 U	4.9 J	5.4 J	40 U			18 J		37 U
ALDRIN	18 U	21 U	19 U		24 U	19 U	18 U	21 U			19 U		19 U
ALPHA-BHC	18 U	21 U	19 U		24 U	19 U	18 U	21 U			19 U		19 U
ALPHA-CHLORDANE	18 U	21 U	19 U		24 U	19 U	18 U	21 U			19 U		19 U
AROCLOR-1016	350 U	410 U	370 U		470 U	370 U	350 U	400 U			370 U		370 U
AROCLOR-1221	720 U	830 U	760 U		960 U	750 U	720 U	820 U			760 U		760 U
AROCLOR-1232	350 U	410 U	370 U		470 U	370 U	350 U	400 U			370 U		370 U
AROCLOR-1242	350 U	410 U	370 U		470 U	370 U	350 U	400 U			370 U		370 U
AROCLOR-1248	350 U	410 U	370 U		470 U	370 U	350 U	400 U			370 U		370 U
AROCLOR-1254	350 U	410 U	370 U		470 U	370 U	350 U	400 U			370 U		370 U
AROCLOR-1260	350 U	410 U	370 U		470 U	370 U	350 U	400 U			370 U		370 U
BETA-BHC	18 U	21 U	19 U		24 U	19 U	18 U	21 U			19 U		19 U
DELTA-BHC	18 U	21 U	19 U		24 U	19 U	18 U	21 U			19 U		19 U
DIELDRIN	35 U	41 U	37 U		47 U	37 U	35 U	40 U			37 U		37 U
ENDOSULFAN I	18 U	21 U	19 U		24 U	19 U	18 U	21 U			19 U		19 U
ENDOSULFAN II	35 U	41 U	37 U		47 U	37 U	35 U	40 U			37 U		37 U
ENDOSULFAN SULFATE	35 U	41 UJ	37 U		47 U	37 U	35 J	40 U			37 U		37 U
ENDRIN	35 U	41 U	37 U		47 U	37 U	35 U	40 U			37 U		37 U
ENDRIN ALDEHYDE	35 U	41 UJ	37 U		47 U	37 U	35 U	40 U			37 U		37 U
ENDRIN KETONE	6.8 J	41 UJ	37 U		47 U	37 U	35 U	40 U			37 U		37 U
GAMMA-BHC (LINDANE)	18 U	21 U	19 U		24 U	19 U	18 U	21 U			19 U		19 U
GAMMA-CHLORDANE	18 U	21 U	19 U		24 U	19 U	18 U	21 U			19 U		19 U
HEPTACHLOR	4.7 J	21 UJ	19 U		24 U	19 U	18 U	21 U			19 U		19 U
HEPTACHLOR EPOXIDE	18 U	21 U	19 U		24 U	19 U	18 U	21 U			19 U		19 U
METHOXYCHLOR	32 J	210 UJ	190 U		240 U	190 U	180 U	210 U			190 U		190 U
TOXAPHENE	1800 U	2100 U	1900 U		2400 U	1900 U	1800 U	2100 U			1900 U		1900 U
Inorganics (mg/kg)													
ALUMINUM	9480	12600	20000	6990	18000	8220	7450	11300	10700	11200	13900		9830
ANTIMONY	3.2 U	7.6 U	10 U	3.4 UJ	8.6	3.4	3 U	3.5 UJ	9.6 J	6.8 R	5.2 R		5.6
ARSENIC	1.6 J	1.1 J	0.82 J	4.5	3.6 J	2 J	1.8 J	3	8.1	7.5	3.4 J		3 J

SUMMARY OF SITE 7 SOIL DATA - TORPEDO SHOPS
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	7MW4S	7MW6S	7MW6S	7MW10S	7MW11S	7MW5S	7MW7S	7MW8S	7MW9S	7MW9S	7TB12	7TB13	7TB13
matrix	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
nsample	7 SO 4S 0103	7 SO 6S 0305	7 SO 6S 0507	7MW10S-0608	7MW11S-0507	7MW5S-1011	7MW7S-0103	7MW8S-0408	7MW9S-0608	7MW9S-0608-D	7TB12-0204	7TB13-0001	7TB1301.5 03.5
sample	7 SO 4S 0103	7 SO 6S 0305	7 SO 6S 0507	7MW10S-0608	7MW11S-0507	7MW5S-1011	7MW7S-0103	7MW8S-0408	7MW9S-0608	7MW9S-0608D	7TB12-0204	7TB13-0001	7TB1301.5 03.5
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	DUP	DUP	NORMAL	NORMAL	NORMAL
top_depth	1	3	5	6	5	10	1	4	6	6	2	0	1.5
bottom_dep	3	5	7	8	7	11	3	8	8	8	4	1	4
sample_dat	3/6/94	3/6/94	3/6/94	2/8/94	3/9/94	3/8/94	3/7/94	2/6/94	2/6/94	2/6/94	3/8/94	3/8/94	3/8/94
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
coll_meth	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
cto	129	129	129	129	129	129	129	129	129	129	129	129	129
proj_manag	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt
duplicate										7MW9S-0608			
BARIUM	99.6 J	102 J	506	30.6	64.4	98.6	104 J	31.6	34.3	39.9	154		58.1
BERYLLIUM	0.35	0.38 J	0.35 J	0.23 U	0.72	0.35	0.21 J	0.47	0.44	0.37	0.6		0.54
BORON	10.8 U	11.8 U	10 U	11.4 U	14.1 UJ	11.2 UJ	10 U	11.8 U	12.5 U	12.4 U	11.6 UJ		11.4 UJ
CADMIUM	0.48	0.67 J	0.64 J	0.68 U	0.56 U	0.45 U	0.4 U	0.71 U	0.75 UJ	0.74 U	0.47 U		0.46 U
CALCIUM	1960	1910	2810	1110	1110	1550	1970	1320	1830	1700	1670		1230
CHROMIUM	17.5	13.7	61.1	9.1 J	25.6	12	8.3 J	18.1 J	18.2 J	17.8 J	23.5		14
COBALT	6.6 J	7.2 J	19.2 J	6.1	6.9	6.8	4.7 J	3.9 U	5.6	5.9	10.4		5.5
COPPER	20.6	24.9	18.1	11.7	10	26.7	12.1	13.6	14.2	15.6	39.9		31.1
CYANIDE													
IRON	15200	20800	32900	6930	12500	14800	12100	8820	20800	16400	18200		11200
LEAD	11.7 J	3.3 J	3.7 J	2.5 U	7.8 J	14.7 J	4 J	9.1 U	4.4 U	3.6 U	27.5 J		16.8 J
MAGNESIUM	5390	6260	19500	2200 J	3350	4790	4370	3080	3370	3810	6910		3410
MANGANESE	367	437	725	171	119	317	215	106	161	140	329		155
MERCURY	0.11 UJ	0.28 J	0.16 J	1.2 J	0.14 U	0.11 U	0.11 J	0.12 UJ	0.12 UJ	0.12 UJ	0.13		0.11 U
NICKEL	8	9.4	42.1 J	12.4	12.7	8.4	5.4 J	10	12.9	12.9	16 J		9.9
POTASSIUM	4810 J	5690 J	18400 J	1380	809	4540	3710 J	991	1490	1680	5130		1910
SELENIUM	0.65 U	0.71 U	0.6 U	0.68 UJ	0.85 UJ	0.67 UJ	0.6 U	0.71 UJ	0.75 UJ	0.74 UJ	0.7 UJ		0.68 UJ
SILVER	0.65 U	0.47 UJ	0.4 UJ	0.46 U	0.56 U	0.88	0.4 UJ	0.47 U	0.73 U	0.5 UJ	0.86 J		0.46 U
SODIUM	708	221 J	240 J	103 U	203	109	207 J	270	252	265	121 J		68.2
THALLIUM	0.26	0.38 J	1 J	0.23 U	0.28 U	0.36 U	0.2 U	0.24 U	0.25 U	0.25 U	0.44 U		0.23 U
VANADIUM	31.9 U	38.4 U	86.7	12.3	26.8	24.8	28.9 U	23.6	21.9	21.3 J	33.7		20.1
ZINC	133 J	78.6 J	84.2 J	18.7	31.4	101	48.7 J	30.2	25.9	28.3	66		38.2
Miscellaneous Parameters (mg/kg)													
TPH				11.6 UJ	14.2 U			898 J	12 UJ	12.2 UJ	160		238
TOTAL ORGANIC CARBON	18800					9370		2740			8390	4740	

U - Not Detected
J - Estimated
R - Rejected

SUMMARY OF SITE 7 SOIL DATA - TORPEDO SHOPS
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	7TB14	7TB15	7TB16	7TB7	7TB8	7TB8	7TB9	B325-MW1	B325-MW1	B325-MW3	B325-MW3	B325-MW4
matrix	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
nsample	7TB14-0507	7TB15-0608	7TB160305	7TB7-0406	7TB8-0202.9	7TB8-0202.9-D	7TB9-0002	B325-SO01-0204	B325-SO01-0406	B325-SO03-0002	B325-SO03-0408	B325-SO04-0406
sample	7TB14-0507	7TB15-0608	7TB160305	7TB7-0406	7TB8-0202.9	7TB8-0202.9D	7TB9-0002	B325-MW01-0204	B325-MW01-0406	B325-MW03-0002	B325-MW03-0408	B325-MW04-0406
sacode	NORMAL	NORMAL	NORMAL	NORMAL	DUP	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
top_depth	5	6	3	4	2	2	0	2	4	0	4	4
bottom_dep	7	8	5	6	2.9	2.9	2	4	6	2	8	6
sample_dat	2/6/94	2/7/94	3/7/94	3/14/94	3/15/94	3/15/94	3/8/94	11/4/94	11/4/94	11/4/94	11/4/94	11/4/94
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
coll_meth	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
cto	129	129	129	129	129	129	129	129	129	129	129	129
proj_manag	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt
duplicate						7TB8-0202.9						
Volatile Organics (ug/kg)												
1,1,1-TRICHLOROETHANE	12 U	12 U	13 U	11 U	13 U	13 U	11 U					
1,1,2,2-TETRACHLOROETHANE	12 U	12 U	13 U	11 U	13 U	13 U	11 U					
1,1,2-TRICHLOROETHANE	12 U	12 U	13 U	11 U	13 U	13 U	11 U					
1,1-DICHLOROETHANE	12 U	12 U	13 U	11 U	13 U	13 U	11 U					
1,1-DICHLOROETHENE	12 U	12 U	13 U	11 U	13 U	13 U	11 U					
1,2-DICHLOROETHANE	12 U	12 U	13 U	11 U	13 U	13 U	11 U					
1,2-DICHLOROETHENE (TOTAL)	12 U	12 U	13 U	11 U	13 U	13 U	11 U					
1,2-DICHLOROPROPANE	12 U	12 U	13 U	11 U	13 U	13 U	11 U					
2-BUTANONE	12 U	12 U	13 U	11 U	13 U	13 U	11 U					
2-HEXANONE	12 U	12 U	13 U	11 U	13 U	13 U	11 U					
4-METHYL-2-PENTANONE	12 U	12 U	13 U	11 U	13 U	13 U	11 U					
ACETONE	48 U	29 U	13 U	11 U	44 U	13 U	11 UJ					
BENZENE	12 U	12 U	13 U	11 U	13 U	13 U	11 U	1.07 U	1.11 U	1.09 U	1.07 U	1.22 U
BROMODICHLOROMETHANE	12 U	12 U	13 U	11 U	13 U	13 U	11 U					
BROMOFORM	12 U	12 U	13 U	11 U	13 U	13 U	11 U					
BROMOMETHANE	12 U	12 U	13 U	11 U	13 U	13 U	11 U					
CARBON DISULFIDE	12 U	12 U	13 U	11 U	13 U	13 U	11 U					
CARBON TETRACHLORIDE	12 U	12 U	13 U	11 U	13 U	13 U	11 U					
CHLOROBENZENE	12 U	12 U	13 U	11 U	13 U	13 U	11 U					
CHLOROETHANE	12 U	12 U	13 U	11 U	13 U	13 U	11 U					
CHLOROFORM	12 U	12 U	13 U	11 U	13 U	13 U	11 U					
CHLOROMETHANE	12 U	12 U	13 U	11 U	13 U	13 U	11 U					
CIS-1,2-DICHLOROETHENE												
CIS-1,3-DICHLOROPROPENE	12 U	12 U	13 U	11 U	13 U	13 U	11 U					
DIBROMOCHLOROMETHANE	12 U	12 U	13 U	11 U	13 U	13 U	11 U					
ETHYLBENZENE	12 U	12 U	13 U	11 U	13 U	13 U	11 U	1.07 U	1.11 U	1.09 U	1.07 U	1.22 U
M+P-XYLENES												
METHYLENE CHLORIDE	60 J	60 J	13 U	11 U	13 U	23 U	5 J					
O-XYLENE												
STYRENE	12 U	12 U	13 U	11 U	13 U	13 U	11 U					
TETRACHLOROETHENE	4 J	3 J	13 U	11 U	13 U	13 U	11 U					
TOLUENE	12 U	12 U	8 J	11 U	13 U	13 U	11 U	1.07 U	1.11 U	1.09 U	1.07 U	1.22 U
TRANS-1,2-DICHLOROETHENE												
TRANS-1,3-DICHLOROPROPENE	12 U	12 U	13 U	11 U	13 U	13 U	11 U					

SUMMARY OF SITE 7 SOIL DATA - TORPEDO SHOPS
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	7TB14	7TB15	7TB16	7TB7	7TB8	7TB8	7TB9	B325-MW1	B325-MW1	B325-MW3	B325-MW3	B325-MW4
matrix	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
nsample	7TB14-0507	7TB15-0608	7TB160305	7TB7-0406	7TB8-0202.9	7TB8-0202.9-D	7TB9-0002	B325-SO01-0204	B325-SO01-0406	B325-SO03-0002	B325-SO03-0408	B325-SO04-0406
sample	7TB14-0507	7TB15-0608	7TB160305	7TB7-0406	7TB8-0202.9	7TB8-0202.9D	7TB9-0002	B325-MW01-0204	B325-MW01-0406	B325-MW03-0002	B325-MW03-0408	B325-MW04-0406
sacode	NORMAL	NORMAL	NORMAL	NORMAL	DUP	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
top_depth	5	6	3	4	2	2	0	2	4	0	4	4
bottom_dep	7	8	5	6	2.9	2.9	2	4	6	2	8	6
sample_dat	2/6/94	2/7/94	3/7/94	3/14/94	3/15/94	3/15/94	3/8/94	11/4/94	11/4/94	11/4/94	11/4/94	11/4/94
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
coll_meth	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
cto	129	129	129	129	129	129	129	129	129	129	129	129
proj_manag	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt
duplicate						7TB8-0202.9						
TRICHLOROETHENE	12 U	12 U	13 U	11 U	13 U	13 U	11 U					
VINYL ACETATE	12 U	12 U	13 U	11 U	13 U	13 U	11 U					
VINYL CHLORIDE	12 U	12 U	13 U	11 U	13 U	13 U	11 U					
XYLENES, TOTAL	12 U	12 U	13 U	11 U	13 U	13 U	11 U	1.07 U	1.11 U	1.09 U	1.07 U	1.22 U
Semivolatile Organics (ug/kg)												
1,2,4-TRICHLOROBENZENE	390 U	400 U	430 U	380 U	420 U	420 U	360 U					
1,2-DICHLOROBENZENE	390 U	400 U	430 U	380 U	420 U	420 U	360 U					
1,3-DICHLOROBENZENE	390 U	400 U	430 U	380 U	420 U	420 U	360 U					
1,4-DICHLOROBENZENE	390 U	400 U	430 U	380 U	420 U	420 U	360 U					
2,2'-OXYBIS(1-CHLOROPROPANE)												
2,4,5-TRICHLOROPHENOL	950 U	980 U	1000 U	910 U	1000 U	1000 U	870 U					
2,4,6-TRICHLOROPHENOL	390 U	400 U	430 U	380 U	420 U	420 U	360 U					
2,4-DICHLOROPHENOL	390 U	400 U	430 U	380 U	420 U	420 U	360 U					
2,4-DIMETHYLPHENOL	390 U	400 U	430 U	380 U	420 U	420 U	360 U					
2,4-DINITROPHENOL	950 U	980 U	1000 U	910 U	1000 U	1000 U	870 U					
2,4-DINITROTOLUENE	390 U	400 U	430 U	380 U	420 U	420 U	360 U					
2,6-DINITROTOLUENE	390 U	400 U	430 U	380 U	420 U	420 U	360 U					
2-CHLORONAPHTHALENE	390 U	400 U	430 U	380 U	420 U	420 U	360 U					
2-CHLOROPHENOL	390 U	400 U	430 U	380 U	420 U	420 U	360 U					
2-METHYLNAPHTHALENE	390 U	400 U	430 U	380 U	420 U	420 U	360 U					
2-METHYLPHENOL	390 U	400 U	430 U	380 U	420 U	420 U	360 U					
2-NITROANILINE	950 U	980 U	1000 U	910 U	1000 U	1000 U	870 U					
2-NITROPHENOL	390 U	400 U	430 U	380 U	420 U	420 U	360 U					
3,3'-DICHLOROBENZIDINE	390 U	400 U	430 U	380 U	420 U	420 U	360 U					
3-NITROANILINE	950 U	980 U	1000 U	910 U	1000 U	1000 U	870 U					
4,6-DINITRO-2-METHYLPHENOL	950 U	980 U	1000 U	910 U	1000 U	1000 U	870 U					
4-BROMOPHENYL PHENYL ETHER	390 U	400 U	430 U	380 U	420 U	420 U	360 U					
4-CHLORO-3-METHYLPHENOL	390 U	400 U	430 U	380 U	420 U	420 U	360 U					
4-CHLOROANILINE	390 U	400 U	430 U	380 U	420 U	420 U	360 U					
4-CHLOROPHENYL PHENYL ETHER	390 U	400 U	430 U	380 U	420 U	420 U	360 U					
4-METHYLPHENOL	390 U	400 U	430 U	380 U	420 U	420 U	360 U					
4-NITROANILINE	950 U	980 U	1000 U	910 U	1000 U	1000 U	870 U					
4-NITROPHENOL	950 U	980 U	1000 U	910 U	1000 U	1000 U	870 U					
ACENAPHTHENE	390 U	400 U	430 U	380 U	420 U	420 U	360 U					
ACENAPHTHYLENE	390 U	400 U	430 U	380 U	420 U	420 U	360 U					

SUMMARY OF SITE 7 SOIL DATA - TORPEDO SHOPS
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	7TB14	7TB15	7TB16	7TB7	7TB8	7TB8	7TB9	B325-MW1	B325-MW1	B325-MW3	B325-MW3	B325-MW4
matrix	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
nsample	7TB14-0507	7TB15-0608	7TB160305	7TB7-0406	7TB8-0202.9	7TB8-0202.9-D	7TB9-0002	B325-SO01-0204	B325-SO01-0406	B325-SO03-0002	B325-SO03-0408	B325-SO04-0406
sample	7TB14-0507	7TB15-0608	7TB160305	7TB7-0406	7TB8-0202.9	7TB8-0202.9D	7TB9-0002	B325-MW01-0204	B325-MW01-0406	B325-MW03-0002	B325-MW03-0408	B325-MW04-0406
sacode	NORMAL	NORMAL	NORMAL	NORMAL	DUP	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
top_depth	5	6	3	4	2	2	0	2	4	0	4	4
bottom_dep	7	8	5	6	2.9	2.9	2	4	6	2	8	6
sample_dat	2/6/94	2/7/94	3/7/94	3/14/94	3/15/94	3/15/94	3/8/94	11/4/94	11/4/94	11/4/94	11/4/94	11/4/94
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
coll_meth	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
cto	129	129	129	129	129	129	129	129	129	129	129	129
proj_manag	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt
duplicate						7TB8-0202.9						
ANTHRACENE	390 U	400 U	430 U	380 U	420 U	420 U	360 U					
BENZO(A)ANTHRACENE	390 U	400 U	430 U	65 J	420 U	420 U	360 U					
BENZO(A)PYRENE	390 U	400 U	430 U	94 J	420 U	420 U	360 U					
BENZO(B)FLUORANTHENE	390 U	400 U	430 U	120 J	21 J	420 U	360 U					
BENZO(G,H,I)PERYLENE	390 U	400 U	430 U	84 J	420 U	420 U	360 U					
BENZO(K)FLUORANTHENE	390 U	400 U	430 U	100 J	420 U	420 U	360 U					
BENZOIC ACID	1900 U	2000 U	2100 U	27 J	31 J	23 J	1700 U					
BENZYL ALCOHOL	390 U	400 U	430 U	380 U	420 U	420 U	360 U					
BIS(2-CHLOROETHOXY)METHANE	390 U	400 U	430 U	380 U	420 U	420 U	360 U					
BIS(2-CHLOROETHYL)ETHER	390 U	400 U	430 U	380 U	420 U	420 U	360 U					
BIS(2-CHLOROISOPROPYL) ETHER	390 U	400 U	430 U	380 U	420 U	420 U	360 U					
BIS(2-ETHYLHEXYL)PHTHALATE	390 U	400 U	430 U	380 U	420 U	420 U	360 U					
BUTYLBENZYL PHTHALATE	390 U	400 U	430 U	26 J	420 U	420 U	360 U					
CARBAZOLE	390 U	400 U	430 U	27 J	420 U	420 U	360 U					
CHRYSENE	390 U	400 U	430 U	120 J	25 J	420 U	360 U					
DI-N-BUTYL PHTHALATE	390 U	400 U	430 U	22 J	25 J	25 J	360 U					
DI-N-OCTYL PHTHALATE	390 U	400 U	430 U	380 U	420 U	420 U	360 U					
DIBENZO(A,H)ANTHRACENE	390 U	400 U	430 U	380 U	420 U	420 U	360 U					
DIBENZOFURAN	390 U	400 U	430 U	380 U	420 U	420 U	360 U					
DIETHYL PHTHALATE	390 U	400 U	430 U	380 U	420 U	420 U	360 U					
DIMETHYL PHTHALATE	390 U	400 U	430 U	380 U	420 U	420 U	360 U					
FLUORANTHENE	390 U	400 U	21 J	220 J	44 J	22 J	360 U					
FLUORENE	390 U	400 U	430 U	380 U	420 U	420 U	360 U					
HEXACHLOROBENZENE	390 U	400 U	430 U	380 U	420 U	420 U	360 U					
HEXACHLOROBUTADIENE	390 U	400 U	430 U	380 U	420 U	420 U	360 U					
HEXACHLOROCYCLOPENTADIENE	390 U	400 U	430 U	380 U	420 U	420 U	360 U					
HEXACHLOROETHANE	390 U	400 U	430 U	380 U	420 U	420 U	360 U					
INDENO(1,2,3-CD)PYRENE	390 U	400 U	430 U	40 J	420 U	420 U	360 U					
ISOPHORONE	390 U	400 U	430 U	380 U	420 U	420 U	360 U					
N-NITROSO-DI-N-PROPYLAMINE	390 U	400 U	430 U	380 U	420 U	420 U	360 U					
N-NITROSODIPHENYLAMINE	390 U	400 U	430 U	380 U	420 U	420 U	360 U					
NAPHTHALENE	390 U	400 U	430 U	380 U	420 U	420 U	360 U					
NITROBENZENE	390 U	400 U	430 U	380 U	420 U	420 U	360 U					
PENTACHLOROPHENOL	950 U	980 U	1000 U	910 U	1000 U	1000 U	870 U					
PHENANTHRENE	390 U	400 U	430 U	100 J	25 J	420 U	360 U					

SUMMARY OF SITE 7 SOIL DATA - TORPEDO SHOPS
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	7TB14	7TB15	7TB16	7TB7	7TB8	7TB8	7TB9	B325-MW1	B325-MW1	B325-MW3	B325-MW3	B325-MW4
matrix	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
nsample	7TB14-0507	7TB15-0608	7TB160305	7TB7-0406	7TB8-0202.9	7TB8-0202.9-D	7TB9-0002	B325-SO01-0204	B325-SO01-0406	B325-SO03-0002	B325-SO03-0408	B325-SO04-0406
sample	7TB14-0507	7TB15-0608	7TB160305	7TB7-0406	7TB8-0202.9	7TB8-0202.9D	7TB9-0002	B325-MW01-0204	B325-MW01-0406	B325-MW03-0002	B325-MW03-0408	B325-MW04-0406
sacode	NORMAL	NORMAL	NORMAL	NORMAL	DUP	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
top_depth	5	6	3	4	2	2	0	2	4	0	4	4
bottom_dep	7	8	5	6	2.9	2.9	2	4	6	2	8	6
sample_dat	2/6/94	2/7/94	3/7/94	3/14/94	3/15/94	3/15/94	3/8/94	11/4/94	11/4/94	11/4/94	11/4/94	11/4/94
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
coll_meth	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
cto	129	129	129	129	129	129	129	129	129	129	129	129
proj_manag	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt
duplicate						7TB8-0202.9						
PHENOL	390 U	400 U	430 U	380 U	420 U	420 U	360 U					
PYRENE	390 U	400 U	21 J	180 J	40 J	22 J	360 U					
Pesticides/PCBs (ug/kg)												
4,4'-DDD			4.4 J	37 U	42 U	42 U	36 U					
4,4'-DDE			5.4 J	37 U	42 U	42 U	36 U					
4,4'-DDT			26 J	37 U	42 U	42 U	36 U					
ALDRIN			22 U	19 U	22 U	22 U	18 U					
ALPHA-BHC			22 U	19 U	22 U	22 U	18 U					
ALPHA-CHLORDANE			22 U	19 U	22 U	22 U	18 U					
AROCLOR-1016			430 U	370 U	420 U	420 U	360 U					
AROCLOR-1221			880 U	760 U	850 U	850 U	730 U					
AROCLOR-1232			430 U	370 U	420 U	420 U	360 U					
AROCLOR-1242			430 U	370 U	420 U	420 U	360 U					
AROCLOR-1248			430 U	370 U	420 U	420 U	360 U					
AROCLOR-1254			430 U	370 U	420 U	420 U	360 U					
AROCLOR-1260			430 U	370 U	420 U	420 U	360 U					
BETA-BHC			22 U	19 U	22 U	22 U	18 U					
DELTA-BHC			22 U	19 U	22 U	22 U	18 U					
DIELDRIN			43 U	37 U	42 U	42 U	36 U					
ENDOSULFAN I			22 U	19 U	22 U	22 U	18 U					
ENDOSULFAN II			43 U	37 U	42 U	42 U	36 U					
ENDOSULFAN SULFATE			43 U	37 U	42 U	42 U	36 U					
ENDRIN			43 U	37 U	42 U	42 U	36 U					
ENDRIN ALDEHYDE			43 U	5.5 J	5.5 J	42 U	36 U					
ENDRIN KETONE			43 U	37 U	42 U	42 U	36 U					
GAMMA-BHC (LINDANE)			22 U	19 U	22 U	22 U	18 U					
GAMMA-CHLORDANE			22 U	19 U	22 U	22 U	18 U					
HEPTACHLOR			22 U	19 U	22 U	22 U	18 U					
HEPTACHLOR EPOXIDE			22 U	19 U	22 U	22 U	18 U					
METHOXYCHLOR			220 U	190 U	220 U	220 U	180 U					
TOXAPHENE			2200 U	1900 U	2200 U	2200 U	1800 U					
Inorganics (mg/kg)												
ALUMINUM	5220	10900	7030	15800	19300	12700	3730					
ANTIMONY	5.1 J	6 J	3 U	3.4 UJ	3.7 UJ	3.4 UJ	3.3 U					
ARSENIC	3.3	4.3	2 J	1.6 U	4.6 U	3 U	3.5 J					

SUMMARY OF SITE 7 SOIL DATA - TORPEDO SHOPS
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	7TB14	7TB15	7TB16	7TB7	7TB8	7TB8	7TB9	B325-MW1	B325-MW1	B325-MW3	B325-MW3	B325-MW4
matrix	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
nsample	7TB14-0507	7TB15-0608	7TB160305	7TB7-0406	7TB8-0202.9	7TB8-0202.9-D	7TB9-0002	B325-SO01-0204	B325-SO01-0406	B325-SO03-0002	B325-SO03-0408	B325-SO04-0406
sample	7TB14-0507	7TB15-0608	7TB160305	7TB7-0406	7TB8-0202.9	7TB8-0202.9D	7TB9-0002	B325-MW01-0204	B325-MW01-0406	B325-MW03-0002	B325-MW03-0408	B325-MW04-0406
sacode	NORMAL	NORMAL	NORMAL	NORMAL	DUP	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
top_depth	5	6	3	4	2	2	0	2	4	0	4	4
bottom_dep	7	8	5	6	2.9	2.9	2	4	6	2	8	6
sample_dat	2/6/94	2/7/94	3/7/94	3/14/94	3/15/94	3/15/94	3/8/94	11/4/94	11/4/94	11/4/94	11/4/94	11/4/94
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
coll_meth	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
cto	129	129	129	129	129	129	129	129	129	129	129	129
proj_manag	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt
duplicate						7TB8-0202.9						
BARIUM	17.4 J	42.2	18.8 J	155	86.8	69.1	23.2					
BERYLLIUM	0.42 J	0.41 J	0.26 J	0.44 J	0.79	0.51	0.22 U					
BORON	12 U	12.3 U	10 U	11.2 UJ	12.3 UJ	11.4 UJ	10.9 UJ					
CADMIUM	0.72 U	0.74 U	0.47 J	0.61 U	1 U	0.5 U	0.44 U					
CALCIUM	882	1420	666 J	1240	2810	2070	1230					
CHROMIUM	9.3 J	20.2 J	10.7	26.6	23.3	16.9	6.8					
COBALT	3.5 U	6.1	1.8 U	9	7.8	6.9	3.5 U					
COPPER	8.7	16.2	7.6	45	37.4	32	9.2					
CYANIDE												
IRON	8230	12300	6750	19700	17300	14700	4580					
LEAD	4.7 U	4.6 U	4.7 J	15.8 J	22.4 J	22.2 J	4.5 J					
MAGNESIUM	1660	4030	1780 J	7310	5120	3790	1510					
MANGANESE	208	194	60.7	357 J	230 J	194 J	87.7					
MERCURY	0.12 UJ	0.12 UJ	0.1 UJ	0.11 U	0.12 U	0.11 U	0.11 U					
NICKEL	5.8	12.6 J	5.4	18.3	16.6	12.8	7.5					
POTASSIUM	848	1990	744 J	5960	2910	2390	1020					
SELENIUM	0.72 UJ	0.74 UJ	0.6 U	0.67 UJ	0.74 UJ	0.68 UJ	0.66 UJ					
SILVER	0.48 U	0.49 U	0.4 UJ	1.4	0.97 J	0.46 U	0.5					
SODIUM	210	214	191 J	187	204	212	60.9					
THALLIUM	0.24 U	0.25 UJ	0.2 U	0.34 J	0.25 UJ	0.23 UJ	0.22 U					
VANADIUM	18.5 J	26.4 J	15.7 U	56	37.9	26	7.7					
ZINC	23.5	33.4	47.4 J	87.5	44.2	35.7	13.8					
Miscellaneous Parameters (mg/kg)												
TPH	11.8 UJ	12.2 UJ						28.9	11.1 U	131	386	12.2 U
TOTAL ORGANIC CARBON												

U - Not Detected
J - Estimated
R - Rejected

SUMMARY OF SITE 7 SOIL DATA - TORPEDO SHOPS
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	B325-MW4	B325-SB5	B325-SB5	B325-SB6	B325-SB6	B325-SB7	B325SS	B325SW	7SB8	7SB9	7SB10	7SB18
matrix	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
nsample	B325-SO04-0608	B325-SO05-0002	B325-SO05-0406	B325-SO06-0002	B325-SO06-0002-D	B325-SO07-0003	B325SS-0203	B325SW-0203	S7SB080607	S7SB090809	S7SB100607	S7SB180506
sample	B325-MW04-0608	B325-MW05-0002	B325-MW05-0406	B325-MW06-0002	DUP-02	B325-MW07-0003	B325SS-0203	B325SW-0203	S7SB080607	S7SB090809	S7SB100607	S7SB180506
sacode	NORMAL	NORMAL	NORMAL	DUP	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
top_depth	6	0	4	0	0	0	2	2	6	8	6	5
bottom_dep	8	2	6	2	2	3	3	3	7	9	7	6
sample_dat	11/4/94	11/5/94	11/5/94	11/5/94	11/5/94	11/5/94	12/2/95	12/2/95	6/13/00	6/13/00	6/13/00	6/13/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE
coll_meth	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
cto	129	129	129	129	129	129	129	129	312	312	312	312
proj_manag	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
duplicate					B325-SO06-0002							
Volatile Organics (ug/kg)												
1,1,1-TRICHLOROETHANE									7 U	6 U	7 U	7 U
1,1,2,2-TETRACHLOROETHANE									7 U	6 U	7 U	7 U
1,1,2-TRICHLOROETHANE									7 U	6 U	7 U	7 U
1,1-DICHLOROETHANE									7 U	6 U	7 U	7 U
1,1-DICHLOROETHENE									7 U	6 U	7 U	7 U
1,2-DICHLOROETHANE									7 U	6 U	7 U	7 U
1,2-DICHLOROETHENE (TOTAL)									14 U	11 U	13 U	13 U
1,2-DICHLOROPROPANE									7 U	6 U	7 U	7 U
2-BUTANONE									8 J	11 U	9 J	3 J
2-HEXANONE									14 U	11 U	13 U	13 U
4-METHYL-2-PENTANONE									14 U	11 U	13 U	13 U
ACETONE									68	14 U	61	49
BENZENE	1.32 U	1.12 U	1.2 U	1.11 U	1.1 U	1.05 U			7 U	6 U	7 U	7 U
BROMODICHLOROMETHANE									7 U	6 U	7 U	7 U
BROMOFORM									7 U	6 U	7 U	7 U
BROMOMETHANE									7 U	6 U	7 U	7 U
CARBON DISULFIDE									6 J	6 U	25	7 U
CARBON TETRACHLORIDE									7 U	6 U	7 U	7 U
CHLOROBENZENE									7 U	1 J	7 U	6 J
CHLOROETHANE									7 U	6 U	7 U	7 U
CHLOROFORM									7 U	6 U	7 U	7 U
CHLOROMETHANE									7 U	6 U	7 U	7 U
CIS-1,2-DICHLOROETHENE									7 U	6 U	7 U	7 U
CIS-1,3-DICHLOROPROPENE									7 U	6 U	7 U	7 U
DIBROMOCHLOROMETHANE									7 U	6 U	7 U	7 U
ETHYLBENZENE	1.32 U	1.12 U	1.2 U	1.11 U	1.1 U	1.05 U			7 U	6 U	7 U	7 U
M+P-XYLENES									14 U	11 U	13 U	13 U
METHYLENE CHLORIDE									7 U	8 U	7 U	8 U
O-XYLENE									7 U	6 U	7 U	7 U
STYRENE									7 U	6 U	7 U	7 U
TETRACHLOROETHENE									7 U	6 U	7 U	7 U
TOLUENE	1.32 U	1.12 U	1.2 U	1.11 U	1.1 U	1.05 U			2 J	3 J	7 U	2 J
TRANS-1,2-DICHLOROETHENE									7 U	6 U	7 U	7 U
TRANS-1,3-DICHLOROPROPENE									7 U	6 U	7 U	7 U

SUMMARY OF SITE 7 SOIL DATA - TORPEDO SHOPS
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	B325-MW4	B325-SB5	B325-SB5	B325-SB6	B325-SB6	B325-SB7	B325SS	B325SW	7SB8	7SB9	7SB10	7SB18
matrix	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
nsample	B325-SO04-0608	B325-SO05-0002	B325-SO05-0406	B325-SO06-0002	B325-SO06-0002-D	B325-SO07-0003	B325SS-0203	B325SW-0203	S7SB080607	S7SB090809	S7SB100607	S7SB180506
sample	B325-MW04-0608	B325-MW05-0002	B325-MW05-0406	B325-MW06-0002	DUP-02	B325-MW07-0003	B325SS-0203	B325SW-0203	S7SB080607	S7SB090809	S7SB100607	S7SB180506
sacode	NORMAL	NORMAL	NORMAL	DUP	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
top_depth	6	0	4	0	0	0	2	2	6	8	6	5
bottom_dep	8	2	6	2	2	3	3	3	7	9	7	6
sample_dat	11/4/94	11/5/94	11/5/94	11/5/94	11/5/94	11/5/94	12/2/95	12/2/95	6/13/00	6/13/00	6/13/00	6/13/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE
coll_meth	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
cto	129	129	129	129	129	129	129	129	312	312	312	312
proj_manag	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
duplicate					B325-SO06-0002							
TRICHLOROETHENE									7 U	6 U	7 U	7 U
VINYL ACETATE												
VINYL CHLORIDE									7 U	6 U	7 U	7 U
XYLENES, TOTAL	1.32 U	1.34	0.96 J	0.78 J	1.1 U	0.53 J			21 U	17 U	20 U	20 U
Semivolatile Organics (ug/kg)												
1,2,4-TRICHLOROBENZENE									220 U	200 U	220 U	220 U
1,2-DICHLOROBENZENE									220 U	200 U	220 U	220 U
1,3-DICHLOROBENZENE									220 U	200 U	220 U	220 U
1,4-DICHLOROBENZENE									220 U	200 U	220 U	220 U
2,2'-OXYBIS(1-CHLOROPROPANE)									220 U	200 U	220 U	220 U
2,4,5-TRICHLOROPHENOL									460 U	410 U	450 U	460 U
2,4,6-TRICHLOROPHENOL									220 U	200 U	220 U	220 U
2,4-DICHLOROPHENOL									220 U	200 U	220 U	220 U
2,4-DIMETHYLPHENOL									220 U	200 U	220 U	220 U
2,4-DINITROPHENOL									460 UJ	410 UJ	450 UJ	460 UJ
2,4-DINITROTOLUENE									220 U	200 U	220 U	220 U
2,6-DINITROTOLUENE									220 U	200 U	220 U	220 U
2-CHLORONAPHTHALENE									220 U	200 U	220 U	220 U
2-CHLOROPHENOL									220 U	200 U	220 U	220 U
2-METHYLNAPHTHALENE									220 U	200 U	220 U	220 U
2-METHYLPHENOL									220 U	200 U	220 U	220 U
2-NITROANILINE									460 U	410 U	450 U	460 U
2-NITROPHENOL									220 U	200 U	220 U	220 U
3,3'-DICHLOROBENZIDINE									220 U	200 U	220 U	220 U
3-NITROANILINE									460 U	410 U	450 U	460 U
4,6-DINITRO-2-METHYLPHENOL									460 U	410 U	450 U	460 U
4-BROMOPHENYL PHENYL ETHER									220 U	200 U	220 U	220 U
4-CHLORO-3-METHYLPHENOL									220 U	200 U	220 U	220 U
4-CHLOROANILINE									220 U	200 U	220 U	220 U
4-CHLOROPHENYL PHENYL ETHER									230 U	200 U	220 U	220 U
4-METHYLPHENOL									230 U	200 U	220 U	220 U
4-NITROANILINE									460 U	410 U	450 U	460 U
4-NITROPHENOL									460 U	410 U	450 U	460 U
ACENAPHTHENE									220 U	200 U	220 U	220 U
ACENAPHTHYLENE									220 U	200 U	220 U	220 U

SUMMARY OF SITE 7 SOIL DATA - TORPEDO SHOPS
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	B325-MW4	B325-SB5	B325-SB5	B325-SB6	B325-SB6	B325-SB7	B325SS	B325SW	7SB8	7SB9	7SB10	7SB18
matrix	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
nsample	B325-SO04-0608	B325-SO05-0002	B325-SO05-0406	B325-SO06-0002	B325-SO06-0002-D	B325-SO07-0003	B325SS-0203	B325SW-0203	S7SB080607	S7SB090809	S7SB100607	S7SB180506
sample	B325-MW04-0608	B325-MW05-0002	B325-MW05-0406	B325-MW06-0002	DUP-02	B325-MW07-0003	B325SS-0203	B325SW-0203	S7SB080607	S7SB090809	S7SB100607	S7SB180506
sacode	NORMAL	NORMAL	NORMAL	DUP	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
top_depth	6	0	4	0	0	0	2	2	6	8	6	5
bottom_dep	8	2	6	2	2	3	3	3	7	9	7	6
sample_dat	11/4/94	11/5/94	11/5/94	11/5/94	11/5/94	11/5/94	12/2/95	12/2/95	6/13/00	6/13/00	6/13/00	6/13/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE
coll_meth	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
cto	129	129	129	129	129	129	129	129	312	312	312	312
proj_manag	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
duplicate					B325-SO06-0002							
ANTHRACENE									220 U	200 U	220 U	220 U
BENZO(A)ANTHRACENE									220 U	200 U	220 U	220 U
BENZO(A)PYRENE									220 U	200 U	220 U	220 U
BENZO(B)FLUORANTHENE									220 U	200 U	220 U	220 U
BENZO(G,H,I)PERYLENE									220 UJ	200 UJ	220 UJ	220 UJ
BENZO(K)FLUORANTHENE									220 U	200 U	220 U	220 U
BENZOIC ACID												
BENZYL ALCOHOL												
BIS(2-CHLOROETHOXY)METHANE									220 U	200 U	220 U	220 U
BIS(2-CHLOROETHYL)ETHER									220 U	200 U	220 U	220 U
BIS(2-CHLOROISOPROPYL) ETHER												
BIS(2-ETHYLHEXYL)PHTHALATE									460 U	410 U	450 U	460 U
BUTYLBENZYL PHTHALATE									220 U	200 U	220 U	220 U
CARBAZOLE									220 U	200 U	220 U	220 U
CHRYSENE									220 U	200 U	220 U	220 U
DI-N-BUTYL PHTHALATE									460 U	410 U	450 U	460 U
DI-N-OCTYL PHTHALATE									220 U	200 U	220 U	220 U
DIBENZO(A,H)ANTHRACENE									220 UJ	200 UJ	220 UJ	220 UJ
DIBENZOFURAN									220 U	200 U	220 U	220 U
DIETHYL PHTHALATE									220 U	200 U	220 U	220 U
DIMETHYL PHTHALATE									220 U	200 U	220 U	220 U
FLUORANTHENE									220 U	200 U	220 U	220 U
FLUORENE									220 U	200 U	220 U	220 U
HEXACHLOROBENZENE									230 U	200 U	220 U	220 U
HEXACHLOROBUTADIENE									220 U	200 U	220 U	220 U
HEXACHLOROCYCLOPENTADIENE									220 UJ	200 UJ	220 U	220 U
HEXACHLOROETHANE									220 U	200 U	220 U	220 U
INDENO(1,2,3-CD)PYRENE									220 UJ	200 UJ	220 UJ	220 UJ
ISOPHORONE									220 U	200 U	220 U	220 U
N-NITROSO-DI-N-PROPYLAMINE									220 U	200 U	220 U	220 U
N-NITROSODIPHENYLAMINE									220 U	200 U	220 U	220 U
NAPHTHALENE									220 U	200 U	220 U	220 U
NITROBENZENE									220 U	200 U	220 U	220 U
PENTACHLOROPHENOL									460 U	410 U	450 U	460 U
PHENANTHRENE									220 U	200 U	220 U	220 U

SUMMARY OF SITE 7 SOIL DATA - TORPEDO SHOPS
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	B325-MW4	B325-SB5	B325-SB5	B325-SB6	B325-SB6	B325-SB7	B325SS	B325SW	7SB8	7SB9	7SB10	7SB18
matrix	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
nsample	B325-SO04-0608	B325-SO05-0002	B325-SO05-0406	B325-SO06-0002	B325-SO06-0002-D	B325-SO07-0003	B325SS-0203	B325SW-0203	S7SB080607	S7SB090809	S7SB100607	S7SB180506
sample	B325-MW04-0608	B325-MW05-0002	B325-MW05-0406	B325-MW06-0002	DUP-02	B325-MW07-0003	B325SS-0203	B325SW-0203	S7SB080607	S7SB090809	S7SB100607	S7SB180506
sacode	NORMAL	NORMAL	NORMAL	DUP	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
top_depth	6	0	4	0	0	0	2	2	6	8	6	5
bottom_dep	8	2	6	2	2	3	3	3	7	9	7	6
sample_dat	11/4/94	11/5/94	11/5/94	11/5/94	11/5/94	11/5/94	12/2/95	12/2/95	6/13/00	6/13/00	6/13/00	6/13/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE
coll_meth	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
cto	129	129	129	129	129	129	129	129	312	312	312	312
proj_manag	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
duplicate					B325-SO06-0002							
PHENOL									220 U	200 U	220 U	220 U
PYRENE									220 U	200 U	25 J	220 U
Pesticides/PCBs (ug/kg)												
4,4'-DDD												
4,4'-DDE												
4,4'-DDT												
ALDRIN												
ALPHA-BHC												
ALPHA-CHLORDANE												
AROCLOR-1016												
AROCLOR-1221												
AROCLOR-1232												
AROCLOR-1242												
AROCLOR-1248												
AROCLOR-1254												
AROCLOR-1260												
BETA-BHC												
DELTA-BHC												
DIELDRIN												
ENDOSULFAN I												
ENDOSULFAN II												
ENDOSULFAN SULFATE												
ENDRIN												
ENDRIN ALDEHYDE												
ENDRIN KETONE												
GAMMA-BHC (LINDANE)												
GAMMA-CHLORDANE												
HEPTACHLOR												
HEPTACHLOR EPOXIDE												
METHOXYCHLOR												
TOXAPHENE												
Inorganics (mg/kg)												
ALUMINUM									16600	13400	18500	13500
ANTIMONY									0.62 UJ	0.71 J	0.92 J	0.67 U
ARSENIC									3.1	2.1	1.2 J	2 J

SUMMARY OF SITE 7 SOIL DATA - TORPEDO SHOPS
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	B325-MW4	B325-SB5	B325-SB5	B325-SB6	B325-SB6	B325-SB7	B325SS	B325SW	7SB8	7SB9	7SB10	7SB18
matrix	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO	SO
nsample	B325-SO04-0608	B325-SO05-0002	B325-SO05-0406	B325-SO06-0002	B325-SO06-0002-D	B325-SO07-0003	B325SS-0203	B325SW-0203	S7SB080607	S7SB090809	S7SB100607	S7SB180506
sample	B325-MW04-0608	B325-MW05-0002	B325-MW05-0406	B325-MW06-0002	DUP-02	B325-MW07-0003	B325SS-0203	B325SW-0203	S7SB080607	S7SB090809	S7SB100607	S7SB180506
sacode	NORMAL	NORMAL	NORMAL	DUP	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
top_depth	6	0	4	0	0	0	2	2	6	8	6	5
bottom_dep	8	2	6	2	2	3	3	3	7	9	7	6
sample_dat	11/4/94	11/5/94	11/5/94	11/5/94	11/5/94	11/5/94	12/2/95	12/2/95	6/13/00	6/13/00	6/13/00	6/13/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE
coll_meth	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
cto	129	129	129	129	129	129	129	129	312	312	312	312
proj_manag	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	Cochran, Matt	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
duplicate					B325-SO06-0002							
BARIUM									43.6	65.9	81.2	36
BERYLLIUM									0.55	0.6	0.81	0.46
BORON												
CADMIUM									0.12 U	0.12 U	0.11 U	0.13 U
CALCIUM									1300	2230	1500	1040
CHROMIUM									18.6	27.9	25.2	20.5
COBALT									6.6	9.4	7.2	5.1
COPPER									12.2 J	13.2 J	16.1	8.8 J
CYANIDE												
IRON									13800	12600	16200	13500
LEAD									9.2	4.6	6.2	4.5
MAGNESIUM									2760	4270	4120	2740
MANGANESE									238	203	181	107
MERCURY									0.14 U	0.07 U	0.06 U	0.1 U
NICKEL									8.1	13.8	11.9	7.3
POTASSIUM									1080	1770	1320	780
SELENIUM									0.62 U	0.61 U	0.55 U	0.67 U
SILVER									3.8	3.6	3.9	3.7
SODIUM									184	232	197	173
THALLIUM									0.48 U	0.48 U	0.55 J	0.52 U
VANADIUM									31.9	29.3	38.4	27.3
ZINC									39.2	42.5	40.3	29.1
Miscellaneous Parameters (mg/kg)												
TPH	13.2 U	28	70.9	367	298	253	92.4	157				
TOTAL ORGANIC CARBON												

U - Not Detected
J - Estimated
R - Rejected

SUMMARY OF SITE 7 SOIL DATA - TORPEDO SHOPS
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	7SB01
matrix	SB
sample	S7SB010912
sacode	NORMAL
depth	09-12
sample_date	6/13/00
validated	TRUE
cto_proj	312
proj_manager	CERCONE, D.
Grain Size (%)	
SIEVE # 10	35.38
SIEVE # 100	27.44
SIEVE # 200	19.49
SIEVE # 4	45.71
SIEVE # 40	30.99
SIEVE # 50	29.82
SIEVE 1-1/2"	100
SIEVE 1/2"	63.77
SIEVE 3"	100
SIEVE 3/4"	100
SIEVE 3/8"	58.69
Miscellaneous Parameters	
BULK DENSITY (LB/FT)	98.77
PH	8.33
POROSITY(N)	0.3736
SPECIFIC GRAVITY	2.53

APPENDIX B.7

SITE 7 - TORPEDO SHOPS GROUNDWATER DATA
TEMPORARY WELLS

SUMMARY OF SITE 7 GROUNDWATER DATA
TEMPORARY WELLS - TORPEDO SHOPS
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	7TW1	7TW2	7TW3	7TW4	7TW5	7TW6	7TW7	7TW7	7TW8	7TW9	7TW10
nsample	S7TW0101	S7TW0201	S7TW0301	S7TW0401	S7TW0501	S7TW0601	S7TW0701	S7TW0701-D	S7TW0801	S7TW0901	S7TW1001
sample	S7TW0101	S7TW0201	S7TW0301	S7TW0401	S7TW0501	S7TW0601	S7TW0701	FD0611001	S7TW0801	S7TW0901	S7TW1001
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	DUP	DUP	NORMAL	NORMAL	NORMAL
qc_type	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
status	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	6/11/00	6/11/00	6/11/00	6/11/00	6/11/00	6/11/00	6/11/00	6/11/00	6/24/00	6/24/00	6/25/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
filtering	UNF	UNF	UNF	UNF	UNF	UNF	UNF	UNF	UNF	UNF	UNF
Volatile Organics (ug/L)											
1,1,1-TRICHLOROETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ
1,1,2,2-TETRACHLOROETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ
1,1,2-TRICHLOROETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ
1,1-DICHLOROETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ
1,1-DICHLOROETHENE	1 UJ	1 UJ	1 U	1 U	1 U	1 U	1 U	1 UJ	1 U	1 U	1 UJ
1,2,4-TRICHLOROBENZENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ
1,2-DIBROMO-3-CHLOROPROPANE	1 U	1 U	1 UR	1 UR	1 UR	1 UR	1 UR	1 U	1 U	1 U	1 UJ
1,2-DIBROMOETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ
1,2-DICHLOROBENZENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ
1,2-DICHLOROETHANE	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 U	1 U	1 UJ
1,2-DICHLOROPROPANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ
1,3-DICHLOROBENZENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ
1,4-DICHLOROBENZENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1.83	9.21	90.5 J
2-BUTANONE	1 UR	1 UR	1 UR	1 UR	1 UR	1 UR	1 UR	1 UR	5 UR	5 UR	5 UR
2-HEXANONE	1 UR	1 UR	1 UR	1 UR	1 UR	1 UR	1 UR	1 UR	5 UR	5 UR	5 UR
4-METHYL-2-PENTANONE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U	5 U	5 UJ
ACETONE	1 UR	1 UR	1 UR	1 UR	1 UR	1 UR	1 UR	1 UR	5 UR	5 UR	5 UR
BENZENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 J
BROMOCHLOROMETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ
BROMODICHLOROMETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ
BROMOFORM	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ
BROMOMETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ
CARBON DISULFIDE	1 UJ	1 UJ	1 U	1 U	1 U	1 U	1 U	1 UJ	1 U	1 U	1 UJ
CARBON TETRACHLORIDE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ
CHLOROBENZENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	6.66	165 J
CHLOROETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ
CHLOROFORM	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ

SUMMARY OF SITE 7 GROUNDWATER DATA
TEMPORARY WELLS - TORPEDO SHOPS
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	7TW1	7TW2	7TW3	7TW4	7TW5	7TW6	7TW7	7TW7	7TW8	7TW9	7TW10
nsample	S7TW0101	S7TW0201	S7TW0301	S7TW0401	S7TW0501	S7TW0601	S7TW0701	S7TW0701-D	S7TW0801	S7TW0901	S7TW1001
sample	S7TW0101	S7TW0201	S7TW0301	S7TW0401	S7TW0501	S7TW0601	S7TW0701	FD0611001	S7TW0801	S7TW0901	S7TW1001
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	DUP	DUP	NORMAL	NORMAL	NORMAL
qc_type	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
status	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	6/11/00	6/11/00	6/11/00	6/11/00	6/11/00	6/11/00	6/11/00	6/11/00	6/24/00	6/24/00	6/25/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
filtering	UNF	UNF	UNF	UNF	UNF	UNF	UNF	UNF	UNF	UNF	UNF
CHLOROMETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ
CIS-1,2-DICHLOROETHENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ
CIS-1,3-DICHLOROPROPENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ
DIBROMOCHLOROMETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ
ETHYLBENZENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ
M+P-XYLENES									2 U	2 U	2 UJ
METHYLENE CHLORIDE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	2 U	2 U
O-XYLENE									1 U	1 U	1 UJ
STYRENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ
TETRACHLOROETHENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ
TOLUENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ
TRANS-1,2-DICHLOROETHENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ
TRANS-1,3-DICHLOROPROPENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ
TRICHLOROETHENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ
VINYL CHLORIDE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ
XYLENES, TOTAL	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ
Dissolved Gases (ug/L)											
ETHANE									2 U	2 U	2 U
ETHENE									3 U	3 U	3 U
METHANE									19	8	6
Semivolatile Organics (ug/L)											
1,2,4-TRICHLOROBENZENE									5 U	5 U	5 U
1,2-DICHLOROBENZENE									5 U	5 U	5 U
1,3-DICHLOROBENZENE									5 U	5 U	5 U
1,4-DICHLOROBENZENE									1 J	6	58
2,2'-OXYBIS(1-CHLOROPROPANE)									5 U	5 U	5 U
2,4,5-TRICHLOROPHENOL									20 U	20 U	20 U
2,4,6-TRICHLOROPHENOL									5 U	5 U	5 U

SUMMARY OF SITE 7 GROUNDWATER DATA
TEMPORARY WELLS - TORPEDO SHOPS
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	7TW1	7TW2	7TW3	7TW4	7TW5	7TW6	7TW7	7TW7	7TW8	7TW9	7TW10
nsample	S7TW0101	S7TW0201	S7TW0301	S7TW0401	S7TW0501	S7TW0601	S7TW0701	S7TW0701-D	S7TW0801	S7TW0901	S7TW1001
sample	S7TW0101	S7TW0201	S7TW0301	S7TW0401	S7TW0501	S7TW0601	S7TW0701	FD0611001	S7TW0801	S7TW0901	S7TW1001
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	DUP	DUP	NORMAL	NORMAL	NORMAL
qc_type	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
status	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	6/11/00	6/11/00	6/11/00	6/11/00	6/11/00	6/11/00	6/11/00	6/11/00	6/24/00	6/24/00	6/25/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
filtering	UNF	UNF	UNF	UNF	UNF	UNF	UNF	UNF	UNF	UNF	UNF
2,4-DICHLOROPHENOL									5 U	5 U	5 U
2,4-DIMETHYLPHENOL									5 U	5 U	5 U
2,4-DINITROPHENOL									20 U	20 U	20 U
2,4-DINITROTOLUENE									5 U	5 U	5 U
2,6-DINITROTOLUENE									5 U	5 U	5 U
2-CHLORONAPHTHALENE									5 U	5 U	5 U
2-CHLOROPHENOL									5 U	5 U	5 U
2-METHYLNAPHTHALENE									5 U	5 U	5 U
2-METHYLPHENOL									5 U	5 U	5 U
2-NITROANILINE									20 U	20 U	20 U
2-NITROPHENOL									5 U	5 U	5 U
3,3'-DICHLOROBENZIDINE									5 U	5 U	5 U
3-NITROANILINE									20 U	20 U	20 U
4,6-DINITRO-2-METHYLPHENOL									20 U	20 U	20 U
4-BROMOPHENYL PHENYL ETHER									5 U	5 U	5 U
4-CHLORO-3-METHYLPHENOL									5 U	5 U	5 U
4-CHLOROANILINE									5 U	5 U	5 U
4-CHLOROPHENYL PHENYL ETHER									5 U	5 U	5 U
4-METHYLPHENOL									5 U	5 U	5 U
4-NITROANILINE									20 U	20 U	20 U
4-NITROPHENOL									20 U	20 U	20 U
ACENAPHTHENE									5 U	5 U	5 U
ACENAPHTHYLENE									5 U	5 U	5 U
ANTHRACENE									5 U	5 U	5 U
BENZO(A)ANTHRACENE									5 U	5 U	5 U
BENZO(A)PYRENE									5 U	5 U	5 U
BENZO(B)FLUORANTHENE									5 U	5 U	5 U
BENZO(G,H,I)PERYLENE									5 U	5 U	5 U

SUMMARY OF SITE 7 GROUNDWATER DATA
TEMPORARY WELLS - TORPEDO SHOPS
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	7TW1	7TW2	7TW3	7TW4	7TW5	7TW6	7TW7	7TW7	7TW8	7TW9	7TW10
nsample	S7TW0101	S7TW0201	S7TW0301	S7TW0401	S7TW0501	S7TW0601	S7TW0701	S7TW0701-D	S7TW0801	S7TW0901	S7TW1001
sample	S7TW0101	S7TW0201	S7TW0301	S7TW0401	S7TW0501	S7TW0601	S7TW0701	FD0611001	S7TW0801	S7TW0901	S7TW1001
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	DUP	DUP	NORMAL	NORMAL	NORMAL
qc_type	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
status	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	6/11/00	6/11/00	6/11/00	6/11/00	6/11/00	6/11/00	6/11/00	6/11/00	6/24/00	6/24/00	6/25/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
filtering	UNF	UNF	UNF	UNF	UNF	UNF	UNF	UNF	UNF	UNF	UNF
BENZO(K)FLUORANTHENE									5 U	5 U	5 U
BIS(2-CHLOROETHOXY)METHANE									5 U	5 U	5 U
BIS(2-CHLOROETHYL)ETHER									5 U	5 U	5 U
BIS(2-ETHYLHEXYL)PHTHALATE									44	49	5 U
BUTYLBENZYL PHTHALATE									5 U	5 U	5 U
CARBAZOLE									5 U	5 U	5 U
CHRYSENE									5 U	5 U	5 U
DI-N-BUTYL PHTHALATE									5 U	5 U	5 U
DI-N-OCTYL PHTHALATE									5 U	5 U	5 U
DIBENZO(A,H)ANTHRACENE									5 U	5 U	5 U
DIBENZOFURAN									5 U	5 U	5 U
DIETHYL PHTHALATE									5 U	5 U	5 U
DIMETHYL PHTHALATE									5 U	5 U	5 U
FLUORANTHENE									5 U	5 U	5 U
FLUORENE									5 U	5 U	5 U
HEXACHLOROBENZENE									5 U	5 U	5 U
HEXACHLOROBUTADIENE									5 U	5 U	5 U
HEXACHLOROCYCLOPENTADIENE									5 U	5 U	5 U
HEXACHLOROETHANE									5 U	5 U	5 U
INDENO(1,2,3-CD)PYRENE									5 U	5 U	5 U
ISOPHORONE									5 U	5 U	5 U
N-NITROSO-DI-N-PROPYLAMINE									5 U	5 U	5 U
N-NITROSODIPHENYLAMINE									5 U	5 U	5 U
NAPHTHALENE									5 U	5 U	5 U
NITROBENZENE									5 U	5 U	5 U
PENTACHLOROPHENOL									20 U	20 U	20 U
PHENANTHRENE									5 U	5 U	5 U
PHENOL									5 U	5 U	5 U

SUMMARY OF SITE 7 GROUNDWATER DATA
TEMPORARY WELLS - TORPEDO SHOPS
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	7TW1	7TW2	7TW3	7TW4	7TW5	7TW6	7TW7	7TW7	7TW8	7TW9	7TW10
nsample	S7TW0101	S7TW0201	S7TW0301	S7TW0401	S7TW0501	S7TW0601	S7TW0701	S7TW0701-D	S7TW0801	S7TW0901	S7TW1001
sample	S7TW0101	S7TW0201	S7TW0301	S7TW0401	S7TW0501	S7TW0601	S7TW0701	FD0611001	S7TW0801	S7TW0901	S7TW1001
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	DUP	DUP	NORMAL	NORMAL	NORMAL
qc_type	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
status	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	6/11/00	6/11/00	6/11/00	6/11/00	6/11/00	6/11/00	6/11/00	6/11/00	6/24/00	6/24/00	6/25/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
filtering	UNF	UNF	UNF	UNF	UNF	UNF	UNF	UNF	UNF	UNF	UNF
PYRENE									5 U	5 U	5 U
Total Metals (ug/L)											
ALUMINUM									891	57500	50.5 U
ANTIMONY									2.6 U	4.1 U	2.6 U
ARSENIC									2.3 U	11.4	2.3 U
BARIUM									38.6 U	434	20.5 U
BERYLLIUM									1.1 U	3.7 U	0.72 U
CADMIUM									0.25 U	0.25 U	0.25 U
CALCIUM									23900	37000	12800
CHROMIUM									6.2 U	127	6.2 U
COBALT									4.2 U	31.3	4.2 U
COPPER									6.8 U	73.2	6.8 U
IRON									4370	59400	282 U
LEAD									1.8 U	32.8	1.8 U
MAGNESIUM									5130	19500	3080
MANGANESE									836	1250	650
MERCURY									0.11 U	0.23 U	0.11 U
NICKEL									9.2 U	52.8 J	9.2 U
POTASSIUM									6060	11600	4410
SELENIUM									2.8 U	2.8 U	2.8 U
SILVER									5.2 U	16.3	5.2 U
SODIUM									64100	67500	29600
THALLIUM									3 U	3 U	3 U
VANADIUM									6.3 U	151	6.3 U
ZINC									21 U	164	15.6 U
Miscellaneous Parameters (mg/L)											
ALKALINITY									82.6	76.4	50.3
AMMONIA, AS NITROGEN									0.43	0.43	0.2

SUMMARY OF SITE 7 GROUNDWATER DATA
TEMPORARY WELLS - TORPEDO SHOPS
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	7TW1	7TW2	7TW3	7TW4	7TW5	7TW6	7TW7	7TW7	7TW8	7TW9	7TW10
nsample	S7TW0101	S7TW0201	S7TW0301	S7TW0401	S7TW0501	S7TW0601	S7TW0701	S7TW0701-D	S7TW0801	S7TW0901	S7TW1001
sample	S7TW0101	S7TW0201	S7TW0301	S7TW0401	S7TW0501	S7TW0601	S7TW0701	FD0611001	S7TW0801	S7TW0901	S7TW1001
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	DUP	DUP	NORMAL	NORMAL	NORMAL
qc_type	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
status	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	6/11/00	6/11/00	6/11/00	6/11/00	6/11/00	6/11/00	6/11/00	6/11/00	6/24/00	6/24/00	6/25/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
filtering	UNF	UNF	UNF	UNF	UNF	UNF	UNF	UNF	UNF	UNF	UNF
AMMONIUM									0.44	0.3	0.3
CHLORIDE									92	69.8	41.2
HARDNESS as CaCO3									80.7	173	44.7
PERCHLORATE									0.004 U	0.004 U	0.004 U
SULFATE									29.8	34.6	13.9
SULFIDE									0.05 U	0.05 U	0.07
TOTAL DISSOLVED SOLIDS									275	266	158
TOTAL ORGANIC CARBON									14	17	9
TOTAL SUSPENDED SOLIDS									29	2950	5 U

U - Not Detected
J - Estimated
R - Rejected

APPENDIX B.8

SITE 7 - TORPEDO SHOPS GROUNDWATER DATA PERMANENT WELLS

SUMMARY OF SITE 7 GROUNDWATER DATA
PERMANENT WELLS - TORPEDO SHOPS
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	B325-MW1	B325-MW3	B325-MW4	7MW1D	7MW1D	7MW2D	7MW2S	7MW3D	7MW3S	7MW4S	7MW5D
nsample	S7B325MW0101	S7B325MW0301	S7B325MW0401	S7MW01D01	S7MW01D01-F	S7MW02D01	S7MW02S01	S7MW03D01	S7MW03S01	S7MW04S01	S7MW05D01
sample	S7B325MW0101	S7B325MW0301	S7B325MW0401	S7MW01D01	S7MW01D01-F	S7MW02D01	S7MW02S01	S7MW03D01	S7MW03S01	S7MW04S01	S7MW05D01
qc_type	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
status	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	7/9/00	7/9/00	7/10/00	7/7/00	7/7/00	7/8/00	7/8/00	6/24/00	7/11/00	7/9/00	7/11/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
Volatile Organics (ug/L)											
1,1,1-TRICHLOROETHANE	1 U	1 U	1 U	1 U		1 U	1 U	1 UJ	1 U	1 U	1 U
1,1,2,2-TETRACHLOROETHANE	1 U	1 U	1 U	1 U		1 U	1 U	1 UJ	1 U	1 U	1 U
1,1,2-TRICHLOROETHANE	1 U	1 U	1 U	1 U		1 U	1 U	1 UJ	1 U	1 U	1 U
1,1-DICHLOROETHANE	1 UJ	1 UJ	1 UJ	1 UJ		1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
1,1-DICHLOROETHENE	1 U	1 U	1 UJ	1 U		1 U	1 U	1 UJ	1 UJ	1 U	1 UJ
1,2,4-TRICHLOROBENZENE	1 U	1 U	1 U	1 U		1 U	1 U	1 UJ	1 U	1 U	1 U
1,2-DIBROMO-3-CHLOROPROPANE	1 UJ	1 UJ	1 UJ	1 UJ		1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
1,2-DIBROMOETHANE	1 U	1 U	1 U	1 U		1 U	1 U	1 UJ	1 U	1 U	1 U
1,2-DICHLOROBENZENE	1 U	1 U	1 U	1 U		1 U	1 U	1 UJ	1 U	1 U	1 U
1,2-DICHLOROETHANE	1 U	1 U	1 U	1 U		1 U	1 U	1 UJ	1 U	1 U	1 U
1,2-DICHLOROPROPANE	1 U	1 UJ	1 UJ	1 U		1 U	1 U	1 UJ	1 UJ	1 UJ	1 UJ
1,3-DICHLOROBENZENE	1 U	1 U	1 U	1 U		1 U	1 U	1 UJ	1.73	1 U	1 U
1,4-DICHLOROBENZENE	1 U	1 U	1 U	1 U		1 U	1 U	1 UJ	1.71	1 U	1 U
2-BUTANONE	5 UR	5 UR	5 UR	5 UR		5 UR	5 UR	5 UR	5 UR	5 UR	5 UR
2-HEXANONE	5 UR	5 UR	5 UR	5 UR		5 UR	5 UR	5 UR	5 UR	5 UR	5 UR
4-METHYL-2-PENTANONE	5 U	5 U	5 UJ	5 U		5 U	5 U	5 UJ	5 UJ	5 U	5 UJ
ACETONE	5 UJ	5 UR	5 UR	5 UJ		5 UJ	5 UJ	5 UR	5 UR	5 UR	5 U
BENZENE	1 U	1 U	1 UJ	1 U		1 U	1 U	1 UJ	1 UJ	1 U	1 UJ
BROMOCHLOROMETHANE	1 U	1 U	1 U	1 U		1 U	1 U	1 UJ	1 U	1 U	1 U
BROMODICHLOROMETHANE	1 U	1 U	1 U	1 U		1 U	1 U	1 UJ	1 U	1 U	1 U
BROMOFORM	1 U	1 U	1 U	1 U		1 U	1 U	1 UJ	1 U	1 U	1 U
BROMOMETHANE	1 U	1 U	1 U	1 U		1 U	1 U	1 UJ	1 U	1 U	1 U
CARBON DISULFIDE	1 UJ	1 U	1 UJ	1 UJ		1 UJ	1 UJ	1 UJ	1 UJ	1 U	1 UJ
CARBON TETRACHLORIDE	1 U	1 U	1 U	1 U		1 U	1 U	1 UJ	1 U	1 U	1 U
CHLOROBENZENE	1 U	1 U	1 U	1 U		1 U	1 U	1 UJ	1 U	1 U	1 U
CHLOROETHANE	1 U	1 UJ	1 UJ	1 U		1 U	1 U	1 UJ	1 UJ	1 UJ	1 UJ
CHLOROFORM	1 U	1 U	1 U	1 U		1 U	1 U	1 UJ	1 U	1 U	1 U
CHLOROMETHANE	1 UJ	1 U	1 UJ	1 UJ		1 UJ	1 UJ	1 UJ	1 UJ	1 U	1 UJ
CIS-1,2-DICHLOROETHENE	1 U	1 U	1 U	1 U		1 U	1 U	1 UJ	1 U	1 U	1 U
CIS-1,3-DICHLOROPROPENE	1 U	1 U	1 U	1 U		1 U	1 U	1 UJ	1 U	1 U	1 U

SUMMARY OF SITE 7 GROUNDWATER DATA
PERMANENT WELLS - TORPEDO SHOPS
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	B325-MW1	B325-MW3	B325-MW4	7MW1D	7MW1D	7MW2D	7MW2S	7MW3D	7MW3S	7MW4S	7MW5D
nsample	S7B325MW0101	S7B325MW0301	S7B325MW0401	S7MW01D01	S7MW01D01-F	S7MW02D01	S7MW02S01	S7MW03D01	S7MW03S01	S7MW04S01	S7MW05D01
sample	S7B325MW0101	S7B325MW0301	S7B325MW0401	S7MW01D01	S7MW01D01-F	S7MW02D01	S7MW02S01	S7MW03D01	S7MW03S01	S7MW04S01	S7MW05D01
qc_type	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
status	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	7/9/00	7/9/00	7/10/00	7/7/00	7/7/00	7/8/00	7/8/00	6/24/00	7/11/00	7/9/00	7/11/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
DIBROMOCHLOROMETHANE	1 U	1 U	1 U	1 U		1 U	1 U	1 UJ	1 U	1 U	1 U
ETHYLBENZENE	1 U	1 U	1 U	1 U		1 U	1 U	1 UJ	1 U	1 U	1 U
M+P-XYLENES	1 U	1 U	1 U	1 U		1 U	1 U	2 UJ	1 U	1 U	1 U
METHYLENE CHLORIDE	3.88 U	1.25 U	2 U	5.24 U		3.17 U	4.05 U	2 U	2 U	1.68 U	2 U
O-XYLENE	1 U	1 U	1 U	1 U		1 U	1 U	1 UJ	1 U	1 U	1 U
STYRENE	1 U	1 U	1 U	1 U		1 U	1 U	1 UJ	1 U	1 U	1 U
TETRACHLOROETHENE	1 U	1 U	1 U	1 U		1 U	1 U	1 UJ	1 U	1 U	1 U
TOLUENE	1 U	1 U	1 U	1 U		1 U	1 U	1 UJ	1 U	1 U	1 U
TRANS-1,2-DICHLOROETHENE	1 U	1 U	1 U	1 U		1 U	1 U	1 UJ	1 U	1 U	1 U
TRANS-1,3-DICHLOROPROPENE	1 U	1 U	1 U	1 U		1 U	1 U	1 UJ	1 U	1 U	1 U
TRICHLOROETHENE	1.93	1.39	1 U	4.09		1.54	1 U	1 UJ	1 U	1 U	7.58
VINYL CHLORIDE	1 UJ	1 UJ	1 UJ	1 UJ		1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
XYLENES, TOTAL	1 U	1 U	1 U	1 U		1 U	1 U	1 UJ	1 U	1 U	1 U
Dissolved Gases (ug/L)											
ETHANE	2 U	2 U	2 U	2 U		2 U	2 U	2 U	2 U	2 U	2 U
ETHENE	3 U	3 U	3 U	3 U		3 U	3 U	3 U	3 U	3 U	3 U
METHANE	1 U	1 U	1 UJ	1 U		1 U	1 U	1	20 J	1 U	1 UJ
Semivolatile Organics (ug/L)											
1-METHYLNAPHTHALENE	0.25 U	0.25 U	0.5 U	0.25 U		0.25 U	0.25 U	0.5 U	0.5 U	0.25 U	0.5 U
2,2'-OXYBIS(1-CHLOROPROPANE)	5 U	5 U	10 UJ	5 U		5 U	5 U	5 UJ	5 UJ	5 U	5 UJ
2,4,5-TRICHLOROPHENOL	20 U	20 U	40 U	20 U		20 U	20 U	20 U	20 U	20 U	20 U
2,4,6-TRICHLOROPHENOL	5 U	5 U	10 U	5 U		5 U	5 U	5 U	5 U	5 U	5 U
2,4-DICHLOROPHENOL	5 U	5 U	10 U	5 U		5 U	5 U	5 U	5 U	5 U	5 U
2,4-DIMETHYLPHENOL	5 U	5 U	10 U	5 U		5 U	5 U	5 U	5 U	5 U	5 U
2,4-DINITROPHENOL	20 U	20 U	40 UJ	20 U		20 U	20 U	20 UJ	20 UJ	20 U	20 UJ
2,4-DINITROTOLUENE	5 U	5 U	10 U	5 U		5 U	5 U	5 U	5 U	5 U	5 U
2,6-DINITROTOLUENE	5 U	5 U	10 UJ	5 U		5 U	5 U	5 UJ	5 UJ	5 U	5 UJ
2-CHLORONAPHTHALENE	5 U	5 U	10 U	5 U		5 U	5 U	5 U	5 U	5 U	5 U
2-CHLOROPHENOL	5 UJ	5 UJ	10 UJ	5 UJ		5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ
2-METHYLNAPHTHALENE	0.25 U	0.25 U	0.5 U	0.25 U		0.25 U	0.25 U	0.5 U	0.5 U	0.25 U	0.5 U
2-METHYLPHENOL	5 U	5 U	10 U	5 U		5 U	5 U	5 U	5 U	5 U	5 U

SUMMARY OF SITE 7 GROUNDWATER DATA
PERMANENT WELLS - TORPEDO SHOPS
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	B325-MW1	B325-MW3	B325-MW4	7MW1D	7MW1D	7MW2D	7MW2S	7MW3D	7MW3S	7MW4S	7MW5D
nsample	S7B325MW0101	S7B325MW0301	S7B325MW0401	S7MW01D01	S7MW01D01-F	S7MW02D01	S7MW02S01	S7MW03D01	S7MW03S01	S7MW04S01	S7MW05D01
sample	S7B325MW0101	S7B325MW0301	S7B325MW0401	S7MW01D01	S7MW01D01-F	S7MW02D01	S7MW02S01	S7MW03D01	S7MW03S01	S7MW04S01	S7MW05D01
qc_type	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
status	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	7/9/00	7/9/00	7/10/00	7/7/00	7/7/00	7/8/00	7/8/00	6/24/00	7/11/00	7/9/00	7/11/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
2-NITROANILINE	20 U	20 U	40 U	20 U		20 U	20 U	20 U	20 U	20 U	20 U
2-NITROPHENOL	5 U	5 U	10 UJ	5 U		5 U	5 U	5 UJ	5 UJ	5 U	5 UJ
3,3'-DICHLOROBENZIDINE	5 U	5 U	10 U	5 U		5 U	5 U	5 U	5 U	5 U	5 U
3-NITROANILINE	20 U	20 U	40 U	20 U		20 U	20 U	20 U	20 U	20 U	20 U
4,6-DINITRO-2-METHYLPHENOL	20 U	20 U	40 UJ	20 U		20 U	20 U	20 UJ	20 UJ	20 U	20 UJ
4-BROMOPHENYL PHENYL ETHER	5 U	5 U	10 U	5 U		5 U	5 U	5 U	5 U	5 U	5 U
4-CHLORO-3-METHYLPHENOL	5 U	5 U	10 U	5 U		5 U	5 U	5 U	5 U	5 U	5 U
4-CHLOROANILINE	5 UR	5 UR	10 U	5 UR		5 UR	5 UR	5 U	5 U	5 UR	5 U
4-CHLOROPHENYL PHENYL ETHER	5 U	5 U	10 U	5 U		5 U	5 U	5 U	5 U	5 U	5 U
4-METHYLPHENOL	5 U	5 U	10 U	5 U		5 U	5 U	5 U	5 U	5 U	5 U
4-NITROANILINE	20 U	20 U	40 U	20 U		20 U	20 U	20 U	20 U	20 U	20 U
4-NITROPHENOL	20 U	20 U	40 U	20 U		20 U	20 U	20 U	20 U	20 U	20 U
ACENAPHTHENE	0.25 U	0.25 U	0.5 U	0.25 U		0.25 U	0.25 U	0.5 U	0.5 U	0.25 U	0.5 U
ACENAPHTHYLENE	0.5 U	0.5 U	1 U	0.5 U		0.5 U	0.5 U	1 U	1 U	0.5 U	1 U
ANTHRACENE	0.03 U	0.03 U	0.05 U	0.03 U		0.03 U	0.03 U	0.05 U	0.05 U	0.03 U	0.05 U
BENZO(A)ANTHRACENE	0.03 U	0.03 U	0.05 U	0.03 U		0.03 U	0.03 U	0.05 U	0.05 U	0.03 U	0.05 U
BENZO(A)PYRENE	0.03 U	0.03 U	0.05 U	0.03 U		0.03 U	0.03 U	0.05 U	0.05 U	0.03 U	0.05 U
BENZO(B)FLUORANTHENE	0.05 U	0.05 U	0.1 U	0.05 U		0.05 U	0.05 U	0.1 U	0.1 U	0.05 U	0.1 U
BENZO(G,H,I)PERYLENE	0.05 U	0.05 U	0.1 U	0.05 U		0.05 U	0.05 U	0.1 U	0.1 U	0.05 U	0.1 U
BENZO(K)FLUORANTHENE	0.03 U	0.03 U	0.05 U	0.03 U		0.03 U	0.03 U	0.05 U	0.05 U	0.03 U	0.05 U
BIS(2-CHLOROETHOXY)METHANE	5 U	5 U	10 U	5 U		5 U	5 U	5 U	5 U	5 U	5 U
BIS(2-CHLOROETHYL)ETHER	5 U	5 U	10 UJ	5 U		5 U	5 U	5 UJ	5 UJ	5 U	5 UJ
BIS(2-ETHYLHEXYL)PHTHALATE	5 U	5 U	10 U	5 U		5 U	5 U	5 U	5 U	5 U	5 U
BUTYLBENZYL PHTHALATE	5 U	5 U	10 U	5 U		5 U	5 U	5 U	5 U	5 U	5 U
CHRYSENE	0.03 U	0.03 U	0.05 U	0.03 U		0.03 U	0.03 U	0.05 U	0.05 U	0.03 U	0.05 U
DIBENZO(A,H)ANTHRACENE	0.05 U	0.05 U	0.1 U	0.05 U		0.05 U	0.05 U	0.1 U	0.1 U	0.05 U	0.1 U
DIBENZOFURAN			10 U					5 U	5 U		5 U
DIETHYL PHTHALATE	5 U	5 U	10 U	5 U		5 U	5 U	5 U	5 U	5 U	5 U
DIMETHYL PHTHALATE	5 U	5 U	10 U	5 U		5 U	5 U	5 U	5 U	5 U	5 U
DI-N-BUTYL PHTHALATE	5 U	5 U	10 U	5 U		5 U	5 U	5 U	5 U	5 U	5 U
DI-N-OCTYL PHTHALATE	5 U	5 U	10 U	5 U		5 U	5 U	5 U	5 U	5 U	5 U

SUMMARY OF SITE 7 GROUNDWATER DATA
PERMANENT WELLS - TORPEDO SHOPS
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	B325-MW1	B325-MW3	B325-MW4	7MW1D	7MW1D	7MW2D	7MW2S	7MW3D	7MW3S	7MW4S	7MW5D
nsample	S7B325MW0101	S7B325MW0301	S7B325MW0401	S7MW01D01	S7MW01D01-F	S7MW02D01	S7MW02S01	S7MW03D01	S7MW03S01	S7MW04S01	S7MW05D01
sample	S7B325MW0101	S7B325MW0301	S7B325MW0401	S7MW01D01	S7MW01D01-F	S7MW02D01	S7MW02S01	S7MW03D01	S7MW03S01	S7MW04S01	S7MW05D01
qc_type	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
status	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	7/9/00	7/9/00	7/10/00	7/7/00	7/7/00	7/8/00	7/8/00	6/24/00	7/11/00	7/9/00	7/11/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
FLUORANTHENE	0.05 U	0.05 U	0.1 U	0.05 U		0.05 U	0.05 U	0.1 U	0.1 U	0.05 U	0.1 U
FLUORENE	0.05 U	0.05 U	0.1 U	0.05 U		0.05 U	0.05 U	0.1 U	0.1 U	0.05 U	0.1 U
HEXACHLOROBENZENE	5 U	5 U	10 U	5 U		5 U	5 U	5 U	5 U	5 U	5 U
HEXACHLOROBUTADIENE	5 U	5 U	10 U	5 U		5 U	5 U	5 U	5 U	5 U	5 U
HEXACHLOROCYCLOPENTADIENE	5 U	5 U	10 U	5 U		5 U	5 U	5 U	5 U	5 U	5 U
HEXACHLOROETHANE	5 U	5 U	10 U	5 U		5 U	5 U	5 U	5 U	5 U	5 U
INDENO(1,2,3-CD)PYRENE	0.03 U	0.03 U	0.05 U	0.03 U		0.03 U	0.03 U	0.05 U	0.05 U	0.03 U	0.05 U
ISOPHORONE	5 U	5 U	10 UJ	5 U		5 U	5 U	5 UJ	5 UJ	5 U	5 UJ
NAPHTHALENE	0.25 U	0.25 U	0.5 U	0.25 U		0.25 U	0.25 U	0.5 U	0.5 U	0.25 U	0.5 U
NITROBENZENE	5 U	5 U	10 U	5 U		5 U	5 U	5 U	5 U	5 U	5 U
N-NITROSO-DI-N-PROPYLAMINE	5 U	5 U	10 U	5 U		5 U	5 U	5 U	5 U	5 U	5 U
N-NITROSODIPHENYLAMINE	5 U	5 U	10 U	5 U		5 U	5 U	5 U	5 U	5 U	5 U
PENTACHLOROPHENOL	20 U	20 U	40 U	20 U		20 U	20 U	20 U	20 U	20 U	20 U
PHENANTHRENE	0.03 U	0.03 U	0.05 U	0.03 U		0.03 U	0.03 U	0.05 U	0.05 U	0.03 U	0.05 U
PHENOL	5 U	5 U	10 U	5 U		5 U	5 U	5 U	5 U	5 U	5 U
PYRENE	0.03 U	0.03 U	0.05 U	0.03 U		0.03 U	0.03 U	0.05 U	0.05 U	0.03 U	0.05 U
Total Metals (ug/L)											
ALUMINUM	72.4 J	246	815	50.5 U		93.9 J	105	1140	50.5 U	50.5 U	598
ANTIMONY	2.6 U	2.6 U	2.6 U	2.6 U		2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U
ARSENIC	2.3 U	2.3 U	2.3 U	2.3 U		2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U
BARIUM	39	35.7	21 U	17.7 U		9.3 U	9.3 U	39.9	33.5	34.1	55.1
BERYLLIUM	0.72 U	0.72 U	1 U	0.72 U		0.72 U	0.72 U	0.72 U	1 U	0.72 U	1 U
CADMIUM	0.25 U	0.25 U	0.25 U	0.25 U		0.25 U	0.25 U	0.25 U	0.27 J	0.38 U	0.25 U
CALCIUM	26000	23400	20500	15100		8350	5480	21900	17000	28300	103000
CHROMIUM	6.2 U	6.2 U	7.6 J	8.8 U		6.2 U	6.2 U	11.7 J	6.2 U	6.2 U	47
COBALT	4.4 J	4.2 U	5.3 J	4.2 U		4.2 U	14.5	13.9 U	7.1 J	4.2 U	4.2 U
COPPER	11.5 U	6.8 U	10.7 J	11.6 U		10.5 U	6.8 U	6.8 U	11.8 J	8 U	10.7 J
IRON	101 U	196 U	648	759 U		75.4 U	13500 J	1440	119 U	72.5 U	996
LEAD	6.7	1.8 U	1.8 U	7.8		4.2	1.8 U	1.8 U	1.8 U	1.8 U	6.5
MAGNESIUM	6170 J	5350 J	3070	1230 J		1420 J	1250 J	8560	5810	6530 J	6950
MANGANESE	33.2 J	9.2 J	35	9.3 J		2.7 UJ	295 J	958	748	4.6 J	96.6

SUMMARY OF SITE 7 GROUNDWATER DATA
PERMANENT WELLS - TORPEDO SHOPS
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	B325-MW1	B325-MW3	B325-MW4	7MW1D	7MW1D	7MW2D	7MW2S	7MW3D	7MW3S	7MW4S	7MW5D
nsample	S7B325MW0101	S7B325MW0301	S7B325MW0401	S7MW01D01	S7MW01D01-F	S7MW02D01	S7MW02S01	S7MW03D01	S7MW03S01	S7MW04S01	S7MW05D01
sample	S7B325MW0101	S7B325MW0301	S7B325MW0401	S7MW01D01	S7MW01D01-F	S7MW02D01	S7MW02S01	S7MW03D01	S7MW03S01	S7MW04S01	S7MW05D01
qc_type	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
status	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	7/9/00	7/9/00	7/10/00	7/7/00	7/7/00	7/8/00	7/8/00	6/24/00	7/11/00	7/9/00	7/11/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
MERCURY	0.11 U	0.12 U	0.07 U	0.09 U		0.09 U	0.09 U	0.11 U	0.07 U	0.11 U	0.07 U
NICKEL	9.2 U	9.2 U	9.2 U	9.2 U		9.2 U	9.2 U	9.2 U	9.2 U	9.2 U	34.3
POTASSIUM	7010	7140	6090	1460		1290	1310	4900	3010	6090	6920
SELENIUM	2.8 U	2.8 U	2.8 U	2.8 U		2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U
SILVER	5.2 U	5.2 U	5.2 U	5.2 U		5.2 U	5.8 U	5.2 U	5.2 U	5.6 U	5.2 U
SODIUM	76600	76000	44600	4020		7280	5240	91600	76500	76900	30000
THALLIUM	3 U	3 U	3 U	3 U		3 U	3 U	3 U	3 U	3 U	3 U
VANADIUM	6.3 U	6.3 U	6.3 U	6.3 U		6.3 U	6.3 U	6.3 U	6.3 U	6.3 U	6.3 U
ZINC	18.1 U	12.8 U	20.5	157 J		17.3 U	7.4 U	16.4 U	17.1	72.8 J	18.6
Dissolved Metals (ug/L)											
ALUMINUM					50.5 U						
ANTIMONY					2.6 U						
ARSENIC					2.3 U						
BARIUM					18.7 U						
BERYLLIUM					0.72 U						
CADMIUM					0.35 U						
CALCIUM					17600						
CHROMIUM					6.2 U						
COBALT					4.2 U						
COPPER					6.8 U						
IRON					51.5 U						
LEAD					1.8 U						
MAGNESIUM					1470						
MANGANESE					7.8 J						
MERCURY					0.1 U						
NICKEL					9.2 U						
POTASSIUM					1730						
SELENIUM					2.8 U						
SILVER					7.5 U						
SODIUM					4690						
THALLIUM					3 U						

SUMMARY OF SITE 7 GROUNDWATER DATA
PERMANENT WELLS - TORPEDO SHOPS
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	B325-MW1	B325-MW3	B325-MW4	7MW1D	7MW1D	7MW2D	7MW2S	7MW3D	7MW3S	7MW4S	7MW5D
nsample	S7B325MW0101	S7B325MW0301	S7B325MW0401	S7MW01D01	S7MW01D01-F	S7MW02D01	S7MW02S01	S7MW03D01	S7MW03S01	S7MW04S01	S7MW05D01
sample	S7B325MW0101	S7B325MW0301	S7B325MW0401	S7MW01D01	S7MW01D01-F	S7MW02D01	S7MW02S01	S7MW03D01	S7MW03S01	S7MW04S01	S7MW05D01
qc_type	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
status	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	7/9/00	7/9/00	7/10/00	7/7/00	7/7/00	7/8/00	7/8/00	6/24/00	7/11/00	7/9/00	7/11/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
VANADIUM					6.3 U						
ZINC					173						
Miscellaneous Parameters (mg/L)											
ALKALINITY	68.5 J	67 J	66.5 J	39.7 J		19 J	15.5 J	59.2	75.7	83.5 J	124
AMMONIA			0.18 J						0.16		0.15
AMMONIA, AS NITROGEN	0.11	0.1 U		0.54 J		0.13	0.14	0.22		0.1 U	
AMMONIUM	0.2 U	0.2 U	0.2 U	0.2 U		0.2 U	0.2 U	0.4	0.2 U	0.2 U	0.2 U
CHLORIDE	96.8 J	95 J	59.5	5.84 J		8.84 J	8.26 J	104	85.1	153 J	142
HARDNESS as CaCO3	90.3	80.4	63.8	42.8		26.7	18.8	89.8	66.4	97.4	285
PERCHLORATE	0.004 U	0.004 U	0.004 U	0.004 U		0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
SULFATE	49.9 J	43 J	21.5	14.1 J		13.5 J	16.3 J	65.4	48.9	50.2 J	62.5
SULFIDE	2 U	2 U	2 UR	2 U		2 U	2 U	0.05 U	2 UR	2 U	2 UR
TOTAL DISSOLVED SOLIDS	158 U	302 J	211 J	111 U		66.2 U	90 U	355	289	359 J	464
TOTAL ORGANIC CARBON	5 U	5 U	3.5	6		5 U	6	8	1.4	5 U	1.5
TOTAL SUSPENDED SOLIDS	5 UJ	26 J	41 J	5 UJ		5 UJ	10 J	57	5 U	5 UJ	108

U - Not Detected
J - Estimated
R - Rejected

SUMMARY OF SITE 7 GROUNDWATER DATA
PERMANENT WELLS - TORPEDO SHOPS
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	7MW5S	7MW5S	7MW6S	7MW7S	7MW8S	7MW9S	7MW10S	7MW10S	7MW10S	7MW10S	7MW11S
nsample	S7MW05S01	S7MW05S01-D	S7MW06S01	S7MW07S01	S7MW08S01	S7MW09S01	S7MW10S01	S7MW10S01-D	S7MW10S01-F	S7MW10S01-F-D	S7MW11S01
sample	S7MW05S01	FD0710001	S7MW06S01	S7MW07S01	S7MW08S01	S7MW09S01	S7MW10S01	FD0707001	S7MW10S01-F	FD0707001-F	S7MW11S01
qc_type	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
status	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	7/10/00	7/10/00	7/11/00	7/10/00	7/8/00	7/11/00	7/7/00	7/7/00	7/7/00	7/7/00	7/11/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
Volatile Organics (ug/L)											
1,1,1-TRICHLOROETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U
1,1,2,2-TETRACHLOROETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U
1,1,2-TRICHLOROETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U
1,1-DICHLOROETHANE	1 UJ	1 UJ	1 U	1 U	1 UJ	1 U	1 U	1 UJ			1 U
1,1-DICHLOROETHENE	1 UJ	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U			1 U
1,2,4-TRICHLOROBENZENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U
1,2-DIBROMO-3-CHLOROPROPANE	1 UJ	1 UJ	1 U	1 U	1 UJ	1 U	1 UR	1 UJ			1 U
1,2-DIBROMOETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U
1,2-DICHLOROBENZENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U
1,2-DICHLOROETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U
1,2-DICHLOROPROPANE	1 UJ	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U			1 U
1,3-DICHLOROBENZENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U
1,4-DICHLOROBENZENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U
2-BUTANONE	5 UR	5 UR	5 UR	5 UR	5 UR	5 UR	5 UR	5 UR			5 UR
2-HEXANONE	5 UR	5 UR	5 UR	5 UR	5 UR	5 UR	5 UR	5 UR			5 UR
4-METHYL-2-PENTANONE	5 UJ	5 UJ	5 U	5 U	5 U	5 U	5 U	5 U			5 U
ACETONE	5 U	5 UR	5 UR	5 UR	5 UJ	8.74 U	5 UR	5 UJ			5 UR
BENZENE	1 UJ	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U			1 U
BROMOCHLOROMETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U
BROMODICHLOROMETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U
BROMOFORM	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U
BROMOMETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U
CARBON DISULFIDE	1 UJ	1 UJ	1 U	1 U	1 UJ	1 U	1 U	1 UJ			1 U
CARBON TETRACHLORIDE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U
CHLOROBENZENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U
CHLOROETHANE	1 UJ	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U			1 U
CHLOROFORM	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U
CHLOROMETHANE	1 UJ	1 UJ	1 U	1 U	1 UJ	1 U	1 U	1 UJ			1 U
CIS-1,2-DICHLOROETHENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U
CIS-1,3-DICHLOROPROPENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U

SUMMARY OF SITE 7 GROUNDWATER DATA
PERMANENT WELLS - TORPEDO SHOPS
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	7MW5S	7MW5S	7MW6S	7MW7S	7MW8S	7MW9S	7MW10S	7MW10S	7MW10S	7MW10S	7MW11S
nsample	S7MW05S01	S7MW05S01-D	S7MW06S01	S7MW07S01	S7MW08S01	S7MW09S01	S7MW10S01	S7MW10S01-D	S7MW10S01-F	S7MW10S01-F-D	S7MW11S01
sample	S7MW05S01	FD0710001	S7MW06S01	S7MW07S01	S7MW08S01	S7MW09S01	S7MW10S01	FD0707001	S7MW10S01-F	FD0707001-F	S7MW11S01
qc_type	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
status	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	7/10/00	7/10/00	7/11/00	7/10/00	7/8/00	7/11/00	7/7/00	7/7/00	7/7/00	7/7/00	7/11/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
DIBROMOCHLOROMETHANE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U
ETHYLBENZENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U
M+P-XYLENES	1 U	1 U	2 U	2 U	1 U	2 U	2 U	1 U			2 U
METHYLENE CHLORIDE	2 U	2 U	2 UJ	2 U	4.47 U	2 U	2.82 U	4.13 U			2 U
O-XYLENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U
STYRENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U
TETRACHLOROETHENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U
TOLUENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U
TRANS-1,2-DICHLOROETHENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U
TRANS-1,3-DICHLOROPROPENE	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U
TRICHLOROETHENE	1 U	1 U	1 U	2.03	1 U	23	1 U	1 U			1 U
VINYL CHLORIDE	1 UJ	1 UJ	1 U	1 U	1 UJ	1 U	1 U	1 UJ			1 U
XYLENES, TOTAL	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U
Dissolved Gases (ug/L)											
ETHANE	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U			2 U
ETHENE	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U			3 U
METHANE	1 UJ	1 U	41 J	1 UJ	1 U	2 U	1 U	1 U			7 J
Semivolatile Organics (ug/L)											
1-METHYLNAPHTHALENE	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.25 U	0.25 U			0.5 U
2,2'-OXYBIS(1-CHLOROPROPANE)	5 UJ	5 UJ	5 UJ	10 UJ	5 U	5 UJ	5 U	5 U			5 UJ
2,4,5-TRICHLOROPHENOL	20 U	20 U	20 U	40 U	20 U	20 U	20 U	20 U			20 U
2,4,6-TRICHLOROPHENOL	5 U	5 U	5 U	10 U	5 UJ	5 U	5 U	5 U			5 U
2,4-DICHLOROPHENOL	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U			5 U
2,4-DIMETHYLPHENOL	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U			5 U
2,4-DINITROPHENOL	20 UJ	20 UJ	20 UJ	40 UJ	20 U	20 UJ	20 U	20 U			20 UJ
2,4-DINITROTOLUENE	5 U	5 U	5 U	10 U	5 UJ	5 U	5 U	5 U			5 U
2,6-DINITROTOLUENE	5 UJ	5 UJ	5 UJ	10 UJ	5 U	5 UJ	5 U	5 U			5 UJ
2-CHLORONAPHTHALENE	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U			5 U
2-CHLOROPHENOL	5 UJ	5 UJ	5 UJ	10 UJ	5 UJ	5 UJ	5 UJ	5 UJ			5 UJ
2-METHYLNAPHTHALENE	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.25 U	0.25 U			0.5 U
2-METHYLPHENOL	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U			5 U

SUMMARY OF SITE 7 GROUNDWATER DATA
PERMANENT WELLS - TORPEDO SHOPS
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	7MW5S	7MW5S	7MW6S	7MW7S	7MW8S	7MW9S	7MW10S	7MW10S	7MW10S	7MW10S	7MW11S
nsample	S7MW05S01	S7MW05S01-D	S7MW06S01	S7MW07S01	S7MW08S01	S7MW09S01	S7MW10S01	S7MW10S01-D	S7MW10S01-F	S7MW10S01-F-D	S7MW11S01
sample	S7MW05S01	FD0710001	S7MW06S01	S7MW07S01	S7MW08S01	S7MW09S01	S7MW10S01	FD0707001	S7MW10S01-F	FD0707001-F	S7MW11S01
qc_type	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
status	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	7/10/00	7/10/00	7/11/00	7/10/00	7/8/00	7/11/00	7/7/00	7/7/00	7/7/00	7/7/00	7/11/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
2-NITROANILINE	20 U	20 U	20 U	40 U	20 U	20 U	20 U	20 U			20 U
2-NITROPHENOL	5 UJ	5 UJ	5 UJ	10 UJ	5 U	5 UJ	5 U	5 U			5 UJ
3,3'-DICHLOROBENZIDINE	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U			5 U
3-NITROANILINE	20 U	20 U	20 U	40 U	20 U	20 U	20 U	20 U			20 U
4,6-DINITRO-2-METHYLPHENOL	20 UJ	20 UJ	20 UJ	40 UJ	20 U	20 UJ	20 U	20 U			20 UJ
4-BROMOPHENYL PHENYL ETHER	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U			5 U
4-CHLORO-3-METHYLPHENOL	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U			5 U
4-CHLOROANILINE	5 U	5 U	5 U	10 U	5 UR	5 U	5 UR	5 UR			5 U
4-CHLOROPHENYL PHENYL ETHER	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U			5 U
4-METHYLPHENOL	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U			5 U
4-NITROANILINE	20 U	20 U	20 U	40 U	20 U	20 U	20 U	20 U			20 U
4-NITROPHENOL	20 U	20 U	20 U	40 U	20 U	20 U	20 U	20 U			20 U
ACENAPHTHENE	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.25 U	0.25 U			0.5 U
ACENAPHTHYLENE	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	0.5 U			1 U
ANTHRACENE	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.03 U	0.03 U			0.05 U
BENZO(A)ANTHRACENE	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.03 U	0.03 U			0.05 U
BENZO(A)PYRENE	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.03 U	0.03 U			0.05 U
BENZO(B)FLUORANTHENE	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.05 U	0.05 U			0.1 U
BENZO(G,H,I)PERYLENE	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.05 U	0.05 U			0.1 U
BENZO(K)FLUORANTHENE	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.03 U	0.03 U			0.05 U
BIS(2-CHLOROETHOXY)METHANE	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U			5 U
BIS(2-CHLOROETHYL)ETHER	5 UJ	5 UJ	5 UJ	10 UJ	5 UJ	5 UJ	5 U	5 U			5 UJ
BIS(2-ETHYLHEXYL)PHTHALATE	5 U	5 U	5 U	10 U	190	5 U	5 U	5 U			5 U
BUTYLBENZYL PHTHALATE	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U			5 U
CHRYSENE	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.03 U	0.03 U			0.05 U
DIBENZO(A,H)ANTHRACENE	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.05 U	0.05 U			0.1 U
DIBENZOFURAN	5 U	5 U	5 U	10 U		5 U					5 U
DIETHYL PHTHALATE	5 U	5 U	5 U	10 U	5 UJ	5 U	5 U	5 U			5 U
DIMETHYL PHTHALATE	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U			5 U
DI-N-BUTYL PHTHALATE	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U			5 U
DI-N-OCTYL PHTHALATE	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U			5 U

SUMMARY OF SITE 7 GROUNDWATER DATA
PERMANENT WELLS - TORPEDO SHOPS
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	7MW5S	7MW5S	7MW6S	7MW7S	7MW8S	7MW9S	7MW10S	7MW10S	7MW10S	7MW10S	7MW11S
nsample	S7MW05S01	S7MW05S01-D	S7MW06S01	S7MW07S01	S7MW08S01	S7MW09S01	S7MW10S01	S7MW10S01-D	S7MW10S01-F	S7MW10S01-F-D	S7MW11S01
sample	S7MW05S01	FD0710001	S7MW06S01	S7MW07S01	S7MW08S01	S7MW09S01	S7MW10S01	FD0707001	S7MW10S01-F	FD0707001-F	S7MW11S01
qc_type	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
status	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	7/10/00	7/10/00	7/11/00	7/10/00	7/8/00	7/11/00	7/7/00	7/7/00	7/7/00	7/7/00	7/11/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
FLUORANTHENE	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.05 U	0.05 U			0.1 U
FLUORENE	0.26 J	0.1 U	0.1 U	0.1 U	6.5	0.1 U	0.05 U	0.05 U			0.1 U
HEXACHLOROBENZENE	5 U	5 U	5 U	10 U	5 UJ	3 J	5 U	5 U			5 U
HEXACHLOROBUTADIENE	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U			5 U
HEXACHLOROCYCLOPENTADIENE	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U			5 U
HEXACHLOROETHANE	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U			5 U
INDENO(1,2,3-CD)PYRENE	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.03 U	0.03 U			0.05 U
ISOPHORONE	5 UJ	5 UJ	5 UJ	10 UJ	5 UJ	5 UJ	5 U	5 U			5 UJ
NAPHTHALENE	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.25 U	0.25 U			0.5 U
NITROBENZENE	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U			5 U
N-NITROSO-DI-N-PROPYLAMINE	5 U	5 U	5 U	10 U	5 UJ	5 U	5 U	5 U			5 U
N-NITROSODIPHENYLAMINE	5 U	5 U	5 U	10 U	5 UJ	5 U	5 U	5 U			5 U
PENTACHLOROPHENOL	20 U	20 U	20 U	40 U	20 U	20 U	20 U	20 U			20 U
PHENANTHRENE	0.05 U	0.05 U	0.05 U	0.05 U	3.7	0.05 U	0.03 U	0.03 U			0.05 U
PHENOL	5 U	5 U	5 U	10 U	5 UJ	5 U	5 U	5 U			5 U
PYRENE	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.03 U	0.03 U			0.05 U
Total Metals (ug/L)											
ALUMINUM	54.2 U	50.5 U	50.5 U	50.5 U	124	430 U	50.5 U	50.5 U			50.5 U
ANTIMONY	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U			2.6 U
ARSENIC	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.9 J	2.3 U	2.3 U			2.3 U
BARIUM	11.7 U	11.4 U	39.4	16.5 U	8.6 U	37.8	33.6	35.7			40.5
BERYLLIUM	0.72 U	0.85 U	1 U	0.85 U	0.72 U	1 U	0.72 U	0.72 U			0.72 U
CADMIUM	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U			0.25 U
CALCIUM	6780	6770	18300	17700	13800	24900	20600	22600			23500
CHROMIUM	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U			6.2 U
COBALT	7.1 J	5.3 J	5.3 J	4.4 J	4.2 U	8.9	4.2 U	7.8 J			4.2 U
COPPER	7.1 J	8.9 J	9.7 J	8.9 J	6.8 U	6.8 U	6.8 U	7 U			6.8 U
IRON	36.5 U	39.5 U	2330	45.1 U	2150 J	14600	37.3 U	31.1 U			298
LEAD	1.8 U	1.8 U	2.1 J	1.8 U	1.8 U	5.5	1.8 U	1.8 U			1.9 J
MAGNESIUM	882	871	4000	2410	1390 J	4010	6280 J	6960 J			5300
MANGANESE	2.7 U	2.7 U	428	10.7	64.3 J	1000	2.7 UJ	2.7 UJ			481

SUMMARY OF SITE 7 GROUNDWATER DATA
PERMANENT WELLS - TORPEDO SHOPS
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	7MW5S	7MW5S	7MW6S	7MW7S	7MW8S	7MW9S	7MW10S	7MW10S	7MW10S	7MW10S	7MW11S
nsample	S7MW05S01	S7MW05S01-D	S7MW06S01	S7MW07S01	S7MW08S01	S7MW09S01	S7MW10S01	S7MW10S01-D	S7MW10S01-F	S7MW10S01-F-D	S7MW11S01
sample	S7MW05S01	FD0710001	S7MW06S01	S7MW07S01	S7MW08S01	S7MW09S01	S7MW10S01	FD0707001	S7MW10S01-F	FD0707001-F	S7MW11S01
qc_type	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
status	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	7/10/00	7/10/00	7/11/00	7/10/00	7/8/00	7/11/00	7/7/00	7/7/00	7/7/00	7/7/00	7/11/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
MERCURY	0.07 U	0.07 U	0.07 U	0.07 U	0.1 U	0.07 U	0.09 U	0.09 U			0.07 U
NICKEL	9.2 U	9.2 U	9.2 U	9.2 U	9.2 U	9.2 U	9.2 U	9.2 U			9.2 U
POTASSIUM	917	1080	5520	3070	2340	4880	3340	3630			6050
SELENIUM	2.8 U	2.8 U	2.8 U	3.2 J	2.8 U	2.8 U	2.8 U	2.8 U			2.8 U
SILVER	5.2 U	5.2 U	5.2 U	5.2 U	5.3 U	5.2 U	5.2 U	5.2 U			5.2 U
SODIUM	5140	5100	41600	23200	17700	55100	43500	47300			61000
THALLIUM	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U			3 U
VANADIUM	6.3 U	6.3 U	6.3 U	6.3 U	6.3 U	7.6 J	6.3 U	6.3 U			6.3 U
ZINC	20.6	21.4	13.4	10.3	27.1 U	8.4 J	194 J	72.8 J			4.6 U
Dissolved Metals (ug/L)											
ALUMINUM									50.5 U	50.5 U	
ANTIMONY									2.6 U	2.6 U	
ARSENIC									2.3 U	2.3 U	
BARIUM									35.5	36.9	
BERYLLIUM									0.72 U	0.72 U	
CADMIUM									0.25 U	0.25 U	
CALCIUM									22200	23400	
CHROMIUM									6.2 U	6.2 U	
COBALT									17.8 U	8.9 U	
COPPER									18	14	
IRON									57.1 U	41.7 U	
LEAD									1.8 U	1.8 U	
MAGNESIUM									6890	7280	
MANGANESE									2.7 UJ	2.7 UJ	
MERCURY									0.09 U	0.09 U	
NICKEL									9.2 U	9.2 U	
POTASSIUM									3480	3520	
SELENIUM									2.8 U	2.8 U	
SILVER									7.6 U	5.3 U	
SODIUM									45900	47600	
THALLIUM									3 U	3 U	

SUMMARY OF SITE 7 GROUNDWATER DATA
PERMANENT WELLS - TORPEDO SHOPS
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	7MW5S	7MW5S	7MW6S	7MW7S	7MW8S	7MW9S	7MW10S	7MW10S	7MW10S	7MW10S	7MW11S
nsample	S7MW05S01	S7MW05S01-D	S7MW06S01	S7MW07S01	S7MW08S01	S7MW09S01	S7MW10S01	S7MW10S01-D	S7MW10S01-F	S7MW10S01-F-D	S7MW11S01
sample	S7MW05S01	FD0710001	S7MW06S01	S7MW07S01	S7MW08S01	S7MW09S01	S7MW10S01	FD0707001	S7MW10S01-F	FD0707001-F	S7MW11S01
qc_type	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
status	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	7/10/00	7/10/00	7/11/00	7/10/00	7/8/00	7/11/00	7/7/00	7/7/00	7/7/00	7/7/00	7/11/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
VANADIUM									6.3 U	6.3 U	
ZINC									67.4	56.4	
Miscellaneous Parameters (mg/L)											
ALKALINITY	10 J	10 J	64	58 J	57.3 J	71.6	71.3 J	41.9 J	-		66
AMMONIA	0.18 J	0.17 J	0.44	0.48 J		0.26					0.26
AMMONIA, AS NITROGEN					0.1		0.42 J	0.25 J			
AMMONIUM	0.2 U	0.2 U	0.4	0.2 U	0.2	0.2 U	0.2 U	0.2 U			0.2 U
CHLORIDE	7.14	7	40.6	35.1	16.5 J	123	155 J	77.8 J			71.4
HARDNESS as CaCO3	20.5	20.5	62.2	54.1	40.2	78.7	77.4	85			80.5
PERCHLORATE	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U			0.004 U
SULFATE	13.8	13.8	43.5	22.2	3.46 J	30.2	71.6 J	44.7 J			40.3
SULFIDE	2 UR	2 UR	2 UR	2 UR	2 U	2 UR	2 U	2 U			2 UR
TOTAL DISSOLVED SOLIDS	50 J	63.8 J	205	139 J	114 U	251	279 J	269 J			274
TOTAL ORGANIC CARBON	0.9	1.1	3.7	120	5 U	2.6	7	1 U			2.4
TOTAL SUSPENDED SOLIDS	5 UJ	5 UJ	5 U	5 UJ	5 UJ	17	5 UJ	5 UJ			5 U

U - Not Detected
J - Estimated
R - Rejected

APPENDIX B.9

SITE 20 - AREA A WEAPONS CENTER GROUNDWATER DATA

SUMMARY OF SITE 20 GROUNDWATER DATA - AREA A WEAPONS CENTER
BASEWIDE GROUDNWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	2WCMW1S	2WCMW2S	2WCMW3S	2WCMW3S	2WCMW4D
sample	S202WCMW1S01	S202WCMW2S01	S202WCMW3S01	S202WCMW3S01-F	S202WMW4D01
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
qc_type	NM	NM	NM	NM	NM
status	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	7/25/00	7/25/00	7/26/00	7/27/00	7/24/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE
coll_metho	GRAB	GRAB	GRAB	GRAB	GRAB
cto_proj	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
Volatile Organics (ug/L)					
1,1,1-TRICHLOROETHANE	1 U	1 U	1 U		1 U
1,1,2,2-TETRACHLOROETHANE	1 U	1 U	1 U		1 U
1,1,2-TRICHLOROETHANE	1 U	1 U	1 U		1 U
1,1-DICHLOROETHANE	1 U	1 U	1 U		1 U
1,1-DICHLOROETHENE	1 U	1 U	1 U		1 U
1,2,4-TRICHLOROBENZENE	1 U	1 U	1 U		1 U
1,2-DIBROMO-3-CHLOROPROPANE	1 U	1 U	1 U		1 U
1,2-DIBROMOETHANE	1 U	1 U	1 U		1 U
1,2-DICHLOROBENZENE	1 U	1 U	1 U		1 U
1,2-DICHLOROETHANE	1 U	1 U	1 U		1 U
1,2-DICHLOROPROPANE	1 U	1 U	1 U		1 U
1,3-DICHLOROBENZENE	1 U	1 U	1 U		1 U
1,4-DICHLOROBENZENE	1 U	1 U	1 U		1 U
2-BUTANONE	5 UR	5 UR	5 UR		5 UR
2-HEXANONE	5 UR	5 UR	5 UR		5 UR
4-METHYL-2-PENTANONE	5 U	1.29 J	5 U		5 U
ACETONE	33.2 U	5 UR	39.8 U		5 UR
BENZENE	1 U	1 U	1 U		1 U
BROMOCHLOROMETHANE	1 U	1 U	1 U		1 U
BROMODICHLOROMETHANE	1 U	1 U	1 U		1 U
BROMOFORM	1 U	1 U	1 U		1 U
BROMOMETHANE	1 U	1 U	1 UJ		1 U
CARBON DISULFIDE	1 UJ	1 UJ	1 UJ		1 UJ

SUMMARY OF SITE 20 GROUNDWATER DATA - AREA A WEAPONS CENTER
BASEWIDE GROUDNWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	2WCMW1S	2WCMW2S	2WCMW3S	2WCMW3S	2WCMW4D
sample	S202WCMW1S01	S202WCMW2S01	S202WCMW3S01	S202WCMW3S01-F	S202WMW4D01
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
qc_type	NM	NM	NM	NM	NM
status	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	7/25/00	7/25/00	7/26/00	7/27/00	7/24/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE
coll_metho	GRAB	GRAB	GRAB	GRAB	GRAB
cto_proj	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
CARBON TETRACHLORIDE	1 U	1 U	1 U		1 U
CHLOROBENZENE	1 U	1 U	1 U		1 U
CHLOROETHANE	1 U	1 U	1 U		1 U
CHLOROFORM	1 U	1 U	1 U		1 U
CHLOROMETHANE	1 UJ	1 UJ	1 UJ		1 UJ
CIS-1,2-DICHLOROETHENE	1 U	1 U	1 U		1 U
CIS-1,3-DICHLOROPROPENE	1 U	1 U	1 U		1 U
DIBROMOCHLOROMETHANE	1 U	1 U	1 U		1 U
ETHYLBENZENE	1 U	1 U	1 U		1 U
M+P-XYLENES	2 U	2 U	2 U		2 U
METHYLENE CHLORIDE	3.97 U	3.32 U	4.26 U		2.97 U
O-XYLENE	1 U	1 U	1 U		1 U
STYRENE	1 U	1 U	1 U		1 U
TETRACHLOROETHENE	1 U	1 U	1 U		1 U
TOLUENE	1 U	1 U	1 U		1 U
TRANS-1,2-DICHLOROETHENE	1 U	1 U	1 U		1 U
TRANS-1,3-DICHLOROPROPENE	1 U	1 U	1 U		1 U
TRICHLOROETHENE	1 U	5.02 J	1 U		3.8 J
VINYL CHLORIDE	1 U	1 U	1 U		1 U
XYLENES, TOTAL	1 U	1 U	1 U		1 U
Semivolatile Organics (ug/L)					
1,2,4-TRICHLOROBENZENE	5 U	5 U			5 U
1,2-DICHLOROBENZENE	5 U	5 U			5 U
1,3-DICHLOROBENZENE	5 U	5 U			5 U

SUMMARY OF SITE 20 GROUNDWATER DATA - AREA A WEAPONS CENTER
BASEWIDE GROUDNWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	2WCMW1S	2WCMW2S	2WCMW3S	2WCMW3S	2WCMW4D
sample	S202WCMW1S01	S202WCMW2S01	S202WCMW3S01	S202WCMW3S01-F	S202WMW4D01
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
qc_type	NM	NM	NM	NM	NM
status	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	7/25/00	7/25/00	7/26/00	7/27/00	7/24/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE
coll_metho	GRAB	GRAB	GRAB	GRAB	GRAB
cto_proj	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
1,4-DICHLOROBENZENE	5 U	5 U			5 U
1-METHYLNAPHTHALENE	0.5 U	0.5 U	0.5 U		0.5 U
2,2'-OXYBIS(1-CHLOROPROPANE)	5 U	5 U	5 U		5 U
2,4,5-TRICHLOROPHENOL	20 U	20 U	20 U		20 U
2,4,6-TRICHLOROPHENOL	5 U	5 U	5 U		5 U
2,4-DICHLOROPHENOL	5 U	5 U	5 U		5 U
2,4-DIMETHYLPHENOL	5 U	5 U	5 U		5 U
2,4-DINITROPHENOL	20 UJ	20 UJ	20 UJ		20 UJ
2,4-DINITROTOLUENE	5 U	5 U	5 U		5 U
2,6-DINITROTOLUENE	5 U	5 U	5 U		5 U
2-CHLORONAPHTHALENE	5 U	5 U	5 U		5 U
2-CHLOROPHENOL	5 UJ	5 UJ	5 UJ		5 UJ
2-METHYLNAPHTHALENE	0.5 U	0.5 U	0.5 U		0.5 U
2-METHYLPHENOL	5 U	5 U	5 U		5 U
2-NITROANILINE	20 U	20 U	20 U		20 U
2-NITROPHENOL	5 U	5 U	5 U		5 U
3,3'-DICHLOROBENZIDINE	5 U	5 U	5 U		5 U
3-NITROANILINE	20 U	20 U	20 U		20 U
4,6-DINITRO-2-METHYLPHENOL	20 U	20 U	20 U		20 U
4-BROMOPHENYL PHENYL ETHER	5 U	5 U	5 U		5 U
4-CHLORO-3-METHYLPHENOL	5 U	5 U	5 U		5 U
4-CHLOROANILINE	5 U	5 U	5 U		5 U
4-CHLOROPHENYL PHENYL ETHER	5 U	5 U	5 U		5 U
4-METHYLPHENOL	5 U	5 U	9		5 U

SUMMARY OF SITE 20 GROUNDWATER DATA - AREA A WEAPONS CENTER
BASEWIDE GROUDNWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	2WCMW1S	2WCMW2S	2WCMW3S	2WCMW3S	2WCMW4D
sample	S202WCMW1S01	S202WCMW2S01	S202WCMW3S01	S202WCMW3S01-F	S202WMW4D01
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
qc_type	NM	NM	NM	NM	NM
status	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	7/25/00	7/25/00	7/26/00	7/27/00	7/24/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE
coll_metho	GRAB	GRAB	GRAB	GRAB	GRAB
cto_proj	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
4-NITROANILINE	20 U	20 U	20 U		20 U
4-NITROPHENOL	20 U	20 U	20 U		20 U
ACENAPHTHENE	0.5 U	0.5 U	0.5 U		0.5 U
ACENAPHTHYLENE	1 U	1 U	1 U		1 U
ANTHRACENE	0.05 U	0.05 U	0.05 U		0.05 U
BENZO(A)ANTHRACENE	0.05 U	0.04 J	0.05 U		0.05 U
BENZO(A)PYRENE	0.05 U	0.05	0.05 U		0.05 U
BENZO(B)FLUORANTHENE	0.1 U	0.08 J	0.1 U		0.1 U
BENZO(G,H,I)PERYLENE	0.1 U	0.07 J	0.1 U		0.1 U
BENZO(K)FLUORANTHENE	0.05 U	0.03 J	0.05 U		0.05 U
BIS(2-CHLOROETHOXY)METHANE	5 U	5 U	5 U		5 U
BIS(2-CHLOROETHYL)ETHER	5 UJ	5 UJ	5 UJ		5 UJ
BIS(2-ETHYLHEXYL)PHTHALATE	5 U	5 U	5 U		5 U
BUTYLBENZYL PHTHALATE	5 U	5 U	5 U		5 U
CARBAZOLE	5 U	5 U			5 U
CHRYSENE	0.05 U	0.05 J	0.05 U		0.05 U
DIBENZO(A,H)ANTHRACENE	0.1 U	0.1 U	0.1 U		0.1 U
DIBENZOFURAN	5 U	5 U	5 U		5 U
DIETHYL PHTHALATE	5 U	5 U	5 U		5 U
DIMETHYL PHTHALATE	5 U	5 U	5 U		5 U
DI-N-BUTYL PHTHALATE	5 U	5 U	5 U		5 U
DI-N-OCTYL PHTHALATE	5 U	5 U	5 U		5 U
FLUORANTHENE	0.1 U	0.13	0.1 U		0.1 U
FLUORENE	0.1 U	0.1 U	0.1 U		0.1 U

SUMMARY OF SITE 20 GROUNDWATER DATA - AREA A WEAPONS CENTER
BASEWIDE GROUDNWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	2WCMW1S	2WCMW2S	2WCMW3S	2WCMW3S	2WCMW4D
sample	S202WCMW1S01	S202WCMW2S01	S202WCMW3S01	S202WCMW3S01-F	S202WMW4D01
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
qc_type	NM	NM	NM	NM	NM
status	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	7/25/00	7/25/00	7/26/00	7/27/00	7/24/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE
coll_metho	GRAB	GRAB	GRAB	GRAB	GRAB
cto_proj	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
HEXACHLOROBENZENE	5 U	5 U	5 U		5 U
HEXACHLOROBUTADIENE	5 U	5 U	5 U		5 U
HEXACHLOROCYCLOPENTADIENE	5 UJ	5 UJ	5 UJ		5 UJ
HEXACHLOROETHANE	5 U	5 U	5 U		5 U
INDENO(1,2,3-CD)PYRENE	0.05 U	0.07	0.05 U		0.05 U
ISOPHORONE	5 U	5 U	5 U		5 U
NAPHTHALENE	0.5 U	0.5 U	0.5 U		0.5 U
NITROBENZENE	5 U	5 U	5 U		5 U
N-NITROSO-DI-N-PROPYLAMINE	5 U	5 U	5 U		5 U
N-NITROSODIPHENYLAMINE	5 U	5 U	5 U		5 U
PENTACHLOROPHENOL	20 U	20 U	20 U		20 U
PHENANTHRENE	0.05 U	0.04 J	0.05 U		0.05 U
PHENOL	5 UJ	5 UJ	5 UJ		5 UJ
PYRENE	0.05 U	0.11	0.05 U		0.05 U
Total Metals (ug/L)					
ALUMINUM	145 U	73.7 U	168 U		50.5 U
ANTIMONY	2.6 U	2.6 U	3.5 J		2.6 U
ARSENIC	15.1	2.3 U	4.1 J		2.3 U
BARIUM	70.1 U	38.2 U	83.5		90.0 U
BERYLLIUM	0.72 U	0.72 U	0.72 U		0.72 U
CADMIUM	0.25 U	0.25 U	0.25 U		0.25 U
CALCIUM	138000	22500	160000		38100
CHROMIUM	26.9	6.2 U	29.2		6.2 U
COBALT	12.0 U	6.8 U	18.8		5.3 U

SUMMARY OF SITE 20 GROUNDWATER DATA - AREA A WEAPONS CENTER
BASEWIDE GROUDNWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	2WCMW1S	2WCMW2S	2WCMW3S	2WCMW3S	2WCMW4D
sample	S202WCMW1S01	S202WCMW2S01	S202WCMW3S01	S202WCMW3S01-F	S202WMW4D01
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
qc_type	NM	NM	NM	NM	NM
status	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	7/25/00	7/25/00	7/26/00	7/27/00	7/24/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE
coll_metho	GRAB	GRAB	GRAB	GRAB	GRAB
cto_proj	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
COPPER	66.6	6.8 U	9.1 J		6.8 U
IRON	40200	25900	14900		188 U
LEAD	8.9	1.8 U	1.8 U		1.8 U
MAGNESIUM	41100	2640	138000		3230
MANGANESE	2170	1590	887		17.2 U
MERCURY	0.09 U	0.09 U	0.09 U		0.09 U
NICKEL	102	9.2 U	13.7 J		9.2 U
POTASSIUM	45200	6770	100000		1440
SELENIUM	2.8 U	2.8 U	2.8 U		2.8 U
SILVER	326 J	114 J	5.2 U		6.0 U
SODIUM	374000	42100	1220000 J		9530
THALLIUM	3.0 U	3.0 U	3.8 J		3.0 U
VANADIUM	10.4 U	6.3 U	10.2 J		6.3 U
ZINC	245	24.6 U	22.7 U		13.5 U
Dissolved Metals (ug/L)					
ALUMINUM				161 U	
ANTIMONY				2.6 U	
ARSENIC				2.3 U	
BARIUM				2.7 U	
BERYLLIUM				0.72 U	
CADMIUM				0.25 U	
CALCIUM				348 J	
CHROMIUM				6.2 U	
COBALT				4.2 U	

SUMMARY OF SITE 20 GROUNDWATER DATA - AREA A WEAPONS CENTER
BASEWIDE GROUDNWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	2WCMW1S	2WCMW2S	2WCMW3S	2WCMW3S	2WCMW4D
sample	S202WCMW1S01	S202WCMW2S01	S202WCMW3S01	S202WCMW3S01-F	S202WMW4D01
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
qc_type	NM	NM	NM	NM	NM
status	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	7/25/00	7/25/00	7/26/00	7/27/00	7/24/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE
coll_metho	GRAB	GRAB	GRAB	GRAB	GRAB
cto_proj	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
COPPER				6.8 U	
IRON				86.8 U	
LEAD				1.8 U	
MAGNESIUM				129 U	
MANGANESE				6.7 U	
MERCURY				0.10 U	
NICKEL				9.2 U	
POTASSIUM				256 U	
SELENIUM				2.8 U	
SILVER				5.2 U	
SODIUM				384 U	
THALLIUM				3.0 U	
VANADIUM				6.3 U	
ZINC				53.4	
Miscellaneous Parameters (mg/L)					
AMMONIUM	2.3	1.5	13.6		0.2 U
PERCHLORATE	0.004 U	0.004 U	0.008 U		0.004 U
TOTAL DISSOLVED SOLIDS	1160	211	5142 J		135
TOTAL SUSPENDED SOLIDS	5 U	8	2788 J		5 U

U - Not Detected
J - Estimated
R - Rejected

APPENDIX B.10

SITE 16 - HOSPITAL INCINERATOR SOIL DATA

SUMMARY OF SITE 16 SOIL DATA - HOSPITAL INCINERATOR
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	S16SB01	S16SB03	S16SB05	S16SB06	S16SB07	S16SB08	S16SB08	S16SS01
matrix	SS	SS	SS	SS	SS	SS	SB	SS
nsample	S16SB010001-SO	S16SB030001-SO	S16SB050001-SO	S16SB060001-SO	S16SB070001-SO	S16SB080001-SO	S16SB080405-SO	S16SS01-SO
sample	S16SB010001	S16SB030001	S16SB050001	S16SB060001	S16SB070001	S16SB080001	S16SB080405	S16SS01
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
top_depth	0	0	0	0	0	0	4	0
bottom_dep	1	1	1	1	1	1	5	0
status	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	6/13/00	6/13/00	6/13/00	6/13/00	6/13/00	6/13/00	6/13/00	6/25/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
Dioxins/Furans (ng/kg)								
1,2,3,4,6,7,8-HPCDD	21	1.9 U	7	3.1 U	120	20	24	31
1,2,3,4,6,7,8-HPCDF	3	0.41	3.4	0.44	0.21 U	0.33 U	0.5 U	5.4
1,2,3,4,7,8,9-HPCDF	0.77 U	0.35 U	0.4 U	0.24 U	0.29 U	0.46 U	0.31 U	1.5 U
1,2,3,4,7,8-HXCDD	0.25 U	0.21 U	0.24 U	0.27 U	0.22 U	0.26 U	0.24 U	1.1 UJ
1,2,3,4,7,8-HXCDF	1.1 U	0.33 U	1.7 U	0.13 U	1.3 U	0.91 U	0.88 U	1.5 U
1,2,3,6,7,8-HXCDD	0.31 U	0.14 U	0.16 U	0.18 U	0.15 U	0.18 U	0.16 U	0.76 U
1,2,3,6,7,8-HXCDF	0.16 U	0.1 U	0.31 U	0.097 U	0.14 U	0.16 U	0.14 U	1.1 UJ
1,2,3,7,8,9-HXCDD	0.19 U	0.16 U	0.18 U	0.21 U	0.17 U	0.2 U	0.18 U	0.87 U
1,2,3,7,8,9-HXCDF	0.25 U	0.16 U	0.23 U	0.15 U	0.22 U	0.25 U	0.23 U	1.7 UJ
1,2,3,7,8-PECDD	0.25 U	0.28 U	0.22 U	0.2 U	0.22 U	0.18 U	0.2 U	0.64 U
1,2,3,7,8-PECDF	0.13 U	0.2 U	0.21	0.11 U	0.19 U	0.12 U	0.14 U	0.37 U
2,3,4,6,7,8-HXCDF	0.18 U	0.12 U	0.5 U	0.11 U	0.16 U	0.18 U	0.17 U	1.2 UJ
2,3,4,7,8-PECDF	0.13 U	0.2 U	0.36	0.11 U	0.19 U	0.12 U	0.14 U	0.38 U
2,3,7,8-TCDD	0.22 U	0.16 U	0.17 U	0.16 U	0.17 U	0.22 U	0.2 U	0.65 UJ
2,3,7,8-TCDF	0.18 U	0.19 U	1.8	0.13 U	0.16 U	0.15 U	0.16 U	0.58 U
OCDD	740	110	240	450	29000	4300	6400	1200 J
OCDF	7.9	0.3 U	2.9	0.24 U	0.25 U	0.13 U	0.18 U	12 J
TOTAL HPCDD	120	1.9 U	20	3.1 U	220	38	43	69
TOTAL HPCDF	3	0.41	3.4	0.69	0.21 U	0.33 U	0.22 U	5.4
TOTAL HXCDD	0.17 U	0.14 U	0.16 U	0.18 U	0.15 U	0.18 U	0.16 U	0.76 UJ
TOTAL HXCDF	3.1	0.1 U	2.1	0.2 U	0.14 U	0.16 U	0.14 U	1.1 UJ
TOTAL PECDD	0.25 U	0.28 U	0.22 U	0.2 U	0.22 U	0.18 U	0.2 U	0.64 U
TOTAL PECDF	0.13 U	0.2 U	4	0.11 U	0.19 U	0.12 U	0.14 U	2.3
TOTAL TCDD	0.22 U	0.54 J	0.17 U	0.16 U	0.17 U	0.22 U	0.2 U	0.65 UJ
TOTAL TCDF	0.9	0.19 U	2.2	0.13 U	0.16 U	0.15 U	0.16 U	0.58 U
Volatile Organics (ug/kg)								
1,1-DICHLOROETHANE	5 U	5 UJ	5 U	5 UJ	7 U	5 U	5 UR	6 UJ
1,1-DICHLOROETHENE	5 U	5 UJ	5 U	5 UJ	7 U	5 U	5 UR	6 UJ
1,2-DICHLOROETHANE	5 U	5 UJ	5 U	5 UJ	7 U	5 U	5 UR	6 UJ
1,2-DICHLOROETHENE (TOTAL)	10 U	10 UJ	10 U	10 UJ	14 U	11 U	10 UR	12 UJ
1,2-DICHLOROPROPANE	5 U	5 UJ	5 U	5 UJ	7 U	5 U	5 UR	6 UJ
2-BUTANONE	4 J	5 J	3 J	10 UJ	3 J	4 J	10 UR	12 U
2-HEXANONE	10 U	10 UJ	10 U	10 UJ	14 U	11 U	10 UR	12 UJ
4-METHYL-2-PENTANONE	10 U	10 UJ	10 U	10 UJ	14 U	11 U	10 UR	12 UJ
ACETONE	37	51 U	29 U	10 U	67 U	56 U	10 UR	180 J
BENZENE	5 U	5 UJ	5 U	5 UJ	7 U	5 U	5 UR	6 UJ

SUMMARY OF SITE 16 SOIL DATA - HOSPITAL INCINERATOR
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	S16SB01	S16SB03	S16SB05	S16SB06	S16SB07	S16SB08	S16SB08	S16SS01
matrix	SS	SS	SS	SS	SS	SS	SB	SS
nsample	S16SB010001-SO	S16SB030001-SO	S16SB050001-SO	S16SB060001-SO	S16SB070001-SO	S16SB080001-SO	S16SB080405-SO	S16SS01-SO
sample	S16SB010001	S16SB030001	S16SB050001	S16SB060001	S16SB070001	S16SB080001	S16SB080405	S16SS01
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
top_depth	0	0	0	0	0	0	4	0
bottom_dep	1	1	1	1	1	1	5	0
status	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	6/13/00	6/13/00	6/13/00	6/13/00	6/13/00	6/13/00	6/13/00	6/25/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
BROMODICHLOROMETHANE	5 U	5 UJ	5 U	5 UJ	7 U	5 U	5 UR	6 UJ
BROMOFORM	5 U	5 UJ	5 U	5 UJ	7 U	5 U	5 UR	6 UJ
BROMOMETHANE	5 U	5 UJ	5 U	5 UJ	7 U	5 U	32 J	6 UJ
CARBON DISULFIDE	5 U	5 UJ	5 U	5 UJ	7 U	5 U	5 UR	6 UJ
CARBON TETRACHLORIDE	5 U	5 UJ	5 U	5 UJ	7 U	5 U	5 UR	6 UJ
CHLOROBENZENE	5 U	5 UJ	5 U	5 UJ	7 U	5 U	5 UR	6 UJ
CHLORODIBROMOMETHANE	5 U	5 UJ	5 U	5 UJ	7 U	5 U	5 UR	6 UJ
CHLOROETHANE	5 U	5 UJ	5 U	5 UJ	7 U	5 U	5 UR	6 UJ
CHLOROFORM	5 U	5 UJ	5 U	5 UJ	7 U	5 U	5 UR	6 UJ
CHLOROMETHANE	5 U	5 UJ	5 U	5 UJ	7 U	5 U	91 J	6 UJ
CIS-1,2-DICHLOROETHENE	5 U	5 UJ	5 U	5 UJ	7 U	5 U	5 UR	6 UJ
CIS-1,3-DICHLOROPROPENE	5 U	5 UJ	5 U	5 UJ	7 U	5 U	5 UR	6 UJ
ETHYLBENZENE	5 U	5 UJ	5 U	5 UJ	7 U	5 U	5 UR	6 UJ
M+P-XYLENES	10 U	10 UJ	10 U	10 UJ	14 U	11 U	10 UR	12 UJ
METHYLENE CHLORIDE	5 U	5 U	5 U	5 U	7 U	5 U	5 UR	31 U
O-XYLENE	5 U	5 UJ	5 U	5 UJ	7 U	5 U	5 UR	6 UJ
STYRENE	5 U	5 UJ	5 U	5 UJ	7 U	5 U	5 UR	6 UJ
TETRACHLOROETHENE	5 U	5 UJ	5 U	5 UJ	7 U	5 U	5 UR	6 UJ
TOLUENE	5 U	3 J	1 J	5 UJ	2 J	1 J	4 J	6 UJ
TRANS-1,2-DICHLOROETHENE	5 U	5 UJ	5 U	5 UJ	7 U	5 U	5 UR	6 UJ
TRANS-1,3-DICHLOROPROPENE	5 U	5 UJ	5 U	5 UJ	7 U	5 U	5 UR	6 UJ
TRICHLOROETHENE	5 U	5 UJ	5 U	5 UJ	7 U	5 U	5 UR	6 UJ
VINYL CHLORIDE	5 U	5 UJ	5 U	5 UJ	7 U	5 U	5 UR	6 UJ
XYLENES, TOTAL	15 U	15 UJ	15 U	15 UJ	21 U	16 U	16 UR	18 UJ
Semivolatile Organics (ug/kg)								
1,2,4-TRICHLOROBENZENE	180 U	170 U	850 U	170 U	200 U	200 U	180 U	190 U
1,2-DICHLOROBENZENE	180 U	170 U	850 U	170 U	200 U	200 U	180 U	190 U
1,3-DICHLOROBENZENE	180 U	170 U	850 U	170 U	200 U	200 U	180 U	190 U
1,4-DICHLOROBENZENE	180 U	170 U	850 U	170 U	200 U	200 U	180 U	190 U
2,2'-OXYBIS(1-CHLOROPROPANE)	180 U	170 U	850 U	170 U	200 U	200 U	180 U	190 U
2,4,5-TRICHLOROPHENOL	360 U	360 U	1800 U	360 U	400 U	410 U	360 U	380 U
2,4,6-TRICHLOROPHENOL	180 U	170 U	850 U	170 U	200 U	200 U	180 U	190 U
2,4-DICHLOROPHENOL	180 U	170 U	850 U	170 U	200 U	200 U	180 U	190 U
2,4-DIMETHYLPHENOL	180 U	170 U	850 U	170 U	200 U	200 U	180 U	190 U
2,4-DINITROPHENOL	360 U	360 U	1800 U	360 U	400 U	410 U	360 U	380 U
2,4-DINITROTOLUENE	180 U	170 U	850 U	170 U	200 U	200 U	180 U	190 U
2,6-DINITROTOLUENE	180 U	170 U	850 U	170 U	200 U	200 U	180 U	190 U

SUMMARY OF SITE 16 SOIL DATA - HOSPITAL INCINERATOR
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	S16SB01	S16SB03	S16SB05	S16SB06	S16SB07	S16SB08	S16SB08	S16SS01
matrix	SS	SS	SS	SS	SS	SS	SB	SS
nsample	S16SB010001-SO	S16SB030001-SO	S16SB050001-SO	S16SB060001-SO	S16SB070001-SO	S16SB080001-SO	S16SB080405-SO	S16SS01-SO
sample	S16SB010001	S16SB030001	S16SB050001	S16SB060001	S16SB070001	S16SB080001	S16SB080405	S16SS01
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
top_depth	0	0	0	0	0	0	4	0
bottom_dep	1	1	1	1	1	1	5	0
status	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	6/13/00	6/13/00	6/13/00	6/13/00	6/13/00	6/13/00	6/13/00	6/25/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
2-CHLORONAPHTHALENE	180 U	170 U	850 U	170 U	200 U	200 U	180 U	190 U
2-CHLOROPHENOL	180 U	170 U	850 U	170 U	200 U	200 U	180 U	190 U
2-METHYLNAPHTHALENE	180 U	170 U	850 U	170 U	190 U	200 U	170 U	190 U
2-METHYLPHENOL	180 U	170 U	850 U	170 U	200 U	200 U	180 U	190 U
2-NITROANILINE	360 U	360 U	1800 U	360 U	400 U	410 U	360 U	380 U
2-NITROPHENOL	180 U	170 U	850 U	170 U	200 U	200 U	180 U	190 U
3,3'-DICHLOROBENZIDINE	180 U	170 U	850 U	170 U	200 U	200 U	180 U	190 U
3-NITROANILINE	360 U	360 U	1800 U	360 U	400 U	410 U	360 U	380 U
4,6-DINITRO-2-METHYLPHENOL	360 U	360 U	1800 U	360 U	400 U	410 U	360 U	380 U
4-BROMOPHENYL PHENYL ETHER	180 U	170 U	850 U	170 U	200 U	200 U	180 U	190 U
4-CHLORO-3-METHYLPHENOL	180 U	170 U	850 U	170 U	200 U	200 U	180 U	190 U
4-CHLOROANILINE	180 U	170 U	850 U	170 U	200 U	200 U	180 U	190 U
4-CHLOROPHENYL PHENYL ETHER	180 U	170 U	850 U	170 U	200 U	200 U	180 U	190 U
4-METHYLPHENOL	180 U	170 U	850 U	170 U	200 U	200 U	180 U	190 U
4-NITROANILINE	360 U	360 U	1800 U	360 U	400 U	410 U	360 U	380 U
4-NITROPHENOL	360 U	360 U	1800 U	360 U	400 U	410 U	360 U	380 U
ACENAPHTHENE	180 U	170 U	850 U	170 U	190 U	200 U	170 U	190 U
ACENAPHTHYLENE	180 U	170 U	99 J	170 U	190 U	200 U	170 U	44 J
ANTHRACENE	180 U	170 U	850 U	170 U	190 U	200 U	170 U	25 J
AZOBENZENE								190 U
BENZIDINE								190 U
BENZO(A)ANTHRACENE	50 J	41 J	410 J	22 J	190 U	200 U	170 U	200
BENZO(A)PYRENE	48 J	41 J	330 J	20 J	190 U	200 U	170 U	200
BENZO(B)FLUORANTHENE	50 J	54 J	260 J	170 U	190 U	200 U	170 U	200
BENZO(G,H,I)PERYLENE	67 J	60 J	360 J	24 J	190 U	200 U	170 U	150 J
BENZO(K)FLUORANTHENE	39 J	48 J	280 J	170 U	190 U	200 U	170 U	200
BENZOIC ACID								180 J
BENZYL ALCOHOL								190 U
BIS(2-CHLOROETHYL)ETHER	180 U	170 U	850 U	170 U	200 U	200 U	180 U	190 U
BIS(2-ETHYLHEXYL)PHTHALATE	360 U	170 U	850 U	170 U	190 U	200 U	170 U	190 U
BUTYL BENZYL PHTHALATE	180 U	170 U	850 U	20 J	200 U	200 U	180 U	190 U
CARBAZOLE	180 U	170 U	850 U	170 U	190 U	200 U	170 U	190 U
CHRYSENE	67 J	63 J	520 J	26 J	190 U	200 U	170 U	260
DI-N-BUTYL PHTHALATE	180 U	170 U	850 U	170 U	190 U	200 U	170 U	190 U
DI-N-OCTYL PHTHALATE	180 U	170 U	850 U	170 U	200 U	200 U	180 U	190 U
DIBENZO(A,H)ANTHRACENE	180 UJ	170 U	850 UJ	170 U	190 U	200 U	170 U	49 J
DIBENZOFURAN	180 U	170 U	850 U	170 U	190 U	200 U	170 U	190 U

SUMMARY OF SITE 16 SOIL DATA - HOSPITAL INCINERATOR
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	S16SB01	S16SB03	S16SB05	S16SB06	S16SB07	S16SB08	S16SB08	S16SS01
matrix	SS	SS	SS	SS	SS	SS	SB	SS
nsample	S16SB010001-SO	S16SB030001-SO	S16SB050001-SO	S16SB060001-SO	S16SB070001-SO	S16SB080001-SO	S16SB080405-SO	S16SS01-SO
sample	S16SB010001	S16SB030001	S16SB050001	S16SB060001	S16SB070001	S16SB080001	S16SB080405	S16SS01
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
top_depth	0	0	0	0	0	0	4	0
bottom_dep	1	1	1	1	1	1	5	0
status	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	6/13/00	6/13/00	6/13/00	6/13/00	6/13/00	6/13/00	6/13/00	6/25/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
DIETHYL PHTHALATE	180 U	170 U	850 U	170 U	200 U	200 U	180 U	190 U
DIMETHYL PHTHALATE	180 U	170 U	850 U	170 U	200 U	200 U	180 U	190 U
FLUORANTHENE	99 J	100 J	630 J	41 J	190 U	200 U	170 U	360
FLUORENE	180 U	170 U	850 U	170 U	190 U	200 U	170 U	190 U
HEXACHLOROBENZENE	180 U	170 U	850 U	170 U	200 U	200 U	180 U	190 U
HEXACHLOROBUTADIENE	180 U	170 U	850 U	170 U	200 U	200 U	180 U	190 U
HEXACHLOROCYCLOPENTADIENE	180 UJ	170 UJ	850 UJ	170 UJ	200 UJ	200 UJ	180 UJ	190 UJ
HEXACHLOROETHANE	180 U	170 U	850 U	170 U	200 U	200 U	180 U	190 U
INDENO(1,2,3-CD)PYRENE	52 J	51 J	280 J	20 J	190 U	200 U	170 U	130 J
ISOPHORONE	180 U	170 U	850 U	170 U	200 U	200 U	180 U	190 U
N-NITROSO-DI-N-PROPYLAMINE	180 U	170 U	850 U	170 U	200 U	200 U	180 U	190 U
N-NITROSODIMETHYLAMINE								190 U
N-NITROSODIPHENYLAMINE	180 U	170 U	850 U	170 U	200 U	200 U	180 U	190 U
NAPHTHALENE	180 U	170 U	850 U	170 U	190 U	200 U	170 U	190 U
NITROBENZENE	180 U	170 U	850 U	170 U	200 U	200 U	180 U	190 U
PENTACHLOROPHENOL	360 U	360 U	1800 U	360 U	400 U	410 U	360 U	380 U
PHENANTHRENE	44 J	46 J	230 J	35 J	190 U	200 U	170 U	120 J
PHENOL	180 U	170 U	850 U	170 U	200 U	200 U	180 U	190 U
PYRENE	91 J	98 J	720 J	47 J	190 U	200 U	170 U	370
PYRIDINE								190 UJ
1,1,1-TRICHLOROETHANE	5 U	5 UJ	5 U	5 UJ	7 U	5 U	5 UR	6 UJ
1,1,2,2-TETRACHLOROETHANE	5 U	5 UJ	5 U	5 UJ	7 UJ	5 UJ	5 UR	6 UJ
1,1,2-TRICHLOROETHANE	5 U	5 UJ	5 U	5 UJ	7 U	5 U	5 UR	6 UJ
Pesticides/PCBs (ug/kg)								
4,4'-DDD	1.4 U	1.4 U	1.4 U	1.4 UJ	2.4	1.6 U	1.4 U	0.76 U
4,4'-DDE	1.4 U	1.4 U	1.4 U	1.4 UJ	4.7 J	1.6 U	1.4 U	2.2 J
4,4'-DDT	2.7 J	1.4 U	1.5 J	1.4 UJ	4.1	1.6 U	1.4 U	10 R
ALDRIN	0.74 U	0.74 U	0.72 U	0.73 UJ	0.84 U	0.85 U	0.74 U	0.39 U
ALPHA-BHC	0.74 U	0.74 U	0.72 U	0.73 UJ	0.84 U	0.85 U	0.74 U	0.39 U
ALPHA-CHLORDANE	0.74 U	0.74 U	0.72 U	0.73 UJ	0.51 J	0.85 U	0.74 U	0.39 U
AROCLOR-1016	7.3 U	7.3 U	7 U	7.2 UJ	8.1 U	8.3 U	7.3 U	7.7 U
AROCLOR-1221	15 U	15 U	14 U	14 UJ	16 U	17 U	15 U	15 U
AROCLOR-1232	7.3 U	7.3 U	7 U	7.2 UJ	8.1 U	8.3 U	7.3 U	7.7 U
AROCLOR-1242	7.3 U	7.3 U	7 U	7.2 UJ	8.1 U	8.3 U	7.3 U	7.7 U
AROCLOR-1248	7.3 U	7.3 U	7 U	7.2 UJ	6 J	8.3 U	7.3 U	7.7 U
AROCLOR-1254	7.3 U	7.3 U	7 U	7.2 UJ	8.1 U	8.3 U	7.3 U	7.7 U
AROCLOR-1260	7.3 U	7.3 U	7 U	7.2 UJ	8.1 U	8.3 U	7.3 U	7.7 U

SUMMARY OF SITE 16 SOIL DATA - HOSPITAL INCINERATOR
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	S16SB01	S16SB03	S16SB05	S16SB06	S16SB07	S16SB08	S16SB08	S16SS01
matrix	SS	SS	SS	SS	SS	SS	SB	SS
nsample	S16SB010001-SO	S16SB030001-SO	S16SB050001-SO	S16SB060001-SO	S16SB070001-SO	S16SB080001-SO	S16SB080405-SO	S16SS01-SO
sample	S16SB010001	S16SB030001	S16SB050001	S16SB060001	S16SB070001	S16SB080001	S16SB080405	S16SS01
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
top_depth	0	0	0	0	0	0	4	0
bottom_dep	1	1	1	1	1	1	5	0
status	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	6/13/00	6/13/00	6/13/00	6/13/00	6/13/00	6/13/00	6/13/00	6/25/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
BETA-BHC	0.74 U	0.74 U	0.72 U	0.73 UJ	0.84 U	0.85 U	0.74 U	0.39 U
DELTA-BHC	0.74 U	0.74 U	0.72 U	0.73 UJ	0.84 U	0.85 U	0.74 U	9.5 R
DIELDRIN	1.4 U	1.4 U	1.4 U	1.4 UJ	1.6 U	1.6 U	1.4 U	0.76 U
ENDOSULFAN I	0.74 U	0.74 U	0.72 U	0.73 UJ	0.84 U	0.85 U	0.74 U	0.39 U
ENDOSULFAN II	1.4 U	1.4 U	1.4 U	1.4 UJ	1.6 U	1.6 U	1.4 U	0.76 U
ENDOSULFAN SULFATE	1.4 U	1.4 U	1.4 U	1.4 UJ	1.6 U	1.6 U	1.4 U	0.76 U
ENDRIN	1.4 U	1.4 U	1.4 U	1.4 UJ	1.6 U	1.6 U	1.4 U	0.76 U
ENDRIN ALDEHYDE	1.4 U	1.4 U	1.4 U	1.4 UJ	1.6 U	1.6 U	1.4 U	0.76 U
ENDRIN KETONE	1.4 U	1.4 U	1.4 U	1.4 UJ	1.6 U	1.6 U	1.4 U	0.76 U
GAMMA-BHC (LINDANE)	0.74 U	0.74 U	0.72 U	0.73 UJ	0.84 U	0.85 U	0.74 U	0.39 U
GAMMA-CHLORDANE	0.74 U	0.74 U	0.72 U	0.73 UJ	4.2	0.85 U	0.74 U	0.39 U
HEPTACHLOR	0.74 U	0.74 U	0.72 U	0.73 UJ	0.84 U	0.85 U	0.74 U	0.39 U
HEPTACHLOR EPOXIDE	0.74 U	0.74 U	0.72 U	0.73 UJ	0.84 U	0.85 U	0.74 U	0.39 U
METHOXYCHLOR	7.4 U	7.4 U	7.2 U	7.3 UJ	8.4 U	8.5 U	7.4 U	3.9 U
TOXAPHENE	74 U	74 U	72 U	73 UJ	84 U	85 U	74 U	39 U
Inorganics (mg/kg)								
ALUMINUM	5600	4400	4600	8900	21000	17000	8100	8900
ANTIMONY	0.48 UJ	0.57 UJ	0.56 UJ	0.54 UJ	0.71 J	0.6 UJ	0.54 UJ	1 U
ARSENIC	3.6	1.7	2.5	2.5	5.2	4.2	4.4	8.5
BARIUM	41	27	34	41	37	29	34	47
BERYLLIUM	0.23 J	0.35 U	0.27	0.59 U	0.7 U	0.74 U	0.38 U	0.36 U
CADMIUM	0.1 U	0.11 U	0.11 U	0.11 U	0.11 U	0.12 U	0.11 U	0.16 U
CALCIUM	1300	660 J	1000	47000 J	1000 J	560 J	1500 J	2100
CHROMIUM	9.7 U	4.9	8.9 U	14	22	23	15	14
COBALT	6	4.6 U	4.9	4.8 U	8 U	9.1 U	6.2 U	7.8
COPPER	13 J	7.3	11 J	12	12	14	14	200
IRON	8400	5600 J	6700	9500 J	18000 J	16000 J	10000 J	16000
LEAD	3.9	3.5	35	5.1	12	4	3.8	16
MAGNESIUM	2200	1500	1900	3200	2800	3900	2500	2500
MANGANESE	130	120 J	200	140 J	100 J	120 J	180 J	400
MERCURY	0.02 U	0.06 U	0.05 U	0.07 U	0.1 U	0.08 U	0.06 U	0.06 U
NICKEL	7.1	5.1 U	6.2	8.7 U	11 U	13 U	10 U	38
POTASSIUM	1600	1100	1400	1600	670	900	1200	1700
SELENIUM	0.48 U	0.57 U	0.56 U	0.54 U	0.56 U	0.6 U	0.54 U	0.63 U
SILVER	2 J	1.3 J	2.2	2.2 J	4.9	4.2	2.6	4.9
SODIUM	76 U	41 U	62 U	210	180 U	160 U	130 U	60 U
THALLIUM	0.65 J	0.53 J	0.44 U	0.49 J	0.54 J	0.63 J	0.44 J	1.2 J

SUMMARY OF SITE 16 SOIL DATA - HOSPITAL INCINERATOR
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	S16SB01	S16SB03	S16SB05	S16SB06	S16SB07	S16SB08	S16SB08	S16SS01
matrix	SS	SS	SS	SS	SS	SS	SB	SS
nsample	S16SB010001-SO	S16SB030001-SO	S16SB050001-SO	S16SB060001-SO	S16SB070001-SO	S16SB080001-SO	S16SB080405-SO	S16SS01-SO
sample	S16SB010001	S16SB030001	S16SB050001	S16SB060001	S16SB070001	S16SB080001	S16SB080405	S16SS01
sacode	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
top_depth	0	0	0	0	0	0	4	0
bottom_dep	1	1	1	1	1	1	5	0
status	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	6/13/00	6/13/00	6/13/00	6/13/00	6/13/00	6/13/00	6/13/00	6/25/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
VANADIUM	16	11	13	21	40	34	20	24 U
ZINC	24	61	26	48	43	25	18 U	1300

Notes:
U - Nondetect
J - Estimated
R - Rejected

APPENDIX B.11

SITE 16 - HOSPITAL INCINERATOR SPLP SOIL DATA

SUMMARY OF SITE 16 SPLP SOIL DATA
HOSPITAL INCINERATOR
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	S16SB01	S16SB03	S16SB05	S16SB06	S16SB07	S16SB08	S16SB08	S16SS01
matrix	SPLP	SPLP	SPLP	SPLP	SPLP	SPLP	SPLP	SPLP
nsample	S16SB010001-SO-P	S16SB030001-SO-P	S16SB050001-SO-P	S16SB060001-SO-P	S16SB070001-SO-P	S16SB080001-SO-P	S16SB080405-SO-P	S16SS01-SO-P
sample	S16SB010001	S16SB030001	S16SB050001	S16SB060001	S16SB070001	S16SB080001	S16SB080405	S16SS01
top_depth	0	0	0	0	0	0	4	0
bottom_dep	1	1	1	1	1	1	5	0
sample_dat	6/13/00	6/13/00	6/13/00	6/13/00	6/13/00	6/13/00	6/13/00	6/25/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
PCBs (ug/L)								
AROCLOR-1016	2 U	2 U	2 U	2 U	2 U	2 U	2 U	0.8 U
AROCLOR-1221	4 U	4 U	4 U	4 U	4 U	4 U	4 U	1.6 U
AROCLOR-1232	2 U	2 U	2 U	2 U	2 U	2 U	2 U	0.8 U
AROCLOR-1242	2 U	2 U	2 U	2 U	2 U	2 U	2 U	0.8 U
AROCLOR-1248	2 U	2 U	2 U	2 U	2 U	2 U	2 U	0.8 U
AROCLOR-1254	2 U	2 U	2 U	2 U	2 U	2 U	2 U	0.8 U
AROCLOR-1260	2 U	2 U	2 U	2 U	2 U	2 U	2 U	0.8 U
Total Metals (ug/L)								
ALUMINUM	760	760	640	500	1200	66 U	66 U	370 U
ANTIMONY	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.6 U
ARSENIC	3.1 U	3.1 U	3.1 U	3.1 U	3.1 U	3.1 U	3.1 U	2.3 U
BARIUM	210 U	170 U	180 U	79 U	210 U	210 U	190 U	200 U
BERYLLIUM	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.72 U
CADMIUM	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U	0.64 U
CALCIUM	1300 J	870 U	840 J	26000 J	1500 U	1200 U	2700 U	2500 U
CHROMIUM	8.4 UJ	8.4 UJ	8.4 UJ	8.4 UJ	8.4 UJ	8.4 UJ	8.4 UJ	7.1 J
COBALT	5.2 U	5.2 U	5.2 U	5.2 U	5.2 U	5.2 U	5.2 U	4.2 U
COPPER	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	34
IRON	540	510	490	84 U	800	22 U	22 U	650
LEAD	2.1 U	2.1 U	2.5 J	2.1 U	2.1 U	2.1 U	2.1 U	3.1 J
MAGNESIUM	280	210	240	270	200	210	150	530
MANGANESE	8.7	16 U	16	3.5 U	3.9 U	19	24	24 U
MERCURY	0.14 U	0.16 U	0.15 U	0.17 U	0.19 U	0.17 U	0.16 U	0.12 U
NICKEL	7.7 U	7.7 U	7.7 U	7.7 U	7.7 U	7.7 U	7.7 U	9.2 U
POTASSIUM	780 U	1100 U	610 U	2100 U	540 U	620 U	360 U	1700
SELENIUM	2.7 U	2.7 U	2.7 U	4 U	2.8 U	2.7 U	2.7 U	2.8 U
SILVER	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U	5.2 U
SODIUM	3900 U	3700 U	3700 U	5700 U	6800 U	6200 U	5200 U	1500 U
THALLIUM	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	3 U
VANADIUM	4.8 J	4.4 U	4.4 U	21	4.4 U	4.4 U	4.4 U	6.3 U
ZINC	24 U	45 U	32 U	23 U	42 U	46 U	25 U	360 U

Notes:
U- Not Detected J- Estimated R - Rejected

APPENDIX B.12

SITE 8 - GOSS COVE LANDFILL GROUNDWATER DATA

SUMMARY OF SITE 8 GROUNDWATER DATA
GOSS COVE LANDFILL
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	8MW1	8MW2D	8MW2S	8MW3	8MW4	8MW5S	8MW5S	8MW6D	8MW6S	8MW6S	8MW09S
matrix	GW	GW	GW	GW	GW	GW	GF	GW	GW	GW	GW
sample	S8MW0101	S8MW02D01	S8MW02S01	S8MW0301	S8MW0401	S8MW05S01	S8MW05S01-F	S8MW06D01	S8MW06S01	FD0808001	S8MW09S01
sample_date	8/8/00	8/7/00	8/7/00	8/8/00	8/8/00	8/7/00	8/7/00	8/8/00	8/8/00	8/8/00	8/18/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312
proj_manager	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
Volatile Organics (ug/L)											
1,1,1-TRICHLOROETHANE	1 U	1 U	1 U	25 U	1 U	1 U		1 U	1 U	1 U	1 U
1,1,2,2-TETRACHLOROETHANE	1 U	1 U	1 U	25 U	1 U	1 U		1 U	1 U	1 U	1 U
1,1,2-TRICHLOROETHANE	1 U	1 U	1 U	25 U	1 U	1 U		1 U	1 U	1 U	1 U
1,1-DICHLOROETHANE	1 U	1 U	1 U	25 U	1 U	1 U		1 U	1 U	1 U	1 U
1,1-DICHLOROETHENE	1 U	1 U	1 U	25 U	1 U	1 U		1 U	1 U	1 U	1 U
1,2,4-TRICHLOROBENZENE	1 U	1 U	1 U	25 U	1 U	1 U		1 U	1 U	1 U	1 U
1,2-DIBROMO-3-CHLOROPROPANE	1 UR	1 UR	1 UR	25 UR	1 UR	1 UR		1 UR	1 UR	1 UR	1 UR
1,2-DIBROMOETHANE	1 U	1 U	1 U	25 U	1 U	1 U		1 U	1 U	1 U	1 U
1,2-DICHLOROBENZENE	1 U	1 U	1 U	25 U	1 U	1 U		1 U	1 U	1 U	1 U
1,2-DICHLOROETHANE	1 U	1 U	1 U	25 U	1 U	1 U		1 U	1 U	1 U	1 U
1,2-DICHLOROPROPANE	1 U	1 U	1 U	25 U	1 U	1 U		1 U	1 U	1 U	1 U
1,3-DICHLOROBENZENE	1 U	1 U	1 U	25 U	1 U	1 U		1 U	1 U	1 U	1 U
1,4-DICHLOROBENZENE	1 U	1 U	1 U	25 U	1 U	1 U		1 U	1 U	1 U	1 U
2-BUTANONE	5 UR	5 UR	5 UR	125 UR	5 UR	5 UR		5 UR	5 UR	5 UR	5 UR
2-HEXANONE	5 U	5 UR	5 UR	125 U	5 U	5 U		5 U	5 U	5 UR	5 U
4-METHYL-2-PENTANONE	5 U	5 U	5 U	125 U	5 U	5 U		5 U	5 U	5 U	5 U
ACETONE	5 UR	5 UR	5 UR	125 UR	5 UR	5 UR		5 UR	5 UR	5 UR	5 UR
BENZENE	1 U	1 U	2	25 U	1 U	1 U		1 U	1 U	1 U	1 U
BROMOCHLOROMETHANE	1 U	1 U	1 U	25 U	1 U	1 U		1 U	1 U	1 U	1 U
BROMODICHLOROMETHANE	1 U	1 U	1 U	25 U	1 U	1 U		1 U	1 U	1 U	1 U
BROMOFORM	1 U	1 U	1 U	25 U	1 U	1 U		1 U	1 U	1 U	1 U
BROMOMETHANE	1 UJ	1 U	1 U	25 UJ	1 UJ	1 UJ		1 UJ	1 UJ	1 U	1 U
CARBON DISULFIDE	1 U	1 U	1 U	25 U	1 U	1 U		1 U	1 U	1 U	1 U
CARBON TETRACHLORIDE	1 U	1 U	1 U	25 U	1 U	1 U		1 U	1 U	1 U	1 U
CHLOROBENZENE	1 U	1 U	1 U	25 U	1 U	1 U		1 U	1 U	1 U	1 U
CHLOROETHANE	1 U	1 U	1 U	25 U	1 U	18 U		1 U	1 U	1 U	1 U
CHLOROFORM	1 U	1 U	1 U	25 U	1 U	1 U		1 U	1 U	1 U	1 U
CHLOROMETHANE	1 U	1 U	1 U	25 U	1 U	1 U		1 U	1 U	1 U	1 U
CIS-1,2-DICHLOROETHENE	1 U	33	1 U	25 U	1 U	1 U		1 U	1 U	1 U	1.03
CIS-1,3-DICHLOROPROPENE	1 U	1 U	1 U	25 U	1 U	1 U		1 U	1 U	1 U	1 U
DIBROMOCHLOROMETHANE	1 U	1 U	1 U	25 U	1 U	1 U		1 U	1 U	1 U	1 U
ETHYLBENZENE	1 U	1 U	18	108	2	1 U		27	2	2	1 U
M+P-XYLENES	2 U	2 U	54 E	284	6	2 U		1 J	1 J	2 J	2 U
METHYLENE CHLORIDE	2 U	4 U	4 U	50 U	2 U	2 U		2 U	2 U	4 U	2.04 U
O-XYLENE	1 U	1 U	31 E	136	2	1 U		33 E	3	3	1 U
STYRENE	1 U	1 U	1 U	25 U	1 U	1 U		1 U	1 U	1 U	1 U
TETRACHLOROETHENE	1 U	31	1 U	25 U	1 U	1 U		1 U	1 U	1 U	1440
TOLUENE	1 U	1 U	2	31	1 U	1 U		1 U	1 U	1 U	1 U
TRANS-1,2-DICHLOROETHENE	1 U	7	1 U	25 U	1 U	1 U		1 U	1 U	1 U	1 U
TRANS-1,3-DICHLOROPROPENE	1 U	1 U	1 U	25 U	1 U	1 U		1 U	1 U	1 U	1 U
TRICHLOROETHENE	1 U	25	1 U	25 U	1 U	1 U		1 U	1 U	1 U	1.52

SUMMARY OF SITE 8 GROUNDWATER DATA
GOSS COVE LANDFILL
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	8MW1	8MW2D	8MW2S	8MW3	8MW4	8MW5S	8MW5S	8MW6D	8MW6S	8MW6S	8MW09S
matrix	GW	GW	GW	GW	GW	GW	GF	GW	GW	GW	GW
sample	S8MW0101	S8MW02D01	S8MW02S01	S8MW0301	S8MW0401	S8MW05S01	S8MW05S01-F	S8MW06D01	S8MW06S01	FD0808001	S8MW09S01
sample_date	8/8/00	8/7/00	8/7/00	8/8/00	8/8/00	8/7/00	8/7/00	8/8/00	8/8/00	8/8/00	8/18/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312
proj_manager	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
VINYL CHLORIDE	1 U	1	1 U	25 U	1 U	1 U		1 U	1 U	1 U	1 U
XYLENES, TOTAL	1 U	1 U	44	454	8	1 U		34	5	5	1 U
Semivolatile Organics (ug/L)											
1-METHYLNAPHTHALENE	0.5 U	0.5 U	6 J	19 J	1.3	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U
2,2'-OXYBIS(1-CHLOROPROPANE)	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U
2,4,5-TRICHLOROPHENOL	20 U	20 U	20 U	20 U	20 U	20 U		20 U	20 U	20 U	20 U
2,4,6-TRICHLOROPHENOL	5 U	5 U	5 UJ	5 U	5 U	5 U		5 U	5 U	5 U	5 U
2,4-DICHLOROPHENOL	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U
2,4-DIMETHYLPHENOL	5 U	5 U	14	240	5 U	5 U		5 U	5 U	5 U	5 U
2,4-DINITROPHENOL	20 UJ	20 UJ	20 UJ	20 UJ	20 UJ	20 UJ		20 UJ	20 UJ	20 UJ	20 U
2,4-DINITROTOLUENE	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U
2,6-DINITROTOLUENE	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U
2-CHLORONAPHTHALENE	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U
2-CHLOROPHENOL	5 UJ	5 UJ	5 UJ	5 UJ	5 U	5 UJ		5 UJ	5 UJ	5 UJ	5 UJ
2-METHYLNAPHTHALENE	0.5 U	0.5 U	4.2 J	15 J	0.82	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U
2-METHYLPHENOL	5 U	5 U	5 U	99	5 U	5 U		5 U	5 U	5 U	5 U
2-NITROANILINE	20 U	20 U	20 U	20 U	20 U	20 U		20 U	20 U	20 U	20 U
2-NITROPHENOL	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U
3,3'-DICHLOROBENZIDINE	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U
3-NITROANILINE	20 U	20 U	20 U	20 UJ	20 U	20 U		20 U	20 U	20 U	20 U
4,6-DINITRO-2-METHYLPHENOL	20 UJ	20 UJ	20 UJ	20 U	20 UJ	20 U		20 UJ	20 UJ	20 UJ	20 U
4-BROMOPHENYL PHENYL ETHER	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U
4-CHLORO-3-METHYLPHENOL	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U
4-CHLOROANILINE	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U
4-CHLOROPHENYL PHENYL ETHER	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U
4-METHYLPHENOL	5 U	5 U	6	27	5 U	5 U		5 U	5 U	5 U	5 U
4-NITROANILINE	20 U	20 U	20 U	20 U	20 U	20 U		20 U	20 U	20 U	20 U
4-NITROPHENOL	20 U	20 U	20 U	20 U	20 U	20 U		20 U	20 U	20 U	20 U
ACENAPHTHENE	0.5 U	0.5 U	5.2 J	7.9 J	1.1	0.5 U		0.5 U	0.85 J	0.9 J	0.5 U
ACENAPHTHYLENE	1 U	1 U	1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U
ANTHRACENE	0.11	0.11	1.4 J	1.4 J	0.24	0.05 U		0.22 J	0.12 J	0.13 J	0.041 J
BENZO(A)ANTHRACENE	0.02 J	0.05 U	0.73 J	1.4 J	0.2	0.13		0.67 J	0.04 J	0.04 J	0.05 U
BENZO(A)PYRENE	0.02 J	0.05 U	0.86 J	2.1 J	0.15	0.1		0.83 J	0.05 U	0.05 U	0.05 U
BENZO(B)FLUORANTHENE	0.05 J	0.1 U	0.88 J	2.4 J	0.2	0.27		1.2 J	0.1 U	0.1 U	0.1 U
BENZO(G,H,I)PERYLENE	0.1 U	0.1 U	0.72 J	2.4 J	0.12	0.14		1 J	0.1 U	0.1 U	0.1 U
BENZO(K)FLUORANTHENE	0.05 U	0.05 U	0.34 J	1.1 J	0.05	0.06		0.48 J	0.05 U	0.05 U	0.05 U
BIS(2-CHLOROETHOXY)METHANE	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U
BIS(2-CHLOROETHYL)ETHER	5 UJ	5 UJ	5 UJ	5 UJ	5 U	5 UJ		5 UJ	5 UJ	5 UJ	5 UJ
BIS(2-ETHYLHEXYL)PHTHALATE	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U
BUTYLBENZYL PHTHALATE	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U
CHRYSEN[illegible]	0.05 U	0.03 J	0.85 J	1.9 J	0[illegible]	0.1		1.1 J	0.03 J	0.03 J	0.0[illegible]
DIBENZ[illegible]NTHRACENE	0.1 U	0.1 U	0.09 J	0.46 J	0[illegible]	0.1 U		0.06 J	0.1 U	0.1 U	([illegible]

SUMMARY OF SITE 8 GROUNDWATER DATA
GOSS COVE LANDFILL
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	8MW1	8MW2D	8MW2S	8MW3	8MW4	8MW5S	8MW5S	8MW6D	8MW6S	8MW6S	8MW09S
matrix	GW	GW	GW	GW	GW	GW	GF	GW	GW	GW	GW
sample	S8MW0101	S8MW02D01	S8MW02S01	S8MW0301	S8MW0401	S8MW05S01	S8MW05S01-F	S8MW06D01	S8MW06S01	FD0808001	S8MW09S01
sample_date	8/8/00	8/7/00	8/7/00	8/8/00	8/8/00	8/7/00	8/7/00	8/8/00	8/8/00	8/8/00	8/18/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312
proj_manager	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
DIETHYL PHTHALATE	5 U	5 U	5 UJ	5 U	5 U	5 U		5 U	5 U	5 U	5 U
DIMETHYL PHTHALATE	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U
DI-N-BUTYL PHTHALATE	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U
DI-N-OCTYL PHTHALATE	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U
FLUORANTHENE	0.3	0.9	4.6 J	5.2 J	1.1	0.19		4.2 J	0.57 J	0.53 J	0.34
FLUORENE	0.1 U	0.11	2.9 J	5.8 J	0.58	0.1 U		0.22 J	0.31 J	0.27 J	0.21
HEXACHLOROBENZENE	5 U	5 U	5 UJ	5 U	5 U	5 U		5 U	5 U	5 U	5 UJ
HEXACHLOROBUTADIENE	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U
HEXACHLOROCYCLOPENTADIENE	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ		5 UJ	5 UJ	5 UJ	5 U
HEXACHLOROETHANE	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U
INDENO(1,2,3-CD)PYRENE	0.02 J	0.05 U	0.48 J	1.4 J	0.13	0.09		0.72 J	0.05 U	0.05 U	0.05 U
ISOPHORONE	5 U	5 U	5 UJ	5 U	5 U	5 U		5 U	5 U	5 U	5 UJ
NAPHTHALENE	0.5 U	0.5 U	19 J	56 J	4.5	0.5 U		0.5 U	1.5 J	2 J	0.5 U
NITROBENZENE	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U
N-NITROSO-DI-N-PROPYLAMINE	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U
N-NITROSODIPHENYLAMINE	5 U	5 U	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U
PENTACHLOROPHENOL	20 U	20 U	20 U	20 U	20 U	20 U		20 U	20 U	20 U	20 U
PHENANTHRENE	0.03 J	0.41	5.9 J	11 J	0.99	0.07		2 J	0.17 J	0.16 J	0.61
PHENOL	5 U	5 U	5 J	6	5 U	5 U		5 U	5 U	5 U	5 U
PYRENE	0.29	0.57	4.1 J	5.4 J	0.75	0.3		3.2 J	0.4 J	0.4 J	0.16
Pesticides/PCBs (ug/L)											
4,4'-DDD	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U		0.020 U	0.020 U	0.020 U	0.020 U
4,4'-DDE	0.020 U	0.020 U	0.020 UJ	0.020 U	0.020 U	0.020 U		0.020 U	0.020 U	0.020 U	0.020 U
4,4'-DDT	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U		0.020 U	0.020 U	0.020 U	0.020 U
ALDRIN	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U		0.010 U	0.010 U	0.010 U	0.010 U
ALPHA-BHC	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U		0.010 U	0.010 U	0.010 U	0.010 U
ALPHA-CHLORDANE	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U		0.010 U	0.010 U	0.010 U	0.010 U
AROCLOR-1016	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U		0.20 U	0.20 U	0.20 U	0.20 U
AROCLOR-1221	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U		0.40 U	0.40 U	0.40 U	0.40 U
AROCLOR-1232	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U		0.20 U	0.20 U	0.20 U	0.20 U
AROCLOR-1242	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U		0.20 U	0.20 U	0.20 U	0.20 U
AROCLOR-1248	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U		0.20 U	0.20 U	0.20 U	0.20 U
AROCLOR-1254	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U		0.20 U	0.20 U	0.20 U	0.20 U
AROCLOR-1260	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U		0.20 U	0.20 U	0.20 U	0.20 U
BETA-BHC	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U		0.010 U	0.010 U	0.010 U	0.010 U
DELTA-BHC	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U		0.010 U	0.010 U	0.010 U	0.010 U
DIELDRIN	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U		0.020 U	0.020 U	0.020 U	0.020 U
ENDOSULFAN I	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U		0.010 U	0.010 U	0.010 U	0.010 U
ENDOSULFAN II	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U		0.020 U	0.020 U	0.020 U	0.020 U
ENDOSULFAN SULFATE	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U		0.020 U	0.020 U	0.020 U	0.020 U
ENDRIN	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U		0.020 U	0.020 U	0.020 U	0.020 U
ENDRIN ALDEHYDE	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U		0.020 U	0.020 U	0.020 U	0.020 U

SUMMARY OF SITE 8 GROUNDWATER DATA
GOSS COVE LANDFILL
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	8MW1	8MW2D	8MW2S	8MW3	8MW4	8MW5S	8MW5S	8MW6D	8MW6S	8MW6S	8MW09S
matrix	GW	GW	GW	GW	GW	GW	GF	GW	GW	GW	GW
sample	S8MW0101	S8MW02D01	S8MW02S01	S8MW0301	S8MW0401	S8MW05S01	S8MW05S01-F	S8MW06D01	S8MW06S01	FD0808001	S8MW09S01
sample_date	8/8/00	8/7/00	8/7/00	8/8/00	8/8/00	8/7/00	8/7/00	8/8/00	8/8/00	8/8/00	8/18/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312
proj_manager	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
ENDRIN KETONE	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U		0.020 U	0.020 U	0.020 U	0.020 U
GAMMA-BHC (LINDANE)	0.010 U	0.010 U	0.010 UJ	0.010 U	0.010 U	0.010 U		0.010 U	0.010 U	0.010 U	0.010 U
GAMMA-CHLORDANE	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U		0.13 R	0.010 U	0.010 U	0.010 U
HEPTACHLOR	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U		0.010 U	0.010 U	0.010 U	0.010 U
HEPTACHLOR EPOXIDE	0.010 U	0.010 U	0.59 R	0.34 R	0.010 U	0.010 U		0.010 U	0.010 U	0.15 R	0.010 U
METHOXYCHLOR	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U		0.10 U	0.10 U	0.10 U	0.10 U
TOXAPHENE	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U
Total Metals (ug/L)											
ALUMINUM	50.5 U	222 U	354 U	50.5 U	303 U	128 U		495 U	50.5 U	50.5 U	50.5 U
ANTIMONY	2.6 U	2.6 U	10.4	2.6 U	2.6 U	2.6 U		2.6 U	2.6 U	2.6 U	2.6 UJ
ARSENIC	2.3 U	14.5 J	5.6	3.8 J	2.3 J	2.3 U		8.4 J	5.1	5.0 J	2.3 U
BARIUM	154	50.8	376	393	1180	41.4 U		43.9 J	801	941	14.1 U
BERYLLIUM	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U		0.72 U	0.72 U	0.72 U	0.72 U
CADMIUM	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U		0.25 U	0.25 U	0.25 U	0.25 UJ
CALCIUM	133000	80200	77000	32800	45200	138000		265000	48300	56200	5930 J
CHROMIUM	6.2 U	23.5	50.5	6.2 U	18.0	6.2 U		7.6 J	6.2 U	6.2 U	6.2 U
COBALT	4.2 UJ	4.2 UJ	4.2 U	4.2 U	4.2 U	4.2 UJ		10.1 J	4.2 U	4.2 U	4.2 U
COPPER	6.8 UJ	6.8 UJ	35.4	6.8 U	22.2	6.8 UJ		6.8 UJ	6.8 U	6.8 U	6.8 U
IRON	2260	14500	4810	378	6050	338		2290	4330	5050	1250 J
LEAD	1.8 U	1.8 U	53.1	1.8 U	27.3	1.8 U		1.8 U	9.2	2.5 J	1.8 UJ
MAGNESIUM	417000	331000	38400	25400	24100	433000		1210000	42400	49700	1350
MANGANESE	214	851	468	30.9 J	83.4	76.9 J		4210	184	217	82.0
MERCURY	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U		0.09 U	0.10 U	0.09 U	0.09 UJ
NICKEL	9.2 UJ	13.5 J	28.7	9.2 U	11.7 J	9.2 UJ		9.2 UJ	9.2 U	9.2 U	9.2 U
POTASSIUM	129000	128000	37900	28800	20000	136000		250000	29800	35400	1130
SELENIUM	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U		2.8 U	2.8 U	2.8 U	2.8 U
SILVER	20.8 U	20.8 U	5.2 U	5.2 U	5.2 U	26.0 U		52.0 U	5.2 U	5.2 U	6.1 U
SODIUM	3450000	3470000	231000	350000	189000	9290000		8330000	286000	346000	9770
THALLIUM	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U		3.0 U	3.0 U	3.0 U	3.0 U
VANADIUM	6.3 U	6.3 U	6.3 U	6.3 U	6.3 U	6.3 U		6.6 J	6.3 U	6.3 U	6.3 U
ZINC	23.6 U	36.7 U	170	14.6 U	63.5	25.7 U		40.0 U	18.8 U	10.4 U	32.5 U
Dissolved Metals (ug/L)											
ALUMINUM							50.5 U				
ANTIMONY							2.6 J				
ARSENIC							2.8 J				
BARIUM							46.9				
BERYLLIUM							0.72 U				
CADMIUM							0.25 U				
CALCIUM							144000				
CHROMIUM							6.2 U				
COBALT							4.2 UJ				
COPPE							6.8 U				

SUMMARY OF SITE 8 GROUNDWATER DATA
GOSS COVE LANDFILL
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	8MW1	8MW2D	8MW2S	8MW3	8MW4	8MW5S	8MW5S	8MW6D	8MW6S	8MW6S	8MW09S
matrix	GW	GW	GW	GW	GW	GW	GF	GW	GW	GW	GW
sample	S8MW0101	S8MW02D01	S8MW02S01	S8MW0301	S8MW0401	S8MW05S01	S8MW05S01-F	S8MW06D01	S8MW06S01	FD0808001	S8MW09S01
sample_date	8/8/00	8/7/00	8/7/00	8/8/00	8/8/00	8/7/00	8/7/00	8/8/00	8/8/00	8/8/00	8/18/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312
proj_manager	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
IRON							266 U				
LEAD							1.8 U				
MAGNESIUM							464000				
MANGANESE							90.2 J				
MERCURY							0.09 U				
NICKEL							9.2 U				
POTASSIUM							154000				
SELENIUM							2.8 U				
SILVER							26.0 U				
SODIUM							4770000				
THALLIUM							3.0 U				
VANADIUM							9.2 J				
ZINC							22.7 U				
Miscellaneous Parameters (mg/L)											
TOTAL DISSOLVED SOLIDS	13200	10744 J	755 J	1126	798	139 J		27042	1460	1456	97.5 J
TOTAL SUSPENDED SOLIDS	8	15 J	23	5 U	10	5 UJ		38	5 U	5 U	5 UJ

APPENDIX B.13

SITE 15 - SPENT ACID STORAGE AND DISPOSAL AREA GROUNDWATER DATA

SUMMARY OF SITE 15 GROUNDWATER DATA
SPENT ACID STORAGE AND DISPOSAL AREA
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

site	15	15	15	15	15
location	15MW1D	15MW1S	15MW2S	15MW2S	15MW3S
nsample	S15MW1D01	S15MW1S01	S15MW2S01	S15MW2S01-D	S15MW3S01
sample	S15MW1D01	S15MW1S01	S15MW2S01	FD0721001	S15MW3S01
sample_date	7/21/00	7/21/00	7/21/00	7/21/00	7/23/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312
proj_manager	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
Volatile Organics (ug/L)					
1,1,1-TRICHLOROETHANE	1 U	1 U	1 U	1 U	1 U
1,1,2,2-TETRACHLOROETHANE	1 U	1 U	1 U	1 U	1 U
1,1,2-TRICHLOROETHANE	1 U	1 U	1 U	1 U	1 U
1,1-DICHLOROETHANE	1 U	1 U	1 U	1 U	1 U
1,1-DICHLOROETHENE	1 U	1 U	1 U	1 U	1 U
1,2,4-TRICHLOROBENZENE	1 U	1 U	1 U	1 U	1 U
1,2-DIBROMO-3-CHLOROPROPANE	1 U	1 U	1 U	1 U	1 U
1,2-DIBROMOETHANE	1 U	1 U	1 U	1 U	1 U
1,2-DICHLOROBENZENE	1 U	1 U	1 U	1 U	1 U
1,2-DICHLOROETHANE	1 U	1 U	1 U	1 U	1 U
1,2-DICHLOROPROPANE	1 U	1 U	1 U	1 U	1 U
1,3-DICHLOROBENZENE	1 U	1 U	1 U	1 U	1 U
1,4-DICHLOROBENZENE	1 U	1 U	1 U	1 U	1 U
2-BUTANONE	5 UR	5 UR	5 UR	5 UR	5 UR
2-HEXANONE	5 UR	5 UR	5 UR	5 UR	5 UR
4-METHYL-2-PENTANONE	5 U	5 U	5 U	5 U	5 U
ACETONE	5 UR	5 UR	11.9 U	5 UR	5 UR
BENZENE	1 U	1 U	1 U	1 U	1 U
BROMOCHLOROMETHANE	1 U	1 U	1 U	1 U	1 U
BROMODICHLOROMETHANE	1 U	1 U	1 U	1 U	1 U
BROMOFORM	1 U	1 U	1 U	1 U	1 U
BROMOMETHANE	1 U	1 U	1 U	1 U	1 U
CARBON DISULFIDE	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
CARBON TETRACHLORIDE	1 U	1 U	1 U	1 U	1 U
CHLOROBENZENE	1 U	1 U	1 U	1 U	1 U
CHLOROETHANE	1 U	1 U	1 U	1 U	1 U
CHLOROFORM	1 U	1 U	1 U	1 U	1 U
CHLOROMETHANE	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
CIS-1,2-DICHLOROETHENE	1 U	1 U	1 U	1 U	1 U
CIS-1,3-DICHLOROPROPENE	1 U	1 U	1 U	1 U	1 U
DIBROMOCHLOROMETHANE	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	1 U	1 U	1 U	1 U	1 U
M+P-XYLENES	2 U	2 U	2 U	2 U	2 U
METHYLENE CHLORIDE	2.27 U	2.44 U	2 U	3.1 U	2.57 U
O-XYLENE	1 U	1 U	1 U	1 U	1 U

SUMMARY OF SITE 15 GROUNDWATER DATA
SPENT ACID STORAGE AND DISPOSAL AREA
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

site	15	15	15	15	15
location	15MW1D	15MW1S	15MW2S	15MW2S	15MW3S
nsample	S15MW1D01	S15MW1S01	S15MW2S01	S15MW2S01-D	S15MW3S01
sample	S15MW1D01	S15MW1S01	S15MW2S01	FD0721001	S15MW3S01
sample_date	7/21/00	7/21/00	7/21/00	7/21/00	7/23/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312
proj_manager	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
STYRENE	1 U	1 U	1 U	1 U	1 U
TETRACHLOROETHENE	1 U	1 U	1 U	1 U	1 U
TOLUENE	1 U	1 U	1 U	1 U	1 U
TRANS-1,2-DICHLOROETHENE	1 U	1 U	1 U	1 U	1 U
TRANS-1,3-DICHLOROPROPENE	1 U	1 U	1 U	1 U	1 U
TRICHLOROETHENE	1 U	3.22 J	2.32 J	3.19 J	16
VINYL CHLORIDE	1 U	1 U	1 U	1 U	1 U
XYLENES, TOTAL	1 U	1 U	1 U	1 U	1 U
Semivolatile Organics (ug/L)					
1,2,4-TRICHLOROBENZENE	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROBENZENE	5 U	5 U	5 U	5 U	5 U
1,3-DICHLOROBENZENE	5 U	5 U	5 U	5 U	5 U
1,4-DICHLOROBENZENE	5 U	5 U	5 U	5 U	5 U
1-METHYLNAPHTHALENE	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2,2'-OXYBIS(1-CHLOROPROPANE)	5 U	5 U	5 U	5 U	5 U
2,4,5-TRICHLOROPHENOL	20 U	20 U	20 U	20 U	20 U
2,4,6-TRICHLOROPHENOL	5 U	5 U	5 U	5 U	5 U
2,4-DICHLOROPHENOL	5 U	5 U	5 U	5 U	5 U
2,4-DIMETHYLPHENOL	5 U	5 U	5 U	5 U	5 U
2,4-DINITROPHENOL	20 U	20 U	20 U	20 U	20 UJ
2,4-DINITROTOLUENE	5 U	5 U	5 U	5 U	5 U
2,6-DINITROTOLUENE	5 U	5 U	5 U	5 U	5 U
2-CHLORONAPHTHALENE	5 U	5 U	5 U	5 U	5 U
2-CHLOROPHENOL	5 UJ	5 UJ	5 UJ	5 UJ	5 UJ
2-METHYLNAPHTHALENE	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2-METHYLPHENOL	5 U	5 U	5 U	5 U	5 U
2-NITROANILINE	20 U	20 U	20 U	20 U	20 U
2-NITROPHENOL	5 U	5 U	5 U	5 U	5 U
3,3'-DICHLOROBENZIDINE	5 U	5 U	5 U	5 U	5 U
3-NITROANILINE	20 U	20 U	20 U	20 U	20 U
4,6-DINITRO-2-METHYLPHENOL	20 U	20 U	20 U	20 U	20 U
4-BROMOPHENYL PHENYL ETHER	5 U	5 U	5 U	5 U	5 U
4-CHLORO-3-METHYLPHENOL	5 U	5 U	5 U	5 U	5 U
4-CHLOROANILINE	5 U	5 U	5 UR	5 U	5 U
4-CHLOROPHENYL PHENYL ETHER	5 U	5 U	5 U	5 U	5 U
4-METHYLPHENOL	5 U	5 U	5 U	5 U	5 U

SUMMARY OF SITE 15 GROUNDWATER DATA
SPENT ACID STORAGE AND DISPOSAL AREA
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

site	15	15	15	15	15
location	15MW1D	15MW1S	15MW2S	15MW2S	15MW3S
nsample	S15MW1D01	S15MW1S01	S15MW2S01	S15MW2S01-D	S15MW3S01
sample	S15MW1D01	S15MW1S01	S15MW2S01	FD0721001	S15MW3S01
sample_date	7/21/00	7/21/00	7/21/00	7/21/00	7/23/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312
proj_manager	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
4-NITROANILINE	20 U	20 U	20 U	20 U	20 U
4-NITROPHENOL	20 U	20 U	20 U	20 U	20 U
ACENAPHTHENE	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
ACENAPHTHYLENE	1 U	1 U	1 U	1 U	1 U
ANTHRACENE	0.05 U	0.05 U	0.05 U	0.05 U	0.02 J
BENZO(A)ANTHRACENE	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
BENZO(A)PYRENE	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
BENZO(B)FLUORANTHENE	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
BENZO(G,H,I)PERYLENE	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
BENZO(K)FLUORANTHENE	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
BIS(2-CHLOROETHOXY)METHANE	5 U	5 U	5 U	5 U	5 U
BIS(2-CHLOROETHYL)ETHER	5 U	5 U	5 U	5 U	5 UJ
BIS(2-ETHYLHEXYL)PHTHALATE	5 U	5 U	5 U	5 U	5 U
BUTYLBENZYL PHTHALATE	5 U	5 U	5 U	5 U	5 U
CARBAZOLE	5 U	5 U	5 U	5 U	5 U
CHRYSENE	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
DIBENZO(A,H)ANTHRACENE	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
DIBENZOFURAN	5 U	5 U	5 U	5 U	5 U
DIETHYL PHTHALATE	5 U	5 U	5 U	5 U	5 U
DIMETHYL PHTHALATE	5 U	5 U	5 U	5 U	5 U
DI-N-BUTYL PHTHALATE	5 U	5 U	5 U	5 U	5 U
DI-N-OCTYL PHTHALATE	5 U	5 U	5 U	5 U	5 U
FLUORANTHENE	0.1 U	0.1 U	0.1 U	0.1 U	0.09 J
FLUORENE	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
HEXACHLOROBENZENE	5 U	5 U	5 U	5 U	5 U
HEXACHLOROBUTADIENE	5 U	5 U	5 U	5 U	5 U
HEXACHLOROCYCLOPENTADIENE	5 U	5 U	5 U	5 U	5 UJ
HEXACHLOROETHANE	5 U	5 U	5 U	5 U	5 U
INDENO(1,2,3-CD)PYRENE	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
ISOPHORONE	5 U	5 U	5 U	5 U	5 U
NAPHTHALENE	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
NITROBENZENE	5 U	5 U	5 U	5 U	5 U
N-NITROSO-DI-N-PROPYLAMINE	5 U	5 U	5 U	5 U	5 U
N-NITROSODIPHENYLAMINE	5 U	5 U	5 U	5 U	5 U
PENTACHLOROPHENOL	20 U	20 U	20 U	20 U	20 U
PHENANTHRENE	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U

SUMMARY OF SITE 15 GROUNDWATER DATA
SPENT ACID STORAGE AND DISPOSAL AREA
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

site	15	15	15	15	15
location	15MW1D	15MW1S	15MW2S	15MW2S	15MW3S
nsample	S15MW1D01	S15MW1S01	S15MW2S01	S15MW2S01-D	S15MW3S01
sample	S15MW1D01	S15MW1S01	S15MW2S01	FD0721001	S15MW3S01
sample_date	7/21/00	7/21/00	7/21/00	7/21/00	7/23/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312
proj_manager	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
PHENOL	5 U	5 U	5 U	5 U	5 UJ
PYRENE	0.05 U	0.05 U	0.05 U	0.05 U	0.06
Total Metals (ug/L)					
ALUMINUM	4200	683 U	3040	3620	1650
ANTIMONY	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U
ARSENIC	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U
BARIUM	53.2 U	65.7 U	42.5 U	43.1 U	45.5 U
BERYLLIUM	0.72 U	0.72 U	1.2 J	1.4	0.72 U
CADMIUM	0.25 U	0.99	3.2	3.4	0.25 U
CALCIUM	21600	18900	6740	8780	22500
CHROMIUM	47.9	121	24.2	7.9 J	21.1
COBALT	12.8 U	4.5 U	10.5 U	6.8 U	9.0 U
COPPER	12.6 J	12.9 J	36.6	30.8	6.8 U
IRON	5430	1430	247 U	250 U	8600
LEAD	2.8 J	24.7	14.6	13.6	4.2
MAGNESIUM	8080	2320	1290	1560	4630
MANGANESE	871	31.3	172	215	309
MERCURY	0.09 UJ	0.09 UJ	0.09 UJ	0.09 UJ	0.09 U
NICKEL	34.4 U	77.6	28.5 U	16.2 U	13.8 U
POTASSIUM	6610	5950	1600	1930	5250
SELENIUM	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U
SILVER	79.1 J	5.2 UR	615 J	5.9 U	215 J
SODIUM	59800	46500	24800	28700	42200
THALLIUM	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
VANADIUM	17.7 U	7.3 U	6.3 U	6.3 U	8.2 U
ZINC	42.0 U	24.4 U	296	349	26.0 U
Miscellaneous Parameters (mg/L)					
TOTAL DISSOLVED SOLIDS	276 J	215 J	146 J	170 J	10 UJ
TOTAL SUSPENDED SOLIDS	80 J	5 J	5 UJ	5 UJ	30 J

APPENDIX B.14

SITE 18 - SOLVENT STORAGE AREA SOIL DATA

SUMMARY OF SITE 18 SOIL DATA - SOLVENT STORAGE AREA
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

site	18	18	18	18	18	18	18	18	18	18	18	18
location	S18SB01	S18SB01	S18SB02	S18SB02	S18SB02	S18SB02	S18SB03	S18SB03	S18SB04	S18SB04	S18SB05	S18SB05
matrix	SS	SB	SS	SB	SB	SB	SS	SB	SS	SB	SS	SB
nsample	S18SB010001-SO	S18SB010506-SO	S18SB020001-SO	S18SB020405-SO	S18SB020405-SO-AVG	S18SB020405-SO-D	S18SB030001-SO	S18SB030708-SO	S18SB040001-SO	S18SB040708-SO	S18SB050001-SO	S18SB050405-SO
sample	S18SB010001	S18SB010506	S18SB020001	S18SB020405	S18SB020405	FD0612001	S18SB030001	S18SB030708	S18SB040001	S18SB040708	S18SB050001	S18SB050405
sacode	NORMAL	NORMAL	NORMAL	DUP	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
top_depth	0	5	0	4	4	4	0	7	0	7	0	4
bottom_dep	1	6	1	5	5	5	1	8	1	8	1	5
qc_type	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
status	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
coll_metho	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
cto_proj	312	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
Volatile Organics (ug/kg)												
1,1,1-TRICHLOROETHANE	5 U	5 U	5 UJ	6 UJ	6 UJ	6 U	5 UJ	5 U	6 UJ	5 U	6 U	6 UJ
1,1,2,2-TETRACHLOROETHANE	5 U	5 U	5 UJ	6 UJ	6 UJ	6 U	5 UJ	5 U	6 UJ	5 U	6 U	6 UJ
1,1,2-TRICHLOROETHANE	5 U	5 U	5 UJ	6 UJ	6 UJ	6 U	5 UJ	5 U	6 UJ	5 U	6 U	6 UJ
1,1-DICHLOROETHANE	5 U	5 U	5 UJ	6 UJ	6 UJ	6 U	5 UJ	5 U	6 UJ	5 U	6 U	6 UJ
1,1-DICHLOROETHENE	5 U	5 U	5 UJ	6 UJ	6 UJ	6 U	5 UJ	5 U	6 UJ	5 U	6 U	6 UJ
1,2-DICHLOROETHANE	5 U	5 U	5 UJ	6 UJ	6 UJ	6 U	5 UJ	5 U	6 UJ	5 U	6 U	6 UJ
1,2-DICHLOROETHENE (TOTAL)	10 U	10 U	10 UJ	11 UJ	11.5 UJ	12 U	11 UJ	10 U	12 UJ	10 U	13 U	11 UJ
1,2-DICHLOROPROPANE	5 U	5 U	5 UJ	6 UJ	6 UJ	6 U	5 UJ	5 U	6 UJ	5 U	6 U	6 UJ
2-BUTANONE	10 UR	10 UR	4 J	11 UJ	11 UJ	12 UR	4 J	10 UR	2 J	10 UR	13 UR	11 UJ
2-HEXANONE	10 U	10 U	10 UJ	11 UJ	11.5 UJ	12 U	11 UJ	10 U	12 UJ	10 U	13 U	11 UJ
4-METHYL-2-PENTANONE	10 U	10 U	10 UJ	11 UJ	11.5 UJ	12 U	11 UJ	10 U	12 UJ	10 U	13 U	11 UJ
ACETONE	84 U	33 U	52 U	28 U	60.5 U	93 U	71 U	14 U	43 U	50 U	82 U	62 U
BENZENE	5 U	5 U	5 UJ	6 UJ	6 UJ	6 U	5 UJ	5 U	6 UJ	5 U	6 U	6 UJ
BROMODICHLOROMETHANE	5 U	5 U	5 UJ	6 UJ	6 UJ	6 U	5 UJ	5 U	6 UJ	5 U	6 U	6 UJ
BROMOFORM	5 U	5 U	5 UJ	6 UJ	6 UJ	6 U	5 UJ	5 U	6 UJ	5 U	6 U	6 UJ
BROMOMETHANE	5 U	5 U	5 UJ	6 UJ	6 UJ	6 U	5 UJ	5 U	6 UJ	5 U	6 U	6 UJ
CARBON DISULFIDE	5 U	5 U	5 UJ	6 UJ	6 UJ	6 U	5 UJ	5 U	6 UJ	5 U	6 U	6 UJ
CARBON TETRACHLORIDE	5 U	5 U	5 UJ	6 UJ	6 UJ	6 U	5 UJ	5 U	6 UJ	5 U	6 U	6 UJ
CHLOROBENZENE	5 U	5 U	5 UJ	6 UJ	6 UJ	6 U	5 UJ	5 U	6 UJ	5 U	6 U	6 UJ
CHLORODIBROMOMETHANE	5 U	5 U	5 UJ	6 UJ	6 UJ	6 U	5 UJ	5 U	6 UJ	5 U	6 U	6 UJ
CHLOROETHANE	5 U	5 U	5 UJ	6 UJ	6 UJ	6 U	5 UJ	5 U	6 UJ	5 U	6 U	6 UJ
CHLOROFORM	5 U	5 U	5 UJ	6 UJ	6 UJ	6 U	5 UJ	5 U	6 UJ	5 U	6 U	6 UJ
CHLOROMETHANE	5 U	5 U	5 UJ	6 UJ	6 UJ	6 U	5 UJ	5 U	6 UJ	5 U	6 U	6 UJ
CIS-1,2-DICHLOROETHENE	5 U	5 U	5 UJ	6 UJ	6 UJ	6 U	5 UJ	5 U	6 UJ	5 U	6 U	6 UJ
CIS-1,3-DICHLOROPROPENE	5 U	5 U	5 UJ	6 UJ	6 UJ	6 U	5 UJ	5 U	6 UJ	5 U	6 U	6 UJ
ETHYLBENZENE	5 U	5 U	5 UJ	6 UJ	6 UJ	6 U	5 UJ	5 U	6 UJ	5 U	6 U	6 UJ
M+P-XYLENES	10 U	10 U	10 UJ	11 UJ	11.5 UJ	12 U	11 UJ	10 U	12 UJ	10 U	13 U	11 UJ
METHYLENE CHLORIDE	9 U	8 U	5 U	5 U	34.75 J	67 J	5 U	14 U	5 U	27 U	14 U	24 U
O-XYLENE	5 U	5 U	5 UJ	6 UJ	6 UJ	6 U	5 UJ	5 U	6 UJ	5 U	6 U	6 UJ
STYRENE	5 U	5 U	5 UJ	6 UJ	6 UJ	6 U	5 UJ	5 U	6 UJ	5 U	6 U	6 UJ
TETRACHLOROETHENE	5 U	5 U	5 UJ	6 UJ	6 UJ	6 U	5 UJ	5 U	6 UJ	5 U	6 U	6 UJ
TOLUENE	2 J	5 U	1 J	2 J	2 J	6 U	2 J	1 J	3 J	1 J	6 J	6 UJ
TRANS-1,2-DICHLOROETHENE	5 U	5 U	5 UJ	6 UJ	6 UJ	6 U	5 UJ	5 U	6 UJ	5 U	6 U	6 UJ
TRANS-1,3-DICHLOROPROPENE	5 U	5 U	5 UJ	6 UJ	6 UJ	6 U	5 UJ	5 U	6 UJ	5 U	6 U	6 UJ

SUMMARY OF SITE 18 SOIL DATA - SOLVENT STORAGE AREA
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

site	18	18	18	18	18	18	18	18	18	18	18	18
location	S18SB01	S18SB01	S18SB02	S18SB02	S18SB02	S18SB02	S18SB03	S18SB03	S18SB04	S18SB04	S18SB05	S18SB05
matrix	SS	SB	SS	SB	SB	SB	SS	SB	SS	SB	SS	SB
nsample	S18SB010001-SO	S18SB010506-SO	S18SB020001-SO	S18SB020405-SO	S18SB020405-SO-AVG	S18SB020405-SO-D	S18SB030001-SO	S18SB030708-SO	S18SB040001-SO	S18SB040708-SO	S18SB050001-SO	S18SB050405-SO
sample	S18SB010001	S18SB010506	S18SB020001	S18SB020405	S18SB020405	FD0612001	S18SB030001	S18SB030708	S18SB040001	S18SB040708	S18SB050001	S18SB050405
sacode	NORMAL	NORMAL	NORMAL	DUP	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
top_depth	0	5	0	4	4	4	0	7	0	7	0	4
bottom_dep	1	6	1	5	5	5	1	8	1	8	1	5
qc_type	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
status	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
coll_metho	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
cto_proj	312	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
TRICHLOROETHENE	5 U	5 U	5 UJ	6 UJ	6 UJ	6 U	5 UJ	5 U	6 UJ	5 U	6 U	6 UJ
VINYL CHLORIDE	5 U	5 U	5 UJ	6 UJ	6 UJ	6 U	5 UJ	5 U	6 UJ	5 U	6 U	6 UJ
XYLENES, TOTAL	15 U	15 U	16 UJ	17 UJ	17 UJ	17 U	16 UJ	15 U	19 UJ	15 U	19 U	17 UJ
Semivolatile Organics (ug/kg)												
1,2,4-TRICHLOROBENZENE	180 U	170 U	190 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
1,2-DICHLOROBENZENE	180 U	170 U	190 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
1,3-DICHLOROBENZENE	180 U	170 U	190 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
1,4-DICHLOROBENZENE	180 U	170 U	190 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
2,2'-OXYBIS(1-CHLOROPROPANE)	180 U	170 U	190 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
2,4,5-TRICHLOROPHENOL	370 U	360 U	380 U	390 U	395 U	400 U	410 U	370 U	400 U	380 U	370 U	400 U
2,4,6-TRICHLOROPHENOL	180 U	170 U	190 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
2,4-DICHLOROPHENOL	180 U	170 U	190 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
2,4-DIMETHYLPHENOL	180 U	170 U	190 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
2,4-DINITROPHENOL	370 U	360 U	380 U	390 U	395 U	400 U	410 U	370 U	400 U	380 U	370 U	400 U
2,4-DINITROTOLUENE	180 U	170 U	190 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
2,6-DINITROTOLUENE	180 U	170 U	190 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
2-CHLORONAPHTHALENE	180 U	170 U	190 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
2-CHLOROPHENOL	180 U	170 U	190 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
2-METHYLNAPHTHALENE	180 U	170 U	180 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
2-METHYLPHENOL	180 U	170 U	190 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
2-NITROANILINE	370 U	360 U	380 U	390 U	395 U	400 U	410 U	370 U	400 U	380 U	370 U	400 U
2-NITROPHENOL	180 U	170 U	190 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
3,3'-DICHLOROBENZIDINE	180 U	170 U	190 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
3-NITROANILINE	370 U	360 U	380 U	390 U	395 U	400 U	410 U	370 U	400 U	380 U	370 U	400 U
4,6-DINITRO-2-METHYLPHENOL	370 U	360 U	380 U	390 U	395 U	400 U	410 U	370 U	400 U	380 U	370 U	400 U
4-BROMOPHENYL PHENYL ETHER	180 U	170 U	190 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
4-CHLORO-3-METHYLPHENOL	180 U	170 U	190 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
4-CHLOROANILINE	180 U	170 U	190 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
4-CHLOROPHENYL PHENYL ETHER	180 U	170 U	190 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
4-METHYLPHENOL	180 U	170 U	190 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
4-NITROANILINE	370 U	360 U	380 U	390 U	395 U	400 U	410 U	370 U	400 U	380 U	370 U	400 U
4-NITROPHENOL	370 U	360 U	380 U	390 U	395 U	400 U	410 U	370 U	400 U	380 U	370 U	400 U
ACENAPHTHENE	26 J	170 U	180 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
ACENAPHTHYLENE	180 U	170 U	180 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
ANTHRACENE	33 J	170 U	180 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U

SUMMARY OF SITE 18 SOIL DATA - SOLVENT STORAGE AREA
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

site	18	18	18	18	18	18	18	18	18	18	18	18
location	S18SB01	S18SB01	S18SB02	S18SB02	S18SB02	S18SB02	S18SB03	S18SB03	S18SB04	S18SB04	S18SB05	S18SB05
matrix	SS	SB	SS	SB	SB	SB	SS	SB	SS	SB	SS	SB
nsample	S18SB010001-SO	S18SB010506-SO	S18SB020001-SO	S18SB020405-SO	S18SB020405-SO-AVG	S18SB020405-SO-D	S18SB030001-SO	S18SB030708-SO	S18SB040001-SO	S18SB040708-SO	S18SB050001-SO	S18SB050405-SO
sample	S18SB010001	S18SB010506	S18SB020001	S18SB020405	S18SB020405	FD0612001	S18SB030001	S18SB030708	S18SB040001	S18SB040708	S18SB050001	S18SB050405
sacode	NORMAL	NORMAL	NORMAL	DUP	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
top_depth	0	5	0	4	4	4	0	7	0	7	0	4
bottom_dep	1	6	1	5	5	5	1	8	1	8	1	5
qc_type	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
status	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
coll_metho	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
cto_proj	312	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
BENZO(A)ANTHRACENE	71 J	26 J	180 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
BENZO(A)PYRENE	54 J	22 J	180 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
BENZO(B)FLUORANTHENE	51 J	22 J	180 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
BENZO(G,H,I)PERYLENE	68 J	29 J	180 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
BENZO(K)FLUORANTHENE	51 J	21 J	180 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
BIS(2-CHLOROETHOXY)METHANE	180 U	170 U	190 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
BIS(2-CHLOROETHYL)ETHER	180 U	170 U	190 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
BIS(2-ETHYLHEXYL)PHTHALATE	180 U	170 U	180 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
BUTYL BENZYL PHTHALATE	180 U	170 U	190 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
CARBAZOLE	27 J	170 U	180 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
CHRYSENE	74 J	30 J	180 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
DI-N-BUTYL PHTHALATE	180 U	170 U	190 U	190 U	190 U	190 U	200 U	180 U	190 U	270 U	180 U	200 U
DI-N-OCTYL PHTHALATE	180 U	170 U	190 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
DIBENZO(A,H)ANTHRACENE	180 U	170 U	180 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
DIBENZOFURAN	180 U	170 U	180 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
DIETHYL PHTHALATE	180 U	170 U	190 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
DIMETHYL PHTHALATE	180 U	170 U	190 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
FLUORANTHENE	170 J	66 J	180 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
FLUORENE	24 J	170 U	180 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
HEXACHLOROBENZENE	180 U	170 U	190 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
HEXACHLOROBUTADIENE	180 U	170 U	190 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
HEXACHLOROCYCLOPENTADIENE	180 UJ	170 UJ	190 U	190 UJ	190 UJ	190 UJ	200 U	180 U	190 UJ	180 U	180 UJ	200 UJ
HEXACHLOROETHANE	180 U	170 U	190 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
INDENO(1,2,3-CD)PYRENE	61 J	25 J	180 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
ISOPHORONE	180 U	170 U	190 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
N-NITROSO-DI-N-PROPYLAMINE	180 U	170 U	190 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
N-NITROSODIPHENYLAMINE	180 U	170 U	190 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
NAPHTHALENE	19 J	170 U	180 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
NITROBENZENE	180 U	170 U	190 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
PENTACHLOROPHENOL	370 U	360 U	380 U	390 U	395 U	400 U	410 U	370 U	400 U	380 U	370 U	400 U
PHENANTHRENE	150 J	51 J	180 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
PHENOL	180 U	170 U	190 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
PYRENE	130 J	49 J	180 U	190 U	190 U	190 U	200 U	180 U	190 U	180 U	180 U	200 U
Pesticides/PCBs (ug/kg)												
4,4'-DDD	1.5 U	1.4 U	1.5 U	1.5 U	1.55 U	1.6 U	1.6 U	1.4 U	1.6 U	1.5 U	1.5 U	1.6 U

SUMMARY OF SITE 18 SOIL DATA - SOLVENT STORAGE AREA
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

site	18	18	18	18	18	18	18	18	18	18	18	18
location	S18SB01	S18SB01	S18SB02	S18SB02	S18SB02	S18SB02	S18SB03	S18SB03	S18SB04	S18SB04	S18SB05	S18SB05
matrix	SS	SB	SS	SB	SB	SB	SS	SB	SS	SB	SS	SB
nsample	S18SB010001-SO	S18SB010506-SO	S18SB020001-SO	S18SB020405-SO	S18SB020405-SO-AVG	S18SB020405-SO-D	S18SB030001-SO	S18SB030708-SO	S18SB040001-SO	S18SB040708-SO	S18SB050001-SO	S18SB050405-SO
sample	S18SB010001	S18SB010506	S18SB020001	S18SB020405	S18SB020405	FD0612001	S18SB030001	S18SB030708	S18SB040001	S18SB040708	S18SB050001	S18SB050405
sacode	NORMAL	NORMAL	NORMAL	DUP	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
top_depth	0	5	0	4	4	4	0	7	0	7	0	4
bottom_dep	1	6	1	5	5	5	1	8	1	8	1	5
qc_type	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
status	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
coll_metho	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
cto_proj	312	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
4,4'-DDE	1.5 U	1.4 U	1.5 U	1.5 U	1.55 U	1.6 U	1.6 U	1.4 U	1.6 U	1.5 U	1.5 U	1.6 U
4,4'-DDT	1.5 U	1.4 U	1.5 U	1.5 U	1.55 U	1.6 U	1.6 U	1.4 U	1.6 U	1.5 U	1.5 U	1.6 U
ALDRIN	0.75 U	0.74 U	0.78 U	0.8 U	0.805 U	0.81 U	0.84 U	0.74 U	0.82 U	0.78 U	0.77 U	0.83 U
ALPHA-BHC	0.75 U	0.74 U	0.78 U	0.8 U	0.805 U	0.81 U	0.84 U	0.74 U	0.82 U	0.78 U	0.77 U	0.83 U
ALPHA-CHLORDANE	0.75 U	0.74 U	0.78 U	0.8 U	0.805 U	0.81 U	0.84 U	0.74 U	0.82 U	0.78 U	0.77 U	0.83 U
AROCLOR-1016	7.4 U	7.2 U	7.8 U	7.8 U	7.9 U	8 U	8.1 U	7.3 U	8.1 U	7.6 U	7.5 U	8.2 U
AROCLOR-1221	15 U	14 U	16 U	16 U	16 U	16 U	16 U	15 U	16 U	15 U	15 U	16 U
AROCLOR-1232	7.4 U	7.2 U	7.8 U	7.8 U	7.9 U	8 U	8.1 U	7.3 U	8.1 U	7.6 U	7.5 U	8.2 U
AROCLOR-1242	7.4 U	7.2 U	7.8 U	7.8 U	7.9 U	8 U	8.1 U	7.3 U	8.1 U	7.6 U	7.5 U	8.2 U
AROCLOR-1248	7.4 U	7.2 U	7.8 U	7.8 U	7.9 U	8 U	8.1 U	7.3 U	8.1 U	7.6 U	7.5 U	8.2 U
AROCLOR-1254	7.4 U	7.2 U	7.8 U	7.8 U	7.9 U	8 U	8.1 U	7.3 U	8.1 U	7.6 U	7.5 U	8.2 U
AROCLOR-1260	7.4 U	7.2 U	7.8 U	7.8 U	7.9 U	8 U	8.1 U	7.3 U	8.1 U	7.6 U	7.5 U	8.2 U
BETA-BHC	0.75 U	0.74 U	0.78 U	0.8 U	0.805 U	0.81 U	0.84 U	0.74 U	0.82 U	0.78 U	0.77 U	0.83 U
DELTA-BHC	0.75 U	0.74 U	0.78 U	0.8 U	0.805 U	0.81 U	0.84 U	0.74 U	0.82 U	0.78 U	0.77 U	0.83 U
DIELDRIN	1.5 U	1.4 U	1.5 U	1.5 U	1.55 U	1.6 U	1.6 U	1.4 U	1.6 U	1.5 U	1.5 U	1.6 U
ENDOSULFAN I	0.75 U	0.74 U	0.78 U	0.8 U	0.805 U	0.81 U	0.84 U	0.74 U	0.82 U	0.78 U	0.77 U	0.83 U
ENDOSULFAN II	1.5 U	1.4 U	1.5 U	1.5 U	1.55 U	1.6 U	1.6 U	1.4 U	1.6 U	1.5 U	1.5 U	1.6 U
ENDOSULFAN SULFATE	1.5 U	1.4 U	1.5 U	1.5 U	1.55 U	1.6 U	1.6 U	1.4 U	1.6 U	1.5 U	1.5 U	1.6 U
ENDRIN	1.5 U	1.4 U	1.5 U	1.5 U	1.55 U	1.6 U	1.6 U	1.4 U	1.6 U	1.5 U	1.5 U	1.6 U
ENDRIN ALDEHYDE	1.5 U	1.4 U	1.5 U	1.5 U	1.55 U	1.6 U	1.6 U	1.4 U	1.6 U	1.5 U	1.5 U	1.6 U
ENDRIN KETONE	1.5 U	1.4 U	1.5 U	1.5 U	1.55 U	1.6 U	1.6 U	1.4 U	1.6 U	1.5 U	1.5 U	1.6 U
GAMMA-BHC (LINDANE)	0.75 U	0.74 U	0.78 U	0.8 U	0.805 U	0.81 U	0.84 U	0.74 U	0.82 U	0.78 U	0.77 U	0.83 U
GAMMA-CHLORDANE	0.75 U	0.74 U	0.78 U	0.8 U	0.805 U	0.81 U	0.84 U	0.74 U	0.82 U	0.78 U	0.77 U	0.83 U
HEPTACHLOR	0.75 U	0.74 U	0.78 U	0.8 U	0.805 U	0.81 U	0.84 U	0.74 U	0.82 U	0.78 U	0.77 U	0.83 U
HEPTACHLOR EPOXIDE	0.75 U	0.74 U	0.78 U	0.8 U	0.805 U	0.81 U	0.84 U	0.74 U	0.82 U	0.78 U	0.77 U	0.83 U
METHOXYCHLOR	7.5 U	7.4 U	7.8 U	8 U	8.05 U	8.1 U	8.4 U	7.4 U	8.2 U	7.8 U	7.7 U	8.3 U
TOXAPHENE	75 U	74 U	78 U	80 U	80.5 U	81 U	84 U	1 U	82 U	78 U	77 U	83 U
Inorganics (mg/kg)												
ALUMINUM	6500	5300	8800	6200	4750	3300	15000	1400	15000	8100	8700	6500
ANTIMONY	0.62 UJ	0.55 UJ	0.64 UJ	0.55 UJ	0.545 UJ	0.54 UJ	0.6 UJ	0.5 UJ	0.67 UJ	0.57 UJ	0.73 J	0.54 UJ
ARSENIC	1.9	0.77 J	3.1	1.2 J	0.755 J	0.62 U	4	0.58 U	2.5	0.65 U	2.3	0.75 J
BARIUM	24	39	35	30	24	18	33	7.7 U	38	43	36	42
BERYLLIUM	0.48 U	0.34 U	0.44 U	0.34 U	0.255 U	0.17 U	0.55 U	0.27 U	0.78 U	0.71 U	0.43 U	0.37 U
CADMIUM	0.12 U	0.11 U	0.13 U	0.11 U	0.11 U	0.11 U	0.12 U	0.1 U	0.13 U	0.11 U	0.1 U	0.11 U
CALCIUM	1000 J	1100 J	1400 J	1100 J	770 J	440 J	480 J	880 J	180 U	700 J	750 J	990 J

SUMMARY OF SITE 18 SOIL DATA - SOLVENT STORAGE AREA
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

site	18	18	18	18	18	18	18	18	18	18	18	18
location	S18SB01	S18SB01	S18SB02	S18SB02	S18SB02	S18SB02	S18SB03	S18SB03	S18SB04	S18SB04	S18SB05	S18SB05
matrix	SS	SB	SS	SB	SB	SB	SS	SB	SS	SB	SS	SB
nsample	S18SB010001-SO	S18SB010506-SO	S18SB020001-SO	S18SB020405-SO	S18SB020405-SO-AVG	S18SB020405-SO-D	S18SB030001-SO	S18SB030708-SO	S18SB040001-SO	S18SB040708-SO	S18SB050001-SO	S18SB050405-SO
sample	S18SB010001	S18SB010506	S18SB020001	S18SB020405	S18SB020405	FD0612001	S18SB030001	S18SB030708	S18SB040001	S18SB040708	S18SB050001	S18SB050405
sacode	NORMAL	NORMAL	NORMAL	DUP	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
top_depth	0	5	0	4	4	4	0	7	0	7	0	4
bottom_dep	1	6	1	5	5	5	1	8	1	8	1	5
qc_type	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
status	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
coll_metho	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB	GRAB
cto_proj	312	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
CHROMIUM	9.5	8.9	13	10	6.75	3.5 J	19	1.6 U	14	9.4	13	9.8
COBALT	5.2 U	6.1 U	5.7 U	5.3 U	3.65 U	2 U	7.6 U	1.6 U	4.8 U	5.8 U	5.8 U	4.3 U
COPPER	7.1	11	12	10	7.05	4.1	8.4	4	4.2	7	11	6.7
IRON	7500 J	7800 J	8700 J	6100 J	4650 J	3200 J	13000 J	1700 J	13000 J	8500 J	9500 J	7000 J
LEAD	2.5	2.4	25	1.9	1.425	0.95 J	5.5	0.39 U	5.3	2.2	430	1.6
MAGNESIUM	1900	2400	2500	2000	1550	1100	2800	360	1400	2100	2600	2300
MANGANESE	110 J	170 J	130 J	110 J	105 J	100 J	110 J	33 J	82 J	220 J	110 J	170 J
MERCURY	0.06 U	0.05 U	0.08 U	0.06 U	0.06 U	0.06 U	0.07 U	0.03 U	0.09 U	0.02 U	0.08 U	0.14 U
NICKEL	7.7 U	6.7 U	10 U	8.3 U	6.1 U	3.9 U	9.6 U	1.5 U	7.4 U	8.6 U	8.5 U	7.7 U
POTASSIUM	870	1800	1300	1400	1145	890	420	300	330	1700	1200	1900
SELENIUM	0.62 U	0.55 U	0.64 U	0.55 U	0.545 U	0.54 U	0.6 U	0.5 U	0.67 U	0.57 U	0.51 U	0.54 U
SILVER	1.6	2.1 J	1.5 J	1.2 U	1.15 U	1.1 U	3.4	1.1 U	3.2	2.2 J	2 J	1.3 J
SODIUM	71 U	47 U	95 U	110 U	84.5 U	59 U	130 U	58 U	15 U	100 U	140 U	89 U
THALLIUM	0.48 U	0.42 U	0.49 U	0.43 U	0.425 U	0.42 U	0.64 J	0.39 U	0.54 J	0.75 J	0.43 J	0.42 U
VANADIUM	16	17	18	14	8.575	6.3 U	33	4.1 U	25	17	21	15
ZINC	19 U	30	21 U	17 U	14 U	11 U	23	7.2 U	38	22	22	19 U

U - Not Detected
J - Estimated
R - Rejected

APPENDIX B.15

SITE 18 - SOLVENT STORAGE SPLP SOIL DATA

SUMMARY OF SITE 18 SPLP SOIL DATA - SOLVENT STORAGE AREA
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	S18SB01	S18SB01	S18SB02	S18SB02	S18SB02	S18SB02	S18SB03	S18SB03	S18SB04	S18SB04	S18SB05	S18SB05
matrix	SPLP	SPLP	SPLP	SPLP	SPLP	SPLP	SPLP	SPLP	SPLP	SPLP	SPLP	SPLP
nsample	S18SB010001-SO-P	S18SB010506-SO-P	S18SB020001-SO-P	S18SB020405-SO-P	S18SB020405-SO-P-AVG	S18SB020405-SO-P-D	S18SB030001-SO-P	S18SB030708-SO-P	S18SB040001-SO-P	S18SB040708-SO-P	S18SB050001-SO-P	S18SB050405-SO-P
sample	S18SB010001	S18SB010506	S18SB020001	S18SB020405	S18SB020405	FD0612001	S18SB030001	S18SB030708	S18SB040001	S18SB040708	S18SB050001	S18SB050405
sacode	NORMAL	NORMAL	NORMAL	DUP	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
top_depth	0	5	0	4	4	4	0	7	0	7	0	4
bottom_dep	1	6	1	5	5	5	1	8	1	8	1	5
status	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
sample_dat	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00	6/12/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
PCBs (ug/L)												
AROCLOR-1016	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
AROCLOR-1221	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U	4 U
AROCLOR-1232	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
AROCLOR-1242	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
AROCLOR-1248	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
AROCLOR-1254	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
AROCLOR-1260	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Total Metals (ug/L)												
ALUMINUM	66 U	66 U	66 U	66 U	66 U	66 U	66 U	66 U	150 U	67 U	66 U	66 U
ANTIMONY	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	86	2.7 U
ARSENIC	3.1 U	3.1 U	3.1 U	3.1 U	3.1 U	3.1 U	3.1 U	3.1 U	3.1 U	3.1 U	3.1 U	3.1 U
BARIUM	140 U	140 U	130 U	130 U	130 U	130 U	130 U	130 U	160 U	130 U	190 U	120 U
BERYLLIUM	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U
CADMIUM	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U
CALCIUM	520 U	3000 U	2400 U	1600 U	1650 U	1700 U	850 U	2300 U	180 U	820 U	1700 U	310 U
CHROMIUM	8.4 UJ	8.4 UJ	8.4 UJ	8.4 UJ	8.4 UJ	8.4 UJ	8.4 UJ	8.4 UJ	8.4 UJ	8.4 UJ	8.4 UJ	8.4 UJ
COBALT	5.2 U	5.2 U	5.2 U	5.2 U	5.2 U	5.2 U	5.2 U	5.2 U	5.2 U	5.2 U	5.2 U	5.2 U
COPPER	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U
IRON	22 U	22 U	22 U	22 U	22 U	22 U	37 U	22 U	57 U	34 U	32 U	28 U
LEAD	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U
MAGNESIUM	120	950	120	110 U	110 U	110 U	110 U	110 U	110 U	120	250 U	110 U
MANGANESE	19 U	46	3.5 U	3.5 U	10.375	19	3.5 U	7.5 U	5.9 U	3.5 U	10 U	3.5 U
MERCURY	0.12 U	0.13 U	0.13 U	0.28 U	0.23 U	0.18 U	0.14 U	0.12 U	0.1 U	0.13 U	0.19 U	0.14 U
NICKEL	7.7 U	7.7 U	7.7 U	7.7 U	7.7 U	7.7 U	7.7 U	7.7 U	7.7 U	7.7 U	7.7 U	7.7 U
POTASSIUM	480 U	360 U	360 U	360 U	1330 U	2300 U	6600	360 U	390 U	370 U	510 U	540 U
SELENIUM	2.7 U	2.7 U	2.7 U	2.7 U	2.8 U	2.9 U	2.9 U	3.4 U	2.7 U	3.9 U	2.7 U	2.7 U
SILVER	5.7 U	5.7 U	5.7 U	5.7 U	5.575	8.3	18	5.7 U	5.7 U	5.7 U	5.7 U	5.7 U
SODIUM	3700 U	3900 U	3900 U	3400 U	3350 U	3300 U	4500 U	3400 U	680 U	1600 U	5900 U	5200 U
THALLIUM	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U
VANADIUM	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U
ZINC	30 U	32 U	15 U	15 U	18 U	21 U	17 U	17 U	260 U	85 U	20 U	19 U

U - Not Detected
J - Estimated
R - Rejected

APPENDIX B.16

SITE 18 - SOLVENT STORAGE GROUNDWATER DATA

SUMMARY OF SITE 18 GROUNDWATER DATA - SOLVENT STORAGE AREA
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	18TB2/18TW2	18TB2/18TW2	18TB4/18TW4
loc	18TW2	18TW2	18TW4
nsample	S18TW0201	S18TW0201-D	S18TW0401
sample	S18TW0201	FD0614001	S18TW0401
sacode	DUP	DUP	NORMAL
status	NORMAL	NORMAL	NORMAL
sample_dat	6/14/00	6/14/00	6/14/00
validated	TRUE	TRUE	TRUE
coll_metho	GRAB	GRAB	GRAB
cto_proj	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.
Volatile Organics (ug/L)			
1,1,1-TRICHLOROETHANE	1 U	1 U	1 U
1,1,2,2-TETRACHLOROETHANE	1 U	1 U	1 U
1,1,2-TRICHLOROETHANE	1 U	1 U	1 U
1,1-DICHLOROETHANE	1 U	1 U	1 U
1,1-DICHLOROETHENE	1 U	1 U	1 U
1,2,4-TRICHLOROBENZENE	1 U	1 U	1 U
1,2-DIBROMO-3-CHLOROPROPANE	1 UJ	1 U	1 UJ
1,2-DIBROMOETHANE	1 U	1 U	1 U
1,2-DICHLOROBENZENE	1 U	1 U	1 U
1,2-DICHLOROETHANE	1 U	1 U	1 U
1,2-DICHLOROPROPANE	1 U	1 U	1 U
1,3-DICHLOROBENZENE	1 U	1 U	1 U
1,4-DICHLOROBENZENE	1 U	1 U	1 U
2-BUTANONE	5 UJ	5 UR	5 UJ
2-HEXANONE	5 U	5 U	5 U
4-METHYL-2-PENTANONE	5 U	5 U	5 U
ACETONE	5 UJ	5 UR	5 UJ
BENZENE	1 U	1 U	1 U
BROMOCHLOROMETHANE	1 U	1 U	1 U
BROMODICHLOROMETHANE	1 U	1 U	1 U
BROMOFORM	1 U	1 U	1 U
BROMOMETHANE	1 U	1 U	1 U
CARBON DISULFIDE	1 U	1 U	1 U
CARBON TETRACHLORIDE	1 U	1 U	1 U
CHLOROBENZENE	1 U	1 U	1 U
CHLOROETHANE	1 U	1 U	1 U
CHLOROFORM	1 U	1 U	1 U
CHLOROMETHANE	1 U	1 U	1 U
CIS-1,2-DICHLOROETHENE	1 U	1 U	1 U
CIS-1,3-DICHLOROPROPENE	1 U	1 U	1 U
DIBROMOCHLOROMETHANE	1 U	1 U	1 U
ETHYLBENZENE	1 U	1 U	1 U
M+P-XYLENES	1 U	1 U	1 U
METHYLENE CHLORIDE	2 U	1 UJ	2 U

SUMMARY OF SITE 18 GROUNDWATER DATA - SOLVENT STORAGE AREA
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	18TB2/18TW2	18TB2/18TW2	18TB4/18TW4
loc	18TW2	18TW2	18TW4
nsample	S18TW0201	S18TW0201-D	S18TW0401
sample	S18TW0201	FD0614001	S18TW0401
sacode	DUP	DUP	NORMAL
status	NORMAL	NORMAL	NORMAL
sample_dat	6/14/00	6/14/00	6/14/00
validated	TRUE	TRUE	TRUE
coll_metho	GRAB	GRAB	GRAB
cto_proj	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.
O-XYLENE	1 U	1 U	1 U
STYRENE	1 U	1 U	1 U
TETRACHLOROETHENE	1 U	1 U	1 U
TOLUENE	1 U	1 U	1 U
TRANS-1,2-DICHLOROETHENE	1 U	1 U	1 U
TRANS-1,3-DICHLOROPROPENE	1 U	1 U	1 U
TRICHLOROETHENE	1 U	1 U	1 U
VINYL CHLORIDE	1 U	1 U	1 U
XYLENES, TOTAL	1 U	1 U	1 U
Semivolatile Organics (ug/L)			
2,2'-OXYBIS(1-CHLOROPROPANE)	10 U	10 U	10 U
2,4,5-TRICHLOROPHENOL	25 U	25 U	25 U
2,4,6-TRICHLOROPHENOL	10 U	10 U	10 U
2,4-DICHLOROPHENOL	10 U	10 U	10 U
2,4-DIMETHYLPHENOL	10 U	10 U	10 U
2,4-DINITROPHENOL	25 U	25 U	25 U
2,4-DINITROTOLUENE	10 U	10 U	10 U
2,6-DINITROTOLUENE	10 U	10 U	10 U
2-CHLORONAPHTHALENE	10 U	10 U	10 U
2-CHLOROPHENOL	10 U	10 U	10 U
2-METHYLNAPHTHALENE	5 U	5 U	5 U
2-METHYLPHENOL	10 U	10 U	10 U
2-NITROANILINE	25 U	25 U	25 U
2-NITROPHENOL	10 U	10 U	10 U
3,3'-DICHLOROBENZIDINE	10 U	10 U	10 U
3-NITROANILINE	25 U	25 U	25 U
4,6-DINITRO-2-METHYLPHENOL	25 U	25 U	25 U
4-BROMOPHENYL PHENYL ETHER	10 U	10 U	10 U
4-CHLORO-3-METHYLPHENOL	10 U	10 U	10 U
4-CHLOROANILINE	10 U	10 U	10 U
4-CHLOROPHENYL PHENYL ETHER	10 U	10 U	10 U
4-METHYLPHENOL	10 U	10 U	10 U
4-NITROANILINE	25 U	25 U	25 U
4-NITROPHENOL	25 U	25 U	25 U
ACENAPHTHENE	5 U	5 U	5 U

SUMMARY OF SITE 18 GROUNDWATER DATA - SOLVENT STORAGE AREA
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	18TB2/18TW2	18TB2/18TW2	18TB4/18TW4
loc	18TW2	18TW2	18TW4
nsample	S18TW0201	S18TW0201-D	S18TW0401
sample	S18TW0201	FD0614001	S18TW0401
sacode	DUP	DUP	NORMAL
status	NORMAL	NORMAL	NORMAL
sample_dat	6/14/00	6/14/00	6/14/00
validated	TRUE	TRUE	TRUE
coll_metho	GRAB	GRAB	GRAB
cto_proj	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.
ACENAPHTHYLENE	5 U	5 U	5 U
ANTHRACENE	5 U	5 U	5 U
BENZO(A)ANTHRACENE	5 U	5 U	5 U
BENZO(A)PYRENE	5 U	5 U	5 U
BENZO(B)FLUORANTHENE	5 U	5 U	5 U
BENZO(G,H,I)PERYLENE	5 U	5 U	5 U
BENZO(K)FLUORANTHENE	5 U	5 U	5 U
BIS(2-CHLOROETHOXY)METHANE	10 U	10 U	10 U
BIS(2-CHLOROETHYL)ETHER	10 U	10 U	10 U
BIS(2-ETHYLHEXYL)PHTHALATE	10 U	10 U	10 U
BUTYLBENZYL PHTHALATE	10 U	10 U	10 U
CARBAZOLE	5 U	5 U	5 U
CHRYSENE	5 U	5 U	5 U
DI-N-BUTYL PHTHALATE	10 U	10 U	10 U
DI-N-OCTYL PHTHALATE	10 U	10 U	10 U
DIBENZO(A,H)ANTHRACENE	5 U	5 U	5 U
DIBENZOFURAN	5 U	5 U	5 U
DIETHYL PHTHALATE	10 U	10 U	10 U
DIMETHYL PHTHALATE	10 U	10 U	10 U
FLUORANTHENE	5 U	5 U	5 U
FLUORENE	5 U	5 U	5 U
HEXACHLOROBENZENE	10 U	10 U	10 U
HEXACHLOROBUTADIENE	10 U	10 U	10 U
HEXACHLOROCYCLOPENTADIENE	10 UJ	10 UJ	10 UJ
HEXACHLOROETHANE	10 U	10 U	10 U
INDENO(1,2,3-CD)PYRENE	5 U	5 U	5 U
ISOPHORONE	10 U	10 U	10 U
N-NITROSO-DI-N-PROPYLAMINE	10 U	10 U	10 U
N-NITROSODIPHENYLAMINE	10 U	10 U	10 U
NAPHTHALENE	5 U	5 U	5 U
NITROBENZENE	10 U	10 U	10 U
PENTACHLOROPHENOL	25 U	25 U	25 U
PHENANTHRENE	5 U	5 U	5 U
PHENOL	10 U	10 U	10 U
PYRENE	5 U	5 U	5 U

SUMMARY OF SITE 18 GROUNDWATER DATA - SOLVENT STORAGE AREA
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	18TB2/18TW2	18TB2/18TW2	18TB4/18TW4
loc	18TW2	18TW2	18TW4
nsample	S18TW0201	S18TW0201-D	S18TW0401
sample	S18TW0201	FD0614001	S18TW0401
sacode	DUP	DUP	NORMAL
status	NORMAL	NORMAL	NORMAL
sample_dat	6/14/00	6/14/00	6/14/00
validated	TRUE	TRUE	TRUE
coll_metho	GRAB	GRAB	GRAB
cto_proj	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.
Pesticides/PCBs (ug/L)			
4,4'-DDD	0.02 U	0.02 U	0.02 U
4,4'-DDE	0.02 U	0.02 U	0.02 U
4,4'-DDT	0.02 U	0.02 U	0.02 U
ALDRIN	0.01 U	0.01 U	0.01 U
ALPHA-BHC	0.01 U	0.01 U	0.01 U
ALPHA-CHLORDANE	0.01 U	0.01 U	0.01 U
AROCLOR-1016	0.2 U	0.2 U	0.2 U
AROCLOR-1221	0.4 U	0.4 U	0.4 U
AROCLOR-1232	0.2 U	0.2 U	0.2 U
AROCLOR-1242	0.2 U	0.2 U	0.2 U
AROCLOR-1248	0.2 U	0.2 U	0.2 U
AROCLOR-1254	0.2 U	0.2 U	0.2 U
AROCLOR-1260	0.2 U	0.2 U	0.2 U
BETA-BHC	0.01 U	0.01 U	0.01 U
DELTA-BHC	0.01 U	0.01 U	0.01 U
DIELDRIN	0.02 U	0.02 U	0.02 U
ENDOSULFAN I	0.01 U	0.01 U	0.01 U
ENDOSULFAN II	0.02 U	0.02 U	0.02 U
ENDOSULFAN SULFATE	0.02 U	0.02 U	0.02 U
ENDRIN	0.02 U	0.02 U	0.02 U
ENDRIN ALDEHYDE	0.02 U	0.02 U	0.02 U
ENDRIN KETONE	0.02 U	0.02 U	0.02 U
GAMMA-BHC (LINDANE)	0.01 U	0.01 U	0.01 U
GAMMA-CHLORDANE	0.01 U	0.01 U	0.01 U
HEPTACHLOR	0.01 U	0.01 U	0.01 U
HEPTACHLOR EPOXIDE	0.01 U	0.01 U	0.01 U
METHOXYCHLOR	0.1 U	0.1 U	0.1 U
TOXAPHENE	1 U	1 U	1 U
Total Metals (ug/L)			
ALUMINUM	189 U	211 U	880
ANTIMONY	2.7 U	2.7 U	2.7 U
ARSENIC	3.1 UJ	3.1 UJ	3.1 UJ
BARIUM	25.5 U	32.8 U	27 U
BERYLLIUM	0.6 U	0.6 U	0.79 J

SUMMARY OF SITE 18 GROUNDWATER DATA - SOLVENT STORAGE AREA
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	18TB2/18TW2	18TB2/18TW2	18TB4/18TW4
loc	18TW2	18TW2	18TW4
nsample	S18TW0201	S18TW0201-D	S18TW0401
sample	S18TW0201	FD0614001	S18TW0401
sacode	DUP	DUP	NORMAL
status	NORMAL	NORMAL	NORMAL
sample_dat	6/14/00	6/14/00	6/14/00
validated	TRUE	TRUE	TRUE
coll_metho	GRAB	GRAB	GRAB
cto_proj	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.
CADMIUM	0.54 U	0.54 U	0.54 U
CALCIUM	25000	25200	9640
CHROMIUM	8.4 U	8.4 U	8.4 U
COBALT	5.2 U	5.2 U	5.2 U
COPPER	11 U	8.8 U	8.9 U
IRON	306	328	1030
LEAD	2.1 U	2.1 U	2.1 U
MAGNESIUM	1590 U	1650 U	2630
MANGANESE	111	111	322
MERCURY	0.13 U	0.13 U	0.13 U
NICKEL	7.7 U	7.7 U	7.7 U
POTASSIUM	1660 U	1670 U	2570
SELENIUM	2.7 U	2.7 U	2.7 U
SILVER	5.7 U	5.7 U	5.7 U
SODIUM	9570	9900	15100
THALLIUM	2.1 U	2.1 U	2.1 U
VANADIUM	4.4 U	4.4 U	4.4 U
ZINC	16.4 U	15.2 U	18.6 U
Miscellaneous Parameters (mg/L)			
TOTAL DISSOLVED SOLIDS	146	174	111
TOTAL SUSPENDED SOLIDS	5 U	5 U	39

Notes:
U - Nondect
J - Estimated
R - Rejected

APPENDIX B.17

SITE 23 - TANK FARM SOIL DATA

SUMMARY OF SITE 23 SOIL DATA
TANK FARM
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

site	23	23
location	23SB02S	23SB04S
matrix	SB	SB
sample	S23SB02S0810	S23SB04S1012
depth	08-10	10-12
sample_date	6/13/00	6/13/00
validated	TRUE	TRUE
cto_proj	312	312
proj_manager	CERCONE, D.	CERCONE, D.
Grain Size (%)		
SIEVE # 10	87.69	97.51
SIEVE # 100	40.62	39.98
SIEVE # 200	25.12	17.01
SIEVE # 4	92.55	98.70
SIEVE # 40	65.74	87.00
SIEVE # 50	57.20	79.31
SIEVE 1-1/2"	100	100
SIEVE 1/2"	98.41	100
SIEVE 3"	100	100
SIEVE 3/4"	100	100
SIEVE 3/8"	97.22	99.57
Miscellaneous Parameters		
BULK DENSITY (LB/CU FT)	90.83	90.75
PH	5.96	7.46
SPECIFIC GRAVITY	2.54	2.68
TOTAL ORGANIC CARBON (MG/KG)	125 U	126 U
POROSITY (N)	0.4263	0.4567

APPENDIX B.18

SITE 23 - TANK FARM GROUNDWATER DATA

SUMMARY OF SITE 23 GROUNDWATER DATA - TANK FARM
BASEWIDE GROUNDWATER OPERABLE UNIT OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	HNUS-11	HNUS-13	HNUS-20	HNUS-2	HNUS-2	HNUS-5	23MW02D	23MW02D	23MW02S	23MW02S	23MW03D	23MW04D	23MW04S
nsample	S23HNUS1101	S23HNUS1301	S23HNUS2001	S23HNUS201	S23HNUS201-F	S23HNUS501	S23MW02D01	S23MW02D01-D	S23MW02S01	S23MW02S01-F	S23MW03D01	S23MW04D01	S23MW04S01
sample	S23HNUS1101	S23HNUS1301	S23HNUS2001	S23HNUS201	S23HNUS201-F	S23HNUS501	S23MW02D01	FD0806001	S23MW02S01	S23MW02S01-F	S23MW03D01	S23MW04D01	S23MW04S01
sample_dat	8/6/00	8/7/00	8/5/00	8/3/00	8/4/00	8/3/00	8/6/00	8/6/00	8/6/00	8/6/00	8/6/00	8/3/00	6/25/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
Volatile Organics (ug/L)													
1,1,1-TRICHLOROETHANE	1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 UJ
1,1,2,2-TETRACHLOROETHANE	1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 UJ
1,1,2-TRICHLOROETHANE	1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 UJ
1,1-DICHLOROETHANE	1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 UJ
1,1-DICHLOROETHENE	1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 UJ
1,2,4-TRICHLOROBENZENE	1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 UJ
1,2-DIBROMO-3-CHLOROPROPANE	1 UR	1 UR	1 UR	1 UR		1 UR	1 UR	1 UR	1 UR		1 UR	1 U	1 UJ
1,2-DIBROMOETHANE	1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 UJ
1,2-DICHLOROBENZENE	1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 UJ
1,2-DICHLOROETHANE	1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 UJ
1,2-DICHLOROPROPANE	1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 UJ
1,3-DICHLOROBENZENE	1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 UJ
1,4-DICHLOROBENZENE	1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 UJ
2-BUTANONE	5 UR	5 UR	5 UR	5 UR		5 UR	5 UR	5 UR	5 UR		5 UR	5 UR	5 UR
2-HEXANONE	5 UR	5 U	5 UR	5 UR		5 UR	5 UR	5 UR	5 UR		5 UR	5 UR	5 UR
4-METHYL-2-PENTANONE	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 UJ
ACETONE	5 UR	5 UR	5 UR	5 UR		7.14 U	5 UR	5 UR	5 UR		5 UR	5 UR	36.2 U
BENZENE	1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 UJ
BROMOCHLOROMETHANE	1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 UJ
BROMODICHLOROMETHANE	1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 UJ
BROMOFORM	1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 UJ
BROMOMETHANE	1 U	1 UJ	1 UJ	1 UJ		1 UJ	1 U	1 U	1 U		1 U	1 U	1 UJ
CARBON DISULFIDE	1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 UJ
CARBON TETRACHLORIDE	1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 UJ
CHLOROBENZENE	1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 UJ
CHLOROETHANE	1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 UJ
CHLOROFORM	1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 UJ
CHLOROMETHANE	1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 UJ
CIS-1,2-DICHLOROETHENE	1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 UJ
CIS-1,3-DICHLOROPROPENE	1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 UJ
DIBROMOCHLOROMETHANE	1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 UJ
ETHYLBENZENE	1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 UJ
M+P-XYLENES	2 U	2 U	2 U	2 U		2 U	2 U	2 U	2		2 U	2 U	2 UJ
METHYLENE CHLORIDE	4 U	2 U	3 U	2.23 U		2.28 U	5 U	5 U	4 U		4 U	2.44 U	2 U
O-XYLENE	1 U	1 U	1 U	1 U		1 U	1 U	1 U	3		1 U	1 U	1 UJ
STYRENE	1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 UJ
TETRACHLOROETHENE	1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U		3	1 U	1 UJ
TOLUENE	1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 UJ
TRANS-1,2-DICHLOROETHENE	1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 UJ
TRANS-1,3-DICHLOROPROPENE	1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 UJ
TRICHLOROETHENE	1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 UJ
VINYL CHLORIDE	1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U		1 U	1 U	1 UJ
XYLENES, TOTAL	1 U	1 U	1 U	1 U		1 U	1 U	1 U	5		1 U	1 U	1 UJ

SUMMARY OF SITE 23 GROUNDWATER DATA - TANK FARM
BASEWIDE GROUNDWATER OPERABLE UNIT OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	HNUS-11	HNUS-13	HNUS-20	HNUS-2	HNUS-2	HNUS-5	23MW02D	23MW02D	23MW02S	23MW02S	23MW03D	23MW04D	23MW04S
nsample	S23HNUS1101	S23HNUS1301	S23HNUS2001	S23HNUS201	S23HNUS201-F	S23HNUS501	S23MW02D01	S23MW02D01-D	S23MW02S01	S23MW02S01-F	S23MW03D01	S23MW04D01	S23MW04S01
sample	S23HNUS1101	S23HNUS1301	S23HNUS2001	S23HNUS201	S23HNUS201-F	S23HNUS501	S23MW02D01	FD0806001	S23MW02S01	S23MW02S01-F	S23MW03D01	S23MW04D01	S23MW04S01
sample_dat	8/6/00	8/7/00	8/5/00	8/3/00	8/4/00	8/3/00	8/6/00	8/6/00	8/6/00	8/6/00	8/6/00	8/3/00	6/25/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
Dissolved Gases (ug/L)													
ETHANE	2 UJ	2 UJ	2 UJ	2 UJ		2 UJ	2 UJ	2 UJ	2 UJ		1 U	1 U	1
ETHENE	3 UJ	3 UJ	3 UJ	3 UJ		3 UJ	3 UJ	3 UJ	3 UJ		1 U	1 U	1
METHANE	260	14	1 U	150		21	1	1	920		1 U	1 U	1
Semivolatile Organics (ug/L)													
1,2,4-TRICHLOROBENZENE													5 U
1,2-DICHLOROBENZENE													5 U
1,3-DICHLOROBENZENE													5 U
1,4-DICHLOROBENZENE													5 U
1-METHYLNAPHTHALENE	0.5 U	0.5 U	0.5 U	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U		0.5 U	0.5 U	
2,2'-OXYBIS(1-CHLOROPROPANE)	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U		.5 U	5 U	5 U
2,4,5-TRICHLOROPHENOL	20 U	20 U	20 U	20 U		20 U	20 U	20 U	20 U		20 U	20 U	20 U
2,4,6-TRICHLOROPHENOL	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U
2,4-DICHLOROPHENOL	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U
2,4-DIMETHYLPHENOL	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U
2,4-DINITROPHENOL	20 UJ	20 UJ	20 UJ	20 UJ		20 UJ	20 UJ	20 UJ	20 UJ		20 UJ	20 UJ	20 U
2,4-DINITROTOLUENE	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U
2,6-DINITROTOLUENE	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U
2-CHLORONAPHTHALENE	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U
2-CHLOROPHENOL	5 U	5 UJ	5 U	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U
2-METHYLNAPHTHALENE	0.5 U	0.5 U	0.5 U	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U		0.5 U	0.5 U	
2-METHYLPHENOL	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U
2-NITROANILINE	20 U	20 U	20 U	20 U		20 U	20 U	20 U	20 U		20 U	20 U	20 U
2-NITROPHENOL	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U
3,3'-DICHLOROBENZIDINE	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U
3-NITROANILINE	20 U	20 U	20 U	20 U		20 U	20 U	20 U	20 U		20 U	20 U	20 U
4,6-DINITRO-2-METHYLPHENOL	20 U	20 UJ	20 U	20 U		20 U	20 UJ	20 U	20 UJ		20 U	20 U	20 U
4-BROMOPHENYL PHENYL ETHER	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U
4-CHLORO-3-METHYLPHENOL	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U
4-CHLOROANILINE	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U
4-CHLOROPHENYL PHENYL ETHER	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U
4-METHYLPHENOL	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U
4-NITROANILINE	20 U	20 U	20 U	20 U		20 U	20 U	20 U	20 U		20 U	20 U	20 U
4-NITROPHENOL	20 U	20 U	20 U	20 U		20 U	20 U	20 U	20 U		20 U	20 U	20 U
ACENAPHTHENE	0.5 U	0.5 U	0.5 U	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U		0.5 U	0.5 U	
ACENAPHTHYLENE	1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U		1 U	1 U	
ANTHRACENE	0.05 U	0.05 U	0.05 U	0.05 U		0.05 U	0.05 U	0.05 U	0.05 U		0.05 U	0.05 U	
BENZO(A)ANTHRACENE	0.05 U	0.05 U	0.05 U	0.05 U		0.05 U	0.05 U	0.05 U	0.05 U		0.05 U	0.05 U	
BENZO(A)PYRENE	0.05 U	0.05 U	0.05 U	0.05 U		0.05 U	0.05 U	0.05 U	0.05 U		0.05 U	0.05 U	
BENZO(B)FLUORANTHENE	0.1 U	0.1 U	0.1 U	0.1 U		0.1 U	0.1 U	0.1 U	0.1 U		0.1 U	0.1 U	
BENZO(G,H,I)PERYLENE	0.1 U	0.1 U	0.1 U	0.1 U		0.1 U	0.1 U	0.1 U	0.1 U		0.1 U	0.1 U	
BENZO(K)FLUORANTHENE	0.05 U	0.05 U	0.05 U	0.05 U		0.05 U	0.05 U	0.05 U	0.05 U		0.05 U	0.05 U	
BIS(2-CHLOROETHOXY)METHANE	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U
BIS(2-CHLOROETHYL)ETHER	5 U	5 UJ	5 U	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U
BIS(2-ETHYLHEXYL)PHTHALATE	5 U	5 U	5 U	7 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U

SUMMARY OF SITE 23 GROUNDWATER DATA - TANK FARM
BASEWIDE GROUNDWATER OPERABLE UNIT OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	HNUS-11	HNUS-13	HNUS-20	HNUS-2	HNUS-2	HNUS-5	23MW02D	23MW02D	23MW02S	23MW02S	23MW03D	23MW04D	23MW04S
nsample	S23HNUS1101	S23HNUS1301	S23HNUS2001	S23HNUS201	S23HNUS201-F	S23HNUS501	S23MW02D01	S23MW02D01-D	S23MW02S01	S23MW02S01-F	S23MW03D01	S23MW04D01	S23MW04S01
sample	S23HNUS1101	S23HNUS1301	S23HNUS2001	S23HNUS201	S23HNUS201-F	S23HNUS501	S23MW02D01	FD0806001	S23MW02S01	S23MW02S01-F	S23MW03D01	S23MW04D01	S23MW04S01
sample_dat	8/6/00	8/7/00	8/5/00	8/3/00	8/4/00	8/3/00	8/6/00	8/6/00	8/6/00	8/6/00	8/6/00	8/3/00	6/25/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
BUTYLBENZYL PHTHALATE	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U
CARBAZOLE													5 U
CHRYSENE	0.05 U	0.05 U	0.05 U	0.05 U		0.05 U	0.05 U	0.05 U	0.05 U		0.05 U	0.05 U	
DIBENZO(A,H)ANTHRACENE	0.1 U	0.1 U	0.1 U	0.1 U		0.1 U	0.1 U	0.1 U	0.1 U		0.1 U	0.1 U	
DIBENZOFURAN				5 U		5 U						5 U	5 U
DIETHYL PHTHALATE	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U
DIMETHYL PHTHALATE	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U
DI-N-BUTYL PHTHALATE	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U
DI-N-OCTYL PHTHALATE	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U
FLUORANTHENE	0.1 U	0.1 U	0.1 U	0.1 U		0.1 U	0.1 U	0.1 U	0.1 U		0.1 U	0.1 U	
FLUORENE	0.1 U	0.1 U	0.1 U	0.1 U		0.1 U	0.1 U	0.1 U	0.1 U		0.1 U	0.1 U	
HEXACHLOROBENZENE	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U
HEXACHLOROBUTADIENE	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U
HEXACHLOROCYCLOPENTADIENE	5 UJ	5 UJ	5 UJ	5 UJ		5 UJ	5 UJ	5 UJ	5 UJ		5 UJ	5 UJ	5 U
HEXACHLOROETHANE	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U
INDENO(1,2,3-CD)PYRENE	0.05 U	0.05 U	0.05 U	0.05 U		0.05 U	0.05 U	0.05 U	0.05 U		0.05 U	0.05 U	
ISOPHORONE	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U
NAPHTHALENE	0.5 U	0.5 U	0.5 U	0.5 U		0.5 U	0.5 U	0.5 U	1.4		0.5 U	0.5 U	
NITROBENZENE	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U
N-NITROSO-DI-N-PROPYLAMINE	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U
N-NITROSODIPHENYLAMINE	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U
PENTACHLOROPHENOL	20 U	20 U	20 U	20 U		20 U	20 U	20 U	20 U		20 U	20 U	20 U
PHENANTHRENE	0.05 U	0.05 U	0.05 U	0.05 U		0.05 U	0.05 U	0.05 U	0.05 U		0.05 U	0.05 U	5 U
PHENOL	5 U	5 U	5 U	5 U		5 U	5 U	5 U	5 U		5 U	5 U	5 U
PYRENE	0.05 U	0.05 U	0.05 U	0.05 U		0.05 U	0.05 U	0.05 U	0.05 U		0.05 U	0.05 U	5 U
Pesticides/PCBs (ug/L)													
4,4'-DDD	0.020 U	0.020 U	0.020 U	0.020 U		0.020 U	0.020 U	0.020 U	0.020 U		0.020 U	0.020 UJ	0.02 U
4,4'-DDE	0.020 U	0.020 U	0.020 U	0.020 U		0.020 U	0.020 U	0.020 U	0.020 U		0.020 U	0.020 UJ	0.02 U
4,4'-DDT	0.020 U	0.020 U	0.020 U	0.020 U		0.020 U	0.020 U	0.020 U	0.020 U		0.020 U	0.020 UJ	0.02 U
ALDRIN	0.010 U	0.010 U	0.010 U	0.010 U		0.010 U	0.010 U	0.010 U	0.010 U		0.010 U	0.010 UJ	0.01 U
ALPHA-BHC	0.010 U	0.010 U	0.010 U	0.010 U		0.010 U	0.010 U	0.010 U	0.010 U		0.010 U	0.010 UJ	0.01 U
ALPHA-CHLORDANE	0.010 U	0.010 U	0.010 U	0.010 U		0.010 U	0.010 U	0.010 U	0.010 U		0.010 U	0.010 UJ	0.01 U
AROCLOR-1016	0.20 U	0.20 U	0.20 U	0.20 U		0.20 U	0.20 U	0.20 U	0.20 U		0.20 U	0.20 UJ	0.2 U
AROCLOR-1221	0.40 U	0.40 U	0.40 U	0.40 U		0.40 U	0.40 U	0.40 U	0.40 U		0.40 U	0.40 UJ	0.4 U
AROCLOR-1232	0.20 U	0.20 U	0.20 U	0.20 U		0.20 U	0.20 U	0.20 U	0.20 U		0.20 U	0.20 UJ	0.2 U
AROCLOR-1242	0.20 U	0.20 U	0.20 U	0.20 U		0.20 U	0.20 U	0.20 U	0.20 U		0.20 U	0.20 UJ	0.2 U
AROCLOR-1248	0.20 U	0.20 U	0.20 U	0.20 U		0.20 U	0.20 U	0.20 U	0.20 U		0.20 U	0.20 UJ	0.2 U
AROCLOR-1254	0.20 U	0.20 U	0.20 U	0.20 U		0.20 U	0.20 U	0.20 U	0.20 U		0.20 U	0.20 UJ	0.2 U
AROCLOR-1260	0.20 U	0.20 U	0.20 U	0.20 U		0.20 U	0.20 U	0.20 U	0.20 U		0.20 U	0.20 UJ	0.2 U
BETA-BHC	0.010 U	0.010 U	0.010 U	0.010 U		0.010 U	0.010 U	0.010 U	0.010 U		0.010 U	0.010 UJ	0.01 U
DELTA-BHC	0.010 U	0.010 U	0.010 U	0.010 U		0.010 U	0.010 U	0.010 U	0.010 U		0.010 U	0.010 UJ	0.01 U
DIELDRIN	0.020 U	0.020 U	0.020 U	0.020 U		0.020 U	0.020 U	0.020 U	0.020 U		0.020 U	0.020 UJ	0.02 U
ENDOSULFAN I	0.010 U	0.010 U	0.010 U	0.010 U		0.010 U	0.010 U	0.010 U	0.010 U		0.010 U	0.010 UJ	0.01 U
ENDOSULFAN II	0.020 U	0.020 U	0.020 U	0.020 U		0.020 U	0.020 U	0.020 U	0.020 U		0.020 U	0.020 UJ	0.02 U
ENDOSULFAN SULFATE	0.020 U	0.020 U	0.020 U	0.020 U		0.020 U	0.020 U	0.020 U	0.020 U		0.020 U	0.020 UJ	0.02 U

SUMMARY OF SITE 23 GROUNDWATER DATA - TANK FARM
BASEWIDE GROUNDWATER OPERABLE UNIT OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	HNUS-11	HNUS-13	HNUS-20	HNUS-2	HNUS-2	HNUS-5	23MW02D	23MW02D	23MW02S	23MW02S	23MW03D	23MW04D	23MW04S
nsample	S23HNUS1101	S23HNUS1301	S23HNUS2001	S23HNUS201	S23HNUS201-F	S23HNUS501	S23MW02D01	S23MW02D01-D	S23MW02S01	S23MW02S01-F	S23MW03D01	S23MW04D01	S23MW04S01
sample	S23HNUS1101	S23HNUS1301	S23HNUS2001	S23HNUS201	S23HNUS201-F	S23HNUS501	S23MW02D01	FD0806001	S23MW02S01	S23MW02S01-F	S23MW03D01	S23MW04D01	S23MW04S01
sample_dat	8/6/00	8/7/00	8/5/00	8/3/00	8/4/00	8/3/00	8/6/00	8/6/00	8/6/00	8/6/00	8/6/00	8/3/00	6/25/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
ENDRIN	0.020 UJ	0.020 U	0.020 UJ	0.020 U		0.020 U	0.020 UJ	0.020 UJ	0.020 UJ		0.020 UJ	0.020 UJ	0.02 U
ENDRIN ALDEHYDE	0.020 U	0.020 U	0.020 U	0.020 U		0.020 U	0.020 U	0.020 U	0.020 U		0.020 U	0.020 UJ	0.02 U
ENDRIN KETONE	0.020 U	0.020 U	0.020 U	0.020 U		0.020 U	0.020 U	0.020 U	0.020 U		0.020 U	0.020 UJ	0.02 U
GAMMA-BHC (LINDANE)	0.010 U	0.010 U	0.010 U	0.010 U		0.010 U	0.010 U	0.010 U	0.010 U		0.010 U	0.010 UJ	0.01 U
GAMMA-CHLORDANE	0.010 U	0.010 U	0.010 U	0.010 U		0.010 U	0.010 U	0.010 U	0.010 U		0.010 U	0.010 UJ	0.01 U
HEPTACHLOR	0.010 U	0.010 U	0.010 U	0.010 U		0.010 U	0.010 U	0.010 U	0.010 U		0.010 U	0.010 UJ	0.01 U
HEPTACHLOR EPOXIDE	0.010 U	0.010 U	0.010 U	0.010 U		0.010 U	0.010 U	0.010 U	0.010 U		0.010 U	0.010 UJ	0.01 U
METHOXYCHLOR	0.10 U	0.10 U	0.10 U	0.10 U		0.10 U	0.10 U	0.10 U	0.10 U		0.10 U	0.10 UJ	0.1 U
TOXAPHENE	1.0 U	1.0 U	1.0 U	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U		1.0 U	1.0 UJ	1 U
Total Metals (ug/L)													
ALUMINUM	81.6 U	83.9 U	130 U	146 U		211 U	50.5 U	74.4 U	2030		591 U	188 U	890
ANTIMONY	2.6 U	2.6 U	2.6 U	2.6 U		2.6 U	2.6 U	2.6 U	2.6 U		2.6 U	2.6 U	2.6 U
ARSENIC	4.7	2.3 U	2.3 U	2.3 U		2.3 U	2.3 U	2.3 U	2.3 U		2.3 U	2.3 U	2.3 U
BARIUM	35.7 U	37.0 U	64.4	42.8		27.2	21.3 U	24.2 U	176		30.8 U	18.0 U	29.2 U
BERYLLIUM	0.72 U	0.72 U	0.72 U	0.72 U		0.72 U	0.72 U	0.72 U	0.72 U		0.72 U	0.72 U	0.72 U
CADMIUM	0.25 U	0.25 U	0.63	0.25 U		0.25 U	0.25 U	0.25 U	0.25 U		0.25 U	0.25 U	0.25 U
CALCIUM	45200	11200	31300	38100		21800	6270	6430	59300		94100	9060	13800
CHROMIUM	6.2 U	6.2 U	6.2 U	6.2 U		6.2 U	6.2 U	6.2 U	43.2		39.9	10.2 J	10.3 J
COBALT	4.2 U	4.2 U	4.2 U	4.2 U		4.5 J	4.2 U	6.4 J	6.4 J		5.5 J	5.3 J	5.2 U
COPPER	6.8 U	6.8 U	6.8 U	6.8 U		6.8 J	6.8 U	6.8 U	10.7 J		6.8 U	6.8 U	6.8 U
IRON	16500	733	175 U	5370		1080	2380	2620	24800		551	202	1230
LEAD	4.8 J	13.2	1.8 U	1.9 J		1.8 U	1.8 U	1.8 U	31.2		5.5 J	1.8 U	1.8 U
MAGNESIUM	5360	2340	3940	4280		3410	1610	1630	7840		544 U	2670	4300
MANGANESE	2170	90.9	41.4 J	1220		297	48.3	50.0	3380		8.8 U	12.1 U	138
MERCURY	0.09 U	0.09 U	0.09 U	0.09 U		0.09 U	0.09 U	0.09 U	0.09 U		0.09 U	0.09 U	0.10 U
NICKEL	9.2 U	9.2 U	9.2 U	9.2 U		9.2 U	9.2 U	9.2 U	33.5		10.0 J	9.2 U	9.9 U
POTASSIUM	4640	2800	5690	6160		4270	1170	1310	7790		3940	2730	5350
SELENIUM	2.8 U	2.8 U	2.8 U	2.8 U		2.8 U	2.8 U	2.8 U	2.8 U		2.8 U	2.8 U	2.8 U
SILVER	5.5 U	5.2 U	5.2 U	5.2 U		5.2 U	5.2 U	5.2 U	8.8 U		5.2 U	5.2 U	5.2 U
SODIUM	57800	31000	8750	99200 J		28100 J	8660	8660	45200		29000	7790 J	10900
THALLIUM	3.0 U	3.0 U	3.0 U	3.0 U		3.0 U	3.0 U	3.0 U	3.0 U		3.0 U	3.0 U	3.0 U
VANADIUM	6.3 U	6.3 U	6.3 U	6.3 U		6.3 U	6.3 U	6.3 U	6.3 U		6.4 J	6.3 U	8.2 U
ZINC	14.4 U	12.8 U	18.3 U	13.0 U		33.4 U	15.3 U	14.4 U	68.4		43.1 U	10.9 U	21.3 U
Dissolved Metals (ug/L)													
ALUMINUM					50.5 U					83.1 U			
ANTIMONY					2.6 U					2.6 U			
ARSENIC					2.3 U					3.1 J			
BARIUM					33.8					150			
BERYLLIUM					0.72 U					0.72 U			
CADMIUM					0.25 U					0.25 U			
CALCIUM					33000					45100			
CHROMIUM					6.2 U					6.2 U			
COBALT					4.2 U					4.2 U			
COPPER					6.8 U					6.8 U			
IRON					4410					15400			

SUMMARY OF SITE 23 GROUNDWATER DATA - TANK FARM
BASEWIDE GROUNDWATER OPERABLE UNIT OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

location	HNUS-11	HNUS-13	HNUS-20	HNUS-2	HNUS-2	HNUS-5	23MW02D	23MW02D	23MW02S	23MW02S	23MW03D	23MW04D	23MW04S
nsample	S23HNUS1101	S23HNUS1301	S23HNUS2001	S23HNUS201	S23HNUS201-F	S23HNUS501	S23MW02D01	S23MW02D01-D	S23MW02S01	S23MW02S01-F	S23MW03D01	S23MW04D01	S23MW04S01
sample	S23HNUS1101	S23HNUS1301	S23HNUS2001	S23HNUS201	S23HNUS201-F	S23HNUS501	S23MW02D01	FD0806001	S23MW02S01	S23MW02S01-F	S23MW03D01	S23MW04D01	S23MW04S01
sample_dat	8/6/00	8/7/00	8/5/00	8/3/00	8/4/00	8/3/00	8/6/00	8/6/00	8/6/00	8/6/00	8/6/00	8/3/00	6/25/00
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
LEAD					1.8 U					10.0			
MAGNESIUM					3770					5830			
MANGANESE					977					2650			
MERCURY					0.09 U					0.09 U			
NICKEL					9.2 U					9.2 U			
POTASSIUM					5500					7340			
SELENIUM					2.8 U					2.8 U			
SILVER					5.2 U					5.8 U			
SODIUM					82600 J					49300			
THALLIUM					3.0 U					3.0 U			
VANADIUM					6.3 U					6.3 U			
ZINC					15.2 U					45.3 U			
Miscellaneous Parameters (mg/L)													
ALKALINITY	164	22	27.5	191		75.5	18	18.5	185		348	34	76.6
AMMONIA				0.54 J		0.25 J						0.16 J	
AMMONIA, AS NITROGEN	0.77 J	0.14 J	0.13 J				0.18 J	0.14 J	6.9 J		0.1 UJ		0.16
CHLORIDE	91.7	49.1	6.55	78.6		23.2	10.5	10.5	124		34.6	6.6	20.7
HARDNESS as CaCO3	135	37.6	94.4	113		68.5	22.3	22.8	180		257	33.6	80.6
SULFATE	10.2	15.8	47.2	10.5		14.6	11.1	9.75	7.6		14.8	10.5	14
SULFIDE	2 UJ	2 UJ	2 UJ	2 U		2 U	2 UJ	2 UJ	2 UJ		2 UJ	2 U	0.05 U
TOTAL DISSOLVED SOLIDS	338 J	132 J	199 J	389 J		139 J	73.8 J	66.2	519 J		298 J	76.2 J	108
TOTAL ORGANIC CARBON	3.9	1.5	3	7.8 J		3.3	1	1.1	8		1.4	1 J	9
TOTAL SUSPENDED SOLIDS	25 J	5 UJ	5 UJ	5 UJ		5 UJ	6 J	5 U	169 J		14 J	8 J	32

Notes:
U - Nondetect
J - Estimated
R - Rejected

Groton Storm Sewer Rehabilitation Project
Underdrain Water Sampling for Oil/Water Separator (OWS) Determination
Monthly Sampling Results

	Sample #	OWS-072500	OWS-082300	OWS-100400	OWS-011701	
	Date sampled	7/25/00	8/23/00	10/4/00	1/17/01	
ANALYSIS	***METHOD***	***RESULTS***	***RESULTS***	***RESULTS***	***RESULTS***	
Fuel Type Fingerprint	8015	ND	ND	ND	NA	
PH	EPA 150.1	6.2 std. Units	6.3 std. Units	6.3 std. Units	NA	
Total petroleum hydrocarbons	418.1	1.1 mg/l	<1.0 mg/l	1.0 mg/l	NA	
Oil and grease	EPA 413.1	<5.0 mg/l	<5.0 mg/l	<5.0 mg/l	NA	
Total suspended solids	EPA 160.2	62 mg/l	720 mg/l	1400 mg/l	<5.0 mg/l	
Metals:	6010B	NA	ug/l	ug/l	ug/l	
					Total	Dissolved
Aluminum		NA	11300	15500	1360	492
Antimony		NA	6.4	4.1	ND	ND
Arsenic		NA	13.4	22.2	ND	ND
Barium		NA	169	223	64.5 B	56.3 B
Beryllium		NA	2.6	0.3	ND	1.7 B
Cadmium		NA	0.8	0.8	ND	ND
Calcium		NA	32500	35800	31100	29700
Chromium		NA	19.6	28.4	2.2 B	ND
Cobalt		NA	9.9	17	2.4 B	ND
Copper		NA	36	39.5	ND	ND
Iron		NA	62100	116000	15100	11100
Lead		NA	79.7	93.7	13.2	7.9
Magnesium		NA	9950	12000	7350	6560
Manganese		NA	1540	2220	884	801
Mercury		NA	0.1	0.2	ND	ND
Nickel		NA	13.2	18.3	ND	ND
Potassium		NA	8600	9060	5430	5100
Selenium		NA	2.2	12.5	ND	ND
Silver		NA	2.8	4	ND	ND
Sodium		NA	39500	51800	41800	37500
Thallium		NA	3.2	3.2	ND	ND
Vanadium		NA	40.5	52.7	4.0 B	ND
Zinc		NA	228	231	53.5	43.5
Cyanide		NA	NR	NR	NA	NA
VOA	OLM2.1					
Methane, chlorodifluoro-					0.004 J	
Ethane, 1,1,2-trichloro-1,2,					.0029 J	
PAH	8310					
Phenanthrene					8.00	
Fluoranthene					3.00	

Notes:
ND = No Calibrated Fuel Type Detected
NA = Not Analyzed
NR = Not reported
J = Indicates an estimated value
B = Indicates the analyte was found in the blank as well as the sample
Semivolatile organic compounds were not detected (Method 8270C)
Pesticide/PCB compounds were not detected (Method OLM2.1)

Groton Storm Sewer Rehabilitation Project

Underdrain Flow Monitoring Data

October 4, 2000 through December 8, 2000

Date	Velocity (fps)	Level From Meter (ft)	Flow (gpd)
4-Oct-00	0.53	3.46	81,089.19
5-Oct-00	0.48	3.49	75,139.82
6-Oct-00	0.52	3.58	84,623.78
7-Oct-00	0.50	3.54	79,652.11
8-Oct-00	0.50	3.59	80,834.84
9-Oct-00	0.52	3.52	81,946.11
10-Oct-00	0.52	3.59	83,699.34
11-Oct-00	0.53	3.65	88,526.04
12-Oct-00	0.53	3.57	85,784.62
13-Oct-00	0.55	3.63	90,293.91
14-Oct-00	0.51	3.52	79,444.23
15-Oct-00	0.55	3.53	86,245.17
16-Oct-00	0.54	3.53	85,146.07
17-Oct-00	0.53	3.44	80,939.49
18-Oct-00	0.53	3.52	84,213.39
19-Oct-00	0.60	3.52	94,559.61
20-Oct-00	0.55	3.50	86,475.46
21-Oct-00	0.55	3.47	84,797.47
22-Oct-00	0.51	3.55	81,749.00
23-Oct-00	0.59	3.16	79,961.43
24-Oct-00	0.58	3.20	79,303.05
25-Oct-00	0.57	3.25	80,522.26
26-Oct-00	0.56	3.32	81,151.99
27-Oct-00	0.54	3.40	81,205.12
28-Oct-00	0.56	3.41	84,625.05
29-Oct-00	0.55	3.40	83,142.05
30-Oct-00	0.58	3.44	88,502.08
31-Oct-00	0.58	3.42	88,169.91
1-Nov-00	0.61	3.32	89,112.40
2-Nov-00	0.62	3.31	89,302.06
3-Nov-00	0.67	3.33	96,885.79
4-Nov-00	0.65	3.30	93,233.55
5-Nov-00	0.61	3.27	87,001.76
6-Nov-00	0.61	3.30	87,749.22
7-Nov-00	0.56	3.32	81,594.24
8-Nov-00	0.55	3.39	82,486.62
9-Nov-00	0.56	3.37	83,656.94
10-Nov-00	0.60	3.45	91,172.09
11-Nov-00	0.59	3.32	85,466.01
12-Nov-00	0.58	3.36	85,809.75
13-Nov-00	0.56	3.43	85,509.45
14-Nov-00	0.61	3.49	95,289.26
15-Nov-00	0.59	3.55	93,427.43
16-Nov-00	0.56	3.58	91,242.06
17-Nov-00	0.57	3.66	94,540.92
18-Nov-00	0.58	3.70	97,930.40
19-Nov-00	0.63	3.44	95,703.03
20-Nov-00	0.66	3.46	101,244.30
21-Nov-00	0.64	3.51	100,429.62
22-Nov-00	0.61	3.60	99,121.16
23-Nov-00	0.62	3.53	98,051.35
24-Nov-00	0.64	3.49	98,967.26
25-Nov-00	0.65	3.53	102,386.02
26-Nov-00	0.68	3.35	99,216.74
27-Nov-00	0.68	3.37	101,352.82
28-Nov-00	0.69	3.40	103,488.90
29-Nov-00	0.70	3.48	108,625.54
30-Nov-00	0.72	3.48	112,167.67
1-Dec-00	0.73	3.56	117,359.56
2-Dec-00	0.75	3.60	121,818.97
3-Dec-00	0.73	3.67	121,659.46
4-Dec-00	0.72	3.68	120,926.12
5-Dec-00	0.65	3.51	102,230.75
6-Dec-00	0.64	3.57	102,815.56
7-Dec-00	0.63	3.60	102,466.88
8-Dec-00	0.78	3.28	110,111.94

APPENDIX B.19

BACKGROUND GROUNDWATER DATA

SUMMARY OF BACKGROUND GROUNDWATER DATA
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

site	2	2	2	2	2	2	2	2	2	2	2	2
location	2LMW20S	2LMW20S	2LMW20S	2LMW20S	2LMW21S	2LMW21S	2MW21S	2MW21S	2MW21D	2MW21D	2MW21D	2MW21D
region	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN
matrix	GW	GF	GW	GF	GW	GF	GW	GF	GW	GF	GW	GF
sample	S2LMW20S02	S2LMW20S02-F	2LGW20S-04	2LGW20S-04-F	2WGW21S-04	2WGW21S-04-F	S2WMW21S02	S2WMW21S02-F	S22WMW21D01	S22WMW21D01-F	S2WMW21D02	S2WMW21D02-F
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
Volatile Organics (ug/L)												
1,1,1-TRICHLOROETHANE	1 U		1 U		1 U		1 U		1 U		1 U	
1,1,2,2-TETRACHLOROETHANE	1 U		1 U		1 U		1 U		1 U		1 U	
1,1,2-TRICHLOROETHANE	1 U		1 U		1 U		1 U		1 U		1 U	
1,1-DICHLOROETHANE	1 U		1 U		1 U		1 U		1 UJ		1 U	
1,1-DICHLOROETHENE	1 U		1 U		1 U		1 U		1 U		1 U	
1,2,4-TRICHLOROBENZENE	1 U						1 U		1 U		1 U	
1,2-DIBROMO-3-CHLOROPROPANE	1 UR		1 U		1 U		1 UR		1 UJ		1 UR	
1,2-DIBROMOETHANE	1 U		1 U		1 U		1 U		1 U		1 U	
1,2-DICHLOROBENZENE	1 U		1 U		1 U		1 U		1 U		1 U	
1,2-DICHLOROETHANE	1 U		1 U		1 U		1 U		1 U		1 U	
1,2-DICHLOROPROPANE	1 U		1 U		1 U		1 U		1 U		1 U	
1,3-DICHLOROBENZENE	1 U		1 U		1 U		1 U		1 U		1 U	
1,4-DICHLOROBENZENE	1 U		1 U		1 U		1 U		1 U		1 U	
2-BUTANONE	5 UR		5 U		5 U		5 UR		5 UR		5 UR	
2-HEXANONE	5 U		5 U		5 U		5 U		5 UR		5 U	
4-METHYL-2-PENTANONE	5 U		5 U		5 U		5 U		5 U		5 U	
ACETONE	5 UR		5 U		5 U		5 UR		5 UJ		5 UR	
BENZENE	1 U		1 U		1 U		1 U		1 U		1 U	
BROMOCHLOROMETHANE	1 U		1 U		1 U		1 U		1 U		1 U	
BROMODICHLOROMETHANE	1 U		1 U		1 U		1 U		1 U		1 U	
BROMOFORM	1 U		1 U		1 U		1 U		1 U		1 U	
BROMOMETHANE	1 UJ		1 U		1 U		1 UJ		1 U		1 UJ	
CARBON DISULFIDE	1 U		1 U		1		1 U		1 UJ		1 U	
CARBON TETRACHLORIDE	1 U		1 U		1 U		1 U		1 U		1 U	
CHLOROBENZENE	1 U		1 U		1 U		1 U		1 U		1 U	
CHLOROETHANE	1 U		1 U		1 U		1 U		1 U		1 U	
CHLOROFORM	1 U		1 U		1 U		1 U		1 U		1 U	
CHLOROMETHANE	1 U		1 U		1 U		1 U		1 UJ		1 U	
CIS-1,2-DICHLOROETHENE	1 U		1 U		1 U		1 U		1 U		1 U	
CIS-1,3-DICHLOROPROPENE	1 U		1 U		1 U		1 U		1 U		1 U	
DIBROMOCHLOROMETHANE	1 U		1 U		1 U		1 U		1 U		1 U	
ETHYLBENZENE	1 U		1 U		1 U		1 U		1 U		1 U	
M+P-XYLENES	2 U						2 U		1 U		2 U	
METHYLENE CHLORIDE	2 U		2 U		2 U		2 U		4.42 U		2 U	
O-XYLENE	1 U						1 U		1 U		1 U	
STYRENE	1 U		1 U		1 U		1 U		1 U		1 U	
TETRACHLOROETHENE	1 U		1 U		1 U		1 U		1 U		1 U	
TOLUENE	1 U		1 U		1 U		1 U		1 U		1 U	
TRANS-1,2-DICHLOROETHENE	1 U		1 U		1 U		1 U		1 U		1 U	
TRANS-1,3-DICHLOROPROPENE	1 U		1 U		1 U		1 U		1 U		1 U	
TRICHLOROETHENE	1 U		1 U		1 U		1 U		1 U		1 U	
VINYL CHLORIDE	1 U		1 U		1 U		1 U		1 UJ		1 U	
XYLENES, TOTAL	1 U		1 U		1 U		1 U		1 U		1 U	

SUMMARY OF BACKGROUND GROUNDWATER DATA
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

site	2	2	2	2	2	2	2	2	2	2	2	2
location	2LMW20S	2LMW20S	2LMW20S	2LMW20S	2LMW21S	2LMW21S	2MW21S	2MW21S	2MW21D	2MW21D	2MW21D	2MW21D
region	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN
matrix	GW	GF	GW	GF	GW	GF	GW	GF	GW	GF	GW	GF
sample	S2LMW20S02	S2LMW20S02-F	2LGW20S-04	2LGW20S-04-F	2WGW21S-04	2WGW21S-04-F	S2WMW21S02	S2WMW21S02-F	S22WMW21D01	S22WMW21D01-F	S2WMW21D02	S2WMW21D02-F
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
Semivolatile Organics (ug/L)												
1,2,4-TRICHLOROBENZENE			2.2 U		2.2 U							
1,2-DICHLOROBENZENE			2.2 U		2.2 U							
1,3-DICHLOROBENZENE			2.2 U		2.2 U							
1,4-DICHLOROBENZENE			2.2 U		2.2 U							
1-METHYLNAPHTHALENE	0.5 U						0.5 U		0.5 U		0.5 U	
2,2'-OXYBIS(1-CHLOROPROPANE)	5 U						5 U		5 U		5 U	
2,4,5-TRICHLOROPHENOL	20 U		5.4 U		5.6 U		20 U		20 U		20 U	
2,4,6-TRICHLOROPHENOL	5 U		5.4 U		5.6 U		5 U		5 U		5 U	
2,4-DICHLOROPHENOL	5 U		5.4 U		5.6 U		5 U		5 U		5 U	
2,4-DIMETHYLPHENOL	5 U		5.4 U		5.6 U		5 U		5 U		5 U	
2,4-DINITROPHENOL	20 U		22 U		22 U		20 U		20 U		20 U	
2,4-DINITROTOLUENE	5 U		2.2 U		2.2 U		5 U		5 U		5 U	
2,6-DINITROTOLUENE	5 U		2.2 U		2.2 U		5 U		5 U		5 U	
2-CHLORONAPHTHALENE	5 U		5.4 U		5.6 U		5 U		5 U		5 U	
2-CHLOROPHENOL	5 UJ		5.4 U		5.6 U		5 UJ		5 UJ		5 UJ	
2-METHYLNAPHTHALENE			2.2 U		2.2 U							
2-METHYLNAPHTHALENE	0.5 U						0.5 U		0.5 U		0.5 U	
2-METHYLPHENOL	5 U		5.4 U		5.6 U		5 U		5 U		5 U	
2-NITROANILINE	20 U		5.4 U		5.6 U		20 U		20 U		20 U	
2-NITROPHENOL	5 U		5.4 U		5.6 U		5 U		5 U		5 U	
3&4-METHYLPHENOL			5.4 U		5.6 U							
3,3'-DICHLOROBENZIDINE	5 U		5.4 U		5.6 U		5 U		5 U		5 U	
3-NITROANILINE	20 U		5.4 UJ		5.6 UJ		20 U		20 U		20 U	
4,6-DINITRO-2-METHYLPHENOL	20 U		22 U		22 U		20 U		20 U		20 U	
4-BROMOPHENYL PHENYL ETHER	5 U		2.2 U		2.2 U		5 U		5 U		5 U	
4-CHLORO-3-METHYLPHENOL	5 U		5.4 U		5.6 U		5 U		5 U		5 U	
4-CHLOROANILINE	5 U		5.4 U		5.6 U		5 U		5 UR		5 U	
4-CHLOROPHENYL PHENYL ETHER	5 U		2.2 U		2.2 U		5 U		5 U		5 U	
4-METHYLPHENOL	1 J						5 U		5 U		5 U	
4-NITROANILINE	20 U		5.4 U		5.6 U		20 U		20 U		20 U	
4-NITROPHENOL	20 U		22 U		22 U		20 U		20 U		20 U	
ACENAPHTHENE			2.2 U		2.2 U							
ACENAPHTHENE	0.5 U						0.5 U		0.5 U		0.5 U	
ACENAPHTHYLENE			2.2 U		2.2 U							
ACENAPHTHYLENE	1 U						1 U		1 U		1 U	
ANTHRACENE			2.2 U		2.2 U							
ANTHRACENE	0.05 U						0.05 U		0.05 U		0.05 U	
BENZO(A)ANTHRACENE			2.2 U		2.2 U							
BENZO(A)ANTHRACENE	0.05 U						0.05 U		0.05 U		0.05 U	
BENZO(A)PYRENE			2.2 U		2.2 U							
BENZO(A)PYRENE	0.05 U						0.05 U		0.05 U		0.05 U	
BENZO(B)FLUORANTHENE			2.2 U		2.2 U							
BENZO(B)FLUORANTHENE	0.1 U						0.1 U		0.1 U		0.1 U	
BENZO(G,H,I)PERYLENE			2.2 U		2.2 U							

SUMMARY OF BACKGROUND GROUNDWATER DATA
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

site	2	2	2	2	2	2	2	2	2	2	2	2
location	2LMW20S	2LMW20S	2LMW20S	2LMW20S	2LMW21S	2LMW21S	2MW21S	2MW21S	2MW21D	2MW21D	2MW21D	2MW21D
region	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN
matrix	GW	GF	GW	GF	GW	GF	GW	GF	GW	GF	GW	GF
sample	S2LMW20S02	S2LMW20S02-F	2LGW20S-04	2LGW20S-04-F	2WGW21S-04	2WGW21S-04-F	S2WMW21S02	S2WMW21S02-F	S22WMW21D01	S22WMW21D01-F	S2WMW21D02	S2WMW21D02-F
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
BENZO(G,H,I)PERYLENE	0.1 U						0.1 U		0.1 U		0.1 U	
BENZO(K)FLUORANTHENE			2.2 U		2.2 U							
BENZO(K)FLUORANTHENE	0.05 U						0.05 U		0.05 U		0.05 U	
BENZOIC ACID			22 UJ		22 UJ							
BIS(2-CHLOROETHOXY)METHANE	5 U		2.2 U		2.2 U		5 U		5 U		5 U	
BIS(2-CHLOROETHYL)ETHER	5 UJ		2.2 U		2.2 U		5 UJ		5 U		5 UJ	
BIS(2-CHLOROISOPROPYL)ETHER			2.2 U		2.2 U							
BIS(2-ETHYLHEXYL)PHTHALATE	5 U		2.2 U		2.2 U		8 U		5 U		5 U	
BUTYLBENZYL PHTHALATE	5 U		2.2 U		2.2 U		5 U		5 U		5 U	
CARBAZOLE			2.2 U		2.2 U							
CHRYSENE			2.2 U		2.2 U							
CHRYSENE	0.05 U						0.05 U		0.05 U		0.05 U	
DIBENZO(A,H)ANTHRACENE			2.2 U		2.2 U							
DIBENZO(A,H)ANTHRACENE	0.1 U						0.1 U		0.1 U		0.1 U	
DIBENZOFURAN			5.4 U		5.6 U							
DIETHYL PHTHALATE	5 U		2.2 U		2.2 U		5 U		5 U		5 U	
DIMETHYL PHTHALATE	5 U		2.2 U		2.2 U		5 U		5 U		5 U	
DI-N-BUTYL PHTHALATE	5 U		2.2 U		2.2 U		5 U		5 U		5 U	
DI-N-OCTYL PHTHALATE	5 U		2.2 U		2.2 U		5 U		5 U		5 U	
FLUORANTHENE			2.2 U		2.2 U							
FLUORANTHENE	0.1 U						0.1 U		0.1 U		0.1 U	
FLUORENE			2.2 U		2.2 U							
FLUORENE	0.1 U						0.1 U		0.1 U		0.1 U	
HEXACHLOROBENZENE	5 UJ		2.2 U		2.2 U		5 UJ		5 U		5 UJ	
HEXACHLOROBUTADIENE	5 U		2.2 U		2.2 U		5 U		5 U		5 U	
HEXACHLOROCYCLOPENTADIENE	5 U		22 U		22 U		5 U		5 U		5 U	
HEXACHLOROETHANE	5 U		5.4 U		5.6 U		5 U		5 U		5 U	
INDENO(1,2,3-CD)PYRENE			2.2 U		2.2 U							
INDENO(1,2,3-CD)PYRENE	0.05 U						0.05 U		0.05 U		0.05 U	
ISOPHORONE	5 U		2.2 U		2.2 U		5 U		5 U		5 U	
NAPHTHALENE			2.2 U		2.2 U							
NAPHTHALENE	0.5 U						0.5 U		0.5 U		0.5 U	
NITROBENZENE	5 U		2.2 U		2.2 U		5 U		5 U		5 U	
N-NITROSO-DI-N-PROPYLAMINE	5 U		2.2 U		2.2 U		5 U		5 U		5 U	
N-NITROSODIPHENYLAMINE	5 U		5.4 U		5.6 U		5 U		5 U		5 U	
PENTACHLOROPHENOL	20 U		22 U		22 U		20 U		20 U		20 U	
PHENANTHRENE			2.2 U		2.2 U							
PHENANTHRENE	0.05 U						0.056		0.05 U		0.05 U	
PHENOL	5 U		5.4 UJ		5.6 UJ		5 U		5 U		5 U	
PYRENE			2.2 U		2.2 U							
PYRENE	0.05 U						0.05 U		0.05 U		0.05 U	
Pesticides/PCBs (ug/L)												
4,4'-DDD	0.02 U		0.021 U		8		6.8		0.02 U		0.02 U	
4,4'-DDE	0.02 U		0.021 U		0.068		0.2 U		0.02 U		0.02 U	
4,4'-DDT	0.02 U		0.021 U		0.022 U		0.2 U		0.02 U		0.02 U	

SUMMARY OF BACKGROUND GROUNDWATER DATA
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

site	2	2	2	2	2	2	2	2	2	2	2	2
location	2LMW20S	2LMW20S	2LMW20S	2LMW20S	2LMW21S	2LMW21S	2MW21S	2MW21S	2MW21D	2MW21D	2MW21D	2MW21D
region	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN
matrix	GW	GF	GW	GF	GW	GF	GW	GF	GW	GF	GW	GF
sample	S2LMW20S02	S2LMW20S02-F	2LGW20S-04	2LGW20S-04-F	2WGW21S-04	2WGW21S-04-F	S2WMW21S02	S2WMW21S02-F	S22WMW21D01	S22WMW21D01-F	S2WMW21D02	S2WMW21D02-F
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
ALDRIN	0.01 U		0.01 U		0.011 U		0.1 U		0.01 U		0.01 U	
ALPHA-BHC	0.01 U		0.01 U		0.011 U		0.1 U		0.01 U		0.01 U	
ALPHA-CHLORDANE	0.01 U		0.01 U		0.011 U		0.1 U		0.01 U		0.01 U	
AROCLOR-1016	0.2 U		0.21 U		0.22 U		2 U		0.2 U		0.2 U	
AROCLOR-1221	0.4 U		0.42 U		0.44 U		4 U		0.4 U		0.4 U	
AROCLOR-1232	0.2 U		0.21 U		0.22 U		2 U		0.2 U		0.2 U	
AROCLOR-1242	0.2 U		0.21 U		0.22 U		2 U		0.2 U		0.2 U	
AROCLOR-1248	0.2 U		0.21 U		0.22 U		2 U		0.2 U		0.2 U	
AROCLOR-1254	0.2 U		0.21 U		0.22 U		2 U		0.2 U		0.2 U	
AROCLOR-1260	0.2 U		0.21 U		0.22 U		2 U		0.2 U		0.2 U	
BETA-BHC	0.01 U		0.01 U		0.011 U		0.1 U		0.01 U		0.01 U	
DELTA-BHC	0.01 U		0.01 U		0.011 U		0.1 U		0.01 U		0.01 U	
DIELDRIN	0.02 U		0.021 U		0.022 U		0.2 U		0.02 U		0.02 U	
ENDOSULFAN I	0.01 U		0.01 U		0.011 U		0.1 U		0.01 U		0.01 U	
ENDOSULFAN II	0.02 U		0.021 U		0.022 U		0.2 U		0.02 U		0.02 U	
ENDOSULFAN SULFATE	0.02 U		0.021 U		0.022 U		0.2 U		0.02 U		0.02 U	
ENDRIN	0.02 U		0.021 U		0.022 U		0.2 U		0.02 U		0.02 U	
ENDRIN ALDEHYDE	0.02 U		0.021 U		0.022 U		0.2 U		0.02 U		0.02 U	
ENDRIN KETONE	0.02 U		0.021 U		0.022 U		0.2 U		0.02 U		0.02 U	
GAMMA-BHC (LINDANE)	0.01 U		0.01 U		0.011 U		0.1 U		0.01 U		0.01 U	
GAMMA-CHLORDANE	0.01 U		0.01 U		0.011 U		0.1 U		0.01 U		0.01 U	
HEPTACHLOR	0.01 U		0.01 U		0.011 U		0.1 U		0.01 U		0.01 U	
HEPTACHLOR EPOXIDE	0.01 U		0.01 U		0.011 U		0.1 U		0.01 U		0.01 U	
METHOXYCHLOR	0.1 U		0.1 U		0.11 U		1 U		0.1 U		0.1 U	
TOXAPHENE	1 U		1 U		1.1 U		10 U		1 U		1 U	
Total Metals (ug/L)												
ALUMINUM	50.5 U		69.1 U		69.1 U		50.5 U		50.5 U		50.5 U	
ANTIMONY	2.6 UJ		2.6 U		2.6 UJ		2.6 UJ		2.6 U		2.6 UJ	
ARSENIC	2.3 U		2.7 U		3 J		2.3 U		2.3 U		2.3 U	
BARIUM	50		49.1		94.7		46.5		80.3		78.3	
BERYLLIUM	0.72 U		0.1 U		0.1 U		0.72 U		0.72 U		0.72 U	
CADMIUM	0.25 UJ		0.32 U		0.71 U		0.25 UJ		0.25 U		0.25 UJ	
CALCIUM	26900		28700		203000		147000		37200		38300	
CHROMIUM	6.2 U		1.3 U		6.6 J		6.2 U		6.2 U		6.2 U	
COBALT	4.2 U		0.94 U		0.94 U		4.2 U		4.2 U		4.2 U	
COPPER	6.8 U		0.87 U		0.87 U		6.8 U		6.8 U		6.8 U	
IRON	1370 J		2160		16400		18500 J		28200 J		20000 J	
LEAD	1.8 U		1.9 U		1.9 U		1.8 U		1.8 U		2 J	
MAGNESIUM	4610		4720		646000		461000		9060 J		9000	
MANGANESE	314		314		210		189		781 J		698	
MERCURY	0.09 UJ		0.1 U		0.1 U		0.09 UJ		0.1 U		0.09 UJ	
NICKEL	9.2 U		4.6 U		1.2 U		9.2 U		9.2 U		9.2 U	
POTASSIUM	4040		3770		215000		139000		3350		3190	
SELENIUM	2.8 U		3.4 UJ		3.4 UJ		2.8 U		2.8 U		2.8 U	
SILVER	6.8 U		1.1 U		1.1 U		20.8 U		11.1 U		7.5 U	

SUMMARY OF BACKGROUND GROUNDWATER DATA
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

site	2	2	2	2	2	2	2	2	2	2	2	2
location	2LMW20S	2LMW20S	2LMW20S	2LMW20S	2LMW21S	2LMW21S	2MW21S	2MW21S	2MW21D	2MW21D	2MW21D	2MW21D
region	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN
matrix	GW	GF	GW	GF	GW	GF	GW	GF	GW	GF	GW	GF
sample	S2LMW20S02	S2LMW20S02-F	2LGW20S-04	2LGW20S-04-F	2WGW21S-04	2WGW21S-04-F	S2WMW21S02	S2WMW21S02-F	S22WMW21D01	S22WMW21D01-F	S2WMW21D02	S2WMW21D02-F
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
SODIUM	40100		38400		4560000		4580000		64500		61900	
THALLIUM	3 U		5 U		5 U		3 U		3 U		3 U	
VANADIUM	6.3 U		2 U		7 J		10.2 J		6.3 U		6.3 U	
ZINC	19.2 U		15.7 J		2.9 U		41.6		21.1 U		18 U	
Dissolved Metals (ug/L)												
ALUMINUM, FILTERED		50.5 U		69.1 U		69.1 U		50.5 U		50.5 U		50.5 U
ANTIMONY, FILTERED		2.6 U		2.6 U		2.6 UJ		2.6 U		2.6 U		2.6 U
ARSENIC, FILTERED		2.3 U		2.7 U		2.7 UJ		2.9 J		2.3 U		2.3 U
BARIUM, FILTERED		49.7		49		92.4		34		79.3		73.9
BERYLLIUM, FILTERED		0.72 U		0.1 U		0.1 U		0.72 U		0.72 U		0.72 U
CADMIUM, FILTERED		0.25 U		0.32 U		0.32 U		0.25 U		0.25 U		0.25 U
CALCIUM, FILTERED		26300		29000		176000		96700		36300		36100
CHROMIUM, FILTERED		6.2 U		1.5 J		6.4 J		6.2 U		6.2 U		6.2 U
COBALT, FILTERED		4.2 U		1 U		0.94 U		4.2 U		4.2 U		4.2 U
COPPER, FILTERED		6.8 U		0.87 U		0.87 U		6.8 U		6.8 U		6.8 U
IRON, FILTERED		1240		2170		3440		5940		25300		18300
LEAD, FILTERED		1.8 UJ		1.9 U		1.9 U		3.6 UJ		1.8 U		1.8 UJ
MAGNESIUM, FILTERED		4800		4790		550000		299000		8970		8730
MANGANESE, FILTERED		296		314		259		225		757		650
MERCURY, FILTERED		0.09 UJ		0.1 U		0.1 U		0.09 UJ		0.09 U		0.09 UJ
NICKEL, FILTERED		9.2 U		5.2 U		1.2 U		9.2 U		9.2 U		9.2 U
POTASSIUM, FILTERED		4240		3820		196000		95400		3250		3100
SELENIUM, FILTERED		2.8 U		3.4 UJ		3.4 UJ		2.8 U		2.8 U		2.8 U
SILVER, FILTERED		10.4 U		1.1 U		1.1 U		10.4 U		9.4 U		5.2 U
SODIUM, FILTERED		43100		39200		4090000		2620000		62600		62700
THALLIUM, FILTERED		3 U		5 U		5 U		3 U		3 U		3 U
VANADIUM, FILTERED		6.3 U		1.8 U		5.7 J		9.9 J		6.3 U		6.3 U
ZINC, FILTERED		21.1 U		14.2		2.6 U		21.5 U		17.8 U		20 U
Miscellaneous Parameters (mg/L)												
ALKALINITY			68.1		1950							
CHEMICAL OXYGEN DEMAND			20 U		570							
CHLORIDE	78.9		84.1 J		9920 J		5530		143 J		140	
HARDNESS AS CACO3			91.1		317							
SULFATE			20 U		200 U							
TOTAL DISSOLVED SOLIDS	248		244 J		17100 J		10700 J		362		384	
TOTAL ORGANIC CARBON			1.6		37.7							
TOTAL SUSPENDED SOLIDS	5 U		4 U		20 J		7 J		38		22	

Notes:
U - Not Detected
J - Estimated
R - Rejected

SUMMARY OF BACKGROUND GROUNDWATER DATA
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

site	2	2	2	2	2	2	2	2	2	2	2	2
location	2MW22S	2MW22S	2MW22S	2MW22S	2MW22D	2MW22D	2MW22D	2MW22D	2LMW35B	2LMW35B	2LMW35B	2LMW35B
region	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	CENTRAL	CENTRAL	CENTRAL	CENTRAL
matrix	GW	GF	GW	GF	GW	GF	GW	GF	GW	GW	GF	GF
sample	S2WMW22S01	S2WMW22S01-F	S2WMW22S02	S2WMW22S02-F	S2WMW22D01	S2WMW22D01-F	S2WMW22D02	S2WMW22D02-F	S2LMW35B01	S2LMW35B01-D	S2LMW35B01-F	S2LMW35B01-F-D
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
Volatile Organics (ug/L)												
1,1,1-TRICHLOROETHANE	1 U		1 U		1 U		1 U		1 UJ	1 UJ		
1,1,2,2-TETRACHLOROETHANE	1 U		1 U		1 U		1 U		1 UJ	1 UJ		
1,1,2-TRICHLOROETHANE	1 U		1 U		1 U		1 U		1 UJ	1 UJ		
1,1-DICHLOROETHANE	1 U		1 U		1 U		1 U		1 UJ	1 UJ		
1,1-DICHLOROETHENE	1 U		1 U		1 U		1 U		1 UJ	1 UJ		
1,2,4-TRICHLOROBENZENE	1 U		1 U		1 U		1 U		1 UJ	1 UJ		
1,2-DIBROMO-3-CHLOROPROPANE	1 U		1 UR		1 U		1 UR		1 UJ	1 UJ		
1,2-DIBROMOETHANE	1 U		1 U		1 U		1 U		1 UJ	1 UJ		
1,2-DICHLOROBENZENE	1 U		1 U		1 U		1 U		1 UJ	1 UJ		
1,2-DICHLOROETHANE	1 U		1 U		1 U		1 U		1 UJ	1 UJ		
1,2-DICHLOROPROPANE	1 U		1 U		1 U		1 U		1 UJ	1 UJ		
1,3-DICHLOROBENZENE	1 U		1 U		1 U		1 U		1 UJ	1 UJ		
1,4-DICHLOROBENZENE	1 U		1 U		1 U		1 U		1 UJ	1 UJ		
2-BUTANONE	5 UR		5 UR		5 UR		5 UR		5 UR	5 UR		
2-HEXANONE	5 UR		5 U		5 UR		5 U		5 UR	5 UR		
4-METHYL-2-PENTANONE	5 U		5 U		5 U		5 U		5 UJ	5 UJ		
ACETONE	5 UR		6.96 J		5 UR		5 UR		5 UR	5 UR		
BENZENE	1 U		1 U		1 U		1 U		1 UJ	1 UJ		
BROMOCHLOROMETHANE	1 U		1 U		1 U		1 U		1 UJ	1 UJ		
BROMODICHLOROMETHANE	1 U		1 U		1 U		1 U		1 UJ	1 UJ		
BROMOFORM	1 U		1 U		1 U		1 U		1 UJ	1 UJ		
BROMOMETHANE	1 U		1 U		1 U		1 U		1 UJ	1 UJ		
CARBON DISULFIDE	1 U		1 U		1 U		1 U		1 UJ	1 UJ		
CARBON TETRACHLORIDE	1 U		1 U		1 U		1 U		1 UJ	1 UJ		
CHLOROBENZENE	1 U		1 U		1 U		1 U		1 UJ	1 UJ		
CHLOROETHANE	1 U		1 U		1 U		1 U		1 UJ	1 UJ		
CHLOROFORM	1 U		1 U		1 U		1 U		1 UJ	1 UJ		
CHLOROMETHANE	1 U		1 U		1 U		1 U		1 UJ	1 UJ		
CIS-1,2-DICHLOROETHENE	1 U		1 U		1 U		1 U		1 UJ	1 UJ		
CIS-1,3-DICHLOROPROPENE	1 U		1 U		1 U		1 U		1 UJ	1 UJ		
DIBROMOCHLOROMETHANE	1 U		1 U		1 U		1 U		1 UJ	1 UJ		
ETHYLBENZENE	1 U		1 U		1 U		1 U		1 UJ	1 UJ		
M+P-XYLENES	2 U		2 U		2 U		2 U		2 UJ	2 UJ		
METHYLENE CHLORIDE	5 U		2 U		5 U		2 U		2 U	2 U		
O-XYLENE	1 U		1 U		1 U		1 U		1 UJ	1 UJ		
STYRENE	1 U		1 U		1 U		1 U		1 UJ	1 UJ		
TETRACHLOROETHENE	1 U		1 U		1 U		1 U		1 UJ	1 UJ		
TOLUENE	1 U		1 U		1 U		1 U		1 UJ	1 UJ		
TRANS-1,2-DICHLOROETHENE	1 U		1 U		1 U		1 U		1 UJ	1 UJ		
TRANS-1,3-DICHLOROPROPENE	1 U		1 U		1 U		1 U		1 UJ	1 UJ		
TRICHLOROETHENE	1 U		1 U		1 U		1 U		1 UJ	1 UJ		
VINYL CHLORIDE	1 U		1 U		1 U		1 U		1 UJ	1 UJ		
XYLENES, TOTAL	1 U		1 U		1 U		1 U		1 UJ	1 UJ		

SUMMARY OF BACKGROUND GROUNDWATER DATA
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

site	2	2	2	2	2	2	2	2	2	2	2	2
location	2MW22S	2MW22S	2MW22S	2MW22S	2MW22D	2MW22D	2MW22D	2MW22D	2LMW35B	2LMW35B	2LMW35B	2LMW35B
region	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	CENTRAL	CENTRAL	CENTRAL	CENTRAL
matrix	GW	GF	GW	GF	GW	GF	GW	GF	GW	GW	GF	GF
sample	S2WMW22S01	S2WMW22S01-F	S2WMW22S02	S2WMW22S02-F	S2WMW22D01	S2WMW22D01-F	S2WMW22D02	S2WMW22D02-F	S2LMW35B01	S2LMW35B01-D	S2LMW35B01-F	S2LMW35B01-F-D
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
Semivolatile Organics (ug/L)												
1,2,4-TRICHLOROBENZENE	5 U				5 U				5 U	5 U		
1,2-DICHLOROBENZENE	5 U				5 U				5 U	5 U		
1,3-DICHLOROBENZENE	5 U				5 U				5 U	5 U		
1,4-DICHLOROBENZENE	5 U				5 U				5 U	5 U		
1-METHYLNAPHTHALENE			0.5 U				0.5 U					
2,2'-OXYBIS(1-CHLOROPROPANE)	5 U		5 U		5 U		5 U		5 U	5 U		
2,4,5-TRICHLOROPHENOL	20 U		20 U		20 U		20 U		20 U	20 U		
2,4,6-TRICHLOROPHENOL	5 U		5 U		5 U		5 U		5 U	5 U		
2,4-DICHLOROPHENOL	5 U		5 U		5 U		5 U		5 U	5 U		
2,4-DIMETHYLPHENOL	5 U		5 U		5 U		5 U		5 U	5 U		
2,4-DINITROPHENOL	20 U		20 U		20 U		20 U		20 U	20 U		
2,4-DINITROTOLUENE	5 U		5 U		5 U		5 U		5 U	5 U		
2,6-DINITROTOLUENE	5 U		5 U		5 U		5 U		5 U	5 U		
2-CHLORONAPHTHALENE	5 U		5 U		5 U		5 U		5 U	5 U		
2-CHLOROPHENOL	5 U		5 UJ		5 UJ		5 UJ		5 U	5 U		
2-METHYLNAPHTHALENE	5 U				5 U				5 U	5 U		
2-METHYLNAPHTHALENE			0.5 U				0.5 U					
2-METHYLPHENOL	5 U		5 U		5 U		5 U		5 U	5 U		
2-NITROANILINE	20 U		20 U		20 U		20 U		20 U	20 U		
2-NITROPHENOL	5 U		5 U		5 U		5 U		5 U	5 U		
3&4-METHYLPHENOL												
3,3'-DICHLOROBENZIDINE	5 U		5 U		5 U		5 U		5 U	5 U		
3-NITROANILINE	20 U		20 U		20 U		20 U		20 U	20 U		
4,6-DINITRO-2-METHYLPHENOL	20 U		20 U		20 U		20 U		20 U	20 U		
4-BROMOPHENYL PHENYL ETHER	5 U		5 U		5 U		5 U		5 U	5 U		
4-CHLORO-3-METHYLPHENOL	5 U		5 U		5 U		5 U		5 U	5 U		
4-CHLOROANILINE	3.9 U		5 U		3.9 U		5 U		5 U	5 U		
4-CHLOROPHENYL PHENYL ETHER	5 U		5 U		5 U		5 U		5 U	5 U		
4-METHYLPHENOL	1 J		5 U		5 U		5 U		5 U	5 U		
4-NITROANILINE	20 U		20 U		20 U		20 U		20 U	20 U		
4-NITROPHENOL	20 U		20 U		20 U		20 U		20 U	20 U		
ACENAPHTHENE	5 U				5 U				5 U	5 U		
ACENAPHTHENE			0.5 U				0.5 U					
ACENAPHTHYLENE	5 U				5 U				5 U	5 U		
ACENAPHTHYLENE			1 U				1 U					
ANTHRACENE	5 U				5 U				5 U	5 U		
ANTHRACENE			0.05 U				0.05 U					
BENZO(A)ANTHRACENE	5 U				5 U				5 U	5 U		
BENZO(A)ANTHRACENE			0.05 U				0.05 U					
BENZO(A)PYRENE	5 U				5 UJ				5 U	5 U		
BENZO(A)PYRENE			0.05 U				0.05 U					
BENZO(B)FLUORANTHENE	5 U				5 U				5 U	5 U		
BENZO(B)FLUORANTHENE			0.1 U				0.1 U					
BENZO(G,H,I)PERYLENE	5 U				5 U				5 U	5 U		

SUMMARY OF BACKGROUND GROUNDWATER DATA
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

site	2	2	2	2	2	2	2	2	2	2	2	2
location	2MW22S	2MW22S	2MW22S	2MW22S	2MW22D	2MW22D	2MW22D	2MW22D	2LMW35B	2LMW35B	2LMW35B	2LMW35B
region	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	CENTRAL	CENTRAL	CENTRAL	CENTRAL
matrix	GW	GF	GW	GF	GW	GF	GW	GF	GW	GW	GF	GF
sample	S2WMW22S01	S2WMW22S01-F	S2WMW22S02	S2WMW22S02-F	S2WMW22D01	S2WMW22D01-F	S2WMW22D02	S2WMW22D02-F	S2LMW35B01	S2LMW35B01-D	S2LMW35B01-F	S2LMW35B01-F-D
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
BENZO(G,H,I)PERYLENE			0.1 U				0.1 U					
BENZO(K)FLUORANTHENE	5 U				5 U				5 U	5 U		
BENZO(K)FLUORANTHENE			0.05 U				0.05 U					
BENZOIC ACID												
BIS(2-CHLOROETHOXY)METHANE	5 U		5 U		5 U		5 U		5 U	5 U		
BIS(2-CHLOROETHYL)ETHER	5 U		5 UJ		5 UJ		5 UJ		5 U	5 U		
BIS(2-CHLOROISOPROPYL)ETHER												
BIS(2-ETHYLHEXYL)PHTHALATE	12		5 U		5		5 U		5 U	5 U		
BUTYLBENZYL PHTHALATE	5 U		5 U		5 U		5 U		5 U	5 U		
CARBAZOLE	5 U				5 U				5 U	5 U		
CHRYSENE	5 U				5 U				5 U	5 U		
CHRYSENE			0.05 U				0.05 U					
DIBENZO(A,H)ANTHRACENE	5 U				5 U				5 U	5 U		
DIBENZO(A,H)ANTHRACENE			0.1 U				0.1 U					
DIBENZOFURAN	5 U				5 U				5 U	5 U		
DIETHYL PHTHALATE	5 U		5 U		5 U		5 U		5 U	5 U		
DIMETHYL PHTHALATE	5 U		5 U		5 U		5 U		5 U	5 U		
DI-N-BUTYL PHTHALATE	5 U		1 J		5 U		5 U		5 U	5 U		
DI-N-OCTYL PHTHALATE	5 U		5 U		5 U		5 U		5 U	5 U		
FLUORANTHENE	5 U				5 U				5 U	5 U		
FLUORANTHENE			0.1 U				0.1 U					
FLUORENE	5 U				5 U				5 U	5 U		
FLUORENE			0.1 U				0.1 U					
HEXACHLOROBENZENE	5 U		5 UJ		5 U		5 UJ		5 U	5 U		
HEXACHLOROBUTADIENE	5 U		5 U		5 U		5 U		5 U	5 U		
HEXACHLOROCYCLOPENTADIENE	5 U		5 U		5 U		5 U		5 U	5 U		
HEXACHLOROETHANE	5 U		5 U		5 U		5 U		5 U	5 U		
INDENO(1,2,3-CD)PYRENE	5 U				5 U				5 U	5 U		
INDENO(1,2,3-CD)PYRENE			0.05 U				0.05 U					
ISOPHORONE	5 U		5 UJ		5 UJ		5 UJ		5 U	5 U		
NAPHTHALENE	5 U				5 U				5 U	5 U		
NAPHTHALENE			0.5 U				0.5 U					
NITROBENZENE	5 U		5 U		5 U		5 U		5 U	5 U		
N-NITROSO-DI-N-PROPYLAMINE	5 U		5 U		5 U		5 U		5 U	5 U		
N-NITROSODIPHENYLAMINE	5 UJ		5 U		5 UJ		5 U		5 U	5 U		
PENTACHLOROPHENOL	20 U		20 U		20 U		20 U		20 U	20 U		
PHENANTHRENE	5 U				5 U				5 U	5 U		
PHENANTHRENE			0.05 U				0.05 U					
PHENOL	5 U		5 U		5 U		5 U		5 U	5 U		
PYRENE	5 U				5 U				5 U	5 U		
PYRENE			0.05 U				0.05 U					
Pesticides/PCBs (ug/L)												
4,4'-DDD	0.02 U		0.02 U		0.02 U		0.02 U		0.02 U	0.02 U		
4,4'-DDE	0.02 U		0.02 U		0.02 U		0.02 U		0.02 U	0.02 U		
4,4'-DDT	0.02 U		0.02 U		0.02 U		0.02 U		0.02 U	0.02 U		

SUMMARY OF BACKGROUND GROUNDWATER DATA
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

site	2	2	2	2	2	2	2	2	2	2	2	2
location	2MW22S	2MW22S	2MW22S	2MW22S	2MW22D	2MW22D	2MW22D	2MW22D	2LMW35B	2LMW35B	2LMW35B	2LMW35B
region	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	CENTRAL	CENTRAL	CENTRAL	CENTRAL
matrix	GW	GF	GW	GF	GW	GF	GW	GF	GW	GW	GF	GF
sample	S2WMW22S01	S2WMW22S01-F	S2WMW22S02	S2WMW22S02-F	S2WMW22D01	S2WMW22D01-F	S2WMW22D02	S2WMW22D02-F	S2LMW35B01	S2LMW35B01-D	S2LMW35B01-F	S2LMW35B01-F-D
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
ALDRIN	0.01 U		0.01 U		0.01 U		0.01 U		0.01 U	0.01 U		
ALPHA-BHC	0.01 U		0.01 U		0.01 U		0.01 U		0.01 U	0.01 U		
ALPHA-CHLORDANE	0.01 U		0.01 U		0.01 U		0.01 U		0.01 U	0.01 U		
AROCLOR-1016	0.2 U		0.2 U		0.2 U		0.2 U		0.2 U	0.2 U		
AROCLOR-1221	0.4 U		0.4 U		0.4 U		0.4 U		0.4 U	0.4 U		
AROCLOR-1232	0.2 U		0.2 U		0.2 U		0.2 U		0.2 U	0.2 U		
AROCLOR-1242	0.2 U		0.2 U		0.2 U		0.2 U		0.2 U	0.2 U		
AROCLOR-1248	0.2 U		0.2 U		0.2 U		0.2 U		0.2 U	0.2 U		
AROCLOR-1254	0.2 U		0.2 U		0.2 U		0.2 U		0.2 U	0.2 U		
AROCLOR-1260	0.2 U		0.2 U		0.2 U		0.2 U		0.2 U	0.2 U		
BETA-BHC	0.01 U		0.01 U		0.01 U		0.01 U		0.01 U	0.01 U		
DELTA-BHC	0.01 U		0.01 U		0.01 U		0.01 U		0.01 U	0.01 U		
DIELDRIN	0.02 U		0.02 U		0.02 U		0.02 U		0.02 U	0.02 U		
ENDOSULFAN I	0.01 U		0.01 U		0.01 U		0.01 U		0.01 U	0.01 U		
ENDOSULFAN II	0.02 U		0.02 U		0.02 U		0.02 U		0.02 U	0.02 U		
ENDOSULFAN SULFATE	0.02 U		0.02 U		0.02 U		0.02 U		0.02 U	0.02 U		
ENDRIN	0.02 U		0.02 U		0.02 U		0.02 U		0.02 U	0.02 U		
ENDRIN ALDEHYDE	0.02 U		0.02 U		0.02 U		0.02 U		0.02 U	0.02 U		
ENDRIN KETONE	0.02 U		0.02 U		0.02 U		0.02 U		0.02 U	0.02 U		
GAMMA-BHC (LINDANE)	0.01 U		0.01 U		0.01 U		0.01 U		0.01 U	0.01 U		
GAMMA-CHLORDANE	0.01 U		0.01 U		0.01 U		0.01 U		0.01 U	0.01 U		
HEPTACHLOR	0.01 U		0.01 U		0.01 U		0.01 U		0.01 U	0.01 U		
HEPTACHLOR EPOXIDE	0.01 U		0.01 U		0.01 U		0.01 U		0.01 U	0.01 U		
METHOXYCHLOR	0.1 U		0.1 U		0.1 U		0.1 U		0.1 U	0.1 U		
TOXAPHENE	1 U		1 U		1 U		1 U		1 U	1 U		
Total Metals (ug/L)												
ALUMINUM	4750		2670		50.5 U		169		71.5 U	102 U		
ANTIMONY	2.6 U		2.6 UJ		2.6 U		2.6 UJ		2.6 U	2.6 U		
ARSENIC	2.3 U		2.3 U		2.3 U		2.3 U		2.3 U	2.3 U		
BARIUM	227		154		96.4		160		72.8	84.3		
BERYLLIUM	2.5 U		0.72 U		1.2 U		0.72 U		0.72 U	0.72 U		
CADMIUM	0.25 U		0.25 UJ		0.25 U		0.25 UJ		0.25 U	0.25 U		
CALCIUM	21500 J		24400		35700 J		40500		39200	44800		
CHROMIUM	25.5		6.2 U		6.2 U		6.2 U		6.2 U	6.2 U		
COBALT	10.4 U		17.8		4.2 UJ		4.2 U		13.9 U	15.7 U		
COPPER	172		53.2		6.8 U		6.8 U		6.8 U	6.8 U		
IRON	4940 J		6420 J		2190 J		1980 J		188 U	221 U		
LEAD	7.3		7.6 J		2.1 J		1.8 U		1.8 U	1.8 U		
MAGNESIUM	6150		6670		7940		8010		4360	5050		
MANGANESE	5810		11700		71.6		81.5		23.6 U	31.1 U		
MERCURY	0.11 U		0.09 UJ		0.1 U		0.09 UJ		0.11 U	0.1 U		
NICKEL	29.9 U		12.4 J		9.2 U		9.2 U		9.2 U	9.2 U		
POTASSIUM	6240		6510		1890		1950		4410	5170		
SELENIUM	2.8 U		6.6		2.8 U		2.8 U		2.8 U	2.8 U		
SILVER	5.2 U		8.6 U		5.2 U		12.5 U		5.2 U	5.2 U		

SUMMARY OF BACKGROUND GROUNDWATER DATA
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

site	2	2	2	2	2	2	2	2	2	2	2	2
location	2MW22S	2MW22S	2MW22S	2MW22S	2MW22D	2MW22D	2MW22D	2MW22D	2LMW35B	2LMW35B	2LMW35B	2LMW35B
region	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	NORTHERN	CENTRAL	CENTRAL	CENTRAL	CENTRAL
matrix	GW	GF	GW	GF	GW	GF	GW	GF	GW	GW	GF	GF
sample	S2WMW22S01	S2WMW22S01-F	S2WMW22S02	S2WMW22S02-F	S2WMW22D01	S2WMW22D01-F	S2WMW22D02	S2WMW22D02-F	S2LMW35B01	S2LMW35B01-D	S2LMW35B01-F	S2LMW35B01-F-D
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
SODIUM	67600		107000		6330		7350		66400	76800		
THALLIUM	3 U		3 U		3 U		3 U		3 U	3 U		
VANADIUM	6.5 J		6.6 J		6.3 U		6.3 U		6.3 U	6.3 U		
ZINC	71.2		40.6		6.7 U		8.9 U		41.1 U	44 U		
Dissolved Metals (ug/L)												
ALUMINUM, FILTERED		50.5 U		50.5 U		50.5 U		50.5 U			50.5 U	50.5 U
ANTIMONY, FILTERED		2.6 U		2.6 U		2.7 J		2.6 U			3.3 U	2.6 U
ARSENIC, FILTERED		2.5 J		2.3 U		2.3 U		2.3 U			2.3 U	2.3 U
BARIUM, FILTERED		96.4		115		96.4		124			75.2	81.8
BERYLLIUM, FILTERED		0.72 U		0.72 U		1.2 U		0.72 U			0.72 U	0.72 U
CADMIUM, FILTERED		0.53 U		0.25 U		0.25 U		0.25 U			0.25 U	0.25 U
CALCIUM, FILTERED		24200 J		20700		31200 J		31300			40800	43600
CHROMIUM, FILTERED		6.2 U		6.2 U		6.2 U		6.2 U			6.2 U	6.2 U
COBALT, FILTERED		20.7 U		14.4		6.9 U		4.2 U			14.8 U	15.7 U
COPPER, FILTERED		39.4		24.6		6.8 U		6.8 U			6.8 U	6.8 U
IRON, FILTERED		312 J		3010		342 J		282			41.6 U	37.3 U
LEAD, FILTERED		1.8 U		4.4 J		1.8 U		1.8 UJ			1.8 U	1.8 U
MAGNESIUM, FILTERED		6110		5270		6980		6540			4670	4980
MANGANESE, FILTERED		6580		9400		51.3		55.6			2.7 U	6.4 U
MERCURY, FILTERED		0.08 U		0.09 UJ		0.09 U		0.09 UJ			0.1 U	0.1 U
NICKEL, FILTERED		34.1 U		9.2 U		9.2 U		9.2 U			9.2 U	9.2 U
POTASSIUM, FILTERED		6240		5060		1850		1630			4840	4990
SELENIUM, FILTERED		2.8 U		8.3 U		2.8 U		2.8 U			2.8 U	2.8 U
SILVER, FILTERED		5.2 U		8.6 U		5.2 U		6.5 U			5.2 U	5.2 U
SODIUM, FILTERED		81100		99200		5630		6590			69800	75100
THALLIUM, FILTERED		3 U		3 U		3 U		3 U			3 U	3 U
VANADIUM, FILTERED		6.3 U		6.3 U		6.3 U		6.3 U			6.3 U	6.3 U
ZINC, FILTERED		46.3 U		37.1 U		9.3 U		17.4 U			47 U	44.1 U
Miscellaneous Parameters (mg/L)												
ALKALINITY												
CHEMICAL OXYGEN DEMAND												
CHLORIDE	99.1		119		8.63		9.3		157	147		
HARDNESS AS CACO3												
SULFATE												
TOTAL DISSOLVED SOLIDS	318		445 J		181		208 J		426	411		
TOTAL ORGANIC CARBON												
TOTAL SUSPENDED SOLIDS	426		65 J		5		5 UJ		13	14		

Notes:
U - Not Detected
J - Estimated
R - Rejected

SUMMARY OF BACKGROUND GROUNDWATER DATA
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

site	2	2	4	4	4	4	8	8	8	8	8	8	8
location	2LMW35B	2LMW35B	4MW1S	4MW1S	4MW1S	4MW1S	8MW8D	8MW8D	8MW8D	8MW8D	8MW10S	8MW10S	8MW10S
region	CENTRAL	CENTRAL	NORTHERN	NORTHERN	NORTHERN	NORTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN
matrix	GW	GF	GW	GF	GW	GF	GW	GF	GW	GF	GW	GF	GW
sample	S2LMW35B02	S2LMW35B02-F	S4MW01S02	S4MW01S02-F	4GW01S-04	4GW01S-04-F	S8MW08D01	S8MW08D01-F	S8MW08D02	S8MW08D02-F	S8MW10S01	S8MW10S01-F	S8MW10S02
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
Volatile Organics (ug/L)													
1,1,1-TRICHLOROETHANE	1 U		1 U		1 U		1 U		1 U		1 U		1 U
1,1,2,2-TETRACHLOROETHANE	1 U		1 U		1 U		1 U		1 U		1 U		1 U
1,1,2-TRICHLOROETHANE	1 U		1 U		1 U		1 U		1 U		1 U		1 U
1,1-DICHLOROETHANE	1 U		1 U		1 U		1 U		1 U		1 U		1 U
1,1-DICHLOROETHENE	1 U		1 U		1 U		1 U		1 U		1 U		1 U
1,2,4-TRICHLOROBENZENE	1 U		1 U				1 U		1 U		1 U		1 U
1,2-DIBROMO-3-CHLOROPROPANE	1 UR		1 UR		1 U		1 UR		1 UR		1 UR		1 UR
1,2-DIBROMOETHANE	1 U		1 U		1 U		1 U		1 U		1 U		1 U
1,2-DICHLOROBENZENE	1 U		1 U		1 U		1 U		1 U		1 U		1 U
1,2-DICHLOROETHANE	1 U		1 U		1 U		1 U		1 U		1 U		1 U
1,2-DICHLOROPROPANE	1 U		1 U		1 U		1 U		1 U		1 U		1 U
1,3-DICHLOROBENZENE	1 U		1 U		1 U		1 U		1 U		1 U		1 U
1,4-DICHLOROBENZENE	1 U		1 U		1 U		1 U		1 U		1 U		1 U
2-BUTANONE	5 UR		5 UR		5 U		5 UR		5 UR		5 UR		5 UR
2-HEXANONE	5 U		5 U		5 U		5 UR		5 U		5 UR		5 UR
4-METHYL-2-PENTANONE	5 U		5 U		5 U		5 U		5 U		5 U		5 U
ACETONE	5 UR		5 UR		5 U		5 UR		5 UR		8.27 U		5 UR
BENZENE	1 U		1 U		1 U		1 U		1 U		1 U		1 U
BROMOCHLOROMETHANE	1 U		1 U		1 U		1 U		1 U		1 U		1 U
BROMODICHLOROMETHANE	1 U		1 U		1 U		1 U		1 U		1 U		1 U
BROMOFORM	1 U		1 U		1 U		1 U		1 U		1 U		1 U
BROMOMETHANE	1 UJ		1 UJ		1 U		1 U		1 U		1 U		1 U
CARBON DISULFIDE	1 U		1 U		1 U		1 U		1 U		1 U		1 U
CARBON TETRACHLORIDE	1 U		1 U		1 U		1 U		1 U		1 U		1 U
CHLOROBENZENE	1 U		1 U		1 U		1 U		1 U		1 U		1 U
CHLOROETHANE	1 U		1 U		1 U		1 U		1 U		1 U		1 U
CHLOROFORM	1 U		1 U		1 U		1 U		1 U		1 U		1 U
CHLOROMETHANE	1 U		1 U		1 U		1 U		1 U		1 U		1 U
CIS-1,2-DICHLOROETHENE	1 U		1 U		1 U		1 U		1 U		1 U		1 U
CIS-1,3-DICHLOROPROPENE	1 U		1 U		1 U		1 U		1 U		1 U		1 U
DIBROMOCHLOROMETHANE	1 U		1 U		1 U		1 U		1 U		1 U		1 U
ETHYLBENZENE	1 U		1 U		1 U		1 U		1 U		1 U		1 U
M+P-XYLENES	2 U		2 U				2 U		2 U		2 U		2 U
METHYLENE CHLORIDE	2 U		2 U		2 U		2.86 U		2 U		3.86 U		4 U
O-XYLENE	1 U		1 U				1 U		1 U		1 U		1 U
STYRENE	1 U		1 U		1 U		1 U		1 U		1 U		1 U
TETRACHLOROETHENE	1 U		1 U		1 U		1690		1900		619		1310
TOLUENE	1 U		1 U		1 U		1 U		1 U		1 U		1 U
TRANS-1,2-DICHLOROETHENE	1 U		1 U		1 U		1 U		1 U		1 U		1 U
TRANS-1,3-DICHLOROPROPENE	1 U		1 U		1 U		1 U		1 U		1 U		1 U
TRICHLOROETHENE	1 U		1 U		1 U		5.49		4.18		1 U		1 U
VINYL CHLORIDE	1 U		1 U		1 U		1 U		1 U		1 U		1 U
XYLENES, TOTAL	1 U		1 U		1 U		1 U		1 U		1 U		1 U

SUMMARY OF BACKGROUND GROUNDWATER DATA
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

site	2	2	4	4	4	4	8	8	8	8	8	8	8
location	2LMW35B	2LMW35B	4MW1S	4MW1S	4MW1S	4MW1S	8MW8D	8MW8D	8MW8D	8MW8D	8MW10S	8MW10S	8MW10S
region	CENTRAL	CENTRAL	NORTHERN	NORTHERN	NORTHERN	NORTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN
matrix	GW	GF	GW	GF	GW	GF	GW	GF	GW	GF	GW	GF	GW
sample	S2LMW35B02	S2LMW35B02-F	S4MW01S02	S4MW01S02-F	4GW01S-04	4GW01S-04-F	S8MW08D01	S8MW08D01-F	S8MW08D02	S8MW08D02-F	S8MW10S01	S8MW10S01-F	S8MW10S02
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
Semivolatile Organics (ug/L)													
1,2,4-TRICHLOROBENZENE					2.1 U								
1,2-DICHLOROBENZENE					2.1 U								
1,3-DICHLOROBENZENE					2.1 U								
1,4-DICHLOROBENZENE					2.1 U								
1-METHYLNAPHTHALENE	0.5 U		0.5 U				0.5 U		0.5 U		0.5 U		0.5 U
2,2'-OXYBIS(1-CHLOROPROPANE)	5 U		5 U				5 U		5 U		5 U		5 U
2,4,5-TRICHLOROPHENOL	20 U		20 U		5.3 U		20 U		20 U		20 U		20 U
2,4,6-TRICHLOROPHENOL	5 U		5 U		5.3 U		5 U		5 U		5 U		5 U
2,4-DICHLOROPHENOL	5 U		5 U		5.3 U		5 U		5 U		5 U		5 U
2,4-DIMETHYLPHENOL	5 U		5 U		5.3 U		5 U		5 U		5 U		5 U
2,4-DINITROPHENOL	20 U		20 U		21 U		20 U		20 U		20 U		20 UJ
2,4-DINITROTOLUENE	5 U		5 U		2.1 U		5 U		5 U		5 U		5 U
2,6-DINITROTOLUENE	5 U		5 U		2.1 U		5 U		5 U		5 U		5 U
2-CHLORONAPHTHALENE	5 U		5 U		5.3 U		5 U		5 U		5 U		5 U
2-CHLOROPHENOL	5 UJ		5 UJ		5.3 U		5 UJ		5 UJ		5 UJ		5 UJ
2-METHYLNAPHTHALENE					2.1 U								
2-METHYLNAPHTHALENE	0.5 U		0.5 U				0.5 U		0.5 U		0.5 U		0.5 U
2-METHYLPHENOL	5 U		5 U		5.3 U		5 U		5 U		5 U		5 U
2-NITROANILINE	20 U		20 U		5.3 U		20 U		20 U		20 U		20 U
2-NITROPHENOL	5 U		5 U		5.3 U		5 U		5 U		5 U		5 U
3&4-METHYLPHENOL					5.3 U								
3,3'-DICHLOROBENZIDINE	5 U		5 U		5.3 U		5 U		5 U		5 U		5 U
3-NITROANILINE	20 U		20 U		5.3 UJ		20 U		20 U		20 U		20 U
4,6-DINITRO-2-METHYLPHENOL	20 U		20 U		21 U		20 U		20 U		20 U		20 U
4-BROMOPHENYL PHENYL ETHER	5 U		5 U		2.1 U		5 U		5 U		5 U		5 U
4-CHLORO-3-METHYLPHENOL	5 U		5 U		5.3 U		5 U		5 U		5 U		5 U
4-CHLOROANILINE	5 U		5 U		5.3 U		5 UR		5 U		5 UR		5 U
4-CHLOROPHENYL PHENYL ETHER	5 U		5 U		2.1 U		5 U		5 U		5 U		5 U
4-METHYLPHENOL	5 U		5 U				5 U		5 U		5 U		5 U
4-NITROANILINE	20 U		20 U		5.3 U		20 U		20 U		20 U		20 U
4-NITROPHENOL	20 U		20 U		21 U		20 U		20 U		20 U		20 U
ACENAPHTHENE					2.1 U								
ACENAPHTHENE	0.5 U		0.5 U				0.5 U		0.5 U		0.5 U		0.5 U
ACENAPHTHYLENE					2.1 U								
ACENAPHTHYLENE	1 U		1 U				1 U		1 U		1 U		1 U
ANTHRACENE					2.1 U								
ANTHRACENE	0.05 U		0.05 U				0.05 U		0.05 U		0.05 U		0.05 U
BENZO(A)ANTHRACENE					2.1 U								
BENZO(A)ANTHRACENE	0.05 U		0.05 U				0.05 U		0.05 U		0.05 U		0.05 U
BENZO(A)PYRENE					2.1 U								
BENZO(A)PYRENE	0.05 U		0.05 U				0.05 U		0.05 U		0.05 U		0.05 U
BENZO(B)FLUORANTHENE					2.1 U								
BENZO(B)FLUORANTHENE	0.1 U		0.1 U				0.1 U		0.1 U		0.1 U		0.1 U
BENZO(G,H,I)PERYLENE					2.1 U								

SUMMARY OF BACKGROUND GROUNDWATER DATA
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

site	2	2	4	4	4	4	8	8	8	8	8	8	8
location	2LMW35B	2LMW35B	4MW1S	4MW1S	4MW1S	4MW1S	8MW8D	8MW8D	8MW8D	8MW8D	8MW10S	8MW10S	8MW10S
region	CENTRAL	CENTRAL	NORTHERN	NORTHERN	NORTHERN	NORTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN
matrix	GW	GF	GW	GF	GW	GF	GW	GF	GW	GF	GW	GF	GW
sample	S2LMW35B02	S2LMW35B02-F	S4MW01S02	S4MW01S02-F	4GW01S-04	4GW01S-04-F	S8MW08D01	S8MW08D01-F	S8MW08D02	S8MW08D02-F	S8MW10S01	S8MW10S01-F	S8MW10S02
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
BENZO(G,H,I)PERYLENE	0.1 U		0.1 U				0.1 U		0.1 U		0.1 U		0.1 U
BENZO(K)FLUORANTHENE					2.1 U								
BENZO(K)FLUORANTHENE	0.05 U		0.05 U				0.05 U		0.05 U		0.05 U		0.05 U
BENZOIC ACID					21 UJ								
BIS(2-CHLOROETHOXY)METHANE	5 U		5 U		2.1 U		5 U		5 U		5 U		5 U
BIS(2-CHLOROETHYL)ETHER	5 UJ		5 UJ		2.1 U		5 U		5 UJ		5 U		5 UJ
BIS(2-CHLOROISOPROPYL)ETHER					2.1 U								
BIS(2-ETHYLHEXYL)PHTHALATE	5 U		5 U		2.1 U		5 U		5 U		5 U		5 U
BUTYLBENZYL PHTHALATE	5 U		5 U		2.1 U		5 U		5 U		5 U		5 U
CARBAZOLE					2.1 U								
CHRYSENE					2.1 U								
CHRYSENE	0.05 U		0.05 U				0.05 U		0.05 U		0.05 U		0.05 U
DIBENZO(A,H)ANTHRACENE					2.1 U								
DIBENZO(A,H)ANTHRACENE	0.1 U		0.1 U				0.1 U		0.1 U		0.1 U		0.1 U
DIBENZOFURAN					5.3 U								
DIETHYL PHTHALATE	5 U		5 U		2.1 U		5 U		5 U		5 U		5 U
DIMETHYL PHTHALATE	5 U		5 U		2.1 U		5 U		5 U		5 U		5 U
DI-N-BUTYL PHTHALATE	5 U		5 U		2.1 U		5 U		5 U		5 U		5 U
DI-N-OCTYL PHTHALATE	5 U		5 U		2.1 U		5 U		5 U		5 U		5 U
FLUORANTHENE					2.1 U								
FLUORANTHENE	0.1 U		0.1 U				0.1 U		0.1 U		0.1 U		0.1 U
FLUORENE					2.1 U								
FLUORENE	0.1 U		0.1 U				0.1 U		0.1 U		0.1 U		0.1 U
HEXACHLOROBENZENE	5 UJ		5 UJ		2.1 U		5 U		5 UJ		5 U		5 U
HEXACHLOROBUTADIENE	5 U		5 U		2.1 U		5 U		5 U		5 U		5 U
HEXACHLOROCYCLOPENTADIENE	5 U		5 U		21 U		5 U		5 U		5 U		5 UJ
HEXACHLOROETHANE	5 U		5 U		5.3 U		5 U		5 U		5 U		5 U
INDENO(1,2,3-CD)PYRENE					2.1 U								
INDENO(1,2,3-CD)PYRENE	0.05 U		0.05 U				0.05 U		0.05 U		0.05 U		0.05 U
ISOPHORONE	5 U		5 U		2.1 U		5 U		5 UJ		5 U		5 U
NAPHTHALENE					2.1 U								
NAPHTHALENE	0.5 U		0.5 U				0.5 U		0.5 U		0.5 U		0.5 U
NITROBENZENE	5 U		5 U		2.1 U		5 U		5 U		5 U		5 U
N-NITROSO-DI-N-PROPYLAMINE	5 U		5 U		2.1 U		5 U		5 U		5 U		5 U
N-NITROSODIPHENYLAMINE	5 U		5 U		5.3 U		5 U		5 U		5 U		5 U
PENTACHLOROPHENOL	20 U		20 U		21 U		20 U		20 U		20 U		20 U
PHENANTHRENE					2.1 U								
PHENANTHRENE	0.05 U		0.05 U				0.05 U		0.05 U		0.05 U		0.05 U
PHENOL	5 U		5 U		5.3 UJ		5 U		5 U		5 U		5 U
PYRENE					2.1 U								
PYRENE	0.05 U		0.05 U				0.03 J		0.05 U		0.05 U		0.05 U
Pesticides/PCBs (ug/L)													
4,4'-DDD	0.02 U		0.02 U		0.021 U		0.02 U		0.02 U		0.02 U		0.02 U
4,4'-DDE	0.02 U		0.02 U		0.021 U		0.02 U		0.02 U		0.02 U		0.02 U
4,4'-DDT	0.02 U		0.02 U		0.021 U		0.02 U		0.02 U		0.02 U		0.02 U

SUMMARY OF BACKGROUND GROUNDWATER DATA
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

site	2	2	4	4	4	4	8	8	8	8	8	8	8
location	2LMW35B	2LMW35B	4MW1S	4MW1S	4MW1S	4MW1S	8MW8D	8MW8D	8MW8D	8MW8D	8MW10S	8MW10S	8MW10S
region	CENTRAL	CENTRAL	NORTHERN	NORTHERN	NORTHERN	NORTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN
matrix	GW	GF	GW	GF	GW	GF	GW	GF	GW	GF	GW	GF	GW
sample	S2LMW35B02	S2LMW35B02-F	S4MW01S02	S4MW01S02-F	4GW01S-04	4GW01S-04-F	S8MW08D01	S8MW08D01-F	S8MW08D02	S8MW08D02-F	S8MW10S01	S8MW10S01-F	S8MW10S02
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
ALDRIN	0.01 U		0.01 U		0.01 U		0.01 U		0.01 U		0.01 U		0.01 U
ALPHA-BHC	0.01 U		0.01 U		0.01 U		0.01 U		0.01 U		0.01 U		0.01 U
ALPHA-CHLORDANE	0.01 U		0.01 U		0.01 U		0.01 U		0.01 U		0.01 U		0.01 U
AROCLOR-1016	0.2 U		0.2 U		0.21 U		0.2 U		0.2 U		0.2 U		0.2 U
AROCLOR-1221	0.4 U		0.4 U		0.42 U		0.4 U		0.4 U		0.4 U		0.4 U
AROCLOR-1232	0.2 U		0.2 U		0.21 U		0.2 U		0.2 U		0.2 U		0.2 U
AROCLOR-1242	0.2 U		0.2 U		0.21 U		0.2 U		0.2 U		0.2 U		0.2 U
AROCLOR-1248	0.2 U		0.2 U		0.21 U		0.2 U		0.2 U		0.2 U		0.2 U
AROCLOR-1254	0.2 U		0.2 U		0.21 U		0.2 U		0.2 U		0.2 U		0.2 U
AROCLOR-1260	0.2 U		0.2 U		0.21 U		0.2 U		0.2 U		0.2 U		0.2 U
BETA-BHC	0.01 U		0.01 U		0.01 U		0.01 U		0.01 U		0.01 U		0.01 U
DELTA-BHC	0.01 U		0.01 U		0.01 U		0.01 U		0.01 U		0.01 U		0.01 U
DIELDRIN	0.02 U		0.02 U		0.021 U		0.02 U		0.02 U		0.02 U		0.02 U
ENDOSULFAN I	0.01 U		0.01 U		0.01 U		0.01 U		0.01 U		0.01 U		0.01 U
ENDOSULFAN II	0.02 U		0.02 U		0.021 U		0.02 U		0.02 U		0.02 U		0.02 U
ENDOSULFAN SULFATE	0.02 U		0.02 U		0.021 U		0.02 U		0.02 U		0.02 U		0.02 U
ENDRIN	0.02 U		0.02 U		0.021 U		0.02 U		0.02 U		0.02 U		0.02 U
ENDRIN ALDEHYDE	0.02 U		0.02 U		0.021 U		0.02 U		0.02 U		0.02 U		0.02 U
ENDRIN KETONE	0.02 U		0.02 U		0.021 U		0.02 U		0.02 U		0.02 U		0.02 U
GAMMA-BHC (LINDANE)	0.01 U		0.01 U		0.01 U		0.01 U		0.01 U		0.01 U		0.01 U
GAMMA-CHLORDANE	0.01 U		0.01 U		0.01 U		0.01 U		0.01 U		0.01 U		0.01 U
HEPTACHLOR	0.01 U		0.01 U		0.01 U		0.01 U		0.01 U		0.01 U		0.01 U
HEPTACHLOR EPOXIDE	0.01 U		0.01 U		0.01 U		0.01 U		0.01 U		0.01 U		0.01 U
METHOXYCHLOR	0.1 U		0.1 U		0.1 U		0.1 U		0.1 U		0.1 U		0.1 U
TOXAPHENE	1 U		1 U		1 U		1 U		1 U		1 U		1 U
Total Metals (ug/L)													
ALUMINUM	50.5 U		50.5 U		69.1 U		187		538		388		65.3 U
ANTIMONY	2.6 UJ		2.6 UJ		2.6 U		2.6 U		2.6 UJ		2.6 U		2.6 U
ARSENIC	2.3 U		2.3 U		2.7 U		2.3 U		2.3 U		2.3 U		2.3 U
BARIUM	73.4		50.3		47.8		34.1		41		15.2 U		19.7 U
BERYLLIUM	0.72 U		0.72 U		0.1 U		0.72 U		0.72 U		0.72 U		0.72 U
CADMIUM	0.25 UJ		0.25 UJ		0.32 U		0.25 U		0.25 UJ		0.25 U		0.25 U
CALCIUM	33800		23300		21000		57100		53700		5280		8180
CHROMIUM	25.5		6.2 U		1.3 U		14.6 U		22.5		49.9		8.4 J
COBALT	48.6		4.2 U		0.94 U		25.6		20.1		27.9		8.3 J
COPPER	12.7 J		6.8 U		0.87 U		8 U		8.3 J		36.1		6.8 U
IRON	179 J		6.1 UJ		23.8 U		463 U		745 J		792 U		85.4 U
LEAD	1.8 U		1.8 U		1.9 U		1.8 U		2.3 J		1.8 U		1.8 U
MAGNESIUM	3640		3310		3220		5690 J		5720		1400 J		1760
MANGANESE	13.3 U		7.7 U		8.9		1190 J		992		29.5 J		11.1 U
MERCURY	0.09 UJ		0.09 UJ		0.1 U		0.12 U		0.09 UJ		0.09 U		0.09 U
NICKEL	23.2		9.2 U		1.5 U		9.2 U		18.6		32.2		9.2 U
POTASSIUM	4200		3000		2770		5350		5110		1400		1720
SELENIUM	2.8 U		2.8 U		3.4 UJ		2.8 U		2.8 U		2.8 U		2.8 U
SILVER	7.6 U		7.4 U		1.1 U		5.2 U		8.3 U		5.2 U		5.2 U

SUMMARY OF BACKGROUND GROUNDWATER DATA
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

site	2	2	4	4	4	4	8	8	8	8	8	8	8
location	2LMW35B	2LMW35B	4MW1S	4MW1S	4MW1S	4MW1S	8MW8D	8MW8D	8MW8D	8MW8D	8MW10S	8MW10S	8MW10S
region	CENTRAL	CENTRAL	NORTHERN	NORTHERN	NORTHERN	NORTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN
matrix	GW	GF	GW	GF	GW	GF	GW	GF	GW	GF	GW	GF	GW
sample	S2LMW35B02	S2LMW35B02-F	S4MW01S02	S4MW01S02-F	4GW01S-04	4GW01S-04-F	S8MW08D01	S8MW08D01-F	S8MW08D02	S8MW08D02-F	S8MW10S01	S8MW10S01-F	S8MW10S02
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
SODIUM	68100		28900		28900		65500		66700		11700		23700
THALLIUM	3 U		3 U		5 U		3 U		3 U		3 U		3 U
VANADIUM	6.3 U		6.3 U		0.71 U		6.3 U		6.3 U		6.3 U		6.3 U
ZINC	55.1		10.3 U		5.5 U		131 J		26.4 U		88.1 J		46.9 U
Dissolved Metals (ug/L)													
ALUMINUM, FILTERED		50.5 U		50.5 U		69.1 U		50.5 U		50.5 U		84.5 J	
ANTIMONY, FILTERED		2.6 U		2.6 U		2.6 U		2.6 U		2.6 U		2.6 U	
ARSENIC, FILTERED		2.3 U		2.8 J		2.7 U		2.3 U		2.3 U		2.3 U	
BARIUM, FILTERED		65.7		44.4		46.2		37.1		35.1		15.2 U	
BERYLLIUM, FILTERED		0.72 U		0.72 U		0.1 U		0.72 U		0.72 U		0.72 U	
CADMIUM, FILTERED		0.25 U		0.25 U		0.32 U		0.25 U		0.25 U		0.25 U	
CALCIUM, FILTERED		30500		21000		21100		65700		57800		6250	
CHROMIUM, FILTERED		6.2 U		6.2 U		1.7 J		6.2 U		6.2 U		6.2 U	
COBALT, FILTERED		43.3		4.2 U		1.1 U		29		17.8		4.2 U	
COPPER, FILTERED		11.9 J		6.8 U		0.87 U		10 J		6.8 U		16.5	
IRON, FILTERED		112		13.1 U		23.8 U		164		126		23.7 U	
LEAD, FILTERED		1.8 UJ		1.8 UJ		1.9 U		1.8 U		1.8 UJ		1.8 U	
MAGNESIUM, FILTERED		3520		3140		3250		6430		5990		1520	
MANGANESE, FILTERED		2.7 U		2.7 U		9.2		1370		1050		9.8 J	
MERCURY, FILTERED		0.09 UJ		0.09 UJ		0.1 U		0.09 U		0.09 UJ		0.1 U	
NICKEL, FILTERED		15.3 J		9.2 U		1.8 U		9.2 U		10.9 J		9.2 U	
POTASSIUM, FILTERED		4040		2890		2690		5370		5300		1420	
SELENIUM, FILTERED		2.8 U		2.8 U		3.4 UJ		2.8 U		2.8 U		2.8 U	
SILVER, FILTERED		9.1 U		6.4 U		1.1 U		5.2 U		5.2 U		5.2 U	
SODIUM, FILTERED		68900		28200		28300		70800		75700		13800	
THALLIUM, FILTERED		3 U		3 U		5 U		3 U		3 U		3 U	
VANADIUM, FILTERED		6.3 U		6.3 U		0.71 U		6.3 U		6.3 U		6.3 U	
ZINC, FILTERED		55.2 U		15.5 U		5.2 U		148		26.1 U		56.4	
Miscellaneous Parameters (mg/L)													
ALKALINITY					36.4								
CHEMICAL OXYGEN DEMAND					20 U								
CHLORIDE					39 J		166 J		139		18.6 J		35.3
HARDNESS AS CACO3					65.7								
SULFATE					45.2								
TOTAL DISSOLVED SOLIDS	362		189		156 J		470		479		78.8 U		111
TOTAL ORGANIC CARBON					1.3								
TOTAL SUSPENDED SOLIDS	5 U		5 U		4 U		8		14 J		5 U		5 U

Notes:
U - Not Detected
J - Estimated
R - Rejected

SUMMARY OF BACKGROUND GROUNDWATER DATA
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

site	8	23	23	23	23	23	23	23	23	23	23	23
location	8MW10S	23MW01S	23MW01S	23MW01S	23MW01S	23MW01D	23MW01D	23MW01D	23MW01D	23MW01D	23MW01D	HNUS-23
region	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN
matrix	GF	GW	GF	GW	GF	GW	GF	GW	GW	GF	GF	GW
sample	S8MW10S02-F	S23MW01S01	S23MW01S01-F	S23MW01S02	S23MW01S02-F	S23MW01D01	S23MW01D01-F	S23MW01D02	S23MW01D02-D	S23MW01D02-F	S23MW01D02-F-D	S23HNUS2301
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
Volatile Organics (ug/L)												
1,1,1-TRICHLOROETHANE		1 UJ		1 U		1 UJ		1 U	1 U			1 UJ
1,1,2,2-TETRACHLOROETHANE		1 UJ		1 U		1 UJ		1 U	1 U			1 UJ
1,1,2-TRICHLOROETHANE		1 UJ		1 U		1 UJ		1 U	1 U			1 UJ
1,1-DICHLOROETHANE		1 UJ		1 U		1 UJ		1 U	1 U			1 UJ
1,1-DICHLOROETHENE		1 UJ		1 U		1 UJ		1 U	1 U			1 UJ
1,2,4-TRICHLOROBENZENE		1 UJ		1 U		1 UJ		1 U	1 U			1 UJ
1,2-DIBROMO-3-CHLOROPROPANE		1 UR		1 UR		1 UR		1 UR	1 UR			1 UR
1,2-DIBROMOETHANE		1 UJ		1 U		1 UJ		1 U	1 U			1 UJ
1,2-DICHLOROBENZENE		1 UJ		1 U		1 UJ		1 U	1 U			1 UJ
1,2-DICHLOROETHANE		1 UJ		1 U		1 UJ		1 U	1 U			1 UJ
1,2-DICHLOROPROPANE		1 UJ		1 U		1 UJ		1 U	1 U			1 UJ
1,3-DICHLOROBENZENE		1 UJ		1 U		1 UJ		1 U	1 U			1 UJ
1,4-DICHLOROBENZENE		1 UJ		1 U		1 UJ		1 U	1 U			1 UJ
2-BUTANONE		5 UR		5 UR		5 UR		5 UR	5 UR			5 UR
2-HEXANONE		5 UR		5 U		5 UR		5 U	5 U			5 UR
4-METHYL-2-PENTANONE		5 UJ		5 U		5 UJ		5 U	5 U			5 UJ
ACETONE		7.16 U		5 UR		6.63 U		5 UR	5 UR			11.8 U
BENZENE		1 UJ		1 U		1 UJ		1 U	1 U			1 UJ
BROMOCHLOROMETHANE		1 UJ		1 U		1 UJ		1 U	1 U			1 UJ
BROMODICHLOROMETHANE		1 UJ		1 U		1 UJ		1 U	1 U			1 UJ
BROMOFORM		1 UJ		1 U		1 UJ		1 U	1 U			1 UJ
BROMOMETHANE		1 UJ		1 UJ		1 UJ		1 UJ	1 UJ			1 UJ
CARBON DISULFIDE		1 UJ		1 U		1 UJ		1 U	1 U			1 UJ
CARBON TETRACHLORIDE		1 UJ		1 U		1 UJ		1 U	1 U			1 UJ
CHLOROBENZENE		1 UJ		1 U		1 UJ		1 U	1 U			1 UJ
CHLOROETHANE		1 UJ		1 U		1 UJ		1 U	1 U			1 UJ
CHLOROFORM		1 UJ		1 U		1 UJ		1 U	1 U			1 UJ
CHLOROMETHANE		1 UJ		1 U		1 UJ		1 U	1 U			1 UJ
CIS-1,2-DICHLOROETHENE		1 UJ		1 U		1 UJ		1 U	1 U			1 UJ
CIS-1,3-DICHLOROPROPENE		1 UJ		1 U		1 UJ		1 U	1 U			1 UJ
DIBROMOCHLOROMETHANE		1 UJ		1 U		1 UJ		1 U	1 U			1 UJ
ETHYLBENZENE		1 UJ		1 U		1 UJ		1 U	1 U			1 UJ
M+P-XYLENES		2 UJ		2 U		2 UJ		2 U	2 U			2 UJ
METHYLENE CHLORIDE		2.82 U		2 U		2.62 U		2.15 U	2 U			2.64 U
O-XYLENE		1 UJ		1 U		1 UJ		1 U	1 U			1 UJ
STYRENE		1 UJ		1 U		1 UJ		1 U	1 U			1 UJ
TETRACHLOROETHENE		1 UJ		1 U		1 UJ		1 U	1 U			1 UJ
TOLUENE		1 UJ		1 U		1 UJ		1 U	1 U			1 UJ
TRANS-1,2-DICHLOROETHENE		1 UJ		1 U		1 UJ		1 U	1 U			1 UJ
TRANS-1,3-DICHLOROPROPENE		1 UJ		1 U		1 UJ		1 U	1 U			1 UJ
TRICHLOROETHENE		1 UJ		1 U		1 UJ		1 U	1 U			1 UJ
VINYL CHLORIDE		1 UJ		1 U		1 UJ		1 U	1 U			1 UJ
XYLENES, TOTAL		1 UJ		1 U		1 UJ		1 U	1 U			1 UJ

SUMMARY OF BACKGROUND GROUNDWATER DATA
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

site	8	23	23	23	23	23	23	23	23	23	23	23
location	8MW10S	23MW01S	23MW01S	23MW01S	23MW01S	23MW01D	23MW01D	23MW01D	23MW01D	23MW01D	23MW01D	HNUS-23
region	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN
matrix	GF	GW	GF	GW	GF	GW	GF	GW	GW	GF	GF	GW
sample	S8MW10S02-F	S23MW01S01	S23MW01S01-F	S23MW01S02	S23MW01S02-F	S23MW01D01	S23MW01D01-F	S23MW01D02	S23MW01D02-D	S23MW01D02-F	S23MW01D02-F-D	S23HNUS2301
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
Semivolatile Organics (ug/L)												
1,2,4-TRICHLOROBENZENE		5 U				5 U						5 U
1,2-DICHLOROBENZENE		5 U				5 U						5 U
1,3-DICHLOROBENZENE		5 U				5 U						5 U
1,4-DICHLOROBENZENE		5 U				5 U						5 U
1-METHYLNAPHTHALENE				0.5 U				0.5 U	0.5 U			
2,2'-OXYBIS(1-CHLOROPROPANE)		5 U		5 U		5 U		5 U	5 U			5 U
2,4,5-TRICHLOROPHENOL		20 U		20 U		20 U		20 U	20 U			20 U
2,4,6-TRICHLOROPHENOL		5 U		5 U		5 U		5 U	5 U			5 U
2,4-DICHLOROPHENOL		5 U		5 U		5 U		5 U	5 U			5 U
2,4-DIMETHYLPHENOL		5 U		5 U		5 U		5 U	5 U			5 U
2,4-DINITROPHENOL		20 U		20 U		20 U		20 U	20 U			20 U
2,4-DINITROTOLUENE		5 U		5 U		5 U		5 U	5 U			5 U
2,6-DINITROTOLUENE		5 U		5 U		5 U		5 U	5 U			5 U
2-CHLORONAPHTHALENE		5 U		5 U		5 U		5 U	5 U			5 U
2-CHLOROPHENOL		5 U		5 UJ		5 U		5 UJ	5 UJ			5 U
2-METHYLNAPHTHALENE		5 U				5 U						5 U
2-METHYLNAPHTHALENE				0.5 U				0.5 U	0.5 U			
2-METHYLPHENOL		5 U		5 U		5 U		5 U	5 U			5 U
2-NITROANILINE		20 U		20 U		20 U		20 U	20 U			20 U
2-NITROPHENOL		5 U		5 U		5 U		5 U	5 U			5 U
3&4-METHYLPHENOL												
3,3'-DICHLOROBENZIDINE		5 U		5 U		5 U		5 U	5 U			5 U
3-NITROANILINE		20 U		20 U		20 U		20 U	20 U			20 U
4,6-DINITRO-2-METHYLPHENOL		20 U		20 U		20 U		20 U	20 U			20 U
4-BROMOPHENYL PHENYL ETHER		5 U		5 U		5 U		5 U	5 U			5 U
4-CHLORO-3-METHYLPHENOL		5 U		5 U		5 U		5 U	5 U			5 U
4-CHLOROANILINE		5 U		5 U		5 U		5 U	5 U			5 U
4-CHLOROPHENYL PHENYL ETHER		5 U		5 U		5 U		5 U	5 U			5 U
4-METHYLPHENOL		5 U		5 U		5 U		5 U	5 U			5 U
4-NITROANILINE		20 U		20 U		20 U		20 U	20 U			20 U
4-NITROPHENOL		20 U		20 U		20 U		20 U	20 U			20 U
ACENAPHTHENE		5 U				5 U						5 U
ACENAPHTHENE				0.5 U				0.5 U	0.5 U			
ACENAPHTHYLENE		5 U				5 U						5 U
ACENAPHTHYLENE				1 U				1 U	1 U			
ANTHRACENE		5 U				5 U						5 U
ANTHRACENE				0.05 U				0.05 U	0.05 U			
BENZO(A)ANTHRACENE		5 U				5 U						5 U
BENZO(A)ANTHRACENE				0.05 U				0.05 U	0.05 U			
BENZO(A)PYRENE		5 U				5 U						5 U
BENZO(A)PYRENE				0.05 U				0.05 U	0.05 U			
BENZO(B)FLUORANTHENE		5 U				5 U						5 U
BENZO(B)FLUORANTHENE				0.1 U				0.1 U	0.1 U			
BENZO(G,H,I)PERYLENE		5 U				5 U						5 U

SUMMARY OF BACKGROUND GROUNDWATER DATA
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

site	8	23	23	23	23	23	23	23	23	23	23	23
location	8MW10S	23MW01S	23MW01S	23MW01S	23MW01S	23MW01D	23MW01D	23MW01D	23MW01D	23MW01D	23MW01D	HNUS-23
region	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN
matrix	GF	GW	GF	GW	GF	GW	GF	GW	GW	GF	GF	GW
sample	S8MW10S02-F	S23MW01S01	S23MW01S01-F	S23MW01S02	S23MW01S02-F	S23MW01D01	S23MW01D01-F	S23MW01D02	S23MW01D02-D	S23MW01D02-F	S23MW01D02-F-D	S23HNUS2301
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
BENZO(G,H,I)PERYLENE				0.1 U				0.1 U	0.1 U			
BENZO(K)FLUORANTHENE		5 U				5 U						5 U
BENZO(K)FLUORANTHENE				0.05 U				0.05 U	0.05 U			
BENZOIC ACID												
BIS(2-CHLOROETHOXY)METHANE		5 U		5 U		5 U		5 U	5 U			5 U
BIS(2-CHLOROETHYL)ETHER		5 U		5 UJ		5 U		5 UJ	5 UJ			5 U
BIS(2-CHLOROISOPROPYL)ETHER												
BIS(2-ETHYLHEXYL)PHTHALATE		5 U		5 U		5 U		5 U	5 U			5 U
BUTYLBENZYL PHTHALATE		5 U		5 U		5 U		5 U	5 U			5 U
CARBAZOLE		5 U				5 U						5 U
CHRYSENE		5 U				5 U						5 U
CHRYSENE				0.05 U				0.05 U	0.05 U			
DIBENZO(A,H)ANTHRACENE		5 U				5 U						5 U
DIBENZO(A,H)ANTHRACENE				0.1 U				0.1 U	0.1 U			
DIBENZOFURAN		5 U				5 U						5 U
DIETHYL PHTHALATE		5 U		5 U		5 U		5 U	5 U			5 U
DIMETHYL PHTHALATE		5 U		5 U		5 U		5 U	5 U			5 U
DI-N-BUTYL PHTHALATE		5 U		5 U		5 U		5 U	5 U			5 U
DI-N-OCTYL PHTHALATE		5 U		5 U		5 U		5 U	5 U			5 U
FLUORANTHENE		5 U				5 U						5 U
FLUORANTHENE				0.1 U				0.1 U	0.1 U			
FLUORENE		5 U				5 U						5 U
FLUORENE				0.1 U				0.1 U	0.1 U			
HEXACHLOROBENZENE		5 U		5 UJ		5 U		5 UJ	5 UJ			5 U
HEXACHLOROBUTADIENE		5 U		5 U		5 U		5 U	5 U			5 U
HEXACHLOROCYCLOPENTADIENE		5 U		5 U		5 U		5 U	5 U			5 U
HEXACHLOROETHANE		5 U		5 U		5 U		5 U	5 U			5 U
INDENO(1,2,3-CD)PYRENE		5 U				5 U						5 U
INDENO(1,2,3-CD)PYRENE				0.05 U				0.05 U	0.05 U			
ISOPHORONE		5 U		5 U		5 U		5 U	5 U			5 U
NAPHTHALENE		5 U				5 U						5 U
NAPHTHALENE				0.5 U				0.5 U	0.5 U			
NITROBENZENE		5 U		5 U		5 U		5 U	5 U			5 U
N-NITROSO-DI-N-PROPYLAMINE		5 U		5 U		5 U		5 U	5 U			5 U
N-NITROSODIPHENYLAMINE		5 U		5 U		5 U		5 U	5 U			5 U
PENTACHLOROPHENOL		20 U		20 U		20 U		20 U	20 U			20 U
PHENANTHRENE		5 U				5 U						5 U
PHENANTHRENE				0.05 U				0.05 U	0.05 U			
PHENOL		5 U		5 U		5 U		5 U	5 U			5 U
PYRENE		5 U				5 U						5 U
PYRENE				0.05 U				0.05 U	0.05 U			
Pesticides/PCBs (ug/L)												
4,4'-DDD		0.02 U		0.02 U		0.02 U		0.02 U	0.02 U			0.1 U
4,4'-DDE		0.02 U		0.02 U		0.02 U		0.02 U	0.02 U			0.1 U
4,4'-DDT		0.02 U		0.02 U		0.02 U		0.02 U	0.02 U			0.1 U

SUMMARY OF BACKGROUND GROUNDWATER DATA
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

site	8	23	23	23	23	23	23	23	23	23	23	23
location	8MW10S	23MW01S	23MW01S	23MW01S	23MW01S	23MW01D	23MW01D	23MW01D	23MW01D	23MW01D	23MW01D	HNUS-23
region	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN
matrix	GF	GW	GF	GW	GF	GW	GF	GW	GW	GF	GF	GW
sample	S8MW10S02-F	S23MW01S01	S23MW01S01-F	S23MW01S02	S23MW01S02-F	S23MW01D01	S23MW01D01-F	S23MW01D02	S23MW01D02-D	S23MW01D02-F	S23MW01D02-F-D	S23HNUS2301
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
ALDRIN		0.01 U		0.01 U		0.01 U		0.01 U	0.01 U			0.05 U
ALPHA-BHC		0.01 U		0.01 U		0.01 U		0.01 U	0.01 U			0.05 U
ALPHA-CHLORDANE		0.01 U		0.01 U		0.01 U		0.01 U	0.01 U			0.05 U
AROCLOR-1016		0.2 U		0.2 U		0.2 U		0.2 U	0.2 U			1 U
AROCLOR-1221		0.4 U		0.4 U		0.4 U		0.4 U	0.4 U			2 U
AROCLOR-1232		0.2 U		0.2 U		0.2 U		0.2 U	0.2 U			1 U
AROCLOR-1242		0.2 U		0.2 U		0.2 U		0.2 U	0.2 U			1 U
AROCLOR-1248		0.2 U		0.2 U		0.2 U		0.2 U	0.2 U			1 U
AROCLOR-1254		0.2 U		0.2 U		0.2 U		0.2 U	0.2 U			1 U
AROCLOR-1260		0.2 U		0.2 U		0.2 U		0.2 U	0.2 U			1 U
BETA-BHC		0.01 U		0.01 U		0.01 U		0.01 U	0.01 U			0.05 U
DELTA-BHC		0.01 U		0.01 U		0.01 U		0.01 U	0.01 U			0.05 U
DIELDRIN		0.02 U		0.02 U		0.02 U		0.02 U	0.02 U			0.1 U
ENDOSULFAN I		0.01 U		0.01 U		0.01 U		0.01 U	0.01 U			0.05 U
ENDOSULFAN II		0.02 U		0.02 U		0.02 U		0.02 U	0.02 U			0.1 U
ENDOSULFAN SULFATE		0.02 U		0.02 U		0.02 U		0.02 U	0.02 U			0.1 U
ENDRIN		0.02 U		0.02 U		0.02 U		0.02 U	0.02 U			0.1 U
ENDRIN ALDEHYDE		0.02 U		0.02 U		0.02 U		0.02 U	0.02 U			0.1 U
ENDRIN KETONE		0.02 U		0.02 U		0.02 U		0.02 U	0.02 U			0.1 U
GAMMA-BHC (LINDANE)		0.01 U		0.01 U		0.01 U		0.01 U	0.01 U			0.05 U
GAMMA-CHLORDANE		0.01 U		0.01 U		0.01 U		0.01 U	0.01 U			0.05 U
HEPTACHLOR		0.01 U		0.01 U		0.01 U		0.01 U	0.01 U			0.05 U
HEPTACHLOR EPOXIDE		0.01 U		0.01 U		0.01 U		0.01 U	0.01 U			0.05 U
METHOXYCHLOR		0.1 U		0.1 U		0.1 U		0.1 U	0.1 U			0.5 U
TOXAPHENE		1 U		1 U		1 U		1 U	1 U			5 U
Total Metals (ug/L)												
ALUMINUM		62.1 U		50.5 U		50.5 U		50.5 U	50.5 U			1080
ANTIMONY		2.6 U		2.6 UJ		2.6 U		2.6 UJ	2.6 UJ			2.6 U
ARSENIC		2.3 U		2.3 U		2.3 U		2.3 U	2.3 U			2.3 U
BARIUM		27.5 U		21.4 U		56.7		61	59.8			49.8
BERYLLIUM		0.72 U		0.72 U		0.72 U		0.72 U	0.72 U			0.72 U
CADMIUM		0.25 U		0.25 UJ		0.25 U		0.25 UJ	0.25 UJ			0.25 U
CALCIUM		13000		14500 J		9770		12700 J	12200 J			37000
CHROMIUM		6.2 U		6.2 U		19.5		7.1 J	6.2 U			19
COBALT		10.4 U		4.2 U		10.4 U		4.2 U	4.2 U			6.1 U
COPPER		6.8 U		8.2 J		6.8 U		7 J	7.6 J			6.8 U
IRON		120 U		73.8 J		76 U		47.6 U	36.4 U			1440
LEAD		1.8 U		1.8 U		1.8 U		5.1 J	5.1 J			1.8 U
MAGNESIUM		3150		3370		2440		3200	2930			8650
MANGANESE		87.8		30.1 U		10.2 U		2.8 U	11.2 U			128
MERCURY		0.09 U		0.09 UJ		0.1 U		0.09 UJ	0.09 UJ			0.09 U
NICKEL		9.2 U		9.2 U		9.9 U		9.2 U	9.2 U			15.4 U
POTASSIUM		3280		3210		2220		2410	2390			3240
SELENIUM		2.8 U		2.8 U		2.8 U		2.8 U	2.8 U			2.8 U
SILVER		5.2 U		5.7 U		5.2 U		8.4 U	6.6 U			5.2 U

SUMMARY OF BACKGROUND GROUNDWATER DATA
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

site	8	23	23	23	23	23	23	23	23	23	23	23
location	8MW10S	23MW01S	23MW01S	23MW01S	23MW01S	23MW01D	23MW01D	23MW01D	23MW01D	23MW01D	23MW01D	HNUS-23
region	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN	SOUTHERN
matrix	GF	GW	GF	GW	GF	GW	GF	GW	GF	GF	GF	GW
sample	S8MW10S02-F	S23MW01S01	S23MW01S01-F	S23MW01S02	S23MW01S02-F	S23MW01D01	S23MW01D01-F	S23MW01D02	S23MW01D02-D	S23MW01D02-F	S23MW01D02-F-D	S23HNUS2301
validated	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
cto_proj	312	312	312	312	312	312	312	312	312	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.	CERCONE, D.
SODIUM		15100		16100		14700		18600	16900			14000
THALLIUM		3 U		3 U		3 U		3 U	3 U			3 U
VANADIUM		6.3 U		6.3 U		6.3 U		6.3 U	6.3 U			6.3 U
ZINC		17.6 U		20.4 U		19.5 U		23.5 U	26.5 U			18.4 U
Dissolved Metals (ug/L)												
ALUMINUM, FILTERED	118 U		59.2 U		50.5 U		50.5 U			50.5 U	50.5 U	
ANTIMONY, FILTERED	2.6 U		2.6 U		2.6 U		2.6 U			2.6 U	2.6 U	
ARSENIC, FILTERED	2.3 U		2.3 U		2.3 U		2.3 U			2.3 U	2.3 U	
BARIUM, FILTERED	22.1 U		18.1 U		18.6		61.7			61.2	58.5	
BERYLLIUM, FILTERED	0.72 U		0.72 U		0.72 U		0.72 U			0.72 U	0.72 U	
CADMIUM, FILTERED	0.25 U		0.25 U		0.25 U		0.25 U			0.25 U	0.25 U	
CALCIUM, FILTERED	8680		13800		13800		11500			13100	12200	
CHROMIUM, FILTERED	6.2 U		8.1 J		6.2 U		17.9			11.6 J	6.8 J	
COBALT, FILTERED	4.2 U		20.9 U		4.2 U		19.1 U			4.2 U	4.2 U	
COPPER, FILTERED	6.8 U		6.8 U		9.5 J		6.8 U			11.3 J	8.3 J	
IRON, FILTERED	72.7 U		115 U		59.2 U		48.8 U			32.9 U	55.5 U	
LEAD, FILTERED	2.3 J		1.8 U		1.8 UJ		1.8 U			1.8 UJ	1.8 UJ	
MAGNESIUM, FILTERED	1840		3330		3280		2850			3200	2980	
MANGANESE, FILTERED	20.2 U		87.3		25.1		2.7 U			6.6 U	2.7 U	
MERCURY, FILTERED	0.09 U		0.07 U		0.09 UJ		0.08 U			0.09 UJ	0.09 UJ	
NICKEL, FILTERED	9.2 U		16.5 U		9.2 U		9.2 U			9.2 U	9.2 U	
POTASSIUM, FILTERED	1850		3330		3240		2540			2540	2330	
SELENIUM, FILTERED	2.8 U		2.8 U		2.8 U		2.8 U			2.8 U	2.8 U	
SILVER, FILTERED	5.2 U		5.2 U		10.1 U		5.2 U			8.4 U	9 U	
SODIUM, FILTERED	26100		15500		16400		17200			19000	17800	
THALLIUM, FILTERED	3 U		3 U		3 U		3 U			3 U	3 U	
VANADIUM, FILTERED	6.3 U		6.3 U		6.3 U		6.3 U			6.3 U	6.3 U	
ZINC, FILTERED	44.4 U		24.4 U		26.1 U		28.4 U			45.5 U	30 U	
Miscellaneous Parameters (mg/L)												
ALKALINITY												
CHEMICAL OXYGEN DEMAND												
CHLORIDE		27.8		28.8		22.4		22.7	22.7			23.4
HARDNESS AS CACO3												
SULFATE												
TOTAL DISSOLVED SOLIDS		144		149		121		126	121			239
TOTAL ORGANIC CARBON												
TOTAL SUSPENDED SOLIDS		30		5 U		5 U		5 U	5 U			89

Notes:
U - Not Detected
J - Estimated
R - Rejected

SUMMARY OF BACKGROUND GROUNDWATER DATA
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

site	23	23	23
location	HNUS-23	HNUS-23	HNUS-23
region	SOUTHERN	SOUTHERN	SOUTHERN
matrix	GF	GW	GF
sample	S23HNUS2301-F	S23HNUS2302	S23HNUS2302-F
validated	TRUE	TRUE	TRUE
cto_proj	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.
Volatile Organics (ug/L)			
1,1,1-TRICHLOROETHANE		1 U	
1,1,2,2-TETRACHLOROETHANE		1 U	
1,1,2-TRICHLOROETHANE		1 U	
1,1-DICHLOROETHANE		1.09	
1,1-DICHLOROETHENE		1 U	
1,2,4-TRICHLOROBENZENE		1 U	
1,2-DIBROMO-3-CHLOROPROPANE		1 UR	
1,2-DIBROMOETHANE		1 U	
1,2-DICHLOROBENZENE		1 U	
1,2-DICHLOROETHANE		1 U	
1,2-DICHLOROPROPANE		1 U	
1,3-DICHLOROBENZENE		1 U	
1,4-DICHLOROBENZENE		1 U	
2-BUTANONE		5 UR	
2-HEXANONE		5 U	
4-METHYL-2-PENTANONE		5 U	
ACETONE		5 UR	
BENZENE		1 U	
BROMOCHLOROMETHANE		1 U	
BROMODICHLOROMETHANE		1 U	
BROMOFORM		1 U	
BROMOMETHANE		1 U	
CARBON DISULFIDE		1 U	
CARBON TETRACHLORIDE		1 U	
CHLOROBENZENE		1 U	
CHLOROETHANE		1 U	
CHLOROFORM		1 U	
CHLOROMETHANE		1 U	
CIS-1,2-DICHLOROETHENE		1 U	
CIS-1,3-DICHLOROPROPENE		1 U	
DIBROMOCHLOROMETHANE		1 U	
ETHYLBENZENE		1 U	
M+P-XYLENES		2 U	
METHYLENE CHLORIDE		2.04 U	
O-XYLENE		1 U	
STYRENE		1 U	
TETRACHLOROETHENE		1 U	
TOLUENE		1 U	
TRANS-1,2-DICHLOROETHENE		1 U	
TRANS-1,3-DICHLOROPROPENE		1 U	
TRICHLOROETHENE		1 U	
VINYL CHLORIDE		1 U	
XYLENES, TOTAL		1 U	

SUMMARY OF BACKGROUND GROUNDWATER DATA
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

site	23	23	23
location	HNUS-23	HNUS-23	HNUS-23
region	SOUTHERN	SOUTHERN	SOUTHERN
matrix	GF	GW	GF
sample	S23HNUS2301-F	S23HNUS2302	S23HNUS2302-F
validated	TRUE	TRUE	TRUE
cto_proj	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.
Semivolatile Organics (ug/L)			
1,2,4-TRICHLOROBENZENE			
1,2-DICHLOROBENZENE			
1,3-DICHLOROBENZENE			
1,4-DICHLOROBENZENE			
1-METHYLNAPHTHALENE		0.5 U	
2,2'-OXYBIS(1-CHLOROPROPANE)		5 U	
2,4,5-TRICHLOROPHENOL		20 U	
2,4,6-TRICHLOROPHENOL		5 U	
2,4-DICHLOROPHENOL		5 U	
2,4-DIMETHYLPHENOL		5 U	
2,4-DINITROPHENOL		20 U	
2,4-DINITROTOLUENE		5 U	
2,6-DINITROTOLUENE		5 U	
2-CHLORONAPHTHALENE		5 U	
2-CHLOROPHENOL		5 UJ	
2-METHYLNAPHTHALENE			
2-METHYLNAPHTHALENE		0.5 U	
2-METHYLPHENOL		5 U	
2-NITROANILINE		20 U	
2-NITROPHENOL		5 U	
3&4-METHYLPHENOL			
3,3'-DICHLOROBENZIDINE		5 U	
3-NITROANILINE		20 U	
4,6-DINITRO-2-METHYLPHENOL		20 U	
4-BROMOPHENYL PHENYL ETHER		5 U	
4-CHLORO-3-METHYLPHENOL		5 U	
4-CHLOROANILINE		5 U	
4-CHLOROPHENYL PHENYL ETHER		5 U	
4-METHYLPHENOL		5 U	
4-NITROANILINE		20 U	
4-NITROPHENOL		20 U	
ACENAPHTHENE			
ACENAPHTHENE		0.5 U	
ACENAPHTHYLENE			
ACENAPHTHYLENE		1 U	
ANTHRACENE			
ANTHRACENE		0.05 U	
BENZO(A)ANTHRACENE			
BENZO(A)ANTHRACENE		0.05 U	
BENZO(A)PYRENE			
BENZO(A)PYRENE		0.05 U	
BENZO(B)FLUORANTHENE			
BENZO(B)FLUORANTHENE		0.1 U	
BENZO(G,H,I)PERYLENE			

SUMMARY OF BACKGROUND GROUNDWATER DATA
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

site	23	23	23
location	HNUS-23	HNUS-23	HNUS-23
region	SOUTHERN	SOUTHERN	SOUTHERN
matrix	GF	GW	GF
sample	S23HNUS2301-F	S23HNUS2302	S23HNUS2302-F
validated	TRUE	TRUE	TRUE
cto_proj	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.
BENZO(G,H,I)PERYLENE		0.1 U	
BENZO(K)FLUORANTHENE			
BENZO(K)FLUORANTHENE		0.05 U	
BENZOIC ACID			
BIS(2-CHLOROETHOXY)METHANE		5 U	
BIS(2-CHLOROETHYL)ETHER		5 UJ	
BIS(2-CHLOROISOPROPYL)ETHER			
BIS(2-ETHYLHEXYL)PHTHALATE		5 U	
BUTYLBENZYL PHTHALATE		5 U	
CARBAZOLE			
CHRYSENE			
CHRYSENE		0.05 U	
DIBENZO(A,H)ANTHRACENE			
DIBENZO(A,H)ANTHRACENE		0.1 U	
DIBENZOFURAN			
DIETHYL PHTHALATE		5 U	
DIMETHYL PHTHALATE		5 U	
DI-N-BUTYL PHTHALATE		5 U	
DI-N-OCTYL PHTHALATE		5 U	
FLUORANTHENE			
FLUORANTHENE		0.1 U	
FLUORENE			
FLUORENE		0.1 U	
HEXACHLOROBENZENE		5 UJ	
HEXACHLOROBUTADIENE		5 U	
HEXACHLOROCYCLOPENTADIENE		5 U	
HEXACHLOROETHANE		5 U	
INDENO(1,2,3-CD)PYRENE			
INDENO(1,2,3-CD)PYRENE		0.05 U	
ISOPHORONE		5 U	
NAPHTHALENE			
NAPHTHALENE		0.5 U	
NITROBENZENE		5 U	
N-NITROSO-DI-N-PROPYLAMINE		5 U	
N-NITROSODIPHENYLAMINE		5 U	
PENTACHLOROPHENOL		20 U	
PHENANTHRENE			
PHENANTHRENE		0.05 U	
PHENOL		5 U	
PYRENE			
PYRENE		0.05 U	
Pesticides/PCBs (ug/L)			
4,4'-DDD		0.02 U	
4,4'-DDE		0.02 U	
4,4'-DDT		0.02 U	

SUMMARY OF BACKGROUND GROUNDWATER DATA
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

site	23	23	23
location	HNUS-23	HNUS-23	HNUS-23
region	SOUTHERN	SOUTHERN	SOUTHERN
matrix	GF	GW	GF
sample	S23HNUS2301-F	S23HNUS2302	S23HNUS2302-F
validated	TRUE	TRUE	TRUE
cto_proj	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.
ALDRIN		0.01 U	
ALPHA-BHC		0.01 U	
ALPHA-CHLORDANE		0.01 U	
AROCLOR-1016		0.2 U	
AROCLOR-1221		0.4 U	
AROCLOR-1232		0.2 U	
AROCLOR-1242		0.2 U	
AROCLOR-1248		0.2 U	
AROCLOR-1254		0.2 U	
AROCLOR-1260		0.2 U	
BETA-BHC		0.01 U	
DELTA-BHC		0.01 U	
DIELDRIN		0.02 U	
ENDOSULFAN I		0.01 U	
ENDOSULFAN II		0.02 U	
ENDOSULFAN SULFATE		0.02 U	
ENDRIN		0.02 U	
ENDRIN ALDEHYDE		0.02 U	
ENDRIN KETONE		0.02 U	
GAMMA-BHC (LINDANE)		0.01 U	
GAMMA-CHLORDANE		0.01 U	
HEPTACHLOR		0.01 U	
HEPTACHLOR EPOXIDE		0.01 U	
METHOXYCHLOR		0.1 U	
TOXAPHENE		1 U	
Total Metals (ug/L)			
ALUMINUM		272	
ANTIMONY		6.2 J	
ARSENIC		2.3 U	
BARIUM		51.4	
BERYLLIUM		0.72 U	
CADMIUM		0.25 UJ	
CALCIUM		30800	
CHROMIUM		6.2 U	
COBALT		4.2 U	
COPPER		6.8 U	
IRON		276 J	
LEAD		2 J	
MAGNESIUM		7650	
MANGANESE		138	
MERCURY		0.09 UJ	
NICKEL		9.2 U	
POTASSIUM		3460	
SELENIUM		2.8 U	
SILVER		5.6 U	

SUMMARY OF BACKGROUND GROUNDWATER DATA
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

site	23	23	23
location	HNUS-23	HNUS-23	HNUS-23
region	SOUTHERN	SOUTHERN	SOUTHERN
matrix	GF	GW	GF
sample	S23HNUS2301-F	S23HNUS2302	S23HNUS2302-F
validated	TRUE	TRUE	TRUE
cto_proj	312	312	312
proj_manag	CERCONE, D.	CERCONE, D.	CERCONE, D.
SODIUM		27100	
THALLIUM		3 U	
VANADIUM		6.3 U	
ZINC		10.2 U	
Dissolved Metals (ug/L)			
ALUMINUM, FILTERED	118 U		50.5 U
ANTIMONY, FILTERED	3.8 U		2.6 U
ARSENIC, FILTERED	2.3 U		2.3 U
BARIUM, FILTERED	37		40.4
BERYLLIUM, FILTERED	0.72 U		0.72 U
CADMIUM, FILTERED	0.25 U		0.25 U
CALCIUM, FILTERED	35400		25900
CHROMIUM, FILTERED	19		6.2 U
COBALT, FILTERED	10.4 U		4.2 U
COPPER, FILTERED	6.8 U		6.8 U
IRON, FILTERED	232		23.8 U
LEAD, FILTERED	1.8 U		1.8 UJ
MAGNESIUM, FILTERED	7730		6790
MANGANESE, FILTERED	116		106
MERCURY, FILTERED	0.08 U		0.09 UJ
NICKEL, FILTERED	15.9 U		9.2 U
POTASSIUM, FILTERED	2680		3080
SELENIUM, FILTERED	2.8 U		2.8 U
SILVER, FILTERED	5.2 U		7.8 U
SODIUM, FILTERED	14000		26100
THALLIUM, FILTERED	3 U		3 U
VANADIUM, FILTERED	6.3 U		6.3 U
ZINC, FILTERED	17.5 U		11.6 U
Miscellaneous Parameters (mg/L)			
ALKALINITY			
CHEMICAL OXYGEN DEMAND			
CHLORIDE		54.8	
HARDNESS AS CACO3			
SULFATE			
TOTAL DISSOLVED SOLIDS		240	
TOTAL ORGANIC CARBON			
TOTAL SUSPENDED SOLIDS		5 U	

Notes:
U - Not Detected
J - Estimated
R - Rejected

APPENDIX C

SUPPORTING INFORMATION FOR HUMAN HEALTH RISK ASSESSMENT

C.1 Screening Criteria
C.2 Background Soil Data
C.3 Toxicological Profiles
C.4 Sample Calculations
C.5 RAGS Part D Tables
C.6 Lead Modeling Results

APPENDIX C.1

SCREENING CRITERIA

APPENDIX C.1

SCREENING CRITERIA

C.1.1 USEPA Region IX Preliminary Remedial Goals Table (November 2000)
COC Screening Levels for Residential Soil Ingestion and Tap Water Ingestion

C.1.2 Connecticut Remediation Standard Regulations (RSRs)
Direct Exposure (Residential and Industrial)
Connecticut RSRs for Pollutant Mobility (GB Classified Area)
Connecticut RSRs for the Protection of Groundwater (GA/GAA)

C.1.3 USEPA Generic Soil Screening Levels (SSLs)
Transfers from Soil to Air (Inhalation) Migration to Groundwater

C.1.4 Federal Maximum Contaminant Levels (MCLs)

C.1.5 State Maximum Contaminant Levels (MCLs)

C.1.6 Connecticut Water Quality Standards (WQSs)

C.1.7 USEPA Region III Risk Based Concentration Table (October 2000) COC Screening Levels for Residential Soil Ingestion and Tap Water Ingestion

APPENDIX C.1.1

USEPA REGION IX PRELIMINARY REMEDIAL GOALS TABLE (NOVEMBER 2000) COC SCREENING LEVELS FOR RESIDENTIAL SOIL INGESTION AND TAP WATER INGESTION

EPA United States Environmental Protection Agency Waste Programs

Region 9

PRGs: What's New in 2000

Subject: Region 9 PRGs Table 2000 Update

From: Stanford J. Smucker, Ph.D.
Regional Toxicologist (SFD-8-B)
Technical Support Group

To: PRG Table Users

The Region 9 PRGs Table has been updated. You can find it at the PRG home page on the Web at: http://www.epa.gov/region09/waste/sfund/prg/.

PRG Home | What's New
FAQ | Other Links

R9 PRG Tables:
A-Bu | Ca-De | Di-Fe | Fl-Mo | Na-Pu | Py-Zi
Soil Calculations:
A-Bu | Ca-De | Di-Fe | Fl-Mo | Na-Pu | Py-Zi
Air-Water Calculations:
A-Bu | Ca-De | Di-Fe | Fl-Mo | Na-Pu | Py-Zi
Toxicity Values:
A-Bu | Ca-De | Di-Fe | Fl-Mo | Na-Pu | Py-Zi
Phys-Chem Data:
A-Di | Ep-Tr

To minimize paper usage, the PRGs Table is now primarily available through the Internet. A PRG mailing list will no longer be maintained for sending out printed copies.

The risk-based concentrations ("PRGs") presented in the Table reflect state-of-the-science approaches in toxicology and exposure assessment. Chemicals for which new toxicity values have been added in the 2000 update include: **benzene, chlorine, cyclohexane, 4,4'-dichlorobenzophenone, 1,3-dichloropropene, diisononyl phthalate, n,n-diphenyl-1,4 benzenediamine (DPPD), dysprosium, ethylene glycol monobutyl ether, hexachlorobutadiene, monomethyl and dimethyl hydrazines, 1,1'-sulfonylbis(4-chlorobenzene), thallium, trimellitic anhydride (TMAN), triphenylphosphine oxide, tris(2-chloroethyl) phosphate, vinyl chloride and uranium.** In addition, **lead** in industrial soils has a new "screening" PRG based on the recommendations of the Technical Review Workgroup (TRW) for Lead. Finally, two new "Cal-Modified PRGs" have been added for **1,1-dichloroethane** and **MTBE** based on California EPA toxicity values. EXIT EPA

In this update, there are no changes to the exposure factors used to calculate PRGs. We are hopeful that the Dermal Guidance document entitled "Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim Guidance" will be officially released in the near future. The recommendations of the dermal workgroup that had previously been incorporated in the 1999 PRG Table for soil exposures have not changed.

Before relying on any number in the table, it is recommended that the user verify the numbers with an agency toxicologist or risk assessor because the toxicity / exposure information in the table may contain errors or default assumptions that need to be refined based on further evaluation. If you find an error please send me a note via email at smucker.stan@epa.gov .

Region 9 Waste Home | Region 9 Superfund Home | Region 9 PRG Home
Region 9 Home | EPA Home | Search | Comments/Questions

Region 9 Office: 75 Hawthorne St., San Francisco, Calif., 94105

Send PRG-related comments and questions to smucker.stan@epa.gov

Posted: November 3, 2000

URL: http://www.epa.gov/region09/waste/sfund/prg/whatsnew.htm

DISCLAIMER

Preliminary remediation goals (PRGs) focus on common exposure pathways and may not consider all exposure pathways encountered at CERCLA / RCRA sites (Exhibit 1-1). PRGs do not consider impact to groundwater or address ecological concerns. PRGs are specifically not intended as a (1) stand-alone decision-making tool, (2) as a substitute for EPA guidance for preparing baseline risk assessments, or (3) a rule to determine if a waste is hazardous under RCRA.

The guidance set out in this document is not final Agency action. It is not intended, nor can it be relied upon to create any rights enforceable by any party in litigation with the United States. EPA officials may decide to follow the guidance provided herein, or act at variance with the guidance, based on an analysis of specific circumstances. The Agency also reserves the right to change this guidance at any time without public notice.

1.0 INTRODUCTION

Region 9 Preliminary Remediation Goals (PRGs) are risk-based tools for evaluating and cleaning up contaminated sites. They are being used to streamline and standardize all stages of the risk decision-making process.

The Region 9 PRG table combines current EPA toxicity values with "standard" exposure factors to estimate contaminant concentrations in environmental media (soil, air, and water) that are considered protective of humans, including sensitive groups, over a lifetime. Chemical concentrations above these levels would not automatically designate a site as "dirty" or trigger a response action. However, exceeding a PRG suggests that further evaluation of the potential risks that may be posed by site contaminants is appropriate. Further evaluation may include additional sampling, consideration of ambient levels in the environment, or a reassessment of the assumptions contained in these screening-level estimates (e.g. appropriateness of route-to-route extrapolations, appropriateness of using chronic toxicity values to evaluate childhood exposures, appropriateness of generic exposure factors for a specific site etc.).

The PRG concentrations presented in the table can be used to screen pollutants in environmental media, trigger further investigation, and provide an initial cleanup goal if applicable. When considering PRGs as preliminary goals, residential concentrations should be used for maximum beneficial uses of a property. Industrial concentrations are included in the table as an alternative cleanup goal for soils. In general, it is not recommended that industrial PRGs be used for screening sites unless they are used in conjunction with residential values.

Before applying PRGs as screening tools or initial goals, the user of the table should consider whether the exposure pathways and exposure scenarios at the site are fully accounted for in the PRG calculation. Region 9 PRG concentrations are based on exposure pathways for which generally accepted methods, models, and assumptions have been developed (i.e. ingestion, dermal contact, and inhalation) for specific land-use conditions and do not consider impact to groundwater or ecological receptors (see Developing a Conceptual Site Model below).

EXHIBIT 1-1
TYPICAL EXPOSURE PATHWAYS BY MEDIUM
FOR RESIDENTIAL AND INDUSTRIAL LAND USES[a]

EXPOSURE PATHWAYS, ASSUMING:		
MEDIUM	RESIDENTIAL LAND USE	INDUSTRIAL LAND USE
Ground Water	***Ingestion from drinking***	Ingestion from drinking
	Inhalation of volatiles	Inhalation of volatiles
	Dermal absorption from bathing	Dermal absorption
Surface Water	***Ingestion from drinking***	Ingestion from drinking
	Inhalation of volatiles	Inhalation of volatiles
	Dermal absorption from bathing	Dermal absorption
	Ingestion during swimming	
	Ingestion of contaminated fish	
Soil	***Ingestion***	***Ingestion***
	Inhalation of particulates	***Inhalation of particulates***
	Inhalation of volatiles	***Inhalation of volatiles***
	Exposure to indoor air from soil gas	Exposure to indoor air from soil gas
	Exposure to ground water contaminated by soil leachate	Exposure to ground water contaminated by soil leachate
	Ingestion via plant, meat, or dairy products	Inhalation of particulates from trucks and heavy equipment
	Dermal absorption	***Dermal absorption***

Footnote:
[a]Exposure pathways considered in the PRG calculations are indicated in boldface italics.

2.0 READING THE PRG TABLE

2.1 General Considerations

With the exceptions described below, PRGs are chemical concentrations that correspond to fixed levels of risk (i.e. either a one-in-one million [10^{-6}] cancer risk or a noncarcinogenic hazard quotient of 1) in soil, air, and water. In most cases, where a substance causes both cancer and noncancer (systemic) effects, the 10^{-6} cancer risk will result in a more stringent criteria and consequently this value is presented in the hard copy of the table. PRG concentrations that equate to a 10^{-6} cancer risk are indicated by "ca". PRG concentrations that equate to a hazard quotient of 1 for noncarcinogenic concerns are indicated by "nc".

If the risk-based concentrations are to be used for site screening, it is recommended that both cancer and noncancer-based PRGs be used. Both carcinogenic and noncarcinogenic values may be obtained at the Region 9 PRG homepage at:

http://www.epa.gov/region09/waste/sfund/prg/

It has come to my attention that some users have been multiplying the cancer PRG concentrations by 10 or 100 to set "action levels" for triggering remediation or to set less stringent cleanup levels for a specific site after considering non-risk-based factors such as ambient levels, detection limits, or technological feasibility. This risk management practice recognizes that there may be a range of values that may be "acceptable" for carcinogenic risk (EPA's risk management range is one-in-a-million [10^{-6}] to one-in-ten thousand [10^{-4}]). However, this practice could lead one to overlook serious noncancer health threats and it is strongly recommended that the user consult with a toxicologist or regional risk assessor before doing this. For carcinogens, I have indicated by asterisk ("ca*") in the PRG table where the noncancer PRGs would be exceeded if the cancer value that is displayed is multiplied by 100. Two stars ("ca**") indicate that the noncancer values would be exceeded if the cancer PRG were multiplied by 10. There is no range of "acceptable" noncarcinogenic "risk" so that under no circumstances should noncancer PRGs be multiplied by 10 or 100, when setting final cleanup criteria.

In general, PRG concentrations in the table are risk-based but for soil there are two important exceptions: (1) for several volatile chemicals, PRGs are based on the soil saturation equation ("sat") and (2) for relatively less toxic inorganic and semivolatile contaminants, a non-risk based "ceiling limit" concentration is given as 10^{+5} mg/kg ("max").

Also included in the PRG table are soil screening levels (SSLs) for protection of groundwater (see Section 2.3); and, California EPA PRGs ("CAL-Modified PRGs") for specific chemicals where CAL-EPA screening values may be "significantly" more restrictive than the federal values (see Section 2.4).

2.2 Toxicity Values

Heirarchy of Toxicity Values

EPA toxicity values, known as noncarcinogenic reference doses (RfD) and carcinogenic slope factors (SF) were obtained from IRIS, NCEA (formerly ECAO) through September 2000, and HEAST. The priority among sources of toxicological constants of the table in order of preference is as follows: (1) IRIS (indicated by "i"), (2) NCEA ("n"), (3) HEAST ("h"), (4) withdrawn from IRIS or HEAST and under review ("x") or obtained from other EPA documents ("o").

Inhalation Conversion Factors

As of January 1991, IRIS and NCEA databases no longer present RfDs or SFs for the inhalation route. These criteria have been replaced with reference concentrations (RfC) for noncarcinogenic effects and unit risk factors (URF) for carcinogenic effects. However, for purposes of estimating risk and calculating risk-based concentrations, inhalation reference doses (RfDi) and inhalation slope factors (SFi) are preferred. This is not a problem for most chemicals because the inhalation toxicity criteria are easily converted. To calculate an RfDi from an RfC, the following equation and assumptions may be used for most chemicals:

$$\text{RfDi}\ \frac{\text{mg}}{(\text{kg-day})} = \text{RfC}\,(\text{mg}/\text{m}^3) \times \frac{20\text{m}^3}{\text{day}} \times \frac{1}{70\text{kg}}$$

Likewise, to calculate an SFi from an inhalation URF, the following equation and assumptions may be used:

$$\text{SFi}\ \frac{(\text{kg-day})}{(\text{mg})} = \text{URF}\,(\text{m}^3/\text{ug}) \times \frac{\text{day}}{20\text{m}^3} \times 70\text{kg} \times \frac{10^3\ \text{ug}}{\text{mg}}$$

Substances with New Toxicity Values

To help users rapidly identify substances with new toxicity values, these chemicals are printed in boldface type. This issue of the PRG table contains new or revised toxicity values for **benzene, chlorine, cyclohexane, 4,4'-dichlorobenzophenone, 1,3-dichloropropene, diisononyl phthalate, n,n-diphenyl-1,4 benzenediamine (DPPD), dysprosium, ethylene glycol monobutyl ether, hexachlorobutadiene, monomethyl and dimethyl hydrazines, 1,1'-sulfonylbis(4-chlorobenzene), thallium, trimellitic anhydride (TMAN), triphenylphosphine oxide, tris(2-chloroethyl) phosphate, vinyl chloride and uranium.** In addition, **lead** in industrial soils has a new PRG based on the recommendations of the Technical Review Workgroup (TRW) for Lead.

Route-to-Route Methods

Route-to-route extrapolations ("r") were frequently used when there were no toxicity values available for a given route of exposure. Oral cancer slope factors ("SFo") and reference doses ("RfDo") were used for both oral and inhaled exposures for organic compounds lacking inhalation values. Inhalation slope factors ("SFi") and inhalation reference doses ("RfDi") were used for both inhaled and oral exposures for organic compounds lacking oral values. Route extrapolations were not performed for inorganics due to portal of entry effects and known differences in absorption efficiency for the two routes of exposure.

An additional route extrapolation is the use of oral toxicity values for evaluating dermal exposures. For many chemicals, a scientifically defensible data base does not exist for making an adjustment of an oral slope factor/RfD to estimate a dermal toxicity value. Based on the current guidance (USEPA 2000a), the only chemical for which an adjustment is recommended is cadmium. An oral absorption efficiency of 5% is assumed for cadmium which leads to an estimated dermal reference dose (RfDd) of 2.5E-05. Please note that the PRG calculations for cadmium are based on this adjustment.

Although route-to-route methods are a useful screening procedure, the appropriateness of these default assumptions for specific contaminants should be verified by a toxicologist or regional risk assessor. Please note that whenever route-extrapolated values are used to calculate risk-based PRGs, additional uncertainties are introduced in the calculation.

2.3 Soil Screening Levels

Generic, soil screening levels (SSLs) for the protection of groundwater have been included in the PRG table for 100 of the most common contaminants at Superfund sites. Generic SSLs are derived using default values in standardized equations presented in *Soil Screening Guidance* (available from NTIS as document numbers PB96-963502 and PB96-963505 or EPA/540/R-95/128 and EPA/540/R-96/018).

The SSLs were developed using a default dilution-attenuation factor (DAF) of 20 to account for natural processes that reduce contaminant concentrations in the subsurface. Also included are generic SSLs that assume no dilution or attenuation between the source and the receptor well (i.e., a DAF of 1). These values can be used at sites where little or no dilution or attenuation of soil leachate concentrations is expected at a site (e.g., sites with shallow water tables, fractured media, karst topography, or source size greater than 30 acres).

In general, if an SSL is not exceeded for the migration to groundwater pathway, the user may eliminate this pathway from further investigation.

2.4 "Cal-Modified PRGs"

When EPA Region 9 first came out with a Draft of the PRG tables in 1992, there was concern expressed by California EPA's Department of Toxic Substances and Control (DTSC) that for some chemicals, the risk-based concentrations calculated using Cal-EPA toxicity

values were "significantly" more protective than the risk-based PRGs calculated by Region 9. At an interagency meeting comprised of mostly toxicologists, it was agreed that values that differed by a factor of four or more would be said to have "significant" difference in risk-based PRGs. Although four was a somewhat arbitrary cutoff point, it reflects a consideration that the numbers are not very precise and at best, are order-of-magnitude estimates of risk.

Cal-Modified PRGs are included for those chemicals where Cal-EPA values are "significantly" more protective. The original list of Cal-Modified PRGs (cadmium, chromium 6, nickel, PAHs benzo(a)pyrene and benzo(k)fluoranthene, tetrachloroethylene [PCE] and lead which has been withdrawn) were based on exposure factors and modeling assumptions presented in California EPA's Preliminary Endangerment Assessment Guidance Manual (PEA 1994). Please note that any Cal-Modified PRGs that have been added to this original list after 1995 have been calculated using Cal-EPA toxicity values and Region 9 exposure methodology. In this issue of the PRG table, Cal-Modified PRGs have been added for **1,1-dichloroethane** and **MTBE**. In the State of California, Cal-Modified PRGs should be used as screening levels because they are more stringent than the Federal numbers.

2.5 Miscellaneous

Volatile organic compounds (VOCs) are indicated by "1" in the VOC column of the table and in general, are defined as those chemicals having a Henry's Law constant greater than 10^{-5} (atm-m^3/mol) and a molecular weight less than 200 g/mole). Three borderline chemicals (dibromochloromethane, 1,2-dibromochloropropane, and pyrene) which do not strictly meet these criteria of volatility have also been included based upon discussions with other state and federal agencies and after a consideration of vapor pressure characteristics etc. Volatile organic chemicals are evaluated for potential volatilization from soil/water to air using volatilization factors (see Section 4.1).

Chemical-specific dermal absorption values for contaminants in soil and dust are presented for arsenic, cadmium, chlordane, 2,4-D, DDT, lindane, TCDD, PAHs, PCBs, and pentachlorophenols as recommended in the "Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim Guidance" (USEPA 2000). Otherwise, default skin absorption fractions are assumed to be 0.10 for nonvolatile organics. Please note that previous defaults of 0.01 and 0.10 for inorganics and VOCs respectively, have been withdrawn per new guidance.

3.0 USING THE PRG TABLE

The decision to use PRGs at a site will be driven by the potential benefits of having generic risk-based concentrations in the absence of site-specific risk assessments. The original intended use of PRGs was to provide initial cleanup goals for individual chemicals given specific medium and land-use combinations (see RAGS Part B, 1991), however risk-based concentrations have several applications. They can also be used for:

- Setting health-based detection limits for chemicals of potential concern
- Screening sites to determine whether further evaluation is appropriate
- Calculating cumulative risks associated with multiple contaminants

A few basic procedures are recommended for using PRGs properly. These are briefly described below. Potential problems with the use of PRGs are also identified.

3.1 Developing a Conceptual Site Model

The primary condition for use of PRGs is that exposure pathways of concern and conditions at the site match those taken into account by the PRG framework. Thus, it is always necessary to develop a conceptual site model (CSM) to identify likely contaminant source areas, exposure pathways, and potential receptors. This information can be used to determine the applicability of PRGs at the site and the need for additional information. For those pathways not covered by PRGs, a risk assessment specific to these additional pathways may be necessary. Nonetheless, the PRG lookup values will still be useful in such situations for focusing further investigative efforts on the exposure pathways not addressed.

To develop a site-specific CSM, perform an extensive records search and compile existing data (e.g. available site sampling data, historical records, aerial photographs, and hydrogeologic information). Once this information is obtained, CSM worksheets such as those provided in ASTM's *Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites* (1995) can be used to tailor the generic worksheet model to a site-specific CSM. The final CSM diagram represents linkages among contaminant sources, release mechanisms, exposure pathways and routes and receptors. It summarizes our understanding of the contamination problem.

As a final check, the CSM should answer the following questions:

- Are there potential ecological concerns?
- Is there potential for land use other than those covered by the PRGs (that is, residential and industrial)?
- Are there other likely human exposure pathways that were not considered in development of the PRGs (e.g. impact to groundwater, local fish consumption, raising beef, dairy, or other livestock)?
- Are there unusual site conditions (e.g. large areas of contamination, high fugitive dust levels, potential for indoor air contamination)?

If any of these four conditions exist, the PRG may need to be adjusted to reflect this new information. Suggested references for evaluating pathways not currently evaluated by Region 9 PRG's are presented in Exhibit 3-1.

EXHIBIT 3-1
SUGGESTED READINGS FOR EVALUATING EXPOSURE PATHWAYS NOT CURRENTLY ADDRESSED BY REGION 9 PRGs

EXPOSURE PATHWAY	REFERENCE
Migration of contaminants to an underlying potable aquifer	*Soil Screening Guidance* (USEPA 1996a,b), *Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites* (ASTM 1995)
Ingestion via plant uptake	*Soil Screening Guidance* (USEPA 1996a,b)
Ingestion via meat, dairy products, human milk	*Estimating Exposure to Dioxin-Like Compounds* (USEPA 1994a)
Inhalation of volatiles that have migrated into basements	*User's Guide for Johnson and Ettinger (1991) Model for Subsurface Vapor Intrusion into Buildings* (USEPA 1997a)
Ecological pathways	*Ecological Risk Assessment: Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments*, (USEPA 1997b), *Guidance for Ecological Risk Assessment at Hazardous Waste Sites and Permitted Facilities* (CAL-EPA 1996)

3.2 Background Levels Evaluation

A necessary step in determining the usefulness of Region 9 PRGs is the consideration of background contaminant concentrations. EPA may be concerned with two types of background at sites: naturally occurring and anthropogenic. Natural background is usually limited to metals whereas anthropogenic (i.e. human-made) "background" includes both organic and inorganic contaminants. Before embarking on an extensive sampling and analysis program to determine local background concentrations in the area, one should first compile existing data on the subject. Far too often there is pertinent information in the literature that gets ignored, resulting in needless expenditures of time and money.

Generally EPA does not clean up below natural background. In some cases, the predictive risk-based models generate PRG levels that lie within or even below typical background. If natural background concentrations are higher than the risk-based PRGs, an adjustment of the PRG is probably needed. Exhibit 3-2 presents summary statistics for selected elements in soils that have background levels that may exceed risk-based PRGs. An illustrative example of this is naturally occurring arsenic in soils which frequently is higher than the risk-based concentration set at a one-in-one-million cancer risk (the PRG for residential soils is 0.39 mg/kg). After considering

background concentrations in a local area, EPA Region 9 has at times used the non-cancer PRG (22 mg/kg) to evaluate sites recognizing that this value tends to be above background levels yet still falls within the range of soil concentrations (0.39-39 mg/kg) that equates to EPA's "acceptable" cancer risk range of 10E-6 to 10E-4.

Where anthropogenic "background" levels exceed PRGs and EPA has determined that a response action is necessary and feasible, EPA's goal will be to develop a comprehensive response to the widespread contamination. This will often require coordination with different authorities that have jurisdiction over the sources of contamination in the area.

EXHIBIT 3-2
BACKGROUND CONCENTRATIONS OF SELECTED ELEMENTS IN SOILS

TRACE	U.S. STUDY DATA[1]			CALIFORNIA DATA[2]		
ELEMENT	Range	GeoMean	ArMean	Range	GeoMean	ArMean
Arsenic	<.1-97	5.2 mg/kg	7.2 mg/kg	0.59-11	2.75 mg/kg	3.54 mg/kg
Beryllium	<1-15	0.63 "	0.92 "	0.10-2.7	1.14 "	1.28 "
Cadmium	<1-10	--	<1	0.05-1.7	0.26	0.36
Chromium	1-2000	37	54	23-1579	76.25	122.08
Nickel	<5-700	13	19	9.0-509	35.75	56.60

[1]Shacklette and Hansford, "Element Concentrations in Soils and Other Surficial Materials of the Conterminous United States",USGS Professional Paper 1270, 1984.

[2]Bradford et. al, "Background Concentrations of Trace and Major Elements in California Soils", Kearney Foundation Special Report, UC-Riverside and CAL-EPA DTSC, March 1996.

3.3 Screening Sites with Multiple Pollutants

A suggested stepwise approach for PRG-screening of sites with multiple pollutants is as follows:

- Perform an extensive records search and compile existing data.

- Identify site contaminants in the PRG table. Record the PRG concentrations for various media and note whether PRG is based on cancer risk (indicated by "ca") or noncancer hazard (indicated by "nc"). Segregate cancer PRGs from non-cancer PRGs and exclude (but don't eliminate) non-risk based PRGs ("sat" or "max").

- For cancer risk estimates, take the site-specific concentration (maximum or 95 UCL) and divide by the PRG concentrations that are designated for cancer evaluation ("ca"). Multiply this ratio by 10^{-6} to estimate chemical-specific risk for a reasonable maximum exposure (RME). For multiple pollutants, simply add the risk for each chemical:

$$Risk = [(\frac{conc_x}{PRG_x}) + (\frac{conc_y}{PRG_y}) + (\frac{conc_z}{PRG_z})] \times 10^{-6}$$

- For non-cancer hazard estimates. Divide the concentration term by its respective non-cancer PRG designated as "nc" and sum the ratios for multiple contaminants. The cumulative ratio represents a non-carcinogenic hazard index (HI). A hazard index of 1 or less is generally considered "safe". A ratio greater than 1 suggests further evaluation. **[Note that carcinogens may also have an associated non-cancer PRG that is not listed in the printed copy of the table sent to folks on the mailing list. To obtain these values, the user should view or download the PRG table at our website and display the appropriate sections.]**

$$Hazard\ Index = [(\frac{conc_x}{PRG_x}) + (\frac{conc_y}{PRG_y}) + (\frac{conc_z}{PRG_z})]$$

For more information on screening site risks, the reader should contact EPA Region 9's Technical Support Group.

3. 4 Potential Problems

As with any risk-based tool, the potential exists for misapplication. In most cases the root cause will be a lack of understanding of the intended use of Region 9 PRGs. In order to prevent misuse of PRGs, the following should be avoided:

- Applying PRGs to a site without adequately developing a conceptual site model that identifies relevant exposure pathways and exposure scenarios,
- Not considering background concentrations when choosing PRGs as cleanup goals,
- Use of PRGs as cleanup levels without the nine-criteria analysis specified in the National Contingency Plan (or, comparable analysis for programs outside of Superfund),
- Use of PRGs as cleanup levels without verifying numbers with a toxicologist or regional risk assessor,
- Use of antiquated PRG tables that have been superseded by more recent publications,
- Not considering the effects of additivity when screening multiple chemicals, and
- Adjusting PRGs upward by factors of 10 or 100 without consulting a toxicologist or regional risk assessor.

4.0 TECHNICAL SUPPORT DOCUMENTATION

Region 9 PRGs consider human exposure hazards to chemicals from contact with contaminated soils, air, and water. The emphasis of the PRG equations and technical discussion are aimed at developing screening criteria for soils, since this is an area where few standards exist. For air and water, additional reference concentrations or standards are available for many chemicals (e.g. MCLs, non-zero MCLGs, AWQC, and NAAQS) and consequently the discussion of these media are brief.

4.1 Soils - Direct Ingestion

Calculation of risk-based PRGs for direct ingestion of soil is based on methods presented in RAGS HHEM, Part B (USEPA 1991a) and *Soil Screening Guidance* (USEPA 1996a,b). Briefly, these methods backcalculate a soil concentration level from a target risk (for carcinogens) or hazard quotient (for noncarcinogens).

A number of studies have shown that inadvertent ingestion of soil is common among children 6 years old and younger (Calabrese et al. 1989, Davis et al. 1990, Van Wijnen et al. 1990). To take into account the higher soil intake rate for children, two different approaches are used to estimate PRGs, depending on whether the adverse health effect is cancer or some effect other than cancer.

For carcinogens, the method for calculating PRGs uses an age-adjusted soil ingestion factor that takes into account the difference in daily soil ingestion rates, body weights, and exposure duration for children from 1 to 6 years old and others from 7 to 31 years old. This health-protective approach is chosen to take into account the higher daily rates of soil ingestion in children as well as the longer duration of exposure that is anticipated for a long-term resident. For more on this method, see USEPA RAGs Part B (1991a).

For noncarcinogenic concerns, the more protective method of calculating a soil PRG is to evaluate childhood exposures separately from adult exposures. In other words, an age-adjustment factor is not applied as was done for carcinogens. This approach is considered conservative because it combines the higher 6-year exposure for children with chronic toxicity criteria. In their analysis of the method, the Science Advisory Board (SAB) indicated that, for most chemicals, the approach may be overly protective. However, they noted that there are specific instances when the chronic RfD may be based on endpoints of toxicity that are specific to children (e.g. fluoride and nitrates) or when the dose-response is steep (i.e., the dosage difference between the no-observed-adverse-effects level [NOAEL] and an adverse effects level is small). Thus, for the purposes of screening, EPA Region 9 has adopted this approach for calculating soil PRGs for noncarcinogenic health concerns.

4.2 Soils - Vapor and Particulate Inhalation

Agency toxicity criteria indicate that risks from exposure to some chemicals via inhalation far outweigh the risk via ingestion; therefore soil PRGs have been designed to address this pathway as well. The models used to calculate PRGs for inhalation of volatiles/particulates are updates of risk assessment methods presented in RAGS Part B (USEPA 1991a) and are identical to the *Soil Screening Guidance: User's Guide and Technical Background Document* (USEPA 1996a,b).

To address the soil-to-air pathways the PRG calculations incorporate volatilization factors (VF_s) for volatile contaminants and particulate emission factors (PEF) for nonvolatile contaminants. These factors relate soil contaminant concentrations to air contaminant concentrations that may be inhaled on-site. The VF_s and PEF equations can be broken into two separate models: an emission model to estimate emissions of the contaminant from the soil and a dispersion model to simulate the dispersion of the contaminant in the atmosphere.

It should be noted that the box model in RAGS Part B has been replaced with a dispersion term (Q/C) derived from a modeling exercise using meteorological data from 29 locations across the United States because the box model may not be applicable to a broad range of site types and meteorology and does not utilize state-of-the-art techniques developed for regulatory dispersion modeling. The dispersion model for both volatiles and particulates is the AREA-ST, an updated version of the Office of Air Quality Planning and Standards, Industrial Source Complex Model, ISC2. However, different Q/C terms are used in the VF and PEF equations. Los Angeles was selected as the 90th percentile data set for volatiles and Minneapolis was selected as the 90th percentile data set for fugitive dusts (USEPA 1996 a,b). A default source size of 0.5 acres was chosen for the PRG calculations. This is consistent with the default exposure area over which Region 9 typically averages contaminant concentrations in soils. If unusual site conditions exist such that the area source is substantially larger than the default source size assumed here, an alternative Q/C could be applied (see USEPA 1996a,b).

Volatilization Factor for Soils

Volatile chemicals, defined as those chemicals having a Henry's Law constant greater than 10^{-5} (atm-m^3/mol) and a molecular weight less than 200 g/mole, were screened for inhalation exposures using a volatilization factor for soils (VF_s). Please note that VF_s's are available at our website.

The emission terms used in the VF_s are chemical-specific and were calculated from physical-chemical information obtained from several sources. The priority of these sources were as follows: *Soil Screening Guidance* (USEPA 1996a,b), *Superfund Chemical Data Matrix* (USEPA 1996c), *Fate and Exposure Data* (Howard 1991), *Subsurface Contamination Reference Guide* (EPA 1990a), and *Superfund Exposure Assessment Manual* (SEAM, EPA 1988). In those cases where Diffusivity Coefficients (Di) were not provided in existing literature, Di's were calculated using Fuller's Method described in SEAM. A surrogate term was required for some chemicals that lacked physico-chemical information. In these cases, a proxy chemical of similar structure was used that may over- or under-estimate the PRG for soils.

Equation 4-9 forms the basis for deriving generic soil PRGs for the inhalation pathway. The following parameters in the standardized equation can be replaced with specific site data to develop a simple site-specific PRG

- Source area
- Average soil moisture content
- Average fraction organic carbon content
- Dry soil bulk density

The basic principle of the VF_s model (Henry's law) is applicable only if the soil contaminant concentration is at or below soil saturation "sat". Above the soil saturation limit, the model

cannot predict an accurate VF-based PRG. How these particular cases are handled, depends on whether the contaminant is liquid or solid at ambient soil temperatures (see Section 4.5).

Particulate Emission Factor for Soils

Inhalation of chemicals adsorbed to respirable particles (PM_{10}) were assessed using a default PEF equal to 1. 316 x 10^9 m^3/kg that relates the contaminant concentration in soil with the concentration of respirable particles in the air due to fugitive dust emissions from contaminated soils. The generic PEF was derived using default values in Equation 4-11, which corresponds to a receptor point concentration of approximately 0.76 ug/m^3. The relationship is derived by Cowherd (1985) for a rapid assessment procedure applicable to a typical hazardous waste site where the surface contamination provides a relatively continuous and constant potential for emission over an extended period of time (e.g. years). This represents an annual average emission rate based on wind erosion that should be compared with chronic health criteria; it is not appropriate for evaluating the potential for more acute exposures.

The impact of the PEF on the resultant PRG concentration (that combines soil exposure pathways for ingestion, skin contact, and inhalation) can be assessed by accessing the Region 9 PRG website and viewing the pathway-specific soil concentrations. Equation 4-11 forms the basis for deriving a generic PEF for the inhalation pathway. For more details regarding specific parameters used in the PEF model, the reader is referred to *Soil Screening Guidance: Technical Background Document* (USEPA 1996a).

Note: the generic PEF evaluates windborne emissions and does not consider dust emissions from traffic or other forms of mechanical disturbance that could lead to greater emissions than assumed here.

4.3 Soils - Dermal Exposure

Dermal Contact Assumptions

Since the 1998 PRG table was issued, exposure factors for dermal contact with soil have changed in a few cases (USEPA 2000a). Recommended RME (reasonable maximum exposure) defaults for adult workers' skin surface areas (3300 cm^2/day) and soil adherence factors (0.2 mg/cm^2) now differ from the defaults recommended for adult residents (5700 cm^2/day, 0.07 mg/cm^2) as noted in Exhibit 4-1. This is due to differences in the range of activities experienced by workers versus residents.

Dermal Absorption

Chemical-specific skin absorption values recommended by the Superfund Dermal Workgroup were applied when available. Chemical-specific values are included for the following chemicals: arsenic, cadmium, chlordane, 2,4-D, DDT, lindane, TCDD, PAHs, PCBs, and pentachlorophenols.

The recently issued "Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim Guidance" (USEPA 2000a) recommends a default dermal absorption factor for semivolatile organic compounds of 10% as a screening method for the majority of SVOCs without dermal

absorption factors. Default dermal absorption values for other chemicals (VOCs and inorganics) are not recommended in the new guidance. Therefore, the assumption of 1% for inorganics and 10% for volatiles is no longer included in the Region 9 PRG table. This change has minimal impact on the final risk-based calculations because human exposure to VOCs and inorganics in soils is generally driven by other pathways of exposure.

4.4 Soils - Migration to Groundwater

The methodology for calculating SSLs for the migration to groundwater was developed to identify chemical concentrations in soil that have the potential to contaminate groundwater. Migration of contaminants from soil to groundwater can be envisioned as a two-stage process: (1) release of contaminant in soil leachate and (2) transport of the contaminant through the underlying soil and aquifer to a receptor well. The SSL methodology considers both of these fate and transport mechanisms.

SSLs are backcalculated from acceptable ground water concentrations (i.e. nonzero MCLGs, MCLs, or risk-based PRGs). First, the acceptable groundwater concentration is multiplied by a dilution factor to obtain a target leachate concentration. For example, if the dilution factor is 10 and the acceptable ground water concentration is 0.05 mg/L, the target soil leachate concentration would be 0.5 mg/L. The partition equation (presented in the *Soil Screening Guidance* document) is then used to calculate the total soil concentration (i.e. SSL) corresponding to this soil leachate concentration.

The SSL methodology was designed for use during the early stages of a site evaluation when information about subsurface conditions may be limited. Because of this constraint, the methodology is based on conservative, simplifying assumptions about the release and transport of contaminants in the subsurface. For more on SSLs, and how to calculate site-specific SSLs versus generic SSLs presented in the PRG table, the reader is referred to the *Soil Screening Guidance* document (USEPA 1996a,b).

4.5 Soil Saturation Limit

The soil saturation concentration "sat" corresponds to the contaminant concentration in soil at which the absorptive limits of the soil particles, the solubility limits of the soil pore water, and saturation of soil pore air have been reached. Above this concentration, the soil contaminant may be present in free phase, i.e., nonaqueous phase liquids (NAPLs) for contaminants that are liquid at ambient soil temperatures and pure solid phases for compounds that are solid at ambient soil temperatures.

Equation 4-10 is used to calculate "sat" for each volatile contaminant. As an update to RAGS HHEM, Part B (USEPA 1991a), this equation takes into account the amount of contaminant that is in the vapor phase in soil in addition to the amount dissolved in the soil's pore water and sorbed to soil particles.

Chemical-specific "sat" concentrations must be compared with each VF-based PRG because a basic principle of the PRG volatilization model is not applicable when free-phase contaminants are present. How these cases are handled depends on whether the contaminant is liquid or solid at ambient temperatures. Liquid contaminant that have a VF-based PRG that exceeds the "sat" concentration are set equal to "sat" whereas for solids (e.g., PAHs), soil screening decisions are

based on the appropriate PRGs for other pathways of concern at the site (e.g., ingestion).

4.6 Ground Water/Surface Water - Ingestion and Inhalation

Calculation of PRGs for ingestion and inhalation of contaminants in domestic water is based on the methodology presented in RAGS HHEM, Part B (USEPA 1991a). Ingestion of drinking water is an appropriate pathway for all chemicals. For the purposes of this guidance, however, inhalation of volatile chemicals from water is considered routinely only for chemicals with a Henry's Law constant of 1×10^{-5} atm-m^3/mole or greater <u>and</u> with a molecular weight of less than 200 g/mole.

For volatile chemicals, an upperbound volatilization constant (VF_w) is used that is based on all uses of household water (e.g showering, laundering, and dish washing). Certain assumptions were made. For example, it is assumed that the volume of water used in a residence for a family of four is 720 L/day, the volume of the dwelling is 150,000 L and the air exchange rate is 0.25 air changes/hour (Andelman in RAGS Part B). Furthermore, it is assumed that the average transfer efficiency weighted by water use is 50 percent (i.e. half of the concentration of each chemical in water will be transferred into air by all water uses). Note: the range of transfer efficiencies extends from 30% for toilets to 90% for dishwashers.

4.7 Default Exposure Factors

Default exposure factors were obtained primarily from RAGS Supplemental Guidance Standard Default *Exposure Factors* (OSWER Directive, 9285.6-03) dated March 25, 1991 and more recent information from U.S. EPA's Office of Solid Waste and Emergency Response, U.S. EPA's Office of Research and Development, and California EPA's Department of Toxic Substances Control (see Exhibit 4-1).

Because contact rates may be different for children and adults, carcinogenic risks during the first 30 years of life were calculated using age-adjusted factors ("adj"). Use of age-adjusted factors are especially important for soil ingestion exposures, which are higher during childhood and decrease with age. However, for purposes of combining exposures across pathways, additional age-adjusted factors are used for inhalation and dermal exposures. These factors approximate the integrated exposure from birth until age 30 combining contact rates, body weights, and exposure durations for two age groups - small children and adults. Age-adjusted factors were obtained from RAGS PART B or developed by analogy (see derivations next page).

For soils only, noncarcinogenic contaminants are evaluated in children separately from adults. No age-adjustment factor is used in this case. The focus on children is considered protective of the higher daily intake rates of soil by children and their lower body weight. For maintaining consistency when evaluating soils, dermal and inhalation exposures are also based on childhood contact rates.

(1) ingestion([mg-yr]/[kg-d]:

$$IFS_{adj} = \frac{ED_c \times IRS_c}{BW_c} + \frac{(ED_r - ED_c) \times IRS_a}{BW_a}$$

(2) skin contact([mg-yr]/[kg-d]:

$$SFS_{adj} = \frac{ED_c \times AF \times SA_c}{BW_c} + \frac{(ED_r - ED_c) \times AF \times SA_a}{BW_a}$$

(3) inhalation ([m^3-yr]/[kg-d]):

$$InhF_{adj} = \frac{ED_c \times IRA_c}{BW_c} + \frac{(ED_r - ED_c) \times IRA_a}{BW_a}$$

EXHIBIT 4-1
STANDARD DEFAULT FACTORS

Symbol	Definition (units)	Default	Reference
CSFo	Cancer slope factor oral (mg/kg-d)-1	--	IRIS, HEAST, or NCEA
CSFi	Cancer slope factor inhaled (mg/kg-d)-1	--	IRIS, HEAST, or NCEA
RfDo	Reference dose oral (mg/kg-d)	--	IRIS, HEAST, or NCEA
RfDi	Reference dose inhaled (mg/kg-d)	--	IRIS, HEAST, or NCEA
TR	Target cancer risk	10^{-6}	--
THQ	Target hazard quotient	1	--
BWa	Body weight, adult (kg)	70	RAGS (Part A), EPA 1989 (EPA/540/1-89/002)
BWc	Body weight, child (kg)	15	Exposure Factors, EPA 1991 (OSWER No. 9285.6-03)
ATc	Averaging time - carcinogens (days)	25550	RAGS(Part A), EPA 1989 (EPA/540/1-89/002)
ATn	Averaging time - noncarcinogens (days)	ED*365	
SAa	Exposed surface area for soil/dust (cm^2/day)		Dermal Assessment, EPA 2000 (EPA/540/R-99/005)
	– adult resident	5700	
	– adult worker	3300	
SAc	Exposed surface area, child in soil (cm^2/day)	2800	Dermal Assessment, EPA 2000 (EPA/540/R-99/005)
AFa	Adherence factor, soils (mg/cm^2)		Dermal Assessment, EPA 2000 (EPA/540/R-99/005)
	– adult resident	0.07	
	– adult worker	0.2	
AFc	Adherence factor, child (mg/cm^2)	0.2	Dermal Assessment, EPA 2000 (EPA/540/R-99/005)
ABS	Skin absorption defaults (unitless):		
	– semi-volatile organics	0.1	Dermal Assessment, EPA 2000 (EPA/540/R-99/005)
	– volatile organics	--	Dermal Assessment, EPA 2000 (EPA/540/R-99/005)
	– inorganics	--	Dermal Assessment, EPA 2000 (EPA/540/R-99/005)
IRAa	Inhalation rate - adult (m^3/day)	20	Exposure Factors, EPA 1991 (OSWER No. 9285.6-03)
IRAc	Inhalation rate - child (m^3/day)	10	Exposure Factors, EPA 1997 (EPA/600/P-95/002Fa)
IRWa	Drinking water ingestion - adult (L/day	2	RAGS(Part A), EPA 1989 (EPA/540/1-89/002)
IRWc	Drinking water ingestion - child (L/day)	1	PEA, Cal-EPA (DTSC, 1994)
IRSa	Soil ingestion - adult (mg/day)	100	Exposure Factors, EPA 1991 (OSWER No. 9285.6-03)
IRSc	Soil ingestion - child (mg/day),	200	Exposure Factors, EPA 1991 (OSWER No. 9285.6-03)
IRSo	Soil ingestion - occupational (mg/day)	50	Exposure Factors, EPA 1991 (OSWER No. 9285.6-03)
EFr	Exposure frequency - residential (d/y)	350	Exposure Factors, EPA 1991 (OSWER No. 9285.6-03)
EFo	Exposure frequency - occupational (d/y)	250	Exposure Factors, EPA 1991 (OSWER No. 9285.6-03)
EDr	Exposure duration - residential (years)	30*	Exposure Factors, EPA 1991 (OSWER No. 9285.6-03)
EDc	Exposure duration - child (years)	6	Exposure Factors, EPA 1991 (OSWER No. 9285.6-03)
EDo	Exposure duration - occupational (years)	25	Exposure Factors, EPA 1991 (OSWER No. 9285.6-03)
	Age-adjusted factors for carcinogens:		
IFSadj	Ingestion factor, soils ([mg-yr]/[kg-d])	114	RAGS(Part B), EPA 1991 (OSWER No. 9285.7-01B)
SFSadj	Dermal factor, soils ([mg-yr]/[kg-d])	361	By analogy to RAGS (Part B)
InhFadj	Inhalation factor, air ([m^3-yr]/[kg-d])	11	By analogy to RAGS (Part B)
IFWadj	Ingestion factor, water ([L-yr]/[kg-d])	1.1	By analogy to RAGS (Part B)
VFw	Volatilization factor for water (L/m^3)	0.5	RAGS(Part B), EPA 1991 (OSWER No. 9285.7-01B)
PEF	Particulate emission factor (m^3/kg)	See below	Soil Screening Guidance (EPA 1996a,b)
VFs	Volatilization factor for soil (m^3/kg)	See below	Soil Screening Guidance (EPA 1996a,b)
sat	Soil saturation concentration (mg/kg)	See below	Soil Screening Guidance (EPA 1996a,b)

Footnote:
*Exposure duration for lifetime residents is assumed to be 30 years total. For carcinogens, exposures are combined for children (6 years) and adults (24 years) .

4.8 Standardized Equations

The equations used to calculate the PRGs for carcinogenic and noncarcinogenic contaminants are presented in Equations 4-1 through 4-8. The PRG equations update RAGS Part B equations. The methodology backcalculates a soil, air, or water concentration level from a target risk (for carcinogens) or hazard quotient (for noncarcinogens). For completeness, the soil equations combine risks from ingestion, skin contact, and inhalation simultaneously. Note: the electronic version of the table also includes pathway-specific PRGs, should the user decide against combining specific exposure pathways; or, the user wants to identify the relative contribution of each pathway to exposure.

To calculate PRGs for volatile chemicals in soil, a chemical-specific volatilization factor is calculated per Equation 4-9. Because of its reliance on Henry's law, the VF_s model is applicable only when the contaminant concentration in soil is at or below saturation (i.e. there is no free-phase contaminant present). Soil saturation ("sat") corresponds to the contaminant concentration in soil at which the adsorptive limits of the soil particles and the solubility limits of the available soil moisture have been reached. Above this point, pure liquid-phase contaminant is expected in the soil. If the PRG calculated using VF_s was greater than the calculated sat, the PRG was set equal to sat, in accordance with *Soil Screening Guidance* (USEPA 1996 a,b). The equation for deriving sat is presented in Equation 4-10.

PRG EQUATIONS

Soil Equations: For soils, equations were based on three exposure routes (ingestion, skin contact, and inhalation).

Equation 4-1: Combined Exposures to Carcinogenic Contaminants in Residential Soil

$$C(mg/kg) = \frac{TR \times AT_c}{EF_r \left[\left(\frac{IFS_{adj} \times CSF_o}{10^6 mg/kg} \right) + \left(\frac{SFS_{adj} \times ABS \times CSF_o}{10^6 mg/kg} \right) + \left(\frac{InhF_{adj} \times CSF_i}{VF_s^a} \right) \right]}$$

Equation 4-2: Combined Exposures to Noncarcinogenic Contaminants in Residential Soil

$$C(mg/kg) = \frac{THQ \times BW_c \times AT_n}{EF_r \times ED_c \left[\left(\frac{1}{RfD_o} \times \frac{IRS_c}{10^6 mg/kg} \right) + \left(\frac{1}{RfD_o} \times \frac{SA_c \times AF \times ABS}{10^6 mg/kg} \right) + \left(\frac{1}{RfD_i} \times \frac{IRA_c}{VF_s^a} \right) \right]}$$

Equation 4-3: Combined Exposures to Carcinogenic Contaminants in Industrial Soil

$$C(mg/kg) = \frac{TR \times BW_a \times AT_c}{EF_o \times ED_o \left[\left(\frac{IRS_o \times CSF_o}{10^6 mg/kg} \right) + \left(\frac{SA_a \times AF \times ABS \times CSF_o}{10^6 mg/kg} \right) + \left(\frac{IRA_a \times CSF_i}{VF_s^a} \right) \right]}$$

Footnote:
[a]Use VF_s for volatile chemicals (defined as having a Henry's Law Constant [atm-m^3/mol] greater than 10^{-5} and a molecular weight less than 200 grams/mol) or PEF for non-volatile chemicals.

$$C(mg/kg) = \frac{THQ \times BW_a \times AT_n}{EF_o \times ED_o[(\frac{1}{RfD_o} \times \frac{IRS_o}{10^6 mg/kg}) + (\frac{1}{RfD_o} \times \frac{SA_a \times AF \times ABS}{10^6 mg/kg}) + (\frac{1}{RfD_i} \times \frac{IRA_a}{VF_s^a})]}$$

Equation 4-4: Combined Exposures to Noncarcinogenic Contaminants in Industrial Soil

Tap Water Equations:

Equation 4-5: Ingestion and Inhalation Exposures to Carcinogenic Contaminants in Water

$$C(ug/L) = \frac{TR \times AT_c \times 1000 ug/mg}{EF_r\ [(IFW_{adj} \times CSF_o) + (VF_w \times InhF_{adj} \times CSF_i)]}$$

Equation 4-6: Ingestion and Inhalation Exposures to Noncarcinogenic Contaminants in Water

$$C(ug/L) = \frac{THQ \times BW_a \times AT_n \times 1000 ug/mg}{EF_r \times ED_r\ [(\frac{IRW_a}{RfD_o}) + (\frac{VF_w \times IRA_a}{RfD_i})]}$$

Air Equations:

Equation 4-7: Inhalation Exposures to Carcinogenic Contaminants in Air

$$C(ug/m^3) = \frac{TR \times AT_c \times 1000 ug/mg}{EF_r \times InhF_{adj} \times CSF_i}$$

Equation 4-8: Inhalation Exposures to Noncarcinogenic Contaminants in Air

$$C(ug/m^3) = \frac{THQ \times RfD_i \times BW_a \times AT_n \times 1000 ug/mg}{EF_r \times ED_r \times IRA_a}$$

Footnote:
[a]Use VF_s for volatile chemicals (defined as having a Henry's Law Constant [atm-m^3/mol] greater than 10^{-5} and a molecular weight less than 200 grams/mol) or PEF for non-volatile chemicals.

SOIL-TO-AIR VOLATILIZATION FACTOR (VF_s)

Equation 4-9: Derivation of the Volatilization Factor

$$VF_s(m^3/kg) = (Q/C) \times \frac{(3.14 \times D_A \times T)^{1/2}}{(2 \times \rho_b \times D_A)} \times 10^{-4}(m^2/cm^2)$$

where:

$$D_A = \frac{[(\Theta_a^{10/3} D_i H' + \Theta_w^{10/3} D_w)/n^2]}{\rho_B K_d + \Theta_w + \Theta_a H'}$$

Parameter	Definition (units)	Default
VF_s	Volatilization factor (m^3/kg)	--
D_A	Apparent diffusivity (cm^2/s)	--
Q/C	Inverse of the mean conc. at the center of a 0.5-acre square source (g/m^2-s per kg/m^3)	68.81
T	Exposure interval (s)	9.5×10^8
ρ_b	Dry soil bulk density (g/cm^3)	1.5
Θ_a	Air filled soil porosity (L_{air}/L_{soil})	0.28 or n-Θ_w
n	Total soil porosity (L_{pore}/L_{soil})	0.43 or 1 - (ρ_b/ρ_s)
Θ_w	Water-filled soil porosity (L_{water}/L_{soil})	0.15
ρ_s	Soil particle density (g/cm^3)	2.65
Di	Diffusivity in air (cm^2/s)	Chemical-specific
H	Henry's Law constant (atm-m^3/mol)	Chemical-specific
H'	Dimensionless Henry's Law constant	Calculated from H by multiplying by 41 (USEPA 1991a)
D_w	Diffusivity in water (cm^2/s)	Chemical-specific
K_d	Soil-water partition coefficient (cm^3/g) = $K_{oc}f_{oc}$	Chemical-specific
K_{oc}	Soil organic carbon-water partition coefficient (cm^3/g)	Chemical-specific
f_{oc}	Fraction organic carbon in soil (g/g)	0.006 (0.6%)

SOIL SATURATION CONCENTRATION (sat)

Equation 4-10: Derivation of the Soil Saturation Limit

$$sat = \frac{S}{\rho_b} (K_d \rho_b + \Theta_w + H' \Theta_a)$$

Parameter	Definition (units)	Default
sat	Soil saturation concentration (mg/kg)	--
S	Solubility in water (mg/L-water)	Chemical-specific
ρ_b	Dry soil bulk density (kg/L)	1.5
n	Total soil porosity (L_{pore}/L_{soil})	0.43 or 1 - (ρ_b/ρ_s)
ρ_s	Soil particle density (kg/L)	2.65
K_d	Soil-water partition coefficient (L/kg)	K_{oc} x f_{oc} (chemical-specific)
k_{oc}	Soil organic carbon/water partition coefficient (L/kg)	Chemical-specific
f_{oc}	Fraction organic carbon content of soil (g/g)	0.006 or site-specific
Θ_w	Water-filled soil porosity (L_{water}/L_{soil})	0.15
Θ_a	Air filled soil porosity (L_{air}/L_{soil})	0.28 or n-Θ_w
w	Average soil moisture content (kg_{water}/kg_{soil} or L_{water}/kg_{soil})	0.1
H	Henry's Law constant (atm-m^3/mol)	Chemical-specific
H'	Dimensionless Henry's Law constant	H x 41, where 41 is a units conversion factor

SOIL-TO-AIR PARTICULATE EMISSION FACTOR (PEF)

Equation 4-11: Derivation of the Particulate Emission Factor

$$PEF(m^3/kg) = Q/C \times \frac{3600 s/h}{0.036 \times (1-V) \times (U_m/U_t)^3 \times F(x)}$$

Parameter	Definition (units)	Default
PEF	Particulate emission factor (m^3/kg)	1.316×10^9
Q/C	Inverse of the mean concentration at the center of a 0.5-acre-square source (g/m^2-s per kg/m^3)	90.80
V	Fraction of vegetative cover (unitless)	0.5
U_m	Mean annual windspeed (m/s)	4.69
U_t	Equivalent threshold value of windspeed at 7 m (m/s)	11.32
F(x)	Function dependent on U_m/U_t derived using Cowherd (1985) (unitless)	0.194

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Key : I=IRIS h=HEAST n=NCEA x=WITHDRAWN o=Other EPA DOCUMENTS r=ROUTE EXTRAPOLATION ca=CANCER PRG nc=NONCANCER PRG sat=SOIL SATURATION max=CEILING LIMIT *(where: nc < 100X ca) **(where: nc < 10X ca)

FOR PLANNING PURPOSES

TOXICITY INFORMATION												CONTAMINANT	PRELIMINARY REMEDIATION GOALS (PRGs)								SOIL SCREENING LEVELS Migration to Ground Water	
SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		V O C	skin abs. soils	CAS No.			Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		DAF 20 (mg/kg)	DAF 1 (mg/kg)
8.7E-03	i	4.0E-03	i	8.7E-03	r	4.0E-03	r	0		30560-19-1		Acephate	5.6E+01	ca**	2.8E+02	ca*	7.7E-01	ca*	7.7E+00	ca*		
				7.7E-03	i	2.6E-03	i	1		75-07-0		Acetaldehyde	1.1E+01	ca**	2.3E+01	ca**	8.7E-01	ca*	1.7E+00	ca		
		2.0E-02	i			2.0E-02	r	0	0.1	34256-82-1		Acetochlor	1.2E+03	nc	1.8E+04	nc	7.3E+01	nc	7.3E+02	nc		
		1.0E-01	i			1.0E-01	r	1		67-64-1		Acetone	1.6E+03	nc	6.2E+03	nc	3.7E+02	nc	6.1E+02	nc	1.6E+01	8.0E-01
		8.0E-04	h			8.0E-04	r	0	0.1	75-86-5		Acetone cyanohydrin	4.9E+01	nc	7.0E+02	nc	2.9E+00	nc	2.9E+01	nc		
		6.0E-03	x			1.7E-02	i	1		75-05-8		Acetonitrile	2.7E+02	nc	1.7E+03	nc	6.2E+01	nc	7.9E+01	nc		
		1.0E-01	i			5.7E-06	x	1		98-86-2		Acetophenone	4.9E-01	nc	1.6E+00	nc	2.1E-02	nc	4.2E-02	nc		
1.1E-01	o	1.3E-02	i	1.1E-01	r	1.3E-02	r	0	0.1	50594-66-6		Acifluorfen	4.4E+00	ca	2.2E+01	ca	6.1E-02	ca	6.1E-01	ca		
		2.0E-02	h			5.7E-06	i	1		107-02-8		Acrolein	1.0E-01	nc	3.4E-01	nc	2.1E-02	nc	4.2E-02	nc		
4.6E+00	i	2.0E-04	i	4.6E+00	i	2.0E-04	r	0	0.1	79-06-1		Acrylamide	1.1E-01	ca	5.4E-01	ca	1.5E-03	ca	1.5E-02	ca		
		5.0E-01	i			2.9E-04	i	0	0.1	79-10-7		Acrylic acid	2.9E+04	nc	1.0E+05	max	1.0E+00	nc	1.8E+04	nc		
5.4E-01	i	1.0E-03	h	2.4E-01	i	5.7E-04	i	1		107-13-1		Acrylonitrile	2.1E-01	ca*	5.1E-01	ca*	2.8E-02	ca*	3.9E-02	ca*		
8.1E-02	h	1.0E-02	i	8.0E-02	r	1.0E-02	r	0	0.1	15972-60-8		Alachlor	6.0E+00	ca	3.1E+01	ca	8.4E-02	ca	8.4E-01	ca		
		1.5E-01	i			1.5E-01	r	0	0.1	1596-84-5		Alar	9.2E+03	nc	1.0E+05	max	5.5E+02	nc	5.5E+03	nc		
		1.0E-03	i			1.0E-03	r	0	0.1	116-06-3		Aldicarb	6.1E+01	nc	8.8E+02	nc	3.7E+00	nc	3.6E+01	nc		
		1.0E-03	i			1.0E-03	r	0	0.1	1646-88-4		Aldicarb sulfone	6.1E+01	nc	8.8E+02	nc	3.7E+00	nc	3.6E+01	nc		
1.7E+01	i	3.0E-05	i	1.7E+01	i	3.0E-05	r	0	0.1	309-00-2		Aldrin	2.9E-02	ca*	1.5E-01	ca	3.9E-04	ca	4.0E-03	ca	5.0E-01	2.0E-02
		2.5E-01	i			2.5E-01	r	0	0.1	5585-64-8		Ally	1.5E+04	nc	1.0E+05	max	9.1E+02	nc	9.1E+03	nc		
		5.0E-03	i			5.0E-03	r	0	0.1	107-18-6		Allyl alcohol	3.1E+02	nc	4.4E+03	nc	1.8E+01	nc	1.8E+02	nc		
		5.0E-02	x			2.9E-04	i	0	0.1	107-05-1		Allyl chloride	3.0E+03	nc	4.3E+04	nc	1.0E+00	nc	1.8E+03	nc		
		1.0E+00	n			1.4E-03	n	0		7429-90-5		Aluminum	7.6E+04	nc	1.0E+05	max	5.1E+00	nc	3.6E+04	nc		
		4.0E-04	i					0		20859-73-8		Aluminum phosphide	3.1E+01	nc	8.2E+02	nc			1.5E+01	nc		
		3.0E-04	i			3.0E-04	r	0	0.1	67485-29-4		Amdro	1.8E+01	nc	2.6E+02	nc	1.1E+00	nc	1.1E+01	nc		
		9.0E-03	i			9.0E-03	r	0	0.1	834-12-8		Ametryn	5.5E+02	nc	7.9E+03	nc	3.3E+01	nc	3.3E+02	nc		
		7.0E-02	h			7.0E-02	r	0	0.1	591-27-5		m-Aminophenol	4.3E+03	nc	6.2E+04	nc	2.6E+02	nc	2.6E+03	nc		
		2.0E-05	h			2.0E-05	r	0	0.1	504-24-5		4-Aminopyridine	1.2E+00	nc	1.8E+01	nc	7.3E-02	nc	7.3E-01	nc		
		2.5E-03	i			2.5E-03	r	0	0.1	33089-61-1		Amitraz	1.5E+02	nc	2.2E+03	nc	9.1E+00	nc	9.1E+01	nc		
						2.9E-02	i			7664-41-7		Ammonia					1.0E+02	nc				
		2.0E-01	i					0	0.1	7773-06-0		Ammonium sulfamate	1.2E+04	nc	1.0E+05	max			7.3E+03	nc		
5.7E-03	i	7.0E-03	n	5.7E-03	r	2.9E-04	i	0	0.1	62-53-3		Aniline	8.5E+01	ca**	4.3E+02	ca*	1.0E+00	nc	1.2E+01	ca*		
		4.0E-04	i					0		7440-36-0		Antimony and compounds	3.1E+01	nc	8.2E+02	nc			1.5E+01	nc	5.0E+00	3.0E-01
		5.0E-04	h					0		1314-60-9		Antimony pentoxide	3.9E+01	nc	1.0E+03	nc			1.8E+01	nc		
		9.0E-04	h					0		28300-74-5		Antimony potassium tartrate	7.0E+01	nc	1.8E+03	nc			3.3E+01	nc		
		4.0E-04	h					0		1332-81-6		Antimony tetroxide	3.1E+01	nc	8.2E+02	nc			1.5E+01	nc		
		4.0E-04	h			5.7E-05	i	0		1309-64-4		Antimony trioxide	3.1E+01	nc	8.2E+02	nc	2.1E-01	nc	1.5E+01	nc		
		1.3E-02	i			1.3E-02	r	0	0.1	74115-24-5		Apollo	7.9E+02	nc	1.1E+04	nc	4.7E+01	nc	4.7E+02	nc		
2.5E-02	i	5.0E-02	h	2.5E-02	i	5.0E-02	r	0	0.1	140-57-8		Aramite	1.9E+01	ca	9.9E+01	ca	2.7E-01	ca	2.7E+00	ca		
		3.0E-04	i					0	0.03	7440-38-2		Arsenic (noncancer endpoint)	2.2E+01	nc	4.4E+02	nc						
1.5E+00	i	3.0E-04	i	1.5E+01	i			0	0.03	7440-38-2		Arsenic (cancer endpoint)	3.9E-01	ca*	2.7E+00	ca	4.5E-04	ca	4.5E-02	ca	2.9E+01	1.0E+00
						1.4E-05	i	0		7784-42-1		Arsine (see arsenic for cancer endpoint)					5.2E-02	nc				
		9.0E-03	i			9.0E-03	r		0.1	76578-12-6		Assure	5.5E+02	nc	7.9E+03	nc	3.3E+01	nc	3.3E+02	nc		
		5.0E-02	i			5.0E-02	r	0	0.1	3337-71-1		Asulam	3.1E+03	nc	4.4E+04	nc	1.8E+02	nc	1.8E+03	nc		
2.2E-01	h	3.5E-02	h	2.2E-01	r	3.5E-02	r	0	0.1	1912-24-9		Atrazine	2.2E+00	ca	1.1E+01	ca	3.1E-02	ca	3.0E-01	ca		
		4.0E-04	i			4.0E-04	r	0	0.1	71751-41-2		Avermectin B1	2.4E+01	nc	3.5E+02	nc	1.5E+00	nc	1.5E+01	nc		
1.1E-01	i			1.1E-01	i			0	0.1	103-33-3		Azobenzene	4.4E+00	ca	2.2E+01	ca	6.2E-02	ca	6.1E-01	ca		

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TOXICITY INFORMATION												CONTAMINANT	PRELIMINARY REMEDIATION GOALS (PRGs)								SOIL SCREENING LEVELS	
SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		V O C	skin abs. soils	CAS No.			Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		Migration to Ground Water DAF 20 (mg/kg)	DAF 1 (mg/kg)
		7.0E-02	i			1.4E-04	h	0		7440-39-3		Barium and compounds	5.4E+03	nc	1.0E+05	max	5.2E-01	nc	2.6E+03	nc	1.6E+03	8.2E+01
		4.0E-03	i			4.0E-03	r	0	0.1	114-26-1		Baygon	2.4E+02	nc	3.5E+03	nc	1.5E+01	nc	1.5E+02	nc		
		3.0E-02	i			3.0E-02	r	0	0.1	43121-43-3		Bayleton	1.8E+03	nc	2.6E+04	nc	1.1E+02	nc	1.1E+03	nc		
		2.5E-02	i			2.5E-02	r	0	0.1	68359-37-5		Baythroid	1.5E+03	nc	2.2E+04	nc	9.1E+01	nc	9.1E+02	nc		
		3.0E-01	i			3.0E-01	r	0	0.1	1861-40-1		Benefin	1.8E+04	nc	1.0E+05	max	1.1E+03	nc	1.1E+04	nc		
		5.0E-02	i			5.0E-02	r	0	0.1	17804-35-2		Benomyl	3.1E+03	nc	4.4E+04	nc	1.8E+02	nc	1.8E+03	nc		
		3.0E-02	i			3.0E-02	r	0	0.1	25057-89-0		Bentazon	1.8E+03	nc	2.6E+04	nc	1.1E+02	nc	1.1E+03	nc		
		1.0E-01	i			1.0E-01	r	0	0.1	100-52-7		Benzaldehyde	6.1E+03	nc	8.8E+04	nc	3.7E+02	nc	3.6E+03	nc		
5.5E-02	i	3.0E-03	n	2.7E-02	i	1.7E-03	n	1		71-43-2		**Benzene**	6.5E-01	ca*	1.5E+00	ca*	2.5E-01	ca*	3.5E-01	ca*	3.0E-02	2.0E-03
2.3E+02	i	3.0E-03	i	2.3E+02	i	3.0E-03	r	0	0.1	92-87-5		Benzidine	2.1E-03	ca	1.1E-02	ca	2.9E-05	ca	2.9E-04	ca		
		4.0E+00	i			4.0E+00	r	0	0.1	65-85-0		Benzoic acid	1.0E+05	max	1.0E+05	max	1.5E+04	nc	1.5E+05	nc	4.0E+02	2.0E+01
1.3E+01	i			1.3E+01	r			0	0.1	98-07-7		Benzotrichloride	3.7E-02	ca	1.9E-01	ca	5.2E-04	ca	5.2E-03	ca		
		3.0E-01	h			3.0E-01	r	0	0.1	100-51-6		Benzyl alcohol	1.8E+04	nc	1.0E+05	max	1.1E+03	nc	1.1E+04	nc		
1.7E-01	i			1.7E-01	r			1		100-44-7		Benzyl chloride	8.9E-01	ca	2.3E+00	ca	4.0E-02	ca	6.6E-02	ca		
		2.0E-03	i	8.4E+00	i	5.7E-06	i	0		7440-41-7		Beryllium and compounds	1.5E+02	nc	2.2E+03	ca**	8.0E-04	ca*	7.3E+01	nc	6.3E+01	3.0E+00
		1.0E-04	i			1.0E-04	r	0	0.1	141-66-2		Bidrin	6.1E+00	nc	8.8E+01	nc	3.7E-01	nc	3.6E+00	nc		
		1.5E-02	i			1.5E-02	r	0	0.1	82657-04-3		Biphenthrin (Talstar)	9.2E+02	nc	1.3E+04	nc	5.5E+01	nc	5.5E+02	nc		
		5.0E-02	i			5.0E-02	r	1		92-52-4		1,1-Biphenyl	3.5E+02	sat	3.5E+02	sat	1.8E+02	nc	3.0E+02	nc		
1.1E+00	i			1.2E+00	i			1		111-44-4		Bis(2-chloroethyl)ether	2.1E-01	ca	6.2E-01	ca	5.8E-03	ca	9.8E-03	ca	4.0E-04	2.0E-05
7.0E-02	h	4.0E-02	i	3.5E-02	h	4.0E-02	r	1		108-60-1		Bis(2-chloroisopropyl)ether	2.9E+00	ca	8.1E+00	ca	1.9E-01	ca	2.7E-01	ca		
2.2E+02	i			2.2E+02	i			1		542-88-1		Bis(chloromethyl)ether	1.9E-04	ca	4.4E-04	ca	3.1E-05	ca	5.2E-05	ca		
7.0E-02	h	4.0E-02	i	3.5E-02	h	4.0E-02	r	1		108-60-1		Bis(2-chloro-1-methylethyl)ether	2.9E+00	ca	8.1E+00	ca	1.9E-01	ca	2.7E-01	ca		
1.4E-02	i	2.0E-02	i	1.4E-02	r	2.2E-02	r	0	0.1	117-81-7		Bis(2-ethylhexyl)phthalate (DEHP)	3.5E+01	ca*	1.8E+02	ca	4.8E-01	ca	4.8E+00	ca		
		5.0E-02	i			5.0E-02	r	0	0.1	80-05-7		Bisphenol A	3.1E+03	nc	4.4E+04	nc	1.8E+02	nc	1.8E+03	nc		
		9.0E-02	i			5.7E-03	h	0	0.1	7440-42-8		Boron	5.5E+03	nc	7.9E+04	nc	2.1E+01	nc	3.3E+03	nc		
						2.0E-04	h	0	0.1	7637-07-2		Boron trifluoride					7.3E-01	nc				
		2.0E-02	n			2.9E-03	n	1		108-86-1		Bromobenzene	2.8E+01	nc	9.2E+01	nc	1.0E+01	nc	2.0E+01	nc		
6.2E-02	i	2.0E-02	i	6.2E-02	r	2.0E-02	r	1		75-27-4		Bromodichloromethane	1.0E+00	ca	2.4E+00	ca	1.1E-01	ca	1.8E-01	ca	6.0E-01	3.0E-02
7.9E-03	i	2.0E-02	i	3.9E-03	i	2.0E-02	r	0	0.1	75-25-2		Bromoform (tribromomethane)	6.2E+01	ca*	3.1E+02	ca*	1.7E+00	ca*	8.5E+00	ca*	8.0E-01	4.0E-02
		1.4E-03	i			1.4E-03	i	1		74-83-9		Bromomethane (Methyl bromide)	3.9E+00	nc	1.3E+01	nc	5.2E+00	nc	8.7E+00	nc	2.0E-01	1.0E-02
								0	0.1	101-55-3		4-Bromophenyl phenyl ether										
		5.0E-03	h			5.0E-03	r	0	0.1	2104-96-3		Bromophos	3.1E+02	nc	4.4E+03	nc	1.8E+01	nc	1.8E+02	nc		
		2.0E-02	i			2.0E-02	r	0	0.1	1689-84-5		Bromoxynil	1.2E+03	nc	1.8E+04	nc	7.3E+01	nc	7.3E+02	nc		
		2.0E-02	i			2.0E-02	r	0	0.1	1689-99-2		Bromoxynil octanoate	1.2E+03	nc	1.8E+04	nc	7.3E+01	nc	7.3E+02	nc		
1.8E+00	r			1.8E+00	i			1		106-99-0		1,3-Butadiene	3.5E-03	ca	7.6E-03	ca	3.7E-03	ca	6.2E-03	ca		
		1.0E-01	i			1.0E-01	r	0	0.1	71-36-3		1-Butanol	6.1E+03	nc	8.8E+04	nc	3.7E+02	nc	3.6E+03	nc	1.7E+01	9.0E-01
		5.0E-02	i			5.0E-02	r	0	0.1	2008-41-5		Butylate	3.1E+03	nc	4.4E+04	nc	1.8E+02	nc	1.8E+03	nc		
		1.0E-02	n			1.0E-02	r	1		104-51-8		n-Butylbenzene	1.4E+02	nc	2.4E+02	sat	3.7E+01	nc	6.1E+01	nc		
		1.0E-02	n			1.0E-02	r	1		135-98-8		sec-Butylbenzene	1.1E+02	nc	2.2E+02	sat	3.7E+01	nc	6.1E+01	nc		
		1.0E-02	n			1.0E-02	r	1		98-06-6		tert-Butylbenzene	1.3E+02	nc	3.9E+02	sat	3.7E+01	nc	6.1E+01	nc		
		2.0E-01	i			2.0E-01	r	0	0.1	85-68-7		Butyl benzyl phthalate	1.2E+04	nc	1.0E+05	max	7.3E+02	nc	7.3E+03	nc	9.3E+02	8.1E+02
		1.0E+00	i			1.0E+00	r	0	0.1	85-70-1		Butylphthalyl butylglycolate	6.1E+04	nc	1.0E+05	max	3.7E+03	nc	3.6E+04	nc		
		3.0E-03	h			3.0E-03	r	0	0.1	75-60-5		Cacodylic acid	1.8E+02	nc	2.6E+03	nc	1.1E+01	nc	1.1E+02	nc		
		5.0E-04	i	6.3E+00	i			0	0.001	7440-43-9		Cadmium and compounds	3.7E+01	nc	8.1E+02	nc	1.1E-03	ca	1.8E+01	nc	8.0E+00	4.0E-01
												"CAL-Modified PRG" (PEA, 1994)	9.0E+00									

Key : i=IRIS h=HEAST n=NCEA x=WITHDRAWN o=Other EPA DOCUMENTS r=ROUTE EXTRAPOLATION ca=CANCER PRG nc=NONCANCER PRG sat=SOIL SATURATION max=CEILING LIMIT *(where: nc < 100X ca) **(where: nc < 10X ca)

FOR PLANNING PURPOSES

TOXICITY INFORMATION											CONTAMINANT	PRELIMINARY REMEDIATION GOALS (PRGs)								SOIL SCREENING LEVELS	
							V O C	skin abs. soils												Migration to Ground Water	
SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)				CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		DAF 20 (mg/kg)	DAF 1 (mg/kg)
		5.0E-01	i			5.0E-01	r	0	0.1	105-60-2	Caprolactam	3.1E+04	nc	1.0E+05	max	1.8E+03	nc	1.8E+04	nc		
8.6E-03	h	2.0E-03	i	8.6E-03	r	2.0E-03	r	0	0.1	2425-06-1	Captafol	5.7E+01	ca**	2.9E+02	ca**	7.8E-01	ca**	7.8E+00	ca**		
3.5E-03	h	1.3E-01	i	3.5E-03	r	1.3E-01	r	0	0.1	133-06-2	Captan	1.4E+02	ca*	7.0E+02	ca	1.9E+00	ca	1.9E+01	ca		
		1.0E-01	i			1.1E-01	r	0	0.1	63-25-2	Carbaryl	6.1E+03	nc	8.8E+04	nc	4.0E+02	nc	3.6E+03	nc		
2.0E-02	h			2.0E-02	r			0	0.1	86-74-8	Carbazole	2.4E+01	ca	1.2E+02	ca	3.4E-01	ca	3.4E+00	ca	6.0E-01	3.0E-02
		5.0E-03	i			5.0E-03	r	0	0.1	1563-66-2	Carbofuran	3.1E+02	nc	4.4E+03	nc	1.8E+01	nc	1.8E+02	nc		
		1.0E-01	i			2.0E-01	i	1		75-15-0	Carbon disulfide	3.6E+02	nc	7.2E+02	sat	7.3E+02	nc	1.0E+03	nc	3.2E+01	2.0E+00
1.3E-01	i	7.0E-04	i	5.3E-02	i	7.0E-04	r	1		56-23-5	Carbon tetrachloride	2.4E-01	ca**	5.3E-01	ca*	1.3E-01	ca*	1.7E-01	ca*	7.0E-02	3.0E-03
		1.0E-02	i			1.0E-02	r	0	0.1	55285-14-8	Carbosulfan	6.1E+02	nc	8.8E+03	nc	3.7E+01	nc	3.6E+02	nc		
		1.0E-01	i			1.0E-01	r	0	0.1	5234-68-4	Carboxin	6.1E+03	nc	8.8E+04	nc	3.7E+02	nc	3.6E+03	nc		
		1.5E-02	i			1.5E-02	r	0	0.1	133-90-4	Chloramben	9.2E+02	nc	1.3E+04	nc	5.5E+01	nc	5.5E+02	nc		
4.0E-01	h			4.0E-01	r			0	0.1	118-75-2	Chloranil	1.2E+00	ca	6.1E+00	ca	1.7E-02	ca	1.7E-01	ca		
3.5E-01	i	5.0E-04	i	3.5E-01	i	2.0E-04	i	0	0.04	12789-03-6	Chlordane	1.6E+00	ca*	1.1E+01	ca*	1.9E-02	ca*	1.9E-01	ca*	1.0E+01	5.0E-01
		2.0E-02	i			2.0E-02	r	0	0.1	90982-32-4	Chlorimuron-ethyl	1.2E+03	nc	1.8E+04	nc	7.3E+01	nc	7.3E+02	nc		
		1.0E-01	i			5.7E-05	n			7782-50-5	**Chlorine**					2.1E-01	nc				
						5.7E-05	i			10049-04-4	Chlorine dioxide					2.1E-01	nc				
								1		107-20-0	Chloroacetaldehyde										
		2.0E-03	h			2.0E-03	r	0	0.1	79-11-8	Chloroacetic acid	1.2E+02	nc	1.8E+03	nc	7.3E+00	nc	7.3E+01	nc		
		8.6E-06	r			8.6E-06	i	1		532-27-4	2-Chloroacetophenone	3.3E-02	nc	1.1E-01	nc	3.1E-02	nc	5.2E-02	nc		
		4.0E-03	i			4.0E-03	r	0	0.1	106-47-8	4-Chloroaniline	2.4E+02	nc	3.5E+03	nc	1.5E+01	nc	1.5E+02	nc	7.0E-01	3.0E-02
		2.0E-02	i			1.7E-02	n	1		108-90-7	Chlorobenzene	1.5E+02	nc	5.4E+02	nc	6.2E+01	nc	1.1E+02	nc	1.0E+00	7.0E-02
2.7E-01	h	2.0E-02	i	2.7E-01	h	2.0E-02	r	0	0.1	510-15-6	Chlorobenzilate	1.8E+00	ca	9.1E+00	ca	2.5E-02	ca	2.5E-01	ca		
		2.0E-01	h			2.0E-01	r	0	0.1	74-11-3	p-Chlorobenzoic acid	1.2E+04	nc	1.0E+05	max	7.3E+02	nc	7.3E+03	nc		
		2.0E-02	h			2.0E-02	r	0	0.1	98-56-6	4-Chlorobenzotrifluoride	1.2E+03	nc	1.8E+04	nc	7.3E+01	nc	7.3E+02	nc		
		2.0E-02	h			2.0E-03	h	1		126-99-8	2-Chloro-1,3-butadiene	3.6E+00	nc	1.2E+01	nc	7.3E+00	nc	1.4E+01	nc		
		4.0E-01	h			4.0E-01	r	1		109-69-3	1-Chlorobutane	4.8E+02	sat	4.8E+02	sat	1.5E+03	nc	2.4E+03	nc		
		1.4E+01	r			1.4E+01	i	1		75-68-3	1-Chloro-1,1-difluoroethane (HCFC-142b)	3.4E+02	sat	3.4E+02	sat	5.2E+04	nc	8.7E+04	nc		
		1.4E+01	r			1.4E+01	i	1		75-45-6	Chlorodifluoromethane	3.4E+02	sat	3.4E+02	sat	5.1E+04	nc	8.5E+04	nc		
2.9E-03	n	4.0E-01	n	2.9E-03	r	2.9E+00	i	1		75-00-3	Chloroethane	3.0E+00	ca	6.5E+00	ca	2.3E+00	ca	4.6E+00	ca		
								1		110-75-8	2-Chloroethyl vinyl ether										
6.1E-03	i	1.0E-02	i	8.1E-02	i	8.6E-05	n	1		67-66-3	Chloroform	2.4E-01	ca**	5.2E-01	ca**	8.4E-02	ca**	1.6E-01	ca**	6.0E-01	3.0E-02
1.3E-02	h			6.3E-03	h	8.6E-02	n	1		74-87-3	Chloromethane	1.2E+00	ca	2.7E+00	ca	1.1E+00	ca	1.5E+00	ca		
5.8E-01	h			5.8E-01	r			0	0.1	95-69-2	4-Chloro-2-methylaniline	8.4E-01	ca	4.3E+00	ca	1.2E-02	ca	1.2E-01	ca		
4.6E-01	h			4.6E-01	r			0	0.1	3165-93-3	4-Chloro-2-methylaniline hydrochloride	1.1E+00	ca	5.4E+00	ca	1.5E-02	ca	1.5E-01	ca		
		8.0E-02	i			8.0E-02	r	1		91-58-7	beta-Chloronaphthalene	3.9E+03	nc	2.7E+04	nc	2.9E+02	nc	4.9E+02	nc		
2.5E-02	h			2.5E-02	r		r	1		88-73-3	o-Chloronitrobenzene	8.1E+00	ca	2.3E+01	ca	2.7E-01	ca	4.5E-01	ca		
1.8E-02	h			1.8E-02	r		r	1		100-00-5	p-Chloronitrobenzene	1.1E+01	ca	3.2E+01	ca	3.7E-01	ca	6.2E-01	ca		
		5.0E-03	i			5.0E-03	r	1		95-57-8	2-Chlorophenol	6.3E+01	nc	2.4E+02	nc	1.8E+01	nc	3.0E+01	nc	4.0E+00	2.0E-01
		2.9E-02	r			2.9E-02	h	1		75-29-6	2-Chloropropane	1.7E+02	nc	5.9E+02	nc	1.0E+02	nc	1.7E+02	nc		
1.1E-02	h	1.5E-02	i	1.1E-02	r	1.5E-02	r	0	0.1	1897-45-6	Chlorothalonil	4.4E+01	ca*	2.2E+02	ca*	6.1E-01	ca*	6.1E+00	ca*		
		2.0E-02	i			2.0E-02	r	1		95-49-8	o-Chlorotoluene	1.6E+02	nc	5.7E+02	nc	7.3E+01	nc	1.2E+02	nc		
		2.0E-01	i			2.0E-01	r	0	0.1	101-21-3	Chlorpropham	1.2E+04	nc	1.0E+05	max	7.3E+02	nc	7.3E+03	nc		
		3.0E-03	i			3.0E-03	r	0	0.1	2921-88-2	Chlorpyrifos	1.8E+02	nc	2.6E+03	nc	1.1E+01	nc	1.1E+02	nc		
		1.0E-02	h			1.0E-02	r	0	0.1	5598-13-0	Chlorpyrifos-methyl	6.1E+02	nc	8.8E+03	nc	3.7E+01	nc	3.6E+02	nc		
		5.0E-02	i			5.0E-02	r	0	0.1	64902-72-3	Chlorsulfuron	3.1E+03	nc	4.4E+04	nc	1.8E+02	nc	1.8E+03	nc		

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FOR PLANNING PURPOSES

TOXICITY INFORMATION										CONTAMINANT	PRELIMINARY REMEDIATION GOALS (PRGs)								SOIL SCREENING LEVELS Migration to Ground Water	
SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		V O C	skin abs. soils	CAS No.	Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		DAF 20 (mg/kg)	DAF 1 (mg/kg)
		8.0E-04	h			8.0E-04	r	0	0.1	60238-56-4	Chlorthiophos	4.9E+01	nc	7.0E+02	nc	2.9E+00	nc	2.9E+01	nc		
				4.2E+01	i			0			Total Chromium (1:6 ratio Cr VI:Cr III)	2.1E+02	ca	4.5E+02	ca	1.6E-04	ca			3.8E+01	2.0E+00
		1.5E+00	i							16065-83-1	Chromium III	1.0E+05	max	1.0E+05	max	0.0E+00		5.5E+04	nc		
		3.0E-03	i	2.9E+02	i			0		18540-29-9	Chromium VI	3.0E+01	ca**	6.4E+01	ca	2.3E-05	ca	1.1E+02	nc	3.8E+01	2.0E+00
											"CAL-Modified PRG" (PEA, 1994)	2.0E-01						1.6E-01			
		6.0E-02	n							7440-48-4	Cobalt	4.7E+03	nc	1.0E+05	max			2.2E+03	nc		
				2.2E+00	i			0		8007-45-2	Coke Oven Emissions					3.1E-03	ca				
		3.7E-02	h					0		7440-50-8	Copper and compounds	2.9E+03	nc	7.6E+04	nc			1.4E+03	nc		
1.9E+00	h			1.9E+00	r			1		123-73-9	Crotonaldehyde	5.3E-03	ca	1.1E-02	ca	3.5E-03	ca	5.9E-03	ca		
		1.0E-01	i			1.1E-01	i	1		98-82-8	Cumene (isopropylbenzene)	1.6E+02	nc	5.2E+02	nc	4.0E+02	nc	6.6E+02	nc		
8.4E-01	h	2.0E-03	h	8.4E-01	r	2.0E-03	r	0	0.1	21725-46-2	Cyanazine	5.8E-01	ca	2.9E+00	ca	8.0E-03	ca	8.0E-02	ca		
		2.0E-02	i			8.6E-04	i	1		74-90-8	Cyanide and compounds	1.1E+01	nc	3.5E+01	nc	3.1E+00	nc	6.2E+00	nc		
		4.0E-02	i			4.0E-02	r	1		460-19-5	Cyanogen	1.3E+02	nc	4.3E+02	nc	1.5E+02	nc	2.4E+02	nc		
		9.0E-02	i			9.0E-02	r	1		506-68-3	Cyanogen bromide	2.9E+02	nc	9.7E+02	nc	3.3E+02	nc	5.5E+02	nc		
		5.0E-02	i			5.0E-02	r	1		506-77-4	Cyanogen chloride	1.6E+02	nc	5.4E+02	nc	1.8E+02	nc	3.0E+02	nc		
		5.7E+00	r			5.7E+00	n	1		110-82-7	**Cyclohexane**	1.4E+02	sat	1.4E+02	sat	2.1E+04	nc	3.5E+04	nc		
		5.0E+00	i			5.0E+00	r	0	0.1	108-94-1	Cyclohexanone	1.0E+05	max	1.0E+05	max	1.8E+04	nc	1.8E+05	nc		
		2.0E-01	i			2.0E-01	r	0	0.1	108-91-8	Cyclohexylamine	1.2E+04	nc	1.0E+05	max	7.3E+02	nc	7.3E+03	nc		
		5.0E-03	i			5.0E-03	r	0	0.1	68085-85-8	Cyhalothrin/Karate	3.1E+02	nc	4.4E+03	nc	1.8E+01	nc	1.8E+02	nc		
		1.0E-02	i			1.0E-02	r	0	0.1	52315-07-8	Cypermethrin	6.1E+02	nc	8.8E+03	nc	3.7E+01	nc	3.6E+02	nc		
		7.5E-03	i			7.5E-03	r	0	0.1	66215-27-8	Cyromazine	4.6E+02	nc	6.6E+03	nc	2.7E+01	nc	2.7E+02	nc		
		1.0E-02	i			1.0E-02	r	0	0.1	1861-32-1	Dacthal	6.1E+02	nc	8.8E+03	nc	3.7E+01	nc	3.6E+02	nc		
		3.0E-02	i			3.0E-02	r	0	0.1	75-99-0	Dalapon	1.8E+03	nc	2.6E+04	nc	1.1E+02	nc	1.1E+03	nc		
		2.5E-02	i			2.5E-02	r	0	0.1	39515-41-8	Danitol	1.5E+03	nc	2.2E+04	nc	9.1E+01	nc	9.1E+02	nc		
2.4E-01	i			2.4E-01	r			0	0.03	72-54-8	DDD	2.4E+00	ca	1.7E+01	ca	2.8E-02	ca	2.8E-01	ca	1.6E+01	8.0E-01
3.4E-01	i			3.4E-01	r			0	0.03	72-55-9	DDE	1.7E+00	ca	1.2E+01	ca	2.0E-02	ca	2.0E-01	ca	5.4E+01	3.0E+00
3.4E-01	i	5.0E-04	i	3.4E-01	i	5.0E-04	r	0	0.03	50-29-3	DDT	1.7E+00	ca*	1.2E+01	ca*	2.0E-02	ca*	2.0E-01	ca*	3.2E+01	2.0E+00
		1.0E-02	i			1.0E-02	r	0	0.1	1163-19-5	Decabromodiphenyl ether	6.1E+02	nc	8.8E+03	nc	3.7E+01	nc	3.6E+02	nc		
		4.0E-05	i			4.0E-05	r	0	0.1	8065-48-3	Demeton	2.4E+00	nc	3.5E+01	nc	1.5E-01	nc	1.5E+00	nc		
6.1E-02	h			6.1E-02	r			0	0.1	2303-16-4	Diallate	8.0E+00	ca	4.0E+01	ca	1.1E-01	ca	1.1E+00	ca		
		9.0E-04	h			9.0E-04	r	0	0.1	333-41-5	Diazinon	5.5E+01	nc	7.9E+02	nc	3.3E+00	nc	3.3E+01	nc		
		4.0E-03	n			4.0E-03	r	1		132-64-9	Dibenzofuran	2.9E+02	nc	5.1E+03	nc	1.5E+01	nc	2.4E+01	nc		
		1.0E-02	i			1.0E-02	r	0	0.1	106-37-6	1,4-Dibromobenzene	6.1E+02	nc	8.8E+03	nc	3.7E+01	nc	3.6E+02	nc		
8.4E-02	i	2.0E-02	i	8.4E-02	r	2.0E-02	r	1		124-48-1	Dibromochloromethane	1.1E+00	ca	2.7E+00	ca	8.0E-02	ca	1.3E-01	ca	4.0E-01	2.0E-02
1.4E+00	h	5.7E-05	r	2.4E-03	h	5.7E-05	i	1		96-12-8	1,2-Dibromo-3-chloropropane	4.5E-01	ca**	4.0E+00	ca**	2.1E-01	nc	4.8E-02	ca**		
											"CAL-Modified PRG" (PEA, 1994)	6.0E-02				9.6E-04		4.7E-03			
8.5E+01	i	5.7E-05	r	7.7E-01	i	5.7E-05	h	1		106-93-4	1,2-Dibromoethane	6.9E-03	ca	4.8E-02	ca*	8.7E-03	ca*	7.6E-04	ca		
		1.0E-01	i			1.0E-01	r	0	0.1	84-74-2	Dibutyl phthalate	6.1E+03	nc	8.8E+04	nc	3.7E+02	nc	3.6E+03	nc	2.3E+03	2.7E+02
		3.0E-02	i			3.0E-02	r	0	0.1	1918-00-9	Dicamba		nc	2.6E+04	nc	1.1E+02	nc	1.1E+03	nc		
		9.0E-02	i			5.7E-02	h	1		95-50-1	1,2-Dichlorobenzene	3.7E+02	sat	3.7E+02	sat	2.1E+02	nc	3.7E+02	nc	1.7E+01	9.0E-01
		9.0E-04	n			9.0E-04	r	1		541-73-1	1,3-Dichlorobenzene	1.3E+01	nc	5.2E+01	nc	3.3E+00	nc	5.5E+00	nc		
2.4E-02	h	3.0E-02	n	2.2E-02	n	2.3E-01	i	1		106-46-7	1,4-Dichlorobenzene	3.4E+00	ca	8.1E+00	ca	3.1E-01	ca	5.0E-01	ca	2.0E+00	1.0E-01
4.5E-01	i			4.5E-01	r			0	0.1	91-94-1	3,3-Dichlorobenzidine	1.1E+00	ca	5.5E+00	ca	1.5E-02	ca	1.5E-01	ca	7.0E-03	3.0E-04
		3.0E-02	n			3.0E-02	r		0.1	90-98-2	**4,4'-Dichlorobenzophenone**	1.8E+03	nc	2.6E+04	nc	1.1E+02	nc	1.1E+03	nc		
9.3E+00	r			9.3E+00	h			1		764-41-0	1,4-Dichloro-2-butene	7.9E-03	ca	1.8E-02	ca	7.2E-04	ca	1.2E-03	ca		

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FOR PLANNING PURPOSES

TOXICITY INFORMATION											CONTAMINANT	PRELIMINARY REMEDIATION GOALS (PRGs)								SOIL SCREENING LEVELS	
							V O C	skin abs. soils		CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		Migration to Ground Water DAF 20 (mg/kg)	DAF 1 (mg/kg)
SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)															
		2.0E-01	i			5.7E-02	h	1		75-71-8	Dichlorodifluoromethane	9.4E+01	nc	3.1E+02	nc	2.1E+02	nc	3.9E+02	nc		
		1.0E-01	h			1.4E-01	h	1		75-34-3	1,1-Dichloroethane	5.9E+02	nc	2.1E+03	nc	5.2E+02	nc	8.1E+02	nc	2.3E+01	1.0E+00
5.7E-03				5.7E-03				1			**"CAL-Modified PRG"**	3.3E+00	ca	7.1E+00	ca	1.2E+00	ca	2.0E+00	ca		
9.1E-02	i	3.0E-02	n	9.1E-02	i	1.4E-03	n	1		107-06-2	1,2-Dichloroethane (EDC)	3.5E-01	ca*	7.6E-01	ca*	7.4E-02	ca*	1.2E-01	ca*	2.0E-02	1.0E-03
6.0E-01	i	9.0E-03	i	1.8E-01	i	9.0E-03	r	1		75-35-4	1,1-Dichloroethylene	5.4E-02	ca	1.2E-01	ca	3.8E-02	ca	4.6E-02	ca	6.0E-02	3.0E-03
		1.0E-02	h			1.0E-02	r	1		156-59-2	1,2-Dichloroethylene (cis)	4.3E+01	nc	1.5E+02	nc	3.7E+01	nc	6.1E+01	nc	4.0E-01	2.0E-02
		2.0E-02	i			2.0E-02	r	1		156-60-5	1,2-Dichloroethylene (trans)	6.3E+01	nc	2.1E+02	nc	7.3E+01	nc	1.2E+02	nc	7.0E-01	3.0E-02
		3.0E-03	i			3.0E-03	r	0	0.1	120-83-2	2,4-Dichlorophenol	1.8E+02	nc	2.6E+03	nc	1.1E+01	nc	1.1E+02	nc	1.0E+00	5.0E-02
		8.0E-03	i			8.0E-03	r	0	0.1	94-82-6	4-(2,4-Dichlorophenoxy)butyric Acid (2,4-DB)	4.9E+02	nc	7.0E+03	nc	2.9E+01	nc	2.9E+02	nc		
		1.0E-02	i			1.0E-02	r	0	0.05	94-75-7	2,4-Dichlorophenoxyacetic Acid (2,4-D)	6.9E+02	nc	1.2E+04	nc	3.7E+01	nc	3.6E+02	nc		
6.8E-02	h	1.1E-03	r	6.8E-02	r	1.1E-03	i	1		78-87-5	1,2-Dichloropropane	3.5E-01	ca*	7.7E-01	ca*	9.9E-02	ca*	1.6E-01	ca*	3.0E-02	1.0E-03
1.0E-01	i	3.0E-02	i	1.4E-02	i	5.7E-03	i	1		542-75-6	**1,3-Dichloropropene**	7.0E-01	ca	1.6E+00	ca	4.8E-01	ca	4.0E-01	ca	4.0E-03	2.0E-04
		3.0E-03	i			3.0E-03	r	0	0.1	616-23-9	2,3-Dichloropropanol	1.8E+02	nc	2.6E+03	nc	1.1E+01	nc	1.1E+02	nc		
2.9E-01	i	5.0E-04	i	2.9E-01	r	1.4E-04	i	0	0.1	62-73-7	Dichlorvos	1.7E+00	ca*	8.5E+00	ca*	2.3E-02	ca*	2.3E-01	ca*		
4.4E-01	x			4.4E-01	r			0	0.1	115-32-2	Dicofol	1.1E+00	ca	5.6E+00	ca	1.5E-02	ca	1.5E-01	ca		
		3.0E-02	h			5.7E-05	h	1		77-73-6	Dicyclopentadiene	5.4E-01	nc	1.8E+00	nc	2.1E-01	nc	4.2E-01	nc		
1.6E+01	i	5.0E-05	i	1.6E+01	i	5.0E-05	r	0	0.1	60-57-1	Dieldrin	3.0E-02	ca	1.5E-01	ca	4.2E-04	ca	4.2E-03	ca	4.0E-03	2.0E-04
		5.7E-03	r			5.7E-03	h	0	0.1	112-34-5	Diethylene glycol, monobutyl ether	3.5E+02	nc	5.0E+03	nc	2.1E+01	nc	2.1E+02	nc		
		2.0E+00	h			2.0E+00	r	0	0.1	111-90-0	Diethylene glycol, monoethyl ether	1.0E+05	max	1.0E+05	max	7.3E+03	nc	7.3E+04	nc		
		1.1E-02	h			1.1E-02	r	0	0.1	617-84-5	Diethylformamide	6.7E+02	nc	9.7E+03	nc	4.0E+01	nc	4.0E+02	nc		
1.2E-03	i	6.0E-01	i	1.2E-03	r	6.0E-01	r	0	0.1	103-23-1	Di(2-ethylhexyl)adipate	4.1E+02	ca	2.1E+03	ca	5.6E+00	ca	5.6E+01	ca		
		8.0E-01	i			8.0E-01	r	0	0.1	84-66-2	Diethyl phthalate	4.9E+04	nc	1.0E+05	max	2.9E+03	nc	2.9E+04	nc		
4.7E+03	h			4.7E+03	r			0	0.1	56-53-1	Diethylstilbestrol	1.0E-04	ca	5.2E-04	ca	1.4E-06	ca	1.4E-05	ca		
		8.0E-02	i			8.0E-02	r	0	0.1	43222-48-6	Difenzoquat (Avenge)	4.9E+03	nc	7.0E+04	nc	2.9E+02	nc	2.9E+03	nc		
		2.0E-02	i			2.0E-02	r	0	0.1	35367-38-5	Diflubenzuron	1.2E+03	nc	1.8E+04	nc	7.3E+01	nc	7.3E+02	nc		
		1.1E+01	r			1.1E+01	i	1		75-37-6	1,1-Difluoroethane					4.2E+04	nc	6.9E+04	nc		
		2.0E-02	n			2.0E-02	r		0.1	28553-12-0	**Diisononyl phthalate**	1.2E+03	nc	1.8E+04	nc	7.3E+01	nc	7.3E+02	nc		
		8.0E-02	i			8.0E-02	r	0	0.1	1445-75-6	Diisopropyl methylphosphonate	4.9E+03	nc	7.0E+04	nc	2.9E+02	nc	2.9E+03	nc		
		2.0E-02	i			2.0E-02	r	0	0.1	55290-64-7	Dimethipin	1.2E+03	nc	1.8E+04	nc	7.3E+01	nc	7.3E+02	nc		
		2.0E-04	i			2.0E-04	r	0	0.1	60-51-5	Dimethoate	1.2E+01	nc	1.8E+02	nc	7.3E-01	nc	7.3E+00	nc		
1.4E-02	h			1.4E-02	r			0	0.1	119-90-4	3,3'-Dimethoxybenzidine	3.5E+01	ca	1.8E+02	ca	4.8E-01	ca	4.8E+00	ca		
		5.7E-06	r			5.7E-06	x	1		124-40-3	Dimethylamine	6.7E-02	nc	2.5E-01	nc	2.1E-02	nc	3.5E-02	nc		
		2.0E-03	i			2.0E-03	r	0	0.1	121-69-7	N-N-Dimethylaniline	1.2E+02	nc	1.8E+03	nc	7.3E+00	nc	7.3E+01	nc		
7.5E-01	h			7.5E-01	r			0	0.1	95-68-1	2,4-Dimethylaniline	6.5E-01	ca	3.3E+00	ca	9.0E-03	ca	9.0E-02	ca		
5.8E-01	h			5.8E-01	r			0	0.1	21436-96-4	2,4-Dimethylaniline hydrochloride	8.4E-01	ca	4.3E+00	ca	1.2E-02	ca	1.2E-01	ca		
9.2E+00	h			9.2E+00	r			0	0.1	119-93-7	3,3'-Dimethylbenzidine	5.3E-02	ca	2.7E-01	ca	7.3E-04	ca	7.3E-03	ca		
2.6E+00	x			3.5E+00	x			0	0.1	57-14-7	1,1-Dimethylhydrazine	1.9E-01	ca	9.5E-01	ca	1.9E-03	ca	2.6E-02	ca		
3.7E+01	x			3.7E+01	x			0	0.1	540-73-8	1,2-Dimethylhydrazine	1.3E-02	ca	6.7E-02	ca	1.8E-04	ca	1.8E-03	ca		
		1.0E-01	h			8.6E-03	i	0	0.1	68-12-2	N,N-Dimethylformamide	6.1E+03	nc	8.8E+04	nc	3.1E+01	nc	3.6E+03	nc		
		1.0E-03	n			1.0E-03	r	0	0.1	122-09-8	Dimethylphenethylamine	6.1E+01	nc	8.8E+02	nc	3.7E+00	nc	3.6E+01	nc		
		2.0E-02	i			2.0E-02	r	0	0.1	105-67-9	2,4-Dimethylphenol	1.2E+03	nc	1.8E+04	nc	7.3E+01	nc	7.3E+02	nc	9.0E+00	4.0E-01
		6.0E-04	i			6.0E-04	r	0	0.1	576-26-1	2,6-Dimethylphenol	3.7E+01	nc	5.3E+02	nc	2.2E+00	nc	2.2E+01	nc		
		1.0E-03	i			1.0E-03	r	0	0.1	95-65-8	3,4-Dimethylphenol	6.1E+01	nc	8.8E+02	nc	3.7E+00	nc	3.6E+01	nc		
		1.0E+01	x			1.0E+01	r	0	0.1	131-11-3	Dimethyl phthalate	1.0E+05	max	1.0E+05	max	3.7E+04	nc	3.6E+05	nc		
		1.0E-01	i			1.0E-01	r	0	0.1	120-61-6	Dimethyl terephthalate	6.1E+03	nc	8.8E+04	nc	3.7E+02	nc	3.6E+03	nc		

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FOR PLANNING PURPOSES

TOXICITY INFORMATION										CONTAMINANT	PRELIMINARY REMEDIATION GOALS (PRGs)								SOIL SCREENING LEVELS	
SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		V O C	skin abs. soils	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		Migration to Ground Water DAF 20 (mg/kg)	DAF 1 (mg/kg)
		2.0E-03	i			2.0E-03	r	0	0.1	131-89-5	4,6-Dinitro-o-cyclohexyl phenol	1.2E+02	nc	1.8E+03	nc	7.3E+00	nc	7.3E+01	nc		
		4.0E-04	h			4.0E-04	r	0	0.1	528-29-0	1,2-Dinitrobenzene	2.4E+01	nc	3.5E+02	nc	1.5E+00	nc	1.5E+01	nc		
		1.0E-04	i			1.0E-04	r	0	0.1	99-65-0	1,3-Dinitrobenzene	6.1E+00	nc	8.8E+01	nc	3.7E-01	nc	3.6E+00	nc		
		4.0E-04	h			4.0E-04	r	0	0.1	100-25-4	1,4-Dinitrobenzene	2.4E+01	nc	3.5E+02	nc	1.5E+00	nc	1.5E+01	nc		
		2.0E-03	i			2.0E-03	r	0	0.1	51-28-5	2,4-Dinitrophenol	1.2E+02	nc	1.8E+03	nc	7.3E+00	nc	7.3E+01	nc	3.0E-01	1.0E-02
6.8E-01	i			6.8E-01	r			0	0.1	25321-14-6	Dinitrotoluene mixture	7.2E-01	ca	3.6E+00	ca	9.9E-03	ca	9.9E-02	ca	8.0E-04	4.0E-05
		2.0E-03	i			2.0E-03	r	0	0.1	121-14-2	2,4-Dinitrotoluene (see Dinitrotoluene mixture)	1.2E+02	nc	1.8E+03	nc	7.3E+00	nc	7.3E+01	nc	8.0E-04	4.0E-05
		1.0E-03	h			1.0E-03	r	0	0.1	606-20-2	2,6-Dinitrotoluene (see Dinitrotoluene mixture)	6.1E+01	nc	8.8E+02	nc	3.7E+00	nc	3.6E+01	nc	7.0E-04	3.0E-05
		1.0E-03	i			1.0E-03	r	0	0.1	88-85-7	Dinoseb	6.1E+01	nc	8.8E+02	nc	3.7E+00	nc	3.6E+01	nc		
		2.0E-02	h			2.0E-02	r	0	0.1	117-84-0	di-n-Octyl phthalate	1.2E+03	nc	1.0E+04	sat	7.3E+01	nc	7.3E+02	nc	1.0E+04	1.0E+04
1.1E-02	i			1.1E-02	r			0	0.1	123-91-1	1,4-Dioxane	4.4E+01	ca	2.2E+02	ca	6.1E-01	ca	6.1E+00	ca		
1.5E+05	h			1.5E+05	h			0	0.03	1746-01-6	Dioxin (2,3,7,8-TCDD)	3.9E-06	ca	2.7E-05	ca	4.5E-08	ca	4.5E-07	ca		
		3.0E-02	i			3.0E-02	r	0	0.1	957-51-7	Diphenamid	1.8E+03	nc	2.6E+04	nc	1.1E+02	nc	1.1E+03	nc		
		2.5E-02	i			2.5E-02	r	0	0.1	122-39-4	Diphenylamine	1.5E+03	nc	2.2E+04	nc	9.1E+01	nc	9.1E+02	nc		
		3.0E-04	n			3.0E-04	r		0.1	74-31-7	**N,N-Diphenyl-1,4 benzenediamine (DPPD)**	1.8E+01	nc	2.6E+02	nc	1.1E+00	nc	1.1E+01	nc		
8.0E-01	i			7.7E-01	i			0	0.1	122-66-7	1,2-Diphenylhydrazine	6.1E-01	ca	3.1E+00	ca	8.7E-03	ca	8.4E-02	ca		
		9.0E-03	n			9.0E-03	r	0	0.1	127-63-9	Diphenyl sulfone	5.5E+02	nc	7.9E+03	nc	3.3E+01	nc	3.3E+02	nc		
		2.2E-03	i			2.2E-03	r	0	0.1	85-00-7	Diquat	1.3E+02	nc	1.9E+03	nc	8.0E+00	nc	8.0E+01	nc		
8.6E+00	h			8.6E+00	r			0	0.1	1937-37-7	Direct black 38	5.7E-02	ca	2.9E-01	ca	7.8E-04	ca	7.8E-03	ca		
8.1E+00	h			8.1E+00	r			0	0.1	2602-46-2	Direct blue 6	6.0E-02	ca	3.0E-01	ca	8.3E-04	ca	8.3E-03	ca		
9.3E+00	h			9.3E+00	r			0	0.1	16071-86-6	Direct brown 95	5.2E-02	ca	2.7E-01	ca	7.2E-04	ca	7.2E-03	ca		
		4.0E-05	i			4.0E-05	r	0	0.1	298-04-4	Disulfoton	2.4E+00	nc	3.5E+01	nc	1.5E-01	nc	1.5E+00	nc		
		1.0E-02	i			1.0E-02	r	0	0.1	505-29-3	1,4-Dithiane	6.1E+02	nc	8.8E+03	nc	3.7E+01	nc	3.6E+02	nc		
		2.0E-03	i			2.0E-03	r	0	0.1	330-54-1	Diuron	1.2E+02	nc	1.8E+03	nc	7.3E+00	nc	7.3E+01	nc		
		4.0E-03	i			4.0E-03	r	0	0.1	2439-10-3	Dodine	2.4E+02	nc	3.5E+03	nc	1.5E+01	nc	1.5E+02	nc		
		2.0E-01	n							7429-91-6	**Dysprosium**	1.6E+04	nc	1.0E+05	max			7.3E+03	nc		
		6.0E-03	i			6.0E-03	r	0	0.1	115-29-7	Endosulfan	3.7E+02	nc	5.3E+03	nc	2.2E+01	nc	2.2E+02	nc	1.8E+01	9.0E-01
		2.0E-02	i			2.0E-02	r	0	0.1	145-73-3	Endothall	1.2E+03	nc	1.8E+04	nc	7.3E+01	nc	7.3E+02	nc		
		3.0E-04	i			3.0E-04	r	0	0.1	72-20-8	Endrin	1.8E+01	nc	2.6E+02	nc	1.1E+00	nc	1.1E+01	nc	1.0E+00	5.0E-02
9.9E-03	i	2.0E-03	h	4.2E-03	i	2.9E-04	i	1		106-89-8	Epichlorohydrin	7.6E+00	nc	2.6E+01	nc	1.0E+00	nc	2.0E+00	nc		
		5.7E-03	r			5.7E-03	i	0	0.1	106-88-7	1,2-Epoxybutane	3.5E+02	nc	5.0E+03	nc	2.1E+01	nc	2.1E+02	nc		
		2.5E-02	i			2.5E-02	r	0	0.1	759-94-4	EPTC (S-Ethyl dipropylthiocarbamate)	1.5E+03	nc	2.2E+04	nc	9.1E+01	nc	9.1E+02	nc		
		5.0E-03	i			5.0E-03	r	0	0.1	16672-87-0	Ethephon (2-chloroethyl phosphonic acid)	3.1E+02	nc	4.4E+03	nc	1.8E+01	nc	1.8E+02	nc		
		5.0E-04	i			5.0E-04	r	0	0.1	563-12-2	Ethion	3.1E+01	nc	4.4E+02	nc	1.8E+00	nc	1.8E+01	nc		
		4.0E-01	h			5.7E-02	i	0	0.1	110-80-5	2-Ethoxyethanol	2.4E+04	nc	1.0E+05	max	2.1E+02	nc	1.5E+04	nc		
		3.0E-01	h			3.0E-01	r	0	0.1	111-15-9	2-Ethoxyethanol acetate	1.8E+04	nc	1.0E+05	max	1.1E+03	nc	1.1E+04	nc		
		9.0E-01	i			9.0E-01	r	1		141-78-6	Ethyl acetate	1.9E+04	nc	3.7E+04	sat	3.3E+03	nc	5.5E+03	nc		
4.8E-02	h			4.8E-02	r			1		140-88-5	Ethyl acrylate	2.1E-01	ca	4.5E-01	ca	1.4E-01	ca	2.3E-01	ca		
		1.0E-01	i			2.9E-01	i	1		100-41-4	Ethylbenzene	2.3E+02	sat	2.3E+02	sat	1.1E+03	nc	1.3E+03	nc	1.3E+01	7.0E-01
2.9E-03	n	4.0E-01	n	2.9E-03	r	2.9E+00	i	1		75-00-3	Ethyl chloride	3.0E+00	ca	6.5E+00	ca	2.3E+00	ca	4.6E+00	ca		
		3.0E-01	h			3.0E-01	r	0	0.1	109-78-4	Ethylene cyanohydrin	1.8E+04	nc	1.0E+05	max	1.1E+03	nc	1.1E+04	nc		
		2.0E-02	h			2.0E-02	r	0	0.1	107-15-3	Ethylene diamine	1.2E+03	nc	1.8E+04	nc	7.3E+01	nc	7.3E+02	nc		
		2.0E+00	i			2.0E+00	r	0	0.1	107-21-1	Ethylene glycol	1.0E+05	max	1.0E+05	max	7.3E+03	nc	7.3E+04	nc		
		5.0E-01	i			3.7E+00	i	0	0.1	111-76-2	**Ethylene glycol, monobutyl ether**	3.1E+04	nc	1.0E+05	max	1.4E+04	nc	1.8E+04	nc		
1.0E+00	h			3.5E-01	h			1		75-21-8	Ethylene oxide	1.4E-01	ca	3.6E-01	ca	1.9E-02	ca	2.4E-02	ca		

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FOR PLANNING PURPOSES

TOXICITY INFORMATION											CONTAMINANT	PRELIMINARY REMEDIATION GOALS (PRGs)								SOIL SCREENING LEVELS	
								V O C	skin abs. soils	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		Migration to Ground Water DAF 20 (mg/kg)	DAF 1 (mg/kg)
SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)															
1.1E-01	h	8.0E-05	i	1.1E-01	r	8.0E-05	r	0	0.1	96-45-7	Ethylene thiourea (ETU)	4.4E+00	ca**	2.2E+01	ca**	6.1E-02	ca**	6.1E-01	ca**		
		2.0E-01	i			2.0E-01	r	1		60-29-7	Ethyl ether	1.8E+03	sat	1.8E+03	sat	7.3E+02	nc	1.2E+03	nc		
		9.0E-02	h			9.0E-02	r	1		97-63-2	Ethyl methacrylate	1.4E+02	sat	1.4E+02	sat	3.3E+02	nc	5.5E+02	nc		
		1.0E-05	i			1.0E-05	r	0	0.1	2104-64-5	Ethyl p-nitrophenyl phenylphosphorothioate	6.1E-01	nc	8.8E+00	nc	3.7E-02	nc	3.6E-01	nc		
		3.0E+00	i			3.0E+00	r	0	0.1	84-72-0	Ethylphthalyl ethyl glycolate	1.0E+05	max	1.0E+05	max	1.1E+04	nc	1.1E+05	nc		
		8.0E-03	i			8.0E-03	r	0	0.1	101200-48-0	Express	4.9E+02	nc	7.0E+03	nc	2.9E+01	nc	2.9E+02	nc		
		2.5E-04	i			2.5E-04	r	0	0.1	22224-92-6	Fenamiphos	1.5E+01	nc	2.2E+02	nc	9.1E-01	nc	9.1E+00	nc		
		1.3E-02	i			1.3E-02	r	0	0.1	2164-17-2	Fluometuron	7.9E+02	nc	1.1E+04	nc	4.7E+01	nc	4.7E+02	nc		
		6.0E-02	i					0	0.1	16984-48-8	Flouride	3.7E+03	nc	5.3E+04	nc			2.2E+03	nc		
		8.0E-02	i			8.0E-02	r	0	0.1	59756-60-4	Fluoridone	4.9E+03	nc	7.0E+04	nc	2.9E+02	nc	2.9E+03	nc		
		2.0E-02	i			2.0E-02	r	0	0.1	58425-91-3	Flurprimidol	1.2E+03	nc	1.8E+04	nc	7.3E+01	nc	7.3E+02	nc		
		6.0E-02	i			6.0E-02	r	0	0.1	66332-96-5	Flutolanil	3.7E+03	nc	5.3E+04	nc	2.2E+02	nc	2.2E+03	nc		
		1.0E-02	i			1.0E-02	r	0	0.1	69409-94-5	Fluvalinate	6.1E+02	nc	8.8E+03	nc	3.7E+01	nc	3.6E+02	nc		
3.5E-03	i	1.0E-01	i	3.5E-03	r	1.0E-01	r	0	0.1	133-07-3	Folpet	1.4E+02	ca*	7.0E+02	ca	1.9E+00	ca	1.9E+01	ca		
1.9E-01	i			1.9E-01	r			0	0.1	72178-02-0	Fomesafen	2.6E+00	ca	1.3E+01	ca	3.5E-02	ca	3.5E-01	ca		
		2.0E-03	i			2.0E-03	r	0	0.1	944-22-9	Fonofos	1.2E+02	nc	1.8E+03	nc	7.3E+00	nc	7.3E+01	nc		
		1.5E-01	i	4.6E-02	i			0	0.1	50-00-0	Formaldehyde	9.2E+03	nc	1.0E+05	nc	1.5E-01	ca	5.5E+03	nc		
		2.0E+00	h			2.0E+00	r	0	0.1	64-18-6	Formic Acid	1.0E+05	max	1.0E+05	max	7.3E+03	nc	7.3E+04	nc		
		3.0E+00	i			3.0E+00	r	0	0.1	39148-24-8	Fosetyl-al	1.0E+05	max	1.0E+05	max	1.1E+04	nc	1.1E+05	nc		
		3.0E+01	i			8.6E+00	h	1		76-13-1	Freon 113	5.6E+03	sat	5.6E+03	sat	3.1E+04	nc	5.9E+04	nc		
		1.0E-03	i			1.0E-03	r	1		110-00-9	Furan	2.5E+00	nc	8.5E+00	nc	3.7E+00	nc	6.1E+00	nc		
3.8E+00	h			3.8E+00	r			0	0.1	67-45-8	Furazolidone	1.3E-01	nc	6.5E-01	nc	1.8E-03	nc	1.8E-02	ca		
		3.0E-03	i			1.4E-02	h	0	0.1	98-01-1	Furfural	1.8E+02	nc	2.6E+03	nc	5.2E+01	nc	1.1E+02	nc		
5.0E+01	h			5.0E+01	r			0	0.1	531-82-8	Furium	9.7E-03	ca	4.9E-02	ca	1.3E-04	ca	1.3E-03	ca		
3.0E-02	i			3.0E-02	r			0	0.1	60568-05-0	Furmecyclox	1.6E+01	ca	8.2E+01	ca	2.2E-01	ca	2.2E+00	ca		
		4.0E-04	i			4.0E-04	r	0	0.1	77182-82-2	Glufosinate-ammonium	2.4E+01	nc	3.5E+02	nc	1.5E+00	nc	1.5E+01	nc		
		4.0E-04	i			2.9E-04	h	0	0.1	765-34-4	Glycidaldehyde	2.4E+01	nc	3.5E+02	nc	1.0E+00	nc	1.5E+01	nc		
		1.0E-01	i			1.0E-01	r	0	0.1	1071-83-6	Glyphosate	6.1E+03	nc	8.8E+04	nc	3.7E+02	nc	3.6E+03	nc		
		5.0E-05	i			5.0E-05	r	0	0.1	69806-40-2	Haloxyfop-methyl	3.1E+00	nc	4.4E+01	nc	1.8E-01	nc	1.8E+00	nc		
		1.3E-02	i			1.3E-02	r	0	0.1	79277-27-3	Harmony	7.9E+02	nc	1.1E+04	nc	4.7E+01	nc	4.7E+02	nc		
4.5E+00	i	5.0E-04	i	4.6E+00	i	5.0E-04	r	0	0.1	76-44-8	Heptachlor	1.1E-01	ca	5.5E-01	ca	1.5E-03	ca	1.5E-02	ca	2.3E+01	1.0E+00
9.1E+00	i	1.3E-05	i	9.1E+00	i	1.3E-05	r	0	0.1	1024-57-3	Heptachlor epoxide	5.3E-02	ca*	2.7E-01	ca*	7.4E-04	ca*	7.4E-03	ca*	7.0E-01	3.0E-02
		2.0E-03	i			2.0E-03	r	0	0.1	87-82-1	Hexabromobenzene	1.2E+02	nc	1.8E+03	nc	7.3E+00	nc	7.3E+01	nc		
1.6E+00	i	8.0E-04	i	1.6E+00	i	8.0E-04	r	0	0.1	118-74-1	Hexachlorobenzene	3.0E-01	ca	1.5E+00	ca	4.2E-03	ca	4.2E-02	ca	2.0E+00	1.0E-01
7.8E-02	i	3.0E-04	n	7.8E-02	i	3.0E-04	r	0	0.1	87-68-3	**Hexachlorobutadiene**	6.2E+00	ca**	3.2E+01	ca**	8.6E-02	ca*	8.6E-01	ca*	2.0E+00	1.0E-01
6.3E+00	i			6.3E+00	i			0	0.04	319-84-6	HCH (alpha)	9.0E-02	ca	5.9E-01	ca	1.1E-03	ca	1.1E-02	ca	5.0E-04	3.0E-05
1.8E+00	i			1.8E+00	i			0	0.04	319-85-7	HCH (beta)	3.2E-01	ca	2.1E+00	ca	3.7E-03	ca	3.7E-02	ca	3.0E-03	1.0E-04
1.3E+00	h	3.0E-04	i	1.3E+00	r	3.0E-04	r	0	0.04	58-89-9	HCH (gamma) Lindane	4.4E-01	ca*	2.9E+00	ca	5.2E-03	ca	5.2E-02	ca	9.0E-03	5.0E-04
1.8E+00	i			1.8E+00	i			0	0.04	608-73-1	HCH-technical	3.2E-01	ca	2.1E+00	ca	3.8E-03	ca	3.7E-02	ca	3.0E-03	1.0E-04
		7.0E-03	i			2.0E-05	h	0	0.1	77-47-4	Hexachlorocyclopentadiene	4.2E+02	nc	5.9E+03	nc	7.3E-02	nc	2.6E+02	nc	4.0E+02	2.0E+01
6.2E+03	i			4.6E+03	i			0	0.1	19408-74-3	Hexachlorodibenzo-p-dioxin mixture (HxCDD)	7.8E-05	ca	4.0E-04	ca	1.5E-06	ca	1.1E-05	ca		
1.4E-02	i	1.0E-03	i	1.4E-02	i	1.0E-03	r	0	0.1	67-72-1	Hexachloroethane	3.5E+01	ca**	1.8E+02	ca**	4.8E-01	ca**	4.8E+00	ca**	5.0E-01	2.0E-02
		3.0E-04	i			3.0E-04	r	0	0.1	70-30-4	Hexachlorophene	1.8E+01	nc	2.6E+02	nc	1.1E+00	nc	1.1E+01	nc		
1.1E-01	i	3.0E-03	i	1.1E-01	r	3.0E-03	r	0	0.1	121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	4.4E+00	ca*	2.2E+01	ca	6.1E-02	ca	6.1E-01	ca		
		2.9E-06	r			2.9E-06	i	0	0.1	822-06-0	1,6-Hexamethylene diisocyanate	1.7E-01	nc	2.5E+00	nc	1.0E-02	nc	1.0E-01	nc		

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FOR PLANNING PURPOSES

TOXICITY INFORMATION												CONTAMINANT	PRELIMINARY REMEDIATION GOALS (PRGs)								SOIL SCREENING LEVELS	
SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		V O C	skin abs. soils	CAS No.			Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		Migration to Ground Water DAF 20 (mg/kg)	DAF 1 (mg/kg)
		6.0E-02	h			5.7E-02	i	1		110-54-3		n-Hexane	1.1E+02	sat	1.1E+02	sat	2.1E+02	nc	3.5E+02	nc		
		3.3E-02	i			3.3E-02	r	0	0.1	51235-04-2		Hexazinone	2.0E+03	nc	2.9E+04	nc	1.2E+02	nc	1.2E+03	nc		
		5.0E-02	i			5.0E-02	r	0	0.1	2691-41-0		HMX	3.1E+03	nc	4.4E+04	nc	1.8E+02	nc	1.8E+03	nc		
3.0E+00	i			1.7E+01	i			0	0.1	302-01-2		Hydrazine, hydrazine sulfate	1.6E-01	ca	8.2E-01	ca	3.9E-04	ca	2.2E-02	ca		
3.0E+00	n			1.7E+01	n				0.1	60-34-4		**Hydrazine, monomethyl**	1.6E-01	ca	8.2E-01	ca	4.0E-04	ca	2.2E-02	ca		
3.0E+00	n			1.7E+01	n				0.1	57-14-7		**Hydrazine, dimethyl**	1.6E-01	ca	8.2E-01	ca	4.0E-04	ca	2.2E-02	ca		
						5.7E-03	i			7647-01-0		Hydrogen chloride					2.1E+01	nc				
		3.0E-03	i			2.9E-04	i			7783-06-4		Hydrogen sulfide					1.0E+00	nc	1.1E+02	nc		
		4.0E-02	h			4.0E-02	r	0	0.1	123-31-9		p-Hydroquinone	2.4E+03	nc	3.5E+04	nc	1.5E+02	nc	1.5E+03	nc		
		1.3E-02	i			1.3E-02	r	0	0.1	35554-44-0		Imazalil	7.9E+02	nc	1.1E+04	nc	4.7E+01	nc	4.7E+02	nc		
		2.5E-01	i			2.5E-01	r	0	0.1	81335-37-7		Imazaquin	1.5E+04	nc	1.0E+05	max	9.1E+02	nc	9.1E+03	nc		
		4.0E-02	i			4.0E-02	r	0	0.1	36734-19-7		Iprodione	2.4E+03	nc	3.5E+04	nc	1.5E+02	nc	1.5E+03	nc		
		3.0E-01	n					0		7439-89-6		Iron	2.3E+04	nc	1.0E+05	max			1.1E+04	nc		
		3.0E-01	i			3.0E-01	r	1		78-83-1		Isobutanol	1.3E+04	nc	4.0E+04	sat	1.1E+03	nc	1.8E+03	nc		
9.5E-04	i	2.0E-01	i	9.5E-04	r	2.0E-01	r	0	0.1	78-59-1		Isophorone	5.1E+02	ca*	2.6E+03	ca*	7.1E+00	ca	7.1E+01	ca	5.0E-01	3.0E-02
		1.5E-02	i			1.5E-02	r	0	0.1	33820-53-0		Isopropalin	9.2E+02	nc	1.3E+04	nc	5.5E+01	nc	5.5E+02	nc		
		1.0E-01	i			1.1E-01	r	0	0.1	1832-54-8		Isopropyl methyl phosphonic acid	6.1E+03	nc	8.8E+04	nc	4.0E+02	nc	3.6E+03	nc		
		5.0E-02	i			5.0E-02	r	0	0.1	82558-50-7		Isoxaben	3.1E+03	nc	4.4E+04	nc	1.8E+02	nc	1.8E+03	nc		
1.8E+01	n			1.8E+01	r			0	0.1	143-50-0		Kepone	2.7E-02	ca	1.4E-01	ca	3.7E-04	ca	3.7E-03	ca		
		2.0E-03	i			2.0E-03	r	0	0.1	77501-63-4		Lactofen	1.2E+02	nc	1.8E+03	nc	7.3E+00	nc	7.3E+01	nc		
PRGs Based on EPA Models (IEUBK 1994 and TRW 1996)										7439-92-1		**Lead**	4.0E+02	nc	7.5E+02	nc						
		1.0E-07	i					0	0.1	78-00-2		Lead (tetraethyl)	6.1E-03	nc	8.8E-02	nc			3.6E-03	nc		
		2.0E-03	i			2.0E-03	r	0	0.1	330-55-2		Linuron	1.2E+02	nc	1.8E+03	nc	7.3E+00	nc	7.3E+01	nc		
		2.0E-02	x					0		7439-93-2		Lithium	1.6E+03	nc	4.1E+04	nc			7.3E+02	nc		
		2.0E-01	i			2.0E-01	r	0	0.1	83055-99-6		Londax	1.2E+04	nc	1.0E+05	max	7.3E+02	nc	7.3E+03	nc		
		2.0E-02	i			2.0E-02	r	0	0.1	121-75-5		Malathion	1.2E+03	nc	1.8E+04	nc	7.3E+01	nc	7.3E+02	nc		
		1.0E-01	i			1.0E-01	r	0	0.1	108-31-6		Maleic anhydride	6.1E+03	nc	8.8E+04	nc	3.7E+02	nc	3.6E+03	nc		
		5.0E-01	i			5.0E-01	r	1		123-33-1		Maleic hydrazide	1.7E+03	nc	2.4E+03	sat	1.8E+03	nc	3.0E+03	nc		
		2.0E-05	h			2.0E-05	r	0	0.1	109-77-3		Malononitrile	1.2E+00	nc	1.8E+01	nc	7.3E-02	nc	7.3E-01	nc		
		3.0E-02	h			3.0E-02	r	0	0.1	8018-01-7		Mancozeb	1.8E+03	nc	2.6E+04	nc	1.1E+02	nc	1.1E+03	nc		
6.0E-02	o	5.0E-03	i	6.0E-02	r	5.0E-03	r	0	0.1	12427-38-2		Maneb	8.1E+00	ca*	4.1E+01	ca	1.1E-01	ca	1.1E+00	ca		
		2.4E-02	i			1.4E-05	i	0		7439-96-5		Manganese and compounds	1.8E+03	nc	3.2E+04	nc	5.1E-02	nc	8.8E+02	nc		
		9.0E-05	h			9.0E-05	r	0	0.1	950-10-7		Mephosfolan	5.5E+00	nc	7.9E+01	nc	3.3E-01	nc	3.3E+00	nc		
		3.0E-02	i			3.0E-02	r	0	0.1	24307-26-4		Mepiquat	1.8E+03	nc	2.6E+04	nc	1.1E+02	nc	1.1E+03	nc		
2.9E-02	n	1.0E-01	n	2.9E-02	r	1.0E-01	r	0	0.1	149-30-4		2-Mercaptobenzothiazole	1.7E+01	ca	8.5E+01	ca	2.3E-01	ca	2.3E+00	ca		
		3.0E-04	i					0		7487-94-7		Mercury and compounds	2.3E+01	nc	6.1E+02	nc			1.1E+01	nc		
						8.6E-05	i			7439-97-6		Mercury (elemental)					3.1E-01	nc				
		1.0E-04	i					0	0.1	22967-92-6		Mercury (methyl)	6.1E+00	nc	8.8E+01	nc			3.6E+00	nc		
		3.0E-05	i			3.0E-05	r	0	0.1	150-50-5		Merphos	1.8E+00	nc	2.6E+01	nc	1.1E-01	nc	1.1E+00	nc		
		3.0E-05	i			3.0E-05	r	0	0.1	78-48-8		Merphos oxide	1.8E+00	nc	2.6E+01	nc	1.1E-01	nc	1.1E+00	nc		
		6.0E-02	i			6.0E-02	r	0	0.1	57837-19-1		Metalaxyl	3.7E+03	nc	5.3E+04	nc	2.2E+02	nc	2.2E+03	nc		
		1.0E-04	i			2.0E-04	h	1		126-98-7		Methacrylonitrile	2.1E+00	nc	8.8E+00	nc	7.3E-01	nc	1.0E+00	nc		
		5.0E-05	i			5.0E-05	r	0	0.1	10265-92-6		Methamidophos	3.1E+00	nc	4.4E+01	nc	1.8E-01	nc	1.8E+00	nc		
		5.0E-01	i			5.0E-01	r	0	0.1	67-56-1		Methanol	3.1E+04	nc	1.0E+05	max	1.8E+03	nc	1.8E+04	nc		
		1.0E-03	i			1.0E-03	r	0	0.1	950-37-8		Methidathion	6.1E+01	nc	8.8E+02	nc	3.7E+00	nc	3.6E+01	nc		

Key : i=IRIS h=HEAST n=NCEA x=WITHDRAWN o=Other EPA DOCUMENTS r=ROUTE EXTRAPOLATION ca=CANCER PRG nc=NONCANCER PRG sat=SOIL SATURATION max=CEILING LIMIT *(where: nc < 100X ca) **(where: nc < 10X ca)

FOR PLANNING PURPOSES

TOXICITY INFORMATION										CONTAMINANT	PRELIMINARY REMEDIATION GOALS (PRGs)								SOIL SCREENING LEVELS	
						V	skin												Migration to Ground Water	
SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		O C	abs. soils	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		DAF 20 (mg/kg)	DAF 1 (mg/kg)
		2.5E-02	i			2.5E-02	r	1		16752-77-5	Methomyl	4.4E+01	nc	1.5E+02	nc	9.1E+01	nc	1.5E+02	nc		
		5.0E-03	i			5.0E-03	r	0	0.1	72-43-5	Methoxychlor	3.1E+02	nc	4.4E+03	nc	1.8E+01	nc	1.8E+02	nc	1.6E+02	8.0E+00
		1.0E-03	h			5.7E-03	i	0	0.1	109-86-4	2-Methoxyethanol	6.1E+01	nc	8.8E+02	nc	2.1E+01	nc	3.6E+01	nc		
		2.0E-03	h			2.0E-03	r	0	0.1	110-49-6	2-Methoxyethanol acetate	1.2E+02	nc	1.8E+03	nc	7.3E+00	nc	7.3E+01	nc		
4.6E-02	h			4.6E-02	r			0	0.1	99-59-2	2-Methoxy-5-nitroaniline	1.1E+01	ca	5.4E+01	ca	1.5E-01	ca	1.5E+00	ca		
		1.0E+00	h			1.0E+00	r	1		79-20-9	Methyl acetate	2.2E+04	nc	9.6E+04	nc	3.7E+03	nc	6.1E+03	nc		
		3.0E-02	h			3.0E-02	r	1		96-33-3	Methyl acrylate	7.0E+01	nc	2.3E+02	nc	1.1E+02	nc	1.8E+02	nc		
2.4E-01	h			2.4E-01	r			0	0.1	95-53-4	2-Methylaniline (o-toluidine)	2.0E+00	ca	1.0E+01	ca	2.8E-02	ca	2.8E-01	ca		
1.8E-01	h			1.8E-01	r			0	0.1	636-21-5	2-Methylaniline hydrochloride	2.7E+00	ca	1.4E+01	ca	3.7E-02	ca	3.7E-01	ca		
		1.0E+00	x			1.0E+00	r	0	0.1	79-22-1	Methyl chlorocarbonate	6.1E+04	nc	1.0E+05	max	3.7E+03	nc	3.6E+04	nc		
		5.0E-04	i			5.0E-04	r	0	0.1	94-74-6	2-Methyl-4-chlorophenoxyacetic acid	3.1E+01	nc	4.4E+02	nc	1.8E+00	nc	1.8E+01	nc		
		1.0E-02	i			1.0E-02	r	0	0.1	94-81-5	4-(2-Methyl-4-chlorophenoxy) butyric acid	6.1E+02	nc	8.8E+03	nc	3.7E+01	nc	3.6E+02	nc		
		1.0E-03	i			1.0E-03	r	0	0.1	93-65-2	2-(2-Methyl-4-chlorophenoxy) propionic acid	6.1E+01	nc	8.8E+02	nc	3.7E+00	nc	3.6E+01	nc		
		1.0E-03	i			1.0E-03	r	0	0.1	16484-77-8	2-(2-Methyl-1,4-chlorophenoxy) propionic acid	6.1E+01	nc	8.8E+02	nc	3.7E+00	nc	3.6E+01	nc		
		8.6E-01	r			8.6E-01	h	1		108-87-2	Methylcyclohexane	2.6E+03	nc	8.8E+03	nc	3.1E+03	nc	5.2E+03	nc		
2.5E-01	h			2.5E-01	r			0	0.1	101-77-9	4,4'-Methylenebisbenzeneamine	1.9E+00	ca	9.9E+00	ca	2.7E-02	ca	2.7E-01	ca		
1.3E-01	h	7.0E-04	h	1.3E-01	h	7.0E-04	r	0	0.1	101-14-4	4,4'-Methylene bis(2-chloroaniline)	3.7E+00	ca*	1.9E+01	ca*	5.2E-02	ca*	5.2E-01	ca*		
4.6E-02	i			4.6E-02	r			0	0.1	101-61-1	4,4'-Methylene bis(N,N'-dimethyl)aniline	1.1E+01	ca	5.4E+01	ca	1.5E-01	ca	1.5E+00	ca		
		1.0E-02	h			1.0E-02	r	1		74-95-3	Methylene bromide	6.7E+01	nc	2.4E+02	nc	3.7E+01	nc	6.1E+01	nc		
7.5E-03	i	6.0E-02	i	1.6E-03	i	8.6E-01	h	1		75-09-2	Methylene chloride	8.9E+00	ca	2.1E+01	ca	4.1E+00	ca	4.3E+00	ca	2.0E-02	1.0E-03
		1.7E-04	r			1.7E-04	i	0	0.1	101-68-8	4,4'-Methylene diphenyl diisocyanate	1.0E+01	nc	1.5E+02	nc	6.2E-01	nc	6.2E+00	nc		
		6.0E-01	i			2.9E-01	i	1		78-93-3	Methyl ethyl ketone	7.3E+03	nc	2.8E+04	nc	1.0E+03	nc	1.9E+03	nc		
1.1E+00	h			1.1E+00	r			0	0.1	60-34-4	Methyl hydrazine	4.4E-01	ca	2.2E+00	ca	6.1E-03	ca	6.1E-02	ca		
		8.0E-02	h			2.3E-02	h	1		108-10-1	Methyl isobutyl ketone	7.9E+02	nc	2.9E+03	nc	8.3E+01	nc	1.6E+02	nc		
		5.7E-04	r			5.7E-04	n	0	0.1	74-93-1	Methyl Mercaptan	3.5E+01	nc	5.0E+02	nc	2.1E+00	nc	2.1E+01	nc		
		1.4E+00	i			2.0E-01	i	1		80-62-6	Methyl methacrylate	2.2E+03	nc	2.7E+03	sat	7.3E+02	nc	1.4E+03	nc		
3.3E-02	h			3.3E-02	r			0	0.1	99-55-8	2-Methyl-5-nitroaniline	1.5E+01	ca	7.5E+01	ca	2.0E-01	ca	2.0E+00	ca		
		2.5E-04	i			2.5E-04	r	0	0.1	298-00-0	Methyl parathion	1.5E+01	nc	2.2E+02	nc	9.1E-01	nc	9.1E+00	nc		
		5.0E-02	i			5.0E-02	r	0	0.1	95-48-7	2-Methylphenol	3.1E+03	nc	4.4E+04	nc	1.8E+02	nc	1.8E+03	nc	1.5E+01	8.0E-01
		5.0E-02	i			5.0E-02	r	0	0.1	108-39-4	3-Methylphenol	3.1E+03	nc	4.4E+04	nc	1.8E+02	nc	1.8E+03	nc		
		5.0E-03	h			5.0E-03	r	0	0.1	106-44-5	4-Methylphenol	3.1E+02	nc	4.4E+03	nc	1.8E+01	nc	1.8E+02	nc		
		2.0E-02	n			2.0E-02	r	0	0.1	993-13-5	Methyl phosphonic acid	1.2E+03	nc	1.8E+04	nc	7.3E+01	nc	7.3E+02	nc		
		6.0E-03	h			1.1E-02	h	1		25013-15-4	Methyl styrene (mixture)	1.3E+02	nc	5.6E+02	nc	4.2E+01	nc	6.0E+01	nc		
		7.0E-02	h			7.0E-02	r	1		98-83-9	Methyl styrene (alpha)	6.8E+02	sat	6.8E+02	sat	2.6E+02	nc	4.3E+02	nc		
						8.6E-01	i	1		1634-04-4	Methyl tertbutyl ether (MTBE)					3.1E+03	nc	2.0E+01	nc/ca		
1.8E-03				1.8E-03				1			**"CAL-Modified PRG"**	1.7E+01	ca	3.7E+01	ca	3.7E+00	ca	6.2E+00	ca		
		1.5E-01	i			1.5E-01	r	0	0.1	51218-45-2	Metolaclor (Dual)	9.2E+03	nc	1.0E+05	max	5.5E+02	nc	5.5E+03	nc		
		2.5E-02	i			2.5E-02	r	0	0.1	21087-64-9	Metribuzin	1.5E+03	nc	2.2E+04	nc	9.1E+01	nc	9.1E+02	nc		
1.8E+00	x	2.0E-04	i	1.8E+00	r	2.0E-04	r	0	0.1	2385-85-5	Mirex	2.7E-01	ca*	1.4E+00	ca	3.7E-03	ca	3.7E-02	ca		
		2.0E-03	i			2.0E-03	r	0	0.1	2212-67-1	Molinate	1.2E+02	nc	1.8E+03	nc	7.3E+00	nc	7.3E+01	nc		
		5.0E-03	h					0		7439-98-7	Molybdenum	3.9E+02	nc	1.0E+04	nc			1.8E+02	nc		
		1.0E-01	h			1.0E-01	h	0	0.1	10599-90-3	Monochloramine	6.1E+03	nc	8.8E+04	nc	3.7E+02	nc	3.6E+03	nc		
		2.0E-03	i			2.0E-03	r	0	0.1	300-76-5	Naled	1.2E+02	nc	1.8E+03	nc	7.3E+00	nc	7.3E+01	nc		
		1.0E-01	i			1.0E-01	r	0	0.1	15299-99-7	Napropamide	6.1E+03	nc	8.8E+04	nc	3.7E+02	nc	3.6E+03	nc		
		2.0E-02	i					0		7440-02-0	Nickel (soluble salts)	1.6E+03	nc	4.1E+04	nc			7.3E+02	nc	1.3E+02	7.0E+00

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FOR PLANNING PURPOSES

TOXICITY INFORMATION										CONTAMINANT	PRELIMINARY REMEDIATION GOALS (PRGs)								SOIL SCREENING LEVELS	
SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		V O C	skin abs. soils	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		Migration to Ground Water DAF 20 (mg/kg)	DAF 1 (mg/kg)
											"CAL-Modified PRG" (PEA, 1994)	1.5E+02									
				6.4E-01	i			0			Nickel refinery dust					8.0E-03	ca				
				1.7E+00	i			0		12035-72-2	Nickel subsulfide			1.1E+04	ca	4.0E-03	ca				
		1.5E-03	x			1.5E-03	r	0	0.1	1929-82-4	Nitrapyrin	9.2E+01	nc	1.3E+03	nc	5.5E+00	nc	5.5E+01	nc		
Tap Water PRG Based on Infant NOAEL (see IRIS)										14797-55-8	Nitrate							1.0E+04	nc		
		1.0E-01	x							10102-43-9	Nitric Oxide	7.8E+03	nc	1.0E+05	max			3.6E+03	nc		
Tap Water PRG Based on Infant NOAEL (see IRIS)										14797-65-0	Nitrite							1.0E+03	nc		
		5.7E-05	r			5.7E-05	h	0	0.1	88-74-4	2-Nitroaniline	3.5E+00	nc	5.0E+01	nc	2.1E-01	nc	2.1E+00	nc		
		5.0E-04	i			5.7E-04	h	1		98-95-3	Nitrobenzene	2.0E+01	nc	1.1E+02	nc	2.1E+00	nc	3.4E+00	nc	1.0E-01	7.0E-03
		7.0E-02	h			7.0E-02	r	0	0.1	67-20-9	Nitrofurantoin	4.3E+03	nc	6.2E+04	nc	2.6E+02	nc	2.6E+03	nc		
1.5E+00	h			9.4E+00	h			0	0.1	59-87-0	Nitrofurazone	3.2E-01	ca	1.6E+00	ca	7.2E-04	ca	4.5E-02	ca		
1.4E-02	n			1.4E-02	r			0	0.1	55-63-0	Nitroglycerin	3.5E+01	ca	1.8E+02	ca	4.8E-01	ca	4.8E+00	ca		
		1.0E-01	i			1.0E-01	r	0	0.1	556-88-7	Nitroguanidine	6.1E+03	nc	8.8E+04	nc	3.7E+02	nc	3.6E+03	nc		
		8.0E-03	n			8.0E-03	r	0	0.1	100-02-7	4-Nitrophenol	4.9E+02	nc	7.0E+03	nc	2.9E+01	nc	2.9E+02	nc		
9.4E+00	r	5.7E-03	r	9.4E+00	h	5.7E-03	i	1		79-46-9	2-Nitropropane					7.2E-04	ca	1.2E-03	ca		
5.4E+00	i			5.6E+00	i			1		924-16-3	N-Nitrosodi-n-butylamine	2.4E-02	ca	6.1E-02	ca	1.2E-03	ca	2.0E-03	ca		
2.8E+00	i			2.8E+00	r			0	0.1	1116-54-7	N-Nitrosodiethanolamine	1.7E-01	ca	8.8E-01	ca	2.4E-03	ca	2.4E-02	ca		
1.5E+02	i			1.5E+02	i			0	0.1	55-18-5	N-Nitrosodiethylamine	3.2E-03	ca	1.6E-02	ca	4.5E-05	ca	4.5E-04	ca		
5.1E+01	i			4.9E+01	i			0	0.1	62-75-9	N-Nitrosodimethylamine	9.5E-03	ca	4.8E-02	ca	1.4E-04	ca	1.3E-03	ca		
4.9E-03	i			4.9E-03	r			0	0.1	86-30-6	N-Nitrosodiphenylamine	9.9E+01	ca	5.0E+02	ca	1.4E+00	ca	1.4E+01	ca	1.0E+00	6.0E-02
7.0E+00	i			7.0E+00	r			0	0.1	621-64-7	N-Nitroso di-n-propylamine	6.9E-02	ca	3.5E-01	ca	9.6E-04	ca	9.6E-03	ca	5.0E-05	2.0E-06
2.2E+01	i			2.2E+01	r			0	0.1	10595-95-6	N-Nitroso-N-methylethylamine	2.2E-02	ca	1.1E-01	ca	3.1E-04	ca	3.1E-03	ca		
2.1E+00	i			2.1E+00	i			0	0.1	930-55-2	N-Nitrosopyrrolidine	2.3E-01	ca	1.2E+00	ca	3.1E-03	ca	3.2E-02	ca		
		1.0E-02	h			1.0E-02	r	1		99-08-1	m-Nitrotoluene	3.7E+02	nc	1.0E+03	sat	3.7E+01	nc	6.1E+01	nc		
		1.0E-02	h			1.0E-02	r	1		88-72-2	o-Nitrotoluene	3.7E+02	nc	1.0E+03	sat	3.7E+01	nc	6.1E+01	nc		
		1.0E-02	h			1.0E-02	r	1		99-99-0	p-Nitrotoluene	3.7E+02	nc	1.0E+03	sat	3.7E+01	nc	6.1E+01	nc		
		4.0E-02	i			4.0E-02	r	0	0.1	27314-13-2	Norflurazon	2.4E+03	nc	3.5E+04	nc	1.5E+02	nc	1.5E+03	nc		
		7.0E-04	i			7.0E-04	r	0	0.1	85509-19-9	NuStar	4.3E+01	nc	6.2E+02	nc	2.6E+00	nc	2.6E+01	nc		
		3.0E-03	i			3.0E-03	r	0	0.1	32536-52-0	Octabromodiphenyl ether	1.8E+02	nc	2.6E+03	nc	1.1E+01	nc	1.1E+02	nc		
		2.0E-03	h			2.0E-03	r	0	0.1	152-16-9	Octamethylpyrophosphoramide	1.2E+02	nc	1.8E+03	nc	7.3E+00	nc	7.3E+01	nc		
		5.0E-02	i			5.0E-02	r	0	0.1	19044-88-3	Oryzalin	3.1E+03	nc	4.4E+04	nc	1.8E+02	nc	1.8E+03	nc		
		5.0E-03	i			5.0E-03	r	0	0.1	19666-30-9	Oxadiazon	3.1E+02	nc	4.4E+03	nc	1.8E+01	nc	1.8E+02	nc		
		2.5E-02	i			2.5E-02	r	0	0.1	23135-22-0	Oxamyl	1.5E+03	nc	2.2E+04	nc	9.1E+01	nc	9.1E+02	nc		
		3.0E-03	i			3.0E-03	r	0	0.1	42874-03-3	Oxyfluorfen	1.8E+02	nc	2.6E+03	nc	1.1E+01	nc	1.1E+02	nc		
		1.3E-02	i			1.3E-02	r	0	0.1	76738-62-0	Paclobutrazol	7.9E+02	nc	1.1E+04	nc	4.7E+01	nc	4.7E+02	nc		
		4.5E-03	i			4.5E-03	r	0	0.1	4685-14-7	Paraquat	2.7E+02	nc	4.0E+03	nc	1.6E+01	nc	1.6E+02	nc		
		6.0E-03	h			6.0E-03	r	0	0.1	56-38-2	Parathion	3.7E+02	nc	5.3E+03	nc	2.2E+01	nc	2.2E+02	nc		
		5.0E-02	h			5.0E-02	r	0	0.1	1114-71-2	Pebulate	3.1E+03	nc	4.4E+04	nc	1.8E+02	nc	1.8E+03	nc		
		4.0E-02	i			4.0E-02	r	0	0.1	40487-42-1	Pendimethalin	2.4E+03	nc	3.5E+04	nc	1.5E+02	nc	1.5E+03	nc		
2.3E-02	h			2.3E-02	r			0	0.1	87-84-3	Pentabromo-6-chloro cyclohexane	2.1E+01	ca	1.1E+02	ca	2.9E-01	ca	2.9E+00	ca		
		2.0E-03	i			2.0E-03	r	0	0.1	32534-81-9	Pentabromodiphenyl ether	1.2E+02	nc	1.8E+03	nc	7.3E+00	nc	7.3E+01	nc		
		8.0E-04	i			8.0E-04	r	0	0.1	608-93-5	Pentachlorobenzene	4.9E+01	nc	7.0E+02	nc	2.9E+00	nc	2.9E+01	nc		
2.6E-01	h	3.0E-03	i	2.6E-01	r	3.0E-03	r	0	0.1	82-68-8	Pentachloronitrobenzene	1.9E+00	ca*	9.5E+00	ca	2.6E-02	ca	2.6E-01	ca		
1.2E-01	i	3.0E-02	i	1.2E-01	r	3.0E-02	r	0	0.25	87-86-5	Pentachlorophenol	3.0E+00	ca	1.1E+01	ca	5.6E-02	ca	5.6E-01	ca	3.0E-02	1.0E-03
		5.0E-04	x					0		7601-90-3	Perchlorate	3.9E+01	nc	1.0E+03	nc			1.8E+01	nc		

Key : l=IRIS h=HEAST n=NCEA x=WITHDRAWN o=Other EPA DOCUMENTS r=ROUTE EXTRAPOLATION ca=CANCER PRG nc=NONCANCER PRG sat=SOIL SATURATION max=CEILING LIMIT *(where: nc < 100X ca) **(where: nc < 10X ca)

FOR PLANNING PURPOSES

TOXICITY INFORMATION										CONTAMINANT	PRELIMINARY REMEDIATION GOALS (PRGs)								SOIL SCREENING LEVELS	
						V O C	skin abs.	soils	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		Migration to Ground Water DAF 20 (mg/kg)	DAF 1 (mg/kg)
SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)														
		5.0E-02	l			5.0E-02	r	0	0.1	52645-53-1	Permethrin	3.1E+03	nc	4.4E+04	nc	1.8E+02	nc	1.8E+03	nc		
		2.5E-01	l			2.5E-01	r	0	0.1	13684-63-4	Phenmedipham	1.5E+04	nc	1.0E+05	max	9.1E+02	nc	9.1E+03	nc		
		6.0E-01	l			6.0E-01	r	0	0.1	108-95-2	Phenol	3.7E+04	nc	1.0E+05	max	2.2E+03	nc	2.2E+04	nc	1.0E+02	5.0E+00
		2.0E-03	n			2.0E-03	r	0	0.1	92-84-2	Phenothiazine	1.2E+02	nc	1.8E+03	nc	7.3E+00	nc	7.3E+01	nc		
		6.0E-03	l			6.0E-03	r	0	0.1	108-45-2	m-Phenylenediamine	3.7E+02	nc	5.3E+03	nc	2.2E+01	nc	2.2E+02	nc		
		1.9E-01	h			1.9E-01	r	0	0.1	108-50-3	p-Phenylenediamine	1.2E+04	nc	1.0E+05	max	6.9E+02	nc	6.9E+03	nc		
		8.0E-05	l			8.0E-05	r	0	0.1	62-38-4	Phenylmercuric acetate	4.9E+00	nc	7.0E+01	nc	2.9E-01	nc	2.9E+00	nc		
1.9E-03	h			1.9E-03	r			0	0.1	90-43-7	2-Phenylphenol	2.5E+02	ca	1.3E+03	ca	3.5E+00	ca	3.5E+01	ca		
		2.0E-04	h			2.0E-04	r	0	0.1	298-02-2	Phorate	1.2E+01	nc	1.8E+02	nc	7.3E-01	nc	7.3E+00	nc		
		2.0E-02	l			2.0E-02	r	0	0.1	732-11-6	Phosmet	1.2E+03	nc	1.8E+04	nc	7.3E+01	nc	7.3E+02	nc		
		3.0E-04	h			8.6E-05	l	0	0.1	7803-51-2	Phosphine	1.8E+01	nc	2.6E+02	nc	3.1E-01	nc	1.1E+01	nc		
						2.9E-03	l			7664-38-2	Phosphoric acid					1.0E+01	nc				
		2.0E-05	l					0		7723-14-0	Phosphorus (white)	1.6E+00	nc	4.1E+01	nc			7.3E-01	nc		
		1.0E+00	h			1.0E+00	r	0	0.1	100-21-0	p-Phthalic acid	6.1E+04	nc	1.0E+05	max	3.7E+03	nc	3.6E+04	nc		
		2.0E+00	l			3.4E-02	h	0	0.1	85-44-9	Phthalic anhydride	1.0E+05	max	1.0E+05	max	1.2E+02	nc	7.3E+04	nc		
		7.0E-02	l			7.0E-02	r	0	0.1	1918-02-1	Picloram	4.3E+03	nc	6.2E+04	nc	2.6E+02	nc	2.6E+03	nc		
		1.0E-02	l			1.0E-02	r	0	0.1	23505-41-1	Pirimiphos-methyl	6.1E+02	nc	8.8E+03	nc	3.7E+01	nc	3.6E+02	nc		
8.9E+00	h	7.0E-06	h	8.9E+00	r	7.0E-06	r	0	0.1		Polybrominated biphenyls	5.5E-02	ca**	2.8E-01	ca*	7.6E-04	ca*	7.6E-03	ca*		
2.0E+00	l			2.0E+00	l			0	0.14	1336-36-3	Polychlorinated biphenyls (PCBs)	2.2E-01	ca	1.0E+00	ca	3.4E-03	ca	3.4E-02	ca		
7.0E-02	l	7.0E-05	l	7.0E-02	l	7.0E-05	r	0	0.14	12674-11-2	Aroclor 1016	3.9E+00	nc	2.9E+01	ca**	9.6E-02	ca**	9.6E-01	ca**		
2.0E+00	l			2.0E+00	l			0	0.14	11104-28-2	Aroclor 1221	2.2E-01	ca	1.0E+00	ca	3.4E-03	ca	3.4E-02	ca		
2.0E+00	l			2.0E+00	l			0	0.14	11141-16-5	Aroclor 1232	2.2E-01	ca	1.0E+00	ca	3.4E-03	ca	3.4E-02	ca		
2.0E+00	l			2.0E+00	l			0	0.14	53469-21-9	Aroclor 1242	2.2E-01	ca	1.0E+00	ca	3.4E-03	ca	3.4E-02	ca		
2.0E+00	l			2.0E+00	l			0	0.14	12672-29-6	Aroclor 1248	2.2E-01	ca	1.0E+00	ca	3.4E-03	ca	3.4E-02	ca		
2.0E+00	l	2.0E-05	l	2.0E+00	l	2.0E-05	r	0	0.14	11097-69-1	Aroclor 1254	2.2E-01	ca**	1.0E+00	ca*	3.4E-03	ca*	3.4E-02	ca*		
2.0E+00	l			2.0E+00	l			0	0.14	11096-82-5	Aroclor 1260	2.2E-01	ca	1.0E+00	ca	3.4E-03	ca	3.4E-02	ca		
									0.13		Polynuclear aromatic hydrocarbons (PAHs)										
		6.0E-02	l			6.0E-02	r	1		83-32-9	Acenaphthene	3.7E+03	nc	3.8E+04	nc	2.2E+02	nc	3.7E+02	nc	5.7E+02	2.9E+01
		3.0E-01	l			3.0E-01	r	1		120-12-7	Anthracene	2.2E+04	nc	1.0E+05	max	1.1E+03	nc	1.8E+03	nc	1.2E+04	5.9E+02
7.3E-01	n			3.1E-01	n			0	0.13	56-55-3	Benz[a]anthracene	6.2E-01	ca	2.9E+00	ca	2.2E-02	ca	9.2E-02	ca	2.0E+00	8.0E-02
7.3E-01	n			3.1E-01	n			0	0.13	205-99-2	Benzo[b]fluoranthene	6.2E-01	ca	2.9E+00	ca	2.2E-02	ca	9.2E-02	ca	5.0E+00	2.0E-01
7.3E-02	n			3.1E-02	n			0	0.13	207-08-9	Benzo[k]fluoranthene	6.2E+00	ca	2.9E+01	ca	2.2E-01	ca	9.2E-01	ca	4.9E+01	2.0E+00
											"CAL-Modified PRG" (PEA, 1994)	6.1E-01									
7.3E+00	l			3.1E+00	n			0	0.13	50-32-8	Benzo[a]pyrene	6.2E-02	ca	2.9E-01	ca	2.2E-03	ca	9.2E-03	ca	8.0E+00	4.0E-01
											"CAL-Modified PRG" (PEA, 1994)							1.5E-03			
7.3E-03	n			3.1E-03	n			0	0.13	218-01-9	Chrysene	6.2E+01	ca	2.9E+02	ca	2.2E+00	ca	9.2E+00	ca	1.6E+02	8.0E+00
											"CAL-Modified PRG" (PEA, 1994)	6.1E+00									
7.3E+00	n			3.1E+00	n			0	0.13	53-70-3	Dibenz[ah]anthracene	6.2E-02	ca	2.9E-01	ca	2.2E-03	ca	9.2E-03	ca	2.0E+00	8.0E-02
		4.0E-02	l			4.0E-02	r	0	0.13	206-44-0	Fluoranthene	2.3E+03	nc	3.0E+04	nc	1.5E+02	nc	1.5E+03	nc	4.3E+03	2.1E+02
		4.0E-02	l			4.0E-02	r	1		86-73-7	Fluorene	2.6E+03	nc	3.3E+04	nc	1.5E+02	nc	2.4E+02	nc	5.6E+02	2.8E+01
7.3E-01	n			3.1E-01	n			0	0.13	193-39-5	Indeno[1,2,3-cd]pyrene	6.2E-01	ca	2.9E+00	ca	2.2E-02	ca	9.2E-02	ca	1.4E+01	7.0E-01
		2.0E-02	l			8.6E-04	l	1		91-20-3	Naphthalene	5.6E+01	nc	1.9E+02	nc	3.1E+00	nc	6.2E+00	nc	8.4E+01	4.0E+00
		3.0E-02	l			3.0E-02	r	1		129-00-0	Pyrene	2.3E+03	nc	5.4E+04	nc	1.1E+02	nc	1.8E+02	nc	4.2E+03	2.1E+02
1.5E-01	l	9.0E-03	l	1.5E-01	r	9.0E-03	r	0	0.1	67747-09-5	Prochloraz	3.2E+00	ca	1.6E+01	ca	4.5E-02	ca	4.5E-01	ca		
		6.0E-03	h			6.0E-03	r	0	0.1	26399-36-0	Profluralin	3.7E+02	nc	5.3E+03	nc	2.2E+01	nc	2.2E+02	nc		

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FOR PLANNING PURPOSES

TOXICITY INFORMATION										CONTAMINANT	PRELIMINARY REMEDIATION GOALS (PRGs)								SOIL SCREENING LEVELS	
						V	skin												Migration to Ground Water	
SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		O abs. C soils	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		DAF 20 (mg/kg)	DAF 1 (mg/kg)
		1.5E-02	i			1.5E-02	r	0	0.1	1610-18-0	Prometon	9.2E+02	nc	1.3E+04	nc	5.5E+01	nc	5.5E+02	nc		
		4.0E-03	i			4.0E-03	r	0	0.1	7287-19-6	Prometryn	2.4E+02	nc	3.5E+03	nc	1.5E+01	nc	1.5E+02	nc		
		7.5E-02	i			7.5E-02	r	0	0.1	23950-58-5	Pronamide	4.6E+03	nc	6.6E+04	nc	2.7E+02	nc	2.7E+03	nc		
		1.3E-02	i			1.3E-02	r	0	0.1	1918-16-7	Propachlor	7.9E+02	nc	1.1E+04	nc	4.7E+01	nc	4.7E+02	nc		
		5.0E-03	i			5.0E-03	r	0	0.1	709-98-8	Propanil	3.1E+02	nc	4.4E+03	nc	1.8E+01	nc	1.8E+02	nc		
		2.0E-02	i			2.0E-02	r	0	0.1	2312-35-8	Propargite	1.2E+03	nc	1.8E+04	nc	7.3E+01	nc	7.3E+02	nc		
		2.0E-03	i			2.0E-03	r	0	0.1	107-19-7	Propargyl alcohol	1.2E+02	nc	1.8E+03	nc	7.3E+00	nc	7.3E+01	nc		
		2.0E-02	i			2.0E-02	r	0	0.1	139-40-2	Propazine	1.2E+03	nc	1.8E+04	nc	7.3E+01	nc	7.3E+02	nc		
		2.0E-02	i			2.0E-02	r	0	0.1	122-42-9	Propham	1.2E+03	nc	1.8E+04	nc	7.3E+01	nc	7.3E+02	nc		
		1.3E-02	i			1.3E-02	r	0	0.1	60207-90-1	Propiconazole	7.9E+02	nc	1.1E+04	nc	4.7E+01	nc	4.7E+02	nc		
		1.0E-01	i			1.1E-01	i	1		98-82-8	Isopropylbenzene (Cumene)	1.6E+02	nc	5.2E+02	nc	4.0E+02	nc	6.6E+02	nc		
		1.0E-02	n			1.0E-02	r	1		103-65-1	n-Propylbenzene	1.4E+02	nc	2.4E+02	sat	3.7E+01	nc	6.1E+01	nc		
		2.0E+01	h			2.0E+01	r	0	0.1	57-55-6	Propylene glycol	1.0E+05	max	1.0E+05	max	7.3E+04	nc	7.3E+05	nc		
		7.0E-01	h			7.0E-01	r	0	0.1	111-35-3	Propylene glycol, monoethyl ether	4.3E+04	nc	1.0E+05	max	2.6E+03	nc	2.6E+04	nc		
		7.0E-01	h			5.7E-01	i	0	0.1	107-98-2	Propylene glycol, monomethyl ether	4.3E+04	nc	1.0E+05	max	2.1E+03	nc	2.6E+04	nc		
2.4E-01	i	8.6E-03	r	1.3E-02	i	8.6E-03	i	1		75-56-9	Propylene oxide	1.9E+00	ca*	9.1E+00	ca*	5.2E-01	ca*	2.2E-01	ca		
		2.5E-01	i			2.5E-01	r	0	0.1	81335-77-5	Pursuit	1.5E+04	nc	1.0E+05	max	9.1E+02	nc	9.1E+03	nc		
		2.5E-02	i			2.5E-02	r	0	0.1	51630-58-1	Pydrin	1.5E+03	nc	2.2E+04	nc	9.1E+01	nc	9.1E+02	nc		
		1.0E-03	i			1.0E-03	r	0	0.1	110-86-1	Pyridine	6.1E+01	nc	8.8E+02	nc	3.7E+00	nc	3.6E+01	nc		
		5.0E-04	i			5.0E-04	r	0	0.1	13593-03-8	Quinalphos	3.1E+01	nc	4.4E+02	nc	1.8E+00	nc	1.8E+01	nc		
1.2E+01	h			1.2E+01	r			0	0.1	91-22-5	Quinoline	4.1E-02	ca	2.1E-01	ca	5.6E-04	ca	5.6E-03	ca		
1.1E-01	i	3.0E-03	i	1.1E-01	r	3.0E-03	r	0	0.1	121-82-4	RDX (Cyclonite)	4.4E+00	ca*	2.2E+01	ca	6.1E-02	ca	6.1E-01	ca		
		3.0E-02	i			3.0E-02	r	0	0.1	10453-86-8	Resmethrin	1.8E+03	nc	2.6E+04	nc	1.1E+02	nc	1.1E+03	nc		
		5.0E-02	h			5.0E-02	r	0	0.1	299-84-3	Ronnel	3.1E+03	nc	4.4E+04	nc	1.8E+02	nc	1.8E+03	nc		
		4.0E-03	i			4.0E-03	r	0	0.1	83-79-4	Rotenone	2.4E+02	nc	3.5E+03	nc	1.5E+01	nc	1.5E+02	nc		
		2.5E-02	i			2.5E-02	r	0	0.1	78587-05-0	Savey	1.5E+03	nc	2.2E+04	nc	9.1E+01	nc	9.1E+02	nc		
		5.0E-03	i					0	0.1	7783-00-8	Selenious Acid	3.1E+02	nc	4.4E+03	nc			1.8E+02	nc		
		5.0E-03	i					0		7782-49-2	Selenium	3.9E+02	nc	1.0E+04	nc			1.8E+02	nc	5.0E+00	3.0E-01
		5.0E-03	h					0	0.1	630-10-4	Selenourea	3.1E+02	nc	4.4E+03	nc			1.8E+02	nc		
		9.0E-02	i			9.0E-02	r	0	0.1	74051-80-2	Sethoxydim	5.5E+03	nc	7.9E+04	nc	3.3E+02	nc	3.3E+03	nc		
		5.0E-03	i					0		7440-22-4	Silver and compounds	3.9E+02	nc	1.0E+04	nc			1.8E+02	nc	3.4E+01	2.0E+00
1.2E-01	h	5.0E-03	i	1.2E-01	r	2.0E-03	r	0	0.1	122-34-9	Simazine	4.1E+00	ca*	2.1E+01	ca	5.6E-02	ca	5.6E-01	ca		
		4.0E-03	i							26628-22-8	Sodium azide										
2.7E-01	h	3.0E-02	i	2.7E-01	r	3.0E-02	r	0	0.1	148-18-5	Sodium diethyldithiocarbamate	1.8E+00	ca	9.1E+00	ca	2.5E-02	ca	2.5E-01	ca		
		2.0E-05	i			2.0E-05	r	0	0.1	62-74-8	Sodium fluoroacetate	1.2E+00	nc	1.8E+01	nc	7.3E-02	nc	7.3E-01	nc		
		1.0E-03	h			1.0E-03	r	0	0.1	13718-26-8	Sodium metavanadate	6.1E+01	nc	8.8E+02	nc	3.7E+00	nc	3.6E+01	nc		
		6.0E-01	i					0		7440-24-6	Strontium, stable	4.7E+04	nc	1.0E+05	max			2.2E+04	nc		
		3.0E-04	i			3.0E-04	r	0	0.1	57-24-9	Strychnine	1.8E+01	nc	2.6E+02	nc	1.1E+00	nc	1.1E+01	nc		
		2.0E-01	i			2.9E-01	i	1		100-42-5	Styrene	1.7E+03	sat	1.7E+03	sat	1.1E+03	nc	1.6E+03	nc	4.0E+00	2.0E-01
		1.0E-03	n			1.0E-03	r			80-07-9	1,1'-Sulfonylbis (4-chlorobenzene)	7.8E+01	nc	2.0E+03	nc	3.7E+00	nc	3.6E+01	nc		
		2.5E-02	i			2.5E-02	r	0	0.1	88671-89-0	Systhane	1.5E+03	nc	2.2E+04	nc	9.1E+01	nc	9.1E+02	nc		
1.5E+05	h			1.5E+05	h			0	0.03	1746-01-6	2,3,7,8-TCDD (dioxin)	3.9E-06	ca	2.7E-05	ca	4.5E-08	ca	4.5E-07	ca		
		7.0E-02	i			7.0E-02	r	0	0.1	34014-18-1	Tebuthiuron	4.3E+03	nc	6.2E+04	nc	2.6E+02	nc	2.6E+03	nc		
		2.0E-02	h			2.0E-02	r	0	0.1	3383-96-8	Temephos	1.2E+03	nc	1.8E+04	nc	7.3E+01	nc	7.3E+02	nc		
		1.3E-02	i			1.3E-02	r	0	0.1	5902-51-2	Terbacil	7.9E+02	nc	1.1E+04	nc	4.7E+01	nc	4.7E+02	nc		

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TOXICITY INFORMATION												CONTAMINANT	PRELIMINARY REMEDIATION GOALS (PRGs)								SOIL SCREENING LEVELS	
								V O C	skin abs.	soils	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		Migration to Ground Water DAF 20 (mg/kg)	DAF 1 (mg/kg)
SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)																
		2.5E-05	h			2.5E-05	r	0	0.1		13071-79-9	Terbufos	1.5E+00	nc	2.2E+01	nc	9.1E-02	nc	9.1E-01	nc		
		1.0E-03	i			1.0E-03	r	0	0.1		886-50-0	Terbutryn	6.1E+01	nc	8.8E+02	nc	3.7E+00	nc	3.6E+01	nc		
		3.0E-04	i			3.0E-04	r	0	0.1		95-94-3	1,2,4,5-Tetrachlorobenzene	1.8E+01	nc	2.6E+02	nc	1.1E+00	nc	1.1E+01	nc		
2.6E-02	i	3.0E-02	i	2.6E-02	i	3.0E-02	r	1			630-20-6	1,1,1,2-Tetrachloroethane	3.0E+00	ca	7.0E+00	ca	2.6E-01	ca	4.3E-01	ca		
2.0E-01	i	6.0E-02	n	2.0E-01	i	6.0E-02	r	1			79-34-5	1,1,2,2-Tetrachloroethane	3.8E-01	ca	9.0E-01	ca	3.3E-02	ca	5.5E-02	ca	3.0E-03	2.0E-04
5.2E-02	n	1.0E-02	i	2.0E-03	n	1.1E-01	n	1			127-18-4	Tetrachloroethylene (PCE)	5.7E+00	ca*	1.9E+01	ca*	3.3E+00	ca	1.1E+00	ca	6.0E-02	3.0E-03
												"CAL-Modified PRG" (PEA, 1994)					3.2E-01					
		3.0E-02	i			3.0E-02	r	0	0.1		58-90-2	2,3,4,6-Tetrachlorophenol	1.8E+03	nc	2.6E+04	nc	1.1E+02	nc	1.1E+03	nc		
2.0E+01	h			2.0E+01	r			0	0.1		5216-25-1	p,a,a,a-Tetrachlorotoluene	2.4E-02	ca	1.2E-01	ca	3.4E-04	ca	3.4E-03	ca		
2.4E-02	h	3.0E-02	i	2.4E-02	r	3.0E-02	r	0	0.1		961-11-5	Tetrachlorovinphos	2.0E+01	ca*	1.0E+02	ca	2.8E-01	ca	2.8E+00	ca		
		5.0E-04	i			5.0E-04	r	0	0.1		3689-24-5	Tetraethyldithiopyrophosphate	3.1E+01	nc	4.4E+02	nc	1.8E+00	nc	1.8E+01	nc		
7.6E-03	n	2.1E-01	n	6.8E-03	n	8.6E-02	n	0	0.1		109-99-9	Tetrahydrofuran	6.4E+01	ca	3.2E+02	ca	9.9E-01	ca	8.8E+00	ca		
		6.6E-05	i					0			7446-18-6	**Thallium and compounds**	5.2E+00	nc	1.3E+02	nc			2.4E+00	nc		
		1.0E-02	i			1.0E-02	r	0	0.1		28249-77-6	Thiobencarb	6.1E+02	nc	8.8E+03	nc	3.7E+01	nc	3.6E+02	nc		
		1.0E-01	n			1.0E-01	r	0	0.1		N/A	Thiocyanate	6.1E+03	nc	1.0E+05	max	3.7E+02	nc	3.6E+03	nc		
		3.0E-04	h			3.0E-04	r	0	0.1		39196-18-4	Thiofanox	1.8E+01	nc	2.6E+02	nc	1.1E+00	nc	1.1E+01	nc		
		8.0E-02	i			8.0E-02	r	0	0.1		23564-05-8	Thiophanate-methyl	4.9E+03	nc	7.0E+04	nc	2.9E+02	nc	2.9E+03	nc		
		5.0E-03	i			5.0E-03	r	0	0.1		137-26-8	Thiram	3.1E+02	nc	4.4E+03	nc	1.8E+01	nc	1.8E+02	nc		
		6.0E-01	h					0				Tin (inorganic, see tributyltin oxide for organic tin)	4.7E+04	nc	1.0E+05	max			2.2E+04	nc		
		2.0E-01	i			1.1E-01	h	1			108-88-3	Toluene	5.2E+02	sat	5.2E+02	sat	4.0E+02	nc	7.2E+02	nc	1.2E+01	6.0E-01
3.2E+00	h			3.2E+00	r			0	0.1		95-80-7	Toluene-2,4-diamine	1.5E-01	ca	7.7E-01	ca	2.1E-03	ca	2.1E-02	ca		
		6.0E-01	h			6.0E-01	r	0	0.1		95-70-5	Toluene-2,5-diamine	3.7E+04	nc	1.0E+05	max	2.2E+03	nc	2.2E+04	nc		
		2.0E-01	h			2.0E-01	r	0	0.1		823-40-5	Toluene-2,6-diamine	1.2E+04	nc	1.0E+05	max	7.3E+02	nc	7.3E+03	nc		
1.9E-01	i			1.9E-01	r			0	0.1		106-49-0	p-Toluidine	2.6E+00	ca	1.3E+01	ca	3.5E-02	ca	3.5E-01	ca		
1.1E+00	i			1.1E+00	i			0	0.1		8001-35-2	Toxaphene	4.4E-01	ca	2.2E+00	ca	6.0E-03	ca	6.1E-02	ca	3.1E+01	2.0E+00
		7.5E-03	i			7.5E-03	r	0	0.1		66841-25-6	Tralomethrin	4.6E+02	nc	6.6E+03	nc	2.7E+01	nc	2.7E+02	nc		
		1.3E-02	i			1.3E-02	r	0	0.1		2303-17-5	Triallate	7.9E+02	nc	1.1E+04	nc	4.7E+01	nc	4.7E+02	nc		
		1.0E-02	i			1.0E-02	r	0	0.1		82097-50-5	Triasulfuron	6.1E+02	nc	8.8E+03	nc	3.7E+01	nc	3.6E+02	nc		
		5.0E-03	i			5.0E-03	r	0	0.1		615-54-3	1,2,4-Tribromobenzene	3.1E+02	nc	4.4E+03	nc	1.8E+01	nc	1.8E+02	nc		
		3.0E-04	i					0	0.1		56-35-9	Tributyltin oxide (TBTO)	1.8E+01	nc	2.6E+02	nc			1.1E+01	nc		
3.4E-02	h			3.4E-02	r			0	0.1		634-93-5	2,4,6-Trichloroaniline	1.4E+01	ca	7.3E+01	ca	2.0E-01	ca	2.0E+00	ca		
2.9E-02	h			2.9E-02	r			0	0.1		33663-50-2	2,4,6-Trichloroaniline hydrochloride	1.7E+01	ca	8.5E+01	ca	2.3E-01	ca	2.3E+00	ca		
		1.0E-02	i			5.7E-02	h	1			120-82-1	1,2,4-Trichlorobenzene	6.5E+02	nc	3.0E+03	sat	2.1E+02	nc	1.9E+02	nc	5.0E+00	3.0E-01
		2.0E-02	n			2.9E-01	n	1			71-55-6	1,1,1-Trichloroethane	6.3E+02	nc	1.4E+03	sat	1.0E+03	nc	5.4E+02	nc	2.0E+00	1.0E-01
5.7E-02	i	4.0E-03	i	5.6E-02	i	4.0E-03	r	1			79-00-5	1,1,2-Trichloroethane	8.4E-01	ca*	1.9E+00	ca*	1.2E-01	ca	2.0E-01	ca	2.0E-02	9.0E-04
1.1E-02	n	6.0E-03	x	6.0E-03	n	6.0E-03	r	1			79-01-6	Trichloroethylene (TCE)	2.8E+00	ca**	6.1E+00	ca*	1.1E+00	ca*	1.6E+00	ca*	6.0E-02	3.0E-03
		3.0E-01	i			2.0E-01	h	1			75-69-4	Trichlorofluoromethane	3.9E+02	nc	2.0E+03	sat	7.3E+02	nc	1.3E+03	nc		
		1.0E-01	i			1.0E-01	r	0	0.1		95-95-4	2,4,5-Trichlorophenol	6.1E+03	nc	8.8E+04	nc	3.7E+02	nc	3.6E+03	nc	2.7E+02	1.4E+01
1.1E-02	i			1.1E-02	i			0	0.1		88-06-2	2,4,6-Trichlorophenol	4.4E+01	ca	2.2E+02	ca	6.2E-01	ca	6.1E+00	ca	2.0E-01	8.0E-03
		1.0E-02	i			1.0E-02	r	0	0.1		93-76-5	2,4,5-Trichlorophenoxyacetic Acid	6.1E+02	nc	8.8E+03	nc	3.7E+01	nc	3.6E+02	nc		
		8.0E-03	i			8.0E-03	r	0	0.1		93-72-1	2-(2,4,5-Trichlorophenoxy) propionic acid	4.9E+02	nc	7.0E+03	nc	2.9E+01	nc	2.9E+02	nc		
		5.0E-03	i			5.0E-03	r	1			598-77-6	1,1,2-Trichloropropane	1.5E+01	nc	5.1E+01	nc	1.8E+01	nc	3.0E+01	nc		
7.0E+00	h	6.0E-03	i	7.0E+00	r	5.0E-03	r	1			96-18-4	1,2,3-Trichloropropane	1.4E-03	ca	3.1E-03	ca	9.6E-04	ca	1.6E-03	ca		
		5.0E-03	h			5.0E-03	r	1			96-19-5	1,2,3-Trichloropropene	1.2E+01	nc	3.9E+01	nc	1.8E+01	nc	3.0E+01	nc		
		3.0E+01	i			8.6E+00	h	1			76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.6E+03	sat	5.6E+03	sat	3.1E+04	nc	5.9E+04	nc		

Key: i=IRIS h=HEAST n=NCEA x=WITHDRAWN o=Other EPA DOCUMENTS r=ROUTE EXTRAPOLATION ca=CANCER PRG nc=NONCANCER PRG sat=SOIL SATURATION max=CEILING LIMIT *(where: nc < 100X ca) **(where: nc < 10X ca)

FOR PLANNING PURPOSES

TOXICITY INFORMATION												CONTAMINANT	PRELIMINARY REMEDIATION GOALS (PRGs)								SOIL SCREENING LEVELS	
SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		V O C	skin* abs. soils	CAS No.			Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		Migration to Ground Water DAF 20 (mg/kg)	DAF 1 (mg/kg)
		3.0E-03	i			3.0E-03	r	0	0.1	58138-08-2		Tridiphane	1.8E+02	nc	2.6E+03	nc	1.1E+01	nc	1.1E+02	nc		
		2.0E-03	r			2.0E-03	i	1		121-44-8		Triethylamine	2.3E+01	nc	8.8E+01	nc	7.3E+00	nc	1.2E+01	nc		
7.7E-03	i	7.5E-03	i	7.7E-03	r	7.5E-03	r	0	0.1	1582-09-8		Trifluralin	6.3E+01	ca**	3.2E+02	ca*	8.7E-01	ca*	8.7E+00	ca*		
		1.4E-04	r			1.4E-04	n		0.1	552-30-7		**Trimellitic Anhydride (TMAN)**	8.6E+00	nc	1.2E+02	nc	5.1E-01	nc	5.1E+00			
		5.0E-02	n			1.7E-03	n	1		95-63-6		1,2,4-Trimethylbenzene	5.2E+01	nc	1.7E+02	nc	6.2E+00	nc	1.2E+01	nc		
		5.0E-02	n			1.7E-03	n	1		108-67-8		1,3,5-Trimethylbenzene	2.1E+01	nc	7.0E+01	nc	6.2E+00	nc	1.2E+01	nc		
3.7E-02	h			3.7E-02	r			0	0.1	512-56-1		Trimethyl phosphate	1.3E+01	ca	6.7E+01	ca	1.8E-01	ca	1.8E+00	ca		
		3.0E-02	i			3.0E-02	r	0	0.1	99-35-4		1,3,5-Trinitrobenzene	1.8E+03	nc	2.6E+04	nc	1.1E+02	nc	1.1E+03	nc		
		1.0E-02	h			1.0E-02	r	0	0.1	479-45-8		Trinitrophenylmethylnitramine	6.1E+02	nc	8.8E+03	nc	3.7E+01	nc	3.6E+02	nc		
3.0E-02	i	5.0E-04	i	3.0E-02	r	5.0E-04	r	0	0.1	118-96-7		2,4,6-Trinitrotoluene	1.6E+01	ca**	8.2E+01	ca**	2.2E-01	ca**	2.2E+00	ca**		
		1.0E-01	n			1.0E-01	r		0.1	791-28-6		**Triphenylphosphine oxide**	6.1E+03	nc	8.8E+04	nc	3.7E+02	nc	3.6E+03	nc		
1.4E-02	n	3.0E-01	n	1.4E-02	r	3.0E-01	r		0.1	115-96-8		**Tris(2-chloroethyl) phosphate**	3.5E+01	ca	1.8E+02	ca	4.8E-01	ca	4.8E+00	ca		
		2.0E-04	n							7440-61-0		**Uranium (chemical toxicity only)**	1.6E+01	nc	4.1E+02	nc			7.3E+00	nc		
		7.0E-03	h					0		7440-62-2		Vanadium and compounds	5.5E+02	nc	1.4E+04	nc			2.6E+02	nc	6.0E+03	3.0E+02
		1.0E-03	i			1.0E-03	r	0	0.1	1929-77-7		Vernam	6.1E+01	nc	8.8E+02	nc	3.7E+00	nc	3.6E+01	nc		
		2.5E-02	i			2.5E-02	r	0	0.1	50471-44-8		Vinclozolin	1.5E+03	nc	2.2E+04	nc	9.1E+01	nc	9.1E+02	nc		
		1.0E+00	h			5.7E-02	i	1		108-05-4		Vinyl acetate	4.3E+02	nc	1.4E+03	nc	2.1E+02	nc	4.1E+02	nc	1.7E+02	8.0E+00
1.1E-01	r	8.6E-04	r	1.1E-01	h	8.6E-04	i	1		593-60-2		Vinyl bromide (bromoethene)	1.9E-01	ca*	4.2E-01	ca*	6.1E-02	ca*	1.0E-01	ca*		
1.5E+00	i	3.0E-03	i	3.1E-02	i	2.9E-02	i	1		75-01-4		**Vinyl chloride (child/adult)**	1.5E-01	ca			2.2E-01	ca	4.1E-02	ca	1.0E-02	7.0E-04
7.5E-01	i	3.0E-03	i	1.6E-02	i	2.9E-02	i	1		75-01-4		**Vinyl chloride (adult)**			8.3E-01	ca						
		3.0E-04	i			3.0E-04	r	0	0.1	81-81-2		Warfarin	1.8E+01	nc	2.6E+02	nc	1.1E+00	nc	1.1E+01	nc		
		2.0E+00	i			2.0E-01	x	1	0.1	1330-20-7		Xylenes	2.1E+02	sat	2.1E+02	sat	7.3E+02	nc	1.4E+03	nc	2.1E+02	1.0E+01
		3.0E-01	i					0		7440-66-6		Zinc	2.3E+04	nc	1.0E+05	max			1.1E+04	nc	1.2E+04	6.2E+02
		3.0E-04	i					0		1314-84-7		Zinc phosphide	2.3E+01	nc	6.1E+02	nc			1.1E+01	nc		
		5.0E-02	i			5.0E-02	r	0	0.1	12122-67-7		Zineb	3.1E+03	nc	4.4E+04	nc	1.8E+02	nc	1.8E+03	nc		

APPENDIX C.1.2

CONNECTICUT REMEDIATION STANDARD REGULATIONS (RSRs)
DIRECT EXPOSURE (RESIDENTIAL AND INDUSTRIAL)
CONNECTICUT RSRs FOR POLLUTANT MOBILITY (GB CLASSIFIED AREA)
CONNECTICUT RSRs FOR THE PROTECTION OF GROUNDWATER(GA/GAA)

SUMMARY OF NUMERICAL CRITERIA
Remediation Standard Regulations
Appendices A, B, C, D, E, and F
January 1996

	Soil				Groundwater/Surface Water				Soil Vapor	
Media	RES DE (mg/kg)	I/C DE (mg/kg)	GA/GAA PM (mg/kg)	GB PM (mg/kg)	GA/GAA GP (ug/L)	SWP (ug/L)	RES Vol. (ug/L)	I/C Vol. (ug/L)	RES Vol. (ppm)	I/C Vol. (ppm)
VOLATILE ORGANIC SUBSTANCES										
Acetone	500	1000	14	140	700	NE	50000	50000	2400	8250
Acrylonitrile	1.1	11	0.01	0.1	0.5	20	NE	NE	NE	NE
Benzene	21	200	0.02	0.2	1	710	215	530	1	113
Bromoform	78	720	0.08	0.8	4	10800	920	3800	1.5	6
2-Butanone (MEK)	500	1000	8	80	400	NE	50000	50000	2400	8285
Carbon tetrachloride	4.7	44	0.1	1	5	132	16	40	1	2.7
Chlorobenzene	500	1000	2	20	100	420000	1800	6150	31	106
Chloroform	100	940	0.12	1.2	6	14100	287	710	4.5	10.4
Dibromochloromethane	7.3	68	0.01	0.1	0.5	1020	NE	NE	NE	NE
1,2-Dichlorobenzene (2 DCB)	500	1000	3.1	3.1	600	170000	30500	50000	240	818
1,3-Dichlorobenzene (3 DCB)	500	1000	12	120	600	26000	24200	50000	240	818
1,4-Dichlorobenzene (4 DCB)	26	240	1.5	15	75	26000	50000	50000	950	3270
1,1,-Dichloroethane (11DCA)	500	1000	1.4	14	70	NE	34600	50000	850	3037
1,2-Dichloroethane (12DCA)	6.7	63	0.02	0.2	1	2970	21	90	1	1
1,1-Dichloroethylene (11DCE)	1	9.5	0.14	1.4	7	96	1	6	1	1
cis-1,2-Dichloroethylene	500	1000	1.4	14	70	NE	NE	NE	NE	NE
trans-1,2-Dichloroethylene	500	1000	2	20	100	NE	NE	NE	NE	NE
1,2-Dichloropropane	9	84	0.1	1	5	NE	14	60	1	1
1,3-Dichloropropene	3.4	32	0.01	0.1	0.5	34000	6	25	1	1
Ethylbenzene	500	1000	10.1	10.1	700	580000	50000	50000	1650	5672
Ethylene dibromide (EDB)	0.007	0.067	0.01	0.1	0.05	NE	4	16	1	1
Methyl-tert-butyl-ether (MTBE)	500	1000	2	20	100	NE	50000	50000	1000	3415
Methyl isobutyl ketone (MIBK)	500	1000	7	14	350	NE	50000	50000	140	480
Methylene chloride	82	760	0.1	1	5	48000	50000	50000	1200	2907
Styrene	500	1000	2	20	100	NE	580	2065	8	28
1,1,1,2-Tetrachloroethane	24	220	0.02	0.2	1	NE	12	50	1	1.5
1,1,2,2-Tetrachloroethane	3.1	29	0.01	0.1	0.5	110	23	100	1	1
Tetrachloroethylene (PCE)	12	110	0.1	1	5	88	1500	3820	11	27
Toluene	500	1000	20	67	1000	4000000	23500	50000	780	2615
1,1,1-Trichloroethane (TCA)	500	1000	4	40	200	62000	20400	50000	1310	4520
1,1,2-Trichloroethane	11	100	0.1	1	5	1260	8000	19600	40	93
Trichloroethylene (TCE)	56	520	0.1	1	5	2340	219	540	7	16
Vinyl chloride	0.32	3	0.04	0.4	2	15750	2	2	1	1
Xylenes	500	1000	19.5	19.5	530	NE	21300	50000	600	1702
Total Petroleum Hydrocarbons	500	2500	500	2500	500	NE	NE	NE	NE	NE
INORGANIC SUBSTANCES & PCBs			(1)	(1)						
Antimony (Sb)	27	8200	0.006	0.06	6	86000	NE	NE	NE	NE
Arsenic (Ar)	10	10	0.05	0.5	50	4	NE	NE	NE	NE
Asbestos	NE	NE	NE	NE	7 (mfl)	7 (mfl)	NE	NE	NE	NE
Barium (Ba)	4700	140000	1	10	1000	NE	NE	NE	NE	NE
Beryllium (Be)	2	2	0.004	0.04	4	4	NE	NE	NE	NE
Cadmium (Cd)	34	1000	0.005	0.05	5	6	NE	NE	NE	NE
Chromium, trivalent (Cr+3)	3900	51000	NE	NE	NE	1200	NE	NE	NE	NE
Chromium, hexavalent (Cr+6)	100	100	NE	NE	NE	110	NE	NE	NE	NE
Chromium, total (Cr)	NE	NE	0.05	0.5	50	NE	NE	NE	NE	NE
Copper (Cu)	2500	76000	1.3	13	1300	48	NE	NE	NE	NE
Cyanide (Cn)	1400	41000	NE	NE	200	52	NE	NE	NE	NE
Cyanide (by SPLP only) (Cn)	NE	NE	0.2	2	NE	NE	NE	NE	NE	NE
Lead (Pb)	500	1000	0.015	0.15	15	13	NE	NE	NE	NE
Mercury (Hg)	20	610	0.002	0.02	2	0.4	NE	NE	NE	NE
Nickel (Ni)	1400	7500	0.1	1	100	880	NE	NE	NE	NE
Selenium (Se)	340	10000	0.05	0.5	50	50	NE	NE	NE	NE
Silver (Ag)	340	10000	0.036	0.36	36	12	NE	NE	NE	NE
Thallium (Tl)	5.4	160	0.005	0.05	5	63	NE	NE	NE	NE
Vanadium (V)	470	14000	0.05	0.5	50	NE	NE	NE	NE	NE
Zinc (Zn)	20000	610000	5	50	5000	123	NE	NE	NE	NE
Polychlorinated Biphenyls (PCBs)	1	10	0.0005	0.005	0.5	0.5	NE	NE	NE	NE

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January 1996

	Soil				Groundwater/Surface Water				Soil Vapor	
Media	RES DE (mg/kg)	I/C DE (mg/kg)	GA/GAA PM (mg/kg)	GB PM (mg/kg)	GA/GAA GP (ug/L)	SWP (ug/L)	RES Vol. (ug/L)	I/C Vol. (ug/L)	RES Vol. (ppm)	I/C Vol. (ppm)
SEMIVOLATILE ORGANICS										
Acenaphthylene	1000	2500	8.4	84	420	0.3	NE	NE	NE	NE
Anthracene	1000	2500	40	400	2000	1100000	NE	NE	NE	NE
Benzo(a)anthracene	1	7.8	1	1	0.06	0.3	NE	NE	NE	NE
Benzo(b)fluoranthene	1	7.8	1	1	0.06	0.3	NE	NE	NE	NE
Benzo(k)fluoranthene	8.4	78	1	1	0.5	0.3	NE	NE	NE	NE
Benzo(a)pyrene	1	1	1	1	0.2	0.3	NE	NE	NE	NE
Bis(2-chloroethyl)ether	1	5.2	1	2.4	12	42	NE	NE	NE	NE
Bis(2-chloroisopropyl)ether	8.8	82	1	2.4	12	3400000	NE	NE	NE	NE
Bis(2-ethyl hexyl)phthalate	44	410	1	11	2	59	NE	NE	NE	NE
Butyl benzl phthalate	1000	2500	20	200	1000	NE	NE	NE	NE	NE
2-chlorophenol	340	2500	1	7.2	36	NE	NE	NE	NE	NE
Di-n-butyl phthalate	1000	2500	14	140	700	120000	NE	NE	NE	NE
Di-n-octyl phthalate	1000	2500	2	20	100	NE	NE	NE	NE	NE
2,4-Dichlorophenol	200	2500	1	4	20	15800	NE	NE	NE	NE
Fluoranthene	1000	2500	5.6	56	280	3700	NE	NE	NE	NE
Fluorene	1000	2500	5.6	56	280	140000	NE	NE	NE	NE
Hexachloroethane	44	410	1	1	3	89	NE	NE	NE	NE
Hexachlorobenzene	1	3.6	1	1	1	0.077	NE	NE	NE	NE
Naphthalene	1000	2500	5.6	56	280	NE	NE	NE	NE	NE
Pentachlorophenol	5.1	48	1	1	1	NE	NE	NE	NE	NE
Phenanthrene	1000	2500	4	40	200	[illegible]	NE	NE	NE	NE
Phenol	1000	2500	80	800	4000	92000000	NE	NE	NE	NE
Pyrene	1000	2500	4	40	200	110000	NE	NE	NE	NE
PESTICIDES										
Alachlor	7.7	72	0.23	0.4	2	NE	NE	NE	NE	NE
Aldicarb	14	410	1	1	3	NE	NE	NE	NE	NE
Atrazine	2.8	26	0.2	0.2	3	NE	NE	NE	NE	NE
Chlordane	0.49	2.2	0.066	0.066	0.3	0.3	NE	NE	NE	NE
Dieldrin	0.038	0.36	0.007	0.007	0.002	0.1	NE	NE	NE	NE
Endrin	20	610	NE	NE	NE	0.1	NE	NE	NE	NE
2-4 D	680	20000	1.4	14	70	NE	NE	NE	NE	NE
Heptachlor epoxide	0.067	0.63	0.02	0.02	0.2	0.05	NE	NE	NE	NE
Heptachlor	0.14	1.3	0.013	0.013	0.4	0.05	NE	NE	NE	NE
Lindane	20	610	0.02	0.04	0.2	NE	NE	NE	NE	NE
Methoxychlor	340	10000	0.8	8	40	NE	NE	NE	NE	NE
Simazine	NE	NE	0.8	8	4	NE	NE	NE	NE	NE
Toxaphene	0.56	5.2	0.33	0.6	3	1	NE	NE	NE	NE

0.3

Abbreviations

RES = Residential
PM = Pollutant Mobility Criteria
Vol. = Volatilization Criteria
ug/L = micrograms per liter or parts per billion
mg/kg = milligrams per kilogram or ppm

I/C = Industrial/Commercial
SWP = Surface Water Protection Criteria
GP = Groundwater Protection Criteria
NE = None Established by DEP
ppm = parts per million

(1) TCLP or SPLP (mg/L)

Compliments of: EPOC

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Approved Criteria for Additional Polluting Substances

Pursuant to Sections 22a-133k(1) through (3) of the Regulations of Connecticut State Agencies

Pollutant	Soil (mg/kg)				Groundwater (µg/l)			
	RES DEC	I/C DEC	GAA/ GA PMC	GB PMC	GWPC	SWPC	RES VC	I/C VC
acenaphthene	1000	2500	8.4	84	420	NE	NE	NE
aldrin	0.036	0.34	In Review	In Review	In Review	NE	NE	NE
benzo(g,h,i)perylene [8]	1000	2500	4.2	42	210	NE	NE	NE
benzoic acid	1000	2500	1000	10000	50000	NE	NE	NE
BHC(alpha-)	0.097	0.91	In Review	In Review	In Review	NE	NE	NE
BHC(beta-)	0.34	3.2	In Review	In Review	In Review	NE	NE	NE
BHC(delta) [1]	0.097	0.91	In Review	In Review	In Review	NE	NE	NE
bromodichloromethane	9.9	92	0.011	0.11	0.56	NE	NE	NE
bromomethane	95	1000	0.2	2	9.8	NE	NE	NE
4-bromophenyl-phenylether	500	1000	8.2	82	410	NE	NE	NE
n-butylbenzene	500	1000	1.4	14	61[13]	NE	NE	NE
sec-butylbenzene	500	1000	1.4	14	61[13]	NE	NE	NE
tert-butylbenzene	500	1000	1.4	14	61[13]	NE	NE	NE
carbazole	31	290	1 #	1 #	10 #	NE	NE	NE

Approved Criteria for Additional Polluting Substances

Pursuant to Sections 22a-133k(1) through (3) of the Regulations of Connecticut State Agencies

Pollutant	Soil (mg/kg)				Groundwater (µg/l)			
	RES DEC	I/C DEC	GAA/ GA PMC	GB PMC	GWPC	SWPC	RES VC	I/C VC
carbon disulfide	500	1000	14	140	700	NE	NE	NE
4-chloroaniline	270	2500	1 #	5.6	28	NE	NE	NE
chloromethane	47	440	0.054	0.54	2.7	NE	NE	NE
2-chloronaphthalene	1000	2500	11	110	560	NE	NE	NE
4-chlorophenyl-phenyl ether [2]	500	1000	8.2	82	410	NE	NE	NE
chrysene	84	780	1 #	1 #	4.8	NE	NE	NE
m-cresol	1000	2500	7	70	350	NE	NE	NE
p-cresol	340	2500	0.7	7	35	NE	NE	NE
4,4'-DDD	2.6	24	In Review	In Review	0.15	NE	NE	NE
4,4'-DDE	1.8	17	In Review	In Review	0.1	NE	NE	NE
4,4'-DDT	1.8	17	In Review	In Review	0.1	NE	NE	NE
dibenzofuran	270	2500	1 #	5.6	28	NE	NE	NE
dibenz(a,h)anthracene	1 #	1 #	1 #	1 #	0.5 #	NE	NE	NE
1,2-dibromo-3-	0.44	4.1	In Review	In Review	In Review	NE	NE	NE

Approved Criteria for Additional Polluting Substances

Pursuant to Sections 22a-133k(1) through (3) of the Regulations of Connecticut State Agencies

Pollutant	Soil (mg/kg)				Groundwater (µg/l)			
	RES DEC	I/C DEC	GAA/ GA PMC	GB PMC	GWPC	SWPC	RES VC	I/C VC
chloropropane								
1,2-dibromoethane	0.0072	0.067	In Review	In Review	In Review	NE	NE	NE
3,3'-dichlorobenzidene	1.4	13	0.33 #	0.33 #	10 #	NE	NE	NE
1,4-dichlorobutene	0.07	0.62	In Review	In Review	In Review	NE	NE	NE
diethyl phthalate	1000	2500	110	1100	5600	NE	NE	NE
2,4-dimethylphenol	1000	2500	2.8	28	140	NE	NE	NE
dimethyl phthalate [10]	1000	2500	110	1100	5600	NE	NE	NE
2,4-dinitrophenol	140	2500	1.65 #	2.8	50 #	NE	NE	NE
2,4-dinitrotoluene	140	2500	1 #	2.8	14	NE	NE	NE
2,6-dinitrotoluene	68	2000	1 #	1.4	10 #	NE	NE	NE
endosulfan I	410	1200	0.84	8.4	42	NE	NE	NE
endosulfan II	410	1200	0.84	8.4	42	NE	NE	NE
endosulfan sulfate [3]	410	1200	0.84	8.4	42	NE	NE	NE
endrin aldehyde [4]	20	610	NE	NE	NE	NE	NE	NE

Approved Criteria for Additional Polluting Substances

Pursuant to Sections 22a-133k(1) through (3) of the Regulations of Connecticut State Agencies

Pollutant	Soil (mg/kg)				Groundwater (µg/l)			
	RES DEC	I/C DEC	GAA/ GA PMC	GB PMC	GWPC	SWPC	RES VC	I/C VC
endrin ketone [5]	20	610	NE	NE	NE	NE	NE	NE
hexachlorobutadiene	7.9	73	1 #	1 #	0.45	NE	NE	NE
hexachlorocyclopentadiene	470	2500	1 #	9.8	49	NE	NE	NE
indeno(1,2,3-cd)pyrene	1 #	7.8	1 #	1 #	0.5 #	NE	NE	NE
isophorone	640	2500	1 #	7.4	37	NE	NE	NE
isopropylbenzene (cumene)	500	1000	0.6	132 [14]	30 [15]	NE	NE	NE
4-isopropyltoluene (p-cymene)	500	1000	0.6	41.8	30 [15]	NE	NE	NE
p-isopropyltoluene [9]	NE	NE	1.4	14	70	NE	NE	NE
2-methylnaphthalene [7]	474	2500	0.98	9.8	49	NE	NE	NE
2-methylphenol	1000	2500	7	70	350	NE	NE	NE
4-methylphenol	340	2500	1 #	7	35	NE	NE	NE
2-nitroaniline	4.1	1200	1.65 #	1.65 #	50 #	NE	NE	NE
3-nitroaniline	200	2500	1.65 #	4.2	50 #	NE	NE	NE

Approved Criteria for Additional Polluting Substances

Pursuant to Sections 22a-133k(1) through (3) of the Regulations of Connecticut State Agencies

Pollutant	Soil (mg/kg)				Groundwater (µg/l)			
	RES DEC	I/C DEC	GAA/ GA PMC	GB PMC	GWPC	SWPC	RES VC	I/C VC
4-nitroaniline	200	2500	1 #	4.2	21	NE	NE	NE
nitrobenzene	34	1000	1 #	1 #	10 #	NE	NE	NE
2-nitrophenol	540	2500	1.1	11	56	NE	NE	NE
N-nitrosodiphenylamine	130	1200	1 #	1.4	10 #	NE	NE	NE
N-nitrosodi-n-propylamine	1 #	1 #	1 #	1 #	10 #	NE	NE	NE
n-propylbenzene	500	1000	1.4	14	61 [13]	NE	NE	NE
1,2,4-trichlorobenzene	680	2500	1.4	14	70	NE	NE	NE
trichloroflouroethane [11]	NE	NE	NE	NE	20000	NE	NE	NE
trichloroflouromethane	500	1000	26	260	1300	NE	NE	NE
2,4,5-trichlorophenol	1000	2500	14	140	700	NE	NE	NE
2,4,6-trichlorophenol	56	520	1 #	1 #	10 #	NE	NE	NE
1,2,4-trimethylbenzene	500	1000	7	70	350	NE	NE	NE
1,3,5-trimethylbenzene	500	1000	7	70	350	NE	NE	NE

Approved Criteria for Additional Polluting Substances

Pursuant to Sections 22a-133k(1) through (3) of the Regulations of Connecticut State Agencies

NE Not Established
Criteria based on detection limits.

Notes: [1] BCH(alpha) used as surrogate for BCH (delta).
[2] 4-bromophenyl-phenyl ether used as surrogate for 4-chlorophenyl-phenyl ether.
[3] Endosulfan used as surrogate for endosulfan sulfate.
[4] Endrin used as surrogate for endrin aldehyde.
[5] Endrin used as surrogate for endrin ketone.
[7] Based on an interim acceptable exposure level of 0.007 mg/kg developed by DPH. Criteria to be used for screening purposes.
[8] Pyrene used as surrogate for benzo(g,h,i)perylene.
[9] Screening level for p-isopropyltoluene is based on isopropylbenzene as a surrogate. Also known as methylisopropylbenzene.
[10] Diethyl phthalate used as surrogate for dimethyl phthalate.
[11] Based on odor threshold. Also known as Freon 113 and 1,1,2-trichloro-1,2,2-triflouroethane.
[12] Based on health based GWPC of 209 μg/l; toxicity is estimated to be three fold greater than cumene.
[13] GWPC from Region III table which incorporates inhalation and drinking exposure routes.
[14] Based on health based GWPC of 660 μg/l.
[15] GWPC based on odor detection from volatilization during showering.

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C-49-03-8-156

March 20, 1998

Brown & Root Environmental Project Number 7237

Mr. Mark Lewis
Connecticut Department of Environmental Protection
Water Management Bureau
Permitting, Enforcement, and Remediation Division
Federal Remediation Program
79 Elm Street
Hartford, Connecticut 06106-5127

Reference: CLEAN Contract No. N62472-90-D-1298
Contract Task Order No. 0260

Subject: Responses to CTDEP's Comments on Calculated Remediation Standards
Lower Subase Remedial Investigation
Naval Submarine Base - New London, Groton, Connecticut

Dear Mr. Lewis:

Brown & Root (B&R) Environmental and the Navy received your February 27, 1998 comment letter regarding the Remediation Standards that were calculated for use in the Lower Subase Remedial Investigation. Responses to CTDEP's comments have been prepared and the appropriate revisions have been made to Tables 1 and 2, which were previously enclosed in B&R Environmental's December 23, 1997 letter. B&R Environmental, on the behalf of the United States Navy, Northern Division Facilities Engineering Command and Naval Submarine Base - New London, has enclosed the Navy's responses to CTDEP's comments and the revised tables for your review and approval.

If you have any questions regarding the responses or the information provided in the revised tables, please contact Mr. Mark Evans at (610) 595-0567 (ext. 162) or me at (412) 921-8244. It is anticipated that any remaining issues can be resolved during a conference call.

Very truly yours,

Corey A. Rich

Corey A. Rich, P.E.
Project Manager

Enclosure(s)

c: Mr. Roger Boucher, NORTHDIV (letter only)
Mr. Mark Evans, NORTHDIV
Mr. Andy Stackpole, NSB-NLON Environmental
Mr. John Trepanowski, B&R Environmental
Mr. Daryl Hutson, B&R Environmental (letter only)
Ms. Karen Smecker, B&R Environmental
File: CTO 0260

RESPONSES TO CTDEP'S COMMENTS (2/27/98)
ON THE CALCULATED CTDEP REMEDIATION STANDARDS (12/23/97)
CTO 260 - LOWER SUBASE REMEDIAL INVESTIGATION
NAVAL SUBMARINE BASE-NEW LONDON, GROTON, CONNECTICUT
MARCH 20, 1998

I. SURROGATE CHEMICALS USED TO SUPPLY TOXICITY VALUES

Comment:

1. **The Navy has used naphthalene as a surrogate to represent the toxicity of benzo(g,h,I)perylene. As noted in Dr. Ginsberg's memorandum, pyrene (RfD 0.03 mg/kg/d) is a more appropriate surrogate. The RfD for naphthalene has been withdrawn from IRIS. Please recalculate the direct exposure, pollutant mobility, and ground water protection criteria for benzo(g,h,i)perylene using this approach. This approach is appropriate for a screening level risk assessment. However, the uncertainties involved with this approach should be acknowledged if these two chemicals are found to be major risk drivers at the site.**

Response:

The direct exposure, pollutant mobility, and groundwater protection criteria for benzo(g,h,i)perylene will be recalculated using pyrene as a surrogate. Benzo(g,h,i)perylene was detected in soil and groundwater at the Lower Subase but was not found to be a major risk driver at any of the zones that were evaluated in the risk assessment. Benzo(g,h,i)perylene was only identified as a COC in groundwater at Zone 4 where it was detected in one sample at a concentration exceeding the State's Ambient Water Quality Criteria (AWQC) for the protection of human health. Consequently, this does not have any impact on the human health risk assessment.

Comment:

2. **It is unclear why the Navy calculated criteria for phenanthrene since the regulations list direct exposure, pollutant mobility, and groundwater protection criteria for this compound. Please use the criteria listed in the Regulations for this compound. The Navy should either withdraw their request for approval of criteria for phenanthrene, or, if the Navy is requesting approval of alternative criteria for this compound under the Regulations, the Navy should so state.**

Response:

The Navy retracts its request for approval of criteria for phenanthrene. The promulgated criteria for phenanthrene were used in the selection of COCs in the human health risk assessment. Consequently, this does not have any impact on the human health risk assessment.

Comment:

3. **Bromodichloromethane should be used as a surrogate for bromochloromethane. Please use the criteria calculated for bromodichloromethane in place of those calculated using chloromethane as a surrogate.**

Response:

Bromodichloromethane will be used as a surrogate for bromochloromethane. Bromodichloromethane was not detected in soil and groundwater samples for any of the zones evaluated in the human health risk assessment, consequently this does not have any impact on the analysis.

Comment:

4. **The Navy's proposal to use 3-methylphenol as a surrogate for 4-chloro-3-methylphenol is not appropriate, due to structural differences between the two compounds. The use of a qualitative risk assessment would be acceptable assuming that concentrations of this chemical do not exceed the low part-per-billion range. Please see Dr. Ginsberg's comments for additional details.**

Response:

No criteria will be developed for 4-chloro-3-methylphenol. Instead, as suggested, 4-chloro-3-methylphenol will be evaluated qualitatively. 4-Chloro-3-methylphenol was only detected in one soil sample at the Lower Subase and at a low concentration (34 ppb), consequently, this does not have any impact on the human health risk assessment.

II. INCORRECT OR UNSUPPORTED POTENCY VALUES

Comment:

5. **Several of the CSFs or RfDs used by the Navy appeared to be incorrect, based on a comparison to the values listed in the EPA Region III Risk Based Concentrations table, IRIS, or HEAST. Please recalculate the direct exposure, pollutant mobility, and ground water protection criteria using correct values for total 1,2-dichloroethene. Please assume that this value pertains to the mixture of *cis* and *trans* isomers. The RfD for the mixture should be 9E-3 mg/kg/d.**

Response:

The direct exposure, pollutant mobility, and groundwater protection criteria for total 1,2-dichloroethene will be recalculated using an oral reference dose of 9E-3 mg/kg/day. This revision does not impact the human health risk assessment since all detected concentrations of total 1,2-dichloroethene are less than the recalculated criteria.

Comment:

6. **The Department was unable to verify the potency factors listed by the Navy for several chemicals. Please either provide references to support the listed potency factors, or derive criteria using acceptable surrogates for the following compounds: chloroethane, 4,6-dinitro-2-methylphenol, 2-hexanone, and 2-methylnaphthalene. Please note that naphthalene is not an appropriate surrogate for 2-methylnaphthalene as the RfD for naphthalene has been withdrawn from IRIS. Please refer to Dr. Ginsberg's memo for additional guidance.**

Response:

The toxicity criteria for chloroethane, 4,6-dinitro-2-methylphenol, 2-hexanone, and 2-methylnaphthalene were obtained from the current U.S. EPA Region III Risk-based Concentration (RBC) Table dated October 22, 1997. The RBC table cites EPA's National Center for Environmental Assessment (NCEA) as the source for the values for chloroethane, 4,6-dinitro-2-methylphenol, and 2-methylnaphthalene. Although not cited in the RBC table, EPA Region III stated in telephone call on March 12, 1998, that NCEA is also the source for the toxicity criteria for 2-hexanone. Therefore, there are no changes necessary to the proposed values.

Comment:

7. **The Department was unable to verify the RfD listed by the Navy for 4-nitrophenol (8.00E-3 mg/kg/d). Please either provide a reference for the listed value, or use the default RfD currently listed in the RBC tables (6.2E-2 mg/kg/d).**

Response:

The current RBC table lists 8.00E-3 mg/kg/day as the oral RfD for 4-nitrophenol and cites EPA's NCEA as the source for the value. The value of 6.2E-2 mg/kg/day was listed in the previous, outdated version of the RBC table. Therefore, there are no changes necessary to the proposed criteria.

III. POLLUTANT MOBILITY CRITERIA FOR METALS

Comment:

8. **The ground water protection criterion for cobalt was calculated correctly by the Navy. However, the approach used by the Navy in calculating pollutant mobility criteria for cobalt is unacceptable. Rather than using the calculated ground water protection criterion (420 μg/l) to establish a pollutant mobility criterion for cobalt, the Navy used the EPA Region III Risk Based Criteria for tap water (2,200 μg/L) as the GAA/GA pollutant mobility criterion. This approach is less conservative than using the calculated ground water protection criterion. The correct pollutant mobility criteria for cobalt, based on the groundwater protection criteria calculated by the Navy, are 420 μg/L for a GAA/GA area, and 4,200 μg/L for a GB area (measurement by TCLP or SPLP).**

Response:

The pollutant mobility criteria for cobalt will be changed to 420 μg/L for a GAA/GA area and 4,200 μg/L for a GB area. This revision has no impact on the human health risk assessment because of the following reasons: (1) none of the historical soil samples that were analyzed by TCLP had leachates that were analyzed for cobalt, and (2) only the soil samples from Zone 6 had SPLP leachates that were analyzed for cobalt and all of the results were nondetects.

Comment:

9. **The ground water protection criterion for manganese was calculated correctly by the Navy. Rather than using the calculated ground water protection criterion (160 μg/l) to establish a pollutant mobility criterion for manganese, the Navy used the EPA Secondary MCL for drinking water (50 μg/L) as the GAA/GA pollutant mobility criterion. This approach is acceptable as it is more conservative than using the calculated ground water protection criterion.**

Response:

No response required.

IV. GB POLLUTANT MOBILITY CRITERIA FOR DIMETHYLPHTHALATE

Comment:

10. **The GB pollutant mobility criteria listed for dimethylphthalate (1,400 mg/kg) in the Navy's Table 2 appears to be a typo. The correct value should be listed as 14,000 mg/kg.**

Response:

The GB pollutant mobility criteria for dimethylphthalate will be corrected to 14,000 mg/kg. This revision has no impact on the analysis since dimethylphthalate was not detected in soil samples in any of the zones that were evaluated in the human health risk assessment.

V. BIS(2-CHLOROETHOXY)METHANE

Comment:

11. **The Navy proposes a qualitative risk assessment for this compound. This approach is acceptable provided that the compound is not present at concentrations above the low part-per-billion range. As noted by Dr. Ginsberg, if it is present above this range, a more quantitative risk assessment may be required.**

Response:

Bis(2-chloroethoxy)methane was not detected in soil or groundwater samples for any of the zones evaluated in the human health risk assessment, consequently this does not have any impact on the analysis.

TABLE 1

SOURCE OF CONNECTICUT REMEDIATION STANDARDS
CTO 260 LOWER SUBASE RI
NEW LONDON, GROTON, CONNECTICUT

Chemical	CAS Number	Chemical Fraction	Basis of Value to be Used in RI Report		
			Promulgated Value[1]	Calculated Value[2]	Surrogate Calculated Value[3]
Acenaphthene	83329	SVOC		X	
Acenaphthylene	208968	SVOC	X		
Anthracene	120127	SVOC	X		
Acetone	67641	VOC	X		
Aldrin	309002	PEST		X	
Aluminum	7429905	INORG	(4)	(4)	(4)
Antimony	7440360	INORG	X		
Arsenic	7440382	INORG	X		
Barium	7440393	INORG	X		
Benzene	71432	VOC	X		
Benz(a)anthracene	56553	SVOC	X		
Benzo(b)fluoranthene	205992	SVOC	X		
Benzo(k)fluoranthene	207089	SVOC	X		
Benzo(g,h,i)perylene	191242	SVOC			X (pyrene)
Benzo(a)pyrene	50328	SVOC	X		
Beryllium	7440417	INORG	X		
BCH (alpha-)	319846	PEST		X	
BCH (beta-)	319857	PEST		X	
BCH (delta-)	319868	PEST			X (alpha-BHC)
BCH (gamma-; Lindane)	58899	PEST	X		
Bis(2-chloroethoxy)methane	111911	SVOC	(5)	(5)	(5)
Bis(2-chloroethyl)ether	111444	SVOC	X		
Bis(2-ethylhexyl)phthalate	117817	SVOC	X		
Bromochloromethane	74975	VOC			X (bromodichloro-methane)
Bromodichloromethane	75274	VOC		X	
Bromoform	75252	VOC	X		
Bromomethane	74839	VOC		X	
4-Bromophenyl-phenylether	101553	SVOC		X	
2-Butanone	78933	VOC	X		
Butylbenzylphthalate	85687	SVOC	X		
Cadmium	7440439	INORG	X		
Calcium	7440702	INORG	(6)	(6)	(6)
Carbazole	86748	SVOC		X	
Carbon disulfide	75150	VOC		X	
Carbon tetrachloride	56235	VOC	X		
Chlordane (alpha-)	57749	PEST	X(7)		
Chlordane (gamma-)	57749	PEST	X(7)		
4-Chloroaniline	106478	SVOC		X	
Chlorobenzene	108907	VOC	X		
Chlorodibromomethane	124481	VOC	X		
Chloroethane	75003	VOC		X	
Chloroform	67663	VOC	X		
Chloromethane	74873	VOC		X	
4-Chloro-3-methylphenol	59507	SVOC	(5)	(5)	(5)

TABLE 1

SOURCE OF CONNECTICUT REMEDIATION STANDARDS
CTO 260 LOWER SUBASE RI
NEW LONDON, GROTON, CONNECTICUT

Chemical	CAS Number	Chemical Fraction	Basis of Value to be Used in RI Report		
			Promulgated Value[1]	Calculated Value[2]	Surrogate Calculated Value[3]
2-Chloronaphthalene	91587	SVOC		X	
2-Chlorophenol	95578	SVOC	X		
4-Chlorophenyl-phenylether	7005723	SVOC			X (4-Bromophenyl-phenylether)
Chromium (total)		INORG	X[8]		
Chrysene	218019	SVOC		X	
Cobalt	7440484	INORG		X	
Copper	7440508	INORG	[4]	[4]	[4]
4,4'-DDD	72548	PEST		X	
4,4'-DDE	72559	PEST		X	
4,4'-DDT	50293	PEST		X	
Dibenzofuran	132649	SVOC		X	
Dibenz(a,h)anthracene	53703	SVOC		X	
1,2-Dibromo-3-chloropropane	96128	VOC		X	
1,2-Dibromoethane	106934	VOC		X	
1,2-Dichlorobenzene	95501	VOC/SVOC	X		
1,3-Dichlorobenzene	541731	VOC/SVOC	X		
1,4-Dichlorobenzene	106467	VOC/SVOC	X		
3,3'-Dichlorobenzidine	91941	SVOC		X	
1,1-Dichloroethane	75343	VOC	X		
1,2-Dichloroethane	107062	VOC	X		
1,1-Dichloroethene	75354	VOC	X		
1,2-Dichloroethene (cis-)	156592	VOC	X		
1,2-Dichloroethene (trans-)	156605	VOC	X		
1,2-Dichloroethene (total)	156605	VOC		X	
2,4-Dichlorophenol	120832	SVOC	X		
1,2-Dichloropropane	78875	VOC	X		
1,3-Dichloropropene (cis-)	542756	VOC	X		
1,3-Dichloropropene (trans-)	542756	VOC	X		
Dieldrin	60571	PEST	X		
Diethyl phthalate	84662	SVOC		X	
2,4-Dimethylphenol	105679	SVOC		X	
Dimethylphthalate	131113	SVOC		X	
Di-n-butylphthalate	84742	SVOC	X		
Di-n-octylphthalate	117840	SVOC	X		
4,6-Dinitro-2-methylphenol	534521	SVOC		X	
2,4-Dinitrophenol	51285	SVOC		X	
2,4-Dinitrotoluene	121142	SVOC		X	
2,6-Dinitrotoluene	606202	SVOC		X	
Endosulfan I	115297	PEST		X[9]	
Endosulfan II	115297	PEST		X[9]	
Endosulfan sulfate	1031078	PEST			X (endosulfan)
Endrin	72208	PEST	X		
Endrin aldehyde	7421363	PEST			X (endrin)
Endrin ketone	53494705	PEST			X (endrin)

TABLE 1

SOURCE OF CONNECTICUT REMEDIATION STANDARDS
CTO 260 LOWER SUBASE RI
NEW LONDON, GROTON, CONNECTICUT

Chemical	CAS Number	Chemical Fraction	Basis of Value to be Used in RI Report		
			Promulgated Value[1]	Calculated Value[2]	Surrogate Calculated Value[3]
Ethylbenzene	100414	VOC	X		
Fluoranthene	206440	SVOC	X		
Fluorene	86737	SVOC	X		
Heptachlor	76448	PEST	X		
Heptachlor epoxide	1024573	PEST	X		
Hexachlorobenzene	118741	SVOC	X		
Hexachlorobutadiene	87683	SVOC		X	
Hexachlorocyclopentadiene	77474	SVOC		X	
Hexachloroethane	67721	SVOC	X		
2-Hexanone	73663715	VOC		X	
Indeno(1,2,3-cd)pyrene	193395	SVOC		X	
Iron	7439896	INORG	(4)	(4)	(4)
Isophorone	78591	SVOC		X	
Lead	7439291	INORG	X		
Magnesium	7439954	INORG	(6)	(6)	(6)
Manganese	7439965	INORG		X	
Mercury	7439976	INORG	X		
Methoxychlor	72435	PEST	X		
Methylene chloride	75092	VOC	X		
2-Methylnaphthalene	91576	SVOC		X	
4-Methyl-2-pentanone	108101	VOC	X		
2-Methylphenol	95487	SVOC		X	
4-Methylphenol	106445	SVOC		X	
Naphthalene	91203	SVOC	X		
Nickel	7440020	INORG	X		
2-Nitroaniline	88744	SVOC		X	
3-Nitroaniline	99092	SVOC		X	
4-Nitroaniline	100016	SVOC		X	
Nitrobenzene	98953	SVOC		X	
2-Nitrophenol	88755	SVOC			X (4-nitrophenol)
4-Nitrophenol	100027	SVOC		X	
N-Nitrosodiphenylamine	86306	SVOC		X	
N-Nitrosodi-n-propylamine	621647	SVOC		X	
2,2'-Oxybis(1-chloropropane)	108601	SVOC	(5)	(5)	(5)
Pentachlorophenol	87865	SVOC	X		
Phenanthrene	85018	SVOC	X		
Phenol	108952	SVOC	X		
Potassium	7440097	INORG	(6)	(6)	(6)
Pyrene	129000	SVOC	X		
Selenium	7782492	INORG	X		
Silver	7440224	INORG	X		
Sodium	7440235	INORG	(6)	(6)	(6)
Styrene	100425	VOC	X		
1,1,2,2-Tetrachloroethane	79345	VOC	X		
Tetrachloroethylene	127184	VOC	X		
Thallium	6533739	INORG	X		
Toluene	108883	VOC	X		
Toxaphene	8001352	PEST	X		

TABLE 1

SOURCE OF CONNECTICUT REMEDIATION STANDARDS
CTO 260 LOWER SUBASE RI
NEW LONDON, GROTON, CONNECTICUT

Chemical	CAS Number	Chemical Fraction	Basis of Value to be Used in RI Report		
			Promulgated Value(1)	Calculated Value(2)	Surrogate Calculated Value(3)
1,2,4-Trichlorobenzene	120821	SVOC		X	
1,1,1-Trichloroethane	71556	VOC	X		
1,1,2-Trichloroethane	79005	VOC	X		
Trichloroethylene	79016	VOC	X		
2,4,5-Trichlorophenol	95954	SVOC		X	
2,4,6-Trichlorophenol	88062	SVOC		X	
Vanadium	7440622	INORG	X		
Vinyl chloride	75014	VOC	X		
Xylene (total)	1330207	VOC	X		
Zinc	7440666	INORG	X		

INORG Inorganic
PEST Pesticide
SVOC Semivolatile organic compound
VOC Volatile organic compound

1 State of Connecticut Remediation Standard Regulations, Section 22a-133k (January 1996).
2 Published toxicity criteria is available. Toxicity criteria from the current USEPA Region III Risk-Based Concentration Table (October 22, 1997) will be used to calculate a value using the methodology presented in the State guidance (January 1996).
3 No toxicity criteria is available. Toxicity criteria for a similarly structured chemical (noted in parentheses) will be used to calculate a value.
4 Region I does not advocate a quantitative evaluation of this chemical. Exposure to this chemical will be addressed in a qualitative fashion.
5 No promulgated value or published toxicity criteria are available. A similarly structured chemical with published toxicity criteria could not be identified. Exposure to this chemical will be addressed in a qualitative fashion.
6 Chemical is an essential nutrient.
7 Value for chlordane is used.
8 Value for hexavalent chromium is used for conservative purposes.
9 Value for endosulfan is used.

TABLE 2

CALCULATED AND SURROGATE CALCULATED VALUES
CTO 260 LOWER SUBASE RI
NEW LONDON, GROTON, CONNECTICUT

Chemical	Published Toxciological Criteria[1]		Calculated Remediation Standards[2]				
	RfD_{oral} (mg/kg/day)	CSF_{oral} (kg/day/mg)	Soil (mg/kg)				Groundwater (ug/L)
			RES DE[3]	I/C DE[3]	GA/GAA PM	GB PM	GA/GAA GP
Acenaphthene	6.00E-02	NA	1000[4]	2500[4]	8.4	84	420
Aldrin	3.00E-05	1.70E+01	0.036	0.34	0.000041	0.00041	0.0021
Benzo(g,h,i)perylene	NA	NA	1000[5]	2500[5]	4[5]	40[5]	200[5]
BCH (alpha-)	NA	6.30E+00	0.097	0.91	0.00011	0.0011	0.0056
BCH (beta-)	NA	1.80E+00	0.34	3.2	0.00039	0.0039	0.0194
BCH (delta-)	NA	NA	0.097[6]	0.91[6]	0.00011[6]	0.0011[6]	0.0056[6]
Bromochloromethane	NA	NA	9.9[7]	92[7]	0.011[7]	0.11[7]	0.56[7]
Bromodichloromethane	2.00E-02	6.20E-02	9.9	92	0.011	0.11	0.56
Bromomethane	1.40E-03	NA	95	1000[4]	0.2	2	9.8
4-Bromophenyl-phenylether	5.80E-02	NA	500[4]	1000[4]	8.2	82	410
Carbazole	NA	2.00E-02	31	290	0.036	0.36	1,8
Carbon disulfide	1.00E-01	NA	500[4]	1000[4]	14	140	700
4-Chloroaniline	4.00E-03	NA	270	2500[4]	0.56	5.6	28
Chloroethane	4.00E-01	2.90E-03	210	1000[4]	0.24	2.4	12
Chloromethane	NA	1.30E-02	47	440	0.054	0.54	2.7
4-Chloro-3-methylphenol	NA	NA	NA[8]	NA[8]	NA[8]	NA[8]	NA[8]
2-Chloronaphthalene	8.00E-02	NA	1000[4]	2500[4]	11	110	560
4-Chlorophenyl-phenylether	NA	NA	500[9]	1000[9]	8.2[9]	82[9]	410[9]
Chrysene	NA	7.30E-03	84	780	0.096	0.96	4.8
Cobalt	6.00E-02	NA	1000[4]	2500[4]	420[10]	4200[10]	420
4,4'-DDD	NA	2.40E-01	2.6	24	0.0029	0.029	0.15
4,4'-DDE	NA	3.40E-01	1.8	17	0.0021	0.021	0.1
4,4'-DDT	5.00E-04	3.40E-01	1.8	17	0.0021	0.021	0.1
Dibenzofuran	4.00E-03	NA	270	2500[4]	0.56	5.6	28
Dibenz(a,h)anthracene	NA	7.30E+00	0.084	0.78	0.000096	0.00096	0.0048
1,2-Dibromo-3-chloropropane	NA	1.40E+00	0.44	4.1	0.0005	0.005	0.025
1,2-Dibromoethane	NA	8.50E+01	0.0072	0.067	0.0000082	0.000082	0.00041
3,3'-Dichlorobenzidine	NA	4.50E-01	1.4	13	0.0016	0.016	0.078
1,2-Dichloroethene (total)	9.00E-03	NA	500[4]	1000[4]	1.2	12	63
Diethyl phthalate	8.00E-01	NA	1000[4]	2500[4]	110	1100	5600
2,4-Dimethylphenol	2.00E-02	NA	1000[4]	2500[4]	2,8	28	140
Dimethylphthalate	1.00E+01	NA	1000[4]	2500[4]	1400	14000	70000

TABLE 2

CALCULATED AND SURROGATE CALCULATED VALUES
CTO 260 LOWER SUBASE RI
NEW LONDON, GROTON, CONNECTICUT

Chemical	Published Toxciological Criteria[1]		Calculated Remediation Standards[2]				
	RfD_{oral} (mg/kg/day)	CSF_{oral} (kg/day/mg)	Soil (mg/kg)				Groundwater (ug/L)
			RES DE[3]	I/C DE[3]	GA/GAA PM	GB PM	GA/GAA GP
4,6-Dinitro-2-methylphenol	1.00E-04	NA	6.8	200	0.014	0.14	0.7
2,4-Dinitrophenol	2.00E-03	NA	140	2500[4]	0.28	2.8	14
2,4-Dinitrotoluene	2.00E-03	NA	140	2500[4]	0.28	2.8	14
2,6-Dinitrotoluene	1.00E-03	NA	68	2000	0.14	1.4	7
Endosulfan I	6.00E-03	NA	410	1200	0.84	8.4	42
Endosulfan II	6.00E-03	NA	410	1200	0.84	8.4	42
Endosulfan sulfate	NA	NA	410[12]	1200[12]	0.84[12]	8.4[12]	42[12]
Endrin aldehyde	NA	NA	20[13]	610[13]	NE[13]	NE[13]	NE[13]
Endrin ketone	NA	NA	20[13]	610[13]	NE[13]	NE[13]	NE[13]
Hexachlorobutadiene	2.00E-04	7.80E-02	7.9	73	0.009	0.09	0.45
Hexachlorocyclopentadiene	7.00E-03	NA	470	2500[4]	0.98	9.8	49
2-Hexanone	4.00E-02	NA	500[4]	1000[4]	5.6	56	280
Indeno(1,2,3-cd)pyrene	NA	7.30E-01	0.84	7.8	0.00096	0.0096	0.045
Isophorone	2.00E-01	9.50E-04	640	2500[4]	0.74	7.4	37
Manganese	2.30E-02	NA	1600	47000	50[10][14]	500[10][14]	160
2-Methylnaphthalene	4.00E-02	NA	1000[4]	2500[4]	5.6	56	280
2-Methylphenol	5.00E-02	NA	1000[4]	2500[4]	7	70	350
4-Methylphenol	5.00E-03	NA	340	2500[4]	0.7	7	35
2-Nitroaniline	6.00E-05	NA	4.1	1200	0.0084	0.084	0.42
3-Nitroaniline	3.00E-03	NA	200	2500[4]	0.42	4.2	21
4-Nitroaniline	3.00E-03	NA	200	2500[4]	0.42	4.2	21
Nitrobenzene	5.00E-04	NA	34	1000	0.07	0.7	3.5
2-Nitrophenol	NA	NA	540[15]	2500[15]	1.1[15]	11[15]	56[15]
4-Nitrophenol	8.00E-03	NA	540	2500[4]	1.1	11	56
N-Nitrosodiphenylamine	NA	4.90E-03	130	1200	0.14	1.4	7.1
N-Nitrosodi-n-propylamine	NA	7.00E+00	0.088	0.82	0.0001	0.001	0.005
1,2,4-Trichlorobenzene	1.00E-02	NA	680	2500[4]	1.4	14	70
2,4,5-Trichlorophenol	1.00E-01	NA	1000[4]	2500[4]	14	140	700
2,4,6-Trichlorophenol	NA	1.10E-02	56	520	0.064	0.64	3.2

RfD Reference dose
CSF Cancer slope factor

TABLE 2

CALCULATED AND SURROGATE CALCULATED VALUES
CTO 260 LOWER SUBASE RI
NEW LONDON, GROTON, CONNECTICUT

RES DE	Direct exposure criteria for residential land use
I/C DE	Direct exposure criteria for industrial/commercial land use.
GA/GAA PM	Pollutant mobility criteria for a GA/GAA classified area
GB PM	Pollutant mobility criteria for a GB classified area
GA/GAA GP	Groundwater protection criteria for a GA/GAA classified area
NA	Not available
NE	None established by Connecticut DEP (January 1996)

1 Values obtained from current USEPA Region III Risk-Based Concentration Table (October 22, 1997)
2 Calculated using methodologies presented in State guidance (January 1996).
3 Calculated value for direct exposure for volatile and semivolatile organics is replaced with the appropriate ceiling limit if the calculated value exceeds the ceiling limit. Ceiling limit for volatiles is 500 mg/kg for residential exposure and 1000 mg/kg for industrial/commercial exposure. Ceiling limit for semivolatiles is 1000 mg/kg for residential exposure and 2500 mg/kg for industrial/commercial exposure.
4 Ceiling limit. Calculated value exceeds the ceiling limit.
5 Value for pyrene is used.
6 Value for alpha-BHC is used.
7 Value for bromodichloromethane is used.
8 Chemical will be addressed qualitatively at CTEP's request
9 Value for 4-bromophenyl-phenylether is used.
10 Value is for aqueous units (ug/L) and is based on SPLP or TCLP analytical results.
11 Value is based on the Region III RBC for tap water (2200 ug/L).
12 Value for endosulfan is used.
13 Value for endrin is used.
14 Value is based on the secondary Federal MCL for drinking water (50 ug/L).
15 Value for 4-nitrophenol is used.

TETRA TECH NUS, INC.
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PITT-04-9-102

April 14, 1999

Tetra Tech NUS Project Number 7856

Ms. Elsie Patton
Connecticut Department of Environmental Protection
Bureau of Water Management
Permitting, Enforcement, and Remediation Division
Federal Remediation Program
79 Elm Street
Hartford, Connecticut 06106-5127

Reference: CLEAN Contract No. N62472-90-D-1298
Contract Task Order No. 0312

Subject: March 16, 1999 CTDEP Comment Letter Regarding
Calculated Additional Remediation Criteria
EDSR for the Basewide Groundwater OU Remedial Investigation
Naval Submarine Base - New London, Groton, Connecticut

Dear Ms. Patton:

Tetra Tech NUS, Inc. (TtNUS), acting on the behalf of the United States Department of the Navy (i.e., Northern Division Naval Facilities Engineering Command and Naval Submarine Base - New London), reviewed the technical comments included in your March 16, 1999 letter and prepared formal responses to address the comments. In addition, Tables B-1 and B-2, which were included in the December 8, 1998 TtNUS letter, were updated to address the comments received from the CTDEP. The responses and tables are attached.

The attached responses and tables should provide the CTDEP with sufficient information to complete the review and approval process of the alternative criteria. Two additional copies of the letter and attachments are enclosed so that you can forward them to the appropriate people at the Connecticut Department of Health.

In order to minimize schedule impacts to this project, the Navy intends to finalize the Existing Data Summary Report for the Basewide Groundwater OU Remedial Investigation (RI) prior to receiving final acceptance of the alternative criteria from the CTDEP. The Navy will address any inconsistencies that could result from this approach during preparation of the Work Plan/Sampling and Analysis Plan for the Basewide Groundwater OU RI.

If you have any questions regarding the information provided in this letter or the attachments please contact Mr. Mark Evans of NORTHDIV at (610) 595-0567 (ext. 162) or me at (412) 921-8244.

Very truly yours,

Corey A. Rich, P.E.
Project Manager

Attachment(s)

c: Mr. Mark Lewis, CTDEP
Mr. Mark Evans, NORTHDIV
Mr. Richard Conant, NSB-NLON Environmental
File: CTO 0312

RESPONSES TO CTDEP'S MARCH 16, 1999 LETTER OF COMMENTS REGARDING ADDITIONAL REMEDIATION CRITERIA BASEWIDE GROUNDWATER OU REMEDIAL INVESTIGATION NAVAL SUBMARINE BASE – NEW LONDON, GROTON, CONNECTICUT

April 14, 1999

Comment No. 1

Additional detailed information needs to be submitted regarding toxicity values used to develop criteria for dioxins and furans (i.e., tox values for TCDD and TEF used). While the submission is not detailed enough for a full review, it appears that the Table B-1 values for dioxins/furans are based upon a misapplication of TEFs.

Response to Comment No. 1

A single dioxin and three furans were positively detected in site soil samples. Toxicity criteria for these four analytes were not available. Therefore, toxicity criteria from the USEPA Region III Risk-Based Concentration Table (April 1, 1998) were used to calculate a groundwater protection standard (2.33E-07 ug/L) and a corresponding remediation standard for GB pollutant mobility (4.67E-08 mg/kg) for 2,3,7,8-TCDD using the methodology presented in the CTDEP guidance (CTDEP 1996). A remediation standard was then calculated for each of the positively detected dioxin/furans by dividing the value calculated for 2,3,7,8-TCDD with the associated toxicity equivalency factor (TEF) as shown in the following table.

Analyte	Calculated Remediation Standard for 2,3,7,8-TCDD (mg/kg)	TEF	Calculated Remediation Standard (mg/kg)
1,2,3,4,6,7,8-HPCDF	4.67E-8	0.01	4.67E-6
1,2,3,4,7,8-HXCDF	4.67E-8	0.1	4.67E-7
1,2,3,6,7,8-HXCDF	4.67E-8	0.1	4.67E-7
OCDD	4.67E-8	0.001	4.67E-5

Tetra Tech NUS, Inc. (TtNUS) understands that this application of TEFs varies somewhat from the typical use of TEFs in quantitative human health risk assessments. However, this application was deemed to be appropriate for the purposes of the screening level assessment provided in the Existing Data Summary Report. When performing a quantitative human health risk assessment, TtNUS uses TEFs in conjunction with sample results to convert the concentrations of any detected dioxin/furan congeners into equivalent concentrations of 2,3,7,8-TCDD. The total 2,3,7,8-TCDD equivalent of the dioxins and furans present in each sample is determined by summing the equivalent concentrations of each congener. The total 2,3,7,8-TCDD equivalent concentrations are then used for comparison with 2,3,7,8-TCDD remediation standards during data evaluation and risk assessment.

Comment No. 2

The groundwater protection criteria used to develop the pollutant mobility criteria listed on Table B-1 need to be provided in all cases.

Response to Comment No. 2

The groundwater protection criteria used to develop pollutant mobility criteria have been added to Table B-1. The revised table is attached.

Comment No. 3

Detection limits for each constituent need to be submitted. Remediation criteria may be based on detection limits as is appropriate. Provide additional information from certified labs regarding detection limits in cases where the proposed criteria are based on detection limits are based on detection limits such as dibenzo(a,h)anthracene and indeno(1,2,3-cd)pyrene.

Response to Comment No. 3

The criteria initially proposed for dibenzo(a,h)anthracene and indeno(1,2,3-cd)pyrene in Tables B-1 and B-2 of the December 8, 1998 letter were based upon typical reporting limits using SW-846 Method 8270 (i.e., a GC/MS method) because GC/MS methods were primarily used for analysis of samples previously collected at NSB-NLON. The following tables present reporting limits for soil and aqueous samples, respectively, for dibenzo(a,h)anthracene and indeno(1,2,3-cd)pyrene obtained from three laboratories certified by the state of Connecticut (i.e., Accutest Laboratories, Katahdin Analytical Services, and Ceimic Corporation). Laboratory reporting limits are presented for SW-846 Method 8310 (i.e., an HPLC method) as well as SW-846 Method 8270. The remediation standards calculated using the methodology presented in the CTDEP guidance (CTDEP 1996) are also presented for comparison with laboratory reporting limits.

Analyte	Calculated GB Pollutant Mobility (mg/kg)	Reporting Limits – Soil Samples (mg/kg)					
		Accutest Laboratories		Katahdin Analytical		Ceimic Corporation	
		SW-846 8270	SW-846 8310	SW-846 8270	SW-846 8310	SW-846 8270	SW-846 8310
D(ah)A	0.00096	0.33	0.005	0.33	0.013	0.33	0.003
I(cd)P	0.0096	0.33	0.005	0.33	0.007	0.33	0.002

D(ah)A = Dibenzo(a,h)anthracene
I(cd)P = Indeno(1,2,3-cd)pyrene

Analyte	Calculated Groundwater Protection Std. (ug/L)	Reporting Limits – Aqueous Samples (ug/L)					
		Accutest Laboratories		Katahdin Analytical		Ceimic Corporation	
		SW-846 8270	SW-846 8310	SW-846 8270	SW-846 8310	SW-846 8270	SW-846 8310
D(ah)A	0.0048	10	0.2	10	0.4	10	0.1
I(cd)P	0.048	10	0.2	10	0.2	10	0.05

D(ah)A = Dibenzo(a,h)anthracene
I(cd)P = Indeno(1,2,3-cd)pyrene

Although GC/MS methods (e.g., SW-846 8270) were primarily used for the analysis of historical samples, TtNUS proposes revising the remediation criteria for dibenzo(a,h)anthracene and indeno(1,2,3-cd)pyrene based upon typical reporting limits for the more sensitive HPLC method (i.e., SW-846 8310). The proposed criteria are presented in the following table. Tables B-1 and B-2 have been revised accordingly and are attached.

Analyte	GB Pollutant Mobility (mg/kg)	Groundwater Protection Standard (ug/L)
Dibenzo(a,h)anthracene	0.005	0.2
Indeno(1,2,3-cd)pyrene	0.005	0.2

TABLE B-1

PUBLISHED AND CALCULATED REMEDIATION STANDARDS - SOLID MEDIA
CTO-312, NSB-NLON, GROTON, CONNECTICUT

Analyte	CAS Number	Published Toxicological Criteria[1]		Groundwater Protection Standard[14] (ug/L)	CTDEP Remediation Standard GB Pollutant Mobility[2] (mg/kg)
		RFD_{oral} (mg/kg/day)	CSF_{oral} (kg/day/mg)		
VOLATILE ORGANICS					
1,1,1-Trichloroethane	71556	2.00E-02	-	--	40
1,1,2,2-Tetrachloroethane	79345	-	2.00E-01	--	0.1
1,1,2-Trichloroethane	79005	4.00E-03	5.70E-02	--	1
1,1-Dichloroethene	75354	9.00E-03	6.00E-01	--	1.4
1,2-Dichloroethene (Total)	540590	9.00E-03	-	63	12[3]
2-Butanone	78933	6.00E-01	-	--	80
4-Methyl-2-pentanone	108101	8.00E-02	-	--	14
Acetone	67641	1.00E-01	-	--	140
Benzene	71432	3.00E-03	2.90E-02	--	0.2
Bromodichloromethane	75274	2.00E-02	6.20E-02	0.56	0.11[3]
Bromomethane	74839	1.40E-03	-	9.8	2[3]
Carbon Disulfide	75150	1.00E-01	-	700	140[3]
Chlorobenzene	108907	2.00E-02	-	--	20
Chloroform	67663	1.00E-02	6.10E-03	--	1.2
Chloromethane	74873	-	1.30E-02	2.7	0.54[3]
cis-1,3-Dichloropropene	10061015	3.00E-04[4]	1.80E-01[4]	--	0.1
Ethylbenzene	100414	1.00E-01	-	--	10.1
Methylene Chloride	75092	6.00E-02	7.50E-03	--	1
Styrene	100425	2.00E-01	-	--	20
Tetrachloroethene	127184	1.00E-02	5.20E-02	--	1
Toluene	108883	2.00E-01	-	--	67
trans-1,3-Dichloropropene	10061026	3.00E-04[4]	1.80E-01[4]	--	0.1
Trichloroethene	79016	6.00E-03	1.10E-02	--	1
Vinyl Acetate	108054	1.00E+00	-	7000	1400[3]
Xylenes, Total	1330207	2.00E+00	-	--	19.5
SEMIVOLATILE ORGANICS					
1,4-Dichlorobenzene	106467	3.00E-02	2.40E-02	--	15
2,4-Dimethylphenol	105679	2.00E-02	-	140	28[3]
2-Methylnaphthalene	91576	4.00E-02	-	280	56[3]
2-Methylphenol	95487	5.00E-02	-	350	70[3]
3,3'-Dichlorobenzidine	91941	-	4.50E-01	0.078	0.016[3]
4-Chloro-3-methylphenol	59507	-	-	--	-
4-Methylphenol	106445	5.00E-03	-	35	7[3]
Acenaphthene	83329	6.00E-02	-	420	84[3]
Acenaphthylene	208968	-	-	--	84
Anthracene	120127	3.00E-01	-	--	400
Benzo(a)anthracene	56553	-	7.30E-01	--	1
Benzo(a)pyrene	50328	-	7.30E+00	--	1
Benzo(b)fluoranthene	205992	-	7.30E-01	--	1
Benzo(g,h,i)perylene	191242	-	-	--	40[5]
Benzo(k)fluoranthene	207089	-	7.30E-02	--	1
Benzoic Acid	65850	4.00E+00	-	28000	5600[3]
Bis(2-Ethylhexyl)phthalate	117817	2.00E-02	1.40E-02	--	11
Butylbenzyl Phthalate	85687	2.00E-01	-	--	200

TABLE B-1

PUBLISHED AND CALCULATED REMEDIATION STANDARDS - SOLID MEDIA
CTO-312, NSB-NLON, GROTON, CONNECTICUT

Analyte	CAS Number	Published Toxicological Criteria[1]		Groundwater Protection Standard[14] (ug/L)	CTDEP Remediation Standard GB Pollutant Mobility[2] (mg/kg)
		RFD_{oral} (mg/kg/day)	CSF_{oral} (kg/day/mg)		
Carbazole	86748	-	2.00E-02	1.8	0.36[3]
Chrysene	218019	-	7.30E-03	4.8	0.96[3]
Dibenzo(a,h)anthracene	53703	-	7.30E+00	--	0.005[6]
Dibenzofuran	132649	4.00E-03	-	28	5.6[3]
Diethyl Phthalate	84662	8.00E-01	-	5600	1100[3]
Dimethyl Phthalate	131113	1.00E+01	-	70000	14,000[3]
Di-n-butyl phthalate	84742	1.00E-01	-	--	140
Di-n-octyl phthalate	117840	2.00E-02	-	--	20
Fluoranthene	206440	4.00E-02	-	--	56
Fluorene	86737	4.00E-02	-	--	56
Indeno(1,2,3-cd)pyrene	193395	-	7.30E-01	--	0.005[6]
Isophorone	78591	2.00E-01	9.50E-04	36.8	7.37[3]
Naphthalene	91203	4.00E-02	-	--	56
Pentachlorophenol	87865	3.00E-02	1.20E-01	--	1
Phenanthrene	85018	-	-	--	40
Phenol	108952	6.00E-01	-	--	800
Pyrene	129000	3.00E-02	-	--	40
PESTICIDES/PCBs					
4,4'-DDD	72548	-	2.40E-01	0.146	0.029[3]
4,4'-DDE	72559	-	3.40E-01	0.103	0.021[3]
4,4'-DDT	50293	5.00E-04	3.40E-01	0.103	0.021[3]
Aldrin	309002	3.00E-05	1.70E+01	0.00206	0.00041[3]
alpha-BHC	319846	-	6.30E+00	0.00556	0.0011[3]
Alpha-Chlordane	5103719	5.00E-04[7]	3.50E-01[7]	--	0.066[7]
Aroclor-1242	53469219	-	2.00E+00	--	-
Aroclor-1248	12672296	-	2.00E+00	--	-
Aroclor-1254	11097691	2.00E-05	2.00E+00	--	-
Aroclor-1260	11096825	-	2.00E+00	--	-
beta-BHC	319857	-	1.80E+00	0.0194	0.0039[3]
delta-BHC	319868	-	-	0.00556[8]	0.0011[8]
Dieldrin	60571	5.00E-05	1.60E+01	--	0.007
Endosulfan I	959988	6.00E-03[9]	-	42[9]	8.4[9]
Endosulfan II	33213659	6.00E-03[9]	-	42[9]	8.4[9]
Endosulfan Sulfate	1031078	6.00E-03[9]	-	42[9]	8.4[9]
Endrin	72208	3.00E-04	-	2.1	0.42[3]
Endrin Aldehyde	7421934	3.00E-04[10]	-	2.1[11]	0.42[11]
Endrin Ketone	53494705	3.00E-04[10]	-	2.1[11]	0.42[11]
gamma-BHC (Lindane)	58899	3.00E-04	1.30E+00	--	0.04
Gamma-Chlordane	5103742	5.00E-04[7]	3.50E-01[7]	--	0.066[7]
Heptachlor	76448	5.00E-04	4.50E+00	--	0.013
Heptachlor Epoxide	1024573	1.30E-05	9.10E+00	--	0.02
Methoxychlor	72435	5.00E-03	-	--	8
DIOXINS/FURANS					
1,2,3,4,6,7,8-HPCDF	67562394	-	-	--	4.67E-06[12]

TABLE B-1

PUBLISHED AND CALCULATED REMEDIATION STANDARDS - SOLID MEDIA
CTO-312, NSB-NLON, GROTON, CONNECTICUT

Analyte	CAS Number	Published Toxicological Criteria[1]		Groundwater Protection Standard[14] (ug/L)	CTDEP Remediation Standard GB Pollutant Mobility[2] (mg/kg)
		RFD_{oral} (mg/kg/day)	CSF_{oral} (kg/day/mg)		
1,2,3,4,7,8-HXCDF	70648269	-	-	--	4.67E-07[12]
1,2,3,6,7,8-HXCDF	57117449	-	-	--	4.67E-07[12]
OCDD	3268879	-	-	--	4.67E-05[12]
INORGANICS					
Aluminum	7429905	1.00E+00	-	--	-
Antimony	7440360	4.00E-04	-	--	-
Arsenic	7440382	3.00E-04	1.50E+00	--	-
Barium	7440393	7.00E-02	-	--	-
Beryllium	7440417	2.00E-03	-	--	-
Boron	7440428	9.00E-02	-	--	-
Cadmium	7440439	5.00E-04	-	--	-
Calcium	7440702	-	-	--	-
Chromium	7440473	5.00E-3[13]	-	--	-
Cobalt	7440484	6.00E-02	-	--	-
Copper	7440508	4.00E-02	-	--	-
Cyanide	57125	2.00E-02	-	--	-
Iron	7439896	3.00E-01	-	--	-
Lead	7439921	-	-	--	-
Magnesium	7439954	-	-	--	-
Manganese	7439965	2.00E-02	-	--	-
Mercury	7439976	-	-	--	-
Nickel	7440020	2.00E-02	-	--	-
Potassium	7440097	-	-	--	-
Selenium	7782492	5.00E-03	-	--	-
Silver	7440224	5.00E-03	-	--	-
Sodium	7440235	-	-	--	-
Thallium	7440280	7.00E-05	-	--	-
Vanadium	7440622	7.00E-03	-	--	-
Zinc	7440666	3.00E-01	-	--	-
TOTAL PETROLEUM HYDROCARBONS					
TPH	-	-	-	--	2500

1 Values obtained from USEPA Region III Risk-Based Concentration Table (April 1, 1998).
2 Unless otherwise noted, value obtained from State of Connecticut Remediation Standard Regulations, Section 22a-133k (January 1996).
3 CTDEP remediation standard not available. Using the methodology presented in the CTDEP guidance (CTDEP 1996) and the toxicity criteria from the USEPA Region III Risk-Based Concentration Table (April 1, 1998), the groundwater protection criterion shown in the previous column is calculated and is then used to calculate a value for GB pollutant mobility.
4 Value for 1,3-dicholoropropene is used.
5 Toxicity criteria not available. Published value for pyrene is used.
6 Calculated value less than reliably achievable detection limits. Reliable and accurately achievable detection limit is used.
7 Published value for chlordane is used.
8 Toxicity criteria not available. Toxicity criteria for alpha-BHC is used to calculate a value.
9 Calculated value for endosulfan is used.
10 Value for endrin is used.
11 Calculated value for endrin is used.

TABLE B-1

PUBLISHED AND CALCULATED REMEDIATION STANDARDS - SOLID MEDIA
CTO-312, NSB-NLON, GROTON, CONNECTICUT

12 Toxicity criteria not available. Toxicity criteria for 2,3,7,8-TCDD in conjunction with toxicity equivalent factor (TEF) (EPA/625/ 3-89/016, March 1989) is used to calculate a value.

13 Value for hexavalent chromium is used.

14 Calculated groundwater protection standard used to determine CTDEP remediation standard for GB pollutant mobility. Groundwater protection standards are not directly applicable to solid sample results. They are provided in this table for specific analytes only when used for the calculation of a remediation standard for GB pollutant mobility.

\- Not available.

– Groundwater protection standard not provided in this table for this analyte because there is no need to calculate a remediation standard for GB pollutant mobility.

TABLE B-2

PUBLISHED AND CALCULATED REMEDIATION STANDARDS - AQUEOUS MEDIA
CTO-312, NSB-NLON, GROTON, CONNECTICUT

Analyte	CAS Number	Published Toxicological Criteria[1]		State Remediation Standards[2]	
		RFD_{oral} (mg/kg/day)	CSF_{oral} (kg/day/mg)	Groundwater Protection (ug/L)	Surface Water Protection (ug/L)
VOLATILE ORGANICS					
1,1,1-Trichloroethane	71556	2.00E-02	-	200	62,000
1,1,2,2-Tetrachloroethane	79345	-	2.00E-01	0.5	110
1,1,2-Trichloroethane	79005	4.00E-03	5.70E-02	5	1260
1,1-Dichloroethane	75343	1.00E-01	-	70	-
1,1-Dichloroethene	75354	9.00E-03	6.00E-01	7	96
1,2-Dichloroethane	107062	3.00E-02	9.10E-02	1	2970
1,2-Dichloroethene (Total)	540590	9.00E-03	-	63[3]	14,000[4,5]
2-Butanone	78933	6.00E-01	-	400	-
2-Hexanone	73663715	4.00E-02	-	280[3]	-
4-Methyl-2-pentanone	108101	8.00E-02	-	350	-
Acetone	67641	1.00E-01	-	700	-
Benzene	71432	3.00E-03	2.90E-02	1	710
Bromodichloromethane	75274	2.00E-02	6.20E-02	0.56[3]	660[4]
Bromomethane	74839	1.40E-03	-	9.8[3]	80,000[4]
Carbon Disulfide	75150	1.00E-01	-	700[3]	-
Chlorobenzene	108907	2.00E-02	-	100	420,000
Chloroform	67663	1.00E-02	6.10E-03	6	14,100
Chloromethane	74873	-	1.30E-02	2.7[3]	9400[4]
Ethylbenzene	100414	1.00E-01	-	700	580,000
Methyl Tert-Butyl Ether	1634044	5.00E-03	-	100	-
Methylene Chloride	75092	6.00E-02	7.50E-03	5	48,000
Tetrachloroethene	127184	1.00E-02	5.20E-02	5	88
Toluene	108883	2.00E-01	-	1000	4,000,000
Trichloroethene	79016	6.00E-03	1.10E-02	5	2340
Vinyl Chloride	75014	-	1.90E+00	2	15,750
Xylenes, Total	1330207	2.00E+00	-	530	-
SEMIVOLATILE ORGANICS					
1,2,4-Trichlorobenzene	120821	1.00E-02	-	70[3]	-
1,2-Dichlorobenzene	95501	9.00E-02	-	600	170,000
1,3-Dichlorobenzene	541731	3.00E-02	-	210[3]	26,000
1,4-Dichlorobenzene	106467	3.00E-02	2.40E-02	75	26,000
2,4-Dichlorophenol	120832	3.00E-03	-	20	15,800
2,4-Dimethylphenol	105679	2.00E-02	-	140[3]	-
2,4-Dinitrotoluene	121142	2.00E-03	-	14[3]	270[4]
2,6-Dinitrotoluene	606202	1.00E-03	-	7[3]	-
2-Chlorophenol	95578	5.00E-03	-	36	46,000[4]
2-Methylnaphthalene	91576	4.00E-02	-	280[3]	-
2-Methylphenol	95487	5.00E-02	-	350[3]	-
4-Methylphenol	106445	5.00E-03	-	35[3]	-
Acenaphthene	83329	6.00E-02	-	420[3]	27,000[4]
Acenaphthylene	208968	-	-	420	0.3
Anthracene	120127	3.00E-01	-	2000	1,100,000
Benzo(a)anthracene	56553	-	7.30E-01	0.06	0.3

TABLE B-2

PUBLISHED AND CALCULATED REMEDIATION STANDARDS - AQUEOUS MEDIA
CTO-312, NSB-NLON, GROTON, CONNECTICUT

Analyte	CAS Number	Published Toxicological Criteria[1]		State Remediation Standards[2]	
		RFD_{oral} (mg/kg/day)	CSF_{oral} (kg/day/mg)	Groundwater Protection (ug/L)	Surface Water Protection (ug/L)
Benzo(a)pyrene	50328	-	7.30E+00	0.2	0.3
Benzo(b)fluoranthene	205992	-	7.30E-01	0.08	0.3
Benzo(g,h,i)perylene	191242	-	-	200[3,6]	0.3[4,6]
Benzo(k)fluoranthene	207089	-	7.30E-02	0.5	0.3
Benzoic Acid	65850	4.00E+00	-	28,000[3]	-
Bis(2-Ethylhexyl)phthalate	117817	2.00E-02	1.40E-02	2	59
Butylbenzyl Phthalate	85687	2.00E-01	-	1000	52,000[4]
Carbazole	86748	-	2.00E-02	1.8[3]	29[4]
Chrysene	218019	-	7.30E-03	4.8[3]	0.3[4]
Dibenzo(a,h)anthracene	53703	-	7.30E+00	0.2[7]	0.3[4]
Dibenzofuran	132649	4.00E-03	-	28[3]	-
Diethyl Phthalate	84662	8.00E-01	-	5600[3]	2,400,000[4]
Dimethyl Phthalate	131113	1.00E+01	-	70,000[3]	58,000,000[4]
Di-n-butyl phthalate	84742	1.00E-01	-	700	120,000
Di-n-octyl phthalate	117840	2.00E-02	-	100	-
Fluoranthene	206440	4.00E-02	-	280	3700
Fluorene	86737	4.00E-02	-	280	140,000
Indeno(1,2,3-cd)pyrene	193395	-	7.30E-01	0.2[7]	0.3[4]
Naphthalene	91203	4.00E-02	-	280	-
N-Nitrosodiphenylamine	86306	-	4.90E-03	7.1[3]	480[4]
Phenanthrene	85018	-	-	200	0.3
Phenol	108952	6.00E-01	-	4000	92,000,000
Pyrene	129000	3.00E-02	-	200	110,000
PESTICIDES/PCBs					
Aroclor-1016	12674112	7.00E-05	7.00E-02	0.5[8]	0.5
Aroclor-1254	11097691	2.00E-05	2.00E+00	0.5[8]	0.5
Aroclor-1260	11096825	-	2.00E+00	0.5[8]	0.5
Heptachlor	76448	5.00E-04	4.50E+00	0.4	0.05
INORGANICS					
Aluminum	7429905	1.00E+00	-	-	-
Antimony	7440360	4.00E-04	-	6	86,000
Arsenic	7440382	3.00E-04	1.50E+00	50	4
Barium	7440393	7.00E-02	-	1000	-
Beryllium	7440417	2.00E-03	-	4	4
Boron	7440428	9.00E-02	-	630[3]	-
Cadmium	7440439	5.00E-04	-	5	6
Calcium	7440702	-	-	-	-
Chromium (Total)	7440473	5.00E-03[9]	-	50	110[9]
Cobalt	7440484	6.00E-02	-	420[3]	-
Copper	7440508	4.00E-02	-	1300	48
Cyanide	57125	2.00E-02	-	200	52
Iron	7439896	3.00E-01	-	-	-
Lead	7439921	-	-	15	13
Magnesium	7439954	-	-	-	-

TABLE B-2

PUBLISHED AND CALCULATED REMEDIATION STANDARDS - AQUEOUS MEDIA
CTO-312, NSB-NLON, GROTON, CONNECTICUT

Analyte	CAS Number	Published Toxicological Criteria[1]		State Remediation Standards[2]	
		RFD_{oral} (mg/kg/day)	CSF_{oral} (kg/day/mg)	Groundwater Protection (ug/L)	Surface Water Protection (ug/L)
Manganese	7439965	2.00E-02	-	50[3]	-
Mercury	7439976	-	-	2	0.4
Nickel	7440020	2.00E-02	-	100	880
Potassium	7440097	-	-	-	-
Selenium	7782492	5.00E-03	-	50	50
Silver	7440224	5.00E-03	-	36	12
Sodium	7440235	-	-	-	-
Thallium	7440280	7.00E-05	-	5	63
Vanadium	7440622	7.00E-03	-	50	-
Zinc	7440666	3.00E-01	-	5000	123
TOTAL PETROLEUM HYDROCARBONS					
Diesel Range Organics	-	-	-	-	-
Gasoline Range Organics	-	-	-	-	-
Oil & Grease	-	-	-	-	-
TPH	-	-	-	500	-
MISCELLANEOUS PARAMETERS					
Ammonia, as Nitrogen	7664417	-	-	-	-
Biochemical Oxygen Demand	-	-	-	-	-
Chemical Oxygen Demand	-	-	-	-	-
Hardness as CaCO3	-	-	-	-	-
Total Organic Carbon	-	-	-	-	-
Total Phosphorus	-	-	-	-	-
Total Suspended Solids	-	-	-	-	-

1 Values obtained from USEPA Region III Risk-Based Concentration Table (April 1, 1998).
2 Unless otherwise noted, value obtained from State of Connecticut Remediation Standard Regulations, Section 22a-133k (January 1996).
3 CTDEP remediation standard not available. Value calculated using methodologies presented in State guidance (January 1996).
4 CTDEP remediation standard not available. Value calculated using lower of human health or freshwater aquifer criteria and dilution factors based on methodologies presented in CTDEP guidance (January 1996).
5 Value used is for trans-1,2-dichloroethene.
6 Calculated value used is for pyrene.
7 Calculated value is less than reliably achievable detection limit. Reliably and accurately achievable detection limit is used.
8 Value used is for polychlorinated biphenyls (PCBs).
9 Hexavalent chromium.
- Not available.

APPENDIX C.1.3

USEPA GENERIC SOIL SCREENING LEVELS (SSLs)
TRANSFERS FROM SOIL TO AIR (INHALATION)
MIGRATION TO GROUNDWATER

United States
Environmental Protection
Agency

Office of Solid Waste and
Emergency Response
Washington, DC 20460

EPA/540/R95/128
May 1996

Superfund

Soil Screening Guidance: Technical Background Document

Second Edition

APPENDIX A

Generic SSLs

APPENDIX A

Generic SSLs

Table A-1 provides generic SSLs for 110 chemicals. Generic SSLs are derived using default values in the standardized equations presented in Part 2 of this document. The default values (listed in Table A-2) are conservative and are likely to be protective for the majority of site conditions across the nation.

However, the generic SSLs are not necessarily protective of all known human exposure pathways, reasonable land uses, or ecological threats. Thus, before applying generic SSLs at a site, it is extremely important to compare the conceptual site model (see the *User's Guide)* with the assumptions behind the SSLs to ensure that the site conditions and exposure pathways match those used to develop generic SSLs (see Parts 1 and 2 and Table A-2). If this comparison indicates that the site is more complex than the SSL scenario, or that there are significant exposure pathways **not** accounted for by the SSLs, then generic SSLs are not sufficient for a full evaluation of the site. A more detailed site-specific approach will be necessary to evaluate the additional pathways or site conditions.

Generic SSLs are presented separately for major pathways of concern in both surface and subsurface soils. The first column to the right of the chemical name presents levels based on direct ingestion of soil and the second column presents levels based on inhalation. As discussed in the *User's Guide*, the fugitive dust pathway may be of concern for certain metals but does not appear to be of concern for organic compounds. Therefore, SSLs for the fugitive dust pathway are only presented for inorganic compounds. Except for mercury, no SSLs for the inhalation of volatiles pathway are provided for inorganic compounds because these chemicals are not volatile.

The user should note that several of the generic SSLs for the inhalation of volatiles pathway are determined by the soil saturation concentration (C_{sat}), which is used to address and screen the potential presence of nonaqueous phase liquids (NAPLs). As explained in Section 2.4.4, for compounds that are liquid at ambient soil temperature, concentrations above C_{sat} indicate a potential for free-phase liquid contamination to be present and the need for additional investigation.

The third column presents generic SSL values for the migration to ground water pathway developed using a default DAF (dilution-attenuation factor) of 20 to account for natural processes that reduce contaminant concentrations in the subsurface (see Section 2.5.6). SSLs in Table A-1 are rounded to two significant figures except for values less than 10, which are rounded to one significant figure. Note that the 20 DAF values in Table A-1 are not exactly 20 times the 1 DAF values because each SSL is calculated independently in both the 20 DAF and 1 DAF columns, with the final value presented according to the aforementioned rounding conventions.

The fourth column contains the generic SSLs for the migration to ground water pathway developed assuming no dilution or attenuation between the source and the receptor well (i.e., a DAF of 1). These values can be used at sites where little or no dilution or attenuation of soil leachate concentrations is expected at a site (e.g., sites with shallow water tables, fractured media, karst topography, or source size greater than 30 acres).

Generally, if an SSL is not exceeded for a pathway of concern, the user may eliminate the pathway or areas of the site from further investigation. If more than one exposure pathway is of concern, the lowest SSL should be used.

Table A-1. Generic SSLs [a]

Organics				Migration to ground water	
CAS No.	Compound	Ingestion (mg/kg)	Inhalation volatiles (mg/kg)	20 DAF (mg/kg)	1 DAF (mg/kg)
83-32-9	Acenaphthene	4,700 [b]	--- [c]	570 [b]	29 [b]
67-64-1	Acetone	7,800 [b]	1.0E+05 [d]	16 [b]	0.8 [b]
309-00-2	Aldrin	0.04 [e]	3 [e]	0.5 [e]	0.02 [e]
120-12-7	Anthracene	23,000 [b]	--- [c]	12,000 [b]	590 [b]
56-55-3	Benz(*a*)anthracene	0.9 [e]	--- [c]	2 [e]	0.08 [e,f]
71-43-2	Benzene	22 [e]	0.8 [e]	0.03	0.002 [f]
205-99-2	Benzo(*b*)fluoranthene	0.9 [e]	--- [c]	5 [e]	0.2 [e,f]
207-08-9	Benzo(*k*)fluoranthene	9 [e]	--- [c]	49 [e]	2 [e]
65-85-0	Benzoic acid	3.1E+05 [b]	--- [c]	400 [b,i]	20 [b,i]
50-32-8	Benzo(*a*)pyrene	0.09 [e,f]	--- [c]	8	0.4
111-44-4	Bis(2-chloroethyl)ether	0.6 [e]	0.2 [e,f]	0.0004 [e,f]	2E-05 [e,f]
117-81-7	Bis(2-ethylhexyl)phthalate	46 [e]	31,000 [d]	3,600	180
75-27-4	Bromodichloromethane	10 [e]	3,000 [d]	0.6	0.03
75-25-2	Bromoform	81 [e]	53 [e]	0.8	0.04
71-36-3	Butanol	7,800 [b]	10,000 [d]	17 [b]	0.9 [b]
85-68-7	Butyl benzyl phthalate	16,000 [b]	930 [d]	930 [d]	810 [b]
86-74-8	Carbazole	32 [e]	--- [c]	0.6 [e]	0.03 [e,f]
75-15-0	Carbon disulfide	7,800 [b]	720 [d]	32 [b]	2 [b]
56-23-5	Carbon tetrachloride	5 [e]	0.3 [e]	0.07	0.003 [f]
57-74-9	Chlordane	0.5 [e]	20 [e]	10	0.5
106-47-8	*p*-Chloroaniline	310 [b]	--- [c]	0.7 [b]	0.03 [b,f]
108-90-7	Chlorobenzene	1,600 [b]	130 [b]	1	0.07
124-48-1	Chlorodibromomethane	8 [e]	1,300 [d]	0.4	0.02
67-66-3	Chloroform	100 [e]	0.3 [e]	0.6	0.03
95-57-8	2-Chlorophenol	390 [b]	53,000 [d]	4 [b,i]	0.2 [b,f,i]
218-01-9	Chrysene	88 [e]	--- [c]	160 [e]	8 [e]
72-54-8	DDD	3 [e]	--- [c]	16 [e]	0.8 [e]
72-55-9	DDE	2 [e]	--- [c]	54 [e]	3 [e]
50-29-3	DDT	2 [e]	--- [g]	32 [e]	2 [e]
53-70-3	Dibenz(*a,h*)anthracene	0.09 [e,f]	--- [c]	2 [e]	0.08 [e,f]
84-74-2	Di-*n*-butyl phthalate	7,800 [b]	2,300 [d]	2,300 [d]	270 [b]
95-50-1	1,2-Dichlorobenzene	7,000 [b]	560 [d]	17	0.9
106-46-7	1,4-Dichlorobenzene	27 [e]	--- [g]	2	0.1 [f]
91-94-1	3,3-Dichlorobenzidine	1 [e]	--- [c]	0.007 [e,f]	0.0003 [e,f]
75-34-3	1,1-Dichloroethane	7,800 [b]	1,300 [b]	23 [b]	1 [b]
107-06-2	1,2-Dichloroethane	7 [e]	0.4 [e]	0.02	0.001 [f]
75-35-4	1,1-Dichloroethylene	1 [e]	0.07 [e]	0.06	0.003 [f]
156-59-2	*cis*-1,2-Dichloroethylene	780 [b]	1,200 [d]	0.4	0.02
156-60-5	*trans*-1,2-Dichloroethylene	1,600 [b]	3,100 [d]	0.7	0.03
120-83-2	2,4-Dichlorophenol	230 [b]	--- [c]	1 [b,i]	0.05 [b,f,i]

Table A-1 (continued)

Organics				Migration to ground water	
CAS No.	Compound	Ingestion (mg/kg)	Inhalation volatiles (mg/kg)	20 DAF (mg/kg)	1 DAF (mg/kg)
78-87-5	1,2-Dichloropropane	9 [e]	15 [b]	0.03	0.001 [f]
542-75-6	1,3-Dichloropropene	4 [e]	0.1 [e]	0.004 [e]	0.0002 [e]
60-57-1	Dieldrin	0.04 [e]	1 [e]	0.004 [e]	0.0002 [e,f]
84-66-2	Diethylphthalate	63,000 [b]	2,000 [d]	470 [b]	23 [b]
105-67-9	2,4-Dimethylphenol	1,600 [b]	--- [c]	9 [b]	0.4 [b]
51-28-5	2,4-Dinitrophenol	160 [b]	--- [c]	0.3 [b,f,i]	0.01 [b,f,i]
121-14-2	2,4-Dinitrotoluene	0.9 [e]	--- [c]	0.0008 [e,f]	4E-05 [e,f]
606-20-2	2,6-Dinitrotoluene	0.9 [e]	--- [c]	0.0007 [e,f]	3E-05 [e,f]
117-84-0	Di-*n*-octyl phthalate	1,600 [b]	10,000 [d]	10,000 [d]	10,000 [d]
115-29-7	Endosulfan	470 [b]	--- [c]	18 [b]	0.9 [b]
72-20-8	Endrin	23 [b]	--- [c]	1	0.05
100-41-4	Ethylbenzene	7,800 [b]	400 [d]	13	0.7
206-44-0	Fluoranthene	3,100 [b]	--- [c]	4,300 [b]	210 [b]
86-73-7	Fluorene	3,100 [b]	--- [c]	560 [b]	28 [b]
76-44-8	Heptachlor	0.1 [e]	4 [e]	23	1
1024-57-3	Heptachlor epoxide	0.07 [e]	5 [e]	0.7	0.03
118-74-1	Hexachlorobenzene	0.4 [e]	1 [e]	2	0.1 [f]
87-68-3	Hexachloro-1,3-butadiene	8 [e]	8 [e]	2	0.1 [f]
319-84-6	α-HCH (α-BHC)	0.1 [e]	0.8 [e]	0.0005 [e,f]	3E-05 [e,f]
319-85-7	β-HCH (β-BHC)	0.4 [e]	--- [g]	0.003 [e]	0.0001 [e,f]
58-89-9	γ-HCH (Lindane)	0.5 [e]	--- [c]	0.009	0.0005 [f]
77-47-4	Hexachlorocyclopentadiene	550 [b]	10 [b]	400	20
67-72-1	Hexachloroethane	46 [e]	55 [e]	0.5 [e]	0.02 [e,f]
193-39-5	Indeno(1,2,3-*cd*)pyrene	0.9 [e]	--- [c]	14 [e]	0.7 [e]
78-59-1	Isophorone	670 [e]	4,600 [d]	0.5 [e]	0.03 [e,f]
7439-97-6	Mercury	23 [b,l]	10 [b,i]	2 [i]	0.1 [i]
72-43-5	Methoxychlor	390 [b]	--- [c]	160	8
74-83-9	Methyl bromide	110 [b]	10 [b]	0.2 [b]	0.01 [b,f]
75-09-2	Methylene chloride	85 [e]	13 [e]	0.02 [e]	0.001 [e,f]
95-48-7	2-Methylphenol	3,900 [b]	--- [c]	15 [b]	0.8 [b]
91-20-3	Naphthalene	3,100 [b]	--- [c]	84 [b]	4 [b]
98-95-3	Nitrobenzene	39 [b]	92 [b]	0.1 [b,f]	0.007 [b,f]
86-30-6	*N*-Nitrosodiphenylamine	130 [e]	--- [c]	1 [e]	0.06 [e,f]
621-64-7	*N*-Nitrosodi-*n*-propylamine	0.09 [e,f]	--- [c]	5E-05 [e,f]	2E-06 [e,f]
1336-36-3	PCBs	1 [h]	--- [h]	--- [h]	--- [h]
87-86-5	Pentachlorophenol	3 [e,j]	--- [c]	0.03 [f,i]	0.001 [f,i]
108-95-2	Phenol	47,000 [b]	--- [c]	100 [b]	5 [b]
129-00-0	Pyrene	2,300 [b]	--- [c]	4,200 [b]	210 [b]
100-42-5	Styrene	16,000 [b]	1,500 [d]	4	0.2
79-34-5	1,1,2,2-Tetrachloroethane	3 [e]	0.6 [e]	0.003 [e,f]	0.0002 [e,f]

Table A-1 (continued)

Organics				Migration to ground water	
CAS No.	Compound	Ingestion (mg/kg)	Inhalation volatiles (mg/kg)	20 DAF (mg/kg)	1 DAF (mg/kg)
127-18-4	Tetrachloroethylene	12 [e]	11 [e]	0.06	0.003 [f]
108-88-3	Toluene	16,000 [b]	650 [d]	12	0.6
8001-35-2	Toxaphene	0.6 [e]	89 [e]	31	2
120-82-1	1,2,4-Trichlorobenzene	780 [b]	3,200 [d]	5	0.3 [f]
71-55-6	1,1,1-Trichloroethane	--- [c]	1,200 [d]	2	0.1
79-00-5	1,1,2-Trichloroethane	11 [e]	1 [e]	0.02	0.0009 [f]
79-01-6	Trichloroethylene	58 [e]	5 [e]	0.06	0.003 [f]
95-95-4	2,4,5-Trichlorophenol	7,800 [b]	--- [c]	270 [b,i]	14 [b,i]
88-06-2	2,4,6-Trichlorophenol	58 [e]	200 [e]	0.2 [e,f,i]	0.008 [e,f,i]
108-05-4	Vinyl acetate	78,000 [b]	1,000 [b]	170 [b]	8 [b]
75-01-4	Vinyl chloride	0.3 [e]	0.03 [e]	0.01 [f]	0.0007 [f]
108-38-3	*m*-Xylene	1.6E+05 [b]	420 [d]	210	10
95-47-6	*o*-Xylene	1.6E+05 [b]	410 [d]	190	9
106-42-3	*p*-Xylene	1.6E+05 [b]	460 [d]	200	10

Table A-1 (continued)

Inorganics				Migration to ground water	
CAS No.	Compound	Ingestion (mg/kg)	Inhalation fugitive particulate (mg/kg)	20 DAF (mg/kg)	1 DAF (mg/kg)
7440-36-0	Antimony	31 [b]	--- [c]	5	0.3
7440-38-2	Arsenic	0.4 [e]	750 [e]	29 [i]	1 [i]
7440-39-3	Barium	5,500 [b]	6.9E+05 [b]	1,600 [i]	82 [i]
7440-41-7	Beryllium	0.1 [e]	1,300 [e]	63 [i]	3 [i]
7440-43-9	Cadmium	78 [b,m]	1,800 [e]	8 [i]	0.4 [i]
7440-47-3	Chromium (total)	390 [b]	270 [e]	38 [i]	2 [i]
16065-83-1	Chromium (III)	78,000 [b]	--- [c]	--- [g]	--- [g]
18540-29-9	Chromium (VI)	390 [b]	270 [e]	38 [i]	2 [i]
57-12-5	Cyanide (amenable)	1,600 [b]	--- [c]	40	2
7439-92-1	Lead	400 [k]	--- [k]	--- [k]	--- [k]
7440-02-0	Nickel	1,600 [b]	13,000 [e]	130 [i]	7 [i]
7782-49-2	Selenium	390 [b]	--- [c]	5 [i]	0.3 [i]
7440-22-4	Silver	390 [b]	--- [c]	34 [b,i]	2 [b,i]
7440-28-0	Thallium	--- [c]	--- [c]	0.7 [i]	0.04 [i]
7440-62-2	Vanadium	550 [b]	--- [c]	6,000 [b]	300 [b]
7440-66-6	Zinc	23,000 [b]	--- [c]	12,000 [b,i]	620 [b,i]

DAF = Dilution and attenuation factor.

[a] Screening levels based on human health criteria only.

[b] Calculated values correspond to a noncancer hazard quotient of 1.

[c] No toxicity criteria available for that route of exposure.

[d] Soil saturation concentration (C_{sat}).

[e] Calculated values correspond to a cancer risk level of 1 in 1,000,000.

[f] Level is at or below Contract Laboratory Program required quantitation limit for Regular Analytical Services (RAS).

[g] Chemical-specific properties are such that this pathway is not of concern at any soil contaminant concentration.

[h] A preliminary remediation goal of 1 mg/kg has been set for PCBs based on *Guidance on Remedial Actions for Superfund Sites with PCB Contamination* (U.S. EPA, 1990) and on EPA efforts to manage PCB contamination.

[i] SSL for pH of 6.8.

[j] Ingestion SSL adjusted by a factor of 0.5 to account for dermal exposure.

[k] A screening level of 400 mg/kg has been set for lead based on *Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities* (U.S. EPA, 1994).

[l] SSL is based on RfD for mercuric chloride (CAS No. 007487-94-7).

[m] SSL is based on dietary RfD.

APPENDIX C.1.4

FEDERAL MAXIMUM CONTAMINANT LEVELS (MCLs)

United States
Environmental Protection
Agency

Office of Water
4304

EPA 822-B-00-001
Summer 2000

EPA

Drinking Water Standards and Health Advisories

DRINKING WATER STANDARDS

AND HEALTH ADVISORIES

Office of Water
U.S. Environmental Protection Agency
Washington, D.C.

Summer 2000

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at least 50% recycled fiber.

The *Drinking Water Standards and Health Advisories* tables are revised periodically by EPA's Office of Water on an "as needed" basis. This Summer 2000 edition of the tables has undergone rather extensive revisions in format and content. The changes are as follows:

The tables are in PDF format to facilitate their printing from the internet.

The Health Advisory status column includes the year of publication for the final or draft Health Advisory. Final Health Advisories have been externally peer reviewed; draft documents have not.

Reference dose (RfD) values have been updated to reflect the values in the Integrated Risk Information System (IRIS), and the Drinking Water Equivalent Level (DWEL) has been calculated accordingly. Thus, both the RfD and DWEL will differ from the values in the Health Advisory document if the IRIS value is more recent than the Health Advisory. The RfD values from IRIS that differ from the values in the Health Advisory documents are in **BOLD** type to distinguish them from the other values. For chemicals with a new IRIS RfD, the lifetime Health Advisory was calculated from the DWEL using the relative source contribution values published in the Health Advisory. Where the revised lifetime value differed from the Maximum Contaminant Level Goal (MCLG), no lifetime value was provided in the Table.

For regulated chemicals, the cancer group designation reflects the status at the time of regulation.

Several pesticides listed in IRIS have been re-evaluated by the Office of Pesticide Programs (OPP) resulting in an RfD other than that in IRIS. For these pesticides, the IRIS value is listed in the Table, and the newer OPP value is given in a footnote.

The longer term Health Advisory values for children and adults were deleted from the table. A large number of these values should be reevaluated in the light of new data. However, due to resource limitations at this time, the Office of Science and Technology (OST) has not been able to update the longer term values.

In some cases there is a Health Advisory value for a contaminant but there is no reference to a Health Advisory document. These Health Advisory values can be found in the Drinking Water Criteria Document for the contaminant.

With a few exceptions, the Health Advisory values have been rounded to one significant figure.

The *Drinking Water Standards and Health Advisories* tables may be reached from the Office of Science and Technology home page at

http://www.epa.gov/OST

The tables are accessed under the OST Programs heading on the OST Home Page.

Although no permanent mailing list is kept, copies may be ordered free of charge from

SAFE DRINKING WATER HOTLINE
1-800-426-4791
Monday thru Friday, 9:00 AM to 5:30 PM EST

Copies of the supporting technical documentation for the health advisories can be ordered for a fee on the Internet at

http://www.epa.gov/OST/orderpubs.html

or from

Educational Resource Information Center (ERIC)
1929 Kenny Road
Columbus, OH 43210-1080
Telephone number 614-292-6717; 1-800-276-0462
FAX 614-292-0263
e-mail ERICSE@osu.edu
Payment by Purchase Order/Check/Visa or Mastercard.

For further information regarding the *Drinking Water Standards and Health Advisories*, call the Safe Drinking Water Hotline at 1-800-426-4791 or 703-285-1093.

DEFINITIONS

The following definitions for terms used in the Tables are not all-encompassing, and should not be construed to be "official" definitions. They are intended to assist the user in understanding terms found on the following pages.

Action Level: The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow. For lead or copper it is the level which, if exceeded in over 10% of the homes tested, triggers treatment.

Cancer Group: A qualitative weight-of-evidence judgement as to the likelihood that a chemical may be a carcinogen for humans. Each chemical is placed into one of the following five categories:

Group	Category
A	Human carcinogen
B	Probable human carcinogen: B1 indicates limited human evidence; B2 indicates sufficient evidence in animals and inadequate or no evidence in humans
C	Possible human carcinogen
D	Not classifiable as to human carcinogenicity
E	Evidence of noncarcinogenicity for humans

This categorization is based on EPA's 1986 *Guidelines for Carcinogen Risk Assessment*. The *Proposed Guidelines for Carcinogen Risk Assessment* which were published in 1996, when final, will replace the 1986 cancer guidelines.

10^{-4} Cancer Risk: The concentration of a chemical in drinking water corresponding to an estimated lifetime cancer risk of 1 in 10,000.

DWEL: Drinking Water Equivalent Level. A lifetime exposure concentration protective of adverse, non-cancer health effects, that assumes all of the exposure to a contaminant is from drinking water.

HA: Health Advisory. An estimate of acceptable drinking water levels for a chemical substance based on health effects information; a Health Advisory is not a legally enforceable Federal standard, but serves as technical guidance to assist Federal, state, and local officials.

One-day HA: The concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to one day of exposure.

Ten-day HA: The concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to ten days of exposure.

Lifetime HA: The concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for a lifetime of exposure.

LED_{10}: Lower Limit on Effective $Dose_{10}$. The 95% lower confidence limit of the dose of a chemical needed to produce an adverse effect in 10% of those exposed to the chemical, relative to the control.

MCLG: Maximum Contaminant Level Goal. A non-enforceable health goal which is set at a level at which no known or anticipated adverse effect on the health of persons occur and which allows an adequate margin of safety.

MCL: Maximum Contaminant Level. The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLG as feasible using the best available treatment technology and taking cost into consideration. MCLs are enforceable standards.

RfD: Reference Dose. An estimate (with uncertainty spanning perhaps an order of magnitude) of a daily oral exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime.

SDWR: Secondary Drinking Water Regulations. Non-enforceable Federal guidelines regarding cosmetic effects (such as tooth or skin discoloration) or aesthetic effects (such as taste, odor, or color) of drinking water.

TT: Treatment Technique. A required process intended to reduce the level of a contaminant in drinking water.

ABBREVIATIONS

D	Draft
F	Final
NA	Not Applicable
NOAEL	No-Observed-Adverse-Effect-Level
OPP	Office of Pesticide Programs
P	Proposed
Reg	Regulation
TT	Treatment Technique

Drinking Water Standards and Health Advisories

Chemicals	Standards			Status HA Document	Health Advisories						Cancer Group
					10-kg Child						
	Status Reg.	MCLG (mg/L)	MCL (mg/L)		One-day (mg/L)	Ten-day (mg/L)	RfD (mg/kg/day)	DWEL (mg/L)	Lifetime (mg/L)	mg/L at 10^{-4} Cancer Risk	
ORGANICS											
Acenaphthene	-	-	-	-	-	-	0.06	2	-	-	-
Acifluorfen (sodium)		-	-	F '88	2	2	0.01	0.4	-	0.1	B2
Acrylamide	F	zero	TT[1]	F '87	1.5	0.3	0.0002	0.007	-	0.001	B2
Acrylonitrile		-	-	-	-	-	-	-	-	0.006	B1
Alachlor	F	zero	0.002	F '88	0.1	0.1	0.01	0.4	-	0.04[2]	B2
Aldicarb[3]	F[4]	0.007	0.007	F '95	0.01	0.01	0.001	0.04	0.007	-	D
Aldicarb sulfone[3]	F[4]	0.007	0.007	F '95	0.01	0.01	0.001	0.04	0.007	-	D
Aldicarb sulfoxide[3]	F[4]	0.007	0.007	F '95	0.01	0.01	0.001	0.04	0.007	-	D
Aldrin	-	-	-	F '92	0.0003	0.0003	0.00003	0.001	-	0.0002	B2
Ametryn	-	-	-	F '88	9	9	0.009	0.3	0.06	-	D
Ammonium sulfamate	-	-	-	F '88	20	20	0.2	8	2	-	D
Anthracene (PAH)[5]	-	-	-	-	-	-	0.3	10	-	-	D
Atrazine[6]	F	0.003	0.003	F '88	-	-	0.035	1	0.2	-	C
Baygon	-	-	-	F '88	0.04	0.04	0.004	0.1	0.003	-	C
Bentazon	-	-	-	F '99	0.3	0.3	0.03	1	0.2	-	E
Benz[a]anthracene (PAH)	-	-	-	-	-	-	-	-	-	-	B2
Benzene	F	zero	0.005	F '87	0.2	0.2	-	-	-	0.1	A
Benzo[a]pyrene (PAH)	F	zero	0.0002	-	-	-	-	-	-	0.002	B2
Benzo[b]fluoranthene (PAH)	-	-	-	-	-	-	-	-	-	-	B2
Benzo[g,h,i]perylene (PAH)	-	-	-	-	-	-	-	-	-	-	D
Benzo[k]fluoranthene (PAH)	-	-	-	-	-	-	-	-	-	-	B2
bis-2-Chloroisopropyl ether	-	-	-	F '89	4	4	0.04	1	0.3	-	D
Bromacil	-	-	-	F '88	5	5	0.1	5	0.09	-	C
Bromobenzene	-	-	-	D '86	4	4	-	-	-	-	D

[1] When acrylamide is used in drinking water systems, the combination (or product) of dose and monomer level shall not exceed that equivalent to a polyacrylamide polymer containing 0.05% monomer dosed at 1 mg/L.
[2] Determined not to be carcinogenic at low doses by OPP.
[3] The lifetime HA value or the MCLG/MCL value for any combination of two or more of these three chemicals should remain at 0.007 mg/L because of similar mode of action.
[4] Administrative stay of the effective date.
[5] PAH = Polycyclic aromatic hydrocarbon
[6] Under review

Drinking Water Standards and Health Advisories

Chemicals	Standards			Status HA Document	Health Advisories						Cancer Group
					10-kg Child						
	Status Reg.	MCLG (mg/L)	MCL (mg/L)		One-day (mg/L)	Ten-day (mg/L)	RfD (mg/kg/day)	DWEL (mg/L)	Lifetime (mg/L)	mg/L at 10^{-4} Cancer Risk	
Bromochloromethane	-	-	-	F '89	50	1	0.01	0.5	0.09	-	D
Bromodichloromethane (THM)	F	zero	0.08[1]	D '93	6	6	0.02	0.7	-	0.06	B2
Bromoform (THM)	F	zero	0.08[1]	D '93	5	2	0.02	0.7	-	0.4	B2
Bromomethane	-	-	-	D '89	0.1	0.1	0.001	0.05	0.01	-	D
Butyl benzyl phthalate (PAE) [2]	-	-	-	-	-	-	0.2	7	-	-	C
Butylate	-	-	-	F '89	2	2	0.05	2	0.4	-	D
Carbaryl	-	-	-	F '88	1	1	0.1	4	0.7	-	D
Carbofuran[3]	F	0.04	0.04	F '87	0.05	0.05	0.005	0.2	0.04	-	E
Carbon tetrachloride	F	zero	0.005	F '87	4	0.2	0.0007	0.03	-	0.03	B2
Carboxin	-	-	-	F '88	1	1	0.1	4	0.7	-	D
Chloramben	-	-	-	F '88	3	3	0.015	0.5	0.1	-	D
Chlordane	F	zero	0.002	F '87	0.06	0.06	**0.0005**	0.02	-	0.001	B2
Chloroform (THM)	F	zero	0.08[1]	D '93	4	4	0.01	0.4	-	0.6	B2
Chloromethane	-	-	-	F '89	9	0.4	0.004	0.1	0.003	-	C
Chlorophenol (2-)	-	-	-	D '94	0.5	0.5	0.005	0.2	0.04	-	D
p-Chlorophenyl methyl sulfide/sulfone/sulfoxide	-	-	-	-	-	-	-	-	-	-	D
Chlorothalonil	-	-	-	F '88	0.2	0.2	0.015	0.5	-	0.15	B2
Chlorotoluene o-	-	-	-	F '89	2	2	0.02	0.7	0.1	-	D
Chlorotoluene p-	-	-	-	F '89	2	2	0.02	0.7	0.1	-	D
Chlorpyrifos	-	-	-	F '92	0.03	0.03	0.003	0.1	0.02	-	D
Chrysene (PAH)	-	-	-	-	-	-	-	-	-	-	B2
Cyanazine	-	-	-	D '96	0.1	0.1	0.002	0.07	0.001	-	-

[1] 1998 Final Rule for Disinfectants and Disinfection By-products: The total for trihalomethanes is 0.08 mg/L.
[2] PAE = phthalate acid ester
[3] Under review

Drinking Water Standards and Health Advisories

Chemicals	Standards			Status HA Document	Health Advisories						Cancer Group
					10-kg Child						
	Status Reg.	MCLG (mg/L)	MCL (mg/L)		One-day (mg/L)	Ten-day (mg/L)	RfD (mg/kg/day)	DWEL (mg/L)	Lifetime (mg/L)	mg/L at 10^{-4} Cancer Risk	
Cyanogen chloride[1]	-	-	-	-	0.05	0.05	0.05	2	-	-	D
2,4-D (2,4-dichlorophenoxyacetic acid)	F	0.07	0.07	F '87	1	0.3	0.01	0.4	0.07	-	D
DCPA (Dacthal)	-	-	-	F '88	80	80	**0.01**	0.4	0.07	-	D
Dalapon (sodium salt)	F	0.2	0.2	F '89	3	3	0.03	0.9	0.2	-	D
Di(2-ethylhexyl)adipate	F	0.4	0.4	-	20	20	0.6	20	0.4	3	C
Di(2-ethylhexyl)phthalate (PAE)	F	zero	0.006	-	-	-	0.02	0.7	-	0.3	B2
Diazinon	-	-	-	F '88	0.02	0.02	0.00009	0.003	0.0006	-	E
Dibromochloromomethane (THM)	F	0.06	0.08[2]	D '93	6	6	0.02	0.7	0.06	0.04	C
Dibromochloropropane (DBCP)	F	zero	0.0002	F '87	0.2	0.05	-	-	-	0.003	B2
Dibutyl phthalate (PAE)	-	-	-	-	-	-	0.1	4	-	-	D
Dicamba	-	-	-	F '88	0.3	0.3	0.03	1	0.2	-	D
Dichloroacetic acid	F	zero	0.06[3]	D '93	5	5	0.004	0.1	-	-[4]	B2
Dichlorobenzene o-	F	0.6	0.6	F '87	9	9	0.09	3	0.6	-	D
Dichlorobenzene m-[5]	-	-	-	F '87	9	9	0.09	3	0.6	-	D
Dichlorobenzene p-	F	0.075	0.075	F '87	11	11	0.1	4	0.075	-	C
Dichlorodifluoromethane	-	-	-	F '89	40	40	0.2	5	1	-	D
Dichloroethylene (1,1-)	F	0.007	0.007	F '87	2	1	0.01	0.4	0.007	-	C
Dichloroethane (1,2-)	F	zero	0.005	F '87	0.7	0.7	-	-	-	0.04	B2
Dichloroethylene (cis-1,2-)	F	0.07	0.07	F '90	4	1	0.01	0.4	0.07	-	D
Dichloroethylene (trans-1,2-)	F	0.1	0.1	F '87	20	1	**0.02**	0.7	0.1	-	D
Dichloromethane	F	zero	0.005	D '93	10	2	0.06	2	-	0.5	B2
Dichlorophenol (2,4-)	-	-	-	D '94	0.03	0.03	0.003	0.1	0.02	-	E
Dichloropropane (1,2-)	F	zero	0.005	F '87	-	0.09	-	-	-	0.06	B2
Dichloropropene (1,3-)	-	-	-	F '88	0.03	0.03	**0.03**	1	-	**0.04**	B2
Dieldrin	-	-	-	F '88	0.0005	0.0005	0.00005	0.002	-	0.0002	B2
Diethyl phthalate (PAE)	-	-	-	-	-	-	0.8	30	-	-	D

[1] Under review
[2] 1998 Final Rule for Disinfectants and Disinfection By-products: The total for trihalomethanes is 0.08 mg/L.
[3] 1998 Final Rule for Disinfectants and Disinfection By-products: The total for five haloacetic acids is 0.06 mg/L.
[4] A quantitative risk estimate has not been determined.
[5] The values for m-dichlorobenzene are based on data for o-dichlorobenzene.

Drinking Water Standards and Health Advisories

Chemicals	Standards			Status HA Document	Health Advisories						Cancer Group
					10-kg Child						
	Status Reg.	MCLG (mg/L)	MCL (mg/L)		One-day (mg/L)	Ten-day (mg/L)	RfD (mg/kg/day)	DWEL (mg/L)	Lifetime (mg/L)	mg/L at 10^{-4} Cancer Risk	
Diisopropyl methylphosphonate	-	-	-	F '89	8	8	0.08	3	0.6	-	D
Dimethrin	-	-	-	F '88	10	10	0.3	10	2	-	D
Dimethyl methylphosphonate	-	-	-	F '92	2	2	0.2	7	0.1	0.7	C
Dimethyl phthalate (PAE)	-	-	-	-	-	-	-	-	-	-	D
Dinitrobenzene (1,3-)	-	-	-	F '91	0.04	0.04	0.0001	0.005	0.001	-	D
Dinitrotoluene (2,4-)	-	-	-	F '92	0.50	0.50	0.002	0.1	-	0.005	B2
Dinitrotoluene (2,6-)	-	-	-	F '92	0.40	0.40	0.001	0.04	-	0.005	B2
Dinitrotoluene (2,6 & 2,4) [1]	-	-	-	F '92	-	-	-	-	-	0.005	B2
Dinoseb	F	0.007	0.007	F '88	0.3	0.3	0.001	0.04	0.007	-	D
Dioxane p-	-	-	-	F '87	4	0.4	-	-	-	**0.3**	B2
Diphenamid	-	-	-	F '88	0.3	0.3	0.03	1	0.2	-	D
Diquat	F	0.02	0.02	-	-	-	**0.002**	0.07	-	-	D
Disulfoton	-	-	-	F '88	0.01	0.01	0.00004	0.001	0.0003	-	E
Dithiane (1,4-)	-	-	-	F '92	0.4	0.4	0.01	0.4	0.08	-	D
Diuron	-	-	-	F '88	1	1	0.002[2]	0.07	0.01	-	D
Endothall	F	0.1	0.1	F '88	0.8	0.8	0.02	0.7	0.1	-	D
Endrin	F	0.002	0.002	F '87	0.02	0.005	**0.0003**	0.01	0.002	-	D
Epichlorohydrin	F	zero	TT[3]	F '87	0.1	0.1	0.002	0.07	-	0.4	B2
Ethylbenzene	F	0.7	0.7	F '87	30	3	0.1	3	0.7	-	D
Ethylene dibromide (EDB)[4]	F	zero	0.00005	F '87	0.008	0.008	-	-	-	0.00005	B2
Ethylene glycol	-	-	-	F '87	20	6	2	70	14	-	D
Ethylene Thiourea (ETU)	-	-	-	F '88	0.3	0.3	**0.00008**	0.003	-	0.02	B2
Fenamiphos	-	-	-	F '88	0.009	0.009	0.00025	0.009	0.002	-	D

[1] technical grade.
[2] New OPP RfD = 0.003 mg/kg/day.
[3] When epichlorohydrin is used in drinking water systems, the combination (or product) of dose and monomer level shall not exceed that equivalent to an epichlorohydrin-based polymer containing 0.01% monomer dosed at 20 mg/L.
[4] 1,2-dibromomethane

Drinking Water Standards and Health Advisories

Chemicals	Standards			Status HA Standards	Health Advisories						Cancer Group
					10-kg Child						
	Status Reg.	MCLG (mg/L)	MCL (mg/L)		One-day (mg/L)	Ten-day (mg/L)	RfD (mg/kg/day)	DWEL (mg/L)	Lifetime (mg/L)	mg/L at 10^{-4} Cancer Risk	
Fluometuron	-	-	-	F '88	2	2	0.01	0.5	0.09		D
Fluorene (PAH)	-	-	-	-	-	-	0.04	1	-	-	D
Fonofos	-	-	-	F '88	0.02	0.02	0.002	0.07	0.01	-	D
Formaldehyde	-	-	-	D '93	10	5	0.15	5	1	-	B1[1]
Glyphosate	F	0.7	0.7	F '88	20	20	0.1[2]	4	0.7	-	D
Heptachlor	F	zero	0.0004	F '87	0.01	0.01	0.0005	0.02	-	0.0008	B2
Heptachlor epoxide	F	zero	0.0002	F '87	0.01	-	0.00001	0.0004	-	0.0004	B2
Hexachlorobenzene	F	zero	0.001	F '87	0.05	0.05	0.0008	0.03	-	0.002	B2
Hexachlorobutadiene	-	-	-	F '89	0.3	0.3	0.002	0.07	0.001	0.05	C
Hexachlorocyclopentadiene	F	0.05	0.05	-	-	-	0.007	0.2	-	-	D
Hexachloroethane	-	-	-	F '91	5	5	0.001	0.04	0.001	-	C
Hexane (n-)	-	-	-	F '87	10	4	-	-	-	-	D
Hexazinone	-	-	-	F '96	3	2	0.05 [3]	2	0.4	-	D
HMX[4]	-	-	-	F '88	5	5	0.05	2	0.4	-	D
Indeno[1,2,3,-c,d]pyrene (PAH)	-	-	-	-	-	-	-	-	-	-	B2
Isophorone	-	-	-	F '92	15	15	0.2	7	0.1	4	C
Isopropyl methylphosphonate	-	-	-	F '92	30	30	0.1	4	0.7	-	D
Isopropylbenzene (cumene)	-	-	-	D '87	11	11	0.1	4	-	-	D
Lindane [5]	F	0.0002	0.0002	F '87	1	1	0.0003	0.01	0.0002	-	C
Malathion	-	-	-	F '92	0.2	0.2	0.02	0.8	0.1	-	D
Maleic hydrazide	-	-	-	F '88	10	10	0.5	20	4	-	D
MCPA [6]	-	-	-	F '88	0.1	0.1	0.0005[7]	0.02	0.004	-	D
Methomyl	-	-	-	F '88	0.3	0.3	0.025	0.9	0.2	-	E
Methoxychlor	F	0.04	0.04	F '87	0.05	0.05	**0.005**	0.2	0.04	-	D
Methyl ethyl ketone	-	-	-	F '87	75	7.5	**0.6**	20	-	-	D
Methyl parathion	-	-	-	F '88	0.3	0.3	0.00025	0.009	0.002	-	D

[1] Carcinogenicity based on inhalation exposure.
[2] New OPP RfD = 2 mg/kg/day.
[3] The Health Advisory is based on a new OPP RfD rather than the IRIS RfD.
[4] HMX = octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
[5] Lindane = γ – hexachlorocyclohexane
[6] MCPA = 4(chloro-2-methoxyphenoxy)acetic acid
[7] New OPP RfD = 0.0015 mg/kg/day

Chemicals	Standards			Status HA Document	Health Advisories						Cancer Group
					10-kg Child						
	Status Reg.	MCLG (mg/L)	MCL (mg/L)		One-day (mg/L)	Ten-day (mg/L)	RfD (mg/kg/day)	DWEL (mg/L)	Lifetime (mg/L)	mg/L at 10^{-4} Cancer Risk	
Metolachlor	-	-	-	F '88	2	2	**0.15**[1]	0.5	0.1	-	C
Metribuzin	-	-	-	F '88	5	5	0.025[2]	0.9	0.2	-	D
Monochloroacetic acid	F	-	0.06[3]	-	-	-	-	-	-	-	-
Monochlorobenzene	F	0.1	0.1	F '87	4	4	**0.02**	0.7	0.1	-	D
Naphthalene	-	-	-	F '90	0.5	0.5	**0.02**	0.7	0.1	-	**C**
Nitrocellulose (non-toxic)	-	-	-	F '88	-	-	-	-	-	-	-
Nitroguanidine	-	-	-	F '90	10	10	0.1	4	0.7	-	D
Nitrophenol p-	-	-	-	F '92	0.8	0.8	0.008	0.3	0.06	-	D
Oxamyl (Vydate)	F	0.2	0.2	F '87	0.2	0.2	0.025	0.9	0.2	-	E
Paraquat	-	-	-	F '88	0.1	0.1	0.0045	0.2	0.03	-	**C**
Pentachlorophenol	F	zero	0.001	F '87	1	0.3	0.03	1	-	0.03	B2
Phenanthrene (PAH)	-	-	-	-	-	-	-	-	-	-	D
Phenol	-	-	-	D '92	6	6	0.6	20	4	-	D
Picloram	F	0.5	0.5	F '88	20	20	0.07[4]	2	0.5	-	D
Polychlorinated biphenyls (PCBs)	F	zero	0.0005	D '93	-	-	-	-	-	0.01	B2
Prometon[5]	-	-	-	F '88	0.2	0.2	0.015	0.5	0.1	-	D
Pronamide	-	-	-	F '88	0.8	0.8	0.075	3	0.05	-	C
Propachlor	-	-	-	F '88	0.5	0.5	0.01	0.5	0.09	-	D
Propazine	-	-	-	F '88	1	1	0.02	0.7	0.01	-	C
Propham	-	-	-	F '88	5	5	0.02	0.6	0.1	-	D
Pyrene (PAH)	-	-	-	-	-	-	0.03	-	-	-	D
RDX[6]	-	-	-	F '88	0.1	0.1	0.003	0.1	0.002	0.03	C
Simazine	F	0.004	0.004	F '88	0.5	0.5	0.005	0.2	0.004	-	C
Styrene	F	0.1	0.1	F '87	20	2	0.2	7	0.1	-	C
2,4,5-T (Trichlorophenoxyacetic acid)	-	-	-	F '88	0.8	0.8	0.01	0.4	0.07	-	D

[1] New OPP RfD = 0.1 mg/kg/day
[2] New OPP RfD = 0.013 mg/kg/day
[3] 1998 Final Rule for Disinfectants and Disinfection By-products: the total for five haloacetic acids is 0.06mg/L.
[4] New OPP RfD = 0.2 mg/kg/day
[5] Under review.
[6] RDX = hexahydro-1,3,5-trinitro-1,3,5-triazine

Chemicals	Standards			Status HA Document	Health Advisories						Cancer Group
					10-kg Child						
	Status Reg.	MCLG (mg/L)	MCL (mg/L)		One-day (mg/L)	Ten-day (mg/L)	RfD (mg/kg/day)	DWEL (mg/L)	Lifetime (mg/L)	mg/L at 10^{-4} Cancer Risk	
2,3,7,8-TCDD (Dioxin)	F	zero	3E-08	F '87	1E-06	1E-07	1E-09	4E-08	-	2E-08	B2
Tebuthiuron	-	-	-	F '88	3	3	0.07	2	0.5	-	D
Terbacil	-	-	-	F '88	0.3	0.3	0.01	0.4	0.09	-	E
Terbufos	-	-	-	F '88	0.005	0.005	0.0001	0.005	0.0009	-	D
Tetrachloroethane (1,1,1,2-)	-	-	-	F '89	2	2	0.03	1	0.07	0.1	C
Tetrachloroethane (1,1,2,2-)	-	-	-	F '89	0.04	0.04	0.00005	0.002	0.0003	0.02	C
Tetrachloroethylene	F	zero	0.005	F '87	2	2	0.01	0.5	0.01	-	-
Trichlorofluoromethane	-	-	-	F '89	7	7	0.3	10	2	-	D
Toluene	F	1	1	D '93	20	2	0.2	7	1	-	D
Toxaphene	F	zero	0.003	F '96	0.004	0.004	0.0004	0.01	-	0.003	B2
2,4,5-TP (Silvex)	F	0.05	0.05	F '88	0.2	0.2	0.008	0.3	0.05	-	D
Trichloroacetic acid	F	0.3	0.06[1]	D '96	4	4	0.1	4.0	0.3	-	C
Trichlorobenzene (1,2,4-)	F	0.07	0.07	F '89	0.1	0.1	0.001	0.05	0.01	-	D
Trichlorobenzene (1,3,5-)	-	-	-	F '89	0.6	0.6	0.006	0.2	0.04	-	D
Trichloroethane (1,1,1-)	F	0.2	0.2	F '87	100	40	0.035	1	0.2	-	D
Trichloroethane (1,1,2-)	F	0.003	0.005	F '89	0.6	0.4	0.004	0.1	0.003	0.06	C
Trichloroethylene [2]	F	zero	0.005	F '87	-	-	0.007	0.2	-	0.2	B2
Trichlorophenol (2,4,6-)	-	-	-	D '94	0.03	0.03	0.0003	0.01	-	0.3	B2
Trichloropropane (1,2,3-)	-	-	-	F '89	0.6	0.6	0.006	0.2	0.04	-	-
Trifluralin	-	-	-	F '90	0.08	0.08	0.0075	0.3	0.005	0.5	C
Trimethylbenzene (1,2,4-)	-	-	-	D '87	-	-	-	-	-	-	D
Trimethylbenzene (1,3,5-)	-	-	-	D '87	10	-	-	-	-	-	D
Trinitroglycerol	-	-	-	F '87	0.005	0.005	-	-	0.005	0.2	-
Trinitrotoluene (2,4,6-)	-	-	-	F '89	0.02	0.02	0.0005	0.02	0.002	0.1	C
Vinyl chloride[2]	F	zero	0.002	F '87	3	3	-	-	-	0.002	A
Xylenes	F	10	10	D '93	40	40	2	70	10	-	D

[1] 1998 Final Rule for Disinfectants and Disinfection By-products: The total for five haloacetic acids is 0.06 mg/L.
[2] Under review

Chemicals	Standards			Status HA Document	Health Advisories						Cancer Group
					10-kg Child						
	Status Reg.	MCLG (mg/L)	MCL (mg/L)		One-day (mg/L)	Ten-day (mg/L)	RfD (mg/kg/day)	DWEL (mg/L)	Lifetime (mg/L)	mg/L at 10^{-4} Cancer Risk	
INORGANICS											
Ammonia	-	-	-	D '92	-	-	-	-	30	-	D
Antimony	F	0.006	0.006	F '92	0.01	0.01	0.0004	0.01	0.006	-	D
Arsenic	P	zero	0.005	D '95	-	-	-	-	-	0.002	A
Asbestos (fibers/l >10μm length)	F	7 MFL[1]	7 MFL	-	-	-	-	-	-	700 MFL	A[2]
Barium	F	2	2	D '93	0.7	0.7	**0.07**	2	2	-	D
Beryllium	F	0.004	0.004	F '92	30	30	**0.002**	0.07	-	-	-
Boron[3]	-	-	-	D '92	4	0.9	0.09	3	0.6	-	D
Bromate	F	zero	0.01	D '98	0.2	-	-	-	-	0.005	B2
Cadmium	F	0.005	0.005	F '87	0.04	0.04	0.0005	0.02	0.005	-	D
Chloramine[4]	F	4[5]	4[5]	D '95	1	1	0.1	3.5	3.0	-	-
Chlorine	F	4	4	D '95	3	3	0.1	5	4	-	D
Chlorine dioxide	F	0.8[5]	0.8[5]	D '98	0.84	0.84	0.03	1	0.8	-	D
Chlorite	F	0.8	1	D '98	0.84	0.84	0.03	1	0.8	-	D
Chromium (total)	F	0.1	0.1	F '87	1	1	**0.003**[6]	0.1	-	-	D
Copper (at tap)	F	1.3	TT[7]	D '98	-	-	-	-	-	-	D
Cyanide	F	0.2	0.2	F '87	0.2	0.2	0.02[8]	0.8	0.2	-	D
Fluoride	F	4	4	-	-	-	0.06[9]	-	-	-	-
Lead (at tap)	F	zero	TT[7]	-	-	-	-	-	-	-	B2
Manganese	-	-	-	-	-	-	0.14[10]	-	-	-	-
Mercury (inorganic)	F	0.002	0.002	F '87	0.002	0.002	**0.0003**	0.01	0.002	-	D
Molybdenum	-	-	-	D '93	0.08	0.08	0.005	0.2	0.04	-	D
Nickel	F	-	-	F '95	1	1	0.02	0.7	0.1	-	-

[1] MFL = million fibers per liter
[2] Carcinogenicity based on inhalation exposure.
[3] Under review.
[4] Monochloramine; measured as free chlorine.
[5] 1998 Final Rule for Disinfectants and Disinfection By-products: MRDLG=Maximum Residual Disinfection Level Goal; and MRDL=Maximum Residual Disinfection Level.
[6] IRIS value for chromium VI.
[7] Copper action level 1.3 mg/L; Lead action level 0.015 mg/L.
[8] This RfD is for Hydrogen Cyanide.
[9] Based on dental fluorosis in children, a cosmetic effect. MCLG based on skeletal fluorosis.
[10] Dietary manganese.

Chemicals	Standards			Status HA Document	Health Advisories						Cancer Group
					10-kg Child						
	Status Reg.	MCLG (mg/L)	MCL (mg/L)		One-day (mg/L)	Ten-day (mg/L)	RfD (mg/kg/day)	DWEL (mg/L)	Life-time (mg/L)	mg/L at 10^{-4} Cancer Risk	
Nitrate (as N)	F	10	10	D '93	10[1]	10[1]	1.6	-	-	-	-
Nitrite (as N)	F	1	1	D '93	1[1]	1[1]	0.16	-	-	-	-
Nitrate + Nitrite (both as N)	F	10	10	D '93	-	-	-	-	-	-	-
Selenium	F	0.05	0.05	-	-	-	0.005	0.2	0.05	-	D
Silver	-	-	-	F '92	0.2	0.2	0.005[2]	0.2	0.1	-	D
Strontium	-	-	-	D '93	25	25	**0.6**	20	**4**	-	D
Thallium	F	0.0005	0.002	F '92	0.007	0.007	0.00007	0.002	0.0005	-	-
White phosphorous	-	-	-	F '90	-	-	0.00002	0.0005	0.0001		D
Zinc	-	-	-	D '93	6	6	0.3	10	2	-	D
RADIONUCLIDES											
Beta particle and photon activity (formerly man-made radionuclides) [3]	F	-[4]	4 mrem	-	-	-	-	-	-	4 mrem/y	A
Gross alpha particle activity [3]	F	-[4]	15 pCi/L	-	-	-	-	-	-	15 pCi/L	A
Combined Radium 226 & 228 [3]	F	-[4]	5 pCi/L	-	-	-	-	-	-	-	A
Radon[3]	P	zero	300 pCi/L	-	-	-	-	-	-	150 pCi/L	A
Uranium[3]	P	zero	20 μg/L	-	-	-	0.003	-	-	-	A

[1] These values are calculated for a 4-kg infant and are protective for all age groups.
[2] Based on a cosmetic effect.
[3] Under review.
[4] No final MCLG, but zero proposed in 1991.

Secondary Drinking Water Regulations

Chemicals	Status	SDWR
Aluminum	F	0.05 to 0.2 mg/L
Chloride	F	250 mg/L
Color	F	15 color units
Copper	F	1.0 mg/L
Corrosivity	F	non-corrosive
Fluoride	F	2.0 mg/L
Foaming agents	F	0.5 mg/L
Iron	F	0.3 mg/L
Manganese	F	0.05 mg/L
Odor	F	3 threshold odor numbers
pH	F	6.5 — 8.5
Silver	F	0.1 mg/L
Sulfate	F	250 mg/L
Total dissolved solids (TDS)	F	500 mg/L
Zinc	F	5 mg/L

Microbiology

	Status Reg.	Status HA Document	MCLG	MCL	Treatment Technique
Cryptosporidium	F	F '93	-	TT	Systems that filter must remove 99% of *Cryptosporidium*
Giardia lamblia	F	-	-	TT	99.9% killed/inactivated
Legionella	F[1]	F '87	zero	TT	No limit; EPA believes that if *Giardia* and viruses are inactivated, *Legionella* will also be controlled
Heterotrophic Plate Count (HPC)	F[1]	-	NA	TT	No more than 500 bacterial colonies per milliliter.
Total Coliforms	F	-	5%	-	No more than 5.0% samples total coliform-positive in a month. Every sample that has total coliforms must be analyzed for fecal coliforms; no fecal coliforms are allowed.
Turbidity	F	-	NA	TT	At no time can turbidity go above 5 NTU (nephelometric turbidity units)
Viruses	F[1]	-	zero	TT	99.99% killed/inactivated

[1] Final for systems using surface water; also being considered for regulation under groundwater disinfection rule.

Consumer Acceptability Advisory Table

Chemicals	Status	MoE	Taste Threshold	Odor Threshold
Methyl tertiary butyl ether (MtBE)	F	At 20 µg/L, MoE for cancer effects is 40,000 or greater; MoE for non-cancer effects is 120,000 or greater. At 40 µg/L, MoE for cancer effects is 20,000 or greater; MoE for non-cancer effects is 60,000 or greater	40 µg/L	20 µg/L

MoE: Margin of Exposure which is calculated by dividing the NOAELs for non-cancer endpoints or LED_{10} for cancer effects by 20 µg/L or 40 µg/L.

Taste Threshold: Concentration at which the majority of consumers do not notice an adverse taste in drinking water; it is recognized that some sensitive individuals may detect a chemical at levels below this threshold.

Odor Threshold: Concentration at which the majority of consumers do not notice an adverse odor in drinking water; it is recognized that some sensitive individuals may detect a chemical at levels below this threshold.

APPENDIX C.1.5

STATE MAXIMUM CONTAMINANT LEVELS (MCLs)

(d) The owner of a private water supply system shall have the source of the private water supply sampled directly or sampled from a cold water faucet supplying water for domestic purposes that is located within the building. If water treatment is provided the owner shall have the sample collected prior to any treatment. The sample shall be at a minimum analyzed for total coliform, nitrate, nitrite, sodium, chloride, iron, manganese, hardness, turbidity, pH, sulfate, apparent color and odor. The local director of health shall require a sample to be analyzed for organic chemicals when reasonable grounds exist to suspect that organic chemicals may be present in the private water supply system. For purposes of organic chemical analyses reasonable grounds means any information that is known by the local director of health that indicates that at the time of sampling the particular private water supply system is located on or in proximity to land associated with the past or present production, storage, use, or disposal of organic chemicals or such information as derived from a phase I environmental site assessment. In the event nitrate is at or greater than 10 milligrams per liter and the local director of health has reasonable grounds to suspect such pesticides or herbicides are present the sample shall also be tested for alachlor, atrazine, dicamba, ethylene dibromide (EDB), metolachlor, simazine and 2, 4-D. For purposes of these seven pesticide or herbicide analyses, reasonable grounds includes but is not limited to any information that is known by the director of health at the time of sampling that the particular private water supply is located on or in proximity to land where any of these seven pesticides or herbicides are or were applied on or in proximity to land used for the production, storage, use or disposal of any of these seven pesticides or herbicides or such information as derived from a phase I environmental site assessment. Compliance with this section shall conform to the following conditions as applicable:

(1) The water quality of a newly constructed source of private water supply shall be sampled by a qualified individual and analyzed by an approved laboratory. The private water supply system shall have been disinfected and the system shall not be sampled until all disinfectant has dissipated. The results of such analyses and a statement signed by a qualified individual attesting to the exact address and location of sampling shall be reported by the approved laboratory to the local director of health of the municipality where the property is located within thirty (30) days of the completion of such analyses. Approval by the local director of health that the results of the laboratory analyses comply with MCLS applicable to this section shall be obtained before the private water supply is used for domestic purposes.

(2) If an existing private water supply system is sampled within six (6) months of the sale of the property on which the private water supply system is located, it must be sampled by a qualified individual and analyzed by an approved laboratory. The results of the analyses conducted shall be reported by the approved laboratory to the local director of health of the municipality where the property is located within thirty (30) days of the completion of the analyses. A test of a private water supply system shall not be required by this section as a consequence or condition of sale, exchange, transfer, purchase or rental of the real property on which the private water supply system is located.

(e) This section shall apply to purchase agreements or contracts for the sale of real estate executed on or after December 30, 1996 where title to real estate has not yet passed and to transfers of real estate occurring between December 30, 1996 and the effective date of these regulations where the tests or analyses described in this section were not performed prior to the transfer.

(Effective June 21, 1985; Amended December 30, 1996; Amended December 23, 1997.)

19-13-B102. Standards for quality of public drinking water

The following standards for the quality of drinking water, minimum treatment methods, and requirements for the design and operation of treatment works and water sources shall be met by all public water systems.

(a) Definitions. As used in Section 19-13-B102:

(1) "Action Level" means the concentration of lead or copper in water specified in subsection (j) (6) (B) of this section which determines, in some cases, the treatment requirements contained in subsection (j) (6) of this section that a water system is required to complete.

(2) "Active Source Of Supply" means all springs, streams, watercourses, brooks, rivers, lakes, ponds, wells, or underground water from which water is taken on a regular or periodic basis for water supply purposes. A number of wells drawing water from a single aquifer or more than one surface water body or a combination of surface water and groundwater sources connected to a common distribution system may, at the discretion of the department, be considered a single source of supply.

(3) "CFR" means code of federal regulations.

(4) "Certified Distribution System Operator" means an operator who has met the education, experience, and examination requirements specified in Section 25-32-11 of the regulations of Connecticut State agencies.

(5) "Certified Treatment Plant Operator" means an operator who has met the education, experience, and examination requirements of Section 25-32-9 of the regulations of Connecticut State agencies.

(6) "Coagulation" means a process using coagulant chemicals and mixing by which colloidal and suspended materials are destabilized and agglomerated into flocs.

(7) "Community Water System" means a public water system that serves at least twenty-five (25) residents throughout the year.

(8) "Complete Conventional Treatment" means coagulation, sedimentation, rapid granular filtration, and disinfection unless approved otherwise by the department.

(9) "Compliance Period" means a three (3) calendar-year period within a compliance cycle. Each compliance cycle has three (3) three-year compliance periods. Within the first compliance cycle, the first compliance period runs from January 1, 1993 to December 31, 1995; the second from January 1, 1996 to December 31, 1998; the third from January 1, 1999 to December 31, 2001.

(10) "Compliance Cycle" means the nine (9) calendar-year cycle during which public water systems shall monitor. Each compliance cycle consists of three (3) three-year compliance periods. The first calendar year cycle begins January 1, 1993 and ends December 31, 2001; the second begins January 1, 2002 and ends December 31, 2010; the third begins January 1, 2011 and ends December 31, 2019.

(11) "Confluent Growth" means a continuous bacterial growth covering the entire filtration area of a membrane filter, or a portion thereof, in which bacterial colonies are not discrete.

(12) "Consecutive Public Water System" means a public water system that purchases all of its water from another public water system and does not operate or control any other sources of supply.

(13) "Consumer" means one that meets the requirements of section 25-32a of the Connecticut General Statutes.

(14) "Contaminant" means any physical, chemical, biological, or radiological substance or matter in water as in section 1401 Title XIV of the Federal Public Health Service Act.

(15) "Conventional Filtration Treatment" means a series of processes including coagulation, flocculation, sedimentation, and filtration resulting in substantial particulate removal.

(16) "Corrosion Inhibitor" means a substance capable of reducing the corrosivity of water toward metal plumbing materials, especially lead and copper, by forming a protective film on the interior surface of those materials.

(17) "CT" or "CT CALC" means the product of the "residual disinfectant concentration" (C) in milligrams per liter (mg/l) determined before or at the first customer, and the corresponding "disinfectant contact time" (T) in minutes (i.e.,

"C" X "T"). If a public water system applies disinfectants at more than one point prior to the first customer, it shall determine the CT of each disinfectant sequence before or at the first customer to determine the total percent inactivation.

(18) "Department" means Connecticut Department of Public Health.

(19) "Diatomaceous Earth Filtration" means a process resulting in substantial particulate removal in which a precoat cake of diatomaceous earth filter media is deposited on a support membrane (septum), and while the water is filtered by passing through the cake on the septum, additional filter media known as body feed is continuously added to the feed water to maintain the permeability of the filter cake.

(20) "Direct Filtration" means a series of processes including coagulation and filtration but excluding sedimentation resulting in substantial particulate removal.

(21) "Disinfectant Contact Time" ("T" in CT calculations) means the time in minutes that it takes for water to move from the point of disinfectant application or the previous point of disinfectant residual measurement to a point before or at the point where residual disinfectant concentration ("C") is measured.

(A) Where only one "C" is measured (single application point), "T" is the time in minutes that it takes for water to move from the point of disinfectant application to a point before or at which residual disinfectant concentration ("C") is measured.

(B) Where more than one "C" is measured (multiple application points), "T" is:

(i) for the first measurement of "C," the time in minutes that it takes for water to move from the first point of disinfectant application to a point before or at the point where the first "C" is measured, and

(ii) for subsequent measurements of "C," the time in minutes that it takes for water to move from the previous "C" measurement point to the "C" measurement point for which the subsequent "T"is being calculated.

(C) Disinfectant contact time in pipelines shall be calculated by dividing the internal volume of the pipe by the maximum hourly flow rate through that pipe (plug flow).

(D) Disinfectant contact time within mixing basins, clearwells, and storage reservoirs shall be determined by tracer studies or an equivalent demonstration.

(22) "Disinfection" means a process which inactivates pathogenic organisms in water by chemical oxidants or equivalent agents.

(23) "Domestic Or Other Non-Distribution System Plumbing Problem" means a coliform contamination problem in a public water system with more than one service connection that is limited to the specific service connection from which the coliform-positive sample was taken.

(24) "EC Medium/Mug Tests" means analytical tests for waterborne bacteria as specified in 40 CFR 141.21(f).

(25) "Effective Corrosion Inhibitor Residual" means a concentration sufficient to form a passivating film on the interior walls of a pipe.

(26) "End Of Distribution System" means the last service connection on a dead-end water main.

(27) "EPA" means the United States Environmental Protection Agency.

(28) "Filtration" means a process for removing particulate matter from water by passage through porous media.

(29) "First Draw Sample" means a one-liter sample of tap water, collected in accordance with subsection (e) (8) (B) (ii) of this section, that has been standing in plumbing pipes at least six (6) hours and is collected without flushing the tap.

(30) "Flocculation" means a process to enhance agglomeration or collection of smaller floc particles into larger, more easily settleable particles through gentle stirring by hydraulic or mechanical means.

(31) "Groundwater Under The Direct Influence Of Surface Water" means any water beneath the surface of the ground with either significant occurrence of insects or other macroorganisms, algae, or large-diameter pathogens such as giardia lamblia, or significant and relatively rapid shifts in water characteristics such as turbidity, temperature, conductivity, or pH which closely correlate to climatological or surface water conditions. Direct influence shall be determined for individual sources in accordance with criteria established by the department. The department determination of direct influence may be based on site-specific measurements of water quality and/or documentation of well construction characteristics and geology with field evaluation according to "Department of Health Services criteria - determination of groundwater under the direct influence of surface water."

(32) "Initial Compliance Period" means the first full three-year compliance period which begins at least eighteen (18) months after promulgation. Initial compliance period runs from January 1, 1993 to December 31, 1995.

(33) "Large Water System" means a water system that serves more than fifty thousand (50,000) persons.

(34) "Lead Service Line" means a service line made of lead that connects the water main to a building inlet and any lead pigtail, gooseneck or other fitting connected to such lead line.

(35) "Legionella" means a genus of bacteria, some species of which have caused a type of pneumonia called legionnaires' disease.

(36) "Local director of health" means a city, town, borough, or district director of health or his authorized agent.

(37) "mg/l" means milligrams per liter.

(38) "Maximum Contaminant Level (MCL)" means the maximum permissible level of a contaminant in water that is delivered to any consumer of a public water system.

(39) "Maximum Contaminant Level Goal" or "MCLG" means the maximum level of a contaminant in drinking water at which no known or anticipated adverse effect on the health of persons would occur, and which allows an adequate margin of safety. Maximum Contaminant Level Goals are non-enforceable health goals.

(40) "Medium-Size Water System" means a water system that serves greater than three thousand three hundred (3,300) and less than or equal to fifty thousand (50,000) persons.

(41) "Method Detection Limit (MDL)" means the minimum concentration of a substance that can be measured and reported with ninety-nine percent (99%) confidence that the true value is greater than zero (0).

(42) "Near The First Service Connection" means at one of the twenty percent (20%) of all service connections in the entire system that are nearest the water supply treatment facility, as measured by water transport time within the distribution system.

(43) "Non-Community Water System" means a public water system that serves at least twenty-five (25) persons at least sixty (60) days out of the year and is not a community or a seasonal water system.

(44) "Non-Transient Non-Community Water System" (NTNC) means a public water system that is not a community system and that regularly serves at least twenty-five (25) of the same persons over six (6) months per year.

(45) "Notification Level" means the level of a contaminant that if exceeded shall require public notification by a public water system to its consumers.

(46) "Optimal Corrosion Control Treatment" means the corrosion control treatment that minimizes the lead and copper concentrations at users' taps while ensuring

that the treatment does not cause the water system to violate any drinking water statutes or regulations.

(47) "Other Unregulated Contaminants" means contaminants that meet or exceed the departments action level or contaminant level for which the maximum contaminant goal has been proposed for drinking water by EPA.

(48) "Physical Parameters" means color, turbidity, pH and odor.

(49) "Point Of Disinfectant Application" is the point where the disinfectant is applied and water downstream of that point is not subject to recontamination by surface water.

(50) "Point Of Entry" means a location on an active source of supply that is after any treatment and before entrance to the distribution system.

(51) "Public Water System" or "System" means any water company supplying water to fifteen (15) or more consumers or twenty-five (25) or more persons, based on the "Design Population" as defined in Section 16-262m-8(a) (3) of the regulations of Connecticut State Agencies, jointly administered by the department and the Department of Public Utility Control, daily at least sixty days (60) of the year.

(52) "Practical Quantification Level (PQL)" means the lowest concentration that can be reliably measured within specific limits of precision and accuracy during routine laboratory operating conditions.

(53) "Repeat Compliance Period" means any subsequent compliance period after the initial compliance period.

(54) "Repeat Sample" means a sample that is collected as a result of a total coliform-positive routine sample.

(55) "Residual Disinfectant Concentration" ("C" in CT calculations) means the concentration of disinfectant measured in mg/l in a representative sample of water.

(56) "Routine Sample" means a sample that is collected at a location and frequency as specified in the approved sample siting plan.

(57) "Sanitarian" means a person who is trained in environmental health and who is qualified to carry out educational and investigational duties in the fields of environmental health such as investigation of air, water, sewage, foodstuffs, housing and refuse by observing, sampling, testing and reporting; and who is licensed pursuant to section 20-361 of the Connecticut General Statutes.

(58) "Sanitary Survey" means an onsite inspection of the water source, facilities, equipment, operation and maintenance of a public water system for the purpose of evaluating the adequacy of such source, facilities, equipment, operation and maintenance for producing and distributing safe drinking water.

(59) "Seasonal Water System" means a public water system that operates on a seasonal basis for six (6) months or less per calendar year.

(60) "Second Compliance Period" means the second full three-year compliance period in the first compliance cycle. Second compliance period runs from January 1, 1996 to December 31, 1998.

(61) "Sedimentation" means a process for removal of solids before filtration by gravity or separation.

(62) "Service Line Sample" means a one (1) liter sample of water, collected in accordance with subsection (e) (8) (B) (iii) of this section, that has been standing for at least six (6) hours in a service line.

(63) "Single Family Structure" means a building constructed as a single-family residence that is currently used as either a residence or a place of business.

(64) "Slow Sand Filtration" means a process involving passage of raw water through a bed of sand at low velocity (generally less than 0.16 gallons per minute per square foot, gpm/sq. ft.) resulting in substantial particulate removal by physical and biological mechanisms.

(65) "Small Water System" means a water system that serves three thousand three hundred (3,300) persons or fewer.

(66) "Source Water" means raw water before any kind or type of treatment at the source of supply.

(67) "Special Purpose Sample" means a sample that is taken to determine whether disinfection practices are sufficient following routine maintenance work on the distribution system.

(68) "Surface Water" means all water that is open to the atmosphere and subject to surface runoff.

(69) "System With A Single Service Connection" means a system that supplies drinking water to consumers via a single service line.

(70) "Tier I Violation" means a public water system has failed to comply with requirements for any of the following:

(A) an applicable maximum contaminant level (MCL) or Action Level;

(B) regulations concerning quality and quantity of drinking water ready for consumption with the exception of odor, color, pH and sodium content;

(C) applicable treatment technique or any schedule prescribed pursuant to a variance or exemption.

(71) "Tier II Violation" means a public water system which:

(A) has failed to perform monitoring requirements according to this section; or

(B) has failed to comply with a current testing procedure established by EPA; or

(C) is subject to a variance or an exemption.

(72) "Too Numerous To Count" means that the total number of bacterial colonies exceeds two hundred (200) on a forty-seven (47) mm diameter membrane filter used for coliform detection.

(73) "Transient Non-Community Water System" means a non-community water system that does not meet the definition of a non-transient non-community water system.

(74) "Virus" means a microorganism of fecal origin which is infectious to humans by waterborne transmission.

(75) "Water Company" means one that meets the requirements of Section 25-32a of the Connecticut General Statutes.

(76) "Water System" means all community water systems, non-transient non-community water systems and seasonal water systems.

(77) "Waterborne Disease Outbreak" means the significant occurrence of acute infectious illness, epidemiologically associated with the ingestion of water from a public water system as determined by the department.

(78) "Zone of Influence" means the land area that directly overlies and has the same horizontal extent as the part of the water table or other potentiometric surface that is perceptibly lowered by the withdrawal of water. The zone of influence delineated by the use of modeling is that area of land in which the water table or potentiometric surface is lowered by at least one-half (0.5) foot. In the event of inadequate information and data to delineate the zone of influence, a radius of one (1) mile shall be utilized for unconsolidated aquifer groundwater sources and a radius of one thousand (1000) feet shall be utilized for confined and bedrock aquifer groundwater sources.

(b) Watershed survey. A water utility having an active surface water source of supply under its control shall make a sanitary survey of the watershed to the intake at least annually. A report on the survey shall be submitted to the State Health Department by March 1 each year covering the preceding calendar year.

(c) Standards for quality of untreated water prior to treatment. All parameters shall be tested for each surface source at least annually, except bacteriological and physical tests which shall be done quarterly.

Groundwater sources shall be tested for these parameters when the department determines that the source is vulnerable to contamination.

Parameter	*Disinfection and Chemical Treatment*	*Degree of Treatment Filtration*
(1) BACTERIOLOGICAL		
Coliform Organisms*	Not to exceed 100/100 ml monthly monthly average, based on a running arithmetic average for the most recent twelve month period. No individual sample is to exceed 500/100 ml	Not to exceed 20,000/100 ml as measured by a monthly geometric mean.

*If coliform organisms are demonstrated to be not associated with a fecal source on the basis sanitary survey and differential tests, exception may be made.

(2) PHYSICAL		
Color	Not to exceed twenty (20) standard units in more than ten percent (10%) of samples for most recent twelve (12) month period.	Not to exceed two hundred fifty (250) standard units as measured by a monthly geometric mean.
Turbidity	The turbidity level as specified in 40 CFR 141.74 (a) (4), in a representative sample of the source water immediately prior to the first or only point of disinfection application shall not exceed (5) Nephelometric Turbidity Units (NTU).	Not to exceed two hundred fifty (250) standard units as measured by a monthly geometric mean.
(3) INORGANIC CHEMICALS		
Arsenic	.05	.05
Barium	1	1
Cadmium	.01	.01
Chloride	250	250
Chromium	.05	.05
Copper	.05	1.0
Cyanide	.01	0.2
Flouride	2.0	2.0
Lead	.05	.05
MBAS (methylen blue active substance)	0.5	0.5
Mercury	.002	.005
Nitrate plus Nitrite as N	10	10
Selenium	.01	.01
Silver	.05	.05

(4) PESTICIDES	ALL DEGREES OF TREATMENT LEVEL (mg/l)
Endrin	0.002
Lindane	0.0002
Methoxychlor	0.04
Toxaphene	0.003
2,4-D	0.07
2,4,5-TP (silvex)	0.05

(d) Facility location. Such as but not limited to treatment plants, pumping stations, storage tanks, etc., but not including water intakes and connecting pipelines.

(1) New facilities are to be located:

(A) Above the level of the one hundred year flood.

(B) Where chlorine gas will not be stored or used within three hundred feet of any residence.

(C) Where the facility is not likely to be subject to fires or other natural or manmade disasters.

(2) The state health department must be notified before entering into a financial commitment for a new public water system or increasing the capacity of an existing public water system, and the approval of the state health department must be obtained before any construction is begun. This includes construction of supply and treatment works, transmission lines, storage tanks, pumping stations and other works of sanitary significance. It does not include the routine extension of laterals or tapping of new service connections.

(e) Water ready for consumption.

(1) Physical Tests. Color is not to exceed fifteen (15) standard units leaving the treatment plant nor at representative sampling points in the distribution system. Turbidity is not to exceed five (5) standard units at representative sampling points in the distribution system.

Odor is not to exceed a value of two (2) in the treatment plant effluent on a scale of 0-5 as follows:

0 - None	3 - Distinct
1 - Very Faint	4 - Decided
2 - Faint	5 - Strong

For systems that are not required to install optimal corrosion control treatment under subsection (j) (7) of this section, the pH value is not to be less than 6.4 nor to exceed 10.0 entering the distribution system.

(2) Inorganic Chemicals

Community, non-transient non-community and seasonal water systems shall test for inorganic chemicals specified below. Transient non-community water systems shall test for nitrate and nitrite only.

Inorganic chemicals (a) and their limits

Chemical	Maximum Contaminant Level (mg/l)	Maximum Contaminant Level Goal (mg/l)
Antimony	0.006	
Arsenic	0.05	
Asbestos	7.0 MFL[fn1]	
Barium	2.0	
Beryllium	0.004	
Cadmium	0.005	
Chromium	0.1	
Cyanide	0.2	
Fluoride	4.0	
Mercury	0.002	
Nickel	0.1	
Nitrate nitrogen	10.0 (as N)	
Nitrite nitrogen	1.0 (as N)	
Nitrate nitrogen plus nitrite nitrogen	10.0 (as N)	
Selenium	0.05	
Silver	0.05	
Sulfate	**	
Chloride	250	
Thallium	0.002	

Lead	***	(0)
Copper	***	1.3

	Notification Level (mg/l)
Sodium	28.0

Notes

(a) The method detection limits for inorganic chemicals shall conform to those accepted and approved by EPA.

** MCL has not been established for this chemical.
*** See Section 19-13-B102 (j) (6).
[1]MFL = million fibers per liter longer than ten (10)micrometers.

(3) Pesticides, Herbicides and PCBs. Community, non-transient non-community and seasonal water systems shall test for pesticides, herbicides and PCB specified below.

Pesticides, Herbicides, PCB, and their limits

Chemical[1]	**Maximum Contaminant Level (mg/l)**
Alachlor	0.002
Aldicarb	**
Aldicarb sulfoxide	**
Aldicarb sulfone	**
Aldrin	**
Atrazine	0.003
Benzo(A)pyrene	0.0002
Butachlor	**
Carbaryl	**
Carbofuran	0.04
Chlordane	0.002
Dalapon	0.2
Di(2-ethylhexyl)adipate	0.4
Di(2-ethylhexyl)phthalates	0.006
Dicamba	**
Dieldrin	**
Dinoseb	0.007
Diquat	0.02
Dibromochloropropane (DBCP)	0.0002
2, 4-D	0.07
Ethylene dibromide (EDB)	0.00005
Endrin	0.002
Endothall	0.1
Glyphosate	0.7
Heptachlor	0.0004*
Heptachlor epoxide	0.0002*
Hexachlorobenzene	0.001
Hexachlorocyclopentadiene	0.05
3-Hydroxycarbofuran	**
Lindane	0.0002
Methoxychlor	0.04
Methomyl	**
Metolachlor	**
Metribuzin	**

Oxamyl (vydate)	0.2
Picloram	0.5
Propachlor	**
Simazine	0.004
2, 3, 7, 8-TCDD (dioxin)	0.00000003
Polychlorinated biphenyls (PCB)	0.0005
Pentachlorophenol	0.001
Toxaphene	0.003
2, 4, 5-TP (silvex)	0.05

Notes:

[1] The method detection limits for all pesticides, herbicides Vand PCB shall conform to those accepted and approved by EPA.

** MCL has not been established for this chemical.

* If monitoring results in detection of one (1) or more ofthese contaminants, then subsequent monitoring shall analyze forall these contaminants.

(4) Organic Chemicals. Community, non-transient non-community (NTNC) and seasonal water systems shall test for organic chemicals specified below.

Organic chemicals[(a)] and their limits.

Chemical[(b)]	**Maximum Contaminant Level (mg/l)**
Benzene	0.005
Bromobenzene	**
Bromomethane	**
n-Butyl Benzene	**
Carbon Tetrachloride	0.005
Chlorobenzene	0.1
Chloroethane	**
Chloromethane	**
o-Chlorotoluene	**
p-Chlorotoluene	**
Dibromomethane	**
m-Dichlorobenzene	**
o-Dichlorobenzene	0.6
p-Dichlorobenzene	0.075
1, 1-Dichloroethane	**
1, 2-Dichloroethane (EDC)	0.005
1, 1-Dichloroethylene	0.007
cis-1, 2-Dichloroethylene	0.07
Trans-1, 2-Dichloroethylene	0.1
Dichloromethane (Methylene chloride)	0.005
1, 2-Dichloropropane	0.005
1, 3-Dichloropropane	**
2, 2-Dichloropropane	**
1, 1-Dichloropropene	**
1, 3-Dichloropropene	**
Ethylbenzene	0.7
Methyl Tert Butyl Ether (MTBE)	**
Naphthalene	**
n-Propyl Benzene	**
Styrene	0.1
1, 1, 1, 2-Tetrachloroethane	**
1, 1, 2, 2-Tetrachloroethane	**

Tetrachloroethylene	0.005
Toluene	1.0
Total Trihalomethanes (TTHM)	0.100
Bromodichloromethane	*
Bromoform	*
Chlorodibromomethane	*
Chloroform	*
1, 1, 1-Trichloroethane	0.200
1, 1, 2-Trichloroethane	0.005
1, 2, 4-Trichlorobenzene	0.07
Trichloroethylene	0.005
1, 2, 3-Trichloropropane	**
1, 2, 4-Trimethylbenzene	**
1, 3, 5-Trimethylbenzene	**
Vinyl Chloride[(c)]	0.002
Xylenes (total)	10.0
m-Xylene	***
o-Xylene	***
p-Xylene	***

Notes:

* The MCL for Total Trihalomethanes (TTHM) is 0.100 mg/l, this is the sum of the four (4) constituent Trihalomethanes.

** MCL has not been established for this chemical.

*** The MCL for Xylenes (total) is 10.0 mg/l, this is the sum of the three (3) constituent Xylenes.

(i) The method detection limit (MDL) for all organic chemicals is 0.0005 mg/l with the exception of MTBE which has an MDL of 0.002 mg/l.

(ii) The department may require the testing of other chemicals for which a Maximum Contaminant Level Goal has been proposed by EPA or which the department has reason to believe may be health threatening.

(iii) Quarterly analysis for vinyl chloride is required for ground water systems only when one or more of the following compounds are detected: trichloroethylene, 1, 2 Tetrachloroethylene, 1, 2 Dichloroethane, 1, 1, 1 Trichloroethane, Cis 1, 2 Dichloroethylene, Trans 1, 2 Dichloroethylene, or 1, 1 Dichloroethylene. If the first analysis does not detect vinyl chloride, the Department may reduce the frequency of vinyl chloride monitoring to once every three (3) years.

(5) Radioactivity.

Natural Radioactivity

Contaminant	*Maximum Allowable Level Picocuries Per Liter (pCi/l)*
Combined radium-226 and radium-228	5
Gross alpha particle activity (including radium-226 but excluding radon and uranium)	15

Procedure. Community systems are to test gross alpha by June 1, 1979. They are to test a composite sample of four (4) quarterly samples, or tests may be made on each of four (4) quarterly samples and the results averaged for reporting purposes.

When gross alpha is more than five (5) pCi/l, the sample is to be tested for radium-226 also. When radium-226 exceeds three (3) pCi/l, the sample shall then be tested for radium-228 in addition.

Tests are to be repeated every four (4) years for ground water supplies and every four (4) years for surface water supplies.

Non-community supplies are not required to test.

Man-Made Radioactivity

Contaminant	*Annual Average Maximum Allowable Level*
Dose equivalent of beta particles plus photon radioactivity	4 millirems
or	
Gross beta particle activity	50 pCi per liter
Tritium	20,000 pCi per liter
Strontium-90	8 pCi per liter
Dose equivalent of Tritium plus Strontium-90	4 millirems

Systems utilizing surface water and serving more than 100,000 persons are to test a composite of four (4) quarterly samples or are to average the results of individual tests on four (4) quarterly samples by June 1, 1979. Tests are to be repeated every four (4) years.

Systems using only groundwater shall not test. Systems serving less than 100,000 persons shall not test.

(6) Total coliforms.

(A) The MCLG for microbiological contaminants which includes E. coli and fecal coliforms is zero (0).

(B) The maximum contaminant level (MCL) is based on the presence or absence of total coliforms in a sample, rather than coliform density. Compliance shall be based on a monthly MCL for total coliforms.

(i) For a system which collects at least forty (40) samples per month, if more than five percent (5.0%) of the samples collected during a month are total coliform-positive, the system is in violation of the MCL for total coliforms.

(ii) For a system which collects fewer than forty (40) samples per month, if more than one (1) sample collected during a month is total coliform-positive, the system is in violation of the MCL for total coliforms.

(C) A system shall determine compliance with the MCL for total coliforms for each month in which it is required to monitor for total coliforms.

(D) Analytical methodology.

(i) Analytical methods for total coliform. The analysis for total coliform should be conducted using either the membrane filter (MF) technique, or the 10-tube multiple tube fermentation (MTF) technique (five (5) tubes may be utilized provided they collectively equal one hundred (100) ml), or the presence-absence (P-A) coliform test, or the colilert system as approved and specified in 40 CFR 141.21 (f). The standard sample volume required for total coliform analysis, regardless of analytical method used, is one hundred (100) ml.

(ii) Analytical methods for fecal coliforms. The use of EC medium for determining the presence of fecal coliform in a total coliform-positive culture is required. The procedure for fecal coliform analysis shall conform to those approved by EPA.

(iii) Analytical methods for E. Coli. The analysis for E. Coli shall be conducted using either the EC medium plus MUG (4-methylumbelliferyl-B-D-glucoronice), the nutrient agar plus MUG test or other testing methods which conform to those approved by EPA.

(7) Monitoring requirements

(A) The monitoring frequency for total coliforms and physical parameters for a community water system (CWS) is based on the population served by the system, and the frequency is as follows:

Table 1

Population Served	Minimum Number Of Routine Samples Per Month
25 to 1,000	1
1,001 to 2,500	2
2,501 to 3,300	3
3,301 to 4,100	4
4,101 to 4,900	5
4,901 to 5,800	6
5,801 to 6,700	7
6,701 to 7,600	8
7,601 to 8,500	9
8,501 to 12,900	10
2,901 to 17,200	15
17,201 to 21,500	20
21,501 to 25,000	25
25,001 to 33,000	30
33,001 to 41,000	40
41,001 to 50,000	50
50,001 to 59,000	60
59,001 to 70,000	70
70,001 to 83,000	80
83,001 to 96,000	90
96,001 to 130,000	100
130,001 to 220,000	120
220,001 to 320,000	150
320,001 to 450,000	180
450,001 to 600,000	210
600,001 to 780,000	240
780,001 to 970,000	270

If a CWS serving twenty five (25) to one thousand (1,000) persons has no history of total coliform violation in its current configuration, and a sanitary survey conducted in the past five (5) years shows that the system is supplied solely by a protected ground water source, and is free of sanitary defects pursuant to sections 19-13-B51a through 19-13-B51m of the Regulations of Connecticut State Agencies; the department may, if it is satisfied that this water is safe for consumption, reduce the monitoring frequency specified to no less than one (1) sample per quarter. Department approval of the reduced monitoring frequency shall be in writing. Water samples shall be collected by technical personnel employed by an environmental laboratory approved by the department under section 25-40 of the Connecticut General Statutes, or a

certified distribution system operator, or a certified treatment plant operator, or a sanitarian, or an employee of the department or a person under the direct supervision of either a certified distribution system, or a certified treatment plant operator.

(B) The monitoring frequency for total coliforms and physical parameters for non-community water systems is as follows:

(i) A non-community water system using only ground water sources that are not under the direct influence of surface water and serving one thousand (1,000) persons or fewer shall monitor during each calendar quarter that the system provides water to the public, except that the department may reduce this monitoring frequency, in writing, to no less than once a year if a sanitary survey shows that the system is free of sanitary defects pursuant to sections 19-13-B51a through 19-13-B51m of the Regulations of Connecticut State Agencies.

(ii) A non-community water system using only ground water sources that are not under the direct influence of surface water and serving more than one thousand (1,000) persons shall monitor as specified in Table 1. Monitoring shall begin no later than December 31, 1990.

(iii) A non-community water system using surface water, in total or in part, shall monitor at the frequency specified in Table 1, regardless of the number of persons it serves. Monitoring shall begin no later than December 31, 1990.

(iv) A non-community water system using groundwater under the direct influence of surface water, shall monitor at the frequency specified in Table 1. Monitoring shall begin six (6) months after the department determines that the ground water is under direct influence of surface water.

(C) Community, non-transient non-community and seasonal water systems shall conduct monitoring beginning in the initial compliance period to determine compliance with the MCLs specified in subdivisions 2, 3, and 4 of subsection 19-13-B102 (e) of the regulations of Connecticut State Agencies. Systems serving fewer than one hundred and fifty (150) service connections shall begin monitoring in the second compliance period for the following chemicals: Benzo(a)pyrene, Dalapon, Di(2-ethylhexyl) adipate, Di(2-ethylhexyl)phthalate, Dinoseb, Diquat, Endothall, Endrin, glyphosate, Hexachlorobenzene, Hexachlorocyclopentadiene, oxamyl(vydate), Picloram, Simazine, 2, 3, 7, 8-TCDD (Dioxin).

(i) Monitoring frequency for community, non-transient non-community and seasonal water systems

Contaminant	BASE SAMPLING REQUIREMENT		REDUCED SAMPLING REQUIREMENT[5]	
	Ground water systems	*Surface water[4] systems*	*Ground water systems*	*Surface water[4] systems*
Asbestos	Every 9 yrs.	Every 9 yrs.	Not Applicable	Not Applicable
Nitrate[1] & Nitrite[1]	Annually	Quarterly	Not Applicable	Annually[2]
Inorganic Chemicals	Every 3 yrs.	Annually	Not Applicable	Not Applicable
Organic Chemicals	Quarterly[6]	Quarterly[6]	Annually[*] [6]	Annually[3]
Pesticides, Herbicides and PCBs	Quarterly[6]	Quarterly[6]	Systems serving more than 3300 persons: two quarters per year ever 3 years[3] Systems serving 3300 persons or less; every 3 years[3]	

Notes:

(1) Each transient non-community water system shall monitor annually for nitrate and nitrite beginning January 1, 1993.

(2) Applicable only if all analytical results from four consecutive quarters are less than fifty percent (50%) of the MCL.

(3) Applicable only if no single contaminant is detected in the results of the base sampling requirement.

(*) Reduce to once every three (3) years after three (3) years of no detection of any contaminant in annual sampling.

(4) Or groundwater under the influence of surface water systems.

(5) Applicable only if granted in writing by the department.

(6) See sections 19-13-B102(e) (7) (C) (x), (xiv) and (xvi) for exception.

(ii) A system shall monitor quarterly beginning in the next quarter, if in any one sample: inorganic chemical, with the exception of nitrate and nitrite, exceeds the MCL; organic chemical, pesticide, herbicide or PCB is detected at a level exceeding the MDL; or nitrate or nitrite exceeds or equals fifty percent (50%) of the MCL.

(iii) The department may decrease the quarterly monitoring requirement of Section 19-13-B102 (e) (7) (C) (ii) for inorganic chemicals, with the exception of nitrate and nitrite, to the base sampling requirement and organic chemicals along with pesticides, herbicides and PCB to annual sampling provided it has determined that the system is below the MCL for a minimum of two (2) consecutive quarters for a ground water system and a minimum of four (4) consecutive quarters for a surface water system. The department may decrease the quarterly monitoring requirement for systems which violated the MCL for organic chemicals, pesticides, herbicides and PCB to annual sampling provided that the system is below the MCL for a minimum of four (4) consecutive quarters. The department may decrease the quarterly monitoring requirement for systems which exceeded the MDL for a contaminant that does not have an established MCL, to the reduced sampling requirement.

(iv) After three (3) consecutive annual samples as required in Section 19-13-B102 (e) (7) (c) (iii) are less than the MDL the department may allow a system to reduce the sampling frequency for organic chemicals, pesticides herbicides and PCB to the reduced sampling requirement.

(v) After four (4) consecutive quarterly samples as required in Section 19-13-B102 (e) (7) (c) (ii) are less than the MCL for a groundwater system and less than fifty percent (50%) of the MCL for a surface water system, the department may allow a system to reduce the sampling frequency for nitrate and nitrite to annually.

(vi) After the initial round of quarterly sampling is completed, a system that is monitoring annually shall take subsequent samples during the quarter(s) that resulted in the highest analytical result.

(vii) The department may increase the required monitoring frequency to detect variations within the system.

(viii) Each public water system shall monitor at the time designated by the department within each compliance period.

APPENDIX C.1.6

CONNECTICUT WATER QUALITY STANDARDS (WQSs)

State of Connecticut
Department of
Environmental Protection
79 Elm Street
Hartford, CT 06106-5127

Arthur J. Rocque, Jr., Commissioner

Water Quality Standards

Surface Water Quality Standards **Effective April 9, 1997**
Ground Water Quality Standards **Effective April 12, 1996**

For further information contact:

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PREFACE

The Water Quality Standards and Criteria (WQS) set forth in this publication are an important element in Connecticut's clean water program. The WQS set an overall policy for management of water quality in accordance with the directive of Section 22a-426 of the General Statutes. In simple terms the policies can be summarized by saying that the Department of Environmental Protection shall:

- Protect surface and ground waters of high quality from degradation.
- Segregate waters used for drinking from those that play a role in waste assimilation.
- Restore surface waters that have been used for waste assimilation to conditions suitable for fishing and swimming.
- Restore degraded ground water to protect existing and designated uses.
- Provide a framework for establishing priorities for pollution abatement and State funding for clean up.
- Adopt standards that promote the State's economy in harmony with the environment.

There are three elements that make up the WQS. The first of these are the Standards themselves. This is the text of the policy statements (pages 5 through 10) which discuss issues such as classification of different water resources according to the desirable use, anti-degradation, allowable types of discharges, the fundamental principles of waste assimilation, and a variety of other subjects. The second element, also contained in this document, are the Criteria (pages 10 through 21). These are descriptive and numerical standards that describe the allowable parameters and goals for the various water quality classifications. The final elements are the WQS and Classification Maps which show the classification assigned to each surface and groundwater resource throughout the State. These maps also show the goals for the water resources, and in that manner provide a blueprint and set of priorities for our efforts to restore water quality.

These three elements comprise the WQS and are adopted using the public participation procedures contained in Section 22a-426 of the General Statutes. The Standards, Criteria and Maps are reviewed and revised roughly every three years. Any change is considered a revision requiring public participation. The public participation process consists of public meetings held at various locations around the State, notification of all chief elected officials, notice in the Connecticut Law Journal and a public hearing. The Classification Maps are the subject of separate public hearings which are held for the adoption of the map covering each major drainage basin in the State.

As with any complex program, it is always difficult to anticipate the questions that the public may have about either proposed or adopted standards. The staff of the Planning and Standards Division of the Bureau of Water Management are the best source of information about these WQS and are always willing to provide answers to your questions. They may be contacted by writing to:

Assistant Director
Planning and Standards Division
Bureau of Water Management
Department of Environmental Protection
79 Elm Street
Hartford, Connecticut 06106-5127

The WQS do not stand alone; rather, they are one critical element in our program to protect and improve water quality. The WQS are written in response to, and in concert with, the principles of Connecticut's Clean Water Act, which is in Chapter 446k of the General Statutes. The Statutes set the broad outline and legal framework for our entire program. They establish the authorities and procedures for the WQS, for permitting discharges to the waters of the State and for the abatement of pollution. Within the framework of the Statutes, the WQS establish broad policy and objectives to meet the statutory goals. These objectives are then carried out by means of specific procedures and requirements of

statutory sections and even more detailed regulations. These include Statutes and Regulations for the permitting of discharges to the waters of the State, hazardous materials management, solid waste management, water diversions, structures, dredging, wetlands and others.

As an example of how these pieces fit together the following may be of assistance.

- Section 22a-430 of the General Statutes allows and sets procedures for the permitting of discharges of treated wastewater to the waters of the State.
- The WQS set forth the types of treated wastewater discharges that can be allowed in various water quality classifications in order to meet the statutory goals. In addition, the WQS provide the principles of waste assimilation and the goals for the receiving waters.
- If the type of discharge is allowed, then the details of application procedures and requirements for treatment, monitoring and reporting of the specific discharge are provided by Sections 22a-430-1 through 4 of the Regulations of Connecticut State Agencies.

The WQS provide policy guidance in many different areas, all of which are subject to detailed statutory and regulatory requirements. Some examples are as follows:

- Decisions on the acceptability of a type of discharge to a specific water resource.
- Any decision on the siting of a landfill.
- Decisions on the type of remediation and priority for the cleanup of hazardous waste sites.
- Decisions on the priority assigned to improvements of municipal sewerage systems and the priority for funding such projects.
- Decisions on Water Quality Certification pursuant to Section 401 of the Federal Clean Water Act, which are required for any federally permitted activity which results in a point or nonpoint source discharge to a surface water resource.

If you have further questions about the Water Quality Standards please do not hesitate to contact the staff.

I. INTRODUCTION

Section 22a-426 of the General Statutes requires that the Commissioner of Environmental Protection adopt standards of water quality for all the State's waters. The purpose of these standards is to provide clear and objective statements for existing and projected water quality and the general program to improve Connecticut's water resources. They also serve to qualify the state and its municipalities for available federal grants for water pollution control.
Section 22a-426 mandates these standards shall:

(1) Apply to interstate waters or portions thereof within the State.

(2) Apply to such other waters within the State as the Commissioner may determine is necessary.

(3) Protect the public health and welfare and promote the economic development of the State.

(4) Preserve and enhance the quality of State waters for present and prospective future use for public water supplies, propagation of fish and aquatic life and wildlife, recreational purposes and agricultural, industrial and other legitimate uses.

(5) Be consistent with the health standards as established by the Department of Public Health Services.

Water Quality Classifications, based on the adopted Water Quality Standards (WQS), establish designated uses for surface and ground waters and identify the criteria necessary to support those uses. The designated use and criteria goals serve to focus the department's water quality management activities, including establishment of water quality based treatment controls and strategies required by the Federal Clean Water Act.

Section 303 of the Federal Clean Water Act requires state adoption of surface WQS and their review and modification at least once every three years. Federal law defines WQS as the identification of water quality goals of a water resource through the assignment of designated uses to be made of the water and by setting criteria necessary to protect the uses.

Federal regulations specify that WQS should, wherever attainable, provide water quality for the protection and propagation of fish, shellfish and wildlife and for recreation in and on the water, taking into consideration their use and value for public water supplies, propagation of fish, shellfish and wildlife, recreation in and on the water and agricultural, industrial and other purposes including navigation.

Although federal law requires adoption of WQS for surface waters, WQS for ground waters are not subject to federal review and approval. Connecticut's WQS recognize that surface and ground waters are interrelated and address the issue of competing use of ground waters for drinking and for waste water assimilation. These standards specifically identify ground water quality goals, designated uses and those measures necessary for protection of public and private drinking water supplies; the principal use of Connecticut's ground waters.

II. SURFACE WATER STANDARDS

1. It is the State's goal to restore or maintain all surface water resources, including wetlands, to a quality consistent with their existing and designated uses and supportive criteria.

2. Existing water uses and the level of water quality necessary to protect the existing and designated uses shall be maintained and protected.

3. Surface waters with a classification goal of B or SB and with an existing quality better than established standards shall be maintained at their existing high quality, unless the Commissioner finds, after adequate opportunity for intergovernmental review and public participation, that allowing lower water quality is necessary to accommodate overriding statewide economic or social development, and that existing and designated uses will be fully protected. The implementation procedures for the anti-degradation provisions of the State Water Quality Standards are provided in full in Appendix A.

4. For new or expanded discharges to high quality waters, the Commissioner shall, at a minimum, require of discharge permit applicants a level of treatment meeting the highest applicable standards of performance promulgated pursuant to the Federal Clean Water Act as well as Sections 22a-426, 22a-430 and 22a-436 of the General Statutes, and require additional treatment measures deemed necessary to prevent pollution and maintain high water quality. The Commissioner shall also require the use of appropriate Best Management Practices for control of point and nonpoint source discharges to high quality waters.

5. Where high quality waters constitute an outstanding National resource, such as waters of National and State parks and forests and wildlife refuges and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected. The lowering of water quality is prohibited for such waters except where limited activities will result in only temporary and insignificant changes in water quality.

6. Standard (1) shall be met except where a Use Attainability Analysis demonstrates that the water resource has been irreparably altered to the extent certain designated uses have been permanently lost. The determination of where these exceptions exist, including identification of the specific uses which have been permanently lost and designation of quality criteria necessary to protect all other existing, designated and potential future uses of the water resource, shall be

made by the Commissioner as a revision to the Water Quality Standards in accordance with Section 22a-426 and shall be subject to the approval of the Federal Environmental Protection Agency.

7. Any person or municipality requesting a change in Water Quality Classification shall demonstrate to the Commissioner that the proposed new Class designation is consistent with all existing or designated uses made of, or presently possible in, such waters. Any such change in a water quality classification shall be considered a revision of the Water Quality Standards and subject to the public participation requirements of Section 22a-426 of the General Statutes. With regard to any such change in Water Quality Classification the provisions of Standards (3) and (4) of this Standard shall be met.

8. Water quality criteria do not apply to conditions brought about by natural causes. Natural hydrologic and geologic conditions may cause excursions from established criteria. The meaning of the word 'natural' is not limited to only those conditions which would exist in water draining from pristine land. Conditions which exist in the water, in part due to normal uses of the land, may be considered natural. It shall not be considered normal use of the land if excursions from established criteria result in the loss of an existing or designated use.

9. Discharges to surface, waters shall be limited as follows:

   (A) Class AA, A and SA surface waters: discharges may be permitted by the Commissioner from public or private drinking water treatment systems, dredging and dredge material dewatering operations and other clean water discharges. In Class AA surface waters such discharges shall be subject to the approval of the Commissioner of Health Services. The Commissioner may authorize other discharges to waters with a water quality goal of SA, A or AA provided the Commissioner finds such discharge will be of short duration and is necessary to remediate surface water or ground water pollution. Any such discharge must be treated or controlled to a level which in the judgement of the Commissioner, protects aquatic life and public health.

   (B) Class B and SB surface waters: discharges may be permitted for all those allowed in Class AA, A and SA waters, cooling water discharges, discharges from municipal and industrial wastewater treatment systems and other discharges subject to the provisions of Section 22a-430.

   (C) The designation of surface waters as Class C/B, D/B, SC/SB or SD/SB shall not be a reason for authorizing a new discharge that would not allow the receiving surface waters to attain Class B or Class SB designated uses and quality criteria.

   (D) The designation of surface waters as Class B/AA, B/A, C/A, SB/SA, or SC/SA shall not be a reason for authorizing a new discharge that would be inconsistent with Class AA, A or SA water quality goals.

10. The Commissioner may, on a case-by-case basis, establish zones of influence when permitting discharges to surface waters to allocate a portion of the receiving water resource for mixing and assimilation of a discharge effluent. Unless otherwise indicated in these Standards, the water quality criteria for a given class apply outside a zone of influence for a discharge permitted pursuant to Section 22a-430 of the General Statutes. The zone of influence shall not preclude attainment of any existing or designated uses of the receiving water resource. The spatial dimensions and/or volume of receiving water allocated to zones of influence will be established based on the unique physical, chemical and biological characteristics of the receiving waterbody. The Commissioner may require Permit applicants to provide information on receiving water and waste water characteristics including the volume of flow and spatial dimensions required for mixing and assimilation of waste. Considerations to be used in establishing zones of influence include. but are not limited to:

   (A) Characteristics of the discharge, such as the volume, strength and persistence of any substances in the discharge effluent, potential bioaccumulation or bioconcentration of these substances in aquatic organisms, the

temperature of the discharge and the potential for any substances, either singly or in combination with other substances present in the effluent or receiving waterbody, to result in an unacceptable risk to human health or the environment.

(B) Allowance for a continuous zone of passage for free swimming and drifting organisms.

(C) Impingement upon spawning grounds or nursery areas of sensitive aquatic organisms or areas utilized by aquatic organisms for shelter and living space to the extent that the environmental value of the receiving waterbody is significantly reduced.

(D) The location of other discharges to the receiving waterbody to insure that the cumulative effect of adjacent zones of influence will not significantly reduce the environmental value or preclude any existing or designated uses of the receiving waterbody.

Assessment of environmental value will be based on a number of receiving water characteristics, including but not limited to: type of waterbody, velocity, depth, number and type of aquatic habitats, migration patterns, nature of the food chain, level of productivity, water temperature, ability of tributaries to provide recruitment, presence of endangered species and value to human uses aesthetic, commercial and sport fishing and recreational uses.) As a guideline, zones of influence for assimilation of thermal discharges shall be limited to no more than 25% of the cross-sectional area or volume of flow.

11. The minimum average daily flow for seven consecutive days that can be expected to occur once in ten years under natural conditions (7Q 10) is the minimum flow to which the standard for surface waters apply, except when a stream has been historically regulated to result in low flows below that level, in which case the standards apply to that low flow determined by the Department of Environmental Protection's Minimum Flow Regulations as amended (Connecticut General Statutes Section 26-141a); the Department's Diversion Permit Program (Section 22a-365 through 22a-378); or the Federal Energy Regulatory Commission's hydropower licensing process (Federal Power Act 18 USC SEC 791). Maintaining a long-term flow of 7Q10 or less may result in significant stress on the physical and biological quality of surface waters. In those surface waters having regulated flows at, near or below the naturally occurring 7Q10 flow, more stringent water quality criteria may be required to achieve and maintain existing and designated uses. The Commissioner may approve limitations based on minimum average daily flow in excess of 7Q10 conditions, provided the Commissioner is satisfied that special measures will be implemented during low flow conditions which provide protection to the environment at least as effective as that protection which would pertain if limitations were based on 7Q10 conditions alone.

Water resources which are influenced by tidal forces or which experience short-term variation in flow due to periodic or irregular water release from upstream diversions or other causes may require special consideration with regard to protecting existing and designated uses, including consideration of the minimum flow to which Standards apply.

12. The Commissioner, pursuant to Chapter 446k of the Connecticut General Statutes and regulations adopted thereunder, will regulate discharges to the waters of the State to assure that such discharges do not cause pollution due to acute or chronic toxicity to aquatic and marine life, impair the biological integrity of aquatic or marine ecosystems or result in an unacceptable risk to human health.

(A) In making a determination under Chapter 446k of the Connecticut General Statutes as to whether a discharge or other activity will or can reasonable be expected to cause pollution of the waters of the State, the Commissioner shall consider the numeric criteria for the toxic pollutants listed in Appendix D.

(B) The Commissioner may amend the numeric criteria for the toxic pollutants listed in Appendix D of these Water Quality Standards in accordance with the procedures specified in Section 22a-426 of the Connecticut

General Statutes on his or her own initiative, or upon request of any person or municipality that site-specific criteria be adopted, provided such request is supported by sound scientific and technical evidence demonstrating the following:

1. Local conditions at the site differ significantly from those used in establishing the statewide criteria.

2. The site-specific criteria will be sufficiently stringent to protect all existing and designated uses of the waterbody.

3. The site-specific criteria were derived consistent with sound scientific and technical principles, giving consideration to all applicable federal guidance.

13. Surface waters and sediments shall be free from chemical constituents in concentrations or combinations which will or can reasonably be expected to result in acute or chronic toxicity to aquatic organisms or impair the biological integrity of aquatic or marine ecosystems outside of any allocated zone of influence or which will or can reasonablely be expected to bioconcentrate or bioaccumulate in tissues of fish, shellfish and other aquatic organisms to levels which will impair the health of aquatic organisms or wildlife or result in unacceptable tastes, odors or health risks to human consumers of aquatic life. In determining consistency with this Standard, the Commissioner shall at a minimum consider the specific numeric criteria listed in Appendix D and any other information he or she deems relevant.

14. Benthic invertebrate criteria may be utilized where appropriate for assessment of the biological integrity of surface waters. The criteria apply to the fauna of erosional or riffle habitats in flowing waters which are not subject to tidal influences.

15. The discharge of radioactive materials in concentrations or combinations which would be harmful to human, animal or aquatic life shall not be allowed. The applicable criteria can be found in Title 10 Part 20 of the Code of Federal Regulations.

16. Reasonable controls or Best Management Practices for control of nonpoint source pollutants may be required by the Commissioner on a case-by-case basis.

17. Controls on point and nonpoint sources of phosphorus and nitrogen which contribute to the eutrophication of any surface water including streams, rivers, lakes, ponds, impoundments and Long Island Sound may be required on a case-by-case basis.

18. Use of Best Management Practices and other reasonable controls of nonpoint sources of nutrients and sediment is preferable to the use of biocides for correction of eutrophic conditions.

19. Potential drinking water supplies identified in the Long Range Plan for Management of Water Resources prepared and adopted pursuant to Section 22a-352 or in an individual water supply plan approved in accordance with Section 22a-32d of the Connecticut General Statutes shall be designated as Class AA surface waters.

20. Section 22a-417 of the Connecticut General Statutes imposes an absolute restriction on the discharge of sewage to Class AA reservoirs and their tributaries. A discharge outside the State shall not be a valid reason for either relaxing the restriction in Connecticut or changing the Class AA designation. It is a State policy to pursue the adoption of compatible Water Quality Standards in neighboring states to assure the protection of Connecticut drinking water supplies.

21. Disinfection shall be required for all treated domestic sewage discharges to surface waters. The period of disinfection shall vary depending on the nature of the receiving waterbody as described below:

1. Continuous disinfection shall be required at all domestic sewage treatment plants located south of Interstate Highway 95 (1-95) to protect the sanitary quality of shellfish resources.

2. Disinfection shall be required during the period from May I to October I at all domestic sewage treatment plants located north of 1-95. Seasonal disinfection is intended to protect the sanitary quality of bathing waters and minimize adverse impacts to aquatic life associated with disinfection. An alternative schedule, including continuous disinfection, may be required if found necessary by the Commissioner to protect existing and designated uses.

   It is recognized that criteria for indicator bacteria may not be met during periods when disinfection of sewage treatment plant effluent is not required.

22. The discharge of sewage, sink and galley wastes from boats, whether or not treated by any marine sanitation device, is prohibited in all inland freshwaters not capable of interstate navigation and in marine waters identified in accordance with Regulations developed through the authority of Public Act 90-173.

23. Indicator bacteria are used to detect the presence of contamination by human or animal wastes. Due to the inherent uncertainty involved in sampling and analytical determination of bacteria levels, excursions from established ambient criteria should be investigated by means of a field survey of sanitary conditions or other appropriate means to determine sanitary quality (see also Appendix B).

24. Physical obstructions such as dams, which prevent fish reaching an area suitable for spawning and growth, shall not be considered a valid reason for not achieving and maintaining water quality conditions necessary to support all existing and designated uses for a waterbody unless the Commissioner has approved a Use Attainability Analysis in accordance with all applicable State and Federal statutes and regulations, consistent with the Department's anti-degradation policy.

25. In the estuarine segments (Class SB) of the Housatonic, Connecticut and Thames Rivers, the allowable temperature increase from discharges shall be consistent with the criteria for the non-tidal segments(ClassB).

26. Except within designated dredged material disposal areas or areas approved by the Commissioner for placement of fill under the authority of Section 22a-32, surface waters and sediments shall be substantially free of pollutants that: a) unduly affect the composition of bottom fauna; b) unduly affect the physical or chemical nature of the bottom; or c) interfere with the propagation and habitats of shellfish, finfish and wildlife. Dredged materials dumped at approved disposal areas shall not pollute the waters of the state and shall not result in: a) floating residues of any sort; b) release of any substance which may result in long-term or permanent degradation of water quality in waters overlying or adjacent to the disposal areas; c) dispersal of sediments outside a zone of influence enclosing the designated disposal points; or d) biological mobilization and subsequent transport of toxic substances to food chains.

27. Surface water quality monitoring methods shall conform to the Department of Environmental Protection, Water Management Bureau's Quality Assurance Project Plan, consistent with 40 CFR Part 30. Other different but equivalent or better methods may be utilized if they have received the Commissioner's prior approval.

28. As part of the Commissioner's continuing efforts to further define WQS, other criteria will be considered. The Commissioner reserves the right to amend or extend the criteria for each Class of waters as new information or improved or more stringent criteria relative to water quality impacts are developed and justified subject to the legal and procedural requirements of State and Federal laws or regulations.

29. Surface waters, including wetlands which are not otherwise designated, shall be considered as Class A or Class SA.

30. Watercourses which are fully enclosed in drainage conduits or pipes and not assigned a specific Class may be considered, on a case-by-case basis, to be the Class of the stream segment to which they discharge.

31. Where existing water quality does not meet the designated use and quality criteria goals, the existing quality will be identified, followed by the use goal (e.g., C/B).

32. Revisions to the WQS, including but not limited to the following, shall be subject to the public participation process provided for in Section 22a-426 of the General Statutes:

    (A) The adoption of a map which depicts the Water Quality Goals and Classifications assigned to any water resource.

    (B) Any decisions regarding the lowering of water quality in existing high quality Class B or SB waters or a change in the Water Quality Classification of any water resource.

    (C) The adoption of any Use Attainability Analysis.

33. The surface WQS shall apply to all tidal waters, harbors, estuaries, rivers, brooks, watercourses, waterways, lakes, ponds, marshes, bogs, those portions of inland wetlands which are inundated or saturated by surface or ground waters at a frequency and duration sufficient to support, and that under normal circumstances do support, prevalence of vegetation typically adapted for life in saturated soil conditions and those portions of tidal wetlands below mean high water.

III. SURFACE WATER CLASSIFICATIONS

INLAND SURFACE WATERS

CLASS AA

Designated Use - Existing or proposed drinking water supply; fish and wildlife habitat; recreational use; agricultural, industrial supply and other purposes, (recreational uses may be restricted).

CRITERIA

Parameter		Standard
1.	Aesthetics	Uniformly excellent
2.	Dissolved oxygen	Not less than 5 mg/l at any time.
3.	Sludge deposits-solid refuse-floating solids-oils and grease-scum	None other than of natural origin.
4.	Color	None other than of natural origin.
5.	Suspended and settleable solids	None in concentrations or combinations which would impair the most sensitive designated use; none aesthetically objectionable; none which would significantly alter the physical or chemical composition of the bottom; none which would adversely impact aquatic organisms living in or on the bottom substrate.

6.	Silt or sand deposits	None other than of natural origin except as may result from normal agricultural, road maintenance, construction activity or dredging provided all reasonable controls or Best Management Practices are used.
7.	Turbidity	Shall not exceed 5 NTU over ambient levels. All reasonable controls or Best Management Practices are to be used.
8.	Indicator bacteria	Total coliform organisms (MF) shall not exceed a monthly moving arithmetic mean of 100/100 ml for the most recent 12 months. No individual sample shall exceed 500/100 ml. Refer to Standard number 23 and Appendix B.
9.	Taste and odor	None other than of natural origin.
10.	pH	As naturally occurs.
11.	Allowable temperature increase	None other than of natural origin except when it can be demonstrated that fish spawning and growth will not be impaired, in which case Class B Standards and Criteria apply.
12.	Chemical constituents	None in concentrations or combinations which would be harmful to the most sensitive designated water use. Refer to Standards numbers 10, 11, 12, 13, and 17.
	(a) Phosphorus	None other than of natural origin
	(b) Sodium	Not to exceed 20 mg/l
13.	Benthic Invertebrates which	A wide variety of macroinvertebrate taxa should normally be inhabit lotic waters present and all functional feeding groups should normally be well represented. Presence and productivity of aquatic species is not limited except by natural conditions, permitted flow regulation or irreversible cultural impacts. Water quality shall be sufficient to sustain a diverse macroinvertebrate community of indigenous species. Taxa within the Orders Plecoptera (stoneflies), Ephemeroptera (mayflies), Coleoptera (beetles) and Trichoptera (caddisflies) should be well represented.

CLASSIFICATIONS

- AA	Known or presumed to meet Water Quality Criteria which support the designated uses.
- B/AA or C/AA	May not be meeting Class AA Water Quality Criteria or designated uses. The water quality goal is achievement of Class AA Criteria and attainment of Class AA designated uses.

INLAND SURFACE WATERS

CLASS A

Designated Uses -	Potential drinking water supply; fish and wildlife habitat; recreational use; agricultural, industrial supply and other legitimate uses, including navigation.

CRITERIA

Parameter		Standard
1.	Aesthetics	Uniformly excellent
2.	Dissolved oxygen	Not less than 5 mg/1 at any time.
3.	Sludge deposits-solid refuse - floating solids -oils and grease-scum.	None other than of natural origin.
4.	Color	None other than of natural origin
5.	Suspended and settleable solids	None in concentrations or combinations which would impair the most sensitive designated use; none aesthetically objectionable; none which would significantly alter the physical or chemical composition of the bottom; none which would adversely impact aquatic organisms living in or on the bottom substrate.
6.	Silt or sand deposits	None other than of natural origin except as may result from normal agricultural, road maintenance, construction activity or dredging provided all reasonable controls or Best Management Practices are used.
7.	Turbidity	Shall not exceed 5 NTU over ambient levels. All reasonable controls or Best Management Practices to be used.
8.	Indicator Bacteria	Total coliform organisms (MF) shall not exceed a monthly moving arithmetic mean of 100/100 ml for the most recent 12 months. No individual sample shall exceed 500/100 ml. For established bathing waters, enterococcal organisms shall not exceed a geometric mean of 33/100 ml and no sample shall exceed 61/100 ml. Refer to Standard number 23 and Appendix B.
9.	Taste and odor	None other than of natural origin.
10.	pH	As naturally occurs.
11.	Allowable	None other than of natural origin except when it can be demonstrated that temperature increase fish spawning and growth will not be impaired, in which case Class B Standards and Criteria apply.
12.	Chemical	None in concentrations or combinations which would be harmful to the most constituents sensitive designated water use. Refer to Standards numbers 10, 11, 12, 13 and 17.
	(a) Phosphorus	None other than of natural origin.
13.	Benthic Invertebrates	A wide variety of macroinvertebrate taxa should normally be present and all which inhabit lotic functional feeding groups should normally be well represented. Presence and productivity of aquatic species is not limited except by natural conditions, permitted flow regulation or irreversible cultural impacts. Water quality shall be sufficient to sustain a diverse macroinvertebrate community of indigenous species. Taxa within the Orders Plecoptera (stoneflies), Ephemeroptera (mayflies), Coleoptera (beetles) and Trichoptera (caddisflies) should be well represented.

CLASSIFICATIONS

- A	Known or presumed to meet Water Quality Criteria which support designated uses.
-B/A or C/A	May not be meeting Water Quality Criteria or one or more designated uses. The water quality goal is achievement of class A Criteria and attainment of Class A designated uses.

INLAND SURFACE WATERS

CLASS B

Designated Use - Recreational use; fish and wildlife habitat; agricultural and industrial supply and other legitimate uses including navigation.

CRITERIA

Parameter		Standard
1.	Aesthetics	Good to excellent
2.	Dissolved oxygen	Not less than 5 mg/1 at any time.
3.	Sludge deposits - solid refuse - floating solids - oil and grease - scum	None except for small amounts that may result from the discharge from a waste treatment facility providing appropriate treatment.
4.	Color	None which causes visible discoloration of the receiving stream outside of any designated zone of influence.
5.	Suspended and settleable solids	None in concentrations of combinations which would impair the most sensitive designated use; none aesthetically objectionable; none which would significantly alter the physical or chemical composition of the bottom; and none which would adversely impact aquatic organisms living in or on the bottom sediments; shall not exceed 10 mg/1 over ambient concentrations.
6.	Silt or sand deposits	None other than of natural origin except as may result from normal agricultural, road maintenance, construction activity or dredging activity provided all reasonable controls or Best Management Practices are used.
7.	Turbidity	Shall not exceed 5 NTU over ambient levels. All reasonable controls and Best Management Practices to be used.
8.	Indicator bacteria	As an indicator of general sanitary quality Fecal coliform shall not exceed a geometric mean of 200 organisms/100 ml in any group of samples nor shall 10% of the samples exceed 400 organisms/100 ml. For established bathing waters, enterococcal organisms shall not exceed a geometric mean of 33 organisms/100 ml, and no single sample shall exceed 61/100 ml. Refer to Standard number 23 and Appendix B.
9.	Taste and odor	None that would impair any usages specifically assigned to this Class.
10.	pH	6.5 - 8.0
11.	Allowable temperature increase	None except where the increase will not exceed the recommended limit on the most sensitive receiving water use and in no case exceed 85°F, or in any case raise the normal temperature of the receiving water more than 4°F.

12.	Chemical constituents	None in concentrations or combinations which would be harmful to the most sensitive designated water use. Refer to Standards numbers 10 11,12, 13, and 17.
13.	Benthic Invertebrates which inhabit lotic waters	Water quality shall be sufficient to sustain a diverse macroinvertebrate community of indigenous species. All functional feeding groups and a wide variety of macroinvertebrate taxa shall be present, however one or more may be disproportionate in abundance. Waters which currently support a high quality aquatic community shall be maintained at that high quality. Presence and productivity of taxa within the Orders Plecoptera (stoneflies), Ephemeroptera (mayflies); and pollution intolerant Coleoptera (beetles) and Trichoptera (caddis-flies) may be limited due to cultural activities. Macroinvertebrate communities in waters impaired by cultural activities shall be restored to the extent practical through implementation of the department's procedures for control of pollutant discharges to surface waters and through Best Management Practices for non-point sources of pollution.

CLASSIFICATIONS

- B	Known or presumed to meet Water Quality Criteria which support designated uses.
- C/B or D/B	Due to point or nonpoint sources of pollution, certain Water Quality Criteria or one or more designated uses assigned to Class B waters are not currently met. The water quality goal achievement of Class B Criteria and attainment of Class B designated uses.

INLAND SURFACE WATERS

CLASS C

Present water quality conditions preclude the full attainment of one or more designated uses for Class B waters some or all of the time. One or more Water Quality Criteria for Class B waters are not being consistently achieved. Class C waters may be suitable for certain fish and wildlife habitat, certain recreational activities, industrial use and other legitimate uses, including navigation. Class C waters may have good aesthetic value. Class C water quality results from conditions which are usually correctable through implementation of established water quality management programs to control point and nonpoint sources of pollution. Examples of conditions which warrant a Class C designation include; combined sewer overflows, urban runoff, inadequate municipal or industrial wastewater treatment, and community-wide septic system failures. The minimum acceptable class goal is Class B unless a DEP and EPA approved Use Attainability Analysis demonstrates that one of more uses are not attainable. In those situations, site-specific Quality Criteria will be employed in the analysis to insure that all existing uses are maintained. Refer to Standard Number 6.

CLASSIFICATIONS

- C/B, C/A or C/AA	Presently not meeting Water Quality Criteria or not supporting one or more assigned designated uses due to pollution. The goal for such waters may be Class AA, A or Class B.

INLAND SURFACE WATERS

CLASS D

Present water quality conditions persistently preclude the attainment of one or more designated uses for Class B waters. One or more Water Quality Criteria for Class B waters are not being achieved most or all of the time. Class D waters may be suitable for bathing or other recreational purposes, certain fish and wildlife habitat, industrial or other legitimate uses, including navigation. Class D waters may have good aesthetic value. Class D water quality results from sources of pollution which are

not readily correctable. Examples of conditions which warrant a Class D designation include contamination of bottom sediments, contamination of fish or shellfish with toxic compounds, and pollution caused by out-of-state sources. The water quality goal is restoration to Class B or Class A conditions. The minimum acceptable class goal is Class B unless a DEP and EPA approved Use Attainability Analysis demonstrates that one or more uses are not attainable. In those situations, site-specific Quality Criteria will be employed in the analysis to insure that all existing uses are maintained. Refer to Standard Number 6.

CLASSIFICATIONS

D/B, D/A - Presently not meeting Water Quality Criteria or not supporting one or more assigned designated uses due to severe pollution. The goal for such waters may be Class A or Class B.

LAKE TROPHIC CLASSIFICATIONS

OLIGOTROPHIC

May be Class AA, Class A, or Class B water. Low in plant nutrients. Low biological productivity characterized by the absence of nuisance macrophyte beds. Excellent opportunities for water contact recreation.

CRITERIA

Parameters		Standard
1.	Total Phosphorus	0-10 ug/1 spring and summer
2.	Total Nitrogen	0-200 ug/1 spring and summer
3.	Chlorophyll-a	0-2 ug/1 mid-summer
4.	Secchi Disk Transparency	6 + meters mid-summer

MESOTROPHIC

May be Class AA, Class A, or Class B water. Moderately enriched with plant nutrients. Moderate biological productivity characterized by occasional nuisance blooms of algae and/or small areas of nuisance macrophyte beds. Good opportunities for water contact recreation.

CRITERIA

Parameters		Standard
1.	Total Phosphorus	10-30 ug/1 spring and summer
2.	Total Nitrogen	200-600 ug/1 spring and summer
3.	Chlorophyll-a	2-15 ug/1 mid-summer
4.	Secchi Disk Transparency	2-6 meters mid-summer

EUTROPHIC

May be Class AA, Class A, or Class B water. Highly enriched with plant nutrients. High biological productivity characterized by frequent nuisance blooms of algae and/or extensive areas of dense macrophyte beds. Water contact recreation opportunities may be limited.

CRITERIA

Parameters		Standard
1.	Total Phosphorus	30-50 ug/l spring and summer
2.	Total Nitrogen	600-1000 ug/l spring and summer
3.	Chlorophyll-a	15-30- ug/l mid-summer
4	Secchi Disk Transparency	1-2 meters mid-summer

HIGHLY EUTROPHIC

May be Class AA, Class A, or Class B water. Excessive enrichment with plant nutrients. High biological productivity, characterized by severe nuisance blooms of algae and/or extensive areas of dense macrophyte beds. Water contact recreation may be extremely limited.

CRITERIA

Parameters		Standard
1.	Total Phosphorus	50 + ug/l spring and summer
2.	Total Nitrogen	1000 + ug/l spring and summer
3.	Chlorophyll-a	30 + ug/l mid-summer
4.	Secchi Disk Transparency	0-1 meters mid-summer

TROPHIC CLASSIFICATION OF LAKES

OLIGOTROPHIC LAKES

Lake	Location
Bashan	East Haddam
Beach	Voluntown
Billings	North Stonington
Mashapaug	Union
Riga	Salisbury
Uncas	Lyme
West Hill	New Hartford

MESOTROPHIC LAKES

Lake	Location
Alexander	Killingly
Anderson's Pond	North Stonington
Ball	New Fairfield
Beseck	Middlefield
Bigelow	Union
Black	Meriden and Middlefield
Black	Woodstock
Burr	Torrington
Candlewood	N. Fairfield, Sherman, Danbury, N. Milford, Brookfield
Cedar	Chester
Columbia	Columbia

Cream Hill	Cornwall
Crystal	Ellington, Stafford
Dodge	East Lyme
East Twin	Salisbury
Fitchville	Fitchville
Gardner	Salem, Bozrah, Montville
Glasgo	Griswold
Gorton	East Lyme
Green Falls	Voluntown
Halls	Eastford
Hatch Pond	Kent
Hayward	East Haddam
Higganum Reservoir	Haddam
Highland	Winchester
Hitchcock	Wolcott
Killingly Pond	Killingly
Little Schoolhouse	Thompson
Long	Ledyard, North Stonington
Lower Bolton	Bolton, Vernon
Mamanasco	Ridgefield
Middle	Bolton, Vernon
Mohawk Pond	Goshen
Moodus	East Haddam
Morey	Ashford
Mount Tom	Litchfield, Morris, Goshen
Norwich	Lyme
Mudge	Sharon
Pachaug	Griswold
Park	Winchester
Pataganset	East Lyme
Pattaconk Reservoir	Chester
Pocotopaug	East Hampton
Powers	East Lyme
Quaddick	Thompson
Quonnipaug	Guilford
Rogers Lyme,	Old Lyme
Shenipsit	Vernon, Ellington, Tolland
South	Spectacle Kent
Squantz	New Fairfield, Sherman
Taunton	Newtown
Terramuggus	Marlborough
Tyler	Goshen
Wangumbaug	Coventry
Waramaug	Warren, Washington, Kent
Wauregan Reservoir	Killingly
West Side	Goshen
Winchester	Winchester
Wononscopomuc	Salisbury
Wright's Pond	Westbrook, Essex, Deep River
Wyassup	North Stonington

EUTROPHIC LAKES

Lake	Location
Amos	Preston
Aspinook	Lisbon and Canterbury
Avery	Preston
Bantam	Litchfield, Morris
Batterson Park	Farmington, New Britain
Crystal	Middletown
Dog	Goshen
Eagleville	Mansfield
Housatonic	Shelton
Howell	Hartland
Kenosia	Danbury
Leonard	Kent
Lillinonah	Bridgewarer, Brookfield
Linsley	Branford, North Branford
Long Meadow	Bethlehem
Moosup	Plainfield
Rainbow Reservoir	Windsor
Red Cedar	Lebanon
Roseland	Woodstock
Wononpakook	Salisbury
Zoar	Newtown, Monroe, Oxford, Southbury

HIGHLY EUTROPHIC LAKES

Lake	Location
Beachdale	Voluntown
Cedar	North Branford
Dooley's	Middletown
1860 Reservoir	Wethersfield
Hanover Pond	Meriden
Holbrook	Hebron
Hopeville	Griswold
Lake of Isles	North Stonington
Lantern Hill	Ledyard, North Stonington
Messerschmidt's	Westbrook, Deep River
North Farms	Wallingford
Pickerel	Colchester
Silver	Berlin, Meriden
West Thompson	Thompson
Winnemaug	Watertown
Wood Creek	Norfolk

COASTAL AND MARINE SURFACE WATERS

CLASS SA

Designated Use - Marine fish, shellfish and wildlife habitat, shellfish harvesting for direct human consumption, recreation, and all other legitimate uses including navigation.

CRITERIA

Parameter		Standard
1.	Aesthetics	Uniformly excellent
2.	Dissolved oxygen	Not less than 6.0 mg/1 at any time.
3.	Sludge deposits-solid refuse-floating solids-oils and grease-scum	None other than of natural origin
4.	Color	None other than of natural origin
5.	Suspended and settleable solids	None other than of natural origin
6.	Silt or sand deposits	None other than of natural origin exc ept as may result from normal agricultural, road maintenance, construction activity, or dredge material disposal provided all reasonable controls and Best Management Practices are used.
7.	Turbidity	None other than of natural origin except as may result from normal agricultural, road maintenance, construction activity, or dredging provided all reasonable controls and Best Management Practices are used.
8.	Indicator bacteria	Fecal coliform organisms shall not exceed a geometric mean of 14 MPN/100 ml nor shall greater than 10% of samples exceed 43 MPN/100 ml. For established bathing waters enterococcal organisms shall not exceed a geometric mean of 33/100 ml and no single sample shall exceed 61/100 ml. Refer to standard number 23 and Appendix B.
9.	Taste and odor	As naturally occurs.
10.	pH	6.8 - 8.5
11.	Allowable temperature increase	None except where the increase will not exceed the recommended limit on the most the most sensitive receiving water use and in no case exceed 83°F or in any case raise the normal temperature of the receiving water more than 4°F. During the period including July, August and September, the normal temperature of the receiving water shall not be raised more than 1.5°F unless it can be shown that spawning and growth of indigenous organisms will not be significantly affected.
12.	Chemical constituents	None in concentrations or combinations which would be harmful to the most sensitive designated water use~ Refer to Standards numbers 10, 11, 12, 13 and 17.

CLASSIFICATIONS

- SA Know or presumed to meet Water Quality Criteria which support designated uses.

-SB/SA or SC/SA Presently not meeting Water Quality Criteria or one or more designated uses. The water quality goal is achievement of Class SA Criteria and attainment of Class SA designated uses.

COASTAL AND MARINE SURFACE WATERS

CLASS SB

Designated Uses - Marine fish, shellfish and wildlife habitat, shellfish harvesting for transfer to a depuration plant or relay (transplant) to approved areas for purification prior to human consumption recreation, industrial and other legitimate uses including navigation.

CRITERIA

Parameter		Standard
1.	Aesthetic	Good to excellent
2.	Dissolved oxygen	Not less than 5.0 mg/1 at any time.
3.	Sludge deposits - solid refuse	None except for small amounts that floating solids-oils and may result from the discharge from a grease-scum-waste treatment facility providing appropriate treatment.
4.	Color	None resulting in obvious discoloration of the receiving water outside of any designated zone of influence.
5.	Suspended and settleable solids	None in concentrations or combinations which would impair the most sensitive designated use; none aesthetically objectionable; none which would significantly alter the physical or chemical composition of bottom sediments; none which would adversely impact organisms living in or on the bottom sediments.
6.	Sand or silt deposits	None other than of natural origin except as may result from normal agricultural, road maintenance, construction activity, or dredging provided all reasonable controls and Best Management Practices arc used.
7.	Turbidity	None other than of natural origin except for small amounts that may result from the discharge from a waste treatment facility providing appropriate treatment. All reasonable controls and Best Management Practices to be used.
8.	Indicator bacteria	As an indicator of general sanitary quality, Fecal coliform shall not exceed a geometric mean of 200 organisms/IOO ml nor shall 10% of the samples exceed 400 organisms/100 ml. For designated shellfish harvesting areas fecal coliform organisms shall not exceed a geometric mean of 88 MPN/1OO ml nor shall greater than 10% of samples exceed 260 MPN/IOO ml. For established bathing waters, enterococcal organisms shall not exceed a geometric mean of 33/100 ml and no single sample shall exceed 61/100 ml. Refer to Standard number 23 and Appendix B.
9.	Taste and odor	As naturally occurs. None that would impair any usages specifically assigned to this Class
10.	pH	6.8 - 8.5
11.	Allowable temperature increase	None except where the increase will not exceed the recommended limit on the most sensitive receiving water use and in no case exceed 83°F or in any case raise the normal temperature of the receiving water more than 4°F. During the period including July, August and September, the normal temperature of the receiving water shall not be raised more than 1.5°F unless it can be shown that spawning and growth of indigenous organisms will not be significantly affected.

12.	Chemical constituents	None in concentrations or combinations which would be harmful to the most sensitive designated water use. Refer to Standards numbers 10, 1 1, 12, 13 and 17

CLASSIFICATIONS

- SB	Known or presumed to meet Water Quality Criteria which support designated uses.
- SC/SB or SD/SB	Due to point or nonpoint sources of pollution certain Water Quality Criteria or one or more designated uses assigned to Class SB waters are not currently met. The water quality goal is achievement of Class SB criteria and attainment of Class SB designated uses.

COASTAL AND MARINE SURFACE WATERS

CLASS SC

May be suitable for fish, shellfish, and wildlife habitat, certain aquaculture operations, recreational uses, industrial and other legitimate uses including navigation. Present water quality conditions preclude the full attainment of one of more designated uses some of all of the time. One or more Water Quality Criteria are not being consistently achieved. Examples of conditions which warrant a Class SC designation include conditions such as combined sewer overflows, urban runoff, inadequate municipal or industrial wastewater treatment, or community-wide septic system failures which can be corrected through implementation of established water quality management programs. Where the water quality goal is Class SA or SB, a DEP and EPA approved Use Attainability Analysis may be performed to demonstrate that one or more uses are not attainable. In those situations, site specific Quality Criteria will be employed in the analysis to insure that all existing uses are maintained. Refer to Standard Number 6.

CLASSIFICATIONS

- SC/SB or SC/SA	Presently not meeting Water Quality Criteria or not supporting one or more assigned designated uses due to pollution. The goal for such waters may be Class SB, or Class SA.

COASTAL WATERS

CLASS SD

Present water quality conditions persistently preclude the attainment of one or more designated uses for Class SB waters. One of more Water Quality Criteria for Class SB waters are not being achieved most or all or the time. Class SD waters may be suitable for bathing or other recreational purposes, certain fish and wildlife habitat, industrial or other legitimate uses, including navigation, may have good aesthetic value. Class SD water quality results from sources of pollution which are not readily correctable through implementation of established State water quality management programs to control point and nonpoint sources of pollution. Examples of conditions which warrant a Class SD designation include contamination of bottom sediments, contamination of fish or shellfish with toxic compounds, and pollution caused by out-of-state sources. The water quality goal is restoration to Class SB or Class SA conditions. Where the water quality goal is Class SA or SB, a DEP and EPA approved Use Attainability Analysis may be performed to demonstrate that one or more uses are not attainable. In those situations, site specific Quality Criteria will be employed in the analysis to insure that all existing uses are maintained. Refer to Standard Number 6.

CLASSIFICATIONS

- SD/SB, SD/SA	Presently not meeting Water Quality Criteria or not supporting one or more assigned designated uses due to severe pollution. The goal for such waters may be Class SA or Class SB

IV. GROUND WATER QUALITY STANDARDS

GW1. The policy of the Department in areas that are classified as GAA, GAA, or GA is to maintain or restore all ground water in such areas to its natural quality.

GW2. If the Commissioner determines that, with respect to a particular pollutant, restoring or maintaining natural quality at a GAA, GAAs, or GA level is not technically practicable, the Department's policy is to:

(A) Maintain or restore quality such that the ground water is suitable for drinking and other domestic uses without treatment, and

(B) Maintain or restore quality such that the ground water will not adversely affect surface water quality or prevent the maintenance or attainment or any designated uses of surface waters to which that ground water discharges, and

(C) Eliminate sources of pollution to such ground water to the extent that the Commissioner determines to be technically practicable, and regulate discharges to such groundwater so as to prevent pollution.

GW3. Ground water is deemed suitable for drinking and other domestic uses without treatment when no pollutant in such groundwater (A) exceeds a level which the Commissioner of Public Health has determined, pursuant to Section 22a-47 1 of the General Statues, creates or reasonably can be expected to create an unacceptable risk of injury to the health *or* safety of persons using such ground water for drinking or other personal or domestic use, (B) is a carcinogen present at a concentration associated with a $1\text{-}x\text{-}10^{-6}$ excess cancer risk, (C) is a non-carcinogen present at a level exceeding that to which the human population, including sensitive subgroups, can be exposed on a daily basis without appreciable risk of adverse health effects during a lifetime, or (D) exceeds a level which the Commissioner determines, in consultation with the Commissioner of Public Health, renders the ground water so aesthetically impaired that a person cannot reasonably be expected to consume or otherwise use it.

GW4. The policy of the Department in areas classified as GB is:

(A) To eliminate or reduce in the ground water any pollutant which presents a hazard of fire, explosion, or toxic or hazardous emission to the environment or otherwise poses a threat to public safety or an unacceptable risk to public health, and

(B) To maintain the ground water at a quality that will not adversely affect the quality of surface waters to which such ground water discharges or prevent the maintenance or attainment of any designated or existing uses in such surface waters, and

(C) To maintain a quality consistent with all designated and existing uses of the ground water, including its use for drinking without treatment if such ground water has, prior to the adoption of these Water Quality Standards, been utilized for, and continues to be utilized, for drinking water, and

(D) To regulate discharges to the ground water in order to prevent further degradation of ground water quality.

GW5. The policy of the Department in areas classified as GC is:

(A) To eliminate or reduce in the ground water any pollutant which presents a hazard of fire, explosion, or toxic or hazardous emission to the air or otherwise poses a threat to public safety or an unacceptable threat to public health, and

(B) To maintain the ground water at a quality that will not adversely affect the quality of surface waters to which such ground water discharges or prevent the maintenance or attainment of any designated or existing uses in such surface waters, and

(C) To limit the impacts of waste discharges on ground water quality to those which, despite the use of treatment technology, cannot be avoided and which result from a discharge which is authorized by a permit under Section 22a-430 of the General Statutes.

GW6. With respect to ground water whose quality is actually higher than that reflected by the assigned classification, the Department's policy is that such ground water should be maintained at its existing, high quality. To maintain such quality, the Commissioner may require that:

(A) A new, increased, or otherwise modified discharge to such ground water shall be given treatment such that, notwithstanding such classification, the actual higher quality is maintained.

(B) If after the adoption of these Water Quality Standards there is an unpermitted release of pollutants to ground water which is classified GB but whose quality is actually GA or GAA, such groundwater shall be remediated to the standards for Class GA or GAA.

GW7. The Commissioner may raise the ground water classification of any area if he finds that such ground water meets the standards for the higher classification.

GW8. (A) The Commissioner may consider an application to lower a ground water classification to GB. Such application shall be subject to the public participation requirements of Section 22a-426 of the General Statutes and shall:

(I) describe the nature and extent and date of commencement of pollution of the ground water proposed to be reclassified,

(ii) identify all sources of drinking water in the area whose ground water is proposed to be reclassified and identify all existing uses of ground water within and down gradient of such area,

(iii) assess the potential of the subject area to produce ground water in an amount suitable for a public water supply,

(iv) describe all past and present land uses in the subject area. with dates, and

(v) provide such other information the Commissioner may reasonably require to determine the most appropriate ground water classification.

(B) A ground water classification shall not be lowered to GB unless the applicant has satisfactorily demonstrated that; any person within or down gradient of the area to be reclassified and extending to an area previously classified as GB or to a surface water body to which the groundwater discharges will be provided with an adequate public water supply, and that lowering of a ground water classification will not prevent attainment of adjacent surface water quality goals or present unacceptable health risks, and

(i) That the ground water to be reclassified is polluted as a result of intense urban, commercial, or industrial development which occurred prior to 1981, and the hydrologic conditions of the subject area are not suitable for the development of a significant public water supply, or

(ii) The ground water proposed to be reclassified is polluted and remediation of such ground water to a quality suitable for drinking without treatment is not technically practicable, or

(iii) There is an overriding social or economic justification for reclassifying the ground water to GB and the proposed reclassification is supported by the affected municipality or municipalities, as affirmed, in writing, by the chief executive officer(s) of the municipality or municipalities. For the purpose of this Standard an "affected municipality" is one in which ground water classifications are to be altered, "social justification" means a specific social need of the affected municipality or the state and "economic justification" means avoidance of an economic impact that would substantially impair or otherwise detrimentally affect the economy of the community or the state. The applicant must also demonstrate that the purposes for the reclassification will not result in development that is inconsistent with the State Policies Plan for Conservation and Development as adopted pursuant to Section 16a-30 of the General Statutes.

GW9. The Commissioner may consider an application to lower a ground water classification to GC. Any such application shall be subject to the public participation requirements of Section 22a-426 of the General Statutes and:

(A) Such application shall be accompanied by a completed application under Section 22a-430 of the General Statutes for a permit to discharge leachate from a solid waste land disposal facility to the subject ground water.

(B) A ground water classification shall not be lowered to GC unless the applicant has satisfactorily demonstrated that:

(i) there is an overriding social or economic justification for reclassifying the ground water to GC and the affected municipality or municipalities have been notified of the proposed reclassification; and

(ii) the ground water proposed to be reclassified is not suitable for development of a significant public water supply and is suitable for waste treatment; and

(iii) the subject area is adjacent to and hydraulically connected with a surface water body classified B or SB; and

(iv) in a Section 22a-430 permit application the applicant has delineated the zone of influence (see standard GW10) of the ground water proposed to be reclassified as extending from the proposed solid waste land disposal facility to the receiving surface water body, and the applicant owns the land overlying such zone of influence, or has an easement with respect to such land which easement is properly recorded and provides protections, as described in subsection D(l) and D(2) of Standard GWI0, or otherwise controls the zone of influence to the satisfaction of the Commissioner.

GW10. Zones of influence. The Commissioner may establish zones of influence when, in the course of permitting discharges to the ground water under Section 22a-430 of the General Statutes, he allocates ground water and soil resources for the treatment of pollutants. Within that zone of influence the Section 22a-430 permittee will be allowed to degrade the ground water such that it may not meet the standards for the assigned classification or be suitable for uses designated by these Water Quality Standards for such classification.

A. For a subsurface sewage disposal system permitted under authority delegated pursuant to Section 22a 430- 1 of the Regulations of Connecticut State Agencies to the Commissioner of Health and Addiction Services, the zone of influence shall be that area required by the minimum separating distances established in Section 19- 13-B 103d of the Regulations of Connecticut State Agencies.

B. For discharges to ground water of treated domestic sewage other than discharges of domestic sewage identified in subparagraph GW1O(A), agricultural wastes, and storm water, the zone of influence shall be the area in which such discharge causes the ground water to be 1) altered in quality from its natural condition, or 2) lowered in quality from that which is suitable for drinking and other domestic uses without treatment. The Commissioner may require the applicant for a permit under Section 22a-430 of the General Statutes to submit for the Commissioner's approval an engineering plan showing the areal extent of any such zone of influence.

C. The applicant for a permit under Section 22a-430 of the General Statutes authorizing a discharge other than a discharge of treated domestic sewage, agricultural waste, or storm water shall delineate the zone of influence associated with the proposed discharge. Such zone of influence shall include all areas beneath which the ground water which is or may be affected in quality by such discharge. The Commissioner may require that such zone of influence extend to a receiving water body with a classification of B or SB.

D. The Commissioner may require the applicant for a permit under Section 22a-430 of the General Statutes to demonstrate that he has acquired rights to the zone of influence of the proposed discharge. Acquisition of such rights means that the applicant owns the land overlying such zone, has obtained an easement with respect to such land and has recorded such easement in the applicable Town Clerk's office, or otherwise controls such zone to the Commissioner's satisfaction. Any such easement or G other control mechanism shall: 1) provide the applicant with the exclusive right to use the ground water in such zone and such right to enter the land overlying such zone as the Commissioner deems necessary to accommodate monitoring or remediation, and 2) assure that the ground water within such zone will not be used for potable water supply.

E. The delineation by a Section 22a-430 permit applicant of the zone of influence of a proposed waste discharge indicates that the underlying ground water may not be suitable for human consumption or other uses. Installation of a withdrawal well in or near such a zone of influence may result in an induced flow of polluted ground water to such well. When reviewing an application to withdraw groundwater pursuant to Connecticut's Water Diversion Policy Act, General Statutes Sections 22a-365 et seq., the Commissioner considers the potential impacts on water quality attributable to induced flow of polluted water from a zone of influence associated with a waste discharge.

GW11. The Department's classification of ground water, whether as GB, GC, or otherwise, conveys no right to degrade that ground water or to utilize less effective treatment measures than those utilized for discharges to groundwater designated for use as potable water. Domestic sewage shall be given the same treatment regardless of the classification of the groundwater to which such sewage is discharged.

GW12. The Commissioner applies the following policies in reviewing applications under Section 22a-430 of the General Statutes to discharge waste to ground water:

A. *Class GAA Ground Waters:* The Commissioner does not issue permits authorizing a discharge to class GAA ground water unless such discharge is of treated domestic sewage as defined in Section 22a-430-1 of the Regulations of Connecticut State Agencies, waste generated by certain agricultural practices, certain water treatment waste waters from public water supply treatment systems, or certain minor cooling waters or clean waters. If a GAA area is within an Aquifer Protection Area designated in accordance with Section 22a-354 of the General Statutes, the Commissioner does not issue permits authorizing a groundwater discharge that conflicts with any regulation adopted pursuant to Section 22a-354(i) of the General Statutes

B. *Class GAAs Ground Waters*: The Commissioner does not issue permits authorizing a discharge to class GAA ground water unless such discharge is of treated domestic sewage as defined in Section 22a-430-1 ofthe Regulations of Connecticut State Agencies, waste generated by certain agricultural

practices, certain water treatment waste waters from public water supply treatment systems, or certain minor cooling waters or clean waters. If a GAAs area is within an Aquifer Protection Area designated in accordance with Section 22a-354 of the General Statutes, the Commissioner does not issue permits authorizing a groundwater discharge that conflicts with any regulation adopted pursuant to Section 22a-354(i) of the General Statutes.

C. *Class GA Ground Waters*: The Commissioner does not issue permits authorizing a discharge to class GA ground water unless such discharge is allowed under subparagraph (A) of this standard or is a discharge from a septage treatment system or of other wastes that are predominantly human, plant, or animal in origin so long as any such wastes are of natural origin, easily biodegradable and, if properly managed, pose no threat of pollution to the ground water. The ground water plume generated by a discharge of septage treatment system must terminate in a stream with classification of B or SB unless the permittee treats the discharge in a manner which the Commissioner determines is adequate to maintain class A water in the receiving stream.

D. *Class GB Ground Waters*: The Commissioner may issue permits authorizing a waste discharge to class GB ground water if such discharge would be allowable in a GA area under subparagraph (C) of this standard or if such discharge meets all of the following criteria:

(i) The Commissioner has determined that such waste is generated by a source which is unlikely to produce persistent pollutants or pollutants that do not biodegrade in soil.

(ii) The waste will be treated as necessary to render it amenable to attenuation by the receiving soil so that the groundwater will not be impaired.

(iii) Such discharge otherwise conforms with all applicable legal requirements and standards.

E. *Class GC Ground Waters*: The Commissioner may issue permits authorizing a discharge to class GC ground water of any material, provided such discharge otherwise conforms with all applicable legal requirements and standards.

GW13. The Commissioner may issue a permit authorizing a discharge of material to ground water, even if such discharge would be inconsistent with subparagraph (A), (B), (C), or (D) of Standard GW12, provided such discharge otherwise conforms with all applicable legal requirements and standards, is necessary to remediate groundwater pollution, and is treated or managed such that, to the maximum extent practicable, the discharge does not impair public health or the environment.

V. GROUND WATER CLASSIFICATIONS AND CRITERIA

CLASS GAA

Designated Uses: Existing or potential public supply of water suitable for drinking without treatment; baseflow for hydraulically-connected surface water bodies.

CRITERIA

	Parameter	Criterion
1.	Dissolved Oxygen	As naturally occurs.
2.	Oils and grease	None other than of natural origin.
3.	Color and turbidity	None other than of natural origin.
4.	Coliform bacteria	None other than of natural origin.
5.	Taste and odor	None other than of natural origin.
6.	pH	As naturally occurs.
7.	Chemical constituents	As naturally occurs.

Sub-Classifications of Class GAA

GAA — Ground water used or which may be used for public supplies of water suitable for drinking without treatment; ground water in the area that contributes to a public drinking water supply well; and ground water in areas that have been designated as a future water supply in an individual water utility supply plan or in the Area wide Supplement prepared by a Water Utility Coordinating Committee pursuant to Title 25 of the General Statutes.

GAA — Ground water that is tributary to a public water supply reservoir.

CLASS GA

Designated Uses: Existing private and potential public or private supplies of water suitable for drinking without treatment; baseflow for hydraulically-connected surface water bodies.

CRITERIA

Parameter		Criterion
1.	Dissolved oxygen	As naturally occurs.
2.	Oils and grease	None other than of natural origin.
3.	Color and turbidity	None other than of natural origin.
4.	Coliform bacteria	None other than of natural origin.
5.	Taste and odor	None other than of natural origin.
6.	pH	As naturally occurs
7.	Chemical constituents	As naturally occurs.

CLASSIFICATIONS

GA — Ground water within the area of existing private water supply wells or an area with the potential to provide water to public or private water supply wells. The Department presumes that ground water in such an area is, at a minimum, suitable for drinking or other domestic uses without treatment.

CLASS GB

Designated Uses: Industrial process water and cooling waters; baseflow for hydraulically-connected surface water bodies; presumed not suitable for human consumption without treatment.

CRITERIA

Ground waters of this class are assumed by the Department to be degraded due to a variety of pollution sources. No specific groundwater quality criteria apply except those that may be promulgated as part of the Site Remediation Regulations required by Section 22a-133k of the General Statutes

CLASSIFICATIONS

GB — Ground water within a historically highly urbanized area or an area of intense industrial activity and where public water supply service is available. Such ground water may not be suitable for human consumption without treatment due to waste discharges, spills or leaks of chemicals or land use impacts.

CLASS GC

Designated Uses: Assimilation of discharges authorized by the Commissioner pursuant to Section 22a-430 of the General Statutes.

CRITERIA

No quantitative criteria are specifically determined until such time as a person applies to the Department under Section 22a-430 of the General Statutes to discharge leachate to ground water. The most important consideration in making a determination to classify ground water as GC is the impact of any authorized ground water discharges on adjacent surface waters.

CLASSIFICATIONS

GC Ground water to which the Commissioner has authorized a discharge under Section §22a 430 of the General Statutes. In the course of applying for Section §22a-430 authorization, the permittee performed all necessary hydrogeologic studies, secured legal rights to all affected ground waters, and complied with all other requirements of Connecticut's Water Quality Standards and any other applicable law. Ground waters classified as GC are not suitable for development of public supplies of potable water.

APPENDIX A

CONNECTICUT ANTI-DEGRADATION IMPLEMENTATION POLICY

I. PURPOSE. The purpose of this document is to establish implementation procedures to carry out Connecticut's anti-degradation policy as required by the Federal Clean Water Act (40 CFR 131.12) and stated in Connecticut Water Quality Standards 2 through 5. The anti-degradation policy requires the maintenance and protection of water quality in high quality waters. .

II. APPLICABILITY. The procedures outlined in this policy would apply to any proposed new or increased discharge to the surface waters of the state or any activity requiring a permit pursuant to Chapters 440, 446i-k, and 368 of the Connecticut General Statutes or requiring Water Quality Certification pursuant to Section 401 of the Clean Water Act.

III. SURFACE WATER RESOURCES TO BE MAINTAINED AT EXISTING HIGH QUALITY. No permit or certification may be issued for any discharge or activity in the following waters:

1) Outstanding National Resource Waters

Where high quality waters constitute an outstanding National resource, such as waters of National and State parks, wildlife refuges, and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected. The lowering of water quality is prohibited in Outstanding National Resource Waters except where limited activities will result in only temporary or short term insignificant changes in water quality.

2) Class A or AA waters

unless:

(a)(1) a temporary discharge is necessary to remediate an existing surface or groundwater pollution problem or

(a)(2) the discharge consists of clean water, treated backwash waters from public or private drinking water treatment systems or dredging and dredged material dewatering operations and does not result in violation of Class A or AA standards;

(b) for nonpoint source discharges, appropriate Best Management Practices as determined by the Commissioner are employed; and

(c) in all cases the Commissioner finds that existing or designated uses will be protected fully. Existing uses are defined in 40 CFR 131.12 those which have occurred on or after November 28. 1975.

3) High quality Class B or SB water resources are those with existing quality better than established standards for that class and which meet all designated use goals. These waters will be maintained at their existing high quality,

unless

(a) the Commissioner finds, after adequate opportunity for intergovernmental and public participation, that allowing lower water quality is necessary to accommodate overriding State economic or social development in accordance with paragraph IV.2 of this document or

(b) the Commissioner finds that the resulting change in water quality is not significant in accordance with paragraph IV. I of this document; and,

(c) in all cases, the Commissioner finds that existing and designated uses will be protected fully.

IV. ANTI-DEGRADATION EVALUATION PROCEDURES FOR CLASS B AND SB WATER RESOURCES

1) Determination of significant lowering of water quality - The Commissioner will make a determination of whether a proposed discharge or activity will result in a significant change in water quality by utilizing all available data and the best professional judgement of Department staff. Factors to be considered in making this determination include, but are not limited to:

(a) percent change in a water quality parameter;

(b) quality and value of the resource;

(c) cumulative impact of discharges and/or activities on water quality;

(d) impact on aquatic biota and habitat;

(e) eutrophic impacts,

(f) impact on existing, designated, and potential uses: and

(g) percent of remaining assimilative capacity for the water resource.

2) Determination that allowing lower water quality is necessary to accommodate overriding economic and social development - If it is determined that a proposed discharge or activity will result in a significant lowering of water quality in a high quality Class B or SB water resource, no permit or certification will be issued unless the Commissioner finds that allowing lower water quality is necessary to accommodate overriding economic and social development which the Commissioner has determined is clearly in the public interest, and that existing uses will be protected fully.

(a) The proposed lowering of water quality will be found to be <u>necessary</u> only if the applicant demonstrates to the satisfaction of the Commissioner that:

- alternatives are not technologically feasible, or
- applicable pollution control alternatives are prohibitively expensive.

Alternatives studied should include but are not necessarily limited to:

- alternative discharge locations
- reduction in scale of the project
- pollution prevention measures
- water recycle or reuse
- process changes and/or innovative technology
- improved operation and maintenance of existing facilities

(b) The burden of proof is on the applicant to show the overriding economic or social benefits to the State which will result from the proposed activity, including any mitigation. The applicant shall also discuss the loss or reduction of natural resource benefits associated with lower water quality. These benefits include but are not limited to active and passive recreation, aquatic life, aquatic habitat including riparian vegetation and intrinsic values such as aesthetic appreciation of the water resource.

3) As required by WQS (4), the Commissioner shall require the highest statutory and regulatory requirements for all new and existing point sources. All cost-effective and reasonable Best Management Practices for nonpoint source discharges must be utilized.

4) The Commissioner may periodically review available treatment technology and reconsider any prior decisions in accordance with Section 22a-431 of the General Statutes.

5) <u>Public Participation</u> - Anti-degradation issues will be evaluated in conjunction with permit or certification issuance described in Section 11 above. For activities where anti-degradation applies, the Public Notice for the proposed activity will contain the Commissioner's finding regarding compliance with the anti-degradation policy.

6) The Commissioner may take into consideration all other mitigating factors not included within these procedures in making a decision.

APPENDIX B

GUIDELINES FOR USE OF CRITERIA FOR INDICATOR BACTERIA

The indicator bacteria criteria established in Connecticut Water Quality Standards identify the minimum requirements for sanitary quality necessary to support the uses designated for each Class of waters. Three uses in particular are sensitive to bacterial contamination; drinking water supply, shellfish harvesting, and contact recreation (bathing). Three groups of indicator bacteria, total coliform, fecal coliform, and Enterococci, are used in Connecticut Water Quality Standards to establish the sanitary quality of waters relative to the support of these designated uses. The results of bacteriological analysis of a water sample also depends to a degree on the methodology used to determine bacterial densities. In practice, both the indicator organism and the method of measurement must be known to make valid assessments of sanitary quality.

Water Quality Classifications for individual waterbodies are reviewed approximately every three years at which time all available water quality monitoring data is considered. Public input is also solicited and considered in determining the appropriate Classification to identify current quality and future quality goals. Nevertheless, the Water Quality Classification mav not be an accurate representation of the current water quality conditions at any particular site. For this reason, the Water Quality Classification should not be considered as a certification of quality by the State or an approval to engage in certain activities such as swimming or shellfish harvesting.

Total coliform bacteria have traditionally been widely used as surrogates for pathogenic organisms normally associated with sewage to indicate the possible contamination of surface and ground waters including evaluation of the sanitary quality of drinking water . However, total coliform bacteria also originate in the intestines of other warm blooded animals. as well as sources which have little sanitary significance such as plants and soils (see also Standard 22). The Public Health Code, adopted pursuant to Section 19-13 of the Connecticut General Statutes, establishes sanitary criteria for untreated drinking water supplies based on total coliform densities determined using the Membrane Filter method described in the most recent edition of Standard Methods. The Connecticut Department of Health Services is designated as the lead agency with the authority to regulate the sanitary quality of public drinking water supplies and certify laboratories for analysis of the sanitary quality of surface and ground waters.

Fecal coliform bacteria comprise a portion of the total coliform group and may be more specific to bacteria of sanitary significance. Fecal coliform density as determined using the Multiple Tube Fermentation method has been designated as the preferred means of assessing the sanitary quality of marine waters with respect to shellfish harvesting. Public Act 89-321 assigns to the Department of Agriculture, Aquaculture Division (DA/AD) the responsibility for regulating the harvesting of shellfish in Connecticut waters. Consistent with this authority, the DA/AD has begun the process of classifying shellfish growing areas with respect to authorized use and sanitary quality in accordance with Federal regulations. The DA/AD has established shellfish growing area classifications (following table) based in part on monitoring of fecal coliform densities consistent with Interstate Shellfish Sanitation Conference (ISSC) National Shellfish Sanitation Program Manual of Operations, Parts I and II.

Additional information on the shellfish growing area classifications used by DA/AD for regulation of shellfish harvesting is provided in the tables which follow. Due to differences in the procedures used to classify waters, some inconsistencies may exist between the Connecticut Water Quality Classification adopted by DEP and the DA/AD Classification of shellfish growing areas. For example, the DA/AD may classify an area as PROHIBITED due to a lack of sufficient monitoring data to satisfy federal/ISSC mandates when, in fact, actual water quality would not result in contamination of the shellfish resource. In this instance, the shellfish classification does not accurately reflect true water quality conditions but rather indicates a shortfall in State and local resources to conduct monitoring. Situations may also arise in which monitoring to verify sanitary quality conducted by DA/AD and local authorities may uncover an area of previously unknown contamination. Here the DEP Water Quality Classification must be revised to reflect actual quality and corrective actions implemented to restore the use of the area for shellfishing. Each triennial revision of the Water Quality Classifications for marine waters will reduce the number of both types of inconsistencies as more direct and intensive monitoring data for Long Island Sound waters is available.

Enterococci have been adopted by the DEP and the Department of Health Services (DHS) as the preferred indicator for evaluation of the sanitary quality of established bathing waters. Enterococci are a subgroup of the fecal streptococci group and are more fecal specific than other commonly used indicators such as total coliform or fecal coliform bacteria. However, they also can be found in domestic animals and birds as well as humans. The local Director of Health is responsible for determining the sanitary quality of bathing waters and closure of waters found not to meet minimum criteria. Enterococci densities are determined using the Membrane filter method using mE agar as described in Test Methods for Escherichia coli and Enterococci in Water by the Membrane Filter Procedure (USEPA 600/4-85/076). Procedures for monitoring and closure of bathing areas by Local Health Authorities are specified in Guidelines for Monitoring Bathing Waters and Closure Protocol, adopted jointly by DEP and DHS in May 1989.

Prior to this revision, the Water Quality Standards included a fecal coliform criteria for evaluation of the sanitary quality of fresh waters as related to use for contact recreation. This criteria is now being replaced with a criteria for established bathing areas which utilizes Enterococci as indicator organism. The old fecal coliform criteria, however, is being retained as a guideline for evaluation of the general sanitary quality of waters relative to maintaining all designated uses for Class B waters:

> Fecal coliform shall not exceed a geometric mean indicator density of 200/100ml in any group of samples nor shall greater than 10% of samples exceed 400/100ml.

A fecal coliform guideline is desirable for several reasons. First, fecal coliform is a more general, broad-based indicator of sanitary quality than Enterococci and may be more useful in identifying and locating sources of sewage contamination in certain situations. Also, there exists a large body of historical monitoring data for fecal coliform densities in surface waters which can be useful in monitoring trends in surface water quality. Facilities which treat sanitary waste use fecal coliform density as a measure of disinfection efficiency. Currently the NPDES discharge permits for all sewage treatment plants in Connecticut include limits on fecal coliform density in the effluent as a means of ensuring that adequate disinfection has taken place prior to discharge. Finally, due to the more widespread past use of the fecal coliform analysis in comparison to the Enterococcal test, the Fecal coliform guideline provides a useful monitoring device during the transition period to greater reliance on the Enterococcial test for sanitary quality.

BACTERIAL INDICATORS OF SANITARY QUALITY FOR DESIGNATED USES
ESTABLISHED IN CONNECTICUT WATER QUALITY STANDARDS

DESIGNATED USE	CLASSES	INDICATOR	INDICATOR BACTERIA CRITERIA
Drinking water supply suitable for drinking following disinfection and chemical treatment.	AA A	Total Coliform (MF)	Shall not exceed a monthly moving average of 100/100 ml for the most recent 12 months. No individual sample shall exceed 500/100 ml.
Contact Recreation Established bathing wafers	A B SA SB	Enterococci (MF)	Shall not exceed a geometric mean indicator density of 33/100 ml. No single sample shall exceed 61/100 ml.
Shellfish Growing Areas for Direct Consumption (DA/AD Classified as APPROVED)	SA	Fecal Coliform (MPN)	Shall not exceed a geometric mean of 14 MPN/100 ml. No more than 10% of samples shall exceed 43 MPN/100 ml.
Shellfish Growing Areas for Indirect Consumption following transfer to a Depuration Plant or DA/AD approved Area for purification. (DA/AD Classified as RESTRICTED-DEPURATION)	SB SB/SA	Fecal Coliform (MPN)	Shall not exceed a geometric mean of 88 MPN/100 ml. No more than 10% of samples shall exceed 260 MPN/100 ml.

DESIGNATED USE	CLASSES	INDICATOR	INDICATOR BACTERIA CRITERIA
Shellfish Growing Areas for Indirect Consumption following transfer to an DA/AD Approved area for purification. (DA/AD Classified as RESTRICTED RELAY)	SB SB/SA	Fecal Coliform (MPN)	Criteria established on a site-specific basis by DA/AD following a sanitary survey.
Shellfish Growing Areas for certain aquaculture operations only. (DA/AD Classified as PROHIBITED)	SC/SA SC/SB SD/SA SD/SB	Fecal Coliform (MPN)	Does not meet SB criteria. Sanitary survey indicates that transfer of shellfish to DA/AD Approved Area will not be an effective means of protecting human health from possible adverse effects.

SHELLFISH GROWING AREA CLASSIFICATIONS
ESTABLISHED BY
THE CONNECTICUT DEPARTMENT OF AGRICULTURE / AQUACULTURE DIVISION

Approved — Approved by the DA/AD for growing or harvesting shellfish for direct marketing as licensed by DA/AD and recreational shellfishing. Classification is determined through a sanitary survey' conducted by DA/AD with local assistance. May be temporarily closed during a public health emergency is declared resulting from, for example, a hurricane or flooding.

Restricted-Depuration — Use is restricted to harvesting of shellfish by DA/AD licensed operators for transfer to a Depuration Plant or to an Approved Area for purification. These shellfish may not be directly marketed or consumed prior to the purification process. These areas require sanitary surveys and must meet specified bacteriological standards.

Restricted-Relay — Use is restricted to harvesting of shellfish by DA/AD licensed operators. Shellfish must be transferred to an Approved Area for natural purification prior to marketing and consumption. Transfer to a depuration plant is not allowed. A sanitary survey is required.

Prohibited — Harvesting of shellfish is prohibited except for certain aquaculture operations licensed by DA/AD such as harvesting of seed oysters for transplant to clean growing areas. This classification results from the presence of conditions that could pose a health hazard such as severe pollution or marine biotoxins. The DA/AD may also prohibit shellfishing in areas where insufficient sanitary survey and water quality information exist to establish an appropriate classification.

Conditional Use

The DA/AD may classify certain shellfishing areas as Conditionally Approved or Conditionally Restricted if it is determined by the DA/AD that the area will meet the criteria established for an Approved or Restricted classification for a predictable period. A conditional classification may be based on seasonal, meteorological or wastewater treatment plant performance characteristics which can be related in a predictable way to the sanitary quality of the shellfish growing area. If the conditions established by DA/AD are met, the area can be used for shellfish harvesting (either Approved or Restricted as Classified); if the conditions are not met, shellfish harvesting in the area would be prohibited until conditions improve. Water Quality Classifications for marine waters which are conditionally classified by DA/AD are determined on a case-by-case basis by DEP taking into consideration the cause and frequency of any restrictions on use.

- A sanitary survey, as referenced here, consists of a shoreline survey to identify and assess potential pollution sources, meteorological effects, water quality examination and assessment using prescribed standards, and corrective action where necessary. Sanitary surveys are required for all shellfish growing area classifications with the exception of PROHIBITED.

APPENDIX C

DEFINITIONS

Acute Toxicity	Adverse effect such as mortality or debilitation caused by a brief exposure to a relatively high concentration of a toxic substance.
Ambient	Normally occurring conditions in a waterbody.
Anti-degradation	A statement of practice required by federal law which prohibits a state from lowering surface water quality classifications or standards in order to accommodate new or increased wastewater discharges or land use practices which impact a particular water course. The state must attain, and maintain the most sensitive existing and potential use for a respective waterbody.
Arithmetic Mean	The average, calculated by dividing the sum of all values by the number of values to be averaged.
Benthic	Refers to organisms or material associated with the bottom of watercourses.
Benthic Macroinvertebrates	Animals large enough to be seen by the unaided eye and can be retained by a U.S. standard No. 30 sieve (28 meshes per inch, 0.595 mm openings). They must live at least part of their life cycle within or upon submerged substrates in a body of water. These animals usually consist of the aquatic life stages of various insects and arthropods, molluscs, leeches and worms. The benthic community is widely used for the environmental assessment of flowing waters. The structure of this community is a function of environmental conditions during the life span of the organisms. Consequently, community structure can be altered by the effects of pollution, including intermittent events which could be easily missed by conventional chemical/physical indicators. The well-being of the benthic community is frequently reflected in the well-being of higher forms of aquatic life, such as fish.
Best Management Practices	Those practices which reduce pollution of the waters of the state and which have been determined by the Commissioner to be acceptable based on, but not limited to, technical, economic and institutional feasibility.
Bioaccumulate	The uptake and retention of substances by an organism from its surrounding medium and/or from food.
Bioconcentrate	The uptake and retention of substances by an organism from its surrounding medium to levels which exceed the concentration of that substance in the medium.
Chronic Toxicity	Adverse effect, such as reduced reproductive success or growth, poor survival of sensitive life stages which occurs as a result of exposure to relatively low concentrations of a toxic substance.

Classifications	Designation of the proposed uses of surface and ground waters with alphabetic character. Where classifications appear in two sections separated by a diagonal line, the first classification indicates existing use or general quality and the second classification indicates the water use goal.
Clean Water	Water, which in the judgement of the Commissioner, is of a quality substantially similar to that occurring naturally in the receiving stream under consideration; e.g., Clean water may include minor cooling waters, residential swimming pool water, and stormwater. Best Management Practices or other treatment may be required.
Coastal and Marine Waters	Those waters generally subject to the rise and fall of the tide and as defined by Section 22a-93 of the Connecticut General Statutes as amended.
Commissioner	Commissioner of Environmental Protection
Criteria	Elements of Connecticut's Water Quality Standards, expressed in parameters and their constituent concentrations, levels, or by narrative statements, representing a quality of water that supports a particular designated use.
Department	The Connecticut Department of Environmental Protection.
Depuration	Controlled shellfish purification process where a controlled environment is used to reduce the level of bacteria and viruses in shellfish. The process usually includes a fixed structure having a specified water circulation and disinfection system, together with designed tanks and racks.
Designated Use	Those uses specified in Connecticut's Water Quality Standards for each surface watercourse or ground water area, whether or not they are being attained.
Discharge	Defined in Sec. 22a-423 as " . . . the emission of any water, substance or material into the waters of the state, whether or not such substance causes pollution."
Discharge Toxicity Evaluation	A structured scientific analysis of the toxic strength and discharge rate of a treated wastewater effluent relative to available dilution in the receiving water.Prepared as described in the Department's guidance document, Guidelines for Preparation of Discharge Toxicity Evaluations. An analysis typically contains data and supporting information on receiving waterbody characteristics and recommendations regarding possible approaches to reduce effluent toxicity and in-stream toxic impacts resulting from the discharge.
Domestic Sewage	Waste water which consists of water and human excretions or other waterborne wastes incidental to the occupancy of a residential building or a non-residential building but not including manufacturing process water, cooling water, wastewater from water softening equipment, commercial laundry wastewater, blowdown from heating or cooling equipment, water from cellar or floor drains or surface water from roofs, paved surfaces, or yard drains.
Dredging	The excavation, removal or dispersal of sediments.
Effuent	Treated waste process waters or cooling waters discharged from a waste treatment or manufacturing facility.
Eutrophication	The process of enrichment of surface waters with plant nutrients which may cause nuisance algae blooms and excessive growth of aquatic weeds.

Existing Uses	Those uses actually attained in the water body on or after November 28, 1975, whether or not they are included in the Water Quality Standards.
Functional Feeding Group	General category of benthic macroinvertebrates based on feeding mechanisms.
Geometric Mean	Also referred to as the log mean, it is a measure of central tendency calculated by taking the anti-log of the mean of the logarithms of the values to be averaged.
Ground Waters	Waters flowing through earth materials, beneath the ground surface.
Ground Water of Natural Quality	Means ground water which is free from pollution by solid waste, wastewater discharges, chemical spills and leaks pesticides or other anthropogenic sources of water pollution except for acid rain.
High Quality Waters	Waters of a quality which exceed established standards for the respective Class. May sustain a sensitive use which is designated for a higher Class. Refer to Standard number 2.
Indigenous	Animal or plant life which are naturally occurring inhabitants of a certain geographic region.
Invertebrates	Animals lacking a backbone.
Lentic	Standing water environments, such as lakes and ponds.
Lotic	Refers to flowing water habitats, as in streams or rivers.
Most Sensitive Use	The water use (drinking, swimming, boating, fish and aquatic life propagation, irrigation etc.) which is most susceptible to degradation by a specific pollutant. (e.g. Bacterial contamination can preclude swimming but not fish production; copper concentrations as low as 20 parts per billion (ppb) may adversely affect sensitive species of fish and aquatic life while drinking water quality is not affected until copper concentrations approach the secondary drinking water Maximum Concentration Level (MCL) of 1,000 parts per billion).
Moving Average	Mean of consecutive values in a time series of a specified duration. For example, a 12 month moving average is calculated by averaging the monthly values for a parameter for the most recent 12 consecutive months. It is called a moving average since as time progresses and more new values are available, old values are dropped resulting in an average which is always based on 12 consecutive monthly values.
MSD	Marine Sanitation Device. Devices installed or used on watercraft for the collection, treatment and disposal of human wastes.
Natural Origin	The natural ambient background level that has been measured.
Non-point Source	Wastewaters, leachate or runoff which originate from diffuse sources or widespread areas. For example: soil erosion from construction sites.
Point Sources	Treated or untreated wastewater discharges from manufacturing or sewage treatment works which are conveyed to their discharge point within discrete, readily identifiable pipes or conduits or are emitted through some other similar single point. For example, an outfall pipe from a sewage treatment plant.
Prudent	Means reasonable, after taking into consideration cost. in light of the social and environmental benefits.

Recreational Use	Water use which involves active or passive leisure activities such as fishing, swimming, boating, and aesthetic appreciation.
Sediments	Any natural or artificial materials which constitute all or part of the banks. bed or bottom of an intermittent or perennial watercourse.
Sewage	Defined in Sec. 22a-423 as, "human and animal excretions and all domestic and such manufacturing wastes as may tend to be detrimental to the public health."
Streamflow Regulation	Control of the rate of stream discharge by means of dams withdrawals, or diversion of water which might otherwise impede the flow of water in a watercourse.
Taxon (pi. Taxa)	Refers to a biological classification category, usually the finest division attainable in current taxonomy. Most benthic organisms are identified to genus or species.
Technically Practicable	Means, with respect to remediation, the greatest degree of remediation that can be achieved using sound engineering and hydro geologic practices.
Based Treatment	301(b) and 304(b) of the Federal Water Pollution Control (Clean Water) Act. The level and type of treatment required is based on the manufacturing process used and type of waste generated.
Tidal Wetlands and Creeks	Defined in Section 22a-29 of the Connecticut General Statutes as those areas which border on or lie beneath tidal waters.
Toxic Substance	Any substance which can adversely affect the survival, growth or reproduction of fish, other forms of aquatic life or humans exposed to the substance either by direct contact or through consumption of aquatic organisms.
Transplantation	Harvesting shellfish from designated closed areas, transporting and placing the shellfish onto other designated areas for propagation, growth, purification or transfer to an approved depuration plant.
Trophic Conditions	The state of enrichment of a waterbody with plant nutrients.
Use Attainability Analysis	A structured scientific assessment of the factors affecting the attainment of a watercourse designated use which may include physical, chemical, biological and economic factors. The analysis process is defined in: the Revised Water Quality Standards Regulations published in the Federal Register (48 FR 5 1400, November 8, 1983). Additional guidance regarding preparation of Use Attainability Analyses is contained in Chapter 3 of the Water Quality Standards Handbook (EPA - 1983) and Technical Support Manual: Water Body Surveys and Assessments for Conducting Use Attainability Analyses (EPA Office of Water, November 1983).
Waters of the State	Defined in Sec. 22a-423 as, " . . . all tidal waters, harbors, estuaries, rivers, brooks, watercourses, waterways. wells, springs, lakes, ponds, marshes, drainage systems, and all other surface or underground streams, bodies or accumulations of water, natural or artificial, public or private, which are contained within, flow through or border upon this state or any portion thereof."
Water Quality	Water Quality A statement of the physical, chemical and biological characteristics of surface or ground waters.

Water Quality Based Treatment	Additional waste treatment defined under the provisions of Section 302 of the Clean Water Act when technology based treatment is not sufficient to protect water quality.
Water Quality Limited Segment	Any segment of a watercourse where it is known that water quality does not meet applicable standards and/or is not expected to meet applicable water quality standards even after the application of technology based effluent limitations.
Water Quality Standards	Provisions of state and federal law which consist of designated use or uses for the state's waters and water quality criteria which will support those uses.
Zone of Influence	Spatial area or volume of receiving water flow within which some degradation of water quality or use impairment is anticipated to occur as a result of a pollutant discharge. May be used to describe an area impacted by thermal, conventional, or toxic pollutants.
Zone of Passage	Spatial area or volume of flow within which the concentration of toxic chemicals and for temperature elevations are below levels which would impede or prohibit the passage of free swimming and drifting aquatic organisms.
7Q10	(Seven-day, Ten-year low flow) - lowest 7 consecutive day mean stream discharge with a recurrence interval of ten (10) years.

APPENDIX D

NUMERICAL CRITERIA FOR TOXIC POLLUTANTS

REVISED APRIL 1997

APPENDIX D
NUMERICAL WATER QUALITY CRITERIA FOR CHEMICAL CONSTITUENTS [1]

Concentrations in ug/L

	Aquatic Life Criteria				Human Health Criteria		
	Freshwater		Saltwater		Consumption of:		
Compound	**Acute [2]**	**Chronic [3]**	**Acute [2]**	**Chronic [3]**	**Organisms Only**	**Water and Organisms**	**Health Designation [4]**
Toxic Metals [5], Cyanides							
Antimony	---	---	---	---	4300	14	TT
Arsenic (Tri)	360	190	69	36	.14	.018	A
Beryllium	---	---	---	---	.13	.0077	TT
Cadmium	1.80	.62	42	9.3	170	16	TT
Chromium (hex)	15	10	1100	50	3,400	170	TT
Chromium (tri)	310	103	---	---	670,000	33,000	TT
Copper	14.3 [6]	4.8 [7]	2.4	2.4	---	1300	TT
Copper (site-specific) [8]	25.7	18.1	---	---	---	1300	TT
Cyanide (HCN + CN-)	22	5.20	1	1	220,000	700	TT
Lead	30	1.2	210	8.1	---	50	TT
Mercury	2.1	.012 (total)	1.8	.025 (total)	.15	.14	TT-HB
Nickel	788	88	74	8.2	4,600	610	TT
Selenium	20 (total)	5 (total)	290	71	6,800	100	TT
Silver	1.02	---	1.96	---	65,000	105	TT
Thallium	---	---	---	---	6.3	1.7	TT
Zinc	63.6	58.2	90	81	---	---	TT

	Aquatic Life Criteria				Human Health Criteria		
	Freshwater		Saltwater		Consumption of:		
Compound	**Acute**	**Chronic**	**Acute**	**Chronic**	**Organisms Only**	**Water and Organisms**	**Health Designation**
Volatiles							
Acrolein	---	---	---	---	780	320	TT
Acrylonitrile	---	---	---	---	.66	.059	C
Benzene	---	---	---	---	71	1.2	A
Bromoform	---	---	---	---	360	4.3	C
Carbon Tetrachloride	---	---	---	---	4.4	.25	C
Chlorobenzene	---	---	---	---	21,000	680	TT
Chlorodibromomethane	---	---	---	---	34	.41	C
Chloroethane	---	---	---	---	---	---	---
Chloroform	---	---	---	---	470	5.7	C
Dichlorobromomethane	---	---	---	---	22	.27	C
1,1 Dichloroethane	---	---	---	---	---	---	---
1-2-Dichloroethane	---	---	---	---	99	.38	C
1,1-Dichloroethylene	---	---	---	---	3.2	0.057	C
1,2,T-Dichloroethylene	---	---	---	---	---	700	TT
1,2-Dichloropropane	---	---	---	---	39	0.52	TT
1,3-Dichloropropylene	---	---	---	---	1,700	10	TT
Ethylbenzene	---	---	---	---	29,000	3,100	TT
Methyl Bromide	---	---	---	---	4,000	48	TT
Methyl Chloride	---	---	---	---	470	5.7	TT
Methylene Chloride	---	---	---	---	1,600	4.7	C
1,1,2,2-Tetrachloroethane	---	---	---	---	11	.17	C-HB
Tetrachloroethylene	---	---	---	---	8.85	.8	TT
Toluene	---	---	---	---	200,000	6,800	TT

	Aquatic Life Criteria				Human Health Criteria		
	Freshwater		Saltwater		Consumption of:		
Compound	**Acute**	**Chronic**	**Acute**	**Chronic**	**Organisms Only**	**Water and Organisms**	**Health Designation**
Volatiles (continued)							
Trichoroethylene	---	---	---	---	81	2.7	C
Vinyl Chloride	---	---	---	---	525	2	C
GC/MS : Acid Compounds							
2-Chlorophenol	---	---	---	---	2300	540	TT
2,4-Dichlorophenol	---	---	---	---	790	93	TT
2,4-Dimethylphenol	---	---	---	---	---	---	---
3-Methyl-4-chlorophenol	---	---	---	---	---	---	---
2-Methyl-4,6-Dintrophenol (=4,6 Dinitro-o-cresol)	---	---	---	---	765	13.4	TT
2,4-Dinitrophenol	---	---	---	---	14,000	70	TT
2-Nitrophenol	---	---	---	---	---	---	---
Pentachlorophenol	9.07	5.73	13	7.9	8.2	.28	C-HB
Phenol	---	---	---	---	4,600,000	21,000	TT
2,4,6-Trichlorophenol	---	---	---	---	6.5	2.1	C-HB
Base Neutral Compounds							
Acenaphthene	---	---	---	---	2700	1200	TT-HB
Acenapthylene	---	---	---	---	.031	.0028	C-HB
Anthracene	---	---	---	---	110,000	9,600	C-HB
Benzidine	---	---	---	---	.00054	.00012	A
Benzo(a)anthracene	---	---	---	---	.031	.0028	C-HB
Benzo(a)pyrene	---	---	---	---	.031	.0028	C-HB
Benzo(b)fluoranthene	---	---	---	---	.031	.0028	C-HB
Benzo(ghi)perylene	---	---	---	---	.031	.0028	C-HB

	Aquatic Life Criteria				Human Health Criteria		
	Freshwater		Saltwater		Consumption of:		
Compound	**Acute**	**Chronic**	**Acute**	**Chronic**	**Organisms Only**	**Water and Organisms**	**Health Designation**
Base Neutral Compounds (continued)							
Benzo(k)fluoranthene	---	---	---	---	.031	.0028	C-HB
Bis(2-chloroethoxy)Methane	---	---	---	---	---	---	---
Bis(2-Chloroethyl)Ether	---	---	---	---	1.4	.031	C
Bis(2-Chloroisopropyl)Ether	---	---	---	---	170,000	1,400	TT
Bis(2-Ethylhexyl)phthalate	---	---	---	---	5.9	1.8	C-HB
4-Bromophenyl ether	---	---	---	---	---	---	---
Butyl benzl phthalate	---	---	---	---	5200	3000	TT-HB
2-Chloronapthalene	---	---	---	---	4300	1700	TT-HB
2-chlorophenyl phenyl ether	---	---	---	---	---	---	---
Chrysene	---	---	---	---	.031	.0028	C-HB
Dibenzo(a,h)anthracene	---	---	---	---	.031	.0028	C-HB
1,2-Dichlorobenzene	---	---	---	---	17,000	2,700	TT-HB
1,3-Dichlorobenzene	---	---	---	---	2,600	400	TT-HB
1,4-Dichlorobenzene	---	---	---	---	2,600	400	TT-HB
3,3-Dichlorobenzidines	---	---	---	---	.077	.04	C-HB
Diethyl Phthalate	---	---	---	---	120,000	23,000	TT
Dimethyl Phthalate	---	---	---	---	2,900,000	313,000	TT
Di-n-butyl Phthalate	---	---	---	---	12,000	2,700	TT-HB
Di-n-octyp phthalate ester	---	---	---	---	---	---	---
2,4-Dinitrotoluene	---	---	---	---	9.1	.11	C
2,6-Dinitrotoluene	---	---	---	---	---	---	---
Di-n-octyl phthalate	---	---	---	---	---	---	---

	Aquatic Life Criteria				Human Health Criteria		
	Freshwater		Saltwater		Consumption of:		
Compound	**Acute**	**Chronic**	**Acute**	**Chronic**	**Organisms Only**	**Water and Organisms**	**Health Designation**
Base Neutral Compounds (continued)							
1,2-Diphenylhydrazine	---	---	---	---	.54	.04	C
Fluoranthene	---	---	---	---	370	300	TT-HB
Fluorene	---	---	---	---	14,000	1,300	C-HB
Hexachlorobenzene	---	---	---	---	.00077	.00075	C-HB
Hexachlorobutadiene	---	---	---	---	50	.44	C-HB
Hexachlorocycopentadiene	---	---	---	---	17,000	240	TT-HB
Hexachloroethane	---	---	---	---	8.9	1.9	C-HB
Indeno(1,2,3-cd)pyrene	---	---	---	---	.031	.0028	C-HB
Isophorone	117,000	---	---	---	600	8.4	TT
Naphthalene	---	---	---	---	---	---	---
Nitrobenzene	---	---	---	---	1,900	17	TT
N-Nitrosodimethylamine	---	---	---	---	8.1	.00069	C
N-Nitrosodi-n-propylamine	---	---	---	---	1.4	0.005	C
N-Nitrosodiphenylamine	---	---	---	---	16	5	C
Phenanthrene	---	---	---	---	.031	.0028	C-HB
Pyrene	---	---	---	---	11,000	960	C-HB
1,2,4-Trichlorobenzene	---	---	---	---	---	---	---
Pesticides:							
Aldrin	1.50	---	.65	---	.00014	.00013	C-HB
Chlordane	1.20	.0043	.045	.004	.00059	.00057	C-HB
DDT	.55	.001	.065	.001	.00059	.00059	C-HB
DDD	---	---	---	---	.00084	.00083	C-HB
DDE	---	---	---	---	.00059	.00059	C-HB

	Aquatic Life Criteria				Human Health Criteria		
	Freshwater		Saltwater		Consumption of:		
Compound	**Acute**	**Chronic**	**Acute**	**Chronic**	**Organisms Only**	**Water and Organisms**	**Health Designation**
Pesticides (continued)							
Dieldrin	1.25	.0019	.355	.0019	.00014	.00014	C
Endosulfan(alpha)	.11	.056	.017	.0087	2.0	.93	TT
Endosulfan (beta)	.11	.056	.017	.0087	2.0	.93	TT
Endosulfan Sulfate	---	---	---	---	2.0	.93	TT
Endrin	.09	.0023	.0185	.0023	.81	.76	TT
Endrin Aldehyde	---	---	---	---	.81	.76	TT
Heptachlor	.26	.0038	.0265	.0036	.00021	.00021	C
Heptachlor epoxide	.26	.0038	.0265	.0036	.00011	.00010	C
Hexachlorocyclohexane (Alpha)	---	---	---	---	.013	.0039	C-HB
Hexachlorocyclohexane (Beta)	---	---	---	---	.046	.014	C-HB
Hexachlorocyclohexane (delta)	---	---	---	---	---	---	---
Hexachlorocyclohexane (Gamma) 'Lindane'	1.0	.08	.08	---	.063	.019	TT-HB
Polychlorinated Biphenyls	---	.014	---	.03	.00017	.00017	C-HB
2,3,7,8-TCDD	---	---	---	---	.000000014	.000000013	C-HB
Toxaphene	.73	.0002	.21	.0002	.00075	.00073	C-HB
Other Substances:							
Ammonia	See Table[9]	See Table[9]	See Table[9]	See Table[9]	---	---	---
Asbestos	---	---	---	---	---	7,000,000 fibers/liter	A
Chlorine	19	11	13	7.5	---	---	---

TABLE NOTES:

1. The minimum data necessary to determine consistency with Connecticut Water Quality Standards shall be subject to the Commissioner's discretion and may not be limited to or include chemical analysis results for all of the constituents listed in Appendix D.

2. Biological integrity is impaired by an exposure of one hour or longer to a concentration which exceeds the acute criteria more frequently than once every three years on average.

3. Biological integrity is impaired when the four-day average concentration exceeds the chronic criteria more frequently than once every three years on average.

4. The Commissioner will consider the following human health designations in allocating zones of influence for point source discharges:

A:	Class A carcinogen (known human carcinogen)
TT:	Threshold Toxicant, not carcinogenic
C:	Carcinogenic (probable or possible carcinogen)
HB:	High potential to bioaccumulate or bioconcentrate.

5. Criteria apply to the dissolved fraction unless otherwise noted.

6. Biological integrity is impaired when the ambient concentration exceeds this value on more than 5% of days in any year.

7. Biological integrity is impaired when the ambient concentration exceeds this value on more than 50% of days in any year.

8. Site specific criteria for copper apply for the following waters:

Bantam River	Litchfield POTW to confluence with Shepaug River
Blackberry River	Norfolk POTW to confluence with Roaring Brook
	North Canaan POTW to confluence with Housatonic River
Factory Brook	Salisbury POTW to mouth
Five Mile River	New Canaan POTW to mouth
Hockanum River	Vernon POTW to confluence with Connecticut River
Mill Brook	Plainfield Village POTW to mouth
Naugatuck River	Torrington POTW to confluence with Housatonic River
Norwalk River	Ridgefield Brook to Branchville
Pequabuck River	Plymouth POTW to confluence with Farmington River
Quinnipiac River	Southington POTW to Broadway, North Haven
Still River	Winsted POTW to confluence with Farmington River
Still River	Limekiln Brook to confluence with Housatonic River
Williams Brook	Ledyard POTW to mouth
Willimantic River	Stafford Springs POTW to Trout Management Area (Willington)
	Eagleville Dam to confluence with Shetucket River

9. Criteria for ammonia may be adjusted to account for seasonal variation in temperature as indicated below. Criteria values are expressed in mg/L NH_3-N.

Acute Toxicity

	Temperature °C 0	5	10	15	20	25	30
Freshwater (general)	23.1	21.4	20.6	19.8	18.9	13.2	9.9
Freshwater (Salmon spawning)	23.1	21.4	20.6	19.8	18.9	13.2	9.9
Estuarine (20 mg/Kg salinity)	29.0	20.0	14.0	9.8	6.7	4.8	3.3
Marine (30 mg/Kg salinity)	31.0	21.0	15.0	10.0	7.3	5.0	3.5

Chronic Toxicity

	Temperature °C 0	5	10	15	20	25	30
Freshwater (general)	2.47	2.30	2.22	2.14	2.06	1.43	1.01
Freshwater (Salmon spawning)	2.47	2.30	2.22	2.14	1.45	1.01	0.72
Estuarine (20 mg/Kg salinity)	4.40	3.00	2.10	1.50-	1.00	0.72	0.31
Marine (30 mg/Kg salinity)	4.70	3.10	2.20	1.60	1.10	0.75	0.53

APPENDIX C.1.7

USEPA REGION III RISK BASED CONCENTRATION TABLE
(OCTOBER 2000)
COC SCREENING LEVELS FOR RESIDENTIAL SOIL INGESTION AND TAP WATER INGESTION

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

SUBJECT: Risk-Based Concentration Table **DATE:** 10/5/2000

FROM: Jennifer Hubbard, Toxicologist
Superfund Technical Support Section (3HS41)

TO: RBC Table Users

Attached is the EPA Region III Risk-Based Concentration (RBC) Table, which we prepare and post periodically for all interested parties.

IMPORTANT NOTES: To make the RBC Table more accessible and to minimize paper usage, it is now primarily available through the Internet. The address is **http://www.epa.gov/reg3hwmd/risk/riskmenu.htm**. The Table is available in both Lotus and Excel as "self-extracting" files. These files should be downloaded and then processed with your computer's "run" function. The files can then be viewed in Lotus or Excel.
If you have technical questions about the toxicological or risk assessment aspects of the RBCs, please contact Jennifer Hubbard at 215-814-3328 or hubbard.jennifer@epa.gov. Other questions can be addressed to Terri Fields at 215-814-3041. You can also consult the Frequently Asked Questions, below.

CONTENTS, USES, AND LIMITATIONS OF THE RBC TABLE

The RBC Table contains Reference Doses (RfDs) and Cancer Slope Factors (CSFs) for 400-500 chemicals. These toxicity factors have been combined with "standard" exposure scenarios to calculate RBCs--chemical concentrations corresponding to fixed levels of risk (i.e., a Hazard Quotient (HQ) of 1, or lifetime cancer risk of 1E-6, whichever occurs at a lower concentration) in water, air, fish tissue, and soil.

The Region III toxicologists use RBCs to screen sites not yet on the NPL, respond rapidly to citizen inquiries, and spot-check formal baseline risk assessments. The primary use of RBCs is for chemical screening during baseline risk assessment (see EPA Regional Guidance EPA/903/R-93-001, "Selecting Exposure Routes and Contaminants of Concern by Risk-Based Screening"). The exposure equations come from EPA's Risk Assessment Guidance for Superfund (RAGS), while the exposure factors are those recommended in RAGS or supplemental guidance from the Superfund program. The

attached technical background document provides specific equations and assumptions. Simply put, RBCs are like risk assessments run in reverse. For a single contaminant in a single medium, under standard default exposure assumptions, the RBC corresponds to the target risk or hazard quotient.

RBCs also have several important limitations. Specifically excluded from consideration are (1) transfers from soil to air, (2) cumulative risk from multiple contaminants or media, and (3) dermal risk. Additionally, the risks for inhalation of vapors from water are based on a very simple model, whereas detailed risk assessments may use more detailed showering models. Also, the toxicity information in the Table has been assembled by hand and (despite extensive checking and years of use) may contain errors. It's advisable to cross-check before relying on any RfDs or CSFs in the Table. If you note any errors, please let us know.

It is important to note that this Table uses inhalation RfDs and CSFs rather than RfCs (Reference Concentrations) and inhalation unit cancer risks. This is because the latter factors incorporate exposure assumptions and therefore can only be used for one exposure scenario. Because risk assessors need to evaluate risks for many types of scenarios, the factors have been converted to the more traditional RfDs and CSFs. Unless otherwise indicated in the toxicity-factor source, the assumption is that RfCs and unit risks should be adjusted by a 70-kilogram body weight and a 20 m^3/day inhalation rate to generate the RfDs and CSFs.

Many users want to know if the RBCs can be used as valid no-action levels or cleanup levels, especially for soils. The answer is a bit complex. First, it is important to realize that <u>the RBC Table does not constitute regulation or guidance, and should not be viewed as a substitute for a site-specific risk assessment</u>. For sites where:

1. A single medium is contaminated;

2. A single contaminant contributes nearly all the health risk;

3. Volatilization, dermal contact, and other pathways not included in the RBCs are not expected to be significant;

4. The exposure scenarios and assumptions used in the RBC table are appropriate for the site;

5. The fixed risk levels used in the RBC table are appropriate for the site; and

6. Risk to ecological receptors is not expected to be significant;

the RBCs would probably be protective as no-action levels or cleanup goals. However, to the extent that a site deviates from this description, as most do, the RBCs would not necessarily be appropriate.

To summarize, the Table should generally not be used to set cleanup or no-action levels at CERCLA sites or RCRA Corrective Action sites, to substitute for EPA guidance for preparing baseline risk assessments, or to determine if a waste is hazardous under RCRA.

SPECIAL NOTES

The RBC Table was originally developed by Roy L. Smith, Ph.D., for use by risk assessors in the Region III Superfund program. Dr. Smith is no longer with Region III, and the Table continues to evolve. You may notice some modifications of formatting and conventions used in the Table.

For instance, besides formatting, the following changes are noteworthy:

As usual, updated toxicity factors have been used wherever available. However, because IRIS and provisional values are updated more frequently than the RBC Table, RBC Table users are ultimately responsible for obtaining the most up-to-date values. The RBC Table is provided as a convenience, but toxicity factors are compiled from the original sources and it is those original sources that should serve as the definitive reference.

Certain outdated and withdrawn numbers have been removed from the Table.

Changes to the table since the last semi-annual version have been marked with asterisks (**). Changes may involve a corrected CAS number or a correction in the VOC status, a change in the SSL, or changes of RfDs and CSFs on IRIS.

RBCs are no longer rounded to 1E6 ppm. For certain low-toxicity chemicals, the RBCs exceed possible concentrations at the target risks. In such cases, Dr. Smith rounded these numbers to the highest possible concentration, or 1E6 ppm. This type of truncation has been discontinued so that Table users can adjust the RBCs to a different target risk whenever necessary. For example, when screening chemicals at a target HQ of 0.1, noncarcinogenic RBCs may simply be divided by 10. Such scaling is not possible when RBCs are rounded. Users who are interested in truncation can also consult the Soil Screening Guidance for a discussion of "Csat," the saturation concentration.

This Table was originally compiled to assist Superfund risk assessors in screening hazardous waste sites. The large number of chemicals made the Table unwieldy and difficult to keep current. Many of the chemicals did not typically (or even occasionally) appear at Superfund sites. Starting with the April 1998 version of the Table, the 600+ chemicals were reduced to some 400-500 chemicals by eliminating many of those atypical chemicals. Through time, the Table may continue to grow or decrease in size. Comments on this issue are appreciated. During the last two and a half years, only one request was received for restoration of a chemical: NuStar was restored to the Table. (A list of the deleted chemicals is attached.)

At Region III Superfund sites, noncancer RBCs are typically adjusted downward to correspond to a target HQ of 0.1 rather than 1. (This is done to ensure that chemicals with additive effects are not prematurely eliminated during screening.) However, some chemicals have RBCs at HQs of 0.1 that are lower than their RBCs at 1E-6 cancer risk. In other words, the screening RBC would change from carcinogenic to noncarcinogenic. A new feature of this Table is that these chemicals are now flagged with a "!" symbol. Therefore, assessors screening with adjusted RBCs will be alerted to this situation.

Earlier versions of this Table included a substitution of inhalation toxicity factors for oral factors whenever oral factors were unavailable (this applied only to groundwater and air, but not soil or fish). This practice has been discontinued in order to minimize the uncertainty associated with such a conversion. The discontinuation of this practice does not significantly decrease the number of available RBCs.

The criterion for "VOC status" is in accordance with RAGS Part B: chemicals with Henry's Law constants greater than 1E-5 and molecular weight less than 200 are now marked as VOCs. This increases consistency with the national guidance and with other EPA regions that use risk-based screening numbers.

Earlier versions of this Table included soil screening levels (SSLs), when those values were available in draft form. Since the finalization of the SSL Guidance, risk assessors are urged to consult the final SSL Guidance directly. However, for generic use in Region III, the table now contains soil-to-groundwater SSLs in accordance with the new guidance. For more information, see the Region III memo on SSLs, or consult the national SSL guidance directly (Soil Screening Guidance: User's Guide, April 1996, Publication 9355.4-23; and Soil Screening Guidance: Technical Background Document, May 1996; EPA/540/R-95/128).

- You may notice there are now two rows for uranium, one reflecting the IRIS (EPA consensus) value and the other reflecting a more recent, but provisional value. Region III has shown both on this table, rather than choosing one over the other, to give Table users as much information as possible.

FREQUENTLY ASKED QUESTIONS

To help you better understand the RBC Table, here are answers to our most often-asked questions:

1. How can the age-adjusted inhalation factor (11.66) be less than the inhalation rate for either a child (12) or an adult (20)?

Age-adjusted factors are not intake rates, but rather partial calculations which have different units from intake rates. (Therefore, they are not directly comparable.) The fact that these partial calculations have values similar to intake rates is really coincidental, an artifact of the similar magnitude of years of exposure and time-averaged body weight.

2. For manganese, IRIS shows an oral RfD of 0.14 mg/kg/day, but the RBC Table uses 2E-2 mg/kg/day. Why?

   The IRIS RfD includes manganese from all sources, including diet. The explanatory text in IRIS recommends using a modifying factor of 3 when calculating risks associated with non-food sources, and the Table follows this recommendation. IRIS also recommends subtracting dietary exposure (default assumption in this case 5 mg). Thus, the IRIS RfD has been lowered by a factor of 2 x 3, or 6. The Table now reflects manganese RBCs for both "food" and "non-food" (most environmental) sources.

3. What is the source of the child's inhalation rate of 12 m^3/day?

   The calculation comes from basic physiology. It's a scaling of the mass-specific 20 m^3/day rate for adults from a body mass of 70 kg to 15 kg, using the 2/3 power of mass, as follows:

   Ircm = mass-specific child inhalation rate (m^3/kg/day)
   Irc = child inhalation rate (m^3/day)

   20 m^3/day / 70 kg = 0.286 m^3/kg/day (mass-specific adult inhalation rate)

   0.286 m^3/kg/day x ($70^{0.67}$) = (Ircm) x ($15^{0.67}$)

   Ircm = 0.803 m^3/kg/day

   Irc = Ircm x 15 kg = 0.803 m^3/kg/day x 15 kg = 12.04 m^3/day

4. Can the oral RfDs in the RBC Table be applied to dermal exposure?

   Not directly. Oral RfDs are usually based on administered dose and therefore tacitly include a GI absorption factor. Thus, any use of oral RfDs (or CSFs) in dermal risk calculations should involve removing this absorption factor. Consult the Risk Assessment Guidance for Superfund, Part A, Appendix A, for further details on how to do this.

5. The exposure variables table in the RBC background document lists the averaging time for non-carcinogens as "ED*365." What does that mean?

ED is exposure duration, in years, and * is the computer-ese symbol for multiplication. Multiplying ED by 365 simply converts the duration to days. In fact, the ED term is included in both the numerator and denominator of the RBC algorithms for non-cancer risk, canceling it altogether. See RAGS for more information.

6. Why is inorganic lead not included in the RBC Table?

EPA has no consensus RfD or CSF for inorganic lead, so it is not possible to calculate RBCs as we have done for other chemicals. EPA considers lead to be a special case because of the difficulty in identifying the classic "threshold" needed to develop an RfD.

EPA therefore evaluates lead exposure by using blood-lead modeling, such as the Integrated Exposure-Uptake Biokinetic Model (IEUBK). The EPA Office of Solid Waste has also released a detailed directive on risk assessment and cleanup of residential soil lead. The directive recommends that soil lead levels less than 400 mg/kg are generally safe for residential use. Above that level, the document suggests collecting data and modeling blood-lead levels with the IEUBK model. For the purposes of screening, therefore, 400 mg/kg is recommended for residential soils. For water, we suggest 15 ug/l (the EPA Action Level in water), and for air, the National Ambient Air Quality Standard.

7. Where did the CSFs for carcinogenic PAHs come from?

The PAH CSFs are all calculated relative to benzo[a]pyrene, which has an IRIS slope factor. The relative factors for the other PAHs can be found in "Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons," Final Draft, ECAO-CIN-842 (March, 1993).

8. May I please have a copy of a previous RBC Table?

We do not distribute outdated copies of the RBC Table. Each new version of the Table supersedes all previous versions.

9. Please elaborate on the meaning of the "W" source code in the Table.

The "W" code means that a RfD or CSF is currently not present on either IRIS or HEAST, but that it was once present on either IRIS or HEAST and was removed. Such withdrawal usually indicates that consensus on the number no longer exists among EPA scientists, but not that EPA believes the contaminant to be unimportant.

Withdrawn numbers are shown in the Table because we still need to deal with these contaminants during the long delays before replacement numbers are ready. For the purpose of

screening, a "W" value is similar to a provisional value in that neither value has achieved Agency consensus. The "W" code should serve as a clear warning that before making any serious decision involving that contaminant, you will need to develop an interim value based on current scientific understanding.

If you are assessing risks at a site where a major contaminant is coded "W," consider working with your Region EPA risk assessor to develop a current toxicity constant. If the site is being studied under CERCLA, the EPA-NCEA Regional Technical Support group may be able to assist.

10. Can I get copies of supporting documents for interim toxicity constants which are coded "E" in the RBC Table?

Unfortunately, Region 3 does not have a complete set of supporting documents. The EPA-NCEA Superfund Technical Support Center prepares these interim toxicity constants in response to site-specific requests from Regional risk assessors, and sends the documentation only to the requestor. The RBC Tables contain only the latest interim values that we've either requested or have otherwise received. NCEA maintains the master data base of these chemicals, but will not release documentation of provisional values unless they are recent. Furthermore, since NCEA's Superfund Technical Support Center is mainly for the support of Superfund, it usually cannot develop new criteria unless authorized to do so for a specific Superfund project.

If an "E"-coded contaminant is a chemical of potential concern at your site, we urge you to work with the EPA Regional risk assessor assigned to the project in order to develop or obtain documentation for provisional values. EPA Region 3 furnishes documents only when needed to support Regional risk assessments or recommendations.

11. Why is there no oral RfD for mercury? How should I handle mercury?

IRIS gives oral RfDs for mercuric chloride and for methylmercury, but not for elemental mercury. Therefore, the RBC Table reflects this primary source. Consult your toxicologist to determine which of the available mercury numbers is suitable for the conditions at your site (e.g., whether mercury is likely to be organic or inorganic.)

Attachment

"DISCONTINUED" CHEMICALS

These chemicals may still have toxicity criteria available in IRIS, HEAST, or NCEA provisional values. However, they are not routine chemicals and therefore will not be routinely maintained in the RBC Table, unless our Table users report a significant need for chemicals to be re-added. Some of the chemicals on this Table were deleted because supporting toxicity information has been withdrawn or is unavailable.

acephate
acetone cyanohyrin
acifluorfen
acrylic acid
ally
allyl alcohol
aluminum phosphide
amdro
ametryn
m-aminophenol
amitraz
ammonium sulfamate
antimony potassium tartrate
apollo
aramite
asulam
avermectin B1
barium cyanide
bayleton
benefin
benomyl
benzotrichloride
bidrin
biphenthin
bis(2-chloro-1-methylethyl)ether
bisphenol A
boron trifluoride
4-bromophenyl phenyl ether
bromoxynil
bromoxynil octanoate
butylphthalyl butylglycolate
cacodylic acid
captafol
captan
carboxin
chloramben
chlorimuron-ethyl
chloroacetaldehyde
2-chloroacetophenone
4-chlorobenzotrifluoride
2-chloroethyl vinyl ether
4-chloro-2-methylaniline hydrochloride
chlorothalonil
chlorpropham
chlorsulfuron
chlorthiophos
coal tar creosote
cyclohexlamine
cyromazine
danitol
decabromodiphenyl ether
demeton
diallate
diethylforamide
diflubenzuron
dimethipin
dimethoate
N,N-dimethylformamide
dimethyl terephthalate
diphenamid
direct black 38
direct blue 6
direct brown 95

dodine
1,2-epoxybutane
ethephon
2-ethoxyethanol acetate
ethyl acrylate
EPTC
ethylene cyanohydrin
ethyl p-nitrophenyl phenylphosphorothioate
ethylphthalyl ethyl glycolate
express
fluoridone
flurprimidol
flutolanil
fluvalinate
folpet
fosteyl-al
furium
furmecyclox
glufosinate-ammonium
haloxyfop-methyl
harmony
imazalil
imazaquin
iprodione
isoxaben
kepone
lactofen
linuron
londax
maleic hydrazide
malononitrile
mancozeb
maneb
merphos
merphos oxide
metalaxyl
methamidophos
methomyl
2-methoxyethanol acetate
2-methoxyethanol
2-methoxy-5-nitroaniline
2-methylaniline hydrochloride
methyl chlorocarbonate
4,4-methylene bisbenzeneamine
metribuzin
molinate
2-naphthylamine
napropamide
nickel subsulfide
nitrapyrin
3-nitroaniline
4-nitroaniline
nitroguanidine
norflurazon
octabromodiphenyl ether
octamethylpyrophosphoramide
paclobutrazol
pebulate
pendimethalin
pentabromo-6-chlorocyclohexane
pentabromodiphenyl ether
phenmedipham
phenylmercuric acetate
phorate
phosmet
picloram
pirimiphos-methyl
prochloraz
profluralin
pronamide
propargyl alcohol
propazine
propham
propiconazole
propylene oxide
pydrin

quinalphos
savey
selenourea
sethoxydim
sodium fluoroacetate
sodium metavanadate
systhane
tebuthiuron
temephos
terbacil
terbufos
terbutryn
tetrachlorovinphos
tetraethyldithiopyrophosphate
thallium selenide
2-(thiocyanomethylthio)-benzothiazole
thiofanox
thiophanate-methyl
thiram
tralomethrin
triallate
triasulfuron
2,4,6-trichloroaniline hydrochloride
tridiphane
triethylamine
trifluralin
vernam

EPA REGION III RISK-BASED CONCENTRATION TABLE: TECHNICAL BACKGROUND INFORMATION

originally developed by Roy L. Smith, Ph.D., Toxicologist
revised 4/12/99 by Jennifer Hubbard, Toxicologist

Development of Risk-Based Concentrations

General

Separate carcinogenic and non-carcinogenic risk-based concentrations were calculated for each compound for each pathway. The concentration in the table is the lower of the two, rounded to two significant figures. The following terms and values were used in the calculations:

Exposure variables	**Value**	**Symboll**
General:		
Carcinogenic potency slope oral (risk per mg/kg/d):	*	CPSo
Carcinogenic potency slope inhaled (risk per mg/kg/d):	*	CPSi
Reference dose oral (mg/kg/d):	*	RfDo
Reference dose inhaled (mg/kg/d):	*	RfDi
Target cancer risk:	1e-06	TR
Target hazard quotient:	1	THQ
Body weight, adult (kg):	70	BWa
Body weight, age 1-6 (kg):	15	BWc
Averaging time carcinogens (d):	25550	ATc
Averaging time non-carcinogens (d):	ED*365	ATn
Inhalation, adult (m3/d):	20	IRAa
Inhalation, child (m3/d):	12	IRAc
Inhalation factor, age-adjusted (m3-y/kg-d):	11.66	IFAadj
Tap water ingestion, adult (L/d):	2	IRWa
Tap water ingestion, age 1-6 (L/d):	1	IRWc
Tap water ingestion factor, age-adjusted (L-y/kg-d):	1.09	IFWadj
Fish ingestion (g/d):	54	IRF
Soil ingestion, adult (mg/d):	100	IRSa
Soil ingestion, age 1-6 (mg/d):	200	IRSc
Soil ingestion factor, age adjusted (mg-y/kg-d):	114.29	IFSadj
Residential:		
Exposure frequency (d/y):	350	EFr
Exposure duration, total (y):	30	EDtot
Exposure duration, age 1-6 (y):	6	EDc
Volatilization factor (L/m3):	0.5	K
Occupational:		
Exposure frequency (d/y):	250	EFo
Exposure duration (y):	25	EDo
Fraction of contaminated soil ingested (unitless)	0.5	FC

*: Contaminant-specific toxicological constants. The priority among sources of toxicological constants was as follows: (1) IRIS, (2) HEAST, (3) HEAST alternative method, (4) EPA-NCEA Superfund Health Risk Technical Support Center, (5) withdrawn from IRIS or HEAST, and (6) other EPA documents. Each source was used only if numbers from higher-priority sources were unavailable, unless NCEA indicated a newer provisional value was superior to an older HEAST value. The EPA Superfund Health Risk Technical Support Center, part of the EPA National Center for Environmental Assessment in Cincinnati, develops provisional RfDs and CPSs on request for contaminants not in IRIS or HEAST. These provisional values are labeled "E = EPA-NCEA provisional" in the table. It is possible they may be obsolete. If one of the "E" constants is important to a Superfund risk assessment, consider requesting, through a Regional risk assessor, a new provisional value.

Age-adjusted factors

Because contact rates with tap water, ambient air, and residential soil are different for children and adults, carcinogenic risks during the first 30 years of life were calculated using age-adjusted factors. These factors approximated the integrated exposure from birth until age 30 by combining contact rates, body weights, and exposure durations for two age groups - small children and adults. The age-adjusted factor for soil was obtained from RAGS IB; the others were developed by analogy.

(1) Air inhalation

$$IFAadj\ \frac{m^3 \cdot y}{kg \cdot d} = \frac{EDc \cdot IRAc}{BWc} + \frac{(EDtot - EDc) \cdot IRAa}{BWa}$$

(2) Tap water ingestion

$$IFWadj\ \frac{L \cdot y}{kg \cdot d} = \frac{EDc \cdot IRWc}{BWc} + \frac{(EDtot - EDc) \cdot IRWa}{BWa}$$

(3) Soil ingestion

$$IFSadj\ \frac{mg \cdot y}{kg \cdot d} = \frac{EDc \cdot IRSc}{BWc} + \frac{(EDtot - EDc) \cdot IRSa}{BWa}$$

Residential water

Volatilization terms were calculated only for compounds with a mark in the "VOC" column. Compounds having a Henry's Law constant greater than 10^{-5} and a molecular weight less than 200 were considered volatile. The list may be incomplete, but is unlikely to include false positives. The equations and the volatilization factor (K, above) were obtained from RAGS IB. Oral potency slopes and reference doses were used for both oral and inhaled exposures for volatile compounds lacking inhalation values. RBCs for carcinogens were based on combined childhood and adult exposure; for non-carcinogens RBCs were based on adult exposure.

(4) Carcinogens

$$RBC\ \frac{\mu g}{L} = \frac{TR \cdot ATc \cdot 1000\frac{\mu g}{mg}}{EFr \cdot ([K \cdot IFAadj \cdot CPSi] + [IFWadj \cdot CPSo])}$$

(5) Non-carcinogens

$$RBC\ \frac{\mu g}{L} = \frac{THQ \cdot BWa \cdot ATn \cdot 1000\frac{\mu g}{mg}}{EFr \cdot EDtot \cdot \left(\frac{K \cdot IRAa}{RfDi} + \frac{IRWa}{RfDo}\right)}$$

Ambient air

Oral potency slopes and references were used where inhalation values were not available. RBCs for carcinogens were based on combined childhood and adult exposure; for non-carcinogens RBCs were based on adult exposure.

(6) Carcinogens

$$RBC\ \frac{\mu g}{m^3} = \frac{TR \cdot ATc \cdot 1000\frac{\mu g}{mg}}{EFr \cdot IFAadj \cdot CPSi}$$

(7) Non-carcinogens

$$RBC\ \frac{\mu g}{m^3} = \frac{THQ \cdot RfDi \cdot BWa \cdot ATn \cdot 1000\frac{\mu g}{mg}}{EFr \cdot EDtot \cdot IRAa}$$

Edible fish

All RBCs were based on adult exposure.

(8) Carcinogens

$$RBC\ \frac{mg}{kg} = \frac{TR \cdot BWa \cdot ATc}{EFr \cdot EDtot \cdot \frac{IRF}{1000\frac{g}{kg}} \cdot CPSo}$$

(9) Non-carcinogens

$$RBC\ \frac{mg}{kg} = \frac{THQ \cdot RfDo \cdot BWa \cdot ATn}{EFr \cdot EDtot \cdot \frac{IRF}{1000\frac{g}{kg}}}$$

Commercial/industrial soil ingestion

RBCs were based on adult occupational exposure, including an assumption that only 50% of total soil ingestion is work-related.

(10) Carcinogens

$$RBC\ \frac{mg}{kg} = \frac{TR \cdot BWa \cdot ATc}{EFo \cdot EDo \cdot \frac{IRSa}{10^6\ \frac{mg}{kg}} \cdot FC \cdot CPSo}$$

(11) Non-carcinogens

$$RBC\ \frac{mg}{kg} = \frac{THQ \cdot RfDo \cdot BWa \cdot ATn}{EFo \cdot EDo \cdot \frac{IRSa}{10^6\ \frac{mg}{kg}} \cdot FC}$$

Residential soil ingestion

RBCs for carcinogens were based on combined childhood and adult exposure; RBCs for non-carcinogens were based on childhood exposure only.

(12) Carcinogens

$$RBC\ \frac{mg}{kg} = \frac{TR \cdot ATc}{EFr \cdot \frac{IFSadj}{10^6\ \frac{mg}{kg}} \cdot CPSo}$$

(13) Non-carcinogens

$$RBC\ \frac{mg}{kg} = \frac{THQ \cdot RfDo \cdot BWc \cdot ATn}{EFr \cdot EDc \cdot \frac{IRSc}{10^6\ \frac{mg}{kg}}}$$

Sources: I = IRIS H = HEAST A = HEAST Alternate W = Withdrawn from IRIS or HEAST
E = EPA-NCEA provisional value O = other

Basis: C = Carcinogenic effects N = Noncarcinogenic effects 1 = RBC at HI of 0.1 < RBC-c

Chemical	CAS	RfDo mg/kg/d	CSFo 1/mg/kg/d	RfDi mg/kg/d	CSFi 1/mg/kg/d	VOC	Risk-based concentrations: Tap water ug/l	Ambient air ug/m3	Fish mg/kg	Soil Industrial mg/kg	Soil Residential mg/kg	Region III SSLs: Soil, for groundwater migration DAF 1 mg/kg	DAF 20 mg/kg
ACETALDEHYDE	75-07-0			2.57E-03 I	7.7E-03 I	y	1.6E+00 C	8.1E-01 C				3.8E-04	7.7E-03 C
ACETOCHLOR	34256-82-1	2E-02 I					7.3E+02 N	7.3E+01 N	2.7E+01 N	4.1E+04 N	1.6E+03 N		
ACETONE	67-64-1	1.00E-01 I				y	6.1E+02 N	3.7E+02 N	1.4E+02 N	2.0E+05 N	7.8E+03 N	1.2E-01	2.5E+00 N
ACETONITRILE	75-05-8			1.7E-02 I		y	1.2E+02 N	6.2E+01 N				2.9E-02	5.8E-01 N
ACETOPHENONE	98-86-2	1.00E-01 I		5.70E-06 W		y	4.2E-02 N	2.1E-02 N	1.4E+02 N	2.0E+05 N	7.8E+03 N	1.1E-05	2.2E-04 N
ACROLEIN	107-02-8	2.00E-02 H		5.70E-06 I		y	4.2E-02 N	2.1E-02 N	2.7E+01 N	4.1E+04 N	1.6E+03 N	1.0E-05	2.0E-04 N
ACRYLAMIDE	79-06-1	2.00E-04 I	4.50E+00 I		4.50E+00 I		1.5E-02 C	1.4E-03 C	7.0E-04 C	1.3E+00 C	1.4E-01 C	3.7E-06	7.4E-05 C
ACRYLONITRILE	107-13-1	1.00E-03 H	5.40E-01 I	5.70E-04 I	2.40E-01 I	y	3.7E-02 C	2.6E-02 C	5.8E-03 C	1.1E+01 C	1.2E+00 C	7.4E-06	1.5E-04 C
ALACHLOR	15972-60-8	1.00E-02 I	8.00E-02 H				8.4E-01 C	7.8E-02 C	3.9E-02 C	7.2E+01 C	8.0E+00 C	3.5E-04	7.0E-03 C
ALAR	1596-84-5	1.50E-01 I					5.5E+03 N	5.5E+02 N	2.0E+02 N	3.1E+05 N	1.2E+04 N		
ALDICARB	116-06-3	1.00E-03 I					3.7E+01 N	3.7E+00 N	1.4E+00 N	2.0E+03 N	7.8E+01 N	1.0E-02	2.1E-01 N
ALDICARB SULFONE	1646-88-4	1.00E-03 I					3.7E+01 N	3.7E+00 N	1.4E+00 N	2.0E+03 N	7.8E+01 N	7.5E-03	1.5E-01 N
ALDRIN	309-00-2	3.00E-05 I	1.70E+01 I		1.70E+01 I		3.9E-03 C	3.7E-04 C	1.9E-04 C	3.4E-01 C	3.8E-02 C	3.8E-04	7.7E-03 C
ALUMINUM	7429-90-5	1.00E+00 E		1.00E-03 E			3.7E+04 N	3.7E+00 N	1.4E+03 N	2.0E+06 N	7.8E+04 N		
AMINODINITROTOLUENES		6.00E-05 E					2.2E+00 N	2.2E-01 N	8.1E-02 N	1.2E+02 N	4.7E+00 N		
4-AMINOPYRIDINE	504-24-5	2.00E-05 H					7.3E-01 N	7.3E-02 N	2.7E-02 N	4.1E+01 N	1.6E+00 N		
AMMONIA	7664-41-7			2.86E-02 I		y	2.1E+02 N	1.0E+02 N					
ANILINE	62-53-3	7.00E-03 E	5.70E-03 I	2.90E-04 I			1.2E+01 C	1.1E+00 N	5.5E-01 C	1.0E+03 C	1.1E+02 C I	6.8E-03	1.4E-01 C
ANTIMONY	7440-36-0	4.00E-04 I					1.5E+01 N	1.5E+00 N	5.4E-01 N	8.2E+02 N	3.1E+01 N	6.6E-01	1.3E+01 N
ANTIMONY PENTOXIDE	1314-60-9	5.00E-04 H					1.8E+01 N	1.8E+00 N	6.8E-01 N	1.0E+03 N	3.9E+01 N		
ANTIMONY TETROXIDE	1332-81-6	4.00E-04 H					1.5E+01 N	1.5E+00 N	5.4E-01 N	8.2E+02 N	3.1E+01 N		
ANTIMONY TRIOXIDE	1309-64-4	4.00E-04 H		5.70E-05 I			1.5E+01 N	2.1E-01 N	5.4E-01 N	8.2E+02 N	3.1E+01 N		
ARSENIC	7440-38-2	3.00E-04 I	1.50E+00 I		1.51E+01 I		4.5E-02 C	4.1E-04 C	2.1E-03 C	3.8E+00 C	4.3E-01 C	1.3E-03	2.6E-02 C
ARSINE	7784-42-1			1.40E-05 I		y	1.0E-01 N	5.1E-02 N					
ASSURE	76578-14-8	9.00E-03 I					3.3E+02 N	3.3E+01 N	1.2E+01 N	1.8E+04 N	7.0E+02 N		
ATRAZINE	1912-24-9	3.50E-02 I	2.20E-01 H				3.0E-01 C	2.8E-02 C	1.4E-02 C	2.6E+01 C	2.9E+00 C	4.4E-04	8.8E-03 C
AZOBENZENE	103-33-3		1.10E-01 I		1.10E-01 I		6.1E-01 C	5.7E-02 C	2.9E-02 C	5.2E+01 C	5.8E+00 C	1.8E-03	3.5E-02 C
BARIUM	7440-39-3	7.00E-02 I		1.40E-04 A			2.6E+03 N	5.1E-01 N	9.5E+01 N	1.4E+05 N	5.5E+03 N	1.1E+02	2.1E+03 N
BAYGON	114-26-1	4.00E-03 I					1.5E+02 N	1.5E+01 N	5.4E+00 N	8.2E+03 N	3.1E+02 N		
BAYTHROID	68359-37-5	2.50E-02 I					9.1E+02 N	9.1E+01 N	3.4E+01 N	5.1E+04 N	2.0E+03 N		
BENTAZON	25057-89-0	3.00E-02 I					1.1E+03 N	1.1E+02 N	4.1E+01 N	6.1E+04 N	2.3E+03 N		
BENZALDEHYDE	100-52-7	1.00E-01 I					3.7E+03 N	3.7E+02 N	1.4E+02 N	2.0E+05 N	7.8E+03 N		
BENZENE	71-43-2	3.00E-03 E	5.5E-02 I	1.70E-03 E	2.90E-02 I	y	3.2E-01 C	2.2E-01 C	5.7E-02 C	1.0E+02 C	1.2E+01 C	9.0E-05	1.8E-03 C
BENZENETHIOL	108-98-5	1.00E-05 H				y	6.1E-02 N	3.7E-02 N	1.4E-02 N	2.0E+01 N	7.8E-01 N		
BENZIDINE	92-87-5	3.00E-03 I	2.30E+02 I		2.30E+02 I		2.9E-04 C	2.7E-05 C	1.4E-05 C	2.5E-02 C	2.8E-03 C		
BENZOIC ACID	65-85-0	4.00E+00 I					1.5E+05 N	1.5E+04 N	5.4E+03 N	8.2E+06 N	3.1E+05 N		
BENZYL ALCOHOL	100-51-6	3.00E-01 H					1.1E+04 N	1.1E+03 N	4.1E+02 N	6.1E+05 N	2.3E+04 N	4.4E+00	8.8E+01 N
BENZYL CHLORIDE	100-44-7		0.17 I			y	6.2E-02 C	3.7E-02 C	1.9E-02 C	3.4E+01 C	3.8E+00 C	1.9E-05	3.7E-04 C
BERYLLIUM	7440-41-7	2.00E-03 I		5.7E-06 I	8.40E+00 I		7.3E+01 N	7.5E-04 C	2.7E+00 N	4.1E+03 N	1.6E+02 N	5.8E+01	1.2E+03 N
BIPHENYL	92-52-4	5.00E-02 I				y	3.0E+02 N	1.8E+02 N	6.8E+01 N	1.0E+05 N	3.9E+03 N	4.8E+00	9.6E+01 N
BIS(2-CHLOROETHYL)ETHER	111-44-4		1.10E+00 I		1.10E+00 I	y	9.6E-03 C	5.7E-03 C	2.9E-03 C	5.2E+00 C	5.8E-01 C	2.2E-06	4.4E-05 C
BIS(2-CHLOROISOPROPYL)ETHER	108-60-1	4.00E-02 I	7.00E-02 H		3.50E-02 H	y	2.6E-01 C	1.8E-01 C	4.5E-02 C	8.2E+01 C	9.1E+00 C	8.4E-05	1.7E-03 C
BIS(CHLOROMETHYL)ETHER	*542-88-1*		*2.20E+02 I*		*2.20E+02 I*	y	*4.8E-05 C*	*2.8E-05 C*	*1.4E-05 C*	*2.6E-02 C*	*2.9E-03 C*	*9.7E-09*	*1.9E-07 C*
BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	2.00E-02 I	1.40E-02 I		1.40E-02 E		4.8E+00 C	4.5E-01 C	2.3E-01 C	4.1E+02 C	4.6E+01 C	1.4E+02	2.9E+03 C
BORON	7440-42-8	9.00E-02 I		5.70E-03 H			3.3E+03 N	2.1E+01 N	1.2E+02 N	1.8E+05 N	7.0E+03 N		
BROMODICHLOROMETHANE	75-27-4	2.00E-02 I	6.20E-02 I			y	1.7E-01 C	1.0E-01 C	5.1E-02 C	9.2E+01 C	1.0E+01 C	5.4E-05	1.1E-03 C
BROMOETHENE	593-60-2			8.6E-04 I	1.10E-01 H	y	1.1E-01 C	5.7E-02 C				5.4E-05	1.1E-03 C
**BROMOFORM	75-25-2	2.00E-02 I	7.90E-03 I		3.90E-03 I		8.5E+00 C	1.6E+00 C	4.0E-01 C	7.2E+02 C	8.1E+01 C	3.3E-03	6.7E-02 C
BROMOMETHANE	74-83-9	1.40E-03 I		1.40E-03 I		y	8.5E+00 N	5.1E+00 N	1.9E+00 N	2.9E+03 N	1.1E+02 N	2.1E-03	4.1E-02 N
BROMOPHOS	2104-96-3	5.00E-03 H					1.8E+02 N	1.8E+01 N	6.8E+00 N	1.0E+04 N	3.9E+02 N		
1,3-BUTADIENE	106-99-0				1.80E+00 H	y	7.0E-03 C	3.5E-03 C				3.9E-06	7.8E-05 C
1-BUTANOL	71-36-3	1.00E-01 I					3.7E+03 N	3.7E+02 N	1.4E+02 N	2.0E+05 N	7.8E+03 N	7.8E-01	1.6E+01 N
BUTYLBENZYLPHTHALATE	85-68-7	2.00E-01 I					7.3E+03 N	7.3E+02 N	2.7E+02 N	4.1E+05 N	1.6E+04 N	8.4E+02	1.7E+04 N
BUTYLATE	2008-41-5	5.00E-02 I					1.8E+03 N	1.8E+02 N	6.8E+01 N	1.0E+05 N	3.9E+03 N		
N-BUTYLBENZENE	104-51-8	4.00E-02 E				y	2.4E+02 N	1.5E+02 N	5.4E+01 N	8.2E+04 N	3.1E+03 N		
SEC-BUTYLBENZENE	135-98-8	4.00E-02 E				y	2.4E+02 N	1.5E+02 N	5.4E+01 N	8.2E+04 N	3.1E+03 N		
TERT-BUTYLBENZENE	98-06-6	4.00E-02 E				y	2.4E+02 N	1.5E+02 N	5.4E+01 N	8.2E+04 N	3.1E+03 N		

Sources: I = IRIS H = HEAST A = HEAST Alternate W = Withdrawn from IRIS or HEAST
E = EPA-NCEA provisional value O = other

Basis: C = Carcinogenic effects N = Noncarcinogenic effects ! = RBC at HI of 0.1 < RBC-c

Chemical	CAS	RfDo mg/kg/d	CSFo 1/mg/kg/d	RfDi mg/kg/d	CSFi 1/mg/kg/d	VOC	Risk-based concentrations: Tap water ug/l	Ambient air ug/m3	Fish mg/kg	Soil Industrial mg/kg	Soil Residential mg/kg	Region III SSLs: Soil, for groundwater migration DAF 1 mg/kg	DAF 20 mg/kg
CADMIUM-WATER	7440-43-9	5.00E-04 I		5.7E-05 E	6.30E+00 I		1.8E+01 N	9.9E-04 C	6.8E-01 N	1.0E+03 N	3.9E+01 N	1.4E+00	2.7E+01 N
CADMIUM-FOOD	7440-43-9	1.00E-03 I		5.7E-05 E	6.30E+00 I		3.7E+01 N	9.9E-04 C	1.4E+00 N	2.0E+03 N	7.8E+01 N	2.7E+00	5.5E+01 N
CAPROLACTAM	105-60-2	5.00E-01 I					1.8E+04 N	1.8E+03 N	6.8E+02 N	1.0E+06 N	3.9E+04 N		
CARBARYL	63-25-2	1.00E-01 I					3.7E+03 N	3.7E+02 N	1.4E+02 N	2.0E+05 N	7.8E+03 N	1.5E+00	3.0E+01 N
CARBON DISULFIDE	75-15-0	1.00E-01 I		2.00E-01 I		y	1.0E+03 N	7.3E+02 N	1.4E+02 N	2.0E+05 N	7.8E+03 N	9.5E-01	1.9E+01 N
CARBON TETRACHLORIDE	56-23-5	7.00E-04 I	1.30E-01 I	5.71E-04 E	5.30E-02 I	y	1.6E-01 C	1.2E-01 C	2.4E-02 C	4.4E+01 C	4.9E+00 C	1.1E-04	2.1E-03 C
CARBOSULFAN	55285-14-8	1.00E-02 I					3.7E+02 N	3.7E+01 N	1.4E+01 N	2.0E+04 N	7.8E+02 N		
CHLORAL HYDRATE	302-17-0	1.00E-01 I					3.7E+03 N	3.7E+02 N	1.4E+02 N	2.0E+05 N	7.8E+03 N		
CHLORANIL	118-75-2		4.00E-01 H				1.7E-01 C	1.6E-02 C	7.9E-03 C	1.4E+01 C	1.6E+00 C		
CHLORDANE	57-74-9	5.00E-04 I	3.5E-01 I	2.00E-04 I	3.5E-01 I		1.9E-01 C	1.8E-02 C	9.0E-03 C	1.6E+01 C	1.8E+00 C	4.6E-02	9.2E-01 C
CHLORINE	7782-50-5	1.00E-01 I		5.7E-05 E		y	4.2E-01 N	2.1E-01 N	1.4E+02 N	2.0E+05 N	7.8E+03 N		
CHLORINE DIOXIDE	10049-04-4			5.70E-05 I		y	4.2E-01 N	2.1E-01 N					
CHLOROACETIC ACID	79-11-8	2.00E-03 H					7.3E+01 N	7.3E+00 N	2.7E+00 N	4.1E+03 N	1.6E+02 N		
4-CHLOROANILINE	106-47-8	4.00E-03 I					1.5E+02 N	1.5E+01 N	5.4E+00 N	8.2E+03 N	3.1E+02 N	4.8E-02	9.7E-01 N
CHLOROBENZENE	108-90-7	2.00E-02 I		1.7E-02 E		y	1.1E+02 N	6.2E+01 N	2.7E+01 N	4.1E+04 N	1.6E+03 N	4.0E-02	8.0E-01 N
CHLOROBENZILATE	510-15-6	2.00E-02 I	2.70E-01 H		2.70E-01 H		2.5E-01 C	2.3E-02 C	1.2E-02 C	2.1E+01 C	2.4E+00 C	1.3E-03	2.7E-02 C
P-CHLOROBENZOIC ACID	74-11-3	2.00E-01 H					7.3E+03 N	7.3E+02 N	2.7E+02 N	4.1E+05 N	1.6E+04 N		
2-CHLORO-1,3-BUTADIENE	126-99-8	2.00E-02 A		2.00E-03 H		y	1.4E+01 N	7.3E+00 N	2.7E+01 N	4.1E+04 N	1.6E+03 N	6.0E-03	1.2E-01 N
1-CHLOROBUTANE	109-69-3	4.00E-01 H				y	2.4E+03 N	1.5E+03 N	5.4E+02 N	8.2E+05 N	3.1E+04 N	1.0E+00	2.0E+01 N
1-CHLORO-1,1-DIFLUOROETHANE	75-68-3			1.40E+01 I		y	1.0E+05 N	5.1E+04 N				7.0E+01	1.4E+03 N
CHLORODIFLUOROMETHANE	75-45-6			1.40E+01 I		y	1.0E+05 N	5.1E+04 N				7.0E+01	1.4E+03 N
CHLOROETHANE	75-00-3	4.00E-01 E	2.90E-03 E	2.90E+00 I		y	3.6E+00 C	2.2E+00 C	1.1E+00 C	2.0E+03 C	2.2E+02 C	9.6E-04	1.9E-02 C
CHLOROFORM	67-66-3	1.00E-02 I	6.10E-03 I	8.6E-05 E	8.10E-02 I	y	1.5E-01 C !	7.7E-02 C !	5.2E-01 C	9.4E+02 C	1.0E+02 C !	4.5E-05	8.9E-04 C
CHLOROMETHANE	74-87-3		1.30E-02 H	8.6E-02 E	3.5E-03 E	y	2.1E+00 C	1.8E+00 C	2.4E-01 C	4.4E+02 C	4.9E+01 C	5.2E-04	1.0E-02 C
4-CHLORO-2-METHYLANILINE	95-69-2		5.80E-01 H				1.2E-01 C	1.1E-02 C	5.4E-03 C	9.9E+00 C	1.1E+00 C		
BETA-CHLORONAPHTHALENE	91-58-7	8.00E-02 I				y	4.9E+02 N	2.9E+02 N	1.1E+02 N	1.6E+05 N	6.3E+03 N	1.6E+00	3.2E+01 N
O-CHLORONITROBENZENE	88-73-3		2.50E-02 H			y	4.2E-01 C	2.5E-01 C	1.3E-01 C	2.3E+02 C	2.6E+01 C		
P-CHLORONITROBENZENE	100-00-5		1.80E-02 H			y	5.9E-01 C	3.5E-01 C	1.8E-01 C	3.2E+02 C	3.5E+01 C		
2-CHLOROPHENOL	95-57-8	5.00E-03 I				y	3.0E+01 N	1.8E+01 N	6.8E+00 N	1.0E+04 N	3.9E+02 N		
2-CHLOROPROPANE	75-29-6			2.90E-02 H		y	2.1E+02 N	1.1E+02 N				6.6E-02	1.3E+00 N
O-CHLOROTOLUENE	95-49-8	2.00E-02 I				y	1.2E+02 N	7.3E+01 N	2.7E+01 N	4.1E+04 N	1.6E+03 N	6.5E-02	1.3E+00 N
CHLORPYRIFOS	2921-88-2	3.00E-03 I					1.1E+02 N	1.1E+01 N	4.1E+00 N	6.1E+03 N	2.3E+02 N	3.2E+00	6.3E+01 N
CHLORPYRIFOS-METHYL	5598-13-0	1.00E-02 H					3.7E+02 N	3.7E+01 N	1.4E+01 N	2.0E+04 N	7.8E+02 N		
CHROMIUM III	16065-83-1	1.50E+00 I					5.5E+04 N	5.5E+03 N	2.0E+03 N	3.1E+06 N	1.2E+05 N	9.9E+07	2.0E+09 N
CHROMIUM VI	18540-29-9	3.00E-03 I		3.00E-05 I	4.10E+01 H		1.1E+02 N	1.5E-04 C	4.1E+00 N	6.1E+03 N	2.3E+02 N	2.1E+00	4.2E+01 N
COBALT	7440-48-4	6.00E-02 E					2.2E+03 N	2.2E+02 N	8.1E+01 N	1.2E+05 N	4.7E+03 N		
COKE OVEN EMISSIONS (COAL TAR)	8007-45-2				2.2 I			2.8E-03 C					
COPPER	7440-50-8	4.00E-02 H					1.5E+03 N	1.5E+02 N	5.4E+01 N	8.2E+04 N	3.1E+03 N	5.3E+02	1.1E+04 N
CROTONALDEHYDE	123-73-9		1.90E+00 H			y	5.6E-03 C	3.3E-03 C	1.7E-03 C	3.0E+00 C	3.4E-01 C	1.5E-05	3.1E-04 C
CUMENE	98-82-8	1.00E-01 I		1.10E-01 I		y	6.6E+02 N	4.0E+02 N	1.4E+02 N	2.0E+05 N	7.8E+03 N	3.2E+00	6.4E+01 N
CYANIDE (FREE)	57-12-5	2.00E-02 I					7.3E+02 N	7.3E+01 N	2.7E+01 N	4.1E+04 N	1.6E+03 N	7.4E+00	1.5E+02 N
CALCIUM CYANIDE	592-01-8	4E-02 I					1.5E+03 N	1.5E+02 N	5.4E+01 N	8.2E+04 N	3.1E+03 N		
COPPER CYANIDE	544-92-3	5.00E-03 I					1.8E+02 N	1.8E+01 N	6.8E+00 N	1.0E+04 N	3.9E+02 N		
CYANAZINE	21725-46-2	2.00E-03 H	8.40E-01 H				8.0E-02 C	7.5E-03 C	3.8E-03 C	6.8E+00 C	7.6E-01 C	2.6E-05	5.3E-04 C
CYANOGEN	460-19-5	4.00E-02 I				y	2.4E+02 N	1.5E+02 N	5.4E+01 N	8.2E+04 N	3.1E+03 N		
CYANOGEN BROMIDE	506-68-3	9.00E-02 I					3.3E+03 N	3.3E+02 N	1.2E+02 N	1.8E+05 N	7.0E+03 N		
CYANOGEN CHLORIDE	506-77-4	5.00E-02 I					1.8E+03 N	1.8E+02 N	6.8E+01 N	1.0E+05 N	3.9E+03 N		
HYDROGEN CYANIDE	74-90-8	2.00E-02 I		8.60E-04 I		y	6.2E+00 N	3.1E+00 N	2.7E+01 N	4.1E+04 N	1.6E+03 N	1.1E-01	2.2E+00 N
POTASSIUM CYANIDE	151-50-8	5.00E-02 I					1.8E+03 N	1.8E+02 N	6.8E+01 N	1.0E+05 N	3.9E+03 N		
POTASSIUM SILVER CYANIDE	506-61-6	2.00E-01 I					7.3E+03 N	7.3E+02 N	2.7E+02 N	4.1E+05 N	1.6E+04 N		
SILVER CYANIDE	506-64-9	1.00E-01 I					3.7E+03 N	3.7E+02 N	1.4E+02 N	2.0E+05 N	7.8E+03 N	3.1E+01	6.2E+02 N
SODIUM CYANIDE	143-33-9	4.00E-02 I					1.5E+03 N	1.5E+02 N	5.4E+01 N	8.2E+04 N	3.1E+03 N		
THIOCYANATE		5.00E-02 E					1.8E+03 N	1.8E+02 N	6.8E+01 N	1.0E+05 N	3.9E+03 N		
ZINC CYANIDE	557-21-1	5.00E-02 I					1.8E+03 N	1.8E+02 N	6.8E+01 N	1.0E+05 N	3.9E+03 N	1.1E+02	2.3E+03 N
CYCLOHEXANONE	108-94-1	5.00E+00 I					1.8E+05 N	1.8E+04 N	6.8E+03 N	1.0E+07 N	3.9E+05 N	6.1E+01	1.2E+03 N
CYHALOTHRIN/KARATE	68085-85-8	5.00E-03 I					1.8E+02 N	1.8E+01 N	6.8E+00 N	1.0E+04 N	3.9E+02 N		
CYPERMETHRIN	52315-07-8	1.00E-02 I					3.7E+02 N	3.7E+01 N	1.4E+01 N	2.0E+04 N	7.8E+02 N		

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E = EPA-NCEA provisional value O = other

Basis: C = Carcinogenic effects N = Noncarcinogenic effects I = RBC at Hi of 0.1 < RBC-c

Chemical	CAS	RfDo mg/kg/d	CSFo 1/mg/kg/d	RfDi mg/kg/d	CSFi 1/mg/kg/d	VOC	Risk-based concentrations: Tap water ug/l	Ambient air ug/m3	Fish mg/kg	Soil Industrial mg/kg	Soil Residential mg/kg	Region III SSLs: Soil, for groundwater migration DAF 1 mg/kg	DAF 20 mg/kg
DACTHAL	1861-32-1	1.00E-02 I					3.7E+02 N	3.7E+01 N	1.4E+01 N	2.0E+04 N	7.8E+02 N		
DALAPON	75-99-0	3.00E-02 I					1.1E+03 N	1.1E+02 N	4.1E+01 N	6.1E+04 N	2.3E+03 N	3.5E-01	7.1E+00 N
DDD	72-54-8		2.40E-01 I				2.8E-01 C	2.6E-02 C	1.3E-02 C	2.4E+01 C	2.7E+00 C	5.6E-01	1.1E+01 C
DDE	72-55-9		3.40E-01 I				2.0E-01 C	1.8E-02 C	9.3E-03 C	1.7E+01 C	1.9E+00 C	1.8E+00	3.5E+01 C
DDT	50-29-3	5.00E-04 I	3.40E-01 I		3.40E-01 I		2.0E-01 C	1.8E-02 C	9.3E-03 C	1.7E+01 C	1.9E+00 C	5.8E-02	1.2E+00 C
DIAZINON	333-41-5	9.00E-04 H					3.3E+01 N	3.3E+00 N	1.2E+00 N	1.8E+03 N	7.0E+01 N	2.1E-02	4.3E-01 N
DIBENZOFURAN	132-64-9	4.00E-03 E				y	2.4E+01 N	1.5E+01 N	5.4E+00 N	8.2E+03 N	3.1E+02 N	3.8E-01	7.7E+00 N
1,4-DIBROMOBENZENE	106-37-6	1.00E-02 I					3.7E+02 N	3.7E+01 N	1.4E+01 N	2.0E+04 N	7.8E+02 N		
DIBROMOCHLOROMETHANE	124-48-1	2.00E-02 I	8.40E-02 I			y	1.3E-01 C	7.5E-02 C	3.8E-02 C	6.8E+01 C	7.6E+00 C	4.1E-05	8.3E-04 C
1,2-DIBROMO-3-CHLOROPROPANE	96-12-8		1.40E+00 H	5.70E-05 I	2.40E-03 H	y	4.7E-02 C !	2.1E-01 N	2.3E-03 C	4.1E+00 C	4.6E-01 C	4.4E-05	8.7E-04 C
1,2-DIBROMOETHANE	106-93-4		8.50E+01 I	5.70E-05 H	7.60E-01 I	y	7.5E-04 C	8.2E-03 C	3.7E-05 C	6.7E-02 C	7.5E-03 C	4.3E-07	8.5E-06 C
DIBUTYLPHTHALATE	84-74-2	1.00E-01 I					3.7E+03 N	3.7E+02 N	1.4E+02 N	2.0E+05 N	7.8E+03 N	2.5E+02	5.0E+03 N
DICAMBA	1918-00-9	3.00E-02 I					1.1E+03 N	1.1E+02 N	4.1E+01 N	6.1E+04 N	2.3E+03 N	2.2E-01	4.5E+00 N
1,2-DICHLOROBENZENE	95-50-1	9.00E-02 I				y	5.5E+02 N	3.3E+02 N	1.2E+02 N	1.8E+05 N	7.0E+03 N	4.6E-01	9.3E+00 N
1,3-DICHLOROBENZENE	541-73-1	9.00E-04 E				y	5.5E+00 N	3.3E+00 N	1.2E+00 N	1.8E+03 N	7.0E+01 N	4.4E-03	8.7E-02 N
1,4-DICHLOROBENZENE	106-46-7	3.00E-02 E	2.40E-02 H	2.29E-01 I	2.2E-02 E	y	4.7E-01 C	2.8E-01 C	1.3E-01 C	2.4E+02 C	2.7E+01 C	3.6E-04	7.1E-03 C
3,3'-DICHLOROBENZIDINE	91-94-1		4.50E-01 I				1.5E-01 C	1.4E-02 C	7.0E-03 C	1.3E+01 C	1.4E+00 C	2.5E-04	4.9E-03 C
1,4-DICHLORO-2-BUTENE	764-41-0				9.30E+00 H	y	1.3E-03 C	6.7E-04 C				4.0E-07	8.0E-06 C
DICHLORODIFLUOROMETHANE	75-71-8	2.00E-01 I		5.00E-02 A		y	3.5E+02 N	1.8E+02 N	2.7E+02 N	4.1E+05 N	1.6E+04 N	5.5E-01	1.1E+01 N
1,1-DICHLOROETHANE	75-34-3	1.00E-01 H		1.40E-01 A		y	8.0E+02 N	5.1E+02 N	1.4E+02 N	2.0E+05 N	7.8E+03 N	2.3E-01	4.5E+00 N
1,2-DICHLOROETHANE	107-06-2	3.00E-02 E	9.10E-02 I	1.40E-03 E	9.10E-02 I	y	1.2E-01 C	6.9E-02 C	3.5E-02 C	6.3E+01 C	7.0E+00 C	5.2E-05	1.0E-03 C
1,1-DICHLOROETHENE	75-35-4	9.00E-03 I	6.00E-01 I		1.75E-01 I	y	4.4E-02 C	3.6E-02 C	5.3E-03 C	9.5E+00 C	1.1E+00 C	1.8E-05	3.6E-04 C
CIS-1,2-DICHLOROETHENE	156-59-2	1.00E-02 H				y	6.1E+01 N	3.7E+01 N	1.4E+01 N	2.0E+04 N	7.8E+02 N	1.7E-02	3.5E-01 N
TRANS-1,2-DICHLOROETHENE	156-60-5	2.00E-02 I				y	1.2E+02 N	7.3E+01 N	2.7E+01 N	4.1E+04 N	1.6E+03 N	4.1E-02	8.2E-01 N
TOTAL 1,2-DICHLOROETHENE	540-59-0	9.00E-03 H				y	5.5E+01 N	3.3E+01 N	1.2E+01 N	1.8E+04 N	7.0E+02 N	1.9E-02	3.7E-01 N
2,4-DICHLOROPHENOL	120-83-2	3.00E-03 I					1.1E+02 N	1.1E+01 N	4.1E+00 N	6.1E+03 N	2.3E+02 N	6.0E-02	1.2E+00 N
2,4-D	94-75-7	1.00E-02 I					3.7E+02 N	3.7E+01 N	1.4E+01 N	2.0E+04 N	7.8E+02 N	4.5E-01	9.0E+00 N
4-(2,4-DICHLOROPHENOXY)BUTYRIC ACID	94-82-6	8E-03 I					2.9E+02 N	2.9E+01 N	1.1E+01 N	1.6E+04 N	6.3E+02 N		
1,2-DICHLOROPROPANE	78-87-5		6.80E-02 H	1.14E-03 I		y	1.6E-01 C	9.2E-02 C	4.6E-02 C	8.4E+01 C	9.4E+00 C	1.0E-04	2.1E-03 C
2,3-DICHLOROPROPANOL	616-23-9	3.00E-03 I					1.1E+02 N	1.1E+01 N	4.1E+00 N	6.1E+03 N	2.3E+02 N		
**1,3-DICHLOROPROPENE	542-75-6	3.00E-02 I	1.00E-01 I	5.71E-03 I	1.00E-02 I	y	4.4E-01 C	6.3E-01 C	3.2E-02 C	5.7E+01 C	6.4E+00 C	1.6E-04	3.1E-03 C
DICHLORVOS	62-73-7	5E-04 I	0.29 I	1.43E-04 I			2.3E-01 C	2.2E-02 C	1.1E-02 C	2.0E+01 C	2.2E+00 C	5.5E-05	1.1E-03 C
DICOFOL	115-32-2		4.4E-01 W				1.5E-01 C	1.4E-02 C	7.2E-03 C	1.3E+01 C	1.5E+00 C	9.3E-04	1.9E-02 C
DICYCLOPENTADIENE	77-73-6	3E-02 H		6.00E-05 A		y	4.4E-01 N	2.2E-01 N	4.1E+01 N	6.1E+04 N	2.3E+03 N		
DIELDRIN	60-57-1	5.00E-05 I	1.60E+01 I		1.60E+01 I		4.2E-03 C	3.9E-04 C	2.0E-04 C	3.6E-01 C	4.0E-02 C	1.1E-04	2.2E-03 C
DIESEL EMISSIONS				1.40E-03 I				5.1E+00 N					
DIETHYLPHTHALATE	84-66-2	8.00E-01 I					2.9E+04 N	2.9E+03 N	1.1E+03 N	1.6E+06 N	6.3E+04 N	2.3E+01	4.5E+02 N
DIETHYLENE GLYCOL, MONOBUTYL ETHER	112-34-5			5.70E-03 H				2.1E+01 N					
DIETHYLENE GLYCOL, MONOETHYL ETHER	111-90-0	2.00E+00 H					7.3E+04 N	7.3E+03 N	2.7E+03 N	4.1E+06 N	1.6E+05 N		
DI(2-ETHYLHEXYL)ADIPATE	103-23-1	6.00E-01 I	1.20E-03 I				5.6E+01 C	5.2E+00 C	2.6E+00 C	4.8E+03 C	5.3E+02 C		
DIETHYLSTILBESTROL	56-53-1		4.70E+03 H				1.4E-05 C	1.3E-06 C	6.7E-07 C	1.2E-03 C	1.4E-04 C		
DIFENZOQUAT (AVENGE)	43222-48-6	8.00E-02 I					2.9E+03 N	2.9E+02 N	1.1E+02 N	1.6E+05 N	6.3E+03 N		
1,1-DIFLUOROETHANE	75-37-6			1.10E+01 I		y	8.0E+04 N	4.0E+04 N					
DIISOPROPYL METHYLPHOSPHONATE (DIMP)	1445-75-6	8.00E-02 I					2.9E+03 N	2.9E+02 N	1.1E+02 N	1.6E+05 N	6.3E+03 N		
3,3'-DIMETHOXYBENZIDINE	119-90-4		1.40E-02 H				4.8E+00 C	4.5E-01 C	2.3E-01 C	4.1E+02 C	4.6E+01 C		
DIMETHYLAMINE	124-40-3			5.70E-06 W		y	4.2E-02 N	2.1E-02 N				8.5E-06	1.7E-04 N
2,4-DIMETHYLANILINE HYDROCHLORIDE	21436-96-4		5.80E-01 H				1.2E-01 C	1.1E-02 C	5.4E-03 C	9.9E+00 C	1.1E+00 C		
2,4-DIMETHYLANILINE	95-68-1		7.50E-01 H				8.9E-02 C	8.3E-03 C	4.2E-03 C	7.6E+00 C	8.5E-01 C		
N,N-DIMETHYLANILINE	121-69-7	2.00E-03 I					7.3E+01 N	7.3E+00 N	2.7E+00 N	4.1E+03 N	1.6E+02 N		
3,3'-DIMETHYLBENZIDINE	119-93-7		9.20E+00 H				7.3E-03 C	6.8E-04 C	3.4E-04 C	6.2E-01 C	6.9E-02 C		
1,1-DIMETHYLHYDRAZINE	57-14-7		2.60E+00 W		3.50E+00 W		2.6E-02 C	1.8E-03 C	1.2E-03 C	2.2E+00 C	2.5E-01 C		
1,2-DIMETHYLHYDRAZINE	540-73-8		3.70E+01 W		3.70E+01 W		1.8E-03 C	1.7E-04 C	8.5E-05 C	1.5E-01 C	1.7E-02 C		
2,4-DIMETHYLPHENOL	105-67-9	2.00E-02 I					7.3E+02 N	7.3E+01 N	2.7E+01 N	4.1E+04 N	1.6E+03 N	3.4E-01	6.7E+00 N
2,6-DIMETHYLPHENOL	576-26-1	6.00E-04 I					2.2E+01 N	2.2E+00 N	8.1E-01 N	1.2E+03 N	4.7E+01 N		
3,4-DIMETHYLPHENOL	95-65-8	1.00E-03 I					3.7E+01 N	3.7E+00 N	1.4E+00 N	2.0E+03 N	7.8E+01 N		
DIMETHYLPHTHALATE	131-11-3	1.00E+01 W					3.7E+05 N	3.7E+04 N	1.4E+04 N	2.0E+07 N	7.8E+05 N		
1,2-DINITROBENZENE	528-29-0	4.00E-04 H					1.5E+01 N	1.5E+00 N	5.4E-01 N	8.2E+02 N	3.1E+01 N		

Sources: I = IRIS H = HEAST A = HEAST Alternate W = Withdrawn from IRIS or HEAST
E = EPA-NCEA provisional value O = other

Basis: C = Carcinogenic effects N = Noncarcinogenic effects I = RBC at HI of 0.1 < RBC-c

Chemical	CAS	RfDo mg/kg/d	CSFo 1/mg/kg/d	RfDi mg/kg/d	CSFi 1/mg/kg/d	VOC	Risk-based concentrations: Tap water ug/l	Ambient air ug/m3	Fish mg/kg	Soil Industrial mg/kg	Soil Residential mg/kg	Region III SSLs: Soil, for groundwater migration DAF 1 mg/kg	DAF 20 mg/kg
1,3-DINITROBENZENE	99-65-0	1.00E-04 I					3.7E+00 N	3.7E-01 N	1.4E-01 N	2.0E+02 N	7.8E+00 N	1.8E-03	3.7E-02 N
1,4-DINITROBENZENE	100-25-4	4.00E-04 H					1.5E+01 N	1.5E+00 N	5.4E-01 N	8.2E+02 N	3.1E+01 N		
4,6-DINITRO-O-CYCLOHEXYL PHENOL	131-89-5	2.00E-03 I					7.3E+01 N	7.3E+00 N	2.7E+00 N	4.1E+03 N	1.6E+02 N		
4,6-DINITRO-2-METHYLPHENOL	534-52-1	1.00E-04 E					3.7E+00 N	3.7E-01 N	1.4E-01 N	2.0E+02 N	7.8E+00 N		
2,4-DINITROPHENOL	51-28-5	2.00E-03 I					7.3E+01 N	7.3E+00 N	2.7E+00 N	4.1E+03 N	1.6E+02 N		
DINITROTOLUENE MIX			6.80E-01 I				9.8E-02 C	9.2E-03 C	4.6E-03 C	8.4E+00 C	9.4E-01 C		
2,4-DINITROTOLUENE	121-14-2	2.00E-03 I					7.3E+01 N	7.3E+00 N	2.7E+00 N	4.1E+03 N	1.6E+02 N	2.9E-02	5.7E-01 N
2,6-DINITROTOLUENE	606-20-2	1.00E-03 H					3.7E+01 N	3.7E+00 N	1.4E+00 N	2.0E+03 N	7.8E+01 N	1.2E-02	2.5E-01 N
DINOSEB	88-85-7	1.00E-03 I					3.7E+01 N	3.7E+00 N	1.4E+00 N	2.0E+03 N	7.8E+01 N	8.7E-03	1.7E-01 N
DIOCTYLPHTHALATE	117-84-0	2.00E-02 H					7.3E+02 N	7.3E+01 N	2.7E+01 N	4.1E+04 N	1.6E+03 N	1.2E+05	2.4E+06 N
1,4-DIOXANE	123-91-1		1.10E-02 I				6.1E+00 C	5.7E-01 C	2.9E-01 C	5.2E+02 C	5.8E+01 C	1.3E-03	2.6E-02 C
DIPHENYLAMINE	122-39-4	2.50E-02 I					9.1E+02 N	9.1E+01 N	3.4E+01 N	5.1E+04 N	2.0E+03 N	1.3E+00	2.5E+01 N
1,2-DIPHENYLHYDRAZINE	122-66-7		8.00E-01 I		8.00E-01 I		8.4E-02 C	7.8E-03 C	3.9E-03 C	7.2E+00 C	8.0E-01 C	1.3E-04	2.5E-03 C
DIQUAT	85-00-7	2.20E-03 I					8.0E+01 N	8.0E+00 N	3.0E+00 N	4.5E+03 N	1.7E+02 N	1.7E-02	3.3E-01 N
DISULFOTON	298-04-4	4.00E-05 I					1.5E+00 N	1.5E-01 N	5.4E-02 N	8.2E+01 N	3.1E+00 N	3.2E-03	6.4E-02 N
1,4-DITHIANE	505-29-3	1.00E-02 I					3.7E+02 N	3.7E+01 N	1.4E+01 N	2.0E+04 N	7.8E+02 N		
DIURON	330-54-1	2.00E-03 I					7.3E+01 N	7.3E+00 N	2.7E+00 N	4.1E+03 N	1.6E+02 N	5.8E-02	1.2E+00 N
ENDOSULFAN	115-29-7	6.00E-03 I					2.2E+02 N	2.2E+01 N	8.1E+00 N	1.2E+04 N	4.7E+02 N	9.8E-01	2.0E+01 N
ENDRIN	72-20-8	3.00E-04 I					1.1E+01 N	1.1E+00 N	4.1E-01 N	6.1E+02 N	2.3E+01 N	2.7E-01	5.4E+00 N
EPICHLOROHYDRIN	106-89-8	2.00E-03 H	9.90E-03 I	2.86E-04 I	4.20E-03 I	y	2.0E+00 N	1.0E+00 N	3.2E-01 C !	5.8E+02 C !	6.5E+01 C !	4.2E-04	8.4E-03 N
ETHION	563-12-2	5.00E-04 I					1.8E+01 N	1.8E+00 N	6.8E-01 N	1.0E+03 N	3.9E+01 N	3.2E-01	6.4E+00 N
2-ETHOXYETHANOL	110-80-5	4.00E-01 H		5.70E-02 I			1.5E+04 N	2.1E+02 N	5.4E+02 N	8.2E+05 N	3.1E+04 N	3.3E+00	6.5E+01 N
ETHYL ACETATE	141-78-6	9.00E-01 I				y	5.5E+03 N	3.3E+03 N	1.2E+03 N	1.8E+06 N	7.0E+04 N	1.7E+00	3.5E+01 N
ETHYLBENZENE	100-41-4	1.00E-01 I		2.90E-01 I		y	1.3E+03 N	1.1E+03 N	1.4E+02 N	2.0E+05 N	7.8E+03 N	7.5E-01	1.5E+01 N
ETHYLENE DIAMINE	107-15-3	2.00E-02 H					7.3E+02 N	7.3E+01 N	2.7E+01 N	4.1E+04 N	1.6E+03 N		
ETHYLENE GLYCOL	107-21-1	2.00E+00 I					7.3E+04 N	7.3E+03 N	2.7E+03 N	4.1E+06 N	1.6E+05 N	1.5E+01	3.0E+02 N
ETHYLENE GLYCOL, MONOBUTYL ETHER	111-76-2	5.00E-01 I		3.70E+00 I			1.8E+04 N	1.4E+04 N	6.8E+02 N	1.0E+06 N	3.9E+04 N		
ETHYLENE OXIDE	75-21-8		1.00E+00 H		3.50E-01 H	y	2.3E-02 C	1.8E-02 C	3.2E-03 C	5.7E+00 C	6.4E-01 C	4.8E-06	9.5E-05 C
ETHYLENE THIOUREA	96-45-7	8.00E-05 I	1.1E-01 H				6.1E-01 C !	5.7E-02 C !	2.9E-02 C !	5.2E+01 C !	5.8E+00 C !		
ETHYL ETHER	60-29-7	2.00E-01 I				y	1.2E+03 N	7.3E+02 N	2.7E+02 N	4.1E+05 N	1.6E+04 N	4.2E-01	8.5E+00 N
ETHYL METHACRYLATE	97-63-2	9.00E-02 H				y	5.5E+02 N	3.3E+02 N	1.2E+02 N	1.8E+05 N	7.0E+03 N	1.0E+00	2.1E+01 N
FENAMIPHOS	22224-92-6	2.50E-04 I					9.1E+00 N	9.1E-01 N	3.4E-01 N	5.1E+02 N	2.0E+01 N	7.6E-03	1.6E-01 N
FLUOMETURON	2164-17-2	1.30E-02 I					4.7E+02 N	4.7E+01 N	1.8E+01 N	2.7E+04 N	1.0E+03 N		
FLUORINE	7782-41-4	6.00E-02 I					2.2E+03 N	2.2E+02 N	8.1E+01 N	1.2E+05 N	4.7E+03 N		
FOMESAFEN	72178-02-0		1.90E-01 I				3.5E-01 C	3.3E-02 C	1.7E-02 C	3.0E+01 C	3.4E+00 C		
FONOFOS	944-22-9	2.00E-03 I					7.3E+01 N	7.3E+00 N	2.7E+00 N	4.1E+03 N	1.6E+02 N	1.8E-01	3.5E+00 N
FORMALDEHYDE	50-00-0	2.00E-01 I			4.50E-02 I		7.3E+03 N	1.4E-01 C	2.7E+02 N	4.1E+05 N	1.6E+04 N	1.5E+00	3.0E+01 N
FORMIC ACID	64-18-6	2.00E+00 H					7.3E+04 N	7.3E+03 N	2.7E+03 N	4.1E+06 N	1.6E+05 N		
FURAN	110-00-9	1.00E-03 I				y	6.1E+00 N	3.7E+00 N	1.4E+00 N	2.0E+03 N	7.8E+01 N	1.5E-03	3.0E-02 N
FURAZOLIDONE	67-45-8		3.80E+00 H				1.8E-02 C	1.6E-03 C	8.3E-04 C	1.5E+00 C	1.7E-01 C		
FURFURAL	98-01-1	3.00E-03 I		1.00E-02 A			1.1E+02 N	3.7E+01 N	4.1E+00 N	6.1E+03 N	2.3E+02 N	2.3E-02	4.6E-01 N
GLYCIDALDEHYDE	765-34-4	4.00E-04 I		2.90E-04 H			1.5E+01 N	1.1E+00 N	5.4E-01 N	8.2E+02 N	3.1E+01 N		
GLYPHOSATE	1071-83-6	1.00E-01 I					3.7E+03 N	3.7E+02 N	1.4E+02 N	2.0E+05 N	7.8E+03 N	2.6E+01	5.3E+02 N
HEPTACHLOR	76-44-8	5.00E-04 I	4.50E+00 I		4.50E+00 I		1.5E-02 C	1.4E-03 C	7.0E-04 C	1.3E+00 C	1.4E-01 C	4.2E-02	8.4E-01 C
HEPTACHLOR EPOXIDE	1024-57-3	1.30E-05 I	9.10E+00 I		9.10E+00 I		7.4E-03 C	6.9E-04 C	3.5E-04 C	6.3E-01 C	7.0E-02 C	1.2E-03	2.5E-02 C
HEXABROMOBENZENE	87-82-1	2.00E-03 I					7.3E+01 N	7.3E+00 N	2.7E+00 N	4.1E+03 N	1.6E+02 N		
HEXACHLOROBENZENE	118-74-1	8.00E-04 I	1.60E+00 I		1.60E+00 I		4.2E-02 C	3.9E-03 C	2.0E-03 C	3.6E+00 C	4.0E-01 C	2.6E-03	5.2E-02 C
HEXACHLOROBUTADIENE	87-68-3	2.00E-04 H	7.80E-02 I		7.80E-02 I		8.6E-01 C !	8.0E-02 C !	4.0E-02 C !	7.3E+01 C !	8.2E+00 C !	9.2E-02	1.8E+00 C
ALPHA-HCH	319-84-6		6.30E+00 I		6.30E+00 I		1.1E-02 C	9.9E-04 C	5.0E-04 C	9.1E-01 C	1.0E-01 C	4.5E-05	8.9E-04 C
BETA-HCH	319-85-7		1.80E+00 I		1.80E+00 I		3.7E-02 C	3.5E-03 C	1.8E-03 C	3.2E+00 C	3.5E-01 C	1.6E-04	3.1E-03 C
GAMMA-HCH (LINDANE)	58-89-9	3.00E-04 I	1.30E+00 H				5.2E-02 C	4.8E-03 C	2.4E-03 C	4.4E+00 C	4.9E-01 C	2.2E-04	4.3E-03 C
TECHNICAL HCH	608-73-1		1.80E+00 I		1.80E+00 I		3.7E-02 C	3.5E-03 C	1.8E-03 C	3.2E+00 C	3.5E-01 C		
HEXACHLOROCYCLOPENTADIENE	77-47-4	7.00E-03 I		2.00E-05 H			2.6E+02 N	7.3E-02 N	9.5E+00 N	1.4E+04 N	5.5E+02 N	1.0E+02	2.0E+03 N
HEXACHLORODIBENZODIOXIN MIX	19408-74-3		6.20E+03 I		4.55E+03 I		1.1E-05 C	1.4E-06 C	5.1E-07 C	9.2E-04 C	1.0E-04 C		
HEXACHLOROETHANE	67-72-1	1.00E-03 I	1.40E-02 I		1.40E-02 I		4.8E+00 C !	4.5E-01 C !	2.3E-01 C !	4.1E+02 C !	4.6E+01 C !	1.8E-02	3.6E-01 C
HEXACHLOROPHENE	70-30-4	3.00E-04 I					1.1E+01 N	1.1E+00 N	4.1E-01 N	6.1E+02 N	2.3E+01 N	1.0E+02	2.0E+03 N
1,6-HEXAMETHYLENE DIISOCYANATE	822-06-0			2.90E-06 I				1.1E-02 N					

Sources I = IRIS H = HEAST A = HEAST Alternate W = Withdrawn from IRIS or HEAST
E = EPA-NCEA provisional value O = other

Basis C = Carcinogenic effects N = Noncarcinogenic effects I = RBC at HI of 0.1 < RBC-c

Chemical	CAS	RfDo mg/kg/d	CSFo 1/mg/kg/d	RfDi mg/kg/d	CSFi 1/mg/kg/d	VOC	Risk-based concentrations: Tap water ug/l	Ambient air ug/m3	Fish mg/kg	Soil Industrial mg/kg	Soil Residential mg/kg	Region III SSLs, Soil, for groundwater migration: DAF 1 mg/kg	DAF 20 mg/kg
HEXANE	110-54-3	6.00E-02 H		5.71E-02 I		y	3.5E+02 N	2.1E+02 N	8.1E+01 N	1.2E+05 N	4.7E+03 N	6.9E-01	1.4E+01 N
2-HEXANONE	591-78-6	4.00E-02 E		1.4E-03 E			1.5E+03 N	5.1E+00 N	5.4E+01 N	8.2E+04 N	3.1E+03 N		
HEXAZINONE	51235-04-2	3.30E-02 I					1.2E+03 N	1.2E+02 N	4.5E+01 N	6.7E+04 N	2.6E+03 N		
HMX	2691-41-0	5.00E-02 I					1.8E+03 N	1.8E+02 N	6.8E+01 N	1.0E+05 N	3.9E+03 N		
HYDRAZINE	302-01-2		3.00E+00 I		1.70E+01 I		2.2E-02 C	3.7E-04 C	1.1E-03 C	1.9E+00 C	2.1E-01 C		
HYDROGEN CHLORIDE	7647-01-0			5.70E-03 I				2.1E+01 N					
HYDROGEN SULFIDE	7783-06-4	3.00E-03 I		2.85E-04 I			1.1E+02 N	1.0E+00 N	4.1E+00 N	6.1E+03 N	2.3E+02 N		
HYDROQUINONE	123-31-9	4.00E-02 H					1.5E+03 N	1.5E+02 N	5.4E+01 N	8.2E+04 N	3.1E+03 N		
IRON	7439-89-6	3.00E-01 E					1.1E+04 N	1.1E+03 N	4.1E+02 N	6.1E+05 N	2.3E+04 N		
ISOBUTANOL	78-83-1	3.00E-01 I				y	1.8E+03 N	1.1E+03 N	4.1E+02 N	6.1E+05 N	2.3E+04 N	5.9E-01	1.2E+01 N
ISOPHORONE	78-59-1	2.00E-01 I	9.50E-04 I				7.0E+01 C	6.6E+00 C	3.3E+00 C	6.0E+03 C	6.7E+02 C	2.1E-02	4.1E-01 C
ISOPROPALIN	33820-53-0	1.50E-02 I					5.5E+02 N	5.5E+01 N	2.0E+01 N	3.1E+04 N	1.2E+03 N		
ISOPROPYL METHYL PHOSPHONIC ACID	1832-54-8	1.00E-01 I					3.7E+03 N	3.7E+02 N	1.4E+02 N	2.0E+05 N	7.8E+03 N		
TETRAETHYLLEAD	78-00-2	1.00E-07 I					3.7E-03 N	3.7E-04 N	1.4E-04 N	2.0E-01 N	7.8E-03 N	4.6E-05	9.2E-04 N
LITHIUM	7439-93-2	2.00E-02 E					7.3E+02 N	7.3E+01 N	2.7E+01 N	4.1E+04 N	1.6E+03 N		
MALATHION	121-75-5	2.00E-02 I					7.3E+02 N	7.3E+01 N	2.7E+01 N	4.1E+04 N	1.6E+03 N	4.0E-01	8.1E+00 N
MALEIC ANHYDRIDE	108-31-6	1.00E-01 I					3.7E+03 N	3.7E+02 N	1.4E+02 N	2.0E+05 N	7.8E+03 N		
MANGANESE-NONFOOD	7439-96-5	2.00E-02 I		1.43E-05 I			7.3E+02 N	5.2E-02 N	2.7E+01 N	4.1E+04 N	1.6E+03 N	4.8E+01	9.5E+02 N
MANGANESE-FOOD	7439-96-5	1.40E-01 I		1.43E-05 I			5.1E+03 N	5.2E-02 N	1.9E+02 N	2.9E+05 N	1.1E+04 N	3.3E+02	6.7E+03 N
MEPHOSFOLAN	950-10-7	9.00E-05 H					3.3E+00 N	3.3E-01 N	1.2E-01 N	1.8E+02 N	7.0E+00 N		
MEPIQUAT CHLORIDE	24307-26-4	3.00E-02 I					1.1E+03 N	1.1E+02 N	4.1E+01 N	6.1E+04 N	2.3E+03 N		
MERCURIC CHLORIDE	7487-94-7	3.00E-04 I					1.1E+01 N	1.1E+00 N	4.1E-01 N	6.1E+02 N	2.3E+01 N		
MERCURY (INORGANIC)	7439-97-6			8.60E-05 I				3.1E-01 N					
METHYLMERCURY	22967-92-6	1.00E-04 I					3.7E+00 N	3.7E-01 N	1.4E-01 N	2.0E+02 N	7.8E+00 N		
METHACRYLONITRILE	126-98-7	1.00E-04 I		2.00E-04 A		y	1.0E+00 N	7.3E-01 N	1.4E-01 N	2.0E+02 N	7.8E+00 N	2.1E-04	4.2E-03 N
METHANOL	67-56-1	5.00E-01 I					1.8E+04 N	1.8E+03 N	6.8E+02 N	1.0E+06 N	3.9E+04 N	3.8E+00	7.5E+01 N
METHIDATHION	950-37-8	1.00E-03 I					3.7E+01 N	3.7E+00 N	1.4E+00 N	2.0E+03 N	7.8E+01 N		
METHOXYCHLOR	72-43-5	5.00E-03 I					1.8E+02 N	1.8E+01 N	6.8E+00 N	1.0E+04 N	3.9E+02 N	1.5E+01	3.1E+02 N
METHYL ACETATE	79-20-9	1.00E+00 H				y	6.1E+03 N	3.7E+03 N	1.4E+03 N	2.0E+06 N	7.8E+04 N	1.2E+00	2.5E+01 N
METHYL ACRYLATE	96-33-3	3.00E-02 A				y	1.8E+02 N	1.1E+02 N	4.1E+01 N	6.1E+04 N	2.3E+03 N	5.0E-01	1.0E+01 N
2-METHYLANILINE	95-53-4		2.40E-01 H				2.8E-01 C	2.6E-02 C	1.3E-02 C	2.4E+01 C	2.7E+00 C	2.8E-04	5.7E-03 C
4-(2-METHYL-4-CHLOROPHENOXY) BUTYRIC ACID	94-81-5	1.00E-02 I					3.7E+02 N	3.7E+01 N	1.4E+01 N	2.0E+04 N	7.8E+02 N		
2-METHYL-4-CHLOROPHENOXYACETIC ACID (MCPA)	94-74-6	5.00E-04 I					1.8E+01 N	1.8E+00 N	6.8E-01 N	1.0E+03 N	3.9E+01 N		
2-(2-METHYL-4-CHLOROPHENOXY)PROPIONIC ACID (	93-65-2	1.00E-03 I					3.7E+01 N	3.7E+00 N	1.4E+00 N	2.0E+03 N	7.8E+01 N		
METHYLCYCLOHEXANE	108-87-2			8.60E-01 H		y	6.3E+03 N	3.1E+03 N					
METHYLENE BROMIDE	74-95-3	1.00E-02 A				y	6.1E+01 N	3.7E+01 N	1.4E+01 N	2.0E+04 N	7.8E+02 N	1.5E-02	3.0E-01 N
METHYLENE CHLORIDE	75-09-2	6.00E-02 I	7.50E-03 I	8.60E-01 H	1.65E-03 I	y	4.1E+00 C	3.8E+00 C	4.2E-01 C	7.6E+02 C	8.5E+01 C	9.5E-04	1.9E-02 C
4,4'-METHYLENE BIS(2-CHLOROANILINE)	101-14-4	7.00E-04 H	1.30E-01 H		1.30E-01 H		5.2E-01 C	4.8E-02 C	2.4E-02 C	4.4E+01 C	4.9E+00 C		
4,4'-METHYLENE BIS(N,N'-DIMETHYL)ANILINE	101-61-1		4.60E-02 I				1.5E+00 C	1.4E-01 C	6.9E-02 C	1.2E+02 C	1.4E+01 C		
4,4'-METHYLENEDIPHENYL ISOCYANATE	101-68-8			1.7E-04 I				6.2E-01 N					
METHYL ETHYL KETONE (2-BUTANONE)	78-93-3	6.00E-01 I		2.86E-01 I		y	1.9E+03 N	1.0E+03 N	8.1E+02 N	1.2E+06 N	4.7E+04 N	4.0E-01	7.9E+00 N
METHYL HYDRAZINE	60-34-4		1.10E+00 W				6.1E-02 C	5.7E-03 C	2.9E-03 C	5.2E+00 C	5.8E-01 C		
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANON	108-10-1	8.00E-02 H		2.00E-02 A		y	1.4E+02 N	7.3E+01 N	1.1E+02 N	1.6E+05 N	6.3E+03 N	6.5E-02	1.3E+00 N
METHYL METHACRYLATE	80-62-6	1.40E+00 I		2.00E-01 I		y	1.4E+03 N	7.3E+02 N	1.9E+03 N	2.9E+06 N	1.1E+05 N	3.2E-01	6.5E+00 N
2-METHYL-5-NITROANILINE	99-55-8		3.30E-02 H				2.0E+00 C	1.9E-01 C	9.6E-02 C	1.7E+02 C	1.9E+01 C		
METHYL PARATHION	298-00-0	2.50E-04 I					9.1E+00 N	9.1E-01 N	3.4E-01 N	5.1E+02 N	2.0E+01 N	4.3E-03	8.5E-02 N
2-METHYLPHENOL	95-48-7	5.00E-02 I					1.8E+03 N	1.8E+02 N	6.8E+01 N	1.0E+05 N	3.9E+03 N		
3-METHYLPHENOL	108-39-4	5.00E-02 I					1.8E+03 N	1.8E+02 N	6.8E+01 N	1.0E+05 N	3.9E+03 N		
4-METHYLPHENOL	106-44-5	5.00E-03 H					1.8E+02 N	1.8E+01 N	6.8E+00 N	1.0E+04 N	3.9E+02 N		
METHYLSTYRENE MIX	25013-15-4	6.00E-03 A		1.00E-02 A		y	5.5E+01 N	3.7E+01 N	8.1E+00 N	1.2E+04 N	4.7E+02 N	5.1E-02	1.0E+00 N
ALPHA-METHYLSTYRENE	98-83-9	7.00E-02 A				y	4.3E+02 N	2.6E+02 N	9.5E+01 N	1.4E+05 N	5.5E+03 N	4.0E-01	7.9E+00 N
METHYL TERT-BUTYL ETHER	1634-04-4			8.57E-01 I		y	6.3E+03 N	3.1E+03 N				1.4E+00	2.8E+01 N
METOLACHLOR (DUAL)	51218-45-2	1.50E-01 I					5.5E+03 N	5.5E+02 N	2.0E+02 N	3.1E+05 N	1.2E+04 N		
MIREX	2385-85-5	2.00E-04 I					7.3E+00 N	7.3E-01 N	2.7E-01 N	4.1E+02 N	1.6E+01 N		
MOLYBDENUM	7439-98-7	5E-03 I					1.8E+02 N	1.8E+01 N	6.8E+00 N	1.0E+04 N	3.9E+02 N		
MONOCHLORAMINE	10599-90-3	1E-01 I		1.00E-01 H			3.7E+03 N	3.7E+02 N	1.4E+02 N	2.0E+05 N	7.8E+03 N		
NALED	300-76-5	2E-03 I					7.3E+01 N	7.3E+00 N	2.7E+00 N	4.1E+03 N	1.6E+02 N		

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Basis C = Carcinogenic effects N = Noncarcinogenic effects 1 = RBC at HI of 0.1 < RBC-c

Chemical	CAS	RfDo mg/kg/d	CSFo 1/mg/kg/d	RfDi mg/kg/d	CSFi 1/mg/kg/d	VOC	Risk-based concentrations: Tap water ug/l	Ambient air ug/m3	Fish mg/kg	Soil Industrial mg/kg	Soil Residential mg/kg	Region III SSLs: Soil, for groundwater migration DAF 1 mg/kg	DAF 20 mg/kg
NICKEL REFINERY DUST					8.4E-01 I			7.5E-03 C					
NICKEL	7440-02-0	2.00E-02 I					7.3E+02 N	7.3E+01 N	2.7E+01 N	4.1E+04 N	1.6E+03 N		
NITRATE	14797-55-8	1.60E+00 I					5.8E+04 N	5.8E+03 N	2.2E+03 N	3.3E+06 N	1.3E+05 N		
NITRIC OXIDE	10102-43-9	1.00E-01 W				y	6.1E+02 N	3.7E+02 N	1.4E+02 N	2.0E+05 N	7.8E+03 N		
NITRITE	14797-65-0	1.00E-01 I					3.7E+03 N	3.7E+02 N	1.4E+02 N	2.0E+05 N	7.8E+03 N		
2-NITROANILINE	88-74-4			5.70E-05 H				2.1E-01 N					
NITROBENZENE	98-95-3	5.00E-04 I		6.00E-04 A		y	3.5E+00 N	2.2E+00 N	6.8E-01 N	1.0E+03 N	3.9E+01 N	1.2E-03	2.3E-02 N
NITROFURANTOIN	67-20-9	7.00E-02 H					2.6E+03 N	2.6E+02 N	9.5E+01 N	1.4E+05 N	5.5E+03 N		
NITROFURAZONE	59-87-0		1.50E+00 H				4.5E-02 C	4.2E-03 C	2.1E-03 C	3.8E+00 C	4.3E-01 C		
NITROGEN DIOXIDE	10102-44-0	1.00E+00 W				y	6.1E+03 N	3.7E+03 N	1.4E+03 N	2.0E+06 N	7.8E+04 N		
NITROGLYCERIN	55-63-0		1.4E-02 E				4.8E+00 C	4.5E-01 C	2.3E-01 C	4.1E+02 C	4.6E+01 C		
4-NITROPHENOL	100-02-7	8.00E-03 E					2.9E+02 N	2.9E+01 N	1.1E+01 N	1.6E+04 N	6.3E+02 N	8.7E-02	1.7E+00 N
2-NITROPROPANE	79-46-9			5.70E-03 I	9.40E+00 H	y	1.3E-03 C	6.7E-04 C				3.2E-07	6.4E-06 C
N-NITROSO-DI-N-BUTYLAMINE	924-16-3		5.40E+00 I		5.60E+00 I	y	1.9E-03 C	1.1E-03 C	5.8E-04 C	1.1E+00 C	1.2E-01 C	1.4E-06	2.7E-05 C
N-NITROSODIETHANOLAMINE	1116-54-7		2.80E+00 I				2.4E-02 C	2.2E-03 C	1.1E-03 C	2.0E+00 C	2.3E-01 C		
N-NITROSODIETHYLAMINE	55-18-5		1.50E+02 I		1.50E+02 I		4.5E-04 C	4.2E-05 C	2.1E-05 C	3.8E-02 C	4.3E-03 C	1.1E-07	2.3E-06 C
N-NITROSODIMETHYLAMINE	62-75-9		5.10E+01 I		5.10E+01 I		1.3E-03 C	1.2E-04 C	6.2E-05 C	1.1E-01 C	1.3E-02 C	2.8E-07	5.7E-06 C
N-NITROSODIPHENYLAMINE	86-30-6		4.90E-03 I				1.4E+01 C	1.3E+00 C	6.4E-01 C	1.2E+03 C	1.3E+02 C	3.8E-02	7.6E-01 C
N-NITROSODIPROPYLAMINE	621-64-7		7.00E+00 I				9.6E-03 C	8.9E-04 C	4.5E-04 C	8.2E-01 C	9.1E-02 C	2.4E-06	4.7E-05 C
N-NITROSO-N-ETHYLUREA	759-73-9		1.40E+02 H				4.8E-04 C	4.5E-05 C	2.3E-05 C	4.1E-02 C	4.6E-03 C		
N-NITROSO-N-METHYLETHYLAMINE	10595-95-6		2.20E+01 I				3.0E-03 C	2.8E-04 C	1.4E-04 C	2.6E-01 C	2.9E-02 C		
N-NITROSOPYRROLIDINE	930-55-2		2.10E+00 I		2.10E+00 I		3.2E-02 C	3.0E-03 C	1.5E-03 C	2.7E+00 C	3.0E-01 C		
M-NITROTOLUENE	99-08-1	2.00E-02 E				y	1.2E+02 N	7.3E+01 N	2.7E+01 N	4.1E+04 N	1.6E+03 N		
O-NITROTOLUENE	88-72-2	1.00E-02 H				y	6.1E+01 N	3.7E+01 N	1.4E+01 N	2.0E+04 N	7.8E+02 N		
P-NITROTOLUENE	99-99-0	1.00E-02 H				y	6.1E+01 N	3.7E+01 N	1.4E+01 N	2.0E+04 N	7.8E+02 N		
NUSTAR	85509-19-9	7.00E-04 I					2.6E+01 N	2.6E+00 N	9.5E-01 N	1.4E+03 N	5.5E+01 N		
ORYZALIN	19044-88-3	5.00E-02 I					1.8E+03 N	1.8E+02 N	6.8E+01 N	1.0E+05 N	3.9E+03 N		
OXADIAZON	19666-30-9	5.00E-03 I					1.8E+02 N	1.8E+01 N	6.8E+00 N	1.0E+04 N	3.9E+02 N		
OXAMYL	23135-22-0	2.50E-02 I					9.1E+02 N	9.1E+01 N	3.4E+01 N	5.1E+04 N	2.0E+03 N	1.9E-01	3.8E+00 N
OXYFLUORFEN	42874-03-3	3.00E-03 I					1.1E+02 N	1.1E+01 N	4.1E+00 N	6.1E+03 N	2.3E+02 N		
PARAQUAT DICHLORIDE	1910-42-5	4.50E-03 I					1.6E+02 N	1.6E+01 N	6.1E+00 N	9.2E+03 N	3.5E+02 N		
PARATHION	56-38-2	6.00E-03 H					2.2E+02 N	2.2E+01 N	8.1E+00 N	1.2E+04 N	4.7E+02 N	5.0E-01	1.0E+01 N
PENTACHLOROBENZENE	608-93-5	8.00E-04 I					2.9E+01 N	2.9E+00 N	1.1E+00 N	1.6E+03 N	6.3E+01 N	1.0E+00	2.0E+01 N
PENTACHLORONITROBENZENE	82-68-8	3.00E-03 I	2.60E-01 H				2.6E-01 C	2.4E-02 C	1.2E-02 C	2.2E+01 C	2.5E+00 C	4.1E-03	8.2E-02 C
PENTACHLOROPHENOL	87-86-5	3.00E-02 I	1.20E-01 I				5.6E-01 C	5.2E-02 C	2.6E-02 C	4.8E+01 C	5.3E+00 C		
PERMETHRIN	52645-53-1	5.00E-02 I					1.8E+03 N	1.8E+02 N	6.8E+01 N	1.0E+05 N	3.9E+03 N	1.2E+02	2.4E+03 N
PHENOL	108-95-2	6.00E-01 I					2.2E+04 N	2.2E+03 N	8.1E+02 N	1.2E+06 N	4.7E+04 N	6.7E+00	1.3E+02 N
M-PHENYLENEDIAMINE	108-45-2	6.00E-03 I					2.2E+02 N	2.2E+01 N	8.1E+00 N	1.2E+04 N	4.7E+02 N	4.9E-02	9.8E-01 N
O-PHENYLENEDIAMINE	95-54-5		4.70E-02 H				1.4E+00 C	1.3E-01 C	6.7E-02 C	1.2E+02 C	1.4E+01 C		
P-PHENYLENEDIAMINE	106-50-3	1.90E-01 H					6.9E+03 N	6.9E+02 N	2.6E+02 N	3.9E+05 N	1.5E+04 N		
2-PHENYLPHENOL	90-43-7		1.90E-03 H				3.5E+01 C	3.3E+00 C	1.7E+00 C	3.0E+03 C	3.4E+02 C		
PHOSPHINE	7803-51-2	3.00E-04 I		8.60E-05 I			1.1E+01 N	3.1E-01 N	4.1E-01 N	6.1E+02 N	2.3E+01 N		
PHOSPHORIC ACID	7664-38-2			2.90E-03 I				1.1E+01 N					
PHOSPHORUS (WHITE)	7723-14-0	2.00E-05 I					7.3E-01 N	7.3E-02 N	2.7E-02 N	4.1E+01 N	1.6E+00 N		
P-PHTHALIC ACID	100-21-0	1.00E+00 H					3.7E+04 N	3.7E+03 N	1.4E+03 N	2.0E+06 N	7.8E+04 N		
PHTHALIC ANHYDRIDE	85-44-9	2.00E+00 I		3.43E-02 H			7.3E+04 N	1.3E+02 N	2.7E+03 N	4.1E+06 N	1.6E+05 N	2.6E+01	5.2E+02 N
POLYBROMINATED BIPHENYLS		7.00E-06 H	8.90E+00 H				7.5E-03 C	7.0E-04 C	3.5E-04 C	6.4E-01 C	7.2E-02 C !		
POLYCHLORINATED BIPHENYLS	1336-36-3		2.00E+00 I		2.00E+00 I		3.3E-02 C	3.1E-03 C	1.6E-03 C	2.9E+00 C	3.2E-01 C	2.1E-02	4.1E-01 C
AROCLOR-1016	12674-11-2	7.00E-05 I	7.00E-02 I		7.00E-02 I		9.6E-01 C !	8.9E-02 C !	4.5E-02 C !	8.2E+01 C !	5.5E+00 N	2.1E-01	4.2E+00 C
AROCLOR-1221	11104-28-2		2.00E+00 I		2.00E+00 I		3.3E-02 C	3.1E-03 C	1.6E-03 C	2.9E+00 C	3.2E-01 C		
AROCLOR-1232	11141-16-5		2.00E+00 I		2.00E+00 I		3.3E-02 C	3.1E-03 C	1.6E-03 C	2.9E+00 C	3.2E-01 C		
AROCLOR-1242	53469-21-9		2.00E+00 I		2.00E+00 I		3.3E-02 C	3.1E-03 C	1.6E-03 C	2.9E+00 C	3.2E-01 C		
AROCLOR-1248	12672-29-6		2.00E+00 I		2.00E+00 I		3.3E-02 C	3.1E-03 C	1.6E-03 C	2.9E+00 C	3.2E-01 C		
AROCLOR-1254	11097-69-1	2.00E-05 I	2.00E+00 I		2.00E+00 I		3.3E-02 C	3.1E-03 C	1.6E-03 C	2.9E+00 C	3.2E-01 C !	5.4E-02	1.1E+00 C
AROCLOR-1260	11096-82-5		2.00E+00 I		2.00E+00 I		3.3E-02 C	3.1E-03 C	1.6E-03 C	2.9E+00 C	3.2E-01 C		
POLYCHLORINATED TERPHENYLS	61788-33-8		4.50E+00 E				1.5E-02 C	1.4E-03 C	7.0E-04 C	1.3E+00 C	1.4E-01 C		
POLYNUCLEAR AROMATIC HYDROCARBONS:													

Sources: I = IRIS H = HEAST A = HEAST Alternate W = Withdrawn from IRIS or HEAST
E = EPA-NCEA provisional value O = other

Basis C = Carcinogenic effects N = Noncarcinogenic effects I = RBC at HI of 0.1 < RBC-c

Chemical	CAS	RfDo mg/kg/d	CSFo 1/mg/kg/d	RfDi mg/kg/d	CSFi 1/mg/kg/d	VOC	Risk-based concentrations: Tap water ug/l	Ambient air ug/m3	Fish mg/kg	Soil Industrial mg/kg	Soil Residential mg/kg	Region III SSLs: Soil, for groundwater migration DAF 1 mg/kg	DAF 20 mg/kg
ACENAPHTHENE	83-32-9	6.00E-02 I				y	3.7E+02 N	2.2E+02 N	8.1E+01 N	1.2E+05 N	4.7E+03 N	5.2E+00	1.0E+02 N
ANTHRACENE	120-12-7	3.00E-01 I				y	1.8E+03 N	1.1E+03 N	4.1E+02 N	6.1E+05 N	2.3E+04 N	2.3E+01	4.7E+02 N
BENZ[A]ANTHRACENE	56-55-3		7.30E-01 E				9.2E-02 C	8.6E-03 C	4.3E-03 C	7.8E+00 C	8.7E-01 C	7.3E-02	1.5E+00 C
BENZO[B]FLUORANTHENE	205-99-2		7.30E-01 E				9.2E-02 C	8.6E-03 C	4.3E-03 C	7.8E+00 C	8.7E-01 C	2.3E-01	4.5E+00 C
BENZO[K]FLUORANTHENE	207-08-9		7.30E-02 E				9.2E-01 C	8.6E-02 C	4.3E-02 C	7.8E+01 C	8.7E+00 C	2.3E+00	4.5E+01 C
BENZO[A]PYRENE	50-32-8		7.30E+00 I		3.10E+00 E		9.2E-03 C	2.0E-03 C	4.3E-04 C	7.8E-01 C	8.7E-02 C	1.9E-02	3.7E-01 C
CARBAZOLE	86-74-8		2.00E-02 H				3.3E+00 C	3.1E-01 C	1.6E-01 C	2.9E+02 C	3.2E+01 C	2.3E-02	4.7E-01 C
CHRYSENE	218-01-9		7.30E-03 E				9.2E+00 C	8.6E-01 C	4.3E-01 C	7.8E+02 C	8.7E+01 C	7.3E+00	1.5E+02 C
DIBENZ[A,H]ANTHRACENE	53-70-3		7.30E+00 E				9.2E-03 C	8.6E-04 C	4.3E-04 C	7.8E-01 C	8.7E-02 C	7.0E-02	1.4E+00 C
DIBENZOFURAN	132-64-9	4.00E-03 E				y	2.4E+01 N	1.5E+01 N	5.4E+00 N	8.2E+03 N	3.1E+02 N	3.8E-01	7.7E+00 N
FLUORANTHENE	206-44-0	4.00E-02 I					1.5E+03 N	1.5E+02 N	5.4E+01 N	8.2E+04 N	3.1E+03 N	3.1E+02	6.3E+03 N
FLUORENE	86-73-7	4.00E-02 I				y	2.4E+02 N	1.5E+02 N	5.4E+01 N	8.2E+04 N	3.1E+03 N	6.8E+00	1.4E+02 N
INDENO[1,2,3-C,D]PYRENE	193-39-5		7.30E-01 E				9.2E-02 C	8.6E-03 C	4.3E-03 C	7.8E+00 C	8.7E-01 C	6.4E-01	1.3E+01 C
2-METHYLNAPHTHALENE	91-57-6	2.00E-02 E				y	1.2E+02 N	7.3E+01 N	2.7E+01 N	4.1E+04 N	1.6E+03 N	1.1E+00	2.2E+01 N
NAPHTHALENE	91-20-3	2.00E-02 I		9.00E-04 I		y	6.5E+00 N	3.3E+00 N	2.7E+01 N	4.1E+04 N	1.6E+03 N	7.7E-03	1.5E-01 N
PYRENE	129-00-0	3.00E-02 I				y	1.8E+02 N	1.1E+02 N	4.1E+01 N	6.1E+04 N	2.3E+03 N	3.4E+01	6.8E+02 N
PROMETON	1610-18-0	1.50E-02 I					5.5E+02 N	5.5E+01 N	2.0E+01 N	3.1E+04 N	1.2E+03 N		
PROMETRYN	7287-19-6	4.00E-03 I					1.5E+02 N	1.5E+01 N	5.4E+00 N	8.2E+03 N	3.1E+02 N		
PROPACHLOR	1918-16-7	1.30E-02 I					4.7E+02 N	4.7E+01 N	1.8E+01 N	2.7E+04 N	1.0E+03 N		
PROPANIL	709-98-8	5.00E-03 I					1.8E+02 N	1.8E+01 N	6.8E+00 N	1.0E+04 N	3.9E+02 N		
PROPARGITE	2312-35-8	2.00E-02 I					7.3E+02 N	7.3E+01 N	2.7E+01 N	4.1E+04 N	1.6E+03 N		
N-PROPYLBENZENE	103-65-1	4.00E-02 E				y	2.4E+02 N	1.5E+02 N	5.4E+01 N	8.2E+04 N	3.1E+03 N	1.4E+00	2.8E+01 N
PROPYLENE GLYCOL	57-55-6	2.00E+01 H					7.3E+05 N	7.3E+04 N	2.7E+04 N	4.1E+07 N	1.6E+06 N		
PROPYLENE GLYCOL, MONOETHYL ETHER	52125-53-8	7.00E-01 H					2.6E+04 N	2.6E+03 N	9.5E+02 N	1.4E+06 N	5.5E+04 N		
PROPYLENE GLYCOL, MONOMETHYL ETHER	107-98-2	7.00E-01 H		5.70E-01 I			2.6E+04 N	2.1E+03 N	9.5E+02 N	1.4E+06 N	5.5E+04 N		
PURSUIT	81335-77-5	2.50E-01 I					9.1E+03 N	9.1E+02 N	3.4E+02 N	5.1E+05 N	2.0E+04 N		
PYRIDINE	110-86-1	1.00E-03 I					3.7E+01 N	3.7E+00 N	1.4E+00 N	2.0E+03 N	7.8E+01 N		
QUINOLINE	91-22-5		1.20E+01 H				5.6E-03 C	5.2E-04 C	2.6E-04 C	4.8E-01 C	5.3E-02 C		
RDX	121-82-4	3.00E-03 I	1.10E-01 I				6.1E-01 C	5.7E-02 C	2.9E-02 C	5.2E+01 C	5.8E+00 C		
RESMETHRIN	10453-86-8	3.00E-02 I					1.1E+03 N	1.1E+02 N	4.1E+01 N	6.1E+04 N	2.3E+03 N		
RONNEL	299-84-3	5.00E-02 H					1.8E+03 N	1.8E+02 N	6.8E+01 N	1.0E+05 N	3.9E+03 N		
ROTENONE	83-79-4	4.00E-03 I					1.5E+02 N	1.5E+01 N	5.4E+00 N	8.2E+03 N	3.1E+02 N		
SELENIOUS ACID	7783-00-8	5.00E-03 I					1.8E+02 N	1.8E+01 N	6.8E+00 N	1.0E+04 N	3.9E+02 N		
SELENIUM	7782-49-2	5.00E-03 I					1.8E+02 N	1.8E+01 N	6.8E+00 N	1.0E+04 N	3.9E+02 N	9.5E-01	1.9E+01 N
SILVER	7440-22-4	5.00E-03 I					1.8E+02 N	1.8E+01 N	6.8E+00 N	1.0E+04 N	3.9E+02 N	1.6E+00	3.1E+01 N
SIMAZINE	122-34-9	5.00E-03 I	1.20E-01 H				5.6E-01 C	5.2E-02 C	2.6E-02 C	4.8E+01 C	5.3E+00 C	1.7E-04	3.3E-03 C
SODIUM AZIDE	26628-22-8	4.00E-03 I					1.5E+02 N	1.5E+01 N	5.4E+00 N	8.2E+03 N	3.1E+02 N		
SODIUM DIETHYLDITHIOCARBAMATE	148-18-5	3.00E-02 I	2.70E-01 H				2.5E-01 C	2.3E-02 C	1.2E-02 C	2.1E+01 C	2.4E+00 C		
STRONTIUM, STABLE	7440-24-6	6.00E-01 I					2.2E+04 N	2.2E+03 N	8.1E+02 N	1.2E+06 N	4.7E+04 N	7.7E+02	1.5E+04 N
STRYCHNINE	57-24-9	3.00E-04 I					1.1E+01 N	1.1E+00 N	4.1E-01 N	6.1E+02 N	2.3E+01 N	8.3E-03	1.7E-01 N
STYRENE	100-42-5	2.00E-01 I		2.86E-01 I		y	1.6E+03 N	1.0E+03 N	2.7E+02 N	4.1E+05 N	1.6E+04 N	2.9E+00	5.7E+01 N
2,3,7,8-TETRACHLORODIBENZODIOXIN	1746-01-6		1.50E+05 H		1.50E+05 H		4.5E-07 C	4.2E-08 C	2.1E-08 C	3.8E-05 C	4.3E-06 C	4.3E-07	8.6E-06 C
1,2,4,5-TETRACHLOROBENZENE	95-94-3	3.00E-04 I					1.1E+01 N	1.1E+00 N	4.1E-01 N	6.1E+02 N	2.3E+01 N	3.3E-02	6.6E-01 N
1,1,1,2-TETRACHLOROETHANE	630-20-6	3.00E-02 I	2.60E-02 I		2.60E-02 I	y	4.1E-01 C	2.4E-01 C	1.2E-01 C	2.2E+02 C	2.5E+01 C	2.0E-04	4.0E-03 C
1,1,2,2-TETRACHLOROETHANE	79-34-5	6.00E-02 E	2.00E-01 I		2.00E-01 I	y	5.3E-02 C	3.1E-02 C	1.6E-02 C	2.9E+01 C	3.2E+00 C	3.4E-05	6.8E-04 C
TETRACHLOROETHENE	127-18-4	1.00E-02 I	5.20E-02 E	1.4E-01 E	2.00E-03 E	y	1.1E+00 C	3.1E+00 C	6.1E-02 C	1.1E+02 C	1.2E+01 C	2.4E-03	4.8E-02 C
2,3,4,6-TETRACHLOROPHENOL	58-90-2	3.00E-02 I					1.1E+03 N	1.1E+02 N	4.1E+01 N	6.1E+04 N	2.3E+03 N		
P,A,A,A-TETRACHLOROTOLUENE	5216-25-1		2.00E+01 H				3.3E-03 C	3.1E-04 C	1.6E-04 C	2.9E-01 C	3.2E-02 C		
1,1,1,2-TETRAFLUOROETHANE	811-97-2			2.29E+01 I		y	1.7E+05 N	8.4E+04 N					
TETRAHYDROFURAN	109-99-9	2.00E-01 E	7.6E-03 E	8.6E-02 E	6.8E-03 E		8.8E+00 C	9.2E-01 C	4.2E-01 C	7.5E+02 C	8.4E+01 C		
TETRYL	479-45-8	1.00E-02 H					3.7E+02 N	3.7E+01 N	1.4E+01 N	2.0E+04 N	7.8E+02 N		
THALLIC OXIDE	1314-32-5	7.00E-05 W					2.6E+00 N	2.6E-01 N	9.5E-02 N	1.4E+02 N	5.5E+00 N		
THALLIUM	7440-28-0	7.00E-05 O					2.6E+00 N	2.6E-01 N	9.5E-02 N	1.4E+02 N	5.5E+00 N	1.8E-01	3.6E+00 N
THALLIUM ACETATE	563-68-8	9.00E-05 I					3.3E+00 N	3.3E-01 N	1.2E-01 N	1.8E+02 N	7.0E+00 N		
THALLIUM CARBONATE	6533-73-9	8.00E-05 I					2.9E+00 N	2.9E-01 N	1.1E-01 N	1.6E+02 N	6.3E+00 N		
THALLIUM CHLORIDE	7791-12-0	8.00E-05 I					2.9E+00 N	2.9E-01 N	1.1E-01 N	1.6E+02 N	6.3E+00 N		
THALLIUM NITRATE	10102-45-1	9.00E-05 I					3.3E+00 N	3.3E-01 N	1.2E-01 N	1.8E+02 N	7.0E+00 N		

Sources: I = IRIS H = HEAST A = HEAST Alternate W = Withdrawn from IRIS or HEAST
E = EPA-NCEA provisional value O = other

Basis: C = Carcinogenic effects N = Noncarcinogenic effects I = RBC at HI of 0.1 < RBC-c

Chemical	CAS	RfDo mg/kg/d	CSFo 1/mg/kg/d	RfDi mg/kg/d	CSFi 1/mg/kg/d	VOC	Risk-based concentrations: Tap water ug/l	Ambient air ug/m3	Fish mg/kg	Soil Industrial mg/kg	Soil Residential mg/kg	Region III SSLs: Soil, for groundwater migration DAF 1 mg/kg	DAF 20 mg/kg
THALLIUM SULFATE (2:1)	7446-18-6	8.00E-05 I					2.9E+00 N	2.9E-01 N	1.1E-01 N	1.6E+02 N	6.3E+00 N		
THIOBENCARB	28249-77-6	1.00E-02 I					3.7E+02 N	3.7E+01 N	1.4E+01 N	2.0E+04 N	7.8E+02 N		
TIN	7440-31-5	6.00E-01 H					2.2E+04 N	2.2E+03 N	8.1E+02 N	1.2E+06 N	4.7E+04 N		
TITANIUM	7440-32-6	4.00E+00 E		8.60E-03 E			1.5E+05 N	3.1E+01 N	5.4E+03 N	8.2E+06 N	3.1E+05 N		
TITANIUM DIOXIDE	13463-67-7	4.00E+00 E		8.60E-03 E			1.5E+05 N	3.1E+01 N	5.4E+03 N	8.2E+06 N	3.1E+05 N		
TOLUENE	108-88-3	2.00E-01 I		1.14E-01 I		y	7.5E+02 N	4.2E+02 N	2.7E+02 N	4.1E+05 N	1.6E+04 N	4.4E-01	8.8E+00 N
TOLUENE-2,4-DIAMINE	95-80-7		3.20E+00 H				2.1E-02 C	2.0E-03 C	9.9E-04 C	1.8E+00 C	2.0E-01 C		
TOLUENE-2,5-DIAMINE	95-70-5	6.00E-01 H					2.2E+04 N	2.2E+03 N	8.1E+02 N	1.2E+06 N	4.7E+04 N		
TOLUENE-2,6-DIAMINE	823-40-5	2.00E-01 H					7.3E+03 N	7.3E+02 N	2.7E+02 N	4.1E+05 N	1.6E+04 N		
P-TOLUIDINE	106-49-0		1.90E-01 H				3.5E-01 C	3.3E-02 C	1.7E-02 C	3.0E+01 C	3.4E+00 C	3.0E-04	5.9E-03 C
TOXAPHENE	8001-35-2		1.10E+00 I		1.10E+00 I		6.1E-02 C	5.7E-03 C	2.9E-03 C	5.2E+00 C	5.8E-01 C	3.1E-02	6.3E-01 C
1,2,4-TRIBROMOBENZENE	615-54-3	5.00E-03 I					1.8E+02 N	1.8E+01 N	6.8E+00 N	1.0E+04 N	3.9E+02 N		
TRIBUTYLTIN OXIDE	56-35-9	3.00E-04 I					1.1E+01 N	1.1E+00 N	4.1E-01 N	6.1E+02 N	2.3E+01 N		
2,4,6-TRICHLOROANILINE	634-93-5		3.40E-02 H				2.0E+00 C	1.8E-01 C	9.3E-02 C	1.7E+02 C	1.9E+01 C		
1,2,4-TRICHLOROBENZENE	120-82-1	1.00E-02 I		5.70E-02 H		y	1.9E+02 N	2.1E+02 N	1.4E+01 N	2.0E+04 N	7.8E+02 N	3.8E-01	7.5E+00 N
1,1,1-TRICHLOROETHANE	71-55-6	2.80E-01 E		6.30E-01 E		y	3.2E+03 N	2.3E+03 N	3.8E+02 N	5.7E+05 N	2.2E+04 N	3.0E+00	6.0E+01 N
1,1,2-TRICHLOROETHANE	79-00-5	4.00E-03 I	5.70E-02 I		5.60E-02 I	y	1.9E-01 C	1.1E-01 C	5.5E-02 C	1.0E+02 C	1.1E+01 C	3.9E-05	7.8E-04 C
TRICHLOROETHENE	79-01-6	6.00E-03 E	1.10E-02 E		6.00E-03 E	y	1.6E+00 C	1.0E+00 C	2.9E-01 C	5.2E+02 C	5.8E+01 C !	7.7E-04	1.5E-02 C
TRICHLOROFLUOROMETHANE	75-69-4	3.00E-01 I		2.00E-01 A		y	1.3E+03 N	7.3E+02 N	4.1E+02 N	6.1E+05 N	2.3E+04 N	1.1E+00	2.3E+01 N
2,4,5-TRICHLOROPHENOL	95-95-4	1.00E-01 I					3.7E+03 N	3.7E+02 N	1.4E+02 N	2.0E+05 N	7.8E+03 N		
2,4,6-TRICHLOROPHENOL	88-06-2		1.10E-02 I		1.00E-02 I		6.1E+00 C	6.3E-01 C	2.9E-01 C	5.2E+02 C	5.8E+01 C		
2,4,5-T	93-76-5	1.00E-02 I					3.7E+02 N	3.7E+01 N	1.4E+01 N	2.0E+04 N	7.8E+02 N	9.8E-02	2.0E+00 N
2-(2,4,5-TRICHLOROPHENOXY)PROPIONIC ACID	93-72-1	8.00E-03 I					2.9E+02 N	2.9E+01 N	1.1E+01 N	1.6E+04 N	6.3E+02 N	1.1E+00	2.1E+01 N
1,1,2-TRICHLOROPROPANE	598-77-6	5.00E-03 I				y	3.0E+01 N	1.8E+01 N	6.8E+00 N	1.0E+04 N	3.9E+02 N	1.2E-02	2.5E-01 N
1,2,3-TRICHLOROPROPANE	96-18-4	6.00E-03 I	2.00E+00 E	1.4E-03 E		y	5.3E-03 C	3.1E-03 C	1.6E-03 C	2.9E+00 C	3.2E-01 C	1.8E-06	3.6E-05 C
1,2,3-TRICHLOROPROPENE	96-19-5	5.00E-03 H				y	3.0E+01 N	1.8E+01 N	6.8E+00 N	1.0E+04 N	3.9E+02 N	1.2E-02	2.5E-01 N
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76-13-1	3.00E+01 I		8.60E+00 H		y	5.9E+04 N	3.1E+04 N	4.1E+04 N	6.1E+07 N	2.3E+06 N	1.2E+02	2.3E+03 N
1,2,4-TRIMETHYLBENZENE	95-63-6	5.00E-02 E		1.70E-03 E		y	1.2E+01 N	6.2E+00 N	6.8E+01 N	1.0E+05 N	3.9E+03 N		
1,3,5-TRIMETHYLBENZENE	108-67-8	5.00E-02 E		1.70E-03 E		y	1.2E+01 N	6.2E+00 N	6.8E+01 N	1.0E+05 N	3.9E+03 N		
TRIMETHYL PHOSPHATE	512-56-1		3.70E-02 H				1.8E+00 C	1.7E-01 C	8.5E-02 C	1.5E+02 C	1.7E+01 C		
1,3,5-TRINITROBENZENE	99-35-4	3.00E-02 I					1.1E+03 N	1.1E+02 N	4.1E+01 N	6.1E+04 N	2.3E+03 N		
2,4,6-TRINITROTOLUENE	118-96-7	5.00E-04 I	3.00E-02 I				2.2E+00 C !	2.1E-01 C !	1.1E-01 C !	1.9E+02 C !	2.1E+01 C !		
**URANIUM (SOLUBLE SALTS; from IRIS)	7440-61-1	3.00E-03 I					1.1E+02 N	1.1E+01 N	4.1E+00 N	6.1E+03 N	2.3E+02 N		
**URANIUM (SOLUBLE SALTS; provisional)	7440-61-1	2.00E-04 E					7.3E+00 N	7.3E-01 N	2.7E-01 N	4.1E+02 N	1.6E+01 N		
VANADIUM	7440-62-2	7.00E-03 H					2.6E+02 N	2.6E+01 N	9.5E+00 N	1.4E+04 N	5.5E+02 N	2.6E+02	5.1E+03 N
VANADIUM PENTOXIDE	1314-62-1	9.00E-03 I					3.3E+02 N	3.3E+01 N	1.2E+01 N	1.8E+04 N	7.0E+02 N		
VANADIUM SULFATE	16785-81-2	2.00E-02 H					7.3E+02 N	7.3E+01 N	2.7E+01 N	4.1E+04 N	1.6E+03 N		
VINCLOZOLIN	50471-44-8	2.50E-02 I					9.1E+02 N	9.1E+01 N	3.4E+01 N	5.1E+04 N	2.0E+03 N		
VINYL ACETATE	108-05-4	1.00E+00 H		5.71E-02 I		y	4.1E+02 N	2.1E+02 N	1.4E+03 N	2.0E+06 N	7.8E+04 N	8.7E-02	1.7E+00 N
**VINYL CHLORIDE: lifetime	75-01-4	3.00E-03 I	1.50E+00 I	2.8E-02 I	3.00E-02 I	y	4.0E-02 C	2.1E-01 C	2.1E-03 C	3.8E+00 C	4.3E-01 C	1.7E-05	3.3E-04 C
**VINYL CHLORIDE: adult	75-01-4	3.00E-03 I	7.50E-01 I	2.8E-02 I	1.5E-02 I	y	8.1E-02 C	4.2E-01 C	4.2E-03 C	7.6E+00 C	8.5E-01 C	3.3E-05	6.6E-04 C
WARFARIN	81-81-2	3.00E-04 I					1.1E+01 N	1.1E+00 N	4.1E-01 N	6.1E+02 N	2.3E+01 N	2.2E-02	4.4E-01 N
M-XYLENE	108-38-3	2.00E+00 H				y	1.2E+04 N	7.3E+03 N	2.7E+03 N	4.1E+06 N	1.6E+05 N	1.3E+01	2.5E+02 N
O-XYLENE	95-47-6	2.00E+00 H				y	1.2E+04 N	7.3E+03 N	2.7E+03 N	4.1E+06 N	1.6E+05 N	1.1E+01	2.3E+02 N
P-XYLENE	106-42-3					y							
XYLENES	1330-20-7	2.00E+00 I				y	1.2E+04 N	7.3E+03 N	2.7E+03 N	4.1E+06 N	1.6E+05 N	8.5E+00	1.7E+02 N
ZINC	7440-66-6	3.00E-01 I					1.1E+04 N	1.1E+03 N	4.1E+02 N	6.1E+05 N	2.3E+04 N	6.8E+02	1.4E+04 N
ZINC PHOSPHIDE	1314-84-7	3E-04 I					1.1E+01 N	1.1E+00 N	4.1E-01 N	6.1E+02 N	2.3E+01 N		
ZINEB	12122-67-7	5E-02 I					1.8E+03 N	1.8E+02 N	6.8E+01 N	1.0E+05 N	3.9E+03 N		

APPENDIX C.2

BACKGROUND SOIL DATA

NAVAL SUBMARINE BASE-NEW LONDON
GROTON, CONNECTICUT

BACKGROUND CONCENTRATIONS OF INORGANICS IN SOIL

Prepared For:

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Atlantic Project No.: 2072-01-06

April 1995

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Appendix B: Correspondence Regarding Background Soils Data Report
Appendix C: Analytical Results
Appendix D: Data Validation Reports
Appendix E: Histograms

1.0 INTRODUCTION

This Background Soils Report was developed under the Navy's Installation Restoration Program. The report pertains to several investigation sites located within the Naval Submarine Base - New London (NSB-NLON) in Groton, Connecticut.

1.1 Objective and Purpose

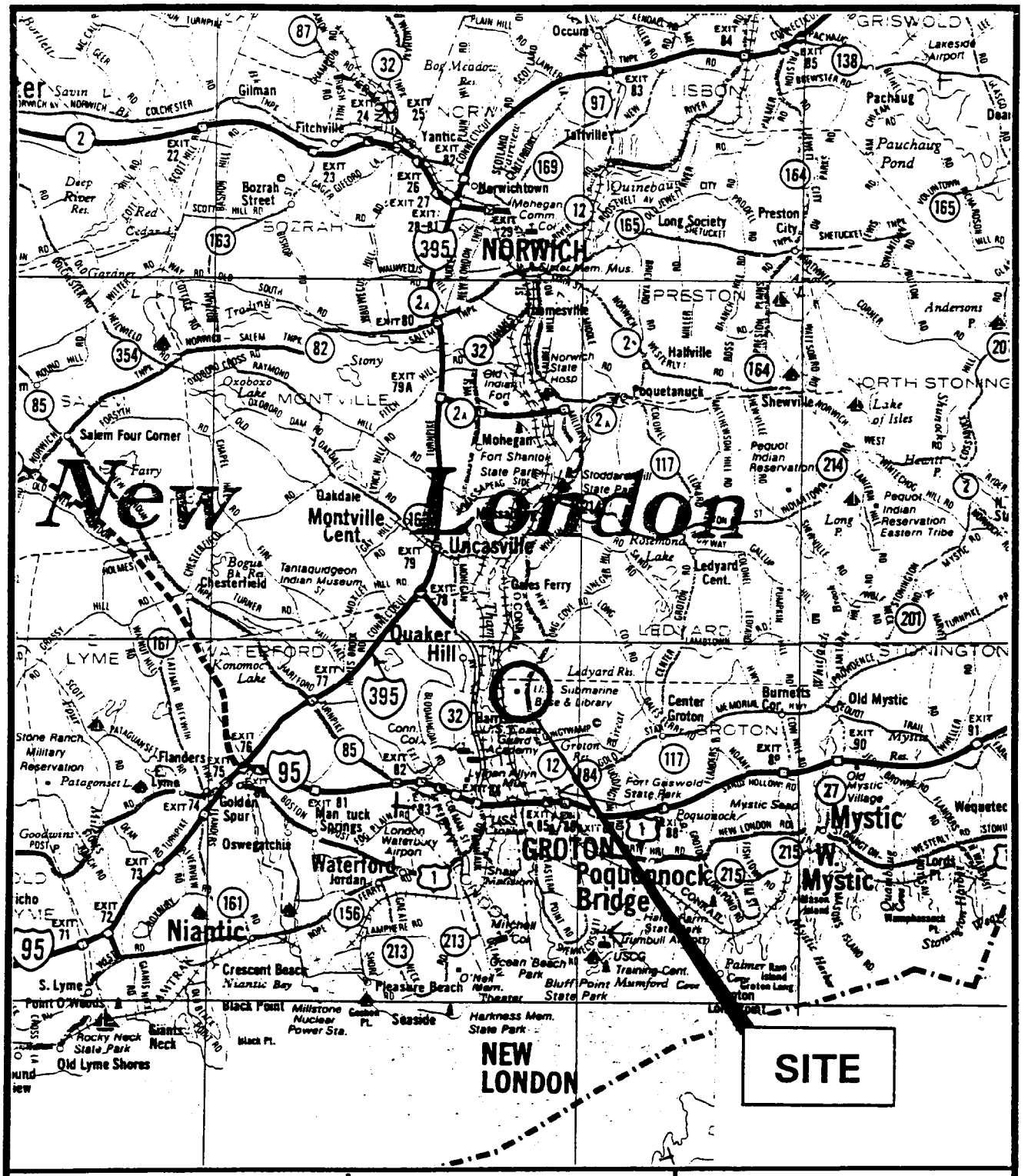
The objective of the soil sampling and analysis program described in this report was to determine the native background concentrations of inorganic chemical analytes in soils at the NSB-NLON located in Groton, Connecticut. Native background concentrations are defined as the concentration of a naturally occurring compound in soil that is unaffected by any release of pollutants.

The intended use of the background concentration data is to compare against soil sample results from remedial investigations at several sites for the purpose of identifying areas where the release of pollutants may have occurred. Areas at which releases of pollutants may have occurred will be further evaluated to determine if contaminant levels detected present a hazard to human health or the environment. Further definition of the purpose and use of background concentrations will be established in a consensus statement to be established among the United States Environmental Protection Agency (EPA), the Navy, and the Connecticut Department of Environmental Protection (CTDEP).

1.2 Background

The NSB-NLON consists of approximately 547 acres of land and associated buildings in southeastern Connecticut in the towns of Ledyard and Groton. NSB-NLON is on the east bank of the Thames River, approximately six miles north of Long Island Sound. Figures 1-1 and 1-2 show the overall NSB-NLON site vicinity and location, respectively. NSB-NLON was placed on the National Priorities List (NPL) on August 30, 1990 by the EPA pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980.

In compliance with CERCLA requirements, a Phase I Remedial Investigation (RI) (Atlantic, August 1992) on nine sites within the overall NSB-NLON sites was completed by Atlantic on behalf of the Navy in August of 1992. In the Phase I RI report, the concentrations of inorganic analytes were compared with published data by the United States Geological Service (USGS) for the eastern United States (Shacklette and Boerngen, 1984). The values used for screening soil sample results were calculated for the upper 95% value limit. Based on comments received on the Phase I RI, the Navy agreed to develop site-specific background levels for inorganic analytes in the soil at NSB-NLON.



INSTALLATION RESTORATION STUDY

NAVAL SUBMARINE BASE - NEW LONDON

GROTON, CT

SOURCE: Marshall Penn-York Co. Inc.

Miles

0 1 2 3

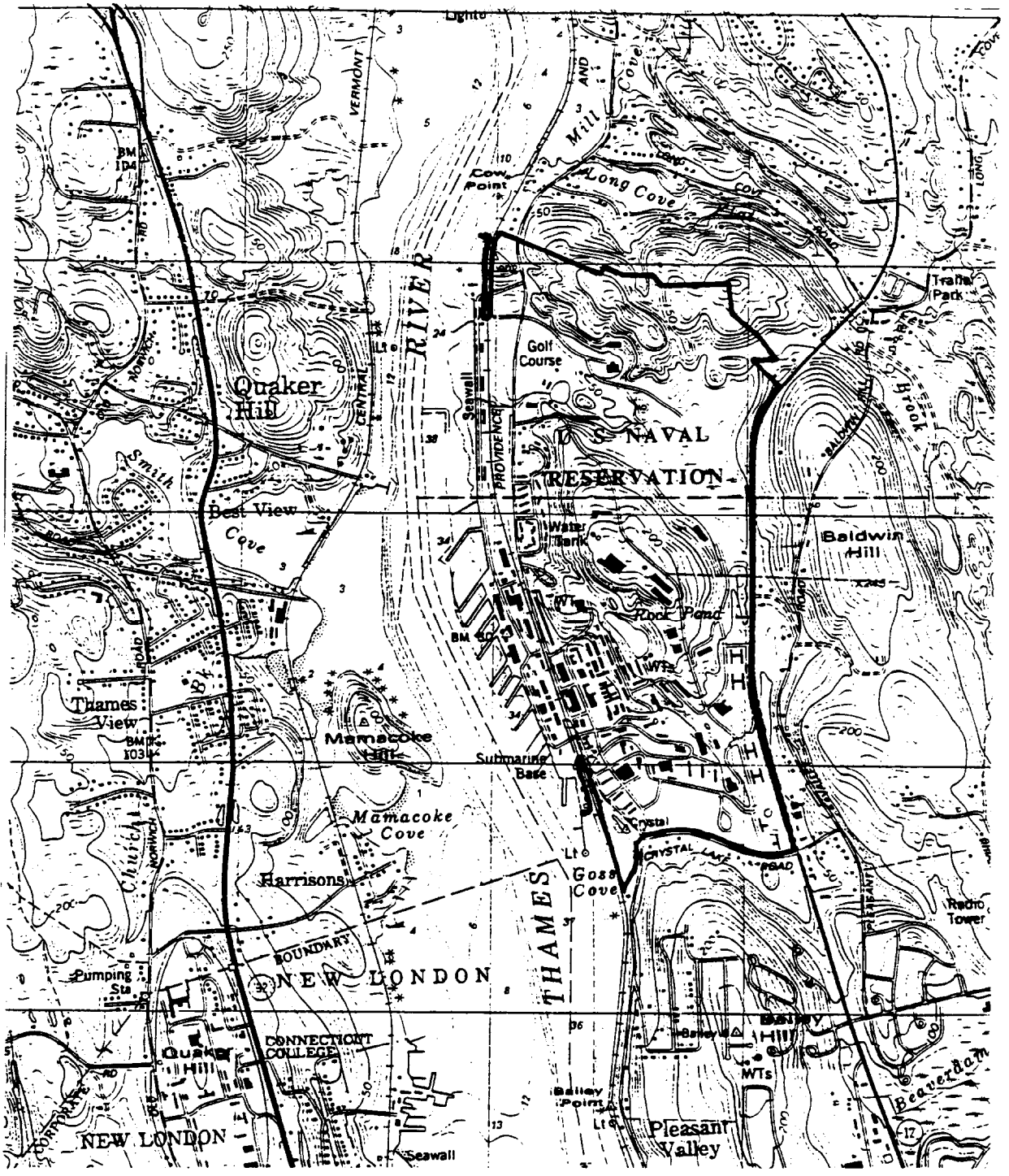
APPROXIMATE SCALE

N

FIGURE 1-1

SITE VICINITY

ATLANTIC ENVIRONMENTAL SERVICES, INC.



INSTALLATION RESTORATION STUDY NAVAL SUBMARINE BASE - NEW LONDON GROTON, CT	SOURCE: Uncasville, CT U.S.G.S. Topographic Map 1984 N	FIGURE 1-2 SITE LOCATION ATLANTIC ENVIRONMENTAL SERVICES, INC.

A draft Plan of Action to Establish Background Concentrations of Inorganics in Soil was prepared in October 1992 (Atlantic, October 1992). Subsequent technical discussions of the Plan of Action took place during TRC meetings held on December 2, 1992, February 4, 1993, May 5, 1993, and August 4, 1993. Based upon these discussions and further discussions between the Navy and EPA, a letter transmitting a revised sample location figure to the Plan of Action was submitted to the EPA in a letter dated February 10, 1993, and was approved by EPA in a letter dated March 24, 1993. These letters are included as Appendix A.

Samples were collected in April 1993 to supplement existing "background" data and a Background Soils Data Report was prepared in July 1994 (Atlantic, July 1994). The EPA commented on this report in a letter dated October 5, 1994. Subsequent discussion regarding the comments took place in a meeting between the Navy, EPA, and CTDEP held on January 4, 1995 in the EPA offices in Boston, Massachusetts. Based upon the discussion during this meeting, a response to the comments was prepared by the Navy and submitted to the EPA in a letter dated February 14, 1995. The EPA concurred with these responses in a letter dated March 1, 1995. The letters referenced in this paragraph are included as Appendix B.

In summary, several agreements between the EPA, Navy, and CTDEP were reached regarding the contents of this report regarding establishment of background soils concentrations.

- Only the 16 samples collected during the April 1993 sampling event will be used to establish levels.

- The background level to be used to screen site data will be the highest level detected in the range of any particular analyte. Separate background levels will be established for the 0 to 2 foot and the 0 to 4 foot intervals.

2.0 BACKGROUND SOILS INVESTIGATION

2.1 Description of Sample Areas and Plan

Eight areas at NSB-NLON were selected for background soil sampling as shown in Figure 2-1. A summary of the field sampling plan from the Plan of Action (Atlantic, October 1992) is shown in Table 2-1, and the rationale for selection of constituents to be analyzed is shown in Table 2-2. All eight locations were wooded, upland, and showed no evidence of being disturbed by development. Soil samples from these locations are considered to be representative of the native background concentration of the individual inorganic analytes in soil in this area. Samples were collected and analyzed as described in the Plan of Action (October, 1992) except sample locations were modified as described in the correspondence included as Appendix A.

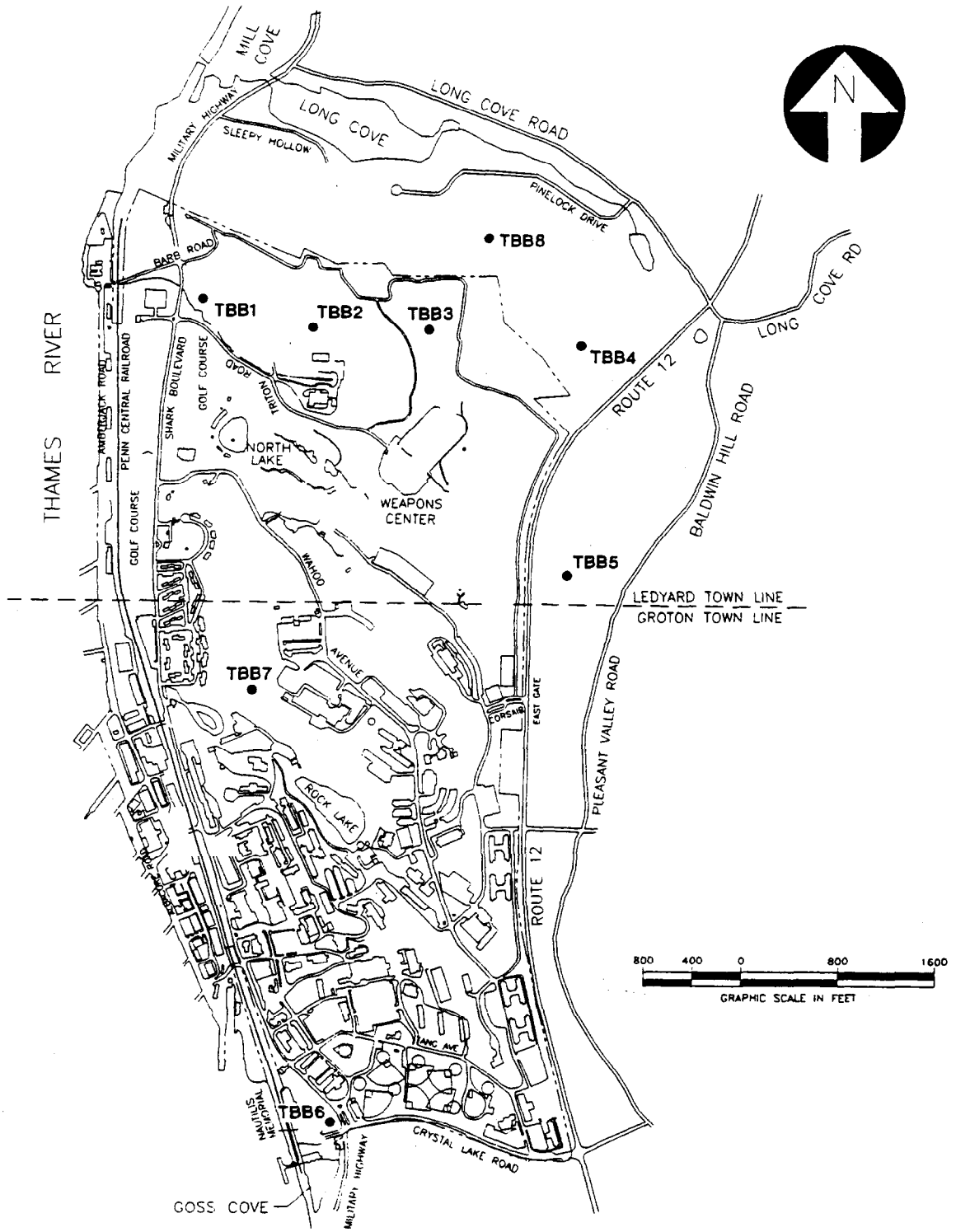
TABLE 2-1
FIELD SAMPLING PLAN

Sample Location	Soil Boring Depth/ Sampling Specifications	Location Rationale and/or Objective	Analysis		
			TCLP Metals	TCL Organics	TAL Inorganics
TBB-1 TBB-2 TBB-3 TBB-4 TBB-5 TBB-6 TBB-7 TBB-8	4 feet/ 0-2', 2-4'	Determine on-site background inorganic concentrations in soil; TCL organics to confirm no prior waste disposal.	•	•	•

TABLE 2-2
RATIONALE FOR SELECTION OF CONSTITUENTS FOR ANALYSIS

Parameter	Rationale
TCLP Metals	Present at NSB-NLON. Needed to establish soil background concentrations in soil.
TCL Organics - VOC, SVOC	Present at NSB-NLON. Needed to determine if background soil samples contain contamination not attributable to natural background sources.
TAL Inorganics	Present at NSB-NLON. Needed to establish soil background concentrations in soil.

The sample areas described above provided soil samples considered to be representative of background levels for inorganic analytes. Shallow soil samples were obtained from two depths (0 to 2 feet and 0 to 4 feet) from each location and analyzed for TCLP metals, TCL organics, and TAL inorganics. Analytical results are summarized in Table 2-3, and complete chemical analysis results are included in Appendix C. Data validation reporting is provided as Appendix D.



INSTALLATION RESTORATION STUDY NAVAL SUBMARINE BASE - NEW LONDON GROTON, CT	LEGEND ● TBB7 – TEST BORING	FIGURE 2-1 BACKGROUND SAMPLING LOCATIONS ATLANTIC ENVIRONMENTAL SERVICES, INC.

TABLE 2-3
NAVAL SUBMARINE BASE - NEW LONDON
BACKGROUND SOILS
SUMMARY OF SOIL ANALYTICAL RESULTS (INORGANICS)
SAMPLES COLLECTED APRIL 1993

PARAMETER	SAMPLE ID / (DEPTH)															
	TBB1 (0-2)	TBB1 (2-4)	TBB2 (0-2)	TBB2 (2-2.3)	TBB3 (0-2)	TBB3 (2-2.5)	TBB4 (0-2)	TBB4 (2-4)	TBB5 (0-2)	TBB5 (2-3.3)	TBB6 (0-2)	TBB6 (2-3.5)	TBB7 (0-2)	TBB7 (2-4)	TBB8 (0-2)	TBB8 (2-3)
TAL INORGANICS (ppm)																
Aluminum	11300	7630	15400	15500	17600	16900	16700	13600	14200	12900	10400	10300	14400	12100	14000	11900
Antimony	2.3 <	2.3 <	3.0 <	2.8 <	3.3 <	2.9 <	2.9 <	2.7 <	2.4 <	2.6 <	2.7 <	2.7 <	4.1 J<	2.7 <	2.7 <	3.2 <
Arsenic	2.5 J	1.7 J	1.9 J	2.6 J	3.5 J	3.5 J	1.4 J	3.3 J	0.72 J	0.53 J	2.0 J	2.3 J	3.6 J	1.9 J	2.7 J	3.1 J
Barium	22.3 J	20.8 J	19.4 J	19.5 J	39.0 J	47.9	35.7 J	20.0 J	35.7 J	57.2	14.4 J	13.6 J	34.0 J	26.7 J	37.4 J	26.6 J
Beryllium	0.58 J	0.39 J<	0.53 <	0.62 J	0.77 <	0.68 <	0.72 J	0.56 J	0.69 J	0.57 J	0.35 J<	0.35 J<	0.69 <	0.54 J	0.60 J	0.42 J<
Boron	3.5 J<	3.3 J<	2.2 <	5.8 J<	6.2 <	3.8 <	3.4 J<	2.9 J<	3.6 J<	3.3 J<	3.6 J<	2.7 J<	2.5 <	2.0 J<	3.0 J<	3.7 J<
Cadmium	0.34 <	0.34 <	0.44 <	0.41 <	0.48 <	0.42 <	0.42 <	0.40 <	0.35 <	0.38 <	0.40 <	0.40 <	0.35 <	0.40 <	0.44 <	0.47 <
Calcium	222 J	499 J	102 J	115 J	258 J	283 J	254 J	245 J	146 J	177 J	212 J	233 J	314 J	278 J	254 J	268 J
Chromium	14.1	11.8	14.0	15.1	19.3	21.5	16.4	18.1	14.6	17.8	10.2	10.8	16.5	18.1	17.7	16.9
Cobalt	4.7 J	5.0 J	4.4 <	5.4 J	6.0 <	8.0 J	5.4 J	7.4 J	5.1 J	7.9 J	4.0 J	5.4 J	5.7 <	6.8 J	7.0 J	7.1 J
Copper	6.5	6.5	5.4 J	7.1	17.9	24.2	16.7	25.0	11.6	25.6	5.5	4.5 J	5.4	6.4	10.3	12.1
Iron	11000	8390	13800	14000	16800	17200	16100	13600	13800	15300	9730	9630	13700	12300	14400	13700
Lead	8.6 J	2.8 J	12.3 J	5.7 J	17.5 J	6.5 J	6.3 J	3.8 J	16.2 J	5.8 J	7.6 J	3.7 J	10.6 J	4.8 J	11.1 J	4.6 J
Magnesium	1980	2230	1410	1810	2460	3460	1910	2870	2010	3650	1560	1680	2010	2800	2210	2590
Manganese	83.9 E	91.2 E	63.6 E	72.4 E	172 E	156 E	84.1 E	128 E	125 E	188 E	69.5 E	68.7 E	124 E	95.8 E	160 E	143 E
Mercury	0.08 <	0.06 <	0.09 <	0.05 J<	0.11 <	0.04 <	0.08 <	0.09 <	0.04 <	0.04 <	0.07 <	0.06 <	0.06 <	0.09 <	0.05 <	0.07 <
Nickel	7.4 J<	7.3 J<	5.2 <	6.6 J<	8.3 <	11.9 <	10.0 J<	9.1 J<	6.6 J<	7.7 J<	6.5 J<	7.2 J<	7.7 <	8.9 J<	7.9 J<	9.0 J<
Potassium	338 J	683 J	229 J	316 J	669 J	1430	297 J	527 J	580 J	2580 J	278 J	351 J	444 J	485 J	336 J	622 J
Selenium	0.31 J<	0.17 J<	0.48 <	0.80 J<	0.89 <	1.30 <	0.30 J<	0.35 J<	0.26 J<	0.37 J<	0.50 J<	0.51 J<	0.44 <	0.47 J<	0.41 J<	0.49 J<
Silver	0.54 <	0.55 <	0.71 <	0.66 <	0.77 <	0.67 <	0.67 <	0.64 <	0.56 <	0.61 <	0.64 <	0.64 <	0.56 <	0.64 <	0.71 <	0.76 <
Sodium	25.3 J<	27.3 J<	26.9 <	26.8 J<	31.1 <	38.3 <	33.0 J<	30.1 J<	28.0 J<	41.0 J<	27.3 J<	26.4 J<	24.0 <	30.7 J<	22.9 J<	34.1 J<
Thallium	0.16 <	0.17 <	0.21 <	0.20 <	0.19 <	0.21 <	0.17 <	0.20 J	0.15 <	0.29 J	0.18 <	0.18 <	0.18 <	0.19 <	0.21 <	0.18 <
Vanadium	23.4	16.0	25.2	24.6	33.3	35.1	29.4	25.2	28.5	29.1	17.8	17.3	28.4	23.9	26.8	24.2
Zinc	19.4	13.9	19.7	18.5	25.6	26.0	20.4	20.8	23.7	31.3	21.1	19.2	21.7	22.4	17.4	17.4

NOTES:

1) Shaded numbers indicate detected compounds.
2) Assigned letters adjacent to numerical values are data qualifiers.
3) ppb indicates a concentration of parts per billion; ppm indicates parts per million.
4) < indicates not detected, less than detection limit.
5) J indicates that a value is estimated.
6) E indicates that a compound was detected above the upper limit of the instrument calibration.

TABLE 2-3 (continued)

NAVAL SUBMARINE BASE - NEW LONDON

BACKGROUND SOILS

SUMMARY OF SOIL ANALYTICAL RESULTS (ORGANICS)

SAMPLES COLLECTED APRIL 1993

PARAMETER	SAMPLE ID															
	TBB1 (0-2)	TBB1 (2-4)	TBB2 (0-2)	TBB2 (2-2.3)	TBB3 (0-2)	TBB3 (2-2.5)	TBB4 (0-2)	TBB4 (2-4)	TBB5 (0-2)	TBB5 (2-3.3)	TBB6 (0-2)	TBB6 (2-3.5)	TBB7 (0-2)	TBB7 (2-4)	TBB8 (0-2)	TBB8 (2-3)
TCL VOLATILE ORGANIC COMPOUNDS (ppb)																
VOCs	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TCL SEMI-VOLATILE ORGANIC COMPOUNDS (ppb)																
SVOCs	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

NOTES:

1) Shaded numbers indicate detected compounds.

2) Assigned letters adjacent to numerical values are data qualifiers.

3) ppb indicates a concentration of parts per billion; ppm indicates parts per million.

4) < indicates not detected, less than detection limit.

5) J indicates that a value is estimated.

6) E indicates that a compound was detected above the upper limit of the instrument calibration.

TABLE 2-3 (continued)
NAVAL SUBMARINE BASE - NEW LONDON
BACKGROUND SOILS
SUMMARY OF SOIL ANALYTICAL RESULTS (TCLP INORGANICS)
SAMPLES COLLECTED APRIL 1993

PARAMETER	SAMPLE ID / (DEPTH)															
	TBB1 (0-2)	TBB1 (2-4)	TBB2 (0-2)	TBB2 (2-2.3)	TBB3 (0-2)	TBB3 (2-2.5)	TBB4 (0-2)	TBB4 (2-4)	TBB5 (0-2)	TBB5 (2-3.3)	TBB6 (0-2)	TBB6 (2-3.5)	TBB7 (0-2)	TBB7 (2-4)	TBB8 (0-2)	TBB8 (2-3)
TCLP INORGANICS (ppb)																
Barium	237 E	195 J	174 J	195 J	142 J	129 J	509 E	211 E	457 E	348 E	119 J	120 J	454 J	299 E	270 E	241 E
Cadmium	1.8 <	1.8 <	1.8 <	1.8 <	1.8 <	1.8 <	1.8 J	1.8 <	1.8 <	1.8 <	1.8 <	1.8 <	1.8 <	1.8 <	1.8 <	1.8 <
Chromium	3.1 <	3.1 <	3.1 <	4.6 J	3.1 <	3.1 <	3.1 <	3.1 <	3.1 <	3.1 <	3.1 <	4.6 J	5.7 <	3.1 <	3.1 <	3.1 <
Lead	9.8	2.6 J	6 <	13	20.5	0.85 <	8.4	2.6 J	13.2	5.8	10.9	1.2 J	4.1 <	43.4	4	2 J
Mercury	0.24	0.1 <	0.1 <	0.1 <	0.1 <	0.1 <	0.1 <	0.1 <	0.1 <	0.1 <	0.1 <	0.1 <	0.1 <	0.1 <	0.1 <	0.1 <

NOTES:

1) Shaded numbers indicate detected compounds.
2) Assigned letters adjacent to numerical values are data qualifiers:
3) ppb indicates a concentration of parts per billion; ppm indicates parts per million.
4) < indicates not detected, less than detection limit.
5) J indicates that a value is estimated.
6) E indicates that a compound was detected above the upper limit of the instrument calibration.

TABLE 2-3 (continued)
NAVAL SUBMARINE BASE - NEW LONDON
BACKGROUND SOILS
SUMMARY OF SOIL ANALTYICAL RESULTS (PESTICIDES)
SAMPLES COLLECTED APRIL 1993

PARAMETER	SAMPLE ID															
	TBB1 (0-2)	TBB1 (2-4)	TBB2 (0-2)	TBB2 (2-2.3)	TBB3 (0-2)	TBB3 (2-2.5)	TBB4 (0-2)	TBB4 (2-4)	TBB5 (0-2)	TBB5 (2-3.3)	TBB6 (0-2)	TBB6 (2-3.5)	TBB7 (0-2)	TBB7 (2-4)	TBB8 (0-2)	TBB8 (2-3)
TCL PESTICIDES (ppb)																
4,4'-DDE	3.4	3.6 <	4.4 <	4.4 <	4.5 <	4.5 <	4 <	4.4 <	9.6	3.7 <	4 <	4.1 <	4 <	4.3 <	4.3 <	4.4 <
4,4'-DDT	5.8	3.6 <	4.4 <	4.4 <	4.5 <	4.5 <	4 <	4.4 <	6.9	3.7 <	4 <	4.1 <	4 <	4.3 <	4.3 <	4.4 <

NOTES:
1) Shaded numbers indicate detected compounds.
2) Assigned letters adjacent to numerical values are data qualifiers.
3) ppb indicates a concentration of parts per billion; ppm indicates parts per million.
4) < indicates not detected, less than detection limit.
5) J indicates that a value is estimated.
6) E indicates that a compound was detected above the upper limit of the instrument calibration.

It should be noted that all arsenic and lead values are all qualified as estimated values based on the data validation performed. Whether or not these estimated values bias the data high or low is indeterminate.

2.2 Establishment of Background Concentrations

The highest value recorded for any analyte was taken as the background level for the site. In instances where laboratory analyses did not detect a given analyte, half the value of the highest detection level for that analyte was taken as the background level. These values are shown in Table 2-4 along with the published background levels used in the Phase I, and levels calculated using the statistical methodology proposed in the Plan of Action. These later two values are presented for comparative purposes only.

2.3 Discussion of Findings

All site-derived background levels are within the ranges published by USGS for background levels for the eastern United States. Average values, range of values found, and statistically derived upper 95% values for both the NSB-NLON and USGS are compared in Table 2-5.

The values for each element (except elements having any non-detect values) were checked for both normal and lognormal distribution and outliers by preparation of histograms, which are included as Appendix E. The distribution among sampling locations does not fit into the normal distribution pattern. This is not surprising in that distributions of geological data generally fit into a lognormal pattern (USGS Miech, A.T. *Methods of Computation in Estimating Geochemical Abundance*. Geological Survey Professional Paper 574-B). The distribution, however, does not appear to fit a lognormal distribution either. Probably due to the small sample size, no data distribution is apparent. Although the histograms do not indicate any particular distribution, no apparent outliers can be observed.

Each sampling location was reviewed from its relative contribution of each element to the background value and its relationship to soil type. The average value for each element was compared with the individual sample values. The results show that sampling locations:

- TBB-3, TBB-4, and TBB-7 had a majority of elements above the average;
- TBB-1, TBB-2, and TBB-6 had a majority below average; and
- TBB-5 and TBB-8 were centered around the average.

Regarding relationships to soil type, the results show that sampling locations:

TABLE 2-4
BACKGROUND SOIL CONCENTRATIONS

Parameter	Naval Submarine Base Site-Specific Background[1] (ppm)		Site-Specific[2] Background (July 1994 Data Report)	Published Background[3] (ppm)
	(0-2 feet)	(0-4 feet)		
Aluminum	17,600	17,600	21,100	272,000
Antimony	2.05[6]	2.05[6]	ND	2.95
Arsenic	3.6	3.6	4.60	31.5
Barium	39	57.2	69.1	1,600
Beryllium	0.72	0.72	1.00	3.52
Boron	3.1[6]	3.1[6]	6.85	109
Cadmium	0.24[6]	0.24[6]	4.54	7[4]
Calcium	314	499	1,190	32,300
Chromium	19.3	21.5	25.3	223
Cobalt	7	8	12.9	39
Copper	17.9	25.6	34.5	102
Iron	16,800	17,200	20,500	115,000
Lead	17.5	17.5	19.3	53.2
Magnesium	2,460	3,650	5,620	26,500
Manganese	172	188	245	3,790
Mercury	0.055[6]	0.05	0.0379	0.51
Nickel	5.0[6]	5.95[6]	21.1	76.7
Potassium	669	2,580	3,045	12,000
Selenium	0.445[6]	0.445[6]	0.824	1.79
Silver	0.385[6]	0.385[5]	ND	5
Sodium	16.5[6]	20.5[6]	142	51,800
Thallium	0.105[6]	0.29	0.21	5[5]
Vanadium	33.3	35.1	42.3	271
Zinc	25.6	31.3	83.6	178

Notes:

1. The site-specific background value is the highest value detected from among all the background soil samples collected in April 1993.
2. The site-specific background value is the upper tolerance limit of the upper 95% confidence limit for the true 95th percentile for the background soil sample results using the April 1993 results and select samples from the Phase I RI as reported in the July 1994 data report.
3. The published background value is the upper limit of the range which contains 95% of the sample results from Shacklette and Boerngen USGS Paper 1270 using the formula $M \times D^2$, where M is the geometric mean and D is the geometric deviation, except as noted.
4. Dragun (1988)
5. Lisk (1972)
6. Value based on one-half of the highest detection level from among all the background soil samples collected in April 1993.

TABLE 2-5
NEW LONDON SUBASE BACKGROUND

Parameter	NSB-NLON			Eastern U.S. (Shacklette)		
	Arithmetic Mean	Range	Upper 95% Value[1]	Arithmetic Mean	Range	Upper 95% Value[2]
Aluminum	13,427	7,630 - 17,600	17,929	57,000	7,000 - >100,000	271,817
Antimony	ND	---	---	0.76	<1 - 8.8	2.95
Arsenic	2.3	0.53 - 3.6	4.0	7.4	<0.1 - 73	31.5
Barium	29.4	2.413.6 - 57.2	49.7	420	10 - 1,500	1,601
Beryllium	0.39	ND - 0.72	---	0.85	<1 - 7	3.5
Boron	ND	---	---	38	<20 - 150	110
Cadmium	ND	---	---	NR	---	---
Calcium	241	102 - 499	392.5	6,300	100 - 280,000	32,253
Chromium	15.8	10.2 - 21.5	20.9	52	1 - 1,000	223
Cobalt	6.0	4.0 - 8.0	3.5	9.2	<0.3 - 70	39
Copper	11.9	4.5 - 25.6	24.4	22	<1 - 700	102
Cyanide	ND	---	---	NR	---	---
Iron	13,341	8,360 - 17,200	17,570	25,000	100 - >100,000	115,317
Lead	8.0	2.8 - 17.5	15.3	17	<10 - 300	53
Magnesium	2,290	1,410 - 3,650	3,355.1	4,600	50 - 50,000	26,465
Manganese	114	63.6 - 188	181.3	640	<2 - 7,000	3,794
Nickel	ND	---	---	18	<5 - 700	77
Potassium	635	229 - 2,580	1,612	12,000	50 - 37,000	21,333
Mercury	ND	---	---	0.12	0.01 - 3.4	0.51
Selenium	ND	---	---	0.45	<0.1 - 3.9	1.8
Silver	ND	---	---	NR	---	---
Sodium	ND	---	---	7,800	<500 - 50,000	51,756
Thallium	2.45	0.20 - 0.29	0.344	NR	---	---
Vanadium	25.5	16.0 - 35.1	34.3	66	<7 - 300	271
Zinc	21.2	13.9 - 31.3	27.9	52	<5 - 2,900	178

Notes:

1. The upper 95% value is calculated as follows: $\bar{x} + 1.65S$, where $\bar{x}$ is the mean and S is the standard deviation.
2. The value is the upper limit of the range which contains 95% of the sample results from Shacklette and Boerngen USGS Paper 1270 using the formula $M \times D^2$, where M is the geometric mean and D is the geometric deviation.
3. ND - not detected.

- TBB-1, TBB-4, TBB-7, and TBB-8 were from an area classified as Hollis-Charlton Rock (15 to 45% slope);
- TBB-2 was from an area classified as Hollis-Charlton Rock (3 to 15% slope);
- TBB-3 was from an area classified as Charlton-Hollis; and
- TBB-6 was from an area classified as Rock Outcrop Hollis (3 to 45% slope).

No particular trends relating to chemical abundance are evident based on sampling locations. Similarly, no particular trend is noted when comparing geological abundance to soil types.

Organic compounds were analyzed to determine if sample locations are truly representative of native background because native soils should not contain any organic compounds. The results are shown in Table 2-3 and are summarized as follows:

- ***Volatiles.*** No volatiles were detected based on validated analytical results. Acetone and methylene chloride were found in the blank, data validation qualified all results for these two compounds as non-detects at the reported level.

- ***Semi-Volatile Organics.*** No semi-volatiles were detected.

- ***Pesticides.*** 4,4'-DDE was detected in samples TBB-1 (0-2) at 3.4 ppb and TBB-5 (0-2) at 9.6 ppb. Also, 4,4-DDT was detected at TBB-1 (0-2) at 5.8 ppb and TBB-5 (0-2) at 6.9 ppb. These values are close to the method detection limit, representing a minimal concentration of these compounds that can be stated positively. These values are also well below any screening values which might indicate potential risks to human health or the environment. Neither gross nor widespread contamination is indicated. These two sampling locations are over a half mile apart, did not contain higher levels of inorganics, and pesticide-free soil is found in between (sample TBB-2).

Based upon the organic compounds detected, it is concluded that all sample locations are representative of native background conditions. Due to the historical use of DDT in this area for mosquito control, low levels are now ubiquitous in the environment.

3.0 SUMMARY AND CONCLUSIONS

Based on the results of analysis of 16 samples collected from the 0 to 2 foot depth and the 2 to 4 foot depth at 8 locations in and near NSB-NLON, background levels (as shown in Table 3-1) were established to be used to screen site analytical data to identify areas where releases of pollutants may have occurred at NSB-NLON.

TABLE 3-1
BACKGROUND SOIL CONCENTRATIONS

Parameter	Naval Submarine Base Site-Specific Background[1] (ppm)	
	(0-2 feet)	(0-4 feet)
Aluminum	17,600	17,600
Arsenic	3.6	3.6
Antimony	2.05[2]	2.05[2]
Barium	39	57.2
Beryllium	0.72	0.72
Boron	3.1[2]	3.1[2]
Cadmium	0.24[2]	0.24[2]
Calcium	314	499
Chromium	19.3	21.5
Cobalt	7	8
Copper	17.9	25.6
Iron	16,800	17,200
Lead	17.5	17.5
Magnesium	2,460	3,650
Manganese	172	188
Mercury	0.055[2]	0.05
Nickel	5.0[2]	5.95[2]
Potassium	669	2,580
Selenium	0.445[2]	0.445[2]
Silver	0.385[2]	0.385[2]
Sodium	16.56[2]	20.56[2]
Thallium	0.105[2]	0.29
Vanadium	33.3	35.1
Zinc	25.6	31.3

Notes:
1. The site-specific background value is the highest value detected from among all the background soil samples collected in April 1993.
2. Value based on one-half of the highest detection level from among all the background soil samples collected in April 1993.

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APPENDIX C.3

TOXICOLOGICAL PROFILES

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C.3.1 ANTIMONY

Pharmacokinetics

Ingested antimony is absorbed slowly and incompletely from the gastrointestinal. Within a few days of acute exposure, highest tissue concentrations are found in the liver, kidney, and thyroid. Organs of storage include skin, bones, and teeth. Highest concentrations in deceased smelter workers (inhalation exposure) occurred in the lungs and skeleton. Excretion is largely via the urine or feces, although some is incorporated into the hair.

Noncancer Toxicity

Acute intoxication from ingestion of large doses of antimony induces GI disturbances, dehydration, and cardiac effects in human. Chronic effects from occupational exposure include irritation of the respiratory tract, pneumoconiosis, pustular eruptions of the skin called "antimony spots," allergic contact dermatitis, and cardiac effects, including abnormalities of the electrocardiograph (ECG) and myocardial changes. Cardiac effects were also observed in rats and rabbits exposed by inhalation for six weeks and in animals (dogs, and possibly other species) treated by intravenous injection.

Chronic oral exposure studies in laboratory animals include two briefly reported lifetime drinking water studies in rates and mice. The only dose tested, 5 ppm potassium antimony tartrate, resulted in reduced longevity in both species and in reduced mean heart weight in rats. The EPA verified an RfD of 0.0004 mg/kg/day for chronic oral exposure to antimony from the LOAEL of 5 ppm potassium antimony tartrate (0.35 mg/antimony/kg body weight-day) in the lifetime study in rats. An uncertainty factor of 1000 was applied; factors of 10 each for inter- and intraspecies variation and to estimate an NOAEL from an LOAEL. The heart is considered a likely target organ for chronic oral exposure of humans.

Carcinogenicity

Data were not located regarding the carcinogenicity of antimony to humans. Antimony fed to rats did not produce an excess of tumors, but a high frequency of lung tumors was observed in rats exposed by inhalation to antimony trioxide for one year. Antimony is classified in EPA cancer weight-of-evidence Group D (not classifiable as a carcinogenicity to humans).

C.3.2 AROCLOR-1254

Aroclor® 1254 is a polychlorinated biphenyl (PCB) mixture containing approximately 21% C12H6Cl4, 48% C12H5Cl5, 23% C12H4Cl6, and 6% C12H3Cl7 with an average chlorine content of 54%. PCBs are inert, thermally and physically stable, and have dielectric properties. In the environment, the behavior of PCB mixtures is directly correlated to the degree of chlorination. Aroclor® is strongly sorbed to soil and remains immobile when leached with water; however, the mixture is highly mobile in the presence of organic solvents. PCBs are resistant to chemical degradation by oxidation or hydrolysis. However, biodegradation, especially of lower chlorinated PCBs, can occur.

Pharmacokinetics

PCBs have high bioconcentration factors, and due to lipophilicity, especially of highly chlorinated congeners, tend to accumulate in the fat of fish, birds, mammals, and humans. PCBs are absorbed after oral, inhalation, or dermal exposure and are stored in adipose tissue. The location of the chlorine atoms on the phenyl rings is an important factor in PCB metabolism and excretion. The major route of PCB excretion is in the urine and feces; however, more important is the elimination in human milk. Metabolites are predominately found in urine and bile, while small amounts of the parent compound are found in the feces. Biliary excretion appears to be the source of fecal excretion.

Noncancer Toxicity

Accidental human poisonings and data from occupational exposure to PCBs suggest initial dermal and mucosal disturbances followed by systemic effects that may manifest themselves several years post-exposure. Initial effects are enlargement and hypersecretion of the Meibomian gland of the eye, swelling of the eyelids, pigmentation of the fingernails and mucous membranes, fatigue, and nausea. These effects were followed by hyperkeratosis, darkening of the skin, acneform eruptions, edema of the arms and legs, neurological symptoms, such as headache and limb numbness, and liver disturbance. Hepatotoxicity is a prominent effect of Aroclor® 1254 that has been well characterized . Effects included hepatic microsomal enzyme induction, increased serum levels of liver-related enzymes indicative of hepatocellular damage, liver enlargement, lipid deposition, fibrosis, and necrosis. Groups of 16 adults (11.1 +/-4.1 years at study initiation) female rhesus monkeys ingested gelatin capsules containing 0, 0.005, 0.02, 0.04, or 0.08 mg/kg/day Aroclor® 1254 daily for more than 5 years. Increases in the incidence of inflamed and/or prominent Meibomian glands; increased incidences of ocular exudate; changes in finger and/or toe nails; decreases in IgG and IgM antibody levels; decreases in the percent of helper T-lymphocytes; increases in suppressor T-lymphocyte count; a decrease in helper/suppressor ratio; and decreases in reticulocyte count, serum cholesterol, total bilirubin, and alpha-1+ alpha-2-globulins were observed in treated monkeys.

A chronic oral reference dose (RfD) of 2E-05 mg/kg/day for Aroclor® 1254 was calculated from a lowest-observed-adverse-effect level (LOAEL) of 0.0005 mg/kg/day derived from the above study.

Carcinogenicity

Data are suggestive but not conclusive concerning the carcinogenicity of PCBs in humans. The EPA has not determined a weight-of-evidence classification or slope factor for Aroclor® 1254 specifically. However, hepatocellular carcinomas in three strains of rats and two strains of mice have led the EPA to classify PCBs as group B2, probable human carcinogen. The carcinogenicity slope factor (q1*) for oral exposure to Aroclor-1254 is 2.0 $(mg/kg/day)^{-1}$.

C.3.3 ARSENIC

Noncancer Toxicity

The toxicity of inorganic arsenic (As) depends on its valence state (-3, +3, or +5), and also on the physical and chemical properties of the compound in which it occurs. Trivalent (As+3) compounds are generally more toxic than pentavalent (As+5) compounds, and the more water soluble compounds are usually more toxic and more likely to have systemic effects than the less soluble compounds, which are more likely to cause chronic pulmonary effects if inhaled. One of the most toxic inorganic arsenic compounds is arsine gas (AsH3). It should be noted that laboratory animals are generally less sensitive than humans to the toxic effects of inorganic arsenic. In addition, in rodents the critical effects appear to be immunosuppression and hepato-renal dysfunction, whereas in humans the skin, vascular system, and peripheral nervous system are the primary target organs. Water soluble inorganic arsenic compounds are absorbed through the G.I. tract (>90%) and lungs; distributed primarily to the liver, kidney, lung, spleen, aorta, and skin; and excreted mainly in the urine at rates as high as 80% in 61 hr following oral dosing. Pentavalent arsenic is reduced to the trivalent form and then methylated in the liver to less toxic methylarsinic acids. Symptoms of acute inorganic arsenic poisoning in humans are nausea, anorexia, vomiting, epigastric and abdominal pain, and diarrhea. Dermatitis (exfoliative erythroderma), muscle cramps, cardiac abnormalities, hepatotoxicity, bone marrow suppression and hematologic abnormalities (anemia), vascular lesions, and peripheral neuropathy (motor dysfunction, paresthesia) have also been reported. Oral doses as low as 20-60 g/kg/day have been reported to cause toxic effects in some individuals. The acute lethal dose to humans has been estimated to be about 0.6 mg/kg/day .

General symptoms of chronic arsenic poisoning in humans are weakness, general debility and lassitude, loss of appetite and energy, loss of hair, hoarseness of voice, loss of weight, and mental disorders. Primary target organs are the skin (hyperpigmentation and hyperkeratosis), nervous system (peripheral neuropathy) and vascular system. Anemia, leukopenia, hepatomegaly, and portal hypertension have also been reported. In addition, possible reproductive effects include a high male to female birth ratio. In animals, acute oral exposures can cause gastrointestinal and neurological effects. Oral LD50 values range from about 10 to 300 mg/kg. Low subchronic doses can result in immunosuppression and hepato-renal effects. Chronic exposures have also resulted in mild hyperkeratosis and bile duct enlargement with hyperplasia, focal necrosis, and fibrosis.

The Reference Dose for chronic oral exposures, 0.0003 mg/kg/day, is based on a NOAEL of 0.0008 mg/kg/day and a LOAEL of 0.014 mg/kg/day for hyperpigmentation, keratosis, and possible vascular complications in a human population consuming arsenic-contaminated drinking water. Because of uncertainties in the data, U.S. EPA states that "strong scientific arguments can be made for various

values within a factor of 2 or 3 of the currently recommended RfD value." The subchronic Reference Dose is the same as the chronic RfD, 0.0003 mg/kg/day.

Acute inhalation exposures to inorganic arsenic can damage mucous membranes, cause rhinitis, pharyngitis and laryngitis, and result in nasal septum perforation. Chronic inhalation exposures, as occurring in the workplace, can lead to rhino-pharyno-laryngitis, tracheobronchitis, dermatitis, hyperpigmentation, hyperkeratosis, and peripheral nerve dysfunction as indicated by abnormal nerve conduction velocities and peripheral vascular disorders as indicated by Raynaud's syndrome and increased vasospastic reactivity in fingers exposed to low temperatures. Higher rates of cardiovascular disease have also been reported in some arsenic-exposed workers. Possible reproductive effects include a high frequency of spontaneous abortions and reduced birth weights. Arsine gas (AsH_3), at concentrations as low as 3-10 ppm for several hours, can cause toxic effects. Hemolysis, hemoglobinuria, jaundice, hemolytic anemia, and necrosis of the renal tubules have been reported in exposed workers. Subchronic and chronic RfCs for inorganic arsenic have not been derived.

Carcinogenicity

Epidemiological studies have revealed an association between arsenic concentrations in drinking water and increased incidences of skin cancers (including squamous cell carcinomas and multiple basal cell carcinomas), as well as cancers of the liver, bladder, respiratory and gastrointestinal tracts. Occupational exposure studies have shown a clear correlation between exposure to arsenic and lung cancer mortality has placed inorganic arsenic in weight-of-evidence group A, human carcinogen. The oral slope factor for arsenic is 1.5 $(mg/kg/day)^{-1}$. For inhalation exposures, a slope factor of 15 $(mg/kg/day)^{-1}$ has been derived.

C.3.4 BARIUM

Noncancer Toxicity

Barium is a naturally occurring alkaline earth metal that comprises approximately 0.04 percent of the earth's crust. Acute oral toxicity was manifested by GI upset, altered cardiac performance, and transient hypertension, convulsions, and muscular paralysis. Repeated oral exposures were associated with hypertension. Occupational exposure to insoluble barium sulfate induced benign pneumoconiosis. The EPA presented a verified chronic oral RfD of 0.07 mg/kg/day, based on an NOAEL of 0.21 mg/kg/day in a ten-week study in humans exposed to barium in drinking water and an uncertainty factor of 3. The EPA presented the same value as a provisional RfD for subchronic oral exposure. A provisional chronic inhalation RfC of 0.0005 mg/m^3 and a provisional subchronic inhalation RfC of 0.005 were based on an NOEL for fetotoxicity in a four-month intermittent-exposure inhalation study in rats. Uncertainty factors of 1000 and 100 were used for the chronic and subchronic RfC values, respectively. The chronic and subchronic inhalation RfC values are equivalent to 0.0001 and 0.001 mg/kg/day, assuming a human inhalation rate of 20 m^3/day and body weight of 70 kg. Barium is principally a muscle toxin. Its targets are the GI system, skeletal muscle, the cardiovascular system, and the fetus.

Carcinogenicity

The EPA classifies barium as a cancer weight-of-evidence Group D substance (not classifiable as to carcinogenicity in humans). Cancer risk is not estimated for Group D substances.

C.3.5 BENZENE

Benzene is absorbed via ingestion, inhalation, and skin application. Experimental data indicate that animals can absorb up to 95% of oral doses and that humans can absorb up to 80% of inhaled benzene (after 5 minutes of exposure). Humans may absorb benzene vapors through the skin as well as the lungs; of the total dose absorbed by the two routes, an estimated 22-36% enters the body through the skin.

Noncancer Toxicity

Autopsy of a youth who died while sniffing benzene revealed that the chemical was distributed to the urine, stomach, bile, liver, kidney, abdominal fat, and brain. The depots for benzene and its metabolites in animals are similar to those in humans, and in addition, include the fetus and placenta, bone marrow, Zymbal gland, and oral and nasal cavities. Numerous studies indicate that the metabolism of benzene is required for its toxicity. The liver is the main site for the metabolism of benzene; the bone marrow, a minor site.

Lethal oral doses of benzene are estimated to be 10 mL in humans; oral LD50 values for benzene in rats range from 0.93 to 5.96 g/kg. These data indicate that benzene is of low acute toxicity. Limited data show that nonlethal oral doses of benzene can impact the nervous, hematological, and immunological systems. Ingested benzene produces symptoms of neurotoxicity at acute doses of 2 mL for humans and 325 mg/kg for rats. A four week exposure of mice to >=8 mg of benzene/kg/day in the drinking water induced the synthesis and catabolism of monoamine neurotransmitters and produced dose-related decreases in red-blood cell parameters and lymphocyte numbers. Rats and mice that were treated with benzene by gavage for 103 weeks developed a dose-related lymphocytopenia (LOAEL, 25 mg/kg/day) and mice had hyperplasia of the bone marrow and lymphoid depletion of the splenic follicles and thymus (100 mg/kg/day).

Inhalation of benzene vapor concentrations of 20,000 ppm for 5-10 minutes can be fatal to humans; death results from central nervous system depression. The estimated LC50 value for the rat is 13,700 ppm.

Subchronic and chronic exposures to benzene vapors induce a progressive depletion of the bone marrow and dysfunction of the hematopoietic system. Early symptoms of bone marrow depression include leukopenia, anemia or thrombocytopenia, or a combination of the three. A group of workers exposed to benzene concentrations of 30 and 150 ppm for 4 months to 1 year had increased incidences of pancytopenia. A group of patients who had been exposed to benzene concentrations of 150 to 650 ppm for 4 months to 15 years exhibited severe blood dyscrasias and eight of the 32 patients died with thrombocytopenic hemorrhage and infection . The human data are supported by animal data showing

bone marrow suppression in mice and rats exposed to benzene concentrations ranging from 10 ppm for 24 weeks to 300 ppm for 13 weeks.

Benzene may also have long-term effects on the central nervous system. Workers exposed to benzene for 0.5 to 4 years exhibited EEG changes and atypical sleep activity consistent with neurotoxicity. Others exposed to benzene concentrations of 210 ppm for 6-8 years had peripheral nerve damage. In humans, benzene crosses the placenta and is present in the cord blood in amounts equal to those in maternal blood. However, studies of the effects of benzene on human reproduction and development have been confounded by the presence of other chemicals in the environment. Benzene does produce developmental effects (fetal toxicity, but not malformations) in the offspring of treated animals, mostly at maternally toxic doses.

Reference doses/concentrations for benzene have not been established. An oral risk assessment for benzene will be reviewed by an EPA work group and an inhalation risk assessment is currently under review. However, EPA-NCEA has developed oral and inhalation RfDs of 0.003 mg/kg-day and 0.0017 mg/kg-day, respectively, for benzene.

Carcinogenicity

Benzene is carcinogenic in humans and animals by inhalation and in animals by the oral route of exposure. Occupational exposure to benzene has been associated mainly with increased incidences of acute myeloblastic or erythroblastic leukemias and chronic myeloid and lymphoid leukemias among workers. Workers at risk were exposed in one study to 8-hour TWA concentrations ranging from 10 to 100 ppm and in another to 8-hour TWA concentrations ranging from <2 to >25 ppm. In a historical prospective mortality study of chemical workers. a dose-response relationship between exposure to benzene and lymphatic and hematopoietic cancers was determined. This adds strength to the association between exposure in the workplace and cancer development. Studies in animals have demonstrated an association between oral and inhalation exposure to benzene and the development of a variety of tumors, including lymphoma and carcinomas of the Zymbal gland, oral cavity, mammary gland, ovaries, lung, and skin. In one study, mice had increased incidences of leukemia, lymphoma, and solid tumors after exposure to 300 ppm for only 16 weeks. Based on "several studies of increased incidence of nonlymphocytic leukemia from occupational exposure, increased incidence of neoplasia in rats and mice exposed by inhalation and gavage, and some supporting data", benzene has been placed in the EPA weight-of-evidence classification A, human carcinogen. The oral and inhalation slope factors for benzene are 5.5E-02 and 2.7E-2 $(mg/kg/day)^{-1}$, respectively

C.3.6 BENZO[A]ANTHRACENE

Noncancer Toxicity

The oral and inhalation RfD and RfC are not available at this time (EPA 1998).

Carcinogenicity

Benzo[a]anthracene has a weight of evidence classification of B2, a probable human carcinogen. The classification was based on sufficient data from animal bioassays. Benzo[a]anthracene produced tumors in mice exposed by gavage; intraperitoneal, subcutaneous or intramuscular injection; and topical application. Benzo[a]anthracene produced mutations in bacteria and in mammalian cells, and transformed mammalian cells in culture.

Although there are no human data that specifically link exposure to benzo[a]anthracene to human cancers, benzo[a]anthracene is a component of mixtures that have been associated with human cancer. These include coal tar, soot, coke oven emissions and cigarette smoke.

Benzo[a]anthracene administration caused an increase in the incidence of tumors by gavage; dermal application; and both subcutaneous injection and intraperitoneal injection assays. A group of male mice was exposed to gavage solutions containing 3% benzo[a]anthracene for 5 weeks. There was an increased incidence of pulmonary adenomas and hepatomas.

Supporting data for carcinogenicity include genetic mutations in five different strains of Salmonella typhimurium. Benzo[a]anthracene produced positive results in an assay for mutations in Drosophila melongaster.

The currently used Oral Slope Factor (CSF) for Benzo[a]anthracene is 7.3E-01 per (mg/kg)/day which is extrapolated from the CSF for Benzo[a]pyrene (BaP), i.e., 0.1 x 7.3 (BaP) = 7.3E-01 per (mg/kg)/day.

The inhalation CSF is not available.

C.3.7 BENZO(A)PYRENE (BAP)

Pharmacokinetics

Benzo(a)pyrene was readily absorbed across the GI and respiratory epithelia. Benzo(a)pyrene was distributed widely in the tissues of treated rats and mice, but primarily to tissues high in fat, such as adipose tissue and mammary gland.

Studies of the metabolism of benzo(a)pyrene provide information relevant to other PAHs because of the structural similarities of all members of the class. Metabolism involves microsomal mixed function oxidase hydroxylation of one or more of the phenyl rings with the formation of phenols and dihydrodiols, probably via formation of arene oxide intermediates. The dihydrodiols may be further oxidized to diol epoxides, which, for certain members of the class, are known to be the ultimate carcinogens. Conjugation with glutathione or glucuronic acid, and reduction to tetrahydrotetrols are important detoxification pathways.

Excretion of benzo(a)pyrene residue was reported to be rapid, although quantitative data were not located. Excretion occurred mainly via the feces, probably largely due to biliary secretion. The EPA concluded that accumulation in the body tissues of PAHs from chronic low level exposure would be unlikely.

Noncancer Toxicity

The oral RfD and inhalation RfC are not available at this time.

Carcinogenicity

The PAHs are ubiquitous, being released to the environment from anthropogenic as well as from natural sources. Benzo (a)pyrene is the most extensively studied member of the class, inducing tumors in multiple tissues of virtually all laboratory species tested by all routes of exposure. Although epidemiology studies suggested that complex mixtures that contain PAHs (coal tar, soots, coke oven emissions, cigarette smoke) are carcinogenic to humans, the carcinogenicity cannot be attributed to PAHs alone because of the presence of other potentially carcinogenic substances in these mixtures. In addition, recent investigations showed that the PAH fraction of roofing tar, cigarette smoke, and coke oven emissions accounted for only 0.1 to 8 percent of the total mutagenic activity of the unfractionated complex mixture in Salmonella. Aromatic amines, nitrogen heterocyclic compounds, highly oxygenated quinones, diones, and nitrooxygenated compounds, none of which would be expected to arise from in vivo metabolism of PAHs, probably accounted for the majority of the mutagenicity of coke oven emissions and cigarette smoke. Coal

tar, which contains a mixture of many PAHs, has a long history of use in the clinical treatment of a variety of skin disorders in humans.

Because of the lack of human cancer data, assignment of individual PAHs to EPA cancer weight-of-evidence groups was based largely on the results of animal studies with large doses of purified compound. Frequently, unnatural routes of exposure, including implants of the test chemical in beeswax and trioctanoin in the lungs of female Osborne-Mendel rats, intratracheal instillation, and subcutaneous or intraperitoneal injection, were used. Benzo (a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene were classified in Group B2 (probable human carcinogens).

The EPA verified a slope factor for oral exposure to benzo(a)pyrene of 7.3 per mg/kg/day, based on several dietary studies in mice and rats. Neither verified nor provisional quantitative risk estimates were available for the other PAHs in Group B2. The EPA promulgated an ambient water quality criterion for "total carcinogenic PAHs," based on an oral slope factor derived from a study with benzo(a)pyrene, as being sufficiently protective for the class. Largely because of this precedent, the quantitative risk estimates for benzo(a)pyrene were adopted for the other carcinogenic PAHs when quantitative estimates were needed.

Human data specifically linking benzo(a)pyrene (BAP) to a carcinogenic effect are lacking. There are, however, multiple animal studies in many species demonstrating BAP to be carcinogenic following administration by numerous routes. In addition, BAP has produced positive results in numerous genotoxicity assays.

The data for animal carcinogenicity was sufficient. The animal data consist of dietary, gavage, inhalation, intratracheal instillation, dermal and subcutaneous studies in numerous strains of at least four species of rodents and several primates. Repeated BAP administration has been associated with increased incidences of total tumors and of tumors at the site of exposure. The tumor types in mice from oral diet studies include forestomach, squamous cell papillomas and carcinomas.

Benzo(a)pyrene has been shown to cause genotoxic effects in a broad range of prokaryotic and mammalian cell assay systems.

The oral slope factor presented in IRIS is 7.3E+0 per mg/kg/day The cancer slope factor for inhalation is not available.

C.3.8 BENZO(B)FLUORANTHENE

Noncancer Toxicity

Little information is available on benzo(b)fluoranthene. However, based on the similarities of chemical structures, most properties should be similar to benzo(a)pyrene.

Carcinogenicity

The EPA has classified benzo(b)fluoranthene in cancer weight-of-evidence Group B2 (Probable Human Carcinogen, sufficient evidence of carcinogenicity in animals with inadequate or lack of evidence in humans) based on lung tumors in mice. The currently used Oral Slope Factor (CSF) for benzo(b)fluoranthene is 7.3E-01 per (mg/kg)/day which is extrapolated from the CSF for Benzo[a]pyrene (BaP), i.e., 0.1 x 7.3 (BaP) = 7.3E-01 per (mg/kg)/day.

C.3.9 BENZO(K)FLUORANTHENE

Noncancer Toxicity

Little information is available on benzo(k)fluoranthene. However, based on the similarities of the chemical structures, most properties should be similar to benzo(a)pyrene.

Carcinogenicity

A Toxicity Equivalency Factor (TEF) has been developed for benzo(k)fluoranthene which allows the estimation of 0.073 mg/kg/day for the CSF for the oral route. The EPA has classified benzo(k)fluoranthene in cancer weight-of-evidence Group B2 (Probable Human Carcinogen, sufficient evidence of carcinogenicity in animals with inadequate or lack of evidence in humans) based on lung tumors in mice.

C.3.10 BIS(2-ETHYLHEXYL)PHTHALATE

Bis(2-ethylhexyl)phthalate is a colorless oily liquid that is extensively used as a plasticizer in a wide variety of industrial, domestic and medical products. It is an environmental contaminant and has been detected in ground water, surface water, drinking water, air, soil, plants, fish and animals.

Noncancer Toxicity

It is rapidly absorbed from the gastrointestinal tract primarily as mono(2-ethylhexyl)phthalate. The diester can be absorbed through the skin and from the lungs. It is rapidly metabolized in the blood and tissues to the monoester, which can be excreted as a glucuronide conjugate or further hydrolyzed to phthalic acid and excreted. Animal studies have indicated that the primary target organs are the liver and Kidneys. However, higher doses are reported to result in testicular effects and decreased hemoglobin and packed cell volume. An epidemiological study reported no toxic effects from occupational exposure to air concentrations of bis(2-ethylhexyl)phthalate up to 0.16 mg/m^3 . Other studies on occupational exposures to mixtures of phthalate esters containing bis(2-ethylhexyl)phthalate have reported polyneuritis and sensory-motor polyneuropathy with decreased thrombocytes, leukocytes and hemoglobin in some exposed workers. Developmental toxicity studies with rats and mice have shown that bis(2-ethylhexyl)phthalate is fetotoxic and teratogenic when given orally during gestation. Oral exposure has also been shown to result in decreased sperm count in rats.

A Reference Dose (RfD) of 0.02 mg/kg/day for both subchronic and chronic oral exposure was calculated from a lowest-observed-adverse-effect level (LOAEL) of 19 mg/kg/day based on increased relative liver weight in guinea pigs given 0, 19, or 64 mg bis(2-ethylhexyl) phthalate/kg/day for 12 months in their diet. Reference Concentration (RfC) for inhalation exposure is not available.

Carcinogenicity

bis(2-ethylhexyl)phthalate is known to induce the proliferation of peroxisomes, which has been associated with carcinogenesis. Dose-dependent, statistically-significant increases in the incidences of hepatocellular carcinomas and combined carcinomas and adenomas were seen in mice and rats exposed to bis(2-ethylhexyl)phthalate in their diet for 103 weeks. An increased incidence of neoplastic nodules and hepatocellular carcinomas was also reported in rats. Based on USEPA guidelines, bis(2-ethylhexyl)phthalate was assigned to weight-of-evidence Group B2, probable human carcinogen, on the basis of an increased incidence of liver tumors in rats and mice. A carcinogenicity slope factor of 0.014 $(mg/kg/day)^{-1}$ for oral exposure was based on the combined incidence of hepatocellular carcinomas and adenomas in male mice. A quantitative estimation of carcinogenic risk from inhalation exposure is not available.

C.3.11 CADMIUM

Cadmium is a naturally occurring metal that is used in various chemical forms in metallurgical and other industrial processes, and in the production of pigments. Environmental exposure can occur via the diet and drinking water.

Noncancer Toxicity

Cadmium is absorbed more efficiently by the lungs (30 to 60%) than by the gastrointestinal tract, the latter being a saturable process. Cadmium is transported in the blood and widely distributed in the body but accumulates primarily in the liver and kidneys. Cadmium burden (especially in the kidneys and liver) tends to increase in a linear fashion up to about 50 or 60 years of age after which the body burden remains somewhat constant.

Acute oral exposure to 20-30 g have caused fatalities in humans. Exposure to lower amounts may cause gastrointestinal irritation, vomiting, abdominal pain, and diarrhea. An asymptomatic period of one-half to one hour may precede the onset of clinical signs. Oral LD50 values in animals range from 63 to 1125 mg/kg, depending on the cadmium compound. Longer term exposure to cadmium primarily affects the kidneys, resulting in tubular proteinosis although other conditions such as "itai-itai" disease may involve the skeletal system. Cadmium involvement in hypertension is not fully understood. Inhalation exposure to cadmium and cadmium compounds may result in effects including headache, chest pains, muscular weakness, pulmonary edema, and death. The 1-minute and 10-minute lethal concentration of cadmium for humans has been estimated to be about 2,500 and 250 mg/m^3, respectively. An 8-hour TWA (time-weighted-average) exposure level of 5 mg/m^3 has been estimated for lethal effects of inhalation exposure to cadmium, and exposure to 1 mg/m^3 is considered to be immediately dangerous to human health. Renal toxicity (tubular proteinosis) may also result from inhalation exposure to cadmium.

Chronic oral RfDs of 5E-4 and 1E-3 mg/kg/day have been established for cadmium exposure via drinking water and food, respectively. Both values reflect incorporation of an uncertainty factor of 10. The RfDs are based on an extensive data base regarding toxicokinetics and toxicity in both human and animals, the critical effect being renal tubular proteinuria. Confidence in the RfD and data base is high. Inhalation RfC values are currently not available. The target organ for cadmium toxicity via oral exposure is the kidney.

Carcinogenicity

There is limited evidence from epidemiologic studies for cadmium-related respiratory tract cancer. An inhalation unit risk of 1.8E-3 $(g/m^3)^{-1}$ and an inhalation slope factor of 6.3E+0 $(mg/kg/day)^{-1}$ are based on respiratory tract cancer associated with occupational exposure. Based on limited evidence from multiple

occupational exposure studies and adequate animal data, cadmium is placed in weight-of-evidence group B1 - probable human carcinogen.

C.3.12 CHLOROBENZENE

Noncancer Toxicity

Oral exposure of animals to chlorobenzene induced liver effects. Inhalation exposure of animals induced narcosis and other CNS effects as well as lung, liver, and kidney changes. Minimal occupational exposure data indicated that chlorobenzene induces respiratory tract irritation and CNS effects (headache) in workers exposed to high levels. The EPA presented a verified chronic oral RfD of 0.02 mg/kg/day, based on an NOAEL for liver lesions in a 13-week oral study in dogs and an uncertainty factor of 1000. The EPA presented a provisional subchronic oral RfD of 0.2 mg/kg/day, based on the same NOAEL and an uncertainty factor of 100. EPA-NCEA has developed a provisional chronic inhalation RfD of 0.017 mg/kg/day. Target organs for the toxicity of chlorobenzene include the liver, CNS, lung, and kidney.

Carcinogenicity

Chlorobenzene is classified as an EPA cancer weight-of-evidence Group D compound (not classifiable as to carcinogenicity for humans), based on no available human cancer data and inadequate animal data. Quantitative risk estimates are not derived for Group D compounds.

C.3.13 CHROMIUM

Elemental chromium (Cr) does not occur in nature, but is present in ores, primarily chromite (FeOCr2O3). Only two of the several oxidation states of chromium, Cr(III) and Cr(VI), are reviewed in this report based on their predominance and stability in the ambient environment and their toxicity in humans and animals. Chromium plays a role in glucose and cholesterol metabolism and is thus an essential element to man and animals. Non-occupational exposure to the metal occurs via the ingestion of chromium-containing food and water, whereas occupational exposure occurs via inhalation. Workers in the chromate industry have been exposed to estimated chromium levels of 10-50 g/m^3 for Cr(III) and 5-1000 g/m^3 for Cr(VI); however, improvements in the newer chrome-plating plants have reduced the Cr(VI) concentrations 10- to 40-fold.

Noncancer Toxicity

Chromium(III) is poorly absorbed, regardless of the route of exposure, whereas chromium(VI) is more readily absorbed. Humans and animals localize chromium in the lung, liver, kidney, spleen, adrenals, plasma, bone marrow, and red blood cells (RBC). Animal studies show that Cr(VI) is generally more toxic than Cr(III), but neither oxidation state is very toxic by the oral route. In long-term studies, rats were not adversely affected by ~1.9 g/kg/day of chromic oxide [Cr(III)](diet), 2.4 mg/kg/day of Cr(III) as chromic chloride (drinking water), or 2.4 mg/kg/day of Cr(VI) as potassium dichromate (drinking water).

The respiratory and dermal toxicity of chromium are well-documented. Workers exposed to chromium have developed nasal irritation (at <0.01 mg/m3, acute exposure), nasal ulcers, perforation of the nasal septum (at ~2 g/m^3, subchronic or chronic exposure) and hypersensitivity reactions and "chrome holes" of the skin. Among the general population, contact dermatitis has been associated with the use of bleaches and detergents. Compounds of both Cr(VI) and Cr(III) have induced developmental effects in experimental animals that include neural tube defects, malformations, and fetal deaths.

The subchronic and chronic oral RfD values are 1 mg/kg/day and 1.5 mg/kg/day respectively for Cr(III) and Cr(VI). No inhalation RfD is available for Cr(III). The chronic RfC for Cr(VI) is 0.0001 mg/m^3.

Carcinogenicity

The inhalation of chromium compounds has been associated with the development of cancer in workers in the chromate industry. The relative risk for developing lung cancer has been calculated to be as much as 30 times that of controls. There is also evidence for an increased risk of developing nasal, pharyngeal, and gastrointestinal carcinomas. The results of inhalation studies in animals have been equivocal or negative. Based on sufficient evidence for humans and animals, Cr(VI) has been placed in the EPA

weight-of-evidence classification A, human carcinogen. For inhalation exposure, the unit risk value is 1.2E-2 $(g/m^3)^{-1}$ and the slope factor is 4.2E+01 $(mg/kg/day)^{-1}$.

C.3.14 DIBENZO(A,H)ANTHRACENE

Noncancer Toxicity

The oral RfD and inhalation RfC are not available.

Carcinogenicity

The EPA has classified dibenzo(a,h)anthracene in cancer weight-of-evidence group B2 (Probable Human Carcinogen, sufficient evidence of carcinogenicity in animals). Based on carcinomas in mice following oral or dermal exposure and injection site tumors in several species following subcutaneous or intramuscular administration. Dibenzo[a,h]anthracene has induced DNA damage and gene mutations in bacteria as well as gene mutations and transformation in several types of mammalian cell cultures.

Although there are no human data that specifically link exposure to dibenzo[a,h]anthracene with human cancers, dibenzo(a)anthracene is a component of mixtures that have been associated with human cancer. These include coal tar, soot, coke oven emissions and cigarette smoke.

Dibenzo[a,h]anthracene has been shown to be carcinogenic when administered to mice by the oral route in a water-olive oil emulsion. Mice developed pulmonary adenomas, pulmonary carcinomas, and mammary carcinomas.

Dibenzo[a,h]anthracene has produced positive results in bacterial DNA damage and mutagenicity assays and in mammalian cell DNA damage, mutagenicity and cell transformation assays.

The currently used Oral Slope Factor (CSF) for Dibenzo[a,h]anthracene is 7.3 per (mg/kg)/day which is extrapolated from the CSF for Benzo(a)pyrene i.e., 1.0 x 7.3 (BaP) = 7.3 per (mg/kg)/day).

The inhalation Cancer Slope Factor for dibenzo(a,h)anthracene is not available.

C.3.15 1,1-DICHLOROETHYLENE

1,1-Dichloroethylene (CAS No. 75-35-4), also known as 1,1-dichloroethene and vinylidine chloride, is a colorless liquid that is used primarily in the production of polyvinylidine chloride (PVC) copolymers and as an intermediate for synthesis of organic chemicals. The major application for PVC copolymers is the production of flexible films for food packaging such as Saran® wrap. 1,1-Dichloroethylene does not occur naturally but is found in the environment due to releases associated with its production and transport and with the production of its polymers. Because of its high volatility, releases to the atmosphere are the greatest source of ambient 1,1-dichloroethylene. Smaller amounts are released to surface waters and soils. Loss of 1,1-dichloroethylene from water and soils is primarily due to volatilization. In the atmosphere, reaction with photochemically generated hydroxyl radicals is expected to be the predominant removal mechanism. Human exposure to 1,1-dichloroethylene is potentially highest in workplace settings and in the vicinity of hazardous waste sites where the compound may contaminate environmental media.

Noncancer Toxicity

The primary effect of acute exposure to high concentrations (approximately 4000 ppm) of 1,1-dichloroethylene vapor in humans is central nervous system (CNS) depression which may progress to unconsciousness. Occupational exposure has been reported to cause liver dysfunction in workers . 1,1-Dichloroethylene is irritating when applied to the skin and prolonged contact can cause first degree burns. Direct contact with the eyes may cause conjunctivitis and transient corneal injury. In experimental animals, the liver and kidneys are target organs for the toxic effects of 1,1-dichloroethylene. Subchronic oral exposure for 90 days to 1,1-dichloroethylene in drinking water produced slight hepatotoxic effects at 200 ppm and chronic oral exposure to drinking water for 2 years produced hepatocellular changes in males at >=100 ppm and in females at >=50 ppm. Gavage administration of 10 mg/kg/day, 5 days/week for 2 years produced chronic inflammation of the kidney in male and female rats and liver necrosis in male and female mice. Exposure by inhalation to 55 ppm 1,1-dichloroethylene, 6 hours/day, 5 days/week for up to 1 year produced fatty liver changes in rats and focal degeneration and necrosis in mice. In a three-generation study, no treatment-related effects on reproduction or neonatal development were seen in male and female Sprague-Dawley rats administered up to 200 ppm of 1,1-dichloroethylene in the drinking water. However, inhalation exposure during gestation produced increased resorptions and minor skeletal alterations in rodents at concentrations that caused maternal toxicity. These effects were reported in rats and mice at >=15 ppm and in rats and rabbits at >=80 ppm and >=160 ppm, respectively. An oral Reference Dose (RfD) of 9E-3 mg/kg/day was derived for chronic exposure and subchronic exposure to 1,1-dichloroethylene, based on liver lesions seen in rats in a 2-year drinking water study. The oral RfD is currently under review and may be subject to change. An inhalation Reference Concentration (RfC) for 1,1-dichloroethylene is under review.

Carcinogenicity

An epidemiology study using a small cohort found no association between the occurrence of cancer or cancer mortality and exposure to 1,1-dichloroethylene. Oral carcinogenicity bioassays (drinking water or gavage exposures) with experimental animals gave generally negative results. In one inhalation study, statistically significant increases in renal adenocarcinomas were noted in male Swiss mice exposed to 25 ppm for 12 months. Also observed were statistically significant increases in mammary gland carcinomas in females and lung tumors in both sexes. Results of other inhalation studies with rats, mice, and hamsters have been negative. Based on EPA guidelines, 1,1-dichloroethylene was assigned to weight-of-evidence group C, possible human carcinogen. For oral exposure, the slope factor is 6E-1 $(mg/kg/day)^{-1}$ and the unit risk is 1.7E-5 $(ug/L)^{-1}$. The inhalation slope factor is 0.175 $(mg/kg/day)^{-1}$.

C.3.16 CIS- AND TRANS-1,2-DICHLOROETHYLENE

1,2-Dichloroethene exists in two isomeric forms, cis-1,2-dichloroethene and trans-1,2-dichloroethene, that are colorless, volatile liquids with a slightly acrid odor. Although not used extensively in industry, 1,2-dichloroethene is used in the production of other chlorinated solvents and as a solvent for dyes, perfumes, and lacquers. Humans are exposed to 1,2-dichloroethene primarily by inhalation, but exposure can also occur by oral and dermal routes.

Noncancer Toxicity

Information on the toxicity of 1,2-dichloroethene in humans and animals is limited. Workers exposed to 1,2-dichloroethene have been reported to suffer from drowsiness, dizziness, nausea, fatigue, and eye irritation. Acute and subchronic oral and inhalation animal studies of trans-1,2-dichloroethene and acute inhalation animal studies of cis-1,2-dichloroethene suggest that the liver is the primary target organ. The toxicity is expressed in increased activities of liver associated enzymes, fatty degeneration, and necrosis. Secondary target organs include the central nervous system and lung. Based on an unpublished study describing decreased hemoglobin and hematocrits in rats treated by gavage for 90 days.

The EPA has assigned a subchronic and chronic oral reference dose (RfD) for cis-1,2-dichloroethene of 1.00E-01 mg/kg/day and 1.00E-02 mg/kg/day, respectively. The RfDs were derived from a no-observed-adverse-effect-level/lowest-observed-adverse-effect-level (NOAEL/LOAEL) of 32 mg/kg/day. An inhalation reference concentration (RfC) for cis-1,2-dichloroethene has not been derived. Subchronic and chronic RfDs of 2.00E-01 mg/kg/day and 2.00E-02 mg/kg/day, respectively, for trans-1,2-dichloroethene have been calculated. The RfDs were derived from a LOAEL of 175 mg/kg/day that was based on increased serum alkaline phosphatase activity in mice that received trans-1,2-dichloroethene in their drinking water. An RfC for trans-1,2-dichloroethene has not been derived. No information was available concerning the chronic, developmental, or reproductive toxicity of cis-1,2-dichloroethene or trans-1,2-dichloroethene.

Carcinogenicity

No cancer bioassays or epidemiological studies were available to assess the carcinogenicity of 1,2-dichloroethene. EPA has placed both cis-1,2-dichloro-ethene and trans-1,2-dichloroethene in weight-of-evidence group D, not classifiable as to human carcinogenicity, based on the lack of human or animal carcinogenicity data and on essentially negative mutagenicity data. Oral and inhalation slope factors have not been calculated for these isomers.

C.3.17 1,4-DICHLOROBENZENE

Pharmacokinetics

No data are available to quantitatively evaluate the absorption of 1,4-dichlorobenzene. Absorption via oral administration is assumed to be 100 percent since this chemical is similar in structure to benzene and smaller chlorinated aliphatic hydrocarbons. Approximately 20 percent of the compound is absorbed following inhalational exposure. The dermal absorption of 1,4-dichlorobenzene has not been studied.

Once absorbed, whether through inhalation or oral exposure, 1,4-dichlorobenzene is mainly deposited in fatty tissue and the liver and kidneys to a lower extent. The major urinary metabolite of 1,4-dichlorobenzene is 2,5-dichlorophenol. This metabolite is eliminated as conjugates of glucuronic and sulfuric acids.

Non-carcinogenic Toxicity

Studies indicate that the liver is the primary target organ associated with toxic effects for 1,4-dichlorobenzene. Malaise, nausea, anemia, proteinuria, hematuria, as well as liver effects, were observed in humans exposed to this chemical.

The U.S. EPA derived an inhalation RfC for 1,4-dichlorobenzene of 8E-1 mg/m^3 from a NOAEL of 301 mg/m^3 for increased liver weights and an uncertainty factor of 100. The NOAEL was estimated from a subchronic two-generation reproductive study where male and female rats were exposed to varying concentrations of 1,4-dichlorobenzene vapors. Although this study lacked chronic data, chronic lifetime exposure studies support the conclusions drawn in the study.

Oral LD_{50} values for male and female rats were identified as 3,900 and 3,800 mg/kg respectively. A NOAEL of 300 mg/kg/day for hepatic effects was derived. No human studies are available regarding toxic effects of 1,4-dichlorobenzene from oral and dermal exposure.

Carcinogenicity

The U.S. EPA has classified this compound in the cancer weight-of-evidence Group C (possible human carcinogen). This classification is based on several oral exposure studies which indicate that this chemical is carcinogenic in male rats. Cancer effect levels of 150 mg/kg/day and 600 mg/kg/day, respectively, were derived for liver and kidney tumors. No reliable carcinogenicity studies were located for the inhalation of or dermal contact with 1,4-dichlorobenzene. EPA has assigned this compound an oral CSF of 0.024 per mg/kg/day.

C.3.18 2,4-DIMETHYLPHENOL

Noncancer Toxicity

Little is known about the toxicity of 2,4-dimethylphenol. The EPA presented a chronic oral RfD of 0.02 mg/kg/day based on an NOAEL for nervous system effects and blood alterations in orally treated mice and an uncertainty factor of 3000. The EPA presented a subchronic oral RfD of 0.2 mg/kg/day based on the same NOAEL and an uncertainty factor of 300. The nervous system and blood may be target organs for the oral toxicity of 2,4-dimethylphenol.

Carcinogenicity

Data were not located regarding the carcinogenicity of 2,4-dimethylphenol.

C.3.19 INDENO(1,2,3-CD)PYRENE

Noncancer Toxicity

Little information was found on the toxicity of indeno(1,2,3-cd)pyrene. Because of its structural similarity its properties should resemble benzo(a)pyrene.

Carcinogenicity

A Toxicity Equivalency Factor (TEF) has been developed for indeno(1,2,3-cd)pyrene. This allows the estimation of an oral CSF of 0.73 mg/kg/day. The EPA has classified indeno(1,2,3-cd)pyrene in cancer weight-of-evidence Group B2 (Probable Human Carcinogen, sufficient evidence of carcinogenicity in animals with inadequate or lack of evidence in humans) based on tumors in mice following lung implants.

C.3.20 LEAD

Pharmacokinetics

Studies in humans indicate that an average of 10 percent of ingested lead is absorbed, but estimates as high as 40 percent were obtained in some individuals. Nutritional factors have a profound effect on GI absorption efficiency. Children absorb ingested lead more efficiently than adults; absorption efficiencies up to 53 percent were recorded for children three months to eight years of age. Similar results were obtained for laboratory animals; absorption efficiencies of 5 to 10 percent were obtained for adults and > 50 percent were obtained for young animals. The deposition rate of inhaled lead averages approximately 30 to 50 percent, depending on particle size, with as much as 60 percent deposition of very small particles (0.03 mm) near highways. All lead deposited in the lungs is eventually absorbed.

Approximately 95 percent of the lead in the blood is located in the erythrocytes. Lead in the plasma exchanges with several body compartments, including the internal organs, bone, and several excretory pathways. In humans, lead concentrations in bone increase with age. About 90 percent of the body burden of lead is located in the skeleton. Neonatal blood concentrations are about 85 percent of maternal concentrations. Excretion of absorbed lead is principally through the urine, although GI secretion, biliary excretion, and loss through hair, nails, and sweat are also significant.

Noncancer Toxicity

The noncancer toxicity of lead to humans has been well characterized through decades of medical observation and scientific research. The principal effects of acute oral exposure are colic with diffuse paroxysmal abdominal pain (probably due to vagal irritation), anemia, and, in severe cases, acute encephalopathy, particularly in children. The primary effects of long-term exposure are neurological and hematological. Limited occupational data indicate that long-term exposure to lead may induce kidney damage. The principal target organs of lead toxicity are the erythrocyte and the nervous system. Some of the effects on the blood, particularly changes in levels of certain blood enzymes, and subtle neurobehavioral changes in children, appear to occur at levels so low as to be considered nonthreshold effects.

The USEPA determined that it is inappropriate to derive an RfD for oral exposure to lead for several reasons. First, the use of an RfD assumes that a threshold for toxicity exists, below which adverse effects are not expected to occur; however, the most sensitive effects of lead exposure, impaired neurobehavioral development in children and altered blood enzyme levels associated with anemia, may occur at blood lead concentrations so low as to be considered practically nonthreshold in nature. Second, RfD values are specific for the route of exposure for which they are derived. Lead, however, is

ubiquitous, so that exposure occurs from virtually all media and by all pathways simultaneously, making it practically impossible to quantify the contribution to blood lead from any one route of exposure. Finally, the dose-response relationships common to many toxicants, and upon which derivation of an RfD is based, do not hold true for lead. This is because the fate of lead within the body depends, in part, on the amount and rate of previous exposures, the age of the recipient, and the rate of exposure. There is, however, a reasonably good correlation between blood lead concentration and effect. Therefore, blood lead concentration is the appropriate parameter on which to base the regulation of lead.

USEPA presented no inhalation RfC for lead, but referred to the National Ambient Air Quality Standard (NAAQS) for lead, which could be used in lieu of an inhalation RfC. The NAAQSs are based solely on human health considerations and are designed to protect the most sensitive subgroup of the human population. The NAAQS for lead is 1.5 mg/m^3, averaged quarterly.

Carcinogenicity

USEPA classifies lead in cancer weight-of-evidence Group B2 (probable human carcinogen), based on inadequate evidence of cancer in humans and sufficient animal evidence. The human data consist of several epidemiologic occupational studies that yielded confusing results. All of the studies lacked quantitative exposure data and failed to control for smoking and concomitant exposure to other possibly carcinogenic metals. Rat and mouse bioassays showed statistically significant increases in renal tumors following dietary and subcutaneous exposure to several soluble lead salts. Various lead compounds were observed to induce chromosomal alterations in vivo and in vitro, sister chromatic exchange in exposed workers, and cell transformation in Syrian hamster embryo cells; to enhance simian adenovirus induction; and to alter molecular processes that regulate gene expression. USEPA declined to estimate risk for oral exposure to lead because many factors (e.g., age, general health, nutritional status, existing body burden and duration of exposure) influence the bioavailability of ingested lead, introducing a great deal of uncertainty into any estimate of risk.

The USEPA IEUBK lead model is an iterated set of equations that estimate blood lead concentration in children aged 0 to 7 years. The biokinetic part of the model describes the movement of lead between the plasma and several body compartments and estimates the resultant blood lead concentration. The rate of the movement of lead between the plasma and each compartment is a function of the transition or residence time (i.e., the mean time for lead to leave the plasma and enter a given compartment, or the mean residence time for lead in that compartment). Compartments modeled include the erythrocytes, liver, kidneys, all the other soft tissue of the body, cortical bone, and trabecular bone. Excretory pathways and their rates are also modeled. These include the mean time for excretion from the plasma to the urine, from the liver to the bile, and from the other soft tissues to the hair, skin, sweat, etc. The model permits the user to adjust the transition and residence times.

USEPA guidance recommends using 400 mg/kg as a screening level for lead in soil for residential scenarios at CERCLA sties and at RCRA Corrective Action sites. Residential areas with soil lead below 400 mg/kg generally require no further action. However, in some special situations, further study is warranted below the screening level (e.g., wetlands, agricultural areas).

C.3.21 MANGANESE

Noncancer Toxicity

Manganese is an essential trace element in humans that can elicit a variety of serious toxic responses upon prolonged exposure to elevated concentrations either orally or by inhalation. The central nervous system is the primary target. Initial symptoms are headache, insomnia, disorientation, anxiety, lethargy, and memory loss. These symptoms progress with continued exposure and eventually include motor disturbances, tremors, and difficulty in walking, symptoms similar to those seen with Parkinsonism. These motor difficulties are often irreversible. Based on human epidemiological studies, 0.8 mg/kg/day for drinking water exposure and 0.34 mg/m^3 in air for inhalation exposure have been estimated as lowest-observed-adverse-effect levels (LOAELs) for central nervous system effects.

Effects on reproduction (decreased fertility, impotence) have been observed in humans with inhalation exposure and in animals with oral exposure at the same or similar doses that initiate the central nervous system effects. An increased incidence of coughs, colds, dyspnea during exercise, bronchitis, and altered lung ventilatory parameters have also been seen in humans and animals with inhalation exposure. A possible effect on the immune system may account for some of these respiratory symptoms.

Because of the greater bioavailability of manganese from water, separate reference doses (RfD) for water and diet were calculated. A chronic oral RfD for nonfood of 0.024 mg/kg/day and 0.14 for food have been developed by the EPA based on human ingestion data. The EPA has derived an inhalation RfD of 1.4E-5 mg/kg/day based on occupational exposure to manganese dioxide.

Carcinogenicity

Some conflicting data exist on possible carcinogenesis following injections of manganese chloride and manganese sulfate in mice. However, the EPA weight-of-evidence classification is: D, not classifiable as to human carcinogenicity based on no evidence in humans and inadequate evidence in animals.

C.3.22 METHYLENE CHLORIDE

Noncancer Toxicity

Occupational exposure to high concentrations of methylene chloride may induce liver damage. Liver effects were induced in animals by inhalation or oral exposure. The EPA presented a verified chronic oral RfD for methylene chloride of 0.06 mg/kg/day based on an NOAEL for liver toxicity in mal and female rats in chronic drinking water studies and an uncertainty factor of 100. The EPA presented the same value as a provisional subchronic oral RfD. The EPA also presented a provisional subchronic and chronic inhalation RfC of 3 mg/m^3, derived from an NOAEL for liver toxicity in a two-year intermittent exposure inhalation study in rats and an uncertainty factor of 100. The inhalation RfC is equivalent to 0.86 mg/kg/day, assuming humans inhale 20 m^3 of air/day and weight 70 kg. The principal target organ for methylene chloride is the liver.

Carcinogenicity

Methylene chloride is classified in EPA cancer weight-of-evidence Group B2 (probable human carcinogen) based on inadequate human data and sufficient evidence of carcinogenicity in animals. Animal inhalation studies showed increased incidence of hepatocellular neoplasms and alveolar/bronchiolar neoplasms in male and female mice, mammary tumors in rats of either sex, salivary gland sarcomas in male rats, and leukemia in female rats. Oral studies were inconclusive. An oral slope factor of 0.0075 per mg/kg/day was based on the incidence of liver tumors in two inhalation studies in mice. An inhalation unit risk of 4.7E-07 per mg/m^3 was based on the incidence of liver and lung tumors in one inhalation study. The inhalation unit risk is equivalent to 0.0016 per mg/kg/day, based on inhaled dose, assuming humans inhale 20 m^3 of air/day and weight 70 kg.

C.3.23 2-METHYLNAPHTHALENE

Noncancer Toxicity

Data located regarding the noncancer toxicity of 2-methylnaphthalene are limited to an oral lowest dose associated with lethality (LD_{Lo}) in rats of 5000 mg/kg (Sax 1984). An oral RfD of 0.02 mg/kg/day was located.

Carcinogenicity

Data regarding the carcinogenicity of 2-methylnaphthalene were not located.

C.3.24 4-METHYLPHENOL (P-CRESOL)

Noncancer Toxicity

The oral toxicity of 4-methylphenol is low; the $LD_{50/30}$ in rats is 1800 mg/kg. Ingestion by animals or humans of mixed isomers of methylphenol was associated with corrosion of the GI tissues, kidney tubular, pancreatic and liver damage, and nodular pneumonia. Occupational exposure of humans or inhalation exposure of animals to mixed isomers of methylphenol was associated with neurological effects, impaired kidney function and irritation of the respiratory tract. The EPA presented a provisional chronic oral RfD of 0.005 mg/kg/day based on an NOAEL for decreased body weight and neurotoxicity in a gavage study in rats and an uncertainty factor of 1000. Principal target organs are the nervous system, respiratory mucosa, liver and kidney.

Carcinogenicity

Methylphenol isomers are tumor promoters in the two-stage mouse skin tumor initiation-promotion test. The EPA classifies 2-methylphenol as a cancer weight-of-evidence Group C compound (possible human carcinogen), but derives no quantitative risk estimates for either oral or inhalation exposure.

C.3.25 NAPTHALENE

Naphthalene (CAS Reg. No. 91-20-3), a white solid with a characteristic odor of mothballs, is a polycyclic aromatic hydrocarbon composed of two fused benzene rings. The principal end use of naphthalene is as a raw material for the production of phthalic anhydride. It is also used as an intermediate for synthetic resins, celluloid, lampblack, smokeless powder, solvents, and lubricants. Naphthalene is used directly as a moth repellant, insecticide, anthelmintic, and intestinal antiseptic.

Naphthalene can be absorbed by the oral, inhalation, and dermal routes of exposure and can cross the placenta in amounts sufficient to cause fetal toxicity. The most commonly observed effect of naphthalene toxicity following acute oral or inhalation exposure in humans is hemolytic anemia associated with decreased hemoglobin and hematocrit values, increased reticulocyte counts, presence of Heinz bodies, and increased serum bilirubin levels. Hemolytic anemia has been observed in an infant dermally exposed to naphthalene and in infants whose mothers were exposed to naphthalene during pregnancy. Infants and individuals having a congenital deficiency of erythrocyte glucose-6-phosphate dehydrogenase are especially susceptible to naphthalene-induced hemolytic anemia. Acute oral and subchronic inhalation exposure of humans to naphthalene has resulted in neurotoxic effects (confusion, lethargy, listlessness, vertigo), gastrointestinal distress, hepatic effects (jaundice, hepatomegaly, elevated serum enzyme levels), renal effects, and ocular effects (cataracts, optical atrophy). Cataracts have been reported in individuals occupationally exposed to naphthalene and in rabbits and rats exposed orally to naphthalene. A number of deaths have been reported following intentional ingestion of naphthalene-containing mothballs. The estimated lethal dose of naphthalene is 5-15 g for adults and 2-3 g for children. Naphthalene is a primary skin irritant and is acutely irritating to the eyes of humans. Increased mortality, clinical signs of toxicity, kidney and thymus lesions, and signs of anemia were observed in rats treated by gavage with 400 mg/kg of naphthalene for 13 weeks. No adverse effects occurred at 50 mg/kg. Transient clinical signs of toxicity were seen in mice exposed by gavage to 53 mg/kg for 13 weeks. Subchronic oral exposure to 133 mg/kg/day for 90 days produced decreased spleen weights in female mice. Reduced numbers of pups/litter were observed when naphthalene was administered orally to pregnant mice. Negative results in a two-year feeding study with rats receiving 10-20 mg naphthalene/kg/day and equivocal results in a mouse lung tumor bioassay suggest that naphthalene is not a potential carcinogen.

A chronic oral reference dose (RfD) of 2E-2 mg/kg/day for naphthalene has been calculated by U.S. EPA. The inhalation reference dose (RfD) for chronic inhalation exposure to naphthalene is 8.6E-4 mg/kg/day.

Available cancer bioassays were insufficient to assess the carcinogenicity of naphthalene. Therefore, U.S. EPA has placed naphthalene in weight-of-evidence group D, not classifiable as to human carcinogenicity.

C.3.26 NICKEL

Noncancer Toxicity

In a subchronic gavage study with nickel chloride in water, clinical signs of toxicity in rats included lethargy, ataxia, irregular breathing, reduced body temperature, salivation, and discolored extremities. Inhalation exposure was associated with asthma and pulmonary fibrosis in welders using nickel alloys. Lung effects were observed in laboratory animals exposed by inhalation. The EPA presented a verified RfD of 0.02 for chronic oral exposure to nickel, based on an NOAEL for decreased organ and body weights in a two-year dietary study with nickel sulfate in rats and an uncertainty factor of 300. The EPA presented the same value as a provisional subchronic oral RfD. The CNS appears to be the target organ for the oral toxicity of nickel. The lung is clearly the target organ for inhalation exposure.

Carcinogenicity

Occupational exposure to nickel was associated with increased risk of nasal, laryngeal and lung cancer. Inhalation exposure of rats to nickel subsulfide increased the incidence of lung tumors. The EPA presents a cancer weight-of-evidence Group A classification (human carcinogen) for nickel, and presents an inhalation unit risk of 0.00024 per $\mu g/m^3$ for nickel refinery dust. The unit risk is equivalent to 0.84 per mg/kg/day, assuming humans inhale 20 m^3 of air/day and weigh 70 kg. The quantitative estimate was derived from the human occupational studies.

C.3.27 SILVER

Pharmacokinetics

The GI absorption of ingested silver in animals was estimated at □10 percent; however, absorption of 18 percent was estimated for one human subject given silver acetate. Highest tissue levels are located in the liver; lower levels are located in the lungs, brain, spleen, bone marrow, muscle, and skin. Excretion is virtually entirely through the bile. The excretion kinetics appear to be species- and organ-dependent. In humans, the apparent half-life for silver in the liver is approximately 50 days. Silver in skin also appeared to have a long half-life (not quantified).

Noncancer Toxicity

Silver compounds have been used in dentistry, medicinally in the treatment of burns, as a local disinfectant, and as a drinking water disinfectant. The classical syndrome of toxicity, called argyria, is a blue-gray to nearly black discoloration of areas of the skin or the viscera resulting from deposition of microscopic granules of silver compounds in the affected tissues. Argyria results from occupational (inhalation), parenteral, or oral exposure. The EPA derived an RfD of 0.005 mg/kg/day for chronic oral exposure based on a 2 to 9 year human i.v. study, where a total i.v. dose of 1g metallic silver (in the form of 4g silver arsphenamine) resulted in minimal observed effects (argyria) in patients. This total i.v. dose for metallic silver was converted into an oral dose (LOAEL) of 0.014 mg/kg/day. The chronic oral RfD was derived by dividing the LOAEL by an uncertainty factor of 3, which was applied to account for minimal effects in a subpopulation that has exhibited an increased propensity for the development of argyria.

Carcinogenicity

The EPA classifies silver in cancer weight-of-evidence Group D (not classifiable as to carcinogenicity to humans). The human data consist of no evidence in the literature of cancer despite frequent medical use of silver compounds. The animal data are limited to studies of implanted silver foil or injected metallic silver that provided unconvincing indications of a carcinogenic response relevant to humans.

C.3.28 TETRACHLOROETHYLENE (PCE)

Tetrachloroethylene (CAS No. 127-18-4) is a halogenated aliphatic hydrocarbon with a vapor pressure of 17.8 mm Hg at 25C. The chemical is used primarily as a solvent in industry and, less frequently, in commercial dry-cleaning operations.

Noncancer Toxicity

Occupational exposure to tetrachloroethylene occurs via inhalation, resulting in systemic effects, and via dermal contact, resulting in local effects. Exposure to the general population can occur through contaminated air, food and water .The respiratory tract is the primary route of entry for tetrachloroethylene. The chemical is rapidly absorbed by this route and reaches an equilibrium in the blood within 3 hours after the initiation of exposure. Tetrachloroethylene is also significantly absorbed by the gastrointestinal (g.i.) tract, but not through the skin. The chemical accumulates in tissues with high lipid content, where the half-life is estimated to be 55 hours, and has been identified in perirenal fat, brain, liver, placentofetal tissue, and amniotic fluid.

The main targets of tetrachloroethylene toxicity are the liver and kidney by both oral and inhalation exposure, and the central nervous system by inhalation exposure. Acute exposure to high concentrations of the chemical (estimated to be greater than 1,500 ppm for a 30-minute exposure) may be fatal to humans. Chronic exposure causes respiratory tract irritation, headache, nausea, sleeplessness, abdominal pains, constipation, cirrhosis of the liver, hepatitis, and nephritis in humans; and microscopic changes in renal tubular cells, squamous metaplasia of the nasal epithelium, necrosis of the liver, and congestion of the lungs in animals. Some epidemiology studies have found an association between inhalation exposure to tetrachloroethylene and an increased risk for spontaneous abortion, idiopathic infertility, and sperm abnormalities among dry-cleaning workers, but others have not found similar effects. The adverse effects in humans are supported in part by the results of animal studies in which tetrachloroethylene induced fetotoxicity (but did not cause malformations) in the offspring of treated dams.

Reference doses (RfDs) for subchronic and chronic oral exposure to tetrachloroethylene are each 1E-2 mg/kg/day. These values are based on hepatotoxicity observed in mice given 100 mg tetrachloroethylene/kg body weight for 6 weeks and a no-observed-adverse effect level (NOAEL) of 20 mg/kg. EPA-NCEA has developed an inhalation RfD of 0.11 mg/kg-day for PCE.

Carcinogenicity

Epidemiology studies of dry cleaning and laundry workers have demonstrated excesses in mortality due to various types of cancer, including liver cancer, but the data are regarded as inconclusive because of

various confounding factors. The tenuous finding of an excess of liver tumors in humans is strengthened by the results of carcinogenicity bioassays in which tetrachloroethylene, administered either orally or by inhalation, induced hepatocellular tumors in mice. The chemical also induced mononuclear cell leukemia and renal tubular cell tumors in rats. Tetrachloroethylene was negative for tumor initiation in a dermal study and for tumor induction in a pulmonary tumor assay. Although U.S. EPA's Science Advisory Board recommended a weight-of-evidence classification of C-B2 continuum (C = possible human carcinogen; B2 = probable human carcinogen), the agency has not adopted a current position on the weight-of-evidence classification. In an earlier evaluation, tetrachloroethylene was assigned to weight-of-evidence Group B2, probable human carcinogen, based on sufficient evidence from oral and inhalation studies for carcinogenicity in animals and no or inadequate evidence for carcinogenicity to humans. The unit risk and slope factor values for tetrachloroethylene have been withdrawn from IRIS and HEAST. Upper bound risk estimates provided by EPA-NCEA are as follows: for oral exposure, the slope factor is 5.2E-2 $(mg/kg/day)^{-1}$; for inhalation exposure, the slope factor is 2.0E-3 $(mg/kg/day)^{-1}$.

C.3.29 THALLIUM

Noncancer Toxicity

Thallium is highly toxic; acute ingestion by humans or laboratory animals induced gastroenteritis, neurological dysfunction, and renal and liver damage. Chronic ingestion of more moderate doses characteristically caused alopecia. Thallium was used medicinally to induce alopecia in cases of ringworm of the scalp, sometimes with disastrous results. In industrial (inhalation, oral, dermal) exposure, neurologic signs preceded alopecia, suggesting that the nervous system is more sensitive than the hair follicle. The EPA presented verified chronic oral RfD values for several thallium compounds (thallium acetate, thallium acetate, thallium carbonate, thallium chloride, thallium nitrate, thallium sulfate, and thallic oxide) based on increased incidence of alopecia and increased serum levels of liver enzymes indicative of hepatocellular damage in rats treated with thallium sulfate for 90 days. EPA presented a chronic oral RfD for thallium of 7E-05 mg/kg/day.

Carcinogenicity

Thallium was classified as a cancer weight-of-evidence Group D substance (not classifiable as to carcinogenicity to humans).

C.3.30 TRICHLOROETHENE

Noncancer Toxicity

Little is known about the toxicity of prolonged oral exposure to trichloroethene. Acute inhalation exposure to high levels induced anesthesia, tachypnea, and ventricular arrhythmias. Occupational exposure was associated with headache, dizziness, lassitude, and other CNS effects. Prolonged inhalation exposure of animals affected the liver and kidneys. An oral RfD of 0.006 mg/kg/day was presented by EPA. An inhalation RfC value was not located for trichloroethene in IRIS or HEAST. The principal target organs for trichloroethene are the CNS and heart, and, to a lesser extent, the liver and kidney.

Carcinogenicity

Carcinogenicity studies in laboratory animals showed increased incidence of hepatocellular carcinomas (gavage exposure) and malignant lymphomas (inhalation exposure) in mice and increased incidence of renal adenocarcinomas in male rats (gavage). Cancer studies in humans were inadequate. Interpretation of the data regarding the carcinogenicity of trichloroethene is controversial, and the EPA has not adopted a final position on a cancer weight-of-evidence classification. Currently, EPA believes the weight-of-evidence to be on the C-B2 continuum (possible-probable human carcinogen), and offers slope factor of 0.011 per mg/kg/day for oral exposure and 0.006 per mg/kg/day for inhalation exposure as being useful.

C.3.31 VANADIUM

Noncancer Toxicity

The oral toxicity of vanadium compounds to humans is very low, probably because little vanadium is absorbed from the GI tract. Effects in humans exposed by inhalation include upper and lower respiratory tract irritation. A provisional subchronic and chronic oral RfD of 0.007 mg/kg/day was derived from an NOEL of 5 ppm in rats in a lifetime drinking water study with vanadyl sulfate and an uncertainty factor of 100. A target organ could not be identified for oral exposure. The respiratory tract is the target organ for inhalation exposure.

Carcinogenicity

No information was located regarding the carcinogenicity of vanadium.

C.3.32 XYLENES

Noncancer Toxicity

Prolonged oral exposure of animals to xylenes was associated with CNS signs and increased mortality, without histopathological alterations in the internal organs. Occupational exposure to xylenes induced CNS effects and GI disturbances. Other effects attributed to occupational exposure to xylene (blood dyscrasias, and heart, liver, and kidney damage) may have arisen from concurrent exposure to other chemicals. The EPA presented a chronic oral RfD for total xylenes of 2 mg/kg/day based on an NOAEL for hyperactivity and decreased body weight and increased mortality in male rats in chronic gavage studies. An uncertainty factor of 100 was used. The EPA presented a subchronic oral RfD of 2 mg/kg/day based on an NOEL for body weight effects in a 13-week gavage study in rats and an uncertainty factor of 100. Inhalation RfC values for xylenes are considered not verifiable by the RfD/RfC Work Group. The CNS is the principal target organ for xylenes.

Carcinogenicity

Xylene is classified as a cancer weight-of-evidence Group D compound (not classifiable as to carcinogenicity to humans). There are no reported human cancer data, and gavage animal studies in rat and mice of both sexes did not result in significant increases in tumor incidence. Quantitative risk estimates are not derived for Group D substances.

C.3.33 VINYL CHLORIDE

Vinyl chloride (CAS Reg. No. 75-01-4), a colorless gas, is a halogenated aliphatic hydrocarbon with the empirical formula of C_2H_3Cl. It is used primarily as an intermediate in the manufacture of polyvinyl chloride (PVC); limited quantities are used as a refrigerant and as an intermediate in the production of chlorinated compounds.

Noncancer Toxicity

Vinyl chloride is rapidly absorbed from the gastrointestinal tract and lungs. Metabolism of vinyl chloride occurs primarily in the liver via oxidation by hepatic microsomal enzymes to polar compounds which can be conjugated with glutathione and/or cysteine. These covalently bound metabolites are then excreted in the urine. In humans and animals, vinyl chloride is a CNS depressant, inducing narcosis and anesthesia at high concentrations. Nonneoplastic toxic effects observed in workers exposed by inhalation to vinyl chloride include hepatotoxicity, acroosteolysis and scleroderma, and Raynaud's syndrome, a vascular disorder of the extremities. Also reported were abnormalities of CNS function, high blood pressure, and occasional pulmonary effects. The evidence for potential developmental effects in humans (increased fetal loss and birth defects) is equivocal. Occupational exposure to vinyl chloride has been associated with reduced sexual function in both sexes and gynecological effects in women. For the oral route of exposure, the primary target organ of vinyl chloride toxicity in animals is the liver. Chronic oral administration of 1.7-14.1 mg/kg/day of vinyl chloride induced dose-related increases in nonneoplastic lesions of the liver of rats. In addition to the CNS, target organs for inhalation exposure include the liver, kidneys, lungs, spleen, and testes. Subchronic inhalation studies with rodents documented hepatic effects at concentrations as low as 50 ppm and degenerative changes of the liver and kidneys at >= 500 ppm. Exposure to higher concentrations caused proliferative changes in the lungs of mice, extensive liver and kidney damage in rats and guinea pigs, cerebral and cerebellar nephrosis in rats, and degeneration of the spleen in guinea pigs. Subchronic exposure of rats to 100 ppm vinyl chloride produced significantly decreased testes weights and testicular regeneration. Evidence of developmental toxicity was seen in rats exposed to vinyl chloride during the first trimester of gestation. An oral reference dose (RfD) of 3E-03 mg/kg/day and an inhalation reference concentration (RfC) of 1E-01 have been derived for vinyl chloride.

Carcinogenicity

The carcinogenicity of vinyl chloride in humans has been demonstrated in a number of epidemiological studies and case reports, many of which associated occupational exposure to vinyl chloride to the development of angiosarcomas of the liver. In addition to liver cancer, exposure to vinyl chloride also has been linked to an increased risk of lung, brain, hematopoietic, and digestive tract cancers. Vinyl chloride has been shown to be carcinogenic in numerous animal studies. Inhalation exposure to vinyl chloride

induced an increased incidence of liver angiosarcomas; kidney nephroblastomas; and lung, brain, and forestomach tumors in rodents. Oral administration of vinyl chloride induced liver, lung, and kidney tumors in rodents. Angiosarcomas observed in offspring of rats exposed by inhalation during gestation indicates that vinyl chloride has the potential to initiate cancer in utero. EPA has classified vinyl chloride as a Group A chemical, human carcinogen. A slope factor of 1.9E+0 $(mg/kg/day)^{-1}$ and a drinking water unit risk of 5.4E-5 $(\mu g/L)^{-1}$ was calculated for oral exposure to vinyl chloride. For inhalation exposure, the slope factor and inhalation unit risk are 1.5E-2 $(mg/kg/day)^{-1}$ and 4.4E-6 $(\mu g/m^3)^{-1}$, respectively. The oral slope factor and inhalation unit risk are 7.2E-01 $(mg/kg/day)^{-1}$ and 7.2E-01 $(\mu g/m^3)^{-1}$, respectively.

APPENDIX C.4

SAMPLE CALCULATIONS

CALCULATION WORKSHEET

CLIENT: NSB-NLON, GROTON, CONNECTICUT		**JOB NUMBER:** 7856
SUBJECT: CALCULATION OF INTAKE/RISK FROM INCIDENTAL INGESTION OF SOIL CHILD RESIDENT - SITE 16 - REASONABLE MAXIMUM EXPOSURES		
BASED ON: USEPA, SEPTEMBER 1989.		
BY: R. JUPIN	**CHECKED BY:** L. Jackson	**DATE:** DECEMBER 15, 2000

PURPOSE: To estimate intake, carcinogenic and noncarcinogenic risks from incidental ingestion of soil by child resident at Site 16.

EQUATION:

$$IEX = \frac{Cs \times IR \times EF \times ED \times FI \times CF}{BW \times AT}$$

Where:

IEX	=	estimated exposure intake (mg/kg-day)
Cs	=	exposure point concentration in soil/sediment (mg/kg)
IR	=	incidental soil ingestion rate (mg/day)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
FI	=	fraction ingested from contaminated source (unitless)
CF	=	conversion factor (1.0E-6 kg/mg)
BW	=	body weight (kg)
AT	=	averaging time (days)
CSFo	=	oral carcinogenic slope factor (kg-day/mg)
RfDo	=	oral noncarcinogenic reference dose (mg/kg-day)

RISKS:

ICLR (Carcinogens) = Intake (mg/kg/day) x CSFo (kg-day/mg)
HQ (Noncarcinogens) = Intake (mg/kg/day) / RFDo (mg/kg-day)

ASSUMPTIONS: - REASONABLE MAXIMUM EXPOSURES

Cs	=	8.5	mg/kg	Arsenic
IR	=	200	mg/day	
EF	=	150	days/year	
ED	=	6	years	
FI	=	1		
CF	=	1.0E-06	kg/mg	
BW	=	15	kg	
ATc	=	25550	days	
ATnc	=	2190	days	
CSFo	=	1.5	(kg-day/mg)	
RfDo	=	3.00E-04	(mg/kg-day)	

CLIENT: NSB-NLON, GROTON, CONNECTICUT		JOB NUMBER: 7856
SUBJECT: CALCULATION OF INTAKE/RISK FROM INCIDENTAL INGESTION OF SOIL CHILD RESIDENT - SITE 16 - REASONABLE MAXIMUM EXPOSURES		
BASED ON: USEPA, SEPTEMBER 1989.		
BY: R. JUPIN	CHECKED BY: T. Jackman	DATE: DECEMBER 15, 2000

EXAMPLE CARCINOGENIC CALCULATION

$$IEXc = \frac{8.5 \text{ mg/kg} \times 200 \text{ mg/day} \times 150 \text{ days/year} \times 6 \text{ years} \times 0.000001 \text{ kg/mg}}{15 \text{ kg} \times 25550 \text{ days}}$$

IEXc = 3.99E-06 mg/kg-day

ICLR = 3.99E-06 mg/kg-day x 1.5 (kg-day/mg) = Incremental Lifetime Cancer Risk

ICLR = 5.99E-06

EXAMPLE NONCARCINOGENIC CALCULATION

$$IEXnc = \frac{8.5 \text{ mg/kg} \times 200 \text{ mg/day} \times 150 \text{ days/year} \times 6 \text{ years} \times 0.000001 \text{ kg/mg}}{15 \text{ kg} \times 2190 \text{ days}}$$

IEXnc = 4.66E-05 mg/kg-day

HQ = 4.66E-05 mg/kg-day / 0.0003 (mg/kg-day) = Hazard Quotient

HQ = 1.55E-01

CALCULATION WORKSHEET

CLIENT: NSB-NLON, GROTON, CONNECTICUT		**JOB NUMBER:** 7856
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH SOIL CHILD RESIDENT - SITE 16 - REASONABLE MAXIMUM EXPOSURES		
BASED ON: USEPA, DEC. 1989, 2000		
BY: R. JUPIN	**CHECKED BY:** T. Jackson	**DATE:** DECEMBER 15, 2000

PURPOSE: To estimate intake, carcinogenic and noncarcinogenic risks from dermal contact with soil by child resident at Site 16.

EQUATION:

$$DEX = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

Where:

DEX	=	estimated exposure intake (mg/kg-day)
Cs	=	exposure point concentration in soil/sediment (mg/kg)
CF	=	conversion factor (1.0E-6 kg/mg)
SA	=	skin surface available for contact (cm^2/day)
ABS	=	absorption factor (unitless)
AF	=	adherence factor (mg/cm^2)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
BW	=	body weight (kg)
AT	=	averaging time (days)
CSFd	=	dermal carcinogenic slope factor (kg-day/mg)
RfDd	=	dermal noncarcinogenic reference dose (mg/kg-day)

RISKS:

ICLR (Carcinogens) = Intake (mg/kg-day) x CSFd (kg-day/mg)
HQ (Noncarcinogens) = Intake (mg/kg-day) / RFDd (mg/kg-day)

ASSUMPTIONS: - REASONABLE MAXIMUM EXPOSURES

Cs	=	8.5	mg/kg	Arsenic
CF	=	1.0E-06	kg/mg	
SA	=	2094	cm^2/day	
AF	=	0.2	mg/cm^2	
ABS	=	0.03		
EF	=	150	days/year	
ED	=	6	years	
BW	=	15	kg	
ATc	=	25550	days	
ATnc	=	2190	days	
CSFd	=	1.50	(kg-day/mg)	
RfDd	=	3.00E-04	(mg/kg-day)	

CLIENT: NSB-NLON, GROTON, CONNECTICUT		JOB NUMBER: 7856
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH SOIL CHILD RESIDENT - SITE 16 - REASONABLE MAXIMUM EXPOSURES		
BASED ON: USEPA, DEC. 1989, 2000		
BY: R. JUPIN	CHECKED BY: T. Jackson	DATE: DECEMBER 15, 2000

EXAMPLE CARCINOGENIC CALCULATION

$$DEXc = \frac{8.5\ mg/kg \times 0.000001\ kg/mg \times 2094\ cm2/day \times 0.2\ mg/cm2 \times 0.03 \times 150\ days/year \times 6\ years}{15\ kg \times 25550\ days}$$

DEXc = 2.51E-07 mg/kg-day

ICLR = 2.51E-07 mg/kg-day x 1.5 (kg-day/mg) = Incremental Lifetime Cancer Risk

ICLR = 3.76E-07

EXAMPLE NONCARCINOGENIC CALCULATION

$$DEXnc = \frac{8.5\ mg/kg \times 0.000001\ kg/mg \times 2094\ cm2/day \times 0.2\ mg/cm2 \times 0.03 \times 150\ days/year \times 6\ years}{15\ kg \times 2190\ days}$$

DEXnc = 2.93E-06 mg/kg-day

HQ = 2.93E-06 mg/kg-day / 0.0003 (mg/kg-day) = Hazard Quotient

HQ = 9.75E-03

CALCULATION WORKSHEET

CLIENT: NSB-NLON, GROTON, CONNECTICUT		**JOB NUMBER:** 7856
SUBJECT: CALCULATION OF INTAKE/RISK FROM INGESTION OF GROUNDWATER ADULT RESIDENT AT SITE 7 - REASONABLE MAXIMUM EXPOSURES		
BASED ON: USEPA, SEPTEMBER 1989.		
BY: R. JUPIN	**CHECKED BY:** L. Jackson	**DATE:** DECEMBER 15, 2000

PURPOSE: To estimate intake, carcinogenic and noncarcinogenic risks from ingestion of groundwater by an adult resident at Site 7.

EQUATION:

$$IEX = \frac{Csw \times CF \times IR \times EF \times ED}{BW \times AT}$$

Where:

IEX	=	estimated exposure intake (mg/kg/day)
Cgw	=	exposure point concentration in groundwater (ug/L)
CF	=	conversion factor (1.0E-3 mg/ug)
IR	=	ingestion rate (L/day)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
BW	=	body weight (kg)
AT	=	averaging time (days)
CSFo	=	oral carcinogenic slope factor ($(mg/kg/day)^{-1}$)
RfDo	=	oral noncarcinogenic reference dose (mg/kg/day)

RISKS:

ICLR (Carcinogens) = Intake (mg/kg/day) x CSFo $(mg/kg/day)^{-1}$
HQ (Noncarcinogens) = Intake (mg/kg/day) / RFDo (mg/kg/day)

ASSUMPTIONS:

Cgw	=	2	ug/L	Benzene
IR	=	2	L/day	
CF	=	1.0E-03	mg/ug	
EF	=	350	days/year	
ED	=	30	years	
BW	=	70	kg	
ATc	=	25550	days	
ATnc	=	10950	days	
CSFo	=	5.5E-02	$(mg/kg/day)^{-1}$	
RfDo	=	3.0E-03	(mg/kg/day)	

CLIENT: NSB-NLON, GROTON, CONNECTICUT		JOB NUMBER: 7856
SUBJECT: CALCULATION OF INTAKE/RISK FROM INGESTION OF GROUNDWATER ADULT RESIDENT AT SITE 7 - REASONABLE MAXIMUM EXPOSURES		
BASED ON: USEPA, SEPTEMBER 1989.		
BY: R. JUPIN	CHECKED BY:	DATE: DECEMBER 15, 2000

EXAMPLE CARCINOGENIC CALCULATION

$$IEXc = \frac{2\ ug/L \times 0.001\ mg/ug \times 2\ L/day \times 350\ days/year \times 30\ years}{70\ kg \times 25550\ days}$$

IEXc = 2.35E-05 mg/kg/day

ICLR = 2.35E-05 mg/kg/day x 0.055 (mg/kg/day)-1 = Incremental Lifetime Cancer Risk

ICLR = 1.29E-06

EXAMPLE NONCARCINOGENIC CALCULATION

$$IEXnc = \frac{2\ ug/L \times 0.001\ mg/ug \times 2\ L/day \times 350\ days/year \times 30\ years}{70\ kg \times 10950\ days}$$

IEXnc = 5.48E-05 mg/kg/day

$$HQ = \frac{5.48E\text{-}05\ mg/kg/day}{0.003\ (mg/kg/day)} = \text{Hazard Quotient}$$

HQ = 1.83E-02

CLIENT: NSB-NLON, GROTON, CONNECTICUT		JOB NUMBER: 7856
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH GROUNDWATER ADULT RESIDENT AT SITE 7 - REASONABLE MAXIMUM EXPOSURES		
BASED ON: USEPA, DEC. 1989, 2000		
BY: R. JUPIN	CHECKED BY:	DATE: DECEMBER 15, 2000

PURPOSE: To estimate intake, carcinogenic and noncarcinogenic risks from dermal contact with groundwater by an adult resident at Site 7.

EQUATION:

$$DAD = \frac{DAevent \times EV \times ED \times EF \times A}{BW \times AT}$$

Where:

DAD	=	dermally absorbed dose (mg/kg/day)
DAevent	=	absorbed does per event (mg/cm^2/event)
EV	=	event frequency (events/day)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
A	=	skin surface available for contact (cm^2)
BW	=	body weight (kg)
AT	=	averaging time (days)
CSFo	=	oral carcinogenic slope factor ((mg/kg/day)$^{-1}$)
RfDo	=	oral noncarcinogenic reference dose (mg/kg/day)

RISKS:

ICLR (Carcinogens) = DAD (mg/kg/day) x CSFd (mg/kg/day)$^{-1}$
HQ (Noncarcinogens) = DAD (mg/kg/day) / RFDd (mg/kg/day)

EQUATION for DAevent:

For Inorganics:

$$DA_{event} = (K_p)(C_{gw})(t_{event})$$

For Organics:

$$\text{If } t_{event} < t^*, \text{ then : } DA_{event} = (2K_p)(C_{gw})(CF)\left(\sqrt{\frac{6\,\tau\, t_{event}}{\pi}}\right)$$

$$\text{If } t_{event} > t^*, \text{ then : } DA_{event} = (K_p)(C_{gw})(CF)\left(\frac{t_{event}}{1+B} + 2\tau\left(\frac{1+3B+3B^2}{(1+B)^2}\right)\right)$$

Where:

$$B = K_p \times \sqrt{MW} \;/\; 2.6 \qquad \tau = 0.105 \times 10^{(0.0056 \times MW)}$$

CLIENT: NSB-NLON, GROTON, CONNECTICUT		**JOB NUMBER:** 7856
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH GROUNDWATER ADULT RESIDENT AT SITE 7 - REASONABLE MAXIMUM EXPOSURES		
BASED ON: USEPA, DEC. 1989, 2000		
BY: R. JUPIN	**CHECKED BY:** T. Jupin	**DATE:** DECEMBER 15, 2000

If $B \leq 0.6$, then $t^* = 2.4 \times \tau$

If $B > 0.6$, then $t^* = (b - \sqrt{b^2 - c^2}) \times \frac{l_{sc}^2}{D_{sc}}$

where: $b = \frac{2 \times (1 + B)^2}{\pi} - c$ $\quad c = \frac{1 + 3B + 3B^2}{3(1 + B)}$

$D_{sc} = l_{sc} \times 10^{(-2.80 - 0.0056 \times MW)}$

Where:

Kp	=	permeability coefficient from water (cm/hr)
Cgw	=	concentration of chemical in groundwater (mg/L)
tevent	=	duration of event (hr/event)
CF	=	conversion factor (0.001 L/cm^3)
MW	=	molecular weight
lsc	=	apparent thickness of skin (cm)
Dsc	=	effective diffusivity for chemical transfer through skin (cm^2/hr)
t*	=	time it takes to reach steady-state (hr/event)
τ	=	lag time (hr/event)
B	=	Bunge Model Constant (dimensionless)

EXAMPLE CALCULATION OF DAevent

ASSUMPTIONS:

Cgw	=	0.002	mg/L	Benzene
Kp	=	0.015	cm/hr	
tevent	=	0.25	hr/event	
CF	=	0.001	L/cm^3	
MW	=	78		
lsc	=	0.001	cm	

CLIENT: NSB-NLON, GROTON, CONNECTICUT		JOB NUMBER: 7856
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH GROUNDWATER ADULT RESIDENT AT SITE 7 - REASONABLE MAXIMUM EXPOSURES		
BASED ON: USEPA, DEC. 1989, 2000		
BY: R. JUPIN	CHECKED BY:	DATE: DECEMBER 15, 2000

B = 0.015 x SQRT(78) / 2.6

B = 5.10E-02

τ = 0.105 x 10^(0.0056 x 78)

τ = 2.87E-01 hr/event

B < 0.6, therefore,

t* = 2.4 x 2.87E-01

t* = 0.69

tevent < t*, therefore,

DAevent = (2 x 0.015 cm/hr) (0.002 mg/L) (0.001 L/cm3) x

SQRT(6 x 2.87E-01 hr/event x 0.25 hr/event / 3.1416)

DAevent = 2.22E-08 mg/cm^2-event

RISK CALCULATIONS

ASSUMPTIONS:

A	=	20000	cm^2/day
EV	=	1	event/day
ED	=	30	years
EF	=	350	days/year
BW	=	70	kg
ATc	=	25550	days
ATnc	=	10950	days
CSFd	=	5.5E-02	(mg/kg/day)$^{-1}$
RfDd	=	3.0E-03	(mg/kg/day)

CLIENT: NSB-NLON, GROTON, CONNECTICUT		JOB NUMBER: 7856
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH GROUNDWATER ADULT RESIDENT AT SITE 7 - REASONABLE MAXIMUM EXPOSURES		
BASED ON: USEPA, DEC. 1989, 2000		
BY: R. JUPIN	CHECKED BY:	DATE: DECEMBER 15, 2000

EXAMPLE CARCINOGENIC CALCULATION

$$DADc = \frac{2.22E\text{-}08 \text{ mg/cm2-event} \times 1 \text{ event/day} \times 30 \text{ years} \times 350 \text{ days/year} \times 20000 \text{ cm2/day}}{70 \text{ kg} \times 25550 \text{ days}}$$

DADc = 2.61E-06 mg/kg/day

DADc = 2.61E-06 mg/kg/day x 0.055 (mg/kg/day)-1 = Incremental Lifetime Cancer Risk

ICLR = 1.43E-07

EXAMPLE NONCARCINOGENIC CALCULATION

$$DADnc = \frac{2.52E\text{-}08 \text{ cm2/day} \times 1 \text{ event/day} \times 30 \text{ years} \times 350 \text{ days/year} \times 20000 \text{ cm2/day}}{70 \text{ kg} \times 10950 \text{ days}}$$

DADnc = 6.91E-06 mg/kg/day

HQ = 6.91E-06 mg/kg/day / 0.003 (mg/kg/day) = Hazard Quotient

HQ = 2.30E-03

APPENDIX C.5

RAGS PART D TABLES

AREA A LANDFILL AND WETLANDS (SITE 2)

TABLE 1
SELECTION OF EXPOSURE PATHWAYS
AREA A LANDFILL AND WETLANDS (SITE 2)
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current/Future	Groundwater	Groundwater	Overburden/Bedrock Aquifer	Construction Workers	Adult	Ingestion Dermal	On-Site On-Site	Quant Quant	Construction workers may have dermal contact with groundwater during excavation activities.
				Full-time Employees	Adult	Ingestion Dermal	On-Site On-Site	None None	Full-time employees are not exposed to groundwater.
				Trespassers	Adolescents	Ingestion Dermal	On-Site On-Site	None None	Trespassers do not have contact with groundwater.
				Residents	Adult	Ingestion Dermal	On-Site On-Site	None None	Residential land usage it not expected to occur at Site 2.
					Child	Ingestion Dermal	On-Site On-Site	None None	Residential land usage it not expected to occur at Site 2.
		Air	Overburden/Bedrock Aquifer	Construction Workers	Adult	Inhalation	On-site	None	Construction workers exposure via volatilization is expected to be insignificant due to dilution with outdoor air.
				Full-time Employees	Adult	Inhalation	On-site	None	Full-time employees are not exposed to groundwater.
				Trespassers	Adolescents	Inhalation	On-Site	None	Trespassers do not have contact with site groundwater.
				Residents	Adult	Inhalation	On-site	None	Residential land usage it not expected to occur at Site 2.
					Child	Inhalation	On-site	None	Residential land usage it not expected to occur at Site 2.

TABLE 2.1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
DIRECT CONTACT EXPOSURE SCENARIOS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Landfill and Wetlands (Site 2

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Risk-Based COPC Screening Level(5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection(6)
Volatile Organics																
78-93-3	2-BUTANONE	2	J	26		ug/L	2WGW39DS-04	5/11	5	26	NA	190 N	400 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
67-64-1	ACETONE	3	J	120		ug/L	2WGW39DS-04	8/11	5	120	NA	61 N	700 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
75-15-0	CARBON DISULFIDE	2		7		ug/L	2WGW45DS-04	3/11	1 - 4	7	NA	100 N	700 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
100-41-4	ETHYLBENZENE	0.3	J	0.3	J	ug/L	2WGW39DS-04	1/11	1	0.3	NA	130 N	700 700 700	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
108-88-3	TOLUENE	0.4	J	0.6	J	ug/L	2WGW39DS-04	2/11	1	0.6	NA	72 N	1000 1000 1000	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
79-01-6	TRICHLOROETHENE	1	J	1	J	ug/L	3GW37S-04	1/11	1	1	NA	1.6 C	5 5 5	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
Semivolatile Organics																
	3&4-METHYLPHENOL	0.75	J	3.5	J	ug/L	2WGW39DS-04	3/11	5.1 - 6.2	3.5	NA	18 N	35 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
65-85-0	BENZOIC ACID	2.3	J	2.3	J	ug/L	2WGW39DS-04	1/10	20 - 25	2.3	NA	15000 N	50000 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
108-95-2	PHENOL	2.5	J	2.5	J	ug/L	2WGW39DS-04	1/11	5 - 6.2	2.5	NA	2200 N	4000 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
Pesticides																
72-54-8	4,4'-DDD	0.042	J	0.058	J	ug/L	2WGW47DS-04	1/11	0.02 - 0.029	0.058	NA	0.28 C	0.15 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
Total Metals																
7429-90-5	ALUMINUM	220		292		ug/L	2WGW47DS-04-D	1/11	69.1 - 138	292	3560	3600 N	N/A 50-200 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	EPAI, BKG
7440-38-2	ARSENIC	16.1	J	30.4	J	ug/L	2WGW47DS-04-D	4/11	2.7 - 10.1	30.4	1.92	0.045 C	50 50 50	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
7440-39-3	BARIUM	28.4	J	920		ug/L	2WGW47DS-04	11/11	N/A	920	227	260 N	1000 2000 2000	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
7440-70-2	CALCIUM	30700		334000		ug/L	2WGW46DS-04	11/11	N/A	334000	188000	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT
7440-47-3	CHROMIUM	1.4	J	11.9	J	ug/L	2WGW46DS-04	7/11	1.3	11.9	49.9	11 N	50 100 100	CTDEP RSR FED-MCL CTDEP-MCL	NO	BKG
7440-48-4	COBALT	0.95	J	13.4		ug/L	2WGW47DS-04, 2WGW47DS-04-D	3/11	0.94	13.4	48.6	220 N	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL, BKG
7439-89-6	IRON	188		234000		ug/L	2WGW47DS-04	10/11	112	234000	28200	1100 N	N/A 300 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	EPAI
7439-95-4	MAGNESIUM	5530		1020000		ug/L	2WGW46DS-04	11/11	N/A	1020000	191000	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT
7439-96-5	MANGANESE	36.6		8960		ug/L	2WGW47DS-04	11/11	N/A	8960	11700	88 N	N/A 50 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	BKG
7439-97-6	MERCURY	0.12	J	1.5		ug/L	2WGW47DS-04-D	2/11	0.1	1.5	ND	0.36 N	2 2 2	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL

TABLE 2.1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
DIRECT CONTACT EXPOSURE SCENARIOS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Landfill and Wetlands (Site 2

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Risk-Based COPC Screening Level(5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection(6)
7440-02-0	NICKEL	7.4		7.4		ug/L	2WGW38DS-04	1/11	1.2 - 5.7	7.4	32.2	73 N	100 N/A 100	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL, BKG
7440-09-7	POTASSIUM	5790	J	361000	J	ug/L	2WGW46DS-04	11/11	N/A	361000	70800	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT
7440-23-5	SODIUM	67000		7930000		ug/L	2WGW46DS-04	11/11	N/A	7930000	1900000	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT
7440-62-2	VANADIUM	9.5	J	14.6	J	ug/L	2WGW45DS-04	3/11	0.71 - 7	14.6	10.2	26 N	50 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
7440-66-6	ZINC	6.1	J	11.1	J	ug/L	2WGW46DS-04	4/11	3.1 - 6.8	11.1	131	1100 N	5000 5000 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	BSL, BKG
Dissolved Metals																
7440-38-2	ARSENIC, FILTERED	29.3	J	35.5	J	ug/L	2WGW47DS-04-F	2/10	2.7 - 13.8	35.5	1.92	0.045 C	50 50 50	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
7440-39-3	BARIUM, FILTERED	28.2	J	1070		ug/L	2WGW47DS-04-F	10/10	N/A	1070	227	260 N	1000 2000 2000	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
7440-70-2	CALCIUM, FILTERED	32000		327000		ug/L	2WGW46DS-04-F	10/10	N/A	327000	NA	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT
7440-47-3	CHROMIUM, FILTERED	1.8	J	13.6	J	ug/L	2WGW46DS-04-F	5/10	1.3	13.6	49.9	11 N	50 100 100	CTDEP RSR FED-MCL CTDEP-MCL	NO	BKG
7440-48-4	COBALT, FILTERED	0.99	J	14.5		ug/L	2WGW47DS-04-F	4/10	0.94 - 1.1	14.5	48.6	220 N	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL, BKG
7439-89-6	IRON, FILTERED	219		263000		ug/L	2WGW47DS-04-F	9/10	167	263000	28200	1100 N	N/A 300 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	EPAI
7439-95-4	MAGNESIUM, FILTERED	5530		1060000		ug/L	2WGW46DS-04-F	10/10	N/A	1060000	191000	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT
7439-96-5	MANGANESE, FILTERED	228		10100		ug/L	2WGW47DS-04-F	10/10	N/A	10100	11700	88 N	N/A 50 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	BKG
7439-97-6	MERCURY, FILTERED	0.12	J	1.3		ug/L	2WGW47DS-04-F-D	2/10	0.1	1.3	ND	0.36 N	2 2 2	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
7440-09-7	POTASSIUM, FILTERED	5090	J	360000	J	ug/L	2WGW46DS-04-F	10/10	N/A	360000	70800	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT
7440-23-5	SODIUM, FILTERED	67300		7940000		ug/L	2WGW46DS-04-F	10/10	N/A	7940000	1900000	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT
7440-62-2	VANADIUM, FILTERED	9.3	J	9.3	J	ug/L	2WGW43DS-04-F	1/10	0.71 - 6.8	9.3	10.2	26 N	50 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL, BKG
7440-66-6	ZINC, FILTERED	13.6	J	18.7	J	ug/L	2WGW47DS-04-F-D	2/10	3.2 - 7.6	18.7	131	1100 N	5000 5000 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	BSL, BKG
Miscellaneous Parameters																
	ALKALINITY	120000		2420000		mg/L	2WGW46DS-04	11/11	N/A	2420000	1950	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NTX
	CHEMICAL OXYGEN DEMAND	41600		2410000		mg/L	2WGW46DS-04	10/11	20,000	2410000	570	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NTX
	CHLORIDE	107000	J	16800000	J	mg/L	2WGW46DS-04	11/11	N/A	16800000	4540	N/A	N/A 250 N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NV

TABLE 2.1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
DIRECT CONTACT EXPOSURE SCENARIOS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Landfill and Wetlands (Site 2

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Risk-Based COPC Screening Level(5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection(6)
	HARDNESS as CaCO3	110000		5030000		mg/L	2WGW46DS-04	11/11	N/A	5030000	ND	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NTX
	SULFATE	20000		989000		mg/L	2WGW40DS-04	8/11	20,000	989000	45.2	N/A	N/A 250 N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NV
	TOTAL DISSOLVED SOLIDS	336000		29400000		mg/L	2WGW46DS-04	11/11	N/A	29400000	6260	N/A	N/A 500 N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NV
	TOTAL ORGANIC CARBON	4000		65200		mg/L	2WGW41DS-04	11/11	N/A	65200	37.7	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NTX
	TOTAL SUSPENDED SOLIDS	22000	J	181000	J	mg/L	2WGW47DS-04	9/11	4,000	181000	236	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NTX

A shaded value indicates that the concentration used for screening exceeds the criterion or background value
A shaded chemical name indicates that the chemical has been selected as a COPC

Footnotes
1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations
2 Values presented are sample-specific quantitation limits
3 The maximum detected concentration is used for screening purposes
4 95% Upper Tolerance Limit (UTL) of site background data
5 The risk-based COPC screening level for tap water use is presented. The value is based on a target hazard quotient of 0.1 for noncarcinogens (denoted with a "N" flag) or an incremental cancer risk of 1E-6 for carcinogens (denoted with a "C" flag) (USEPA, Region IX, November 2000)
6 The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level and/or an ARAR/TBC(s).
7 Pyrene is used as a surrogate for phenanthrene
8 Value is for hexavalent chromium

Associated Samples

2WGW38DS-04	2WGW42DS-04	2WGW45DS-04-F	3GW37S-04
2WGW39DS-04	2WGW42DS-04-F	2WGW46DS-04	3GW37S-04-F
2WGW39DS-04-F	2WGW43DS-04	2WGW46DS-04-F	
2WGW40DS-04	2WGW43DS-04-F	2WGW47DS-04	
2WGW40DS-04-F	2WGW44DS-04	2WGW47DS-04-D	
2WGW41DS-04	2WGW44DS-04-F	2WGW47DS-04-F	
2WGW41DS-04-F	2WGW45DS-04	2WGW47DS-04-F-D	

Definitions
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogen
COPC = Chemical of Potential Concern
J = Estimated Value
N = Noncarcinogen
N/A = Not Applicable
FED-MCL = Federal Maximum Contaminant Level (USEPA, August 2000)
FED-SMCL = Federal Secondary Maximum Contaminant Level (USEPA, August 2000)
FED-AL = Federal Action Level (USEPA, August 2000)
CTDEP-RSR = Connecticut DEP Remediation Standard Regulations, 1996
CTDEP-MCL = Connecticut Maximum Contaminant Level

Rationale Codes
For Selection as a COPC
ASL = Above COPC Screening Level/ARAR/TBC

For Elimination as a COPC
BKG = Within Background Levels
BSL = Below COPC Screening Level/ARAR/TBC
NUT = Essential Nutrient
NTX = No Toxicity Information
EPAI = USEPA Region one does not advocate evaluation of this chemical

TABLE 2.2
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
MIGRATION PATHWAYS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Landfill and Wetlands (Site 2)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Surface Water Protection Criteria(5)	Volatilization Criteria(5)	COPC Flag	Rationale for Contaminant Deletion or Selection(6)
Volatile Organics															
78-93-3	2-BUTANONE	2	J	26		ug/L	2WGW39DS-04	5/11	5	26	N/A	N/A	50000	NO	BSL
67-64-1	ACETONE	3	J	120		ug/L	2WGW39DS-04	8/11	5	120	N/A	N/A	50000	NO	BSL
75-15-0	CARBON DISULFIDE	2		7		ug/L	2WGW45DS-04	3/11	1 - 4	7	N/A	N/A	N/A	NO	NTX
100-41-4	ETHYLBENZENE	0.3	J	0.3	J	ug/L	2WGW39DS-04	1/11	1	0.3	N/A	580000	50000	NO	BSL
108-88-3	TOLUENE	0.4	J	0.6	J	ug/L	2WGW39DS-04	2/11	1	0.6	N/A	4000000	23500	NO	BSL
79-01-6	TRICHLOROETHENE	1	J	1	J	ug/L	3GW37S-04	1/11	1	1	N/A	2340	219	NO	BSL
Semivolatile Organics															
	3&4-METHYLPHENOL	0.75	J	3.5	J	ug/L	2WGW39DS-04	3/11	5.1 - 6.2	3.5	N/A	N/A	N/A	NO	NTX
65-85-0	BENZOIC ACID	2.3	J	2.3	J	ug/L	2WGW39DS-04	1/10	20 - 25	2.3	N/A	N/A	N/A	NO	NTX
108-95-2	PHENOL	2.5	J	2.5	J	ug/L	2WGW39DS-04	1/11	5 - 6.2	2.5	N/A	92000000	N/A	NO	BSL
Pesticides															
72-54-8	4,4'-DDD	0.042	J	0.058	J	ug/L	2WGW47DS-04	1/11	0.02 - 0.029	0.058	N/A	N/A	N/A	NO	NTX
Total Metals															
7429-90-5	ALUMINUM	220		292		ug/L	2WGW47DS-04-D	1/11	69.1 - 138	292	3560	N/A	N/A	NO	BKG
7440-38-2	ARSENIC	16.1	J	30.4	J	ug/L	2WGW47DS-04-D	4/11	2.7 - 10.1	30.4	1.92	4	N/A	YES	ASL
7440-39-3	BARIUM	28.4	J	920		ug/L	2WGW47DS-04	11/11	N/A	920	227	N/A	N/A	NO	NTX
7440-70-2	CALCIUM	30700		334000		ug/L	2WGW46DS-04	11/11	N/A	334000	188000	N/A	N/A	NO	NTX
7440-47-3	CHROMIUM VI	1.4	J	11.9	J	ug/L	2WGW46DS-04	7/11	1.3	11.9	49.9	110	N/A	NO	BSL, BKG
7440-48-4	COBALT	0.95	J	13.4		ug/L	2WGW47DS-04, 2WGW47DS-04-D	3/11	0.94	13.4	48.6	N/A	N/A	NO	BKG
7439-89-6	IRON	188		234000		ug/L	2WGW47DS-04	10/11	112	234000	28200	N/A	N/A	NO	NTX
7439-95-4	MAGNESIUM	5530		1020000		ug/L	2WGW46DS-04	11/11	N/A	1020000	191000	N/A	N/A	NO	NTX
7439-96-5	MANGANESE	36.6		8960		ug/L	2WGW47DS-04	11/11	N/A	8960	11700	N/A	N/A	NO	BKG
7439-97-6	MERCURY	0.12	J	1.5		ug/L	2WGW47DS-04-D	2/11	0.1	1.5	ND	0.4	N/A	YES	ASL
7440-02-0	NICKEL	7.4		7.4		ug/L	2WGW38DS-04	1/11	1.2 - 5.7	7.4	32.2	880	N/A	NO	BSL, BKG
7440-09-7	POTASSIUM	5790	J	361000	J	ug/L	2WGW46DS-04	11/11	N/A	361000	70800	N/A	N/A	NO	NTX
7440-23-5	SODIUM	67000		7930000		ug/L	2WGW46DS-04	11/11	N/A	7930000	1900000	N/A	N/A	NO	NTX
7440-62-2	VANADIUM	9.5	J	14.6	J	ug/L	2WGW45DS-04	3/11	0.71 - 7	14.6	10.2	N/A	N/A	NO	NTX
7440-66-6	ZINC	6.1	J	11.1	J	ug/L	2WGW46DS-04	4/11	3.1 - 6.8	11.1	131	123	N/A	NO	BSL, BKG
Dissolved Metals															
7440-38-2	ARSENIC, FILTERED	29.3	J	35.5	J	ug/L	2WGW47DS-04-F	2/10	2.7 - 13.8	35.5	1.92	4	N/A	YES	ASL
7440-39-3	BARIUM, FILTERED	28.2	J	1070		ug/L	2WGW47DS-04-F	10/10	N/A	1070	227	N/A	N/A	NO	NTX
7440-70-2	CALCIUM, FILTERED	32000		327000		ug/L	2WGW46DS-04-F	10/10	N/A	327000	188000	N/A	N/A	NO	NTX
7440-47-3	CHROMIUM, FILTERED	1.8	J	13.6	J	ug/L	2WGW46DS-04-F	5/10	1.3	13.6	49.9	110	N/A	NO	BSL, BKG
7440-48-4	COBALT, FILTERED	0.99	J	14.5		ug/L	2WGW47DS-04-F	4/10	0.94 - 1.1	14.5	48.6	N/A	N/A	NO	BKG
7439-89-6	IRON, FILTERED	219		263000		ug/L	2WGW47DS-04-F	9/10	167	263000	28200	N/A	N/A	NO	NTX
7439-95-4	MAGNESIUM, FILTERED	5530		1060000		ug/L	2WGW46DS-04-F	10/10	N/A	1060000	191000	N/A	N/A	NO	NTX
7439-96-5	MANGANESE, FILTERED	228		10100		ug/L	2WGW47DS-04-F	10/10	N/A	10100	11700	N/A	N/A	NO	BKG
7439-97-6	MERCURY, FILTERED	0.12	J	1.3		ug/L	2WGW47DS-04-F-D	2/10	0.1	1.3	ND	0.4	N/A	YES	ASL
7440-09-7	POTASSIUM, FILTERED	5090	J	360000	J	ug/L	2WGW46DS-04-F	10/10	N/A	360000	70800	N/A	N/A	NO	NTX
7440-23-5	SODIUM, FILTERED	67300		7940000		ug/L	2WGW46DS-04-F	10/10	N/A	7940000	1900000	N/A	N/A	NO	NTX
7440-62-2	VANADIUM, FILTERED	9.3	J	9.3	J	ug/L	2WGW43DS-04-F	1/10	0.71 - 6.8	9.3	10.2	N/A	N/A	NO	BKG
7440-66-6	ZINC, FILTERED	13.6	J	18.7	J	ug/L	2WGW47DS-04-F-D	2/10	3.2 - 7.6	18.7	131	123	N/A	NO	BSL, BKG
Miscellaneous Parameters															
	ALKALINITY	120000		2420000		mg/L	2WGW46DS-04	11/11	N/A	2420000	1950	N/A	N/A	NO	NTX
	CHEMICAL OXYGEN DEMAND	41600		2410000		mg/L	2WGW46DS-04	10/11	20,000	2410000	570	N/A	N/A	NO	NTX
	CHLORIDE	107000	J	16800000	J	mg/L	2WGW46DS-04	11/11	N/A	16800000	4540	N/A	N/A	NO	NTX
	HARDNESS as CaCO3	110000		5030000		mg/L	2WGW46DS-04	11/11	N/A	5030000	ND	N/A	N/A	NO	NTX
	SULFATE	20000		989000		mg/L	2WGW40DS-04	8/11	20,000	989000	45.2	N/A	N/A	NO	NTX
	TOTAL DISSOLVED SOLIDS	336000		29400000		mg/L	2WGW46DS-04	11/11	N/A	29400000	6260	N/A	N/A	NO	NTX
	TOTAL ORGANIC CARBON	4000		65200		mg/L	2WGW41DS-04	11/11	N/A	65200	37.7	N/A	N/A	NO	NTX
	TOTAL SUSPENDED SOLIDS	22000	J	181000	J	mg/L	2WGW47DS-04	9/11	4,000	181000	236	N/A	N/A	NO	NTX

TABLE 2.2
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
MIGRATION PATHWAYS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Landfill and Wetlands (Site 2)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Surface Water Protection Criteria(5)	Volatilization Criteria(5)	COPC Flag	Rationale for Contaminant Deletion or Selection(6)

A shaded value indicates that the concentration used for screening exceeds the criterion or background value.
A shaded chemical name indicates that the chemical has been selected as a COPC .

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 *Values presented are sample-specific quantitation limits.*
3 The maximum detected concentration is used for screening purposes.
4 95% Upper Tolerance Limit (UTL) of site background data
5 Connecticut DEP Surface Water Protection criteria.
6 Connecticut DEP Volatilization criteria.
7 The chemical is selected as a COPC if the maximum detected concentration exceeds the CTDEP surface water protection or volatilization criteria.

Associated Samples:

2WGW38DS-04	2WGW42DS-04	2WGW45DS-04-F	3GW37S-04
2WGW39DS-04	2WGW42DS-04-F	2WGW46DS-04	3GW37S-04-F
2WGW39DS-04-F	2WGW43DS-04	2WGW46DS-04-F	
2WGW40DS-04	2WGW43DS-04-F	2WGW47DS-04	
2WGW40DS-04-F	2WGW44DS-04	2WGW47DS-04-D	
2WGW41DS-04	2WGW44DS-04-F	2WGW47DS-04-F	
2WGW41DS-04-F	2WGW45DS-04	2WGW47DS-04-F-D	

Definitions:
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogen
COPC = Chemical of Potential Concern
J = Estimated Value
N = Noncarcinogen
NA = Not Applicable.

Rationale Codes:
For Selection as a COPC:
ASL = Above COPC Screening Level/ARAR/TBC

For Elimination as a COPC:
BKG = Within Background Levels
BSL = Below COPC Screening Level/ARAR/TBC
NTX = No Toxicity Information

TABLE 3.1
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
AREA A LANDFILL AND WETLANDS (SITE 2)
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Landfill and Wetlands (Site 2)

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency Exposure		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Acetone	ug/L	18.4	60.7	120		ug/L	120	max	1	18.4	average	1
Arsenic	ug/L	10.6	57.8	30	J	ug/L	30	max	1	10.6	average	1
Barium	ug/L	153	319	898		ug/L	898	max	1	153	average	1
Mercury	ug/L	0.184	0.334	1.5		ug/L	1.5	max	1	0.184	average	1

Notes:
[1] - The maximum detected and average concentration is used for the RME and CTE sceanrios, respectively per EPA Region I guidance.

TABLE 4.1
VALUES USED FOR DAILY INTAKE CALCULATIONS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Landfill and Wetlands (Site 2)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/	CT Value	CT Rationale/	Intake Equation/ Model Name
Dermal	DAevent	Absorbed dose per event	mg/cm2-event	See Text	See Text	See Text	See Text	Dermally Absorbed Dose (mg/kg/day)
	SA	Skin Surface Available for Contact	cm2	3800	EPA, 1992	3800	EPA, 1992	$= \frac{DAevent \times EV \times EF \times ED \times SA}{BW \times AT}$
	EV	Event Frequency	events/day	1	EPA, 1994	1	EPA, 1994	
	ET	Exposure Time	hours/event	4	(1)	2	(1)	
	EF	Exposure Frequency	days/year	20	Atlantic, 1992	10	Atlantic, 1992	
	ED	Exposure Duration	years	1	Atlantic, 1992	1	Atlantic, 1992	See text for calculation of DAevent.
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	365	EPA, 1989	365	EPA, 1989	

Notes:
(1) - Professinal judgement.
Sources:
EPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.
EPA, 1992: Dermal Exposure Assessment: Principles and Applications.
EPA, 1994: US EPA Region I Risk Updates, Number 2.
EPA, 1998: Risk Assessment Guidance for Superfund, Supplemental Guidance, Dermal Risk Assessment, Interim Guidance.
Atlantic 1992: Phase I Remedial Investigation Naval Submarine Base - New London, Connecticut, August.

TABLE 5.1
NON-CANCER TOXICITY DATA -- ORAL/DERMAL
NSB-NLON, GROTON, CONNECTICUT

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal RfD (2)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ (3) (MM/DD/YY)
Volatile Organic Compounds										
Acetone	Chronic	1.0E-01	mg/kg/day	100%	1.0E-01	mg/kg/day	Liver, Kidney	1000/1	IRIS	01/02/01
	Subchronic	1.0E+00	mg/kg/day	100%	1.0E+00	mg/kg/day	Liver, Kidney	100	HEAST	7/97
Inorganics										
Arsenic	Chronic	3.0E-04	mg/kg/day	100%	3.0E-04	mg/kg/day	Skin	3/1	IRIS	01/02/01
	Subchronic	3.0E-04	mg/kg/day	100%	3.0E-04	mg/kg/day	Skin	3	HEAST	7/97
Barium	Chronic	7.0E-02	mg/kg/day	7%	4.9E-03	mg/kg/day	CVS	3/1	IRIS	01/02/01
	Subchronic	7.0E-02	mg/kg/day	7%	4.9E-03	mg/kg/day	CVS	3	HEAST	7/97
Mercury (Methyl)	Chronic	1.0E-04	mg/kg/day	100%	1.0E-04	mg/kg/day	CNS	10/1	IRIS	01/02/01
	Subchronic	1.0E-04	mg/kg/day	100%	1.0E-04	mg/kg/day	CNS	10/1	HEAST	7/97

Notes:
(1) - USEPA 1998.
(2) - RfDdermal = RfDoral x Oral to Dermal Adjustment Factor.
(3) For IRIS values date that IRIS was searched.
For HEAST values, the date of HEAST.
FOR EPA IX, date of PRG Table.
(4) - Naphthalene is used as a surrogate.
NA = Not Applicable.
IRIS = Integrated Risk Information System.
HEAST= Health Effects Assessment Summary Tables.
EPA IX = USEPA Region IX Preliminary Remediation Goals Table, November 1, 2000.
EPA III = USEPA Region III Risk-based Concentration Table, April 13, 2000.

CNS = Central Nervous System
CVS = Cardiovascular System
GS = Gastrointestinal
Chronic = No subchronic value available, chronic value is presented.

TABLE 6.1
CANCER TOXICITY DATA -- ORAL/DERMAL
NSB-NLON, GROTON, CONNECTICUT

Chemical of Potential Concern	Oral Cancer Slope Factor	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal Cancer Slope Factor (2)	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (3) (MM/DD/YY)
Volatile Organic Compounds							
Acetone	NA	NA	NA	NA	D	IRIS	01/02/01
Inorganics							
Arsenic	1.5E+00	100%	1.5E+00	$(mg/kg\text{-}day)^{-1}$	A	IRIS	01/02/01
Barium	NA	NA	NA	NA	D	IRIS	01/02/01
Mercury (Methyl)	NA	NA	NA	NA	C	IRIS	01/02/01

Notes:

IRIS = Integrated Risk Information System

HEAST= Health Effects Assessment Summary Tables

(1) - USEPA 1998.

(2) - CSFdermal = CSForal/Oral to Dermal Adjustment Factor.

(3) - For IRIS values, the date IRIS was searched.
For HEAST values, the date of HEAST.

NA = Not Applicable

IRIS = Integrated Risk Information System

EPA Group:

A - Human carcinogen

B1 - Probable human carcinogen - indicates that limited human data are available

B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans

C - Possible human carcinogen

D - Not classifiable as a human carcinogen

E - Evidence of noncarcinogenicity

TABLE 7.1
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Landfill and Wetlands (Site 2)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Acetone	120	ug/L	120	ug/L	M	7.6E-06	mg/kg/day	1.0E-01	mg/kg/day	N/A	N/A	7.6E-05
	Arsenic	30.0	ug/L	30.0	ug/L	M	0.0E+00	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	- -
	Barium	898	ug/L	898	ug/L	M	0.0E+00	mg/kg/day	4.9E-03	mg/kg/day	N/A	N/A	- -
	Mercury	1.45	ug/L	1.45	ug/L	M	0.0E+00	mg/kg/day	1.0E-04	mg/kg/day	N/A	N/A	- -
	(Total)												7.6E-05
												Total Hazard Index Across All Exposure Routes/Pathways	7.6E-05

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Subchronic.

TABLE 7.2
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Landfill and Wetlands (Site 2)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Acetone	18.4	ug/L	18.4	ug/L	M	3.8E-06	mg/kg/day	1.0E-01	mg/kg/day	N/A	N/A	3.8E-05
	Arsenic	10.6	ug/L	10.6	ug/L	M	0.0E+00	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	- -
	Barium	153	ug/L	153	ug/L	M	0.0E+00	mg/kg/day	4.9E-03	mg/kg/day	N/A	N/A	- -
	Mercury	0.184	ug/L	0.184	ug/L	M	0.0E+00	mg/kg/day	1.0E-04	mg/kg/day	N/A	N/A	- -
	(Total)												3.8E-05
												Total Hazard Index Across All Exposure Routes/Pathways	3.8E-05

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Subchronic.

TABLE 8.1
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Landfill and Wetlands (Site 2)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Acetone	120	ug/L	120	ug/L	M	1.1E-07	mg/kg/day	NA	(mg/kg/day) -1	- -
	Arsenic	30.0	ug/L	30.0	ug/L	M	0.0E+00	mg/kg/day	1.5E+00	(mg/kg/day) -1	0.0E+00
	Barium	898	ug/L	898	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Mercury	1.45	ug/L	1.45	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										- -
										Total Risk Across All Exposure Routes/Pathways	- -

(1) Medium-Specific (M) EPC selected for risk calculation.

TABLE 8.2
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Landfill and Wetlands (Site 2)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Acetone	18.4	ug/L	18.4	ug/L	M	4.6E-09	mg/kg/day	NA	(mg/kg/day) -1	- -
	Arsenic	10.6	ug/L	10.6	ug/L	M	0.0E+00	mg/kg/day	1.5E+00	(mg/kg/day) -1	0.0E+00
	Barium	153	ug/L	153	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Mercury	0.184	ug/L	0.184	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										- -
										Total Risk Across All Exposure Routes/Pathways	- -

(1) Medium-Specific (M) EPC selected for risk calculation.

TABLE 9.1
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Area A Landfill and Wetlands (Site 2)	Acetone	- -	- -	- -	- -	Acetone	Liver, Kidney	- -	- -	7.6E-05	7.6E-05
			Arsenic	- -	- -	- -	- -	Arsenic	Skin	- -	- -	- -	- -
			Barium	- -	- -	- -	- -	Barium	CVS, Fetus	- -	- -	- -	- -
			Mercury	- -	- -	- -	- -	Mercury	CNS	- -	- -	- -	- -
			(Total)	- -	- -	- -	- -	(Total)		- -	- -	7.6E-05	7.6E-05
			Total Risk Across Groundwater				- -	Total Hazard Index Across All Media and All Exposure Routes					7.6E-05
			Total Risk Across All Media and All Exposure Routes				- -						

Total Skin HI	- -
Total Liver HI	7.6E-05
Total Kidney HI	7.6E-05
Total CVS HI	- -
Total Fetus HI	- -
Total CNS HI	- -

TABLE 9 2
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Area A Landfill and Wetlands (Site 2)	Acetone	- -	- -	- -	- -	Acetone	Liver, Kidney	- -	- -	3 8E-05	3 8E-05
			Arsenic	- -	- -	- -	- -	Arsenic	Skin	- -	- -	- -	- -
			Barium	- -	- -	- -	- -	Barium	CVS, Fetus	- -	- -	- -	- -
			Mercury	- -	- -	- -	- -	Mercury	CNS	- -	- -	- -	- -
			(Total)	- -	- -	- -	- -	(Total)		- -	- -	3 8E-05	3 8E-05
			Total Risk Across Groundwater				- -	Total Hazard Index Across All Media and All Exposure Routes					3 8E-05
			Total Risk Across All Media and All Exposure Routes				- -						

Total Skin HI	- -
Total Liver HI	3 8E-05
Total Kidney HI	3 8E-05
Total CVS HI	- -
Total Fetus HI	- -
Total CNS HI	- -

TABLE 10.1
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Area A Landfill and Wetlands (Site 2)	Acetone	- -	- -	- -	- -	Acetone	Liver, Kidney	- -	- -	7 6E-05	7 6E-05
			Arsenic	- -	- -	- -	- -	Arsenic	Skin	- -	- -	- -	- -
			Barium	- -	- -	- -	- -	Barium	CVS, Fetus	- -	- -	- -	- -
			Mercury	- -	- -	- -	- -	Mercury	CNS	- -	- -	- -	- -
			(Total)	- -	- -	- -	- -	(Total)		- -	- -	7 6E-05	7 6E-05
			Total Risk Across Groundwater				- -	Total Hazard Index Across All Media and All Exposure Routes					7 6E-05
			Total Risk Across All Media and All Exposure Routes				- -						

Total Skin HI	- -
Total Liver HI	7 6E-05
Total Kidney HI	7 6E-05
Total CVS HI	- -
Total Fetus HI	- -
Total CNS HI	- -

TABLE 10.2
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Area A Landfill and Wetlands (Site 2)	Acetone	- -	- -	- -	- -	Acetone	Liver, Kidney	- -	- -	3.8E-05	3.8E-05
			Arsenic	- -	- -	- -	- -	Arsenic	Skin	- -	- -	- -	- -
			Barium	- -	- -	- -	- -	Barium	CVS, Fetus	- -	- -	- -	- -
			Mercury	- -	- -	- -	- -	Mercury	CNS	- -	- -	- -	- -
			(Total)	- -	- -	- -	- -	(Total)		- -	- -	3.8E-05	3.8E-05
			Total Risk Across Groundwater				- -	Total Hazard Index Across All Media and All Exposure Routes					3.8E-05
			Total Risk Across All Media and All Exposure Routes				- -						

Total Skin HI	- -
Total Liver HI	3.8E-05
Total Kidney HI	3.8E-05
Total CVS HI	- -
Total Fetus HI	- -
Total CNS HI	- -

AREA A DOWNSTREAM (SITE 3)

TABLE 1
SELECTION OF EXPOSURE PATHWAYS
AREA A DOWNSTREAM (SITE 3)
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current/Future	Groundwater	Groundwater	Overburden/Bedrock Aquifer	Construction Workers	Adult	Ingestion Dermal	On-Site On-Site	Quant Quant	Construction workers may have dermal contact with groundwater during excavation activities.
				Full-time Employees	Adult	Ingestion Dermal	On-Site On-Site	None None	Full-time employees are not exposed to groundwater.
				Trespassers	Adolescents	Ingestion Dermal	On-Site On-Site	None None	Trespassers do not have contact with groundwater.
				Residents	Adult	Ingestion Dermal	On-Site On-Site	Quant Quant	Groundwater may be used as a potable water source in the future.
					Child	Ingestion Dermal	On-Site On-Site	None None	Exposures to a child resident are less than those for an adult resident
		Air	Overburden/Bedrock Aquifer	Construction Workers	Adult	Inhalation	On-site	None	Construction workers exposure via volatilization is expected to be insignificant due to dilution with outdoor air.
				Full-time Employees	Adult	Inhalation	On-site	None	Full-time employees are not exposed to groundwater.
				Trespassers	Adolescents	Inhalation	On-Site	None	Trespassers do not have contact with site groundwater.
				Residents	Adult	Inhalation	On-site	Quant	On-site residents may be exposed to volatile emissions from groundwater while showering.
					Child	Inhalation	On-site	None	Exposures to a child resident are less than those for an adult resident

TABLE 2.1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
DIRECT CONTACT EXPOSURE SCENARIOS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Downstream (Site 3)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Risk-Based COPC Screening Level(5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection(6)
Volatile Organics																
67-64-1	ACETONE	27.8	J	28.9	J	ug/L	S3TW2201	1/4	5 - 13.4	28.9	NA	61 N	700 NA NA	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
67-66-3	CHLOROFORM	2.11		5.72		ug/L	S32DMW26S01	4/26	1	5.72	NA	0.16 C	6 80 100	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
156-59-2	CIS-1,2-DICHLOROETHENE	1.71		12.2		ug/L	S32DMW29S04	3/26	1	12.2	NA	6.1 N	70 70 70	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
79-01-6	TRICHLOROETHENE	1.88		8.76	J	ug/L	S32DMW28D01	9/26	1	8.76	NA	1.6 C	5 5 5	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
75-01-4	VINYL CHLORIDE	4.65		31.3		ug/L	S32DMW29S04	2/26	1	31.3	NA	0.041 C	2 2 2	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
Dissolved Gases																
74-84-0	ETHANE	12		12		ug/L	S32DMW29S04	1/18	2	12	NA	NA	NA NA NA	CTDEP RSR FED-MCL CTDEP-MCL	NO	NTX
74-85-1	ETHENE	13		13		ug/L	S32DMW29S04	1/18	3	13	NA	NA	NA NA NA	CTDEP RSR FED-MCL CTDEP-MCL	NO	NTX
74-82-8	METHANE	1		400	J	ug/L	S32DMW29S04	12/18	1 - 2	400	NA	NA	NA NA NA	CTDEP RSR FED-MCL CTDEP-MCL	NO	NTX
Semivolatile Organics																
106-44-5	4-METHYLPHENOL	2	J	2	J	ug/L	S32DMW26D01	1/17	5	2	NA	18 N	35 NA NA	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
120-12-7	ANTHRACENE	0.04	J	0.04	J	ug/L	S32DMW16S01	1/17	0.05	0.04	NA	180 N	2000 NA NA	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
56-55-3	BENZO(A)ANTHRACENE	0.06		0.06		ug/L	S32DMW30S01	1/17	0.05	0.06	NA	0.092 C	0.06 NA NA	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
50-32-8	BENZO(A)PYRENE	0.08		0.08		ug/L	S32DMW30S01	1/17	0.05	0.08	NA	0.0092 C	0.2 0.2 NA	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
205-99-2	BENZO(B)FLUORANTHENE	0.05	J	0.05	J	ug/L	S32DMW30S01	1/17	0.1	0.05	NA	0.092 C	0.08 NA NA	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
191-24-2	BENZO(G,H,I)PERYLENE	0.09	J	0.09	J	ug/L	S32DMW30S01	1/17	0.1	0.09	NA	18 (7) N	210 NA NA	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
207-08-9	BENZO(K)FLUORANTHENE	0.03	J	0.03	J	ug/L	S32DMW30S01	1/17	0.05	0.03	NA	0.92 C	0.5 NA NA	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
218-01-9	CHRYSENE	0.04	J	0.04	J	ug/L	S32DMW30S01	1/17	0.05	0.04	NA	9.2 C	4.8 NA NA	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
206-44-0	FLUORANTHENE	0.04	J	0.1		ug/L	S32DMW30S01	3/17	0.1	0.1	NA	150 N	280 NA NA	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
86-73-7	FLUORENE	0.04	J	0.04	J	ug/L	S32DMW16S01	1/17	0.1	0.04	NA	24 N	280 NA NA	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL

TABLE 2.1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
DIRECT CONTACT EXPOSURE SCENARIOS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Downstream (Site 3)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Risk-Based COPC Screening Level(5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection(6)
193-39-5	INDENO(1,2,3-CD)PYRENE	0.06		0.06		ug/L	S32DMW30S01	1/17	0.05	0.06	NA	0.092 C	0.5 NA NA	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
85-01-8	PHENANTHRENE	0.03	J	0.03	J	ug/L	S32DMW30S01	1/17	0.05	0.03	NA	18 (7) N	200 NA NA	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
129-00-0	PYRENE	0.06		0.13		ug/L	S32DMW30S01	2/17	0.05	0.13	NA	18 N	200 NA NA	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
Pesticides/PCBs																
72-54-8	4,4'-DDD	0.019	J	0.019	J	ug/L	S32DMW30S01	1/17	0.02	0.019	NA	0.28 C	NA NA NA	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
50-29-3	4,4'-DDT	0.034	J	0.034	J	ug/L	S32DMW30S01	1/17	0.02	0.034	NA	0.2 C	NA NA NA	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
Total Metals																
7429-90-5	ALUMINUM	517		983		ug/L	S32DMW23D01	3/18	50.5 - 338	983	3560	3600 N	NA 50-200 NA	CTDEP RSR FED-SMCL CTDEP-MCL	NO	EPAI, BKG
7440-38-2	ARSENIC	6.1		6.1		ug/L	S32DMW29S04	1/18	2.3	6.1	1.92	0.045 C	50 50 50	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
7440-39-3	BARIUM	26		170		ug/L	S32DMW28S01	8/18	4.1 - 48.5	170	227	260 N	1000 2000 2000	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL, BKG
7440-43-9	CADMIUM	0.71		0.71		ug/L	S32DMW28S01	1/18	0.25	0.71	ND	1.8 N	5 5 5	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
7440-70-2	CALCIUM	6550		155000		ug/L	S32DMW16D01	18/18	0	155000	188000	NA	NA NA NA	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT, BKG
7440-47-3	CHROMIUM	15.1		25.3		ug/L	S32DMW10D01	3/18	6.2	25.3	49.9	11 (8) N	NA 100 50	CTDEP RSR FED-MCL CTDEP-MCL	NO	BKG
7440-48-4	COBALT	4.5	J	8.9		ug/L	S32DMW30S01	4/18	4.2 - 6	8.9	48.6	220 N	NA NA NA	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL, BKG
7440-50-8	COPPER	12	J	12	J	ug/L	S32DMW30S01	1/18	6.8	12	107	140 N	1300 1300 NA	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL, BKG
7439-89-6	IRON	268		34600		ug/L	S32DMW16D01	14/18	37.2 - 270	34600	28200	1100 N	NA 300 NA	CTDEP RSR FED-SMCL CTDEP-MCL	NO	EPAI
7439-92-1	LEAD	1.9	J	6.5		ug/L	S32DMW25S01	5/18	1.8	6.5	6.63	NA	15 15 NA	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL, BKG
7439-95-4	MAGNESIUM	1240		23000		ug/L	S32DMW16D01	18/18	0	23000	191000	NA	NA NA NA	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT, BKG
7439-96-5	MANGANESE	50.9		2380		ug/L	S32DMW28D01	16/18	5.6 - 10.2	2380	11700	88 N	NA 50 NA	CTDEP RSR FED-SMCL CTDEP-MCL	NO	BKG
7440-02-0	NICKEL	16.1	J	26.4		ug/L	S32DMW10D01	3/18	9.2	26.4	32.2	73 N	100 NA 100	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL, BKG
7440-09-7	POTASSIUM	857		11600		ug/L	S32DMW16D01	18/18	0	11600	70800	NA	NA NA NA	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT, BKG

TABLE 2.1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
DIRECT CONTACT EXPOSURE SCENARIOS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Downstream (Site 3)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Risk-Based COPC Screening Level(5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection(6)
7440-22-4	SILVER	5.5	J	7.6	J	ug/L	S32DMW16D01	2/12	5.2	7.6	ND	18 N	36 100 50	CTDEP RSR FED-SMCL CTDEP-MCL	NO	BSL
7440-23-5	SODIUM	5700	J	298000	J	ug/L	S32DMW16D01	18/18	0	298000	1900000	NA	NA NA NA	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT, BKG
7440-28-0	THALLIUM	4.4	J	4.4	J	ug/L	S32DMW10D01	1/18	3	4.4	ND	0.24 N	5 2 2	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
7440-66-6	ZINC	17.4		73.9		ug/L	S32DMW27D01	5/18	4.6 - 28.6	73.9	131	1100 N	5000 5000 NA	CTDEP RSR FED-SMCL CTDEP-MCL	NO	BSL, BKG
Dissolved Metals																
7440-70-2	CALCIUM, FILTERED	12200		32500		ug/L	S32DMW16S01-F	2/2	0	32500	152000	NA	NA NA NA	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT, BKG
7440-47-3	CHROMIUM, FILTERED	8.3	J	8.3	J	ug/L	S32DMW16S01-F	1/2	6.2	8.3	16	11 (8) N	NA 100 50	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL, BKG
7440-48-4	COBALT, FILTERED	4.5	J	4.5	J	ug/L	S32DMW16S01-F	1/2	4.2	4.5	43.3	220 N	NA NA NA	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL, BKG
7440-50-8	COPPER, FILTERED	12.1	J	12.1	J	ug/L	S32DMW10D01-F	1/2	6.8	12.1	39.4	140 N	1300 1300 NA	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL, BKG
7439-89-6	IRON, FILTERED	430		8990		ug/L	S32DMW10D01-F	2/2	0	8990	25300	1100 N	NA 300 NA	CTDEP RSR FED-SMCL CTDEP-MCL	NO	EPAI
7439-95-4	MAGNESIUM, FILTERED	2320		6900		ug/L	S32DMW16S01-F	2/2	0	6900	150000	NA	NA NA NA	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT, BKG
7439-96-5	MANGANESE, FILTERED	320		783		ug/L	S32DMW16S01-F	2/2	0	783	9400	73 N	NA 50 NA	CTDEP RSR FED-MCL CTDEP-MCL	NO	BKG
7440-02-0	NICKEL, FILTERED	10.3	J	10.3	J	ug/L	S32DMW10D01-F	1/2	9.2	10.3	15.3	88 N	NA NA NA	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL, BKG
7440-09-7	POTASSIUM, FILTERED	2970		4000		ug/L	S32DMW16S01-F	2/2	0	4000	60000	NA	NA NA NA	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT, BKG
7440-23-5	SODIUM, FILTERED	25500	J	50400	J	ug/L	S32DMW16S01-F	2/2	0	50400	1580000	NA	NA NA NA	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT, BKG
7440-28-0	THALLIUM, FILTERED	3.2	J	3.2	J	ug/L	S32DMW16S01-F	1/2	3	3.2	ND	0.24 N	5 2 2	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
Miscellaneous Parameters																
E-14506	ALKALINITY	10.5	J	209		mg/L	S32DMW16D01	18/18	0	209	1950	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BKG
7664-41-7	AMMONIA	0.11	J	1.04	J	mg/L	S32DMW24S01	16/18	0	1.04	ND	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NTX
000-02-0	CHLORIDE	6.17		495		mg/L	S32DMW16D01	18/18	0	495	4540	N/A	N/A 250 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	BKG
E-11778	HARDNESS as CaCO3	22.7		482		mg/L	S32DMW16D01	17/18	2	482	ND	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NTX

TABLE 2.1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
DIRECT CONTACT EXPOSURE SCENARIOS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Downstream (Site 3)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Risk-Based COPC Screening Level(5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection(6)
14808-79-8	SULFATE	6.25		70.3		mg/L	S32DMW11S01	18/18	0	70.3	45.2	N/A	N/A 250 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	BSL
000-09-0	TOTAL DISSOLVED SOLIDS	55	J	1688	J	mg/L	S32DMW16D01	18/18	0	1688	6260	N/A	N/A 500 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	BKG
	TOTAL ORGANIC CARBON	1.1		18		mg/L	S32DMW29S04	18/18	0	18	37.7	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NTX
000-08-9	TOTAL SUSPENDED SOLIDS	5	J	751		mg/L	S32DMW30S01	10/18	5	751	236	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NTX

A shaded value indicates that the concentration used for screening exceeds the criterion or background value.
A shaded chemical name indicates that the chemical has been selected as a COPC .

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 95% Upper Tolerance Limit (UTL) of site background data
5 The risk-based COPC screening level for tap water use is presented. The value is based on a target hazard quotient of 0.1 for noncarcinogens (denoted with a "N" flag) or an incremental cancer risk of 1E-6 for carcinogens (denoted with a "C" flag) (USEPA, Region IX, November 2000).
6 The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level and/or an ARAR/TBC(s).
7 Pyrene is used as a surrogate for phenanthrene.
8 Value is for hexavalent chromium.

Associated Samples:
S18TW0201
S18TW0201-D
S18TW0401

Definitions:
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogen
COC = Chemical of Concern
J = Estimated Value
N = Noncarcinogen
N/A = Not Applicable.
FED-MCL = Federal Maximum Contaminant Level (USEPA, August 2000)
FED-SMCL = Federal Secondary Maximum Contaminant Level (USEPA, August 2000)
FED-AL = Federal Action Level (USEPA, August 2000)
CTDEP-RSR = Connecticut DEP Remediation Standard Regulations, 1996.
CTDEP-MCL = Connecticut Maximum Contaminant Level

Rationale Codes:
For Selection as a COC:
ASL = Above COC Screening Level/ARAR/TBC

For Elimination as a COC:
BKG = Within Background Levels
BSL = Below COC Screening Level/ARAR/TBC
NUT = Essential Nutrient
NTX = No Toxicity Information
EPAI = USEPA Region one does not advocate evaluation of this chemical.

TABLE 2.2
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
MIGRATION PATHWAYS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Downstream (Site 3)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Surface Water Protection Criteria(5)	Volatilization Criteria(6)	COPC Flag	Rationale for Contaminant Deletion or Selection(7)
Volatile Organics															
67-64-1	ACETONE	27.8	J	29	J	ug/L	S3TW2201	1/4	5 - 13.4	29	NA	NA	50000	NO	BSL
67-66-3	CHLOROFORM	2.11		5.72		ug/L	S32DMW26S01	4/26	1	5.72	NA	14100	287	NO	BSL
156-59-2	CIS-1,2-DICHLOROETHENE	1.71		12.2		ug/L	S32DMW29S04	3/26	1	12.2	NA	NA	NA	NO	NTX
79-01-6	TRICHLOROETHENE	1.88		9	J	ug/L	S32DMW28D01	9/26	1	9	NA	2340	219	NO	BSL
75-01-4	VINYL CHLORIDE	4.65		31.3		ug/L	S32DMW29S04	2/26	1	31.3	NA	15750	2	YES	ASL
Dissolved Gases															
74-84-0	ETHANE	12		12		ug/L	S32DMW29S04	1/18	2	12	NA	NA	NA	NO	NTX
74-85-1	ETHENE	13		13		ug/L	S32DMW29S04	1/18	3	13	NA	NA	NA	NO	NTX
74-82-8	METHANE	1		400	J	ug/L	S32DMW29S04	12/18	1 - 2	400	NA	NA	NA	NO	NTX
Semivolatile Organics															
106-44-5	4-METHYLPHENOL	2	J	2	J	ug/L	S32DMW26D01	1/17	5	2	NA	NA	NA	NO	NTX
120-12-7	ANTHRACENE	0.04	J	0.04	J	ug/L	S32DMW16S01	1/17	0.05	0.04	NA	1100000	NA	NO	BSL
56-55-3	BENZO(A)ANTHRACENE	0.06		0.06		ug/L	S32DMW30S01	1/17	0.05	0.06	NA	0.3	NA	NO	BSL
50-32-8	BENZO(A)PYRENE	0.08		0.08		ug/L	S32DMW30S01	1/17	0.05	0.08	NA	0.3	NA	NO	BSL
205-99-2	BENZO(B)FLUORANTHENE	0.05	J	0.05	J	ug/L	S32DMW30S01	1/17	0.1	0.05	NA	0.3	NA	NO	BSL
191-24-2	BENZO(G,H,I)PERYLENE	0.09	J	0.09	J	ug/L	S32DMW30S01	1/17	0.1	0.09	NA	NA	NA	NO	NTX
207-08-9	BENZO(K)FLUORANTHENE	0.03	J	0.03	J	ug/L	S32DMW30S01	1/17	0.05	0.03	NA	0.3	NA	NO	BSL
218-01-9	CHRYSENE	0.04	J	0.04	J	ug/L	S32DMW30S01	1/17	0.05	0.04	NA	NA	NA	NO	NTX
206-44-0	FLUORANTHENE	0.04	J	0.10		ug/L	S32DMW30S01	3/17	0.1	0.1	NA	3700	NA	NO	BSL
86-73-7	FLUORENE	0.04	J	0.04	J	ug/L	S32DMW16S01	1/17	0.1	0.04	NA	140000	NA	NO	BSL
193-39-5	INDENO(1,2,3-CD)PYRENE	0.06		0.06		ug/L	S32DMW30S01	1/17	0.05	0.06	NA	NA	NA	NO	NTX
85-01-8	PHENANTHRENE	0.03	J	0.03	J	ug/L	S32DMW30S01	1/17	0.05	0.03	NA	0.3	NA	NO	BSL
129-00-0	PYRENE	0.06		0.13		ug/L	S32DMW30S01	2/17	0.05	0.13	NA	110000	NA	NO	BSL
Pesticides/PCBs															
72-54-8	4,4'-DDD	0.019	J	0.019	J	ug/L	S32DMW30S01	1/17	0.02	0	NA	NA	NA	NO	NTX
50-29-3	4,4'-DDT	0.034	J	0.034	J	ug/L	S32DMW30S01	1/17	0.02	0.034	NA	NA	NA	NO	NTX
Total Metals															
7429-90-5	ALUMINUM	517		983		ug/L	S32DMW23D01	3/18	50.5 - 338	983	3560	NA	NA	NO	BKG
7440-38-2	ARSENIC	6.1		6.1		ug/L	S32DMW29S04	1/18	2.3	6.1	1.92	4	NA	YES	ASL
7440-39-3	BARIUM	26		170		ug/L	S32DMW28S01	8/18	4.1 - 48.5	170	227	NA	NA	NO	BKG
7440-43-9	CADMIUM	0.71		1		ug/L	S32DMW28S01	1/18	0.25	0.71	ND	6	NA	NO	BKG
7440-70-2	CALCIUM	6550		155000		ug/L	S32DMW16D01	18/18	0	155000	188000	NA	NA	NO	BKG
7440-47-3	CHROMIUM	15.1		25.3		ug/L	S32DMW10D01	3/18	6.2	25.3	49.9	110	NA	NO	BSL
7440-48-4	COBALT	4.5	J	9		ug/L	S32DMW30S01	4/18	4.2 - 6	8.9	48.6	NA	NA	NO	NTX
7440-50-8	COPPER	12	J	12	J	ug/L	S32DMW30S01	1/18	6.8	12	107	48	NA	NO	BSL
7439-89-6	IRON	268		34,600		ug/L	S32DMW16D01	14/18	37.2 - 270	34600	28200	NA	NA	NO	NTX
7439-92-1	LEAD	1.9	J	6.5		ug/L	S32DMW25S01	5/18	1.8	6.5	6.63	13	NA	NO	BSL, BKG
7439-95-4	MAGNESIUM	1240		23,000		ug/L	S32DMW16D01	18/18	0	23000	191000	NA	NA	NO	BKG
7439-96-5	MANGANESE	50.9		2380		ug/L	S32DMW28D01	16/18	5.6 - 10.2	2380	11700	NA	NA	NO	BKG
7440-02-0	NICKEL	16.1	J	26.4		ug/L	S32DMW10D01	3/18	9.2	26.4	32.2	880	NA	NO	BSL, BKG
7440-09-7	POTASSIUM	857		11,600		ug/L	S32DMW16D01	18/18	0	11600	70800	NA	NA	NO	BKG
7440-22-4	SILVER	5.5	J	7.6	J	ug/L	S32DMW16D01	2/12	5.2	7.6	ND	12	NA	NO	BSL
7440-23-5	SODIUM	5700	J	298000	J	ug/L	S32DMW16D01	18/18	0	298000	1900000	NA	NA	NO	BKG
7440-28-0	THALLIUM	4.4	J	4	J	ug/L	S32DMW10D01	1/18	3	4.4	ND	63	NA	NO	BSL
7440-66-6	ZINC	17		74		ug/L	S32DMW27D01	5/18	4.6 - 28.6	73.9	131	123	NA	NO	BSL, BKG
Dissolved Metals															
7440-70-2	CALCIUM, FILTERED	12200		32,500		ug/L	S32DMW16S01-F	2/2	0	32500	152000	NA	NA	NO	BKG
7440-47-3	CHROMIUM, FILTERED	8.3	J	8.3	J	ug/L	S32DMW16S01-F	1/2	6.2	8.3	16	110	NA	NO	BSL, BKG
7440-48-4	COBALT, FILTERED	4.5	J	4.5	J	ug/L	S32DMW16S01-F	1/2	4.2	4.5	43.3	NA	NA	NO	BKG
7440-50-8	COPPER, FILTERED	12.1	J	12	J	ug/L	S32DMW10D01-F	1/2	6.8	12.1	39.4	48	NA	NO	BSL, BKG
7439-89-6	IRON, FILTERED	430		8990		ug/L	S32DMW10D01-F	2/2	0	8990	25300	NA	NA	NO	BKG
7439-95-4	MAGNESIUM, FILTERED	2320		6900		ug/L	S32DMW16S01-F	2/2	0	6900	150000	NA	NA	NO	BKG
7439-96-5	MANGANESE, FILTERED	320		783		ug/L	S32DMW16S01-F	2/2	0	783	9400	NA	NA	NO	BKG

TABLE 2.2
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
MIGRATION PATHWAYS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Downstream (Site 3)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Surface Water Protection Criteria(5)	Volatilization Criteria(6)	COPC Flag	Rationale for Contaminant Deletion or Selection(7)
7440-02-0	NICKEL, FILTERED	10	J	10	J	ug/L	S32DMW10D01-F	1/2	9.2	10.3	15.3	880	NA	NO	BSL, BKG
7440-09-7	POTASSIUM, FILTERED	2970		4000		ug/L	S32DMW16S01-F	2/2	0	4000	60000	NA	NA	NO	BKG
7440-23-5	SODIUM, FILTERED	25500	J	50,400	J	ug/L	S32DMW16S01-F	2/2	0	50400	1580000	NA	NA	NO	BKG
7440-28-0	THALLIUM, FILTERED	3	J	3	J	ug/L	S32DMW16S01-F	1/2	3	3.2	ND	63	NA	NO	BSL
Miscellaneous Parameters															
E-14506	ALKALINITY	11	J	209		mg/L	S32DMW16D01	18/18	0	209	1950	NA	NA	NO	BKG
7664-41-7	AMMONIA	0	J	1	J	mg/L	S32DMW24S01	16/18	0	1.04	ND	NA	NA	NO	NTX
000-02-0	CHLORIDE	6		495		mg/L	S32DMW16D01	18/18	0	495	4540	NA	NA	NO	BKG
E-11778	HARDNESS as CaCO3	23		482		mg/L	S32DMW16D01	17/18	2	482	ND	NA	NA	NO	NTX
14808-79-8	SULFATE	6		70		mg/L	S32DMW11S01	18/18	0	70.3	45.2	NA	NA	NO	NTX
000-09-0	TOTAL DISSOLVED SOLIDS	55	J	1,688	J	mg/L	S32DMW16D01	18/18	0	1688	6260	NA	NA	NO	BKG
	TOTAL ORGANIC CARBON	1		18		mg/L	S32DMW29S04	18/18	0	18	37.7	NA	NA	NO	BKG
000-08-9	TOTAL SUSPENDED SOLIDS	5	J	751		mg/L	S32DMW30S01	10/18	5	751	236	NA	NA	NO	NTX

A shaded value indicates that the concentration used for screening exceeds the criterion or background value.
A shaded chemical name indicates that the chemical has been selected as a COPC .

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 95% Upper Tolerance Limit (UTL) of site background data
5 Connecticut DEP Surface Water Protection criteria.
6 Connecticut DEP Volatilization criteria for residential exposures.
7 The chemical is selected as a COPC if the maximum detected concentration exceeds the CTDEP surface water protection or volatilization criteria.

Associated Samples:
S18TW0201
S18TW0201-D
S18TW0401

Definitions:
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogen
COC = Chemical of Concern
J = Estimated Value
N = Noncarcinogen
NA = Not Applicable.

Rationale Codes:
For Selection as a COPC:
ASL = Above COPC Screening Level/ARAR/TBC

For Elimination as a COPC:
BKG = Within Background Levels
BSL = Below COPC Screening Level/ARAR/TBC
NTX = No Toxicity Information

TABLE 3.1
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
AREA A DOWNSTREAM (SITE 3)
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Downstream (Site 3)

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency Exposure		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Chloroform	ug/L	0.978	1.40	5.72		ug/L	5.72	max	1	0.978	average	1
cis-1,2-Dichloroethene	ug/L	1.10	1.89	12.2		ug/L	12.2	max	1	1.10	average	1
Trichloroethene	ug/L	1.77	2.50	8.76	J	ug/L	8.76	max	1	1.77	average	1
Vinyl Chloride	ug/L	1.84	3.88	31.3		ug/L	31.3	max	1	1.84	average	1
Benzo(a)pyrene	ug/L	0.028	0.034	0.08		ug/L	0.08	max	1	0.028	average	1
Arsenic	ug/L	1.43	1.90	6.1		ug/L	6.10	max	1	1.43	average	1
Thallium	ug/L	1.66	1.94	4.4	J	ug/L	4.40	max	1	1.66	average	1

Notes:
[1] - The maximum detected and average concentration is used for the RME and CTE sceanrios, respectively per EPA Region I guidance.

TABLE 4.1
VALUES USED FOR DAILY INTAKE CALCULATIONS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Downstream (Site 3)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Dermal	DAevent	Absorbed dose per event	mg/cm2-event	See Text	See Text	See Text	See Text	Dermally Absorbed Dose (mg/kg/day)
	SA	Skin Surface Available for Contact	cm2	3800	EPA, 1992	3800	EPA, 1992	$= \frac{DAevent \times EV \times EF \times ED \times SA}{BW \times AT}$
	EV	Event Frequency	events/day	1	EPA, 1994	1	EPA, 1994	
	ET	Exposure Time	hours/event	4	(1)	2	(1)	
	EF	Exposure Frequency	days/year	20	Atlantic, 1992	10	Atlantic, 1992	
	ED	Exposure Duration	years	1	Atlantic, 1992	1	Atlantic, 1992	See text for calculation of DAevent.
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	365	EPA, 1989	365	EPA, 1989	

Notes:
(1) - Professinal judgement.
Sources:
EPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.
EPA, 1992: Dermal Exposure Assessment: Principles and Applications.
EPA, 1994: US EPA Region I Risk Updates, Number 2.
EPA, 1998: Risk Assessment Guidance for Superfund, Supplemental Guidance, Dermal Risk Assessment, Interim Guidance.
Atlantic 1992: Phase I Remedial Investigation Naval Submarine Base - New London, Connecticut, August.

TABLE 4.2
VALUES USED FOR DAILY INTAKE CALCULATIONS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Downstream (Site 3)
Receptor Population: Adult Residnts
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CGW	Chemical Concentration in Groundwater	mg/L	Maximum	EPA, 1994	Average	EPA, 1994	Chronic Daily Intake (CDI) (mg/kg/day) =
	IR-GW	Ingestion Rate of Groundwater	L/day	2	EPA, 1994	1.4	EPA, 1994	
	EF	Exposure Frequency	days/year	350	EPA, 1994	234	EPA, 1994	$\frac{CW \times IRGW \times EF \times ED}{BW \times AT}$
	ED	Exposure Duration	years	30	EPA, 1994	9	EPA, 1994	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	10,950	EPA, 1989	3,285	EPA, 1989	
Dermal	DAevent	Absorbed dose per event	mg/cm2-event	See Text	See Text	See Text	See Text	Dermally Absorbed Dose (mg/kg/day)
	SA	Skin Surface Available for Contact	cm2	20,000	EPA, 1992	20,000	EPA, 1992	
	EV	Event Frequency	events/day	1	EPA, 1994	1	EPA, 1994	$= \frac{DAevent \times EV \times EF \times ED \times SA}{BW \times AT}$
	ET	Exposure Time	hours/event	0.25	EPA, 1992	0.167	EPA, 1992	
	EF	Exposure Frequency	days/year	350	EPA, 1994	.234	EPA, 1994	
	ED	Exposure Duration	years	30	EPA, 1994	9	EPA, 1994	See text for calculation of DAevent.
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	10,950	EPA, 1989	3,285	EPA, 1989	

Notes:
(1) - Professinal judgement.
Sources:
EPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.
EPA, 1992: Dermal Exposure Assessment: Principles and Applications.
EPA, 1994: US EPA Region I Risk Updates, Number 2.
EPA, 1998: Risk Assessment Guidance for Superfund, Supplemental Guidance, Dermal Risk Assessment, Interim Guidance.

TABLE 5.1
NON-CANCER TOXICITY DATA – ORAL/DERMAL
NSB-NLON, GROTON, CONNECTICUT

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal RfD (2)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ (3) (MM/DD/YY)
Volatile Organic Compounds										
cis-1,2-Dichloroethene	Chronic	1.0E-02	mg/kg/day	100%	1.0E-02	mg/kg/day	Blood	3000	HEAST	7/97
	Subchronic	1.0E-01	mg/kg/day	100%	1.0E-01	mg/kg/day	Blood	300	HEAST	7/97
Chloroform	Chronic	1.0E-02	mg/kg/day	100%	1.0E-02	mg/kg/day	Liver	1000/1	IRIS	01/02/01
	Subchronic	1.0E-02	mg/kg/day	100%	1.0E-02	mg/kg/day	Liver	1000	HEAST	7/97
Trichloroethene	Chronic	6.0E-03	mg/kg/day	100%	6.0E-03	mg/kg/day	Liver	NA	EPA IX	11/1/00
	Subchronic	6.0E-03	mg/kg/day	100%	6.0E-03	mg/kg/day	Liver	NA	Chronic	11/1/00
Vinyl Chloride	Chronic	3.0E-03	mg/kg/day	100%	3.0E-03	mg/kg/day	Liver	30/1	IRIS	01/02/01
	Subchronic	3.0E-03	mg/kg/day	100%	3.0E-03	mg/kg/day	Liver	30/1	Chronic	01/02/01
Semivolatile Organic Compounds										
Benzo(a)pyrene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics										
Arsenic	Chronic	3.0E-04	mg/kg/day	100%	3.0E-04	mg/kg/day	Skin	3/1	IRIS	01/02/01
	Subchronic	3.0E-04	mg/kg/day	100%	3.0E-04	mg/kg/day	Skin	3	HEAST	7/97
Thallium	Chronic	7.0E-05	mg/kg/day	100%	7.0E-05	mg/kg/day	None Specified	NA	EPA IX	11/1/00
	Subchronic	7.0E-05	mg/kg/day	100%	7.0E-05	mg/kg/day	None Specified	NA	Chronic	11/1/00

Notes:

(1) - USEPA 1998.

(2) - RfDdermal = RfDoral x Oral to Dermal Adjustment Factor.

(3) For IRIS values date that IRIS was searched.
For HEAST values, the date of HEAST.
FOR EPA IX, date of PRG Table.

(4) - Naphthalene is used as a surrogate.

NA = Not Applicable.

IRIS = Integrated Risk Information System.

HEAST= Health Effects Assessment Summary Tables.

EPA IX = USEPA Region IX Preliminary Remediation Goals Table, November 1, 2000.

Chronic = No subchronic value available, chronic value is presented.

TABLE 6.1
CANCER TOXICITY DATA -- ORAL/DERMAL
NSB-NLON, GROTON, CONNECTICUT

Chemical of Potential Concern	Oral Cancer Slope Factor	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal Cancer Slope Factor (2)	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (3) (MM/DD/YY)
Volatile Organic Compounds							
cis-1,2-Dichloroethene	NA	NA	NA	NA	D	IRIS	01/02/01
Chloroform	6.1E-03	100%	6.1E-03	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	01/02/01
Trichloroethene	1.1E-02	100%	1.1E-02	$(mg/kg\text{-}day)^{-1}$	NA	EPA IX	11/01/00
Vinyl Chloride	7.2E-01	100%	7.2E-01	$(mg/kg\text{-}day)^{-1}$	A	IRIS	01/02/01
Semivolatile Organic Compounds							
Benzo(a)pyrene	7.3E+00	100%	7.3E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	01/02/01
Inorganics							
Arsenic	1.5E+00	100%	1.5E+00	$(mg/kg\text{-}day)^{-1}$	A	IRIS	01/02/01
Thallium	NA	NA	NA	NA	D	IRIS	01/02/01

Notes:

IRIS = Integrated Risk Information System

(1) - USEPA 1998.

(2) - CSFdermal = CSForal/Oral to Dermal Adjustment Factor.

(3) - For IRIS values, the date IRIS was searched.

NA = Not Applicable

IRIS = Integrated Risk Information System

EPA Group:

A - Human carcinogen

B1 - Probable human carcinogen - indicates that limited human data are available

B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans

C - Possible human carcinogen

D - Not classifiable as a human carcinogen

E - Evidence of noncarcinogenicity

TABLE 7.1
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Downstream (Site 3)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Chloroform	5.72	ug/L	5.72	ug/L	M	5.9E-07	mg/kg/day	1.0E-02	mg/kg/day	N/A	N/A	5.9E-05
	cis-1,2-Dichloroethene	12.2	ug/L	12.2	ug/L	M	2.2E-06	mg/kg/day	1.0E-02	mg/kg/day	N/A	N/A	2.2E-04
	Trichloroethene	8.76	ug/L	8.76	ug/L	M	1.6E-06	mg/kg/day	6.0E-03	mg/kg/day	N/A	N/A	2.6E-04
	Vinyl Chloride	31.3	ug/L	31.3	ug/L	M	2.4E-06	mg/kg/day	3.0E-03	mg/kg/day	N/A	N/A	7.9E-04
	Benzo(a)pyrene	0.080	ug/L	0.080	ug/L	M	1.6E-06	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Arsenic	6.10	ug/L	6.10	ug/L	M	0.0E+00	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	- -
	Thallium	4.40	ug/L	4.40	ug/L	M	0.0E+00	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	- -
	(Total)												1.3E-03
												Total Hazard Index Across All Exposure Routes/Pathways	1.3E-03

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Subchronic.

TABLE 7.2
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Downstream (Site 3)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Chloroform	0.978	ug/L	0.978	ug/L	M	3.0E-07	mg/kg/day	1.0E-02	mg/kg/day	N/A	N/A	3.0E-05
	cis-1,2-Dichloroethene	1.10	ug/L	1.10	ug/L	M	1.1E-06	mg/kg/day	1.0E-02	mg/kg/day	N/A	N/A	1.1E-04
	Trichloroethene	1.77	ug/L	1.77	ug/L	M	7.9E-07	mg/kg/day	6.0E-03	mg/kg/day	N/A	N/A	1.3E-04
	Vinyl Chloride	1.84	ug/L	1.84	ug/L	M	1.2E-06	mg/kg/day	3.0E-03	mg/kg/day	N/A	N/A	3.9E-04
	Benzo(a)pyrene	0.028	ug/L	0.028	ug/L	M	8.2E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Arsenic	1.43	ug/L	1.43	ug/L	M	0.0E+00	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	- -
	Thallium	1.66	ug/L	1.66	ug/L	M	0.0E+00	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	- -
	(Total)												6.7E-04
												Total Hazard Index Across All Exposure Routes/Pathways	6.7E-04

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Subchronic.

TABLE 7.3
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Downstream (Site 3)
Receptor Population: Adult Residnts
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Chloroform	5.72	ug/L	5.72	ug/L	M	1.6E-04	mg/kg/day	1.0E-02	mg/kg/day	N/A	N/A	1.6E-02
	cis-1,2-Dichloroethene	12.2	ug/L	12.2	ug/L	M	3.3E-04	mg/kg/day	1.0E-02	mg/kg/day	N/A	N/A	3.3E-02
	Trichloroethene	8.76	ug/L	8.76	ug/L	M	2.4E-04	mg/kg/day	6.0E-03	mg/kg/day	N/A	N/A	4.0E-02
	Vinyl Chloride	31.3	ug/L	31.3	ug/L	M	8.6E-04	mg/kg/day	3.0E-03	mg/kg/day	N/A	N/A	2.9E-01
	Benzo(a)pyrene	0.080	ug/L	0.080	ug/L	M	2.2E-06	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Arsenic	6.10	ug/L	6.10	ug/L	M	1.7E-04	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	5.6E-01
	Thallium	4.40	ug/L	4.40	ug/L	M	1.2E-04	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	1.7E+00
													2.7E+00
Dermal	Chloroform	5.72	ug/L	5.72	ug/L	M	1.1E-05	mg/kg/day	1.0E-02	mg/kg/day	N/A	N/A	1.1E-03
	cis-1,2-Dichloroethene	12.2	ug/L	12.2	ug/L	M	3.8E-05	mg/kg/day	1.0E-02	mg/kg/day	N/A	N/A	3.8E-03
	Trichloroethene	8.76	ug/L	8.76	ug/L	M	3.1E-05	mg/kg/day	6.0E-03	mg/kg/day	N/A	N/A	5.1E-03
	Vinyl Chloride	31.3	ug/L	31.3	ug/L	M	3.3E-05	mg/kg/day	3.0E-03	mg/kg/day	N/A	N/A	1.1E-02
	Benzo(a)pyrene	0.080	ug/L	0.080	ug/L	M	3.8E-05	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Arsenic	6.10	ug/L	6.10	ug/L	M	0.0E+00	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	- -
	Thallium	4.40	ug/L	4.40	ug/L	M	0.0E+00	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	- -
	(Total)												2.1E-02
												Total Hazard Index Across All Exposure Routes/Pathways	2.7E+00

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Chronic.

TABLE 7.4
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Downstream (Site 3)
Receptor Population: Adult Residnts
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Chloroform	0.978	ug/L	0.978	ug/L	M	1.3E-05	mg/kg/day	1.0E-02	mg/kg/day	N/A	N/A	1.3E-03
	cis-1,2-Dichloroethene	1.10	ug/L	1.10	ug/L	M	1.4E-05	mg/kg/day	1.0E-02	mg/kg/day	N/A	N/A	1.4E-03
	Trichloroethene	1.77	ug/L	1.77	ug/L	M	2.3E-05	mg/kg/day	6.0E-03	mg/kg/day	N/A	N/A	3.8E-03
	Vinyl Chloride	1.84	ug/L	1.84	ug/L	M	2.4E-05	mg/kg/day	3.0E-03	mg/kg/day	N/A	N/A	7.9E-03
	Benzo(a)pyrene	0.028	ug/L	0.028	ug/L	M	3.6E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Arsenic	1.43	ug/L	1.43	ug/L	M	1.8E-05	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	6.1E-02
	Thallium	1.66	ug/L	1.66	ug/L	M	2.1E-05	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	3.0E-01
													3.8E-01
Dermal	Chloroform	0.978	ug/L	0.978	ug/L	M	7.2E-06	mg/kg/day	1.0E-02	mg/kg/day	N/A	N/A	7.2E-04
	cis-1,2-Dichloroethene	1.10	ug/L	1.10	ug/L	M	2.5E-05	mg/kg/day	1.0E-02	mg/kg/day	N/A	N/A	2.5E-03
	Trichloroethene	1.77	ug/L	1.77	ug/L	M	2.0E-05	mg/kg/day	6.0E-03	mg/kg/day	N/A	N/A	3.4E-03
	Vinyl Chloride	1.84	ug/L	1.84	ug/L	M	2.2E-05	mg/kg/day	3.0E-03	mg/kg/day	N/A	N/A	7.4E-03
	Benzo(a)pyrene	0.028	ug/L	0.028	ug/L	M	2.5E-05	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Arsenic	1.43	ug/L	1.43	ug/L	M	0.0E+00	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	- -
	Thallium	1.66	ug/L	1.66	ug/L	M	0.0E+00	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	- -
	(Total)												1.4E-02
												Total Hazard Index Across All Exposure Routes/Pathways	3.9E-01

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Chronic.

TABLE 8.1
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Downstream (Site 3)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Chloroform	5.72	ug/L	5.72	ug/L	M	8.4E-09	mg/kg/day	6.1E-03	(mg/kg/day) -1	5.2E-11
	cis-1,2-Dichloroethene	12.2	ug/L	12.2	ug/L	M	3.2E-08	mg/kg/day	NA	(mg/kg/day) -1	- -
	Trichloroethene	8.76	ug/L	8.76	ug/L	M	2.3E-08	mg/kg/day	1.1E-02	(mg/kg/day) -1	2.5E-10
	Vinyl Chloride	31.3	ug/L	31.3	ug/L	M	3.4E-08	mg/kg/day	7.2E-01	(mg/kg/day) -1	2.4E-08
	Benzo(a)pyrene	0.080	ug/L	0.080	ug/L	M	2.4E-08	mg/kg/day	7.3E+00	(mg/kg/day) -1	1.7E-07
	Arsenic	6.10	ug/L	6.10	ug/L	M	0.0E+00	mg/kg/day	1.5E+00	(mg/kg/day) -1	0.0E+00
	Thallium	4.40	ug/L	4.40	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										2.0E-07
										Total Risk Across All Exposure Routes/Pathways	2.0E-07

(1) Medium-Specific (M) EPC selected for risk calculation.

TABLE 8.2
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Downstream (Site 3)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Chloroform	0.978	ug/L	0.978	ug/L	M	4.4E-10	mg/kg/day	6.1E-03	(mg/kg/day) -1	2.7E-12
	cis-1,2-Dichloroethene	1.10	ug/L	1.10	ug/L	M	8.5E-10	mg/kg/day	NA	(mg/kg/day) -1	- -
	Trichloroethene	1.77	ug/L	1.77	ug/L	M	1.4E-09	mg/kg/day	1.1E-02	(mg/kg/day) -1	1.6E-11
	Vinyl Chloride	1.84	ug/L	1.84	ug/L	M	5.5E-10	mg/kg/day	7.2E-01	(mg/kg/day) -1	4.0E-10
	Benzo(a)pyrene	0.028	ug/L	0.028	ug/L	M	2.9E-09	mg/kg/day	7.3E+00	(mg/kg/day) -1	2.1E-08
	Arsenic	1.43	ug/L	1.43	ug/L	M	0.0E+00	mg/kg/day	1.5E+00	(mg/kg/day) -1	0.0E+00
	Thallium	1.66	ug/L	1.66	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										2.2E-08
										Total Risk Across All Exposure Routes/Pathways	2.2E-08

(1) Medium-Specific (M) EPC selected for risk calculation.

TABLE 8.3
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Downstream (Site 3)
Receptor Population: Adult Residnts
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Chloroform	5.72	ug/L	5.72	ug/L	M	6.7E-05	mg/kg/day	6.1E-03	(mg/kg/day) -1	4.1E-07
	cis-1,2-Dichloroethene	12.2	ug/L	12.2	ug/L	M	1.4E-04	mg/kg/day	NA	(mg/kg/day) -1	- -
	Trichloroethene	8.76	ug/L	8.76	ug/L	M	1.0E-04	mg/kg/day	1.1E-02	(mg/kg/day) -1	1.1E-06
	Vinyl Chloride	31.3	ug/L	31.3	ug/L	M	3.7E-04	mg/kg/day	7.2E-01	(mg/kg/day) -1	2.6E-04
	Benzo(a)pyrene	0.080	ug/L	0.080	ug/L	M	9.4E-07	mg/kg/day	7.3E+00	(mg/kg/day) -1	6.9E-06
	Arsenic	6.10	ug/L	6.10	ug/L	M	7.2E-05	mg/kg/day	1.5E+00	(mg/kg/day) -1	1.1E-04
	Thallium	4.40	ug/L	4.40	ug/L	M	5.2E-05	mg/kg/day	NA	(mg/kg/day) -1	- -
											3.8E-04
Dermal	Chloroform	5.72	ug/L	5.72	ug/L	M	4.6E-06	mg/kg/day	6.1E-03	(mg/kg/day) -1	2.8E-08
	cis-1,2-Dichloroethene	12.2	ug/L	12.2	ug/L	M	1.6E-05	mg/kg/day	NA	(mg/kg/day) -1	- -
	Trichloroethene	8.76	ug/L	8.76	ug/L	M	1.3E-05	mg/kg/day	1.1E-02	(mg/kg/day) -1	1.4E-07
	Vinyl Chloride	31.3	ug/L	31.3	ug/L	M	1.4E-05	mg/kg/day	7.2E-01	(mg/kg/day) -1	1.0E-05
	Benzo(a)pyrene	0.080	ug/L	0.080	ug/L	M	1.6E-05	mg/kg/day	7.3E+00	(mg/kg/day) -1	1.2E-04
	Arsenic	6.10	ug/L	6.10	ug/L	M	0.0E+00	mg/kg/day	1.5E+00	(mg/kg/day) -1	0.0E+00
	Thallium	4.40	ug/L	4.40	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										1.3E-04
										Total Risk Across All Exposure Routes/Pathways	5.1E-04

(1) Medium-Specific (M) EPC selected for risk calculation.

TABLE 8.4
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Downstream (Site 3)
Receptor Population: Adult Residnts
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Chloroform	0.978	ug/L	0.978	ug/L	M	1.6E-06	mg/kg/day	6.1E-03	(mg/kg/day) -1	9.8E-09
	cis-1,2-Dichloroethene	1.10	ug/L	1.10	ug/L	M	1.8E-06	mg/kg/day	NA	(mg/kg/day) -1	- -
	Trichloroethene	1.77	ug/L	1.77	ug/L	M	2.9E-06	mg/kg/day	1.1E-02	(mg/kg/day) -1	3.2E-08
	Vinyl Chloride	1.84	ug/L	1.84	ug/L	M	3.0E-06	mg/kg/day	7.2E-01	(mg/kg/day) -1	2.2E-06
	Benzo(a)pyrene	0.028	ug/L	0.028	ug/L	M	4.7E-08	mg/kg/day	7.3E+00	(mg/kg/day) -1	3.4E-07
	Arsenic	1.43	ug/L	1.43	ug/L	M	2.3E-06	mg/kg/day	1.5E+00	(mg/kg/day) -1	3.5E-06
	Thallium	1.66	ug/L	1.66	ug/L	M	2.7E-06	mg/kg/day	NA	(mg/kg/day) -1	- -
											6.1E-06
Dermal	Chloroform	0.978	ug/L	0.978	ug/L	M	1.3E-07	mg/kg/day	6.1E-03	(mg/kg/day) -1	7.9E-10
	cis-1,2-Dichloroethene	1.10	ug/L	1.10	ug/L	M	2.4E-07	mg/kg/day	NA	(mg/kg/day) -1	- -
	Trichloroethene	1.77	ug/L	1.77	ug/L	M	4.3E-07	mg/kg/day	1.1E-02	(mg/kg/day) -1	4.8E-09
	Vinyl Chloride	1.84	ug/L	1.84	ug/L	M	1.4E-07	mg/kg/day	7.2E-01	(mg/kg/day) -1	9.9E-08
	Benzo(a)pyrene	0.028	ug/L	0.028	ug/L	M	9.4E-07	mg/kg/day	7.3E+00	(mg/kg/day) -1	6.9E-06
	Arsenic	1.43	ug/L	1.43	ug/L	M	5.6E-09	mg/kg/day	1.5E+00	(mg/kg/day) -1	8.4E-09
	Thallium	1.66	ug/L	1.66	ug/L	M	6.5E-09	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										7.0E-06
										Total Risk Across All Exposure Routes/Pathways	1.3E-05

(1) Medium-Specific (M) EPC selected for risk calculation.

TABLE 9.1
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Area A Downstream (Site 3)	Chloroform	- -	- -	5.2E-11	5.2E-11	Chloroform	Liver	- -	- -	5.9E-05	5.9E-05
			cis-1,2-Dichloroethene	- -	- -	- -	- -	cis-1,2-Dichloroethene	Blood	- -	- -	2.2E-04	2.2E-04
			Trichloroethene	- -	- -	2.5E-10	2.5E-10	Trichloroethene	Liver	- -	- -	2.6E-04	2.6E-04
			Vinyl Chloride	- -	- -	2.4E-08	2.4E-08	Vinyl Chloride	Liver	- -	- -	7.9E-04	7.9E-04
			Benzo(a)pyrene	- -	- -	1.7E-07	1.7E-07	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Arsenic	- -	- -	- -	- -	Arsenic	Skin	- -	- -	- -	- -
			Thallium	- -	- -	- -	- -	Thallium	None Specified	- -	- -	- -	- -
			(Total)	- -	- -	2.0E-07	2.0E-07	(Total)		- -	- -	1.3E-03	1.3E-03
			Total Risk Across Groundwater				2.0E-07	Total Hazard Index Across All Media and All Exposure Routes					1.3E-03
			Total Risk Across All Media and All Exposure Routes				2.0E-07						

Total Skin HI	- -
Total Liver HI	1.1E-03
Total Blood HI	2.2E-04
Total None Specified HI	- -

TABLE 9.2
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Area A Downstream (Site 3)	Chloroform	--	--	2.7E-12	2.7E-12	Chloroform	Liver	--	--	3.0E-05	3.0E-05
			cis-1,2-Dichloroethene	--	--	--	--	cis-1,2-Dichloroethene	Blood	--	--	1.1E-04	1.1E-04
			Trichloroethene	--	--	1.6E-11	1.6E-11	Trichloroethene	Liver	--	--	1.3E-04	1.3E-04
			Vinyl Chloride	--	--	4.0E-10	4.0E-10	Vinyl Chloride	Liver	--	--	3.9E-04	3.9E-04
			Benzo(a)pyrene	--	--	2.1E-08	2.1E-08	Benzo(a)pyrene	NA	--	--	--	--
			Arsenic	--	--	--	--	Arsenic	Skin	--	--	--	--
			Thallium	--	--	--	--	Thallium	None Specified	--	--	--	--
			(Total)	--	--	2.2E-08	2.2E-08	(Total)		--	--	6.7E-04	6.7E-04
			Total Risk Across Groundwater				2.2E-08	Total Hazard Index Across All Media and All Exposure Routes					6.7E-04
			Total Risk Across All Media and All Exposure Routes				2.2E-08						

Total Skin HI	--
Total Liver HI	5.6E-04
Total Blood HI	1.1E-04
Total None Specified HI	--

TABLE 9.3
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Adult Residnts
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Area A Downstream (Site 3)	Chloroform	4.1E-07	4.1E-07	2.8E-08	8.5E-07	Chloroform	Liver	1.6E-02	1.6E-02	1.1E-03	3.2E-02
			cis-1,2-Dichloroethene	- -	- -	- -	- -	cis-1,2-Dichloroethene	Blood	3.3E-02	1.6E-02	3.8E-03	5.3E-02
			Trichloroethene	1.1E-06	1.1E-06	1.4E-07	2.4E-06	Trichloroethene	Liver	4.0E-02	1.6E-02	5.1E-03	6.1E-02
			Vinyl Chloride	2.6E-04	2.6E-04	1.0E-05	5.4E-04	Vinyl Chloride	Liver	2.9E-01	1.6E-02	1.1E-02	3.1E-01
			Benzo(a)pyrene	6.9E-06	- -	1.2E-04	1.3E-04	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Arsenic	1.1E-04	- -	- -	1.1E-04	Arsenic	Skin	5.6E-01	- -	- -	5.6E-01
			Thallium	- -	- -	- -	- -	Thallium	None Specified	1.7E+00	- -	- -	1.7E+00
			(Total)	3.8E-04	2.7E-04	1.3E-04	7.8E-04	(Total)		2.7E+00	6.3E-02	2.1E-02	2.7E+00
						Total Risk Across Groundwater	7.8E-04					Total Hazard Index Across All Media and All Exposure Routes	2.7E+00
						Total Risk Across All Media and All Exposure Routes	7.8E-04						

Total Skin HI	5.6E-01
Total Liver HI	4.1E-01
Total Blood HI	5.3E-02
Total None Specified HI	1.7E+00

TABLE 9.4
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Adult Residnts
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Area A Downstream (Site 3)	Chloroform	9.8E-09	9.8E-09	7.9E-10	2.0E-08	Chloroform	Liver	1.3E-03	1.3E-03	7.2E-04	3.2E-03
			cis-1,2-Dichloroethene	--	--	--	--	cis-1,2-Dichloroethene	Blood	1.4E-03	1.3E-03	2.5E-03	5.2E-03
			Trichloroethene	3.2E-08	9.8E-09	4.8E-09	4.7E-08	Trichloroethene	Liver	3.8E-03	1.3E-03	3.4E-03	8.4E-03
			Vinyl Chloride	2.2E-06	9.8E-09	9.9E-08	2.3E-06	Vinyl Chloride	Liver	7.9E-03	1.3E-03	7.4E-03	1.7E-02
			Benzo(a)pyrene	3.4E-07	--	6.9E-06	7.2E-06	Benzo(a)pyrene	NA	--	--	--	--
			Arsenic	3.5E-06	--	8.4E-09	3.5E-06	Arsenic	Skin	6.1E-02	--	--	6.1E-02
			Thallium	--	--	--	--	Thallium	None Specified	3.0E-01	--	--	3.0E-01
			(Total)	6.1E-06	3.0E-08	7.0E-06	1.3E-05	(Total)		3.8E-01	5.0E-03	1.4E-02	4.0E-01
			Total Risk Across Groundwater				1.3E-05	Total Hazard Index Across All Media and All Exposure Routes					4.0E-01
			Total Risk Across All Media and All Exposure Routes				1.3E-05						

TABLE 10.1
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Area A Downstream (Site 3)	Chloroform	- -	- -	5.2E-11	5.2E-11	Chloroform	Liver	- -	- -	5.9E-05	5.9E-05
			cis-1,2-Dichloroethene	- -	- -	- -	- -	cis-1,2-Dichloroethene	Blood	- -	- -	2.2E-04	2.2E-04
			Trichloroethene	- -	- -	2.5E-10	2.5E-10	Trichloroethene	Liver	- -	- -	2.6E-04	2.6E-04
			Vinyl Chloride	- -	- -	2.4E-08	2.4E-08	Vinyl Chloride	Liver	- -	- -	7.9E-04	7.9E-04
			Benzo(a)pyrene	- -	- -	1.7E-07	1.7E-07	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Arsenic	- -	- -	- -	- -	Arsenic	Skin	- -	- -	- -	- -
			Thallium	- -	- -	- -	- -	Thallium	None Specified	- -	- -	- -	- -
			(Total)	- -	- -	2.0E-07	2.0E-07	(Total)		- -	- -	1.3E-03	1.3E-03

Total Risk Across Groundwater 2.0E-07
Total Risk Across All Media and All Exposure Routes 2.0E-07

Total Hazard Index Across All Media and All Exposure Routes 1.3E-03

Total Skin HI	- -
Total Liver HI	1.1E-03
Total Blood HI	2.2E-04
Total None Specified HI	- -

TABLE 10.2
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Area A Downstream (Site 3)	Chloroform	- -	- -	2.7E-12	2.7E-12	Chloroform	Liver	- -	- -	3.0E-05	3.0E-05
			cis-1,2-Dichloroethene	- -	- -	- -	- -	cis-1,2-Dichloroethene	Blood	- -	- -	1.1E-04	1.1E-04
			Trichloroethene	- -	- -	1.6E-11	1.6E-11	Trichloroethene	Liver	- -	- -	1.3E-04	1.3E-04
			Vinyl Chloride	- -	- -	4.0E-10	4.0E-10	Vinyl Chloride	Liver	- -	- -	3.9E-04	3.9E-04
			Benzo(a)pyrene	- -	- -	2.1E-08	2.1E-08	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Arsenic	- -	- -	- -	- -	Arsenic	Skin	- -	- -	- -	- -
			Thallium	- -	- -	- -	- -	Thallium	None Specified	- -	- -	- -	- -
			(Total)	- -	- -	2.2E-08	2.2E-08	(Total)		- -	- -	6.7E-04	6.7E-04
						Total Risk Across Groundwater	2.2E-08					Total Hazard Index Across All Media and All Exposure Routes	6.7E-04
						Total Risk Across All Media and All Exposure Routes	2.2E-08						

Total Skin HI	- -
Total Liver HI	5.6E-04
Total Blood HI	1.1E-04
Total None Specified HI	- -

TABLE 10.3
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Adult Residnts
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Area A Downstream (Site 3)	Trichloroethene	1.1E-06	1.1E-06	1.4E-07	2.4E-06	Trichloroethene	Liver	4.0E-02	4.0E-02	5.1E-03	8.5E-02
			Vinyl Chloride	2.6E-04	2.6E-04	1.0E-05	5.4E-04	Vinyl Chloride	Liver	2.9E-01	2.9E-01	1.1E-02	5.8E-01
			Benzo(a)pyrene	6.9E-06	- -	1.2E-04	1.3E-04	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Arsenic	1.1E-04	- -	- -	1.1E-04	Arsenic	Skin	5.6E-01	- -	- -	5.6E-01
			Thallium	- -	- -	- -	- -	Thallium	None Specified	1.7E+00	- -	- -	1.7E+00
			(Total)	3.8E-04	2.7E-04	1.3E-04	7.7E-04	(Total)		2.6E+00	3.3E-01	1.6E-02	2.9E+00
						Total Risk Across Groundwater	7.7E-04					Total Hazard Index Across All Media and All Exposure Routes	2.9E+00
						Total Risk Across All Media and All Exposure Routes	7.7E-04						
												Total None Specified HI	1.7E+00

TABLE 10.4
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Adult Residnts
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Area A Downstream (Site 3)	Vinyl Chloride	2.2E-06	2.2E-06	9.9E-08	4.5E-06	Vinyl Chloride	Liver	7.9E-03	7.9E-03	7.4E-03	2.3E-02
			Benzo(a)pyrene	3.4E-07	- -	6.9E-06	7.2E-06	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Arsenic	3.5E-06	- -	8.4E-09	3.5E-06	Arsenic	Skin	6.1E-02	- -	- -	6.1E-02
			(Total)	6.1E-06	2.2E-06	7.0E-06	1.5E-05	(Total)		6.9E-02	7.9E-03	7.4E-03	8.4E-02
						Total Risk Across Groundwater	1.5E-05					Total Hazard Index Across All Media and All Exposure Routes	8.4E-02
						Total Risk Across All Media and All Exposure Routes	1.5E-05						

TORPEDO SHOP (SITE 7)

TABLE 1
SELECTION OF EXPOSURE PATHWAYS
TORPEDO SHOPS (SITE 7)
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current/Future	Surface Soil	Surface Soil	Surface Soil	Construction Workers	Adult	Ingestion Dermal	On-Site On-Site	Quant Quant	Construction workers may have contact with surface soil during excavation activities.
				Full-time Employees	Adult	Ingestion Dermal	On-Site On-Site	Quant Quant	Full-time employees may contact surface soil during normal work activities.
				Trespassers	Adolescents	Ingestion Dermal	On-Site On-Site	Quant Quant	Trespassers may be exposed to surface soil while at the site.
		Air	Surface Soil	Construction Workers	Adult	Inhalation	On-site	None	No COCs were identified in surface soil for the inhalation pathway.
				Full-time Employees	Adult	Inhalation	On-site	None	No COCs were identified in surface soil for the inhalation pathway.
				Trespassers	Adolescents	Inhalation	On-Site	None	No COCs were identified in surface soil for the inhalation pathway.
	Subsurface Soil	Subsurface Soil	Subsurface Soil	Construction Workers	Adult	Ingestion Dermal	On-Site On-Site	Quant Quant	Construction workers may have contact with subsurface soil during excavation activities.
				Full-time Employees	Adult	Ingestion Dermal	On-Site On-Site	None None	Full-time employees are not exposed to subsurface soil.
				Trespassers	Adolescents	Ingestion Dermal	On-Site On-Site	None None	Trespassers are not exposed to subsurface soil.
		Air	Subsurface Soil	Construction Workers	Adult	Inhalation	On-site	Quant	Construction workers may be exposed to fugitive dust and volatile emissions during construction activities.
				Full-time Employees	Adult	Inhalation	On-site	None	Full-time employees are not exposed to subsurface soil.
				Trespassers	Adolescents	Inhalation	On-Site	None	Trespassers are not exposed to subsurface soil.
Future	Surface Soil	Surface Soil	Surface Soil	Residents	Child	Ingestion Dermal	On-Site On-Site	Quant Quant	Child residents may contact surface soil.
					Adult	Ingestion Dermal	On-Site On-Site	Quant Quant	Adult residents may contact surface soil.
		Air	Surface Soil	Residents	Child	Inhalation	On-site	Quant	Child residents may be exposed to fugitive dust and volatile emissions from surface soil.
					Adult	Inhalation	On-site	Quant	Adult residents may be exposed to fugitive dust and volatile emissions from surface soil.
		Subsurface Soil	Subsurface Soil	Residents	Child	Ingestion Dermal	On-Site On-Site	Quant Quant	Child residents may contact subsurface soil that has been brought to the surface.
					Adult	Ingestion Dermal	On-Site On-Site	Quant Quant	Adult residents may contact subsurface soil that has been brought to the surface.
		Air	Subsurface Soil	Residents	Child	Inhalation	On-site	Quant	Child residents may be exposed to fugitive dust and volatile emissions from subsurface soil that has been brought to the surface.
					Adult	Inhalation	On-site	Quant	Adult residents may be exposed to fugitive dust and volatile emissions from subsurface soil that has been brought to the surface.

TABLE 1
SELECTION OF EXPOSURE PATHWAYS
TORPEDO SHOPS (SITE 7)
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current/Future	Groundwater	Groundwater	Overburden/Bedrock Aquifer	Construction Workers	Adult	Ingestion Dermal	On-Site On-Site	Quant Quant	Construction workers may have dermal contact with groundwater during excavation activities.
				Full-time Employees	Adult	Ingestion Dermal	On-Site On-Site	None None	Full-time employees are not exposed to groundwater.
				Trespassers	Adolescents	Ingestion Dermal	On-Site On-Site	None None	Trespassers do not have contact with groundwater.
				Residents	Adult	Ingestion Dermal	On-Site On-Site	Quant Quant	Groundwater may be used as a potable water source in the future.
					Child	Ingestion Dermal	On-Site On-Site	None None	Exposures to a child resident are less than those for an adult resident
		Air	Overburden/Bedrock Aquifer	Construction Workers	Adult	Inhalation	On-site	None	Construction workers exposure via volatilization is expected to be insignificant due to dilution with outdoor air.
				Full-time Employees	Adult	Inhalation	On-site	None	Full-time employees are not exposed to chemicals volatilizing from groundwater.
				Trespassers	Adolescents	Inhalation	On-Site	None	Trespassers do not have contact with site groundwater.
				Residents	Adult	Inhalation	On-site	Quant	On-site residents may be exposed to volatile emissions from groundwater while showering.
					Child	Inhalation	On-site	None	Exposures to a child resident are less than those for an adult resident

TABLE 2.1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
DIRECT CONTACT EXPOSURE SCENARIOS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Torpedo Shops (Site 7)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Risk-Based COPC Screening Level(5)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection(6)
Volatile Organics																	
75-09-2	METHYLENE CHLORIDE	0.005	J	0.005	J	mg/kg	7TB9-0002	1/2	0.007	0.005	NA	8.9	C	13 82	SSL-INH CTRESSOIL	NO	BSL
1330-20-7	XYLENES, TOTAL	0.00053	J	0.00134		mg/kg	B325-SO05-0002	3/6	0.00109 - 0.011	0.00134	NA	210	sat	410 500	SSL-INH CTRESSOIL	NO	BSL
Semivolatile Organics																	
56-55-3	BENZO(A)ANTHRACENE	0.27	J	0.27	J	mg/kg	081390-7MW1(0-2)	1/2	0.36	0.27	NA	0.62	C	N/A 1	SSL-INH CTRESSOIL	NO	BSL
50-32-8	BENZO(A)PYRENE	0.57		0.57		mg/kg	081390-7MW1(0-2)	1/2	0.36	0.57	NA	0.062	C	N/A 1	SSL-INH CTRESSOIL	YES	ASL
205-99-2	BENZO(B)FLUORANTHENE	0.61		0.61		mg/kg	081390-7MW1(0-2)	1/2	0.36	0.61	NA	0.62	C	N/A 1	SSL-INH CTRESSOIL	NO	BSL
191-24-2	BENZO(G,H,I)PERYLENE	0.54		0.54		mg/kg	081390-7MW1(0-2)	1/2	0.36	0.54	NA	230 (7)	N	N/A 1000	SSL-INH CTRESSOIL	NO	BSL
207-08-9	BENZO(K)FLUORANTHENE	0.51		0.51		mg/kg	081390-7MW1(0-2)	1/2	0.36	0.51	NA	6.2	C	N/A 8.4	SSL-INH CTRESSOIL	NO	BSL
218-01-9	CHRYSENE	0.38	J	0.38	J	mg/kg	081390-7MW1(0-2)	1/2	0.36	0.38	NA	62	C	N/A 84	SSL-INH CTRESSOIL	NO	BSL
53-70-3	DIBENZO(A,H)ANTHRACENE	0.063	J	0.063	J	mg/kg	081390-7MW1(0-2)	1/2	0.36	0.063	NA	0.062	C	N/A 1	SSL-INH CTRESSOIL	YES	ASL
206-44-0	FLUORANTHENE	0.39	J	0.39	J	mg/kg	081390-7MW1(0-2)	1/2	0.36	0.39	NA	230	N	N/A 1000	SSL-INH CTRESSOIL	NO	BSL
193-39-5	INDENO(1,2,3-CD)PYRENE	0.54		0.54		mg/kg	081390-7MW1(0-2)	1/2	0.36	0.54	NA	0.62	C	N/A 1	SSL-INH CTRESSOIL	NO	BSL
85-01-8	PHENANTHRENE	0.17	J	0.17	J	mg/kg	081390-7MW1(0-2)	1/2	0.36	0.17	NA	230 (7)	N	N/A 1000	SSL-INH CTRESSOIL	NO	BSL
85-01-8	PYRENE	0.33	J	0.33	J	mg/kg	081390-7MW1(0-2)	1/2	0.36	0.33	NA	230	N	N/A 1000	SSL-INH CTRESSOIL	NO	BSL
Inorganics																	
7429-90-5	ALUMINUM	3730		13,700		mg/kg	081390-7MW1(0-2)	2/2	NA	13700	17600	7600	N	N/A N/A	SSL-INH CTRESSOIL	NO	BKG, EPAI
7440-36-0	ANTIMONY	19.4	J	19.4	J	mg/kg	081390-7MW1(0-2)	1/2	3.3	19.4	2.05	3.1	N	N/A 27	SSL-INH CTRESSOIL	NO	BSL
7440-38-2	ARSENIC	1.4		3.5	J	mg/kg	7TB9-0002	2/2	NA	3.5	3.6	0.39	C	750 10	SSL-INH CTRESSOIL	NO	BKG
7440-39-3	BARIUM	23.2		159		mg/kg	081390-7MW1(0-2)	2/2	NA	159	39	540	N	690000 4700	SSL-INH CTRESSOIL	NO	BSL
7440-41-7	BERYLLIUM	0.58		0.58		mg/kg	081390-7MW1(0-2)	1/2	0.22	0.58	0.72	15	N	1300 2	SSL-INH CTRESSOIL	NO	BSL, BKG
7440-43-9	CADMIUM	4.6		5		mg/kg	081390-7MW1(0-2)	1/2	0.44	4.6	0.24	3.7	N	1800 34	SSL-INH CTRESSOIL	YES	ASL
7440-70-2	CALCIUM	1230		5830		mg/kg	081390-7MW1(0-2)	2/2	NA	5830	314	N/A		N/A N/A	SSL-INH CTRESSOIL	NO	NUT
7440-47-3	CHROMIUM	6.8		18.4	J	mg/kg	081390-7MW1(0-2)	2/2	NA	18.4	19.3	30 (8)	C	270 100	SSL-INH CTRESSOIL	NO	BSL, BKG
7440-48-4	COBALT	14.8		14.8		mg/kg	081390-7MW1(0-2)	1/2	3.5	14.8	7	470	N	N/A N/A	SSL-INH CTRESSOIL	NO	BSL
7440-50-8	COPPER	9.2		40	J	mg/kg	081390-7MW1(0-2)	2/2	NA	39.8	17.9	290	N	N/A 2500	SSL-INH CTRESSOIL	NO	BSL
7439-89-6	IRON	4580		21600		mg/kg	081390-7MW1(0-2)	2/2	NA	21600	16800	2300	N	N/A N/A	SSL-INH CTRESSOIL	NO	EPAI

TABLE 2.1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
DIRECT CONTACT EXPOSURE SCENARIOS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Torpedo Shops (Site 7)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Risk-Based COPC Screening Level(5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection(6)
7439-92-1	LEAD	4.5	J	7.1	J	mg/kg	081390-7MW1(0-2)	2/2	NA	7.1	17.5	400 (9)	N/A 500	SSL-INH CTRESSOIL	NO	BSL, BKG
7439-95-4	MAGNESIUM	1510		6440		mg/kg	081390-7MW1(0-2)	2/2	NA	6440	2460	N/A	N/A N/A	SSL-INH CTRESSOIL	NO	NUT
7439-96-5	MANGANESE	87.7		300	J	mg/kg	081390-7MW1(0-2)	2/2	NA	300	172	180 N	N/A N/A	SSL-INH CTRESSOIL	YES	ASL
7440-02-0	NICKEL	7.5		14.4	J	mg/kg	081390-7MW1(0-2)	2/2	NA	14.4	5	160 N	13000 1400	SSL-INH CTRESSOIL	NO	BSL
7440-09-7	POTASSIUM	1020		5360	J	mg/kg	081390-7MW1(0-2)	2/2	NA	5360	669	N/A	N/A N/A	SSL-INH CTRESSOIL	NO	NUT
7440-22-4	SILVER	0.5		5.5	J	mg/kg	081390-7MW1(0-2)	2/2	NA	5.5	0.385	39 N	N/A 340	SSL-INH CTRESSOIL	NO	BSL
7440-23-5	SODIUM	60.9		366	J	mg/kg	081390-7MW1(0-2)	2/2	NA	366	16.56	N/A	N/A N/A	SSL-INH CTRESSOIL	NO	NUT
7440-62-2	VANADIUM	7.7		45.8		mg/kg	081390-7MW1(0-2)	2/2	NA	45.8	33.3	55 N	N/A 470	SSL-INH CTRESSOIL	NO	BSL
7440-66-6	ZINC	13.8		62.9	J	mg/kg	081390-7MW1(0-2)	2/2	NA	62.9	25.6	2300 N	N/A 20000	SSL-INH CTRESSOIL	NO	BSL

A shaded value indicates that the concentration used for screening exceeds the criterion or background value.
A shaded chemical name indicates that the chemical has been selected as a COPC .

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 Atlantic Environmental Services, April 1995. Background concentrations of Inorganics in Soil - Naval Submarine Base - New London. If the maximum detected concentration of an inorganic is less than the background concentration, then that metal is not selected as a COC.
5 The risk-based COC screening level for residential land use is presented. The value is based on a target hazard quotient of 0.1 for noncarcinogens (denoted with a "N" flag) or an incremental cancer risk of 1E-6 for carcinogens (denoted with a "C" flag) (USEPA, Region IX, November 2000).
6 The chemical is selected as a COC if the maximum detected concentration exceeds the risk-based COC screening level and/or an ARAR/TBC(s).
7 Pyrene is used as a surrogate for benzo(g,h,i)perylene and phenanthrene.
8 Hexavalent Chromium.
9 OSWER soil screening level for residential land use (USEPA, July 1994).

Associated Samples:

081390-7MW1(0-2)	B325-SO05-0002
7TB13-0001	B325-SO06-0002
7TB9-0002	B325-SO06-0002-D
B325-SO03-0002	B325-SO07-0003

Definitions:

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogen
COC = Chemical of Concern
J = Estimated Value
N = Noncarcinogen
NA = Not Applicable
SSL-INH - Soil Screening Level for transfers from soil to air (Inhalation) (USEPA, May 1996)
CTRESSOIL - CTDEP direct contact criteria for residential exposures to soil.

Rationale Codes:

For Selection as a COC:
ASL = Above COC Screening Level/ARAR/TBC

For Elimination as a COC:
BKG = Within Background Levels
BSL = Below COC Screening Level/ARAR/TBC
NUT = Essential Nutrient
NTX = No criteria available.
EPAI = USEPA Region one does not advocate evaluation of this chemical

TABLE 2.2
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
MIGRATION PATHWAYS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Torpedo Shops (Site 7)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	EPA SSL-Soil to GW(5)	CTDEP Mobility Criteria(6)	CTDEP Soil Vapor Volatilization(6)	COPC Flag	Rationale for Contaminant Deletion or Selection(7)
Volatile Organics (mg/kg)																
75-09-2	METHYLENE CHLORIDE	0.005	J	0.005	J	mg/kg	7TB9-0002	1/2	0.007	0.005	NA	0.02	1	1200	NO	BSL
1330-20-7	XYLENES, TOTAL	0.00053	J	0.00134		mg/kg	B325-SO05-0002	3/6	0.00109 - 0.011	0.00134	NA	190	19.5	500	NO	BSL
Semivolatile Organics (mg/kg)																
56-55-3	BENZO(A)ANTHRACENE	0.27	J	0.27	J	mg/kg	081390-7MW1(0-2)	1/2	0.36	0.27	NA	2	1	N/A	NO	BSL
50-32-8	BENZO(A)PYRENE	0.57		0.57		mg/kg	081390-7MW1(0-2)	1/2	0.36	0.57	NA	8	1	N/A	NO	BSL
205-99-2	BENZO(B)FLUORANTHENE	0.61		0.61		mg/kg	081390-7MW1(0-2)	1/2	0.36	0.61	NA	NA	1	N/A	NO	BSL
191-24-2	BENZO(G,H,I)PERYLENE	0.54		0.54		mg/kg	081390-7MW1(0-2)	1/2	0.36	0.54	NA	4200 (B)	42	N/A	NO	BSL
207-08-9	BENZO(K)FLUORANTHENE	0.51		0.51		mg/kg	081390-7MW1(0-2)	1/2	0.36	0.51	NA	49	1	N/A	NO	BSL
218-01-9	CHRYSENE	0.38	J	0.38	J	mg/kg	081390-7MW1(0-2)	1/2	0.36	0.38	NA	160	1	N/A	NO	BSL
53-70-3	DIBENZO(A,H)ANTHRACENE	0.063	J	0.063	J	mg/kg	081390-7MW1(0-2)	1/2	0.36	0.063	NA	2	1	N/A	NO	BSL
206-44-0	FLUORANTHENE	0.39	J	0.39	J	mg/kg	081390-7MW1(0-2)	1/2	0.36	0.39	NA	4300	56	N/A	NO	BSL
193-39-5	INDENO(1,2,3-CD)PYRENE	0.54		0.54		mg/kg	081390-7MW1(0-2)	1/2	0.36	0.54	NA	14	1	N/A	NO	BSL
85-01-8	PHENANTHRENE	0.17	J	0.17	J	mg/kg	081390-7MW1(0-2)	1/2	0.36	0.17	NA	4200 (B)	40	N/A	NO	BSL
85-01-8	PYRENE	0.33	J	0.33	J	mg/kg	081390-7MW1(0-2)	1/2	0.36	0.33	NA	4200	40	N/A	NO	BSL
Inorganics (mg/kg)																
7429-90-5	ALUMINUM	3730		13,700		mg/kg	081390-7MW1(0-2)	2/2	NA	13700	17600	N/A	N/A	N/A	NO	BKG
7440-36-0	ANTIMONY	19.4	J	19.4	J	mg/kg	081390-7MW1(0-2)	1/2	3.3	19.4	2.05	5	N/A	N/A	YES	ASL
7440-38-2	ARSENIC	1.4		3.5	J	mg/kg	7TB9-0002	2/2	NA	3.5	3.6	29	N/A	N/A	NO	BSL, BKG
7440-39-3	BARIUM	23.2		159		mg/kg	081390-7MW1(0-2)	2/2	NA	159	39	1600	N/A	N/A	NO	BSL
7440-41-7	BERYLLIUM	0.58		0.58		mg/kg	081390-7MW1(0-2)	1/2	0.22	0.58	0.72	63	N/A	N/A	NO	BSL, BKG
7440-43-9	CADMIUM	4.6		5		mg/kg	081390-7MW1(0-2)	1/2	0.44	4.6	0.24	8	N/A	N/A	NO	BSL
7440-70-2	CALCIUM	1230		5830		mg/kg	081390-7MW1(0-2)	2/2	NA	5830	314	N/A	N/A	N/A	NO	NTX
7440-47-3	CHROMIUM	6.8		18.4	J	mg/kg	081390-7MW1(0-2)	2/2	NA	18.4	19.3	38	N/A	N/A	NO	BSL, BKG
7440-48-4	COBALT	14.8		14.8		mg/kg	081390-7MW1(0-2)	1/2	3.5	14.8	7	N/A	N/A	N/A	NO	NTX
7440-50-8	COPPER	9.2		40	J	mg/kg	081390-7MW1(0-2)	2/2	NA	39.8	17.9	N/A	N/A	N/A	NO	NTX
7439-89-6	IRON	4580		21600		mg/kg	081390-7MW1(0-2)	2/2	NA	21600	16800	N/A	N/A	N/A	NO	NTX
7439-92-1	LEAD	4.5	J	7.1	J	mg/kg	081390-7MW1(0-2)	2/2	NA	7.1	17.5	N/A	N/A	N/A	NO	BKG
7439-95-4	MAGNESIUM	1510		6440		mg/kg	081390-7MW1(0-2)	2/2	NA	6440	2460	N/A	N/A	N/A	NO	NTX
7439-96-5	MANGANESE	87.7		300	J	mg/kg	081390-7MW1(0-2)	2/2	NA	300	172	N/A	N/A	N/A	NO	NTX
7440-02-0	NICKEL	7.5		14.4	J	mg/kg	081390-7MW1(0-2)	2/2	NA	14.4	5	130	N/A	N/A	NO	BSL
7440-09-7	POTASSIUM	1020		5360	J	mg/kg	081390-7MW1(0-2)	2/2	NA	5360	669	N/A	N/A	N/A	NO	NTX
7440-22-4	SILVER	0.5		5.5	J	mg/kg	081390-7MW1(0-2)	2/2	NA	5.5	0.385	34	N/A	N/A	NO	BSL
7440-23-5	SODIUM	60.9		366	J	mg/kg	081390-7MW1(0-2)	2/2	NA	366	16.56	N/A	N/A	N/A	NO	NTX
7440-62-2	VANADIUM	7.7		45.8		mg/kg	081390-7MW1(0-2)	2/2	NA	45.8	33.3	6000	N/A	N/A	NO	BSL
7440-66-6	ZINC	13.8		62.9	J	mg/kg	081390-7MW1(0-2)	2/2	NA	62.9	25.6	12000	N/A	N/A	NO	BSL

A shaded value indicates that the concentration used for screening exceeds the criterion or background value.
A shaded chemical name indicates that the chemical has been selected as a COPC .

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 Atlantic Environmental Services, April 1995. Background concentrations of Inorganics in Soil - Naval Submarine Base - New London. If the maximum detected concentration of an inorganic is less than the background concentration, then that metal is not selected as a COC.

Definitions:

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogen
COC = Chemical of Concern
J = Estimated Value
N = Noncarcinogen
NA = Not Applicable

TABLE 2.2
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
MIGRATION PATHWAYS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Torpedo Shops (Site 7)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	EPA SSL-Soil to GW(5)	CTDEP Mobility Criteria(6)	CTDEP Soil Vapor Volatilization(6)	COPC Flag	Rationale for Contaminant Deletion or Selection(7)

5 USEPA Soil Screening Level Guidance, May 1996.
6 CTDEP Remediation Standard Regulations, 1996.
7 The chemical is selected as a COC if the maximum detected concentration exceeds the risk-based COC screening level and/or an ARAR/TBC(s).
8 Pyrene is used as a surrogate for benzo(g,h,i)perylene and phenanthrene

Associated Samples:

081390-7MW1(0-2)	B325-SO05-0002
7TB13-0001	B325-SO06-0002
7TB9-0002	B325-SO06-0002-D
B325-SO03-0002	B325-SO07-0003

Rationale Codes:
For Selection as a COC:
ASL = Above COC Screening Level/ARAR/TBC

For Elimination as a COC:
BKG = Within Background Levels
NTX = No criteria available.

TABLE 2.2
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
MIGRATION PATHWAYS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Torpedo Shops (Site 7)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	EPA SSL-Soil to GW(5)	CTDEP Mobility Criteria(6)	CTDEP Soil Vapor Volatilization(6)	COPC Flag	Rationale for Contaminant Deletion or Selection(7)

5 USEPA Soil Screening Level Guidance, May 1996.
6 CTDEP Remediation Standard Regulations, 1996.
7 The chemical is selected as a COC if the maximum detected concentration exceeds the risk-based COC screening level and/or an ARAR/TBC(s).
8 Pyrene is used as a surrogate for benzo(g,h,i)perylene and phenanthrene

Associated Samples:

081390-7MW1(0-2)	B325-SO05-0002
7TB13-0001	B325-SO06-0002
7TB9-0002	B325-SO06-0002-D
B325-SO03-0002	B325-SO07-0003

Rationale Codes:

For Selection as a COC:
ASL = Above COC Screening Level/ARAR/TBC

For Elimination as a COC:
BKG = Within Background Levels
NTX = No criteria available.

TABLE 2.3
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SUBSURFACE SOIL
DIRECT CONTACT EXPOSURE SCENARIOS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil
Exposure Point: Torpedo Shops (Site 7)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Risk-Based COPC Screening Level(5)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection(6)
Volatile Organics																	
75-35-4	1,1-DICHLOROETHENE	0.003	J	0.003	J	mg/kg	7 SO 4S 0103	1/29	0.006 - 0.061	0.003	NA	0.054	C	0.07 1	SSL-INH CTRESSOIL	NO	BSL
78-93-3	2-BUTANONE	0.003		0.032		mg/kg	081090-7TB5(6-8)	2/29	0.011 - 0.061	0.032	NA	730	N	N/A 500	SSL-INH CTRESSOIL	NO	BSL
67-64-1	ACETONE	0.011	J	0.17		mg/kg	081090-7TB5(6-8)	7/29	0.011 - 0.27	0.17	NA	160	N	100000 500	SSL-INH CTRESSOIL	NO	BSL
71-43-2	BENZENE	0.004	J	0.004	J	mg/kg	081090-7TB5(6-8)	1/35	0.00107 - 0.07	0.004	NA	0.65	C	0.8 21	SSL-INH CTRESSOIL	NO	BSL
75-15-0	CARBON DISULFIDE	0.003	J	0.025	J	mg/kg	081090-7TB5(6-8)	4/29	0.006 - 0.061	0.005	NA	36	N	720 500	SSL-INH CTRESSOIL	NO	BSL
108-90-7	CHLOROBENZENE	0.001	J	0.006	J	mg/kg	S7SB180506	2/29	0.006 - 0.061	0.006	NA	15	N	130 500	SSL-INH CTRESSOIL	NO	BSL
75-09-2	METHYLENE CHLORIDE	0.003	J	0.42	J	mg/kg	7MW8S-0408	13/29	0.006 - 0.023	0.42	NA	8.9	C	13 82	SSL-INH CTRESSOIL	NO	BSL
127-18-4	TETRACHLOROETHENE	0.003	J	0.018	J	mg/kg	7MW8S-0408	5/29	0.006 - 0.024	0.018	NA	5.7	C	11 12	SSL-INH CTRESSOIL	NO	BSL
108-88-3	TOLUENE	0.002	J	0.008	J	mg/kg	7TB160305	9/35	0.00107 - 0.061	0.008	NA	520	sat	650 500	SSL-INH CTRESSOIL	NO	BSL
1330-20-7	XYLENES, TOTAL	0.00096	J	0.011	J	mg/kg	7 SO 4S 0103	3/35	0.00107 - 0.061	0.011	NA	210	sat	410 500	SSL-INH CTRESSOIL	NO	BSL
Semivolatile Organics																	
91-57-6	2-METHYLNAPHTHALENE	0.023	J	0.17	J	mg/kg	7 SO 4S 0103	3/29	0.2 - 0.5	0.17	NA	5.6 (7)	N	N/A 474	SSL-INH CTRESSOIL	NO	BSL
106-44-5	4-METHYLPHENOL	0.56		0.56		mg/kg	080990-7MW2(2-4)	1/29	0.2 - 0.5	0.56	NA	31	N	N/A 340	SSL-INH CTRESSOIL	NO	BSL
83-32-9	ACENAPHTHENE	0.043	J	0.79		mg/kg	7 SO 4S 0103	5/29	0.2 - 0.5	0.79	NA	370	N	N/A 1000	SSL-INH CTRESSOIL	NO	BSL
208-96-8	ACENAPHTHYLENE	0.02	J	0.055	J	mg/kg	7 SO 10 0103	3/29	0.2 - 0.5	0.055	NA	230 (8)	N	N/A 1000	SSL-INH CTRESSOIL	NO	BSL
120-12-7	ANTHRACENE	0.021	J	1.3		mg/kg	7 SO 10 0103	6/29	0.2 - 0.5	1.3	NA	2200	N	N/A 1000	SSL-INH CTRESSOIL	NO	BSL
56-55-3	BENZO(A)ANTHRACENE	0.036	J	2.7		mg/kg	7 SO 10 0103	8/29	0.2 - 0.5	2.7	NA	0.62	C	N/A 1	SSL-INH CTRESSOIL	YES	ASL
50-32-8	BENZO(A)PYRENE	0.033	J	1.9		mg/kg	7 SO 10 0103	11/29	0.2 - 0.5	1.9	NA	0.062	C	N/A 1	SSL-INH CTRESSOIL	YES	ASL
205-99-2	BENZO(B)FLUORANTHENE	0.021	J	3.2	J	mg/kg	7 SO 10 0103	10/29	0.2 - 0.5	3.2	NA	0.62	C	N/A 1	SSL-INH CTRESSOIL	YES	ASL
191-24-2	BENZO(G,H,I)PERYLENE	0.02	J	1.3	J	mg/kg	7 SO 4S 0103	9/29	0.2 - 0.5	1.3	NA	230 (8)	N	N/A 1000	SSL-INH CTRESSOIL	NO	BSL
207-08-9	BENZO(K)FLUORANTHENE	0.024	J	0.52		mg/kg	7TB12-0204	8/29	0.2 - 0.5	0.52	NA	6.2	C	N/A 8.4	SSL-INH CTRESSOIL	NO	BSL
65-85-0	BENZOIC ACID	0.023	J	0.13	J	mg/kg	7 SO 4S 0103	10/25	1.7 - 2.4	0.13	NA	100000	max	N/A 1000	SSL-INH CTRESSOIL	NO	BSL
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	0.13	J	0.74	J	mg/kg	081390-7TB3(4-6)	4/29	0.35 - 0.5	0.74	NA	35	C	31000 44	SSL-INH CTRESSOIL	NO	BSL
85-68-7	BUTYLBENZYL PHTHALATE	0.026	J	0.026	J	mg/kg	7TB7-0406	1/29	0.2 - 0.5	0.026	NA	1200	N	930 1000	SSL-INH CTRESSOIL	NO	BSL
86-74-8	CARBAZOLE	0.027	J	0.66		mg/kg	7 SO 4S 0103	4/21	0.2 - 0.47	0.66	NA	24	C	N/A 31	SSL-INH CTRESSOIL	NO	BSL
218-01-9	CHRYSENE	0.025	J	2.4		mg/kg	7 SO 10 0103	10/29	0.2 - 0.5	2.4	NA	62	C	N/A 84	SSL-INH CTRESSOIL	NO	BSL
84-74-2	DI-N-BUTYL PHTHALATE	0.02	J	0.17	J	mg/kg	081490-7TB4(4-6)	10/29	0.35 - 0.47	0.17	NA	610	N	2300 1000	SSL-INH CTRESSOIL	NO	BSL
132-64-9	DIBENZOFURAN	0.027	J	0.35	J	mg/kg	7 SO 4S 0103	3/29	0.2 - 0.5	0.35	NA	29	N	N/A 270	SSL-INH CTRESSOIL	NO	BSL

TABLE 2.3
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SUBSURFACE SOIL
DIRECT CONTACT EXPOSURE SCENARIOS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil
Exposure Point: Torpedo Shops (Site 7)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Risk-Based Screening Level(5)	COPC	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection(6)
84-66-2	DIETHYL PHTHALATE	0.094	J	14		mg/kg	7MW7S-0103	2/29	0.2 - 0.48	14	NA	4900	N	2000 1000	SSL-INH CTRESSOIL	NO	BSL
206-44-0	FLUORANTHENE	0.018	J	3.8	J	mg/kg	7 SO 10 0103	13/29	0.2 - 0.5	3.8	NA	230	N	N/A 1000	SSL-INH CTRESSOIL	NO	BSL
86-73-7	FLUORENE	0.043	J	0.71		mg/kg	7 SO 4S 0103	5/29	0.2 - 0.5	0.71	NA	260	N	N/A 1000	SSL-INH CTRESSOIL	NO	BSL
193-39-5	INDENO(1,2,3-CD)PYRENE	0.024	J	1.2		mg/kg	7 SO 10 0103	9/29	0.2 - 0.5	1.2	NA	0.62	C	N/A 1	SSL-INH CTRESSOIL	YES	ASL
91-20-3	NAPHTHALENE	0.26	J	0.31	J	mg/kg	7 SO 4S 0103	2/29	0.2 - 0.5	0.31	NA	5.6	N	N/A 1000	SSL-INH CTRESSOIL	NO	BSL
85-01-8	PHENANTHRENE	0.025	J	4.3	J	mg/kg	7 SO 4S 0103	9/29	0.2 - 0.5	4.3	NA	230 (8)	N	N/A 1000	SSL-INH CTRESSOIL	NO	BSL
85-01-8	PYRENE	0.021	J	4.2	J	mg/kg	7 SO 10 0103	14/29	0.2 - 0.5	4.2	NA	230	N	N/A 1000	SSL-INH CTRESSOIL	NO	BSL
Pesticides/PCBs																	
72-54-8	4,4'-DDD	0.0044	J	0	J	mg/kg	7MW7S-0103	4/21	0.02 - 0.047	0.025	NA	2.4	C	N/A 2.6	SSL-INH CTRESSOIL	NO	BSL
72-55-9	4,4'-DDE	0.0054	J	0.21		mg/kg	081390-7TB3(4-6)	4/21	0.02 - 0.047	0.21	NA	1.7	C	N/A 1.8	SSL-INH CTRESSOIL	NO	BSL
50-29-3	4,4'-DDT	0.0049	J	0.026	J	mg/kg	7TB160305	5/21	0.02 - 0.047	0.026	NA	1.7	C	N/A 1.8	SSL-INH CTRESSOIL	NO	BSL
11097-69-1	AROCLOR-1254	0.66		0.66		mg/kg	080990-7MW2(2-4)	1/21	0.2 - 0.47	0.66	NA	0.22	C	N/A 1	SSL-INH CTRESSOIL	YES	ASL
1031-07-8	ENDOSULFAN SULFATE	0.013	J	0.035	J	mg/kg	7MW7S 0103	2/21	0.02 - 0.047	0.035	NA	37 (9)	N	N/A 410	SSL-INH CTRESSOIL	NO	BSL
7421-93-4	ENDRIN ALDEHYDE	0.0055	J	0	J	mg/kg	7B7-0406, 7TB8-0202	2/13	0.035 - 0.047	0.0055	NA	1.8 (10)	N	N/A 20	SSL-INH CTRESSOIL	NO	BSL
53494-70-5	ENDRIN KETONE	0.0068	J	0.0068	J	mg/kg	7 SO 4S 0103	1/21	0.02 - 0.047	0.0068	NA	1.8 (10)	N	N/A 20	SSL-INH CTRESSOIL	NO	BSL
76-44-8	HEPTACHLOR	0.0047	J	0.0047	J	mg/kg	7 SO 4S 0103	1/21	0.0098 - 0.024	0.0047	NA	0.11	C	4 0.1	SSL-INH CTRESSOIL	NO	BSL
72-43-5	METHOXYCHLOR	0.032	J	0.032	J	mg/kg	7 SO 4S 0103	1/21	0.098 - 0.24	0.032	NA	31	N	N/A 340	SSL-INH CTRESSOIL	NO	BSL
Inorganics																	
7429-90-5	ALUMINUM	4450		20,000		mg/kg	7 SO 6S 0507	29/29	NA	20000	17600	7.600	N	N/A N/A	SSL-INH CTRESSOIL	NO	EPAI
7440-36-0	ANTIMONY	3.4		19.4	J	mg/kg	080990-7TB2(2-4)	13/28	0.62 - 18.2	19.4	2.05	3.1	N	N/A 27	SSL-INH CTRESSOIL	YES	ASL
7440-38-2	ARSENIC	0.82	J	8.1		mg/kg	7MW9S-0608	27/29	1.6 - 4.6	8.1	3.6	0.39	C	750 10	SSL-INH CTRESSOIL	YES	ASL
7440-39-3	BARIUM	17.4	J	506		mg/kg	7 SO 6S 0507	29/29	NA	506	57.2	540	N	690000 4700	SSL-INH CTRESSOIL	NO	BSL
7440-41-7	BERYLLIUM	0.21	J	1		mg/kg	080990-7TB1(2-4)-D	27/29	0.2 - 0.23	1	0.72	15	N	1300 2	SSL-INH CTRESSOIL	NO	BSL
7440-43-9	CADMIUM	0.47	J	5		mg/kg	080990-7TB1(2-4)-D	12/29	0.11 - 1	5.1	0.24	3.7	N	1800 34	SSL-INH CTRESSOIL	YES	ASL
7440-70-2	CALCIUM	600	J	2810		mg/kg	7TB8-0202.9, 7 SO 6S 0507	29/29	NA	2810	499	N/A		N/A N/A	SSL-INH CTRESSOIL	NO	NUT
7440-47-3	CHROMIUM	7		61.1		mg/kg	7 SO 6S 0507	29/29	NA	61.1	21.5	30 (11)	C	270 100	SSL-INH CTRESSOIL	YES	ASL
7440-48-4	COBALT	4.7	J	19.2	J	mg/kg	7 SO 6S 0507	25/29	1.8 - 3.9	19.2	8	470	N	N/A N/A	SSL-INH CTRESSOIL	NO	BSL
7440-50-8	COPPER	7.6		45		mg/kg	7TB7-0406	29/29	NA	45	25.6	290	N	N/A 2500	SSL-INH CTRESSOIL	NO	EPAI

TABLE 2.3
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SUBSURFACE SOIL
DIRECT CONTACT EXPOSURE SCENARIOS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil
Exposure Point: Torpedo Shops (Site 7)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Risk-Based COPC Screening Level(5)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection(6)
7439-89-6	IRON	6750		32900		mg/kg	7 SO 6S 0507	29/29	NA	32900	17200	2300	N	N/A N/A	SSL-INH CTRESSOIL	NO	EPAI
7439-92-1	LEAD	3.3	J	27.5	J	mg/kg	7TB12-0204	24/29	2.5 - 9.1	27.5	17.5	400 (12)		N/A 500	SSL-INH CTRESSOIL	NO	BSL
7439-95-4	MAGNESIUM	1660		19500		mg/kg	7 SO 6S 0507	29/29	NA	19500	3650	N/A		N/A N/A	SSL-INH CTRESSOIL	NO	NUT
7439-96-5	MANGANESE	60.7		725		mg/kg	7 SO 6S 0507	29/29	NA	725	188	180	N	N/A N/A	SSL-INH CTRESSOIL	YES	ASL
7439-97-6	MERCURY	0.11	J	1.2	J	mg/kg	7MW10S-0608	5/29	0.06 - 0.14	1.2	0.05	2.3	N	10 20	SSL-INH CTRESSOIL	NO	BSL
7440-02-0	NICKEL	5.1		42.1	J	mg/kg	7 SO 6S 0507	29/29	NA	42.1	5.95	160	N	13000 1400	SSL-INH CTRESSOIL	NO	BSL
7440-09-7	POTASSIUM	575	J	18400	J	mg/kg	7 SO 6S 0507	29/29	NA	18400	2580	N/A		N/A N/A	SSL-INH CTRESSOIL	NO	NUT
7782-49-2	SELENIUM	0.77		0.77		mg/kg	081090-7TB5(6-8)	1/29	0.44 - 0.85	0.77	0.445	39	N	N/A 340	SSL-INH CTRESSOIL	NO	BSL
7440-22-4	SILVER	0.86	J	5.4	J	mg/kg	081490-7TB6(6-8)	13/29	0.4 - 2.4	5.4	0.385	39	N	N/A 340	SSL-INH CTRESSOIL	NO	BSL
7440-23-5	SODIUM	54.8	J	708		mg/kg	7 SO 4S 0103	28/29	103	708	20.56	N/A		N/A N/A	SSL-INH CTRESSOIL	NO	NUT
7440-28-0	THALLIUM	0.26		1	J	mg/kg	7 SO 6S 0507	5/29	0.2 - 1.2	1	0.29	0.52	N	N/A 5.4	SSL-INH CTRESSOIL	YES	ASL
7440-62-2	VANADIUM	12.3		86.7		mg/kg	7 SO 6S 0507	24/29	14.3 - 38.4	86.7	35.1	55	N	N/A 470	SSL-INH CTRESSOIL	YES	ASL
7440-66-6	ZINC	18.7		133	J	mg/kg	7 SO 4S 0103	29/29	NA	133	31.3	2300	N	N/A 20000	SSL-INH CTRESSOIL	NO	BSL

A shaded value indicates that the concentration used for screening exceeds the criterion or background value.
A shaded chemical name indicates that the chemical has been selected as a COPC.

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 Atlantic Environmental Services, April 1995. Background concentrations of Inorganics in Soil - Naval Submarine Base - New London. If the maximum detected concentration of an inorganic is less than the background concentration, then that metal is not selected as a COC.
5 The risk-based COC screening level for residential land use is presented. The value is based on a target hazard quotient of 0.1 for noncarcinogens (denoted with a "N" flag) or an incremental cancer risk of 1E-6 for carcinogens (denoted with a "C" flag) (USEPA, Region IX, November 2000).
6 The chemical is selected as a COC if the maximum detected concentration exceeds the risk-based COC screening level and/or an ARAR/TBC(s).
7 Value is for naphthalene.
8 Pyrene is used as a surrogate for acenaphthylene, benzo(g,h,i)perylene and phenanthrene.
9 Value is for endosulfan.
10 Value is for endrin.
11 Hexavalent Chromium.
12 OSWER soil screening level for residential land use (USEPA, July 1994).

Definitions:
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogen
COC = Chemical of Concern
J = Estimated Value
N = Noncarcinogen
NA = Not Applicable
SSL-INH = Soil Screening Level for transfers from soil to air (Inhalation) (USEPA, May 1996)
CTRESSOIL - CTDEP direct contact criteria for residential exposures to soil.

Rationale Codes:
For Selection as a COC:
ASL = Above COC Screening Level/ARAR/TBC

For Elimination as a COC:
BKG = Within Background Levels
BSL = Below COC Screening Level/ARAR/TBC
NUT = Essential Nutrient
NTX = No criteria available.

TABLE 2.3
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SUBSURFACE SOIL
DIRECT CONTACT EXPOSURE SCENARIOS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil
Exposure Point: Torpedo Shops (Site 7)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Risk-Based COPC Screening Level(5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection(6)
												EPAI = USEPA Region one does not advocate evaluation of this chemical.				

Associated Samples:

080990-7MW2(2-4)	7 SO 4S 0103	7TB13-0001	B325-SO03-0002	S7SB080607
080990-7TB1(2-4)-AVG	7 SO 6S 0305	7TB1301.5 03.5	B325-SO03-0408	S7SB090809
080990-7TB2(2-4)	7 SO 6S 0507	7TB14-0507	B325-SO04-0406	S7SB100607
081090-7TB5(6-8)	7MW10S-0608	7TB15-0608	B325-SO04-0608	S7SB180506
081390-7MW1(0-2)	7MW11S-0507	7TB160305	B325-SO05-0002	
081390-7TB3(4-6)	7MW5S-1011	7TB7-0406	B325-SO05-0406	
081490-7MW3(6-8)	7MW7S-0103	7TB8-0202.9-AVG	B325-SO06-0002-AVG	
081490-7TB4(4-6)	7MW8S-0408	7TB9-0002	B325-SO07-0003	
081490-7TB6(6-8)	7MW9S-0608-AVG	B325-SO01-0204	B325SS-0203	
7 SO 10 0103	7TB12-0204	B325-SO01-0406	B325SW-0203	

TABLE 2.4
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
MIGRATION PATHWAYS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil
Exposure Point: Torpedo Shops (Site 7)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	EPA SSL-Soil to GW(5)	CTDEP Mobility Criteria(6)	CTDEP Soil Vapor Volatilization(6)	COPC Flag	Rationale for Contaminant Deletion or Selection(7)
Volatile Organics																
75-35-4	1,1-DICHLOROETHENE	0.003	J	0.003	J	mg/kg	7 SO 4S 0103	1/29	0.006 - 0.061	0.003	N/A	0.06	1.4	1	NO	BSL
78-93-3	2-BUTANONE	0.003		0.032		mg/kg	081090-7TB5(6-8)	2/29	0.011 - 0.061	0.032	N/A	N/A	80	2400	NO	BSL
67-64-1	ACETONE	0.011	J	0.17		mg/kg	081090-7TB5(6-8)	7/29	0.011 - 0.27	0.17	N/A	16	140	2400	NO	BSL
71-43-2	BENZENE	0.004	J	0.004	J	mg/kg	081090-7TB5(6-8)	1/35	0.00107 - 0.07	0.004	N/A	0.03	0.2	1	NO	BSL
75-15-0	CARBON DISULFIDE	0.003	J	0.025	J	mg/kg	081090-7TB5(6-8)	4/29	0.006 - 0.061	0.005	N/A	32	140	N/A	NO	BSL
108-90-7	CHLOROBENZENE	0.001	J	0.006	J	mg/kg	S7SB180506	2/29	0.006 - 0.061	0.006	N/A	1	20	31	NO	BSL
75-09-2	METHYLENE CHLORIDE	0.003	J	0.42	J	mg/kg	7MW8S-0408	13/29	0.006 - 0.023	0.42	N/A	0.02	1	1200	YES	ASL
127-18-4	TETRACHLOROETHENE	0.003	J	0.018	J	mg/kg	7MW8S-0408	5/29	0.006 - 0.024	0.018	N/A	0.06	1	11	NO	BSL
108-88-3	TOLUENE	0.002	J	0.008	J	mg/kg	7TB160305	9/35	0.00107 - 0.061	0.008	N/A	12	67	780	NO	BSL
1330-20-7	XYLENES, TOTAL	0.00096	J	0.011	J	mg/kg	7 SO 4S 0103	3/35	0.00107 - 0.061	0.011	N/A	190	19.5	500	NO	BSL
Semivolatile Organics																
91-57-6	2-METHYLNAPHTHALENE	0.023	J	0.17	J	mg/kg	7 SO 4S 0103	3/29	0.2 - 0.5	0.17	N/A	N/A	9.8	N/A	NO	BSL
106-44-5	4-METHYLPHENOL	0.56		0.56		mg/kg	080990-7MW2(2-4)	1/29	0.2 - 0.5	0.56	N/A	N/A	7	N/A	NO	BSL
83-32-9	ACENAPHTHENE	0.043	J	0.79		mg/kg	7 SO 4S 0103	5/29	0.2 - 0.5	0.79	N/A	570	84	N/A	NO	BSL
208-96-8	ACENAPHTHYLENE	0.02	J	0.055	J	mg/kg	7 SO 10 0103	3/29	0.2 - 0.5	0.055	N/A	N/A	84	N/A	NO	BSL
120-12-7	ANTHRACENE	0.021	J	1.3		mg/kg	7 SO 10 0103	6/29	0.2 - 0.5	1.3	N/A	12000	400	N/A	NO	BSL
56-55-3	BENZO(A)ANTHRACENE	0.036	J	2.7		mg/kg	7 SO 10 0103	8/29	0.2 - 0.5	2.7	N/A	2	1	N/A	YES	ASL
50-32-8	BENZO(A)PYRENE	0.033	J	1.9		mg/kg	7 SO 10 0103	11/29	0.2 - 0.5	1.9	N/A	8	1	N/A	YES	ASL
205-99-2	BENZO(B)FLUORANTHENE	0.021	J	3.2	J	mg/kg	7 SO 10 0103	10/29	0.2 - 0.5	3.2	N/A	N/A	1	N/A	YES	ASL
191-24-2	BENZO(G,H,I)PERYLENE	0.02	J	1.3	J	mg/kg	7 SO 4S 0103	9/29	0.2 - 0.5	1.3	N/A	4200 (8)	42	N/A	NO	BSL
207-08-9	BENZO(K)FLUORANTHENE	0.024	J	0.52		mg/kg	7TB12-0204	8/29	0.2 - 0.5	0.52	N/A	49	1	N/A	NO	BSL
65-85-0	BENZOIC ACID	0.023	J	0.13	J	mg/kg	7 SO 4S 0103	10/25	1.7 - 2.4	0.13	N/A	400	10000	N/A	NO	BSL
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	0.13	J	0.74	J	mg/kg	081390-7TB3(4-6)	4/29	0.35 - 0.5	0.74	N/A	3600	11	N/A	NO	BSL
85-68-7	BUTYLBENZYL PHTHALATE	0.026	J	0.026	J	mg/kg	7TB7-0406	1/29	0.2 - 0.5	0.026	N/A	930	200	N/A	NO	BSL
86-74-8	CARBAZOLE	0.027	J	0.66		mg/kg	7 SO 4S 0103	4/21	0.2 - 0.47	0.66	N/A	0.6	1	N/A	YES	ASL
218-01-9	CHRYSENE	0.025	J	2.4		mg/kg	7 SO 10 0103	10/29	0.2 - 0.5	2.4	N/A	160	1	N/A	YES	ASL
84-74-2	DI-N-BUTYL PHTHALATE	0.02	J	0.17	J	mg/kg	081490-7TB4(4-6)	10/29	0.35 - 0.47	0.17	N/A	2300	140	N/A	NO	BSL
132-64-9	DIBENZOFURAN	0.027	J	0.35	J	mg/kg	7 SO 4S 0103	3/29	0.2 - 0.5	0.35	N/A	N/A	5.6	N/A	NO	BSL
84-66-2	DIETHYL PHTHALATE	0.094	J	14		mg/kg	7MW7S-0103	2/29	0.2 - 0.48	14	N/A	470	1100	N/A	NO	BSL
206-44-0	FLUORANTHENE	0.018	J	3.8	J	mg/kg	7 SO 10 0103	13/29	0.2 - 0.5	3.8	N/A	4300	56	N/A	NO	BSL
86-73-7	FLUORENE	0.043	J	0.71		mg/kg	7 SO 4S 0103	5/29	0.2 - 0.5	0.71	N/A	560	56	N/A	NO	BSL
193-39-5	INDENO(1,2,3-CD)PYRENE	0.024	J	1.2		mg/kg	7 SO 10 0103	9/29	0.2 - 0.5	1.2	N/A	14	1	N/A	YES	ASL
91-20-3	NAPHTHALENE	0.26	J	0.31	J	mg/kg	7 SO 4S 0103	2/29	0.2 - 0.5	0.31	N/A	84	56	N/A	NO	BSL
85-01-8	PHENANTHRENE	0.025	J	4.3	J	mg/kg	7 SO 4S 0103	9/29	0.2 - 0.5	4.3	N/A	4200 (8)	40	N/A	NO	BSL
85-01-8	PYRENE	0.021	J	4.2	J	mg/kg	7 SO 10 0103	14/29	0.2 - 0.5	4.2	N/A	4200	40	N/A	NO	BSL
Pesticides/PCBs																
72-54-8	4,4'-DDD	0.0044	J	0	J	mg/kg	7MW7S-0103	4/21	0.02 - 0.047	0.025	N/A	16	N/A	N/A	NO	BSL
72-55-9	4,4'-DDE	0.0054	J	0.21		mg/kg	081390-7TB3(4-6)	4/21	0.02 - 0.047	0.21	N/A	54	N/A	N/A	NO	BSL
50-29-3	4,4'-DDT	0.0049	J	0.026	J	mg/kg	7TB160305	5/21	0.02 - 0.047	0.026	N/A	32	N/A	N/A	NO	BSL
11097-69-1	AROCLOR-1254	0.66		0.66		mg/kg	080990-7MW2(2-4)	1/21	0.2 - 0.47	0.66	N/A	N/A	0.005	N/A	YES	ASL
1031-07-8	ENDOSULFAN SULFATE	0.013	J	0.035	J	mg/kg	7MW7S-0103	2/21	0.02 - 0.047	0.035	N/A	18 (9)	8.4	N/A	NO	BSL
7421-93-4	ENDRIN ALDEHYDE	0.0055	J	0	J	mg/kg	TB7-0406, 7TB8-0202	2/13	0.035 - 0.047	0.0055	N/A	1 (10)	N/A	N/A	NO	BSL
53494-70-5	ENDRIN KETONE	0.0068	J	0.0068	J	mg/kg	7 SO 4S 0103	1/21	0.02 - 0.047	0.0068	N/A	1 (10)	N/A	N/A	NO	BSL
76-44-8	HEPTACHLOR	0.0047	J	0.0047	J	mg/kg	7 SO 4S 0103	1/21	0.0098 - 0.024	0.0047	N/A	23	0.013	N/A	NO	BSL
72-43-5	METHOXYCHLOR	0.032	J	0.032	J	mg/kg	7 SO 4S 0103	1/21	0.098 - 0.24	0.032	N/A	160	8	N/A	NO	BSL
Inorganics																
7429-90-5	ALUMINUM	4450		20,000		mg/kg	7 SO 6S 0507	29/29	N/A	20000	17600	N/A	N/A	N/A	NO	NTX
7440-36-0	ANTIMONY	3.4		19.4	J	mg/kg	080990-7TB2(2-4)	13/28	0.62 - 18.2	19.4	2.05	5	N/A	N/A	YES	ASL
7440-38-2	ARSENIC	0.82	J	8.1		mg/kg	7MW9S-0608	27/29	1.6 - 4.6	8.1	3.6	29	N/A	N/A	NO	BSL
7440-39-3	BARIUM	17.4	J	506		mg/kg	7 SO 6S 0507	29/29	N/A	506	57.2	1600	N/A	N/A	NO	BSL

TABLE 2.4
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
MIGRATION PATHWAYS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil
Exposure Point: Torpedo Shops (Site 7)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	EPA SSL-Soil to GW(5)	CTDEP Mobility Criteria(6)	CTDEP Soil Vapor Volatilization(6)	COPC Flag	Rationale for Contaminant Deletion or Selection(7)
7440-41-7	BERYLLIUM	0.21	J	1		mg/kg	080990-7TB1(2-4)-D	27/29	0.2 - 0.23	1	0.72	63	N/A	N/A	NO	BSL
7440-43-9	CADMIUM	0.47	J	5		mg/kg	080990-7TB1(2-4)-D	12/29	0.11 - 1	5.1	0.24	8	N/A	N/A	NO	BSL
7440-70-2	CALCIUM	600	J	2810		mg/kg	7TB8-0202.9, 7 SO 6S 0507	29/29	N/A	2810	499	N/A	N/A	N/A	NO	NTX
7440-47-3	CHROMIUM	7		61.1		mg/kg	7 SO 6S 0507	29/29	N/A	61.1	21.5	38	N/A	N/A	YES	ASL
7440-48-4	COBALT	4.7	J	19.2	J	mg/kg	7 SO 6S 0507	25/29	1.8 - 3.9	19.2	8	N/A	N/A	N/A	NO	NTX
7440-50-8	COPPER	7.6		45		mg/kg	7TB7-0406	29/29	N/A	45	25.6	N/A	N/A	N/A	NO	NTX
7439-89-6	IRON	6750		32900		mg/kg	7 SO 6S 0507	29/29	N/A	32900	17200	N/A	N/A	N/A	NO	NTX
7439-92-1	LEAD	3.3	J	27.5	J	mg/kg	7TB12-0204	24/29	2.5 - 9.1	27.5	17.5	N/A	N/A	N/A	NO	NTX
7439-95-4	MAGNESIUM	1660		19500		mg/kg	7 SO 6S 0507	29/29	N/A	19500	3650	N/A	N/A	N/A	NO	NTX
7439-96-5	MANGANESE	60.7		725		mg/kg	7 SO 6S 0507	29/29	N/A	725	188	N/A	N/A	N/A	NO	NTX
7439-97-6	MERCURY	0.11	J	1.2	J	mg/kg	7MW10S-0608	5/29	0.06 - 0.14	1.2	0.05	2	N/A	N/A	NO	BSL
7440-02-0	NICKEL	5.1		42.1	J	mg/kg	7 SO 6S 0507	29/29	N/A	42.1	5.95	130	N/A	N/A	NO	BSL
7440-09-7	POTASSIUM	575	J	18400	J	mg/kg	7 SO 6S 0507	29/29	N/A	18400	2580	N/A	N/A	N/A	NO	NTX
7782-49-2	SELENIUM	0.77		0.77		mg/kg	081090-7TB5(6-8)	1/29	0.44 - 0.85	0.77	0.445	5	N/A	N/A	NO	BSL
7440-22-4	SILVER	0.86	J	5.4	J	mg/kg	081490-7TB6(6-8)	13/29	0.4 - 2.4	5.4	0.385	34	N/A	N/A	NO	BSL
7440-23-5	SODIUM	54.8	J	708		mg/kg	7 SO 4S 0103	28/29	103	708	20.56	N/A	N/A	N/A	NO	NTX
7440-28-0	THALLIUM	0.26		1	J	mg/kg	7 SO 6S 0507	5/29	0.2 - 1.2	1	0.29	0.7	N/A	N/A	YES	ASL
7440-62-2	VANADIUM	12.3		86.7		mg/kg	7 SO 6S 0507	24/29	14.3 - 38.4	86.7	35.1	6000	N/A	N/A	NO	BSL
7440-66-6	ZINC	18.7		133	J	mg/kg	7 SO 4S 0103	29/29	N/A	133	31.3	12000	N/A	N/A	NO	BSL

A shaded value indicates that the concentration used for screening exceeds the criterion or background value.
A shaded chemical name indicates that the chemical has been selected as a COC .

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 Atlantic Environmental Services, April 1995. Background concentrations of Inorganics in Soil - Naval Submarine Base - New London. If the maximum detected concentration of an inorganic is less than the background concentration, then that metal is not selected as a COC.
5 USEPA Soil Screening Level Guidance, May 1996.
6 CTDEP Remediation Standard Regulations, 1996.
7 The chemical is selected as a COC if the maximum detected concentration exceeds the risk-based COC screening level and/or an ARAR/TBC(s).
8 Pyrene is used as a surrogate for benzo(g,h,i)perylene and phenanthrene
9 Value is for endosulfan.
10 Value is for endrin.

Definitions:

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogen
COC = Chemical of Concern
J = Estimated Value
N = Noncarcinogen
NA = Not Applicable

Rationale Codes:

For Selection as a COC:
ASL = Above COC Screening Level/ARAR/TBC

For Elimination as a COC:
BKG = Within Background Levels
NTX = No criteria available.

TABLE 2.4
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
MIGRATION PATHWAYS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil
Exposure Point: Torpedo Shops (Site 7)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	EPA SSL-Soil to GW(5)	CTDEP Mobility Criteria(6)	CTDEP Soil Vapor Volatilization(6)	COPC Flag	Rationale for Contaminant Deletion or Selection(7)
	Associated Samples:															
	080990-7MW2(2-4)	7 SO 4S 0103		7TB13-0001			B325-SO03-0002	S7SB080607								
	080990-7TB1(2-4)-AVG	7 SO 6S 0305		7TB1301.5 03.5			B325-SO03-0408	S7SB090809								
	080990-7TB2(2-4)	7 SO 6S 0507		7TB14-0507			B325-SO04-0406	S7SB100607								
	081090-7TB5(6-8)	7MW10S-0608		7TB15-0608			B325-SO04-0608	S7SB180506								
	081390-7MW1(0-2)	7MW11S-0507		7TB160305			B325-SO05-0002									
	081390-7TB3(4-6)	7MW5S-1011		7TB7-0406			B325-SO05-0406									
	081490-7MW3(6-8)	7MW7S-0103		7TB8-0202.9-AVG			B325-SO06-0002-AVG									
	081490-7TB4(4-6)	7MW8S-0408		7TB9-0002			B325-SO07-0003									
	081490-7TB6(6-8)	7MW9S-0608-AVG		B325-SO01-0204			B325SS-0203									
	7 SO 10 0103	7TB12-0204		B325-SO01-0406			B325SW-0203									

TABLE 2.5
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
DIRECT CONTACT EXPOSURE SCENARIOS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Torpedo Shops (Site 7)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Risk-Based COPC Screening Level(5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection(6)
Volatile Organics																
106-46-7	1,4-DICHLOROBENZENE	1	J	90.5	J	ug/L	S7TW1001	1/30	1	90.5	N/A	0.5 C	75 75 N/A	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
108-90-7	CHLOROBENZENE	6.66		165	J	ug/L	S7TW1001	7/30	1	165	N/A	11 N	100 100 100	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
541-73-1	1,3-DICHLOROBENZENE	1.73		1.73		ug/L	S7MW03S01	1/27	1 - 5	1.73	N/A	0.55 N	600 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
71-43-2	BENZENE	2	J	2	J	ug/L	S7TW1001	2/27	1	2	N/A	0.35 C	1 5 5	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
79-01-6	TRICHLOROETHENE	1.39		23		ug/L	S7MW09S01	7/27	1	23	N/A	1.6 C	5 5 5	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
Dissolved Gases																
74-82-8	METHANE	1		41	J	ug/L	S7MW06S01	7/20	1 - 2	41	N/A	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NTX
Semivolatile Organics																
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	44		190		ug/L	S7MW08S01	3/20	5 - 10	190	N/A	4.8 C	2 6 N/A	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
118-74-1	HEXACHLOROBENZENE	3	J	3	J	ug/L	S7MW09S01	2/20	5 - 10	3	N/A	0.042 C	1 1 N/A	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
85-01-8	PHENANTHRENE	3.7		3.7		ug/L	S7MW08S01	1/20	0.03 - 5	3.7	N/A	18 (7) N	200 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL, BKG
86-73-7	FLUORENE	0.26	J	6.5		ug/L	S7MW08S01	1/20	0.05 - 5	6.5	N/A	24 N	280 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL, BKG
Total Metals																
7429-90-5	ALUMINUM	72.4	J	57500		ug/L	S7TW0901	10/20	50.5 - 430	57500	3560	3600 N	N/A 50 to 200 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	EPAI
7440-38-2	ARSENIC	2.9	J	11.4		ug/L	S7TW0901	2/20	2.3	11.4	1.92	0.045 C	50 50 50	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
7440-39-3	BARIUM	33.5		434		ug/L	S7TW0901	11/20	8.6 - 38.6	434	227	260 N	1000 2000 2000	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
7440-43-9	CADMIUM	0.27	J	0.27	J	ug/L	S7MW03S01	1/20	0.25 - 0.38	0.27	ND	1.8 N	5 5 5	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
7440-70-2	CALCIUM	5480		103000		ug/L	S7MW05D01	20/20	N/A	103000	188000	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT, BKG
7440-47-3	CHROMIUM	7.6	J	127		ug/L	S7TW0901	4/20	6.2 - 8.8	127	49.9	110 (8) N	50 100 N/A	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
7440-48-4	COBALT	4.4	J	31.3		ug/L	S7TW0901	10/20	4.2 - 13.9	31.3	48.6	220 N	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL, BKG
7440-50-8	COPPER	7.1	J	73.2		ug/L	S7TW0901	7/20	6.8 - 11.6	73.2	107	140 N	1300 1300 N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL, BKG

TABLE 2.5
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
DIRECT CONTACT EXPOSURE SCENARIOS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Torpedo Shops (Site 7)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Risk-Based COPC Screening Level(5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection(6)
7439-89-6	IRON	298		59400		ug/L	S7TW0901	10/20	31.1 - 759	59400	28200	1100 N	N/A 300 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	EPAI
7439-92-1	LEAD	1.9	J	32.8		ug/L	S7TW0901	8/20	1.8	32.8	6.63	N/A	15 15 N/A	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
7439-95-4	MAGNESIUM	871		19500		ug/L	S7TW0901	20/20	N/A	19500	191000	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT, BKG
7439-96-5	MANGANESE	4.6	J	1250		ug/L	S7TW0901	17/20	2.7	1250	11700	88 N	N/A 50 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	BKG
7440-02-0	NICKEL	34.3		52.8	J	ug/L	S7TW0901	2/20	9.2	52.8	32.2	73 N	100 N/A 100	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
7440-09-7	POTASSIUM	917		11600		ug/L	S7TW0901	20/20	N/A	11600	70800	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT, BKG
7782-49-2	SELENIUM	3.2	J	3.2	J	ug/L	S7MW07S01	1/20	2.8	3.2	3.19	18 N	50 50 50	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
7440-22-4	SILVER	16.3		16.3		ug/L	S7TW0901	1/20	5.2 - 5.8	16.3	ND	18 N	36 100 50	CTDEP RSR FED-SMCL CTDEP-MCL	NO	BSL
7440-23-5	SODIUM	4020		91600		ug/L	S7MW03D01	20/20	N/A	91600	1900000	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT, BKG
7440-62-2	VANADIUM	7.6	J	151		ug/L	S7TW0901	2/20	6.3	151	10.2	26 N	50 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
7440-66-6	ZINC	8.4	J	194	J	ug/L	S7MW10S01	11/20	4.6 - 27.1	194	131	1100 N	5000 5000 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	BSL
Dissolved Metals																
7440-39-3	BARIUM, FILTERED	35.5		36.9		ug/L	S7MW10S01-F-D	1/2	18.7	36.9	124	260 N	1000 2000 2000	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL, BKG
7440-70-2	CALCIUM, FILTERED	17600		23400		ug/L	S7MW10S01-F-D	2/2	N/A	23400	152000	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT, BKG
7440-50-8	COPPER, FILTERED	14		18		ug/L	S7MW10S01-F	1/2	6.8	18	39.4	140 N	1300 1300 N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL, BKG
7439-95-4	MAGNESIUM, FILTERED	1470		7280		ug/L	S7MW10S01-F-D	2/2	N/A	7280	150000	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT, BKG
7439-96-5	MANGANESE, FILTERED	7.8	J	7.8	J	ug/L	S7MW01D01-F	1/2	2.7	7.8	9400	88 N	N/A 50 N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL, BKG
7440-09-7	POTASSIUM, FILTERED	1730		3520		ug/L	S7MW10S01-F-D	2/2	N/A	3520	60000	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT, BKG
7440-23-5	SODIUM, FILTERED	4690		47600		ug/L	S7MW10S01-F-D	2/2	N/A	47600	1580000	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT, BKG
7440-66-6	ZINC, FILTERED	56.4		173		ug/L	S7MW01D01-F	2/2	N/A	173	109	1100 N	5000 5000 N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL

TABLE 2.5
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
DIRECT CONTACT EXPOSURE SCENARIOS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Torpedo Shops (Site 7)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Risk-Based COPC Screening Level(5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection(6)
Miscellaneous Parameters																
E-14506	ALKALINITY	10	J	124		mg/L	S7MW05D01	20/20	N/A	124	1950	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BKG
7664-41-7	AMMONIA	0.15		0.48	J	mg/L	S7MW07S01	8/8	N/A	0.48	ND	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NTX
7664-41-7	AMMONIA, AS NITROGEN	0.1		0.54	J	mg/L	S7MW01D01	10/12	N/A	0.54	ND	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NTX
7664-41-7	AMMONIUM	0.2		0.44		mg/L	S7TW0801	6/20	N/A	0.44	ND	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NTX
000-02-0	CHLORIDE	5.84	J	155	J	mg/L	S7MW10S01	20/20	N/A	155	4540	N/A	N/A 250 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	BSL, BKG
E-11778	HARDNESS as CaCO3	18.8		285		mg/L	S7MW05D01	20/20	N/A	285	ND	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NTX
14808-79-8	SULFATE	3.46	J	71.6	J	mg/L	S7MW10S01	20/20	N/A	71.6	45.2	N/A	N/A 250 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	BSL
18496-25-8	SULFIDE	0.07		0.07		mg/L	S7TW1001	1/12	0.05 - 2	0.07	ND	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NTX
000-09-0	TOTAL DISSOLVED SOLIDS	50	J	464		mg/L	S7MW05D01	15/20	66.2 - 158	464	6260	N/A	N/A 500 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	BSL, BKG
7440-44-0	TOTAL ORGANIC CARBON	0.9		120		mg/L	S7MW07S01	15/20	1 - 5	120	37.7	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NTX
000-08-9	TOTAL SUSPENDED SOLIDS	10	J	2950		mg/L	S7TW0901	8/20	5	2950	236	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NTX

A shaded value indicates that the concentration used for screening exceeds the criterion or background value.
A shaded chemical name indicates that the chemical has been selected as a COPC .

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 95% Upper Tolerance Limit (UTL) of site background data
5 The risk-based COPC screening level for tap water use is presented. The value is based on a target hazard quotient of 0.1 for noncarcinogens (denoted with a "N" flag) or an incremental cancer risk of 1E-6 for carcinogens (denoted with a "C" flag) (USEPA, Region IX, November 2000).
6 The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level and/or an ARAR/TBC(s).
7 Pyrene is used as a surrogate for phenanthrene.
8 Value is for hexavalent chromium.

Definitions:

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogen
COC = Chemical of Concern
J = Estimated Value
N = Noncarcinogen
N/A = Not Applicable.
FED-MCL = Federal Maximum Contaminant Level (USEPA, August 2000)
FED-SMCL = Federal Secondary Maximum Contaminant Level (USEPA, August 2000)
FED-AL = Federal Action Level (USEPA, August 2000)
CTDEP-RSR = Connecticut DEP Remediation Standard Regulations, 1996
CTDEP-MCL = Connecticut Maximum Contaminant Level

TABLE 2.5
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
DIRECT CONTACT EXPOSURE SCENARIOS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Torpedo Shops (Site 7)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Risk-Based COPC Screening Level(5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection(6)

Associated Samples:

S7B325MW0101	S7MW02S01	S7MW05S01-D	S7MW10S01-D	S7TW0301	S7TW0801
S7B325MW0301	S7MW03D01	S7MW06S01	S7MW10S01-F	S7TW0401	S7TW0901
S7B325MW0401	S7MW03S01	S7MW07S01	S7MW10S01-F-D	S7TW0501	S7TW1001
S7MW01D01	S7MW04S01	S7MW08S01	S7MW11S01	S7TW0601	
S7MW01D01-F	S7MW05D01	S7MW09S01	S7TW0101	S7TW0701	
S7MW02D01	S7MW05S01	S7MW10S01	S7TW0201	S7TW0701-D	

Rationale Codes:

For Selection as a COC:
ASL = Above COC Screening Level/ARAR/TBC

For Elimination as a COC:
BKG = Within Background Levels
BSL = Below COC Screening Level/ARAR/TBC
NUT = Essential Nutrient
NTX = No Toxicity Information
EPAI = USEPA Region one does not advocate evaluation of this chemical

TABLE 2.6
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
MIGRATION PATHWAYS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Torpedo Shops (Site 7)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Surface Water Protection Criteria(5)	Volatilization Criteria(6)	COPC Flag	Rationale for Contaminant Deletion or Selection(7)
Volatile Organics															
106-46-7	1,4-DICHLOROBENZENE	1	J	90.5	J	ug/L	S7TW1001	1/30	1	90.5	N/A	26000	50000	NO	BSL
108-90-7	CHLOROBENZENE	6.66		165	J	ug/L	S7TW1001	7/30	1	165	N/A	420000	1800	NO	BSL
541-73-1	1,3-DICHLOROBENZENE	1.73		1.73		ug/L	S7MW03S01	1/27	1 - 5	1.73	N/A	26000	24200	NO	BSL
71-43-2	BENZENE	2	J	2	J	ug/L	S7TW1001	2/27	1	2	N/A	710	215	NO	BSL
79-01-6	TRICHLOROETHENE	1.39		23		ug/L	S7MW09S01	7/27	1	23	N/A	2340	219	NO	BSL
Dissolved Gases															
74-82-8	METHANE	1		41	J	ug/L	S7MW06S01	7/20	1 - 2	41	N/A	N/A	N/A	NO	NTX
Semivolatile Organics															
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	44		190		ug/L	S7MW08S01	3/20	5 - 10	190	N/A	59	N/A	YES	ASL
118-74-1	HEXACHLOROBENZENE	3	J	3	J	ug/L	S7MW09S01	2/20	5 - 10	3	N/A	0.077	N/A	YES	ASL
85-01-8	PHENANTHRENE	3.7		3.7		ug/L	S7MW08S01	1/20	0.03 - 5	3.7	N/A	0.3	N/A	YES	ASL
86-73-7	FLUORENE	0.26	J	6.5		ug/L	S7MW08S01	1/20	0.05 - 5	6.5	N/A	140000	N/A	NO	BSL
Total Metals															
7429-90-5	ALUMINUM	72.4	J	57500		ug/L	S7TW0901	10/20	50.5 - 430	57500	3560	N/A	N/A	NO	NTX
7440-38-2	ARSENIC	2.9	J	11.4		ug/L	S7TW0901	2/20	2.3	11.4	1.92	4	N/A	YES	ASL
7440-39-3	BARIUM	33.5		434		ug/L	S7TW0901	11/20	8.6 - 38.6	434	227	N/A	N/A	NO	NTX
7440-43-9	CADMIUM	0.27	J	0.27	J	ug/L	S7MW03S01	1/20	0.25 - 0.38	0.27	ND	6	N/A	NO	BSL
7440-70-2	CALCIUM	5480		103000		ug/L	S7MW05D01	20/20	N/A	103000	188000	N/A	N/A	NO	BKG
7440-47-3	CHROMIUM	7.6	J	127		ug/L	S7TW0901	4/20	6.2 - 8.8	127	49.9	N/A	N/A	NO	NTX
7440-48-4	COBALT	4.4	J	31.3		ug/L	S7TW0901	10/20	4.2 - 13.9	31.3	48.6	N/A	N/A	NO	BKG
7440-50-8	COPPER	7.1	J	73.2		ug/L	S7TW0901	7/20	6.8 - 11.6	73.2	107	48	N/A	NO	BKG
7439-89-6	IRON	298		59400		ug/L	S7TW0901	10/20	31.1 - 759	59400	28200	N/A	N/A	NO	NTX
7439-92-1	LEAD	1.9	J	32.8		ug/L	S7TW0901	8/20	1.8	32.8	6.63	13	N/A	YES	ASL
7439-95-4	MAGNESIUM	871		19500		ug/L	S7TW0901	20/20	N/A	19500	191000	N/A	N/A	NO	BKG
7439-96-5	MANGANESE	4.6	J	1250		ug/L	S7TW0901	17/20	2.7	1250	11700	N/A	N/A	NO	BKG
7440-02-0	NICKEL	34.3		52.8	J	ug/L	S7TW0901	2/20	9.2	52.8	32.2	880	N/A	NO	BSL
7440-09-7	POTASSIUM	917		11600		ug/L	S7TW0901	20/20	N/A	11600	70800	N/A	N/A	NO	BKG
7782-49-2	SELENIUM	3.2	J	3.2	J	ug/L	S7MW07S01	1/20	2.8	3.2	3.19	50	N/A	NO	BSL
7440-22-4	SILVER	16.3		16.3		ug/L	S7TW0901	1/20	5.2 - 5.8	16.3	ND	12	N/A	YES	ASL
7440-23-5	SODIUM	4020		91600		ug/L	S7MW03D01	20/20	N/A	91600	1900000	N/A	N/A	NO	BKG
7440-62-2	VANADIUM	7.6	J	151		ug/L	S7TW0901	2/20	6.3	151	10.2	N/A	N/A	NO	NTX
7440-66-6	ZINC	8.4	J	194	J	ug/L	S7MW10S01	11/20	4.6 - 27.1	194	131	123	N/A	YES	ASL
Dissolved Metals															
7440-39-3	BARIUM, FILTERED	35.5		36.9		ug/L	S7MW10S01-F-D	1/2	18.7	36.9	124	N/A	N/A	NO	BKG
7440-70-2	CALCIUM, FILTERED	17600		23400		ug/L	S7MW10S01-F-D	2/2	N/A	23400	152000	N/A	N/A	NO	BKG
7440-50-8	COPPER, FILTERED	14		18		ug/L	S7MW10S01-F	1/2	6.8	18	39.4	48	N/A	NO	BSL, BKG
7439-95-4	MAGNESIUM, FILTERED	1470		7280		ug/L	S7MW10S01-F-D	2/2	N/A	7280	150000	N/A	N/A	NO	BKG
7439-96-5	MANGANESE, FILTERED	7.8	J	7.8	J	ug/L	S7MW01D01-F	1/2	2.7	7.8	9400	N/A	N/A	NO	BKG
7440-09-7	POTASSIUM, FILTERED	1730		3520		ug/L	S7MW10S01-F-D	2/2	N/A	3520	60000	N/A	N/A	NO	BKG
7440-23-5	SODIUM, FILTERED	4690		47600		ug/L	S7MW10S01-F-D	2/2	N/A	47600	1580000	N/A	N/A	NO	BKG
7440-66-6	ZINC, FILTERED	56.4		173		ug/L	S7MW01D01-F	2/2	N/A	173	109	123	N/A	YES	ASL
Miscellaneous Parameters															
E-14506	ALKALINITY	10	J	124		mg/L	S7MW05D01	20/20	N/A	124	1950	N/A	NA	NO	BKG
7664-41-7	AMMONIA	0.15		0.48	J	mg/L	S7MW07S01	8/8	N/A	0.48	ND	N/A	NA	NO	NTX
7664-41-7	AMMONIA, AS NITROGEN	0.1		0.54	J	mg/L	S7MW01D01	10/12	N/A	0.54	ND	N/A	NA	NO	NTX
7664-41-7	AMMONIUM	0.2		0.44		mg/L	S7TW0801	6/20	N/A	0.44	ND	N/A	NA	NO	NTX
000-02-0	CHLORIDE	5.84	J	155	J	mg/L	S7MW10S01	20/20	N/A	155	4540	N/A	NA	NO	BKG
E-11778	HARDNESS as CaCO3	18.8		285		mg/L	S7MW05D01	20/20	N/A	285	ND	N/A	NA	NO	NTX
14808-79-8	SULFATE	3.46	J	71.6	J	mg/L	S7MW10S01	20/20	N/A	71.6	45.2	N/A	NA	NO	NTX
18496-25-8	SULFIDE	0.07		0.07		mg/L	S7TW1001	1/12	0.05 - 2	0.07	ND	N/A	NA	NO	NTX
000-09-0	TOTAL DISSOLVED SOLIDS	50	J	464		mg/L	S7MW05D01	15/20	66.2 - 158	464	6260	N/A	NA	NO	BKG
7440-44-0	TOTAL ORGANIC CARBON	0.9		120		mg/L	S7MW07S01	15/20	1 - 5	120	37.7	N/A	NA	NO	NTX
000-08-9	TOTAL SUSPENDED SOLIDS	10	J	2950		mg/L	S7TW0901	8/20	5	2950	236	N/A	NA	NO	NTX

TABLE 2.6
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
MIGRATION PATHWAYS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Torpedo Shops (Site 7)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Surface Water Protection Criteria(5)	Volatilization Criteria(6)	COPC Flag	Rationale for Contaminant Deletion or Selection(7)

A shaded value indicates that the concentration used for screening exceeds the criterion or background value.
A shaded chemical name indicates that the chemical has been selected as a COPC .

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 95% Upper Tolerance Limit (UTL) of site background data
5 Connecticut DEP Surface Water Protection criteria.
6 Connecticut DEP Volatilization criteria for residential exposures.
7 The chemical is selected as a COPC if the maximum detected concentration exceeds the CTDEP surface water protection or volatilization criteria.

Associated Samples:

S7B325MW0101	S7MW02S01	S7MW05S01-D	S7MW10S01-D	S7TW0301	S7TW0801
S7B325MW0301	S7MW03D01	S7MW06S01	S7MW10S01-F	S7TW0401	S7TW0901
S7B325MW0401	S7MW03S01	S7MW07S01	S7MW10S01-F-D	S7TW0501	S7TW1001
S7MW01D01	S7MW04S01	S7MW08S01	S7MW11S01	S7TW0601	
S7MW01D01-F	S7MW05D01	S7MW09S01	S7TW0101	S7TW0701	
S7MW02D01	S7MW05S01	S7MW10S01	S7TW0201	S7TW0701-D	

Definitions:

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogen
COC = Chemical of Concern
J = Estimated Value
N = Noncarcinogen
NA = Not Applicable.

Rationale Codes:

For Selection as a COPC:
ASL = Above COPC Screening Level/ARAR/TBC

For Elimination as a COPC:
BKG = Within Background Levels
BSL = Below COPC Screening Level/ARAR/TBC
NTX = No Toxicity Information

TABLE 3.1
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Torpedo Shops (Site 7)

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency Exposure		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Benzo(a)pyrene	mg/kg	0.375	1	0.57		mg/kg	0.57	Maximum	2	0.375	Average	2
Dibenzo(a,h)anthracene	mg/kg	0.122	1	0.063	J	mg/kg	0.063	Maximum	2	0.122	Average	2
Cadmium	mg/kg	2.41	1	4.6		mg/kg	4.6	Maximum	2	2.41	Average	2
Manganese	mg/kg	194	1	300	J	mg/kg	300	Maximum	2	194	Average	2

Notes:
1 Insufficient number of samples to calculate an UCL.
2 There were less than 10 samples taken; therefore, the maximum concentration was used for RME and average concentration was used for CTE.

TABLE 3.2
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Torpedo Shops (Site 7)

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency Exposure		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Benzo(a)anthracene	mg/kg	0.341	0.524	2.7		mg/kg	0.412	95% UCL-L	W - Test (1)	0.412	95% UCL-L	W - Test (1)
Benzo(a)pyrene	mg/kg	0.299	0.430	1.9		mg/kg	0.406	95% UCL-L	W - Test (1)	0.406	95% UCL-L	W - Test (1)
Benzo(b)fluoranthene	mg/kg	0.385	0.605	3.2		mg/kg	0.511	95% UCL-L	W - Test (1)	0.511	95% UCL-L	W - Test (1)
Indeno(1,2,3-cd)pyrene	mg/kg	0.249	0.331	1.2		mg/kg	0.373	95% UCL-L	W - Test (1)	0.373	95% UCL-L	W - Test (1)
Aroclor-1254	mg/kg	0.184	0.224	0.66		mg/kg	0.215	95% UCL-L	W - Test (1)	0.215	95% UCL-L	W - Test (1)
Antimony	mg/kg	6.43	8.37	19.4		mg/kg	13.4	95% UCL-L	W - Test (1)	13.4	95% UCL-L	W - Test (1)
Arsenic	mg/kg	2.50	2.92	7.8		mg/kg	3.00	95% UCL-L	W - Test (1)	3.00	95% UCL-L	W - Test (1)
Barium	mg/kg	80.4	107	506		mg/kg	101	95% UCL-L	W - Test (1)	101	95% UCL-L	W - Test (1)
Cadmium	mg/kg	1.21	1.68	4.7		mg/kg	2.71	95% UCL-L	W - Test (1)	2.71	95% UCL-L	W - Test (1)
Chromium	mg/kg	18.5	21.5	61.1		mg/kg	21.7	95% UCL-L	W - Test (1)	21.7	95% UCL-L	W - Test (1)
Manganese	mg/kg	233	273	725		mg/kg	282	95% UCL-L	W - Test (1)	282	95% UCL-L	W - Test (1)
Nickel	mg/kg	11.8	13.8	42.1		mg/kg	13.5	95% UCL-L	W - Test (1)	13.5	95% UCL-L	W - Test (1)
Silver	mg/kg	1.75	2.34	5.5		mg/kg	3.65	95% UCL-L	W - Test (1)	3.65	95% UCL-L	W - Test (1)
Thallium	mg/kg	0.306	0.370	1		mg/kg	0.403	95% UCL-L	W - Test (1)	0.403	95% UCL-L	W - Test (1)
Vanadium	mg/kg	27.8	32.5	86.7		mg/kg	34.3	95% UCL-L	W - Test (1)	34.3	95% UCL-L	W - Test (1)

Notes:
For non-detects, 1/2 sample quantitation limit was used as a proxy concentration; for duplicate sample results, the average value was used in the calculation.
W - Test: Developed by Shapiro and Wilk, refer to Supplemental Guidance to RAGS: Calculating the Concentration Term, OSWER Directive 9285.7-081, May 1992.
Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).
(1) - Shapiro-Wilk W Test indicates that data is lognormally distributed.
(2) - Shapiro-Wilk W Test indicates that data is normally distributed, UCL exceeds maximum detected concentration, therefore maximum detected concentration is used as EPC.

TABLE 3.3
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Torpedo Shops (Site 7)

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency Exposure		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
1,3-Dichlorobenzene	ug/L	0.546	0.623	1.73		ug/L	1.73	max	1	0.546	average	1
1,4-Dichlorobenzene	ug/L	4.25	9.94	90.5	J	ug/L	90.5	max	1	4.25	average	1
Chlorobenzene	ug/L	6.82	17.2	165	J	ug/L	165	max	1	6.82	average	1
Benzene	ug/L	0.556	0.650	2	J	ug/L	2	max	1	0.556	average	1
Trichloroethene	ug/L	1.91	3.38	23		ug/L	23	max	1	1.91	average	1
Bis(2-ethylhexyl)phthalate	ug/L	16.5	33.1	190		ug/L	190	max	1	16.5	average	1
Hexachlorobenzene	ug/L	2.78	3.07	3	J	ug/L	3	max	1	2.78	average	1
Arsenic	ug/L	1.75	2.64	11.4		ug/L	11.4	max	1	1.75	average	1
Barium	ug/L	45.0	80.9	434		ug/L	434	max	1	45.0	average	1
Chromium	ug/L	12.2	23.3	127		ug/L	127	max	1	12.2	average	1
Lead	ug/L	3.92	6.70	32.8		ug/L	3.92	average	2	3.92	average	2
Vanadium	ug/L	10.8	23.5	151		ug/L	151	max	1	10.8	average	1

Notes:
[1] - The maximum detected and average concentration is used for the RME and CTE sceanrios, respectively per EPA Region I guidance.
[2] - IEUBK require the use of the average concentration as the exposure point concentration.

TABLE 4.1
VALUES USED FOR DAILY INTAKE CALCULATIONS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: All Soil
Exposure Medium: All Soil
Exposure Point: Torpedo Shops (Site 7)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	Chemical concentration in soil	mg/kg	95% UCL	EPA, 1994	95% UCL	EPA, 1994	Intake (mg/kg/day) =
	IR-S	Ingestion Rate	mg/day	480	EPA, 1994	240	(1)	
	CF3	Conversion Factor 3	kg/mg	1.0E-06	- -	1.0E-06	- -	$\frac{Cs \times IRS \times CF3 \times FI \times EF \times ED}{BW \times AT}$
	FI	Fraction Ingested	unitless	1	EPA, 1994	1	EPA, 1994	
	EF	Exposure Frequency	days/year	120	Atlantic, 1992	80	Atlantic, 1992	
	ED	Exposure Duration	years	1	Atlantic, 1992	1	Atlantic, 1992	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	365	EPA, 1989	365	EPA, 1989	
Dermal	CS	Chemical concentration in soil	mg/kg	95% UCL	EPA, 1994	95% UCL	EPA, 1994	Dermally Absorbed Dose (mg/kg/day) =
	CF3	Conversion Factor 3	kg/mg	1.0E-06	- -	1.0E-06	- -	$\frac{Cs \times CF3 \times SA \times SSAF \times DABS \times EF \times ED}{BW \times AT}$
	SA	Skin Surface Available for Contact	cm2	3,800	EPA, 1989	3,800	EPA, 1989	
	SSAF	Soil to Skin Adherence Factor	mg/cm2/event	0.2	EPA, 1998	0.02	EPA, 1998	
	DABS	Absorption Factor	unitless	See Text	See Text	See Text	See Text	
	EF	Exposure Frequency	days/year	120	Atlantic, 1992	80	Atlantic, 1992	
	ED	Exposure Duration	years	1	Atlantic, 1992	1	Atlantic, 1992	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	365	EPA, 1989	365	EPA, 1989	

Notes:
(1) - Professinal judgement.
Sources:
EPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.
EPA, 1992: Dermal Exposure Assessment: Principles and Applications.
EPA, 1994: US EPA Region I Risk Updates, Number 2.
EPA, 1998: Risk Assessment Guidance for Superfund, Supplemental Guidance, Dermal Risk Assessment, Interim Guidance.
Atlantic 1992: Phase I Remedial Investigation Naval Submarine Base - New London, Connecticut, August.

TABLE 4.2
VALUES USED FOR DAILY INTAKE CALCULATIONS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Torpedo Shops (Site 7)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Dermal	DAevent	Absorbed dose per event	mg/cm2-event	See Text	See Text	See Text	See Text	Dermally Absorbed Dose (mg/kg/day)
	SA	Skin Surface Available for Contact	cm2	3800	EPA, 1992	3800	EPA, 1992	$= \frac{DAevent \times EV \times EF \times ED \times SA}{BW \times AT}$
	EV	Event Frequency	events/day	1	EPA, 1994	1	EPA, 1994	
	ET	Exposure Time	hours/event	4	(1)	2	(1)	
	EF	Exposure Frequency	days/year	20	Atlantic, 1992	10	Atlantic, 1992	
	ED	Exposure Duration	years	1	Atlantic, 1992	1	Atlantic, 1992	See text for calculation of DAevent.
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	365	EPA, 1989	365	EPA, 1989	

Notes:
(1) - Professinal judgement.
Sources:
EPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.
EPA, 1992: Dermal Exposure Assessment: Principles and Applications.
EPA, 1994: US EPA Region I Risk Updates, Number 2.
EPA, 1998: Risk Assessment Guidance for Superfund, Supplemental Guidance, Dermal Risk Assessment, Interim Guidance.
Atlantic 1992: Phase I Remedial Investigation Naval Submarine Base - New London, Connecticut, August.

TABLE 5.1
NON-CANCER TOXICITY DATA -- ORAL/DERMAL
NSB-NLON, GROTON, CONNECTICUT

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal RfD (2)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ (3) (MM/DD/YY)
Volatile Organic Compounds										
1,3-Dichlorobenzene	Chronic	9.0E-04	mg/kg/day	100%	9.0E-04	mg/kg/day	None Specified	NA	EPA IX	11/1/00
	Subchronic	9.0E-04	mg/kg/day	100%	9.0E-04	mg/kg/day	None Specified	NA	Chronic	11/1/00
1,4-Dichlorobenzene	Chronic	3.0E-02	mg/kg/day	100%	3.0E-02	mg/kg/day	None Specified	NA	EPA IX	11/1/00
	Subchronic	3.0E-02	mg/kg/day	100%	3.0E-02	mg/kg/day	None Specified	NA	Chronic	11/1/00
Benzene	Chronic	3.0E-03	mg/kg/day	100%	3.0E-03	mg/kg/day	None Specified	NA	EPA IX	11/1/00
	Subchronic	3.0E-03	mg/kg/day	100%	3.0E-03	mg/kg/day	None Specified	NA	Chronic	11/1/00
Chlorobenzene	Chronic	2.0E-02	mg/kg/day	100%	2.0E-02	mg/kg/day	Liver	1000/1	IRIS	01/02/01
	Subchronic	2.0E-02	mg/kg/day	100%	2.0E-02	mg/kg/day	Liver	1000/1	Chronic	11/17/00
Trichloroethene	Chronic	6.0E-03	mg/kg/day	100%	6.0E-03	mg/kg/day	Liver	NA	EPA IX	11/1/00
	Subchronic	6.0E-03	mg/kg/day	100%	6.0E-03	mg/kg/day	Liver	NA	Chronic	11/1/00
Semivolatile Organic Compounds										
Benzo(a)anthracene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	Chronic	2.0E-02	mg/kg/day	100%	2.0E-02	mg/kg/day	Liver	1000/1	IRIS	01/02/01
	Subchronic	2.0E-02	mg/kg/day	100%	2.0E-02	mg/kg/day	Liver	1000/1	Chronic	01/02/01
Dibenzo(a,h)anthracene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	Chronic	8.0E-04	mg/kg/day	100%	8.0E-04	mg/kg/day	Liver	100/1	IRIS	01/02/01
	Subchronic	8.0E-04	mg/kg/day	100%	8.0E-04	mg/kg/day	Liver	100/1	Chronic	01/02/01
PCBs										
Aroclor-1254	Chronic	2.0E-05	mg/kg/day	100%	2.0E-05	mg/kg/day	Immune	300/1	IRIS	01/02/01
	Subchronic	2.0E-05	mg/kg/day	100%	2.0E-05	mg/kg/day	Immune	300/1	Chronic	01/02/01
Inorganics										
Antimony	Chronic	4.0E-04	mg/kg/day	15%	6.0E-05	mg/kg/day	Blood	1000/1	IRIS	01/02/01
	Subchronic	4.0E-04	mg/kg/day	15%	6.0E-05	mg/kg/day	Blood	1000	HEAST	7/97
Arsenic	Chronic	3.0E-04	mg/kg/day	100%	3.0E-04	mg/kg/day	Skin	3/1	IRIS	01/02/01
	Subchronic	3.0E-04	mg/kg/day	100%	3.0E-04	mg/kg/day	Skin	3	HEAST	7/97
Barium	Chronic	7.0E-02	mg/kg/day	7%	4.9E-03	mg/kg/day	CVS	3/1	IRIS	01/02/01
	Subchronic	7.0E-02	mg/kg/day	7%	4.9E-03	mg/kg/day	CVS	3	HEAST	7/97
Cadmium	Chronic	5.0E-04	mg/kg/day	5%	2.5E-05	mg/kg/day	Kidney	10/1	IRIS	01/02/01
	Subchronic	5.0E-04	mg/kg/day	5%	2.5E-05	mg/kg/day	Kidney	10/1	Chronic	01/02/01
Chromium VI	Chronic	3.0E-03	mg/kg/day	2.5%	7.5E-05	mg/kg/day	None Specified	300/3	IRIS	01/02/01
	Subchronic	2.0E-02	mg/kg/day	2.5%	5.0E-04	mg/kg/day	None Specified	100	HEAST	7/97
Lead	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese (Soil)	Chronic	1.4E-01	mg/kg/day	4%	5.6E-03	mg/kg/day	CNS	1/1	IRIS	01/02/01
	Subchronic	1.4E-01	mg/kg/day	4%	5.6E-03	mg/kg/day	CNS	1	HEAST	7/97
Thallium	Chronic	7.0E-05	mg/kg/day	100%	7.0E-05	mg/kg/day	None Specified	NA	EPA IX	11/1/00
	Subchronic	7.0E-05	mg/kg/day	100%	7.0E-05	mg/kg/day	None Specified	NA	Chronic	11/1/00
Vanadium	Chronic	7.0E-03	mg/kg/day	2.6%	1.8E-04	mg/kg/day	None Specified	100	HEAST	7/97
	Subchronic	7.0E-03	mg/kg/day	2.6%	1.8E-04	mg/kg/day	None Specified	100	HEAST	7/97

Notes:
(1) - USEPA 1998.
(2) - RfDdermal = RfDoral x Oral to Dermal Adjustment Factor.
(3) For IRIS values date that IRIS was searched.

CNS = Central Nervous System
CVS = Cardiovascular System
GS = Gastrointestinal

TABLE 5.1
NON-CANCER TOXICITY DATA -- ORAL/DERMAL
NSB-NLON, GROTON, CONNECTICUT

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal RfD (2)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ (3) (MM/DD/YY)

For HEAST values, the date of HEAST.
FOR EPA IX, date of PRG Table.
Chronic = No subchronic value available, chronic value is presented
(4) - Naphthalene is used as a surrogate.
NA = Not Applicable.
IRIS = Integrated Risk Information System.
HEAST= Health Effects Assessment Summary Tables.
EPA IX = USEPA Region IX Preliminary Remediation Goals Table, November 1, 2000.

TABLE 6.1
CANCER TOXICITY DATA -- ORAL/DERMAL
NSB-NLON, GROTON, CONNECTICUT

Chemical of Potential Concern	Oral Cancer Slope Factor	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal Cancer Slope Factor (2)	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (3) (MM/DD/YY)
Volatile Organic Compounds							
1,3-Dichlorobenzene	NA	NA	NA	NA	D	IRIS	01/02/01
1,4-Dichlorobenzene	2.4E-02	100%	2.4E-02	$(mg/kg\text{-}day)^{-1}$	C	HEAST	7/97
Benzene	5.5E-02	100%	5.5E-02	$(mg/kg\text{-}day)^{-1}$	A	IRIS	01/02/01
Chlorobenzene	NA	NA	NA	NA	D	IRIS	01/02/01
Trichloroethene	1.1E-02	100%	1.1E-02	$(mg/kg\text{-}day)^{-1}$	NA	EPA IX	11/01/00
Semivolatile Organic Compounds							
Benzo(a)anthracene (4)	7.3E-01	100%	7.3E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	01/02/01
Benzo(a)pyrene	7.3E+00	100%	7.3E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	01/02/01
Benzo(b)fluoranthene (4)	7.3E-01	100%	7.3E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	01/02/01
Bis(2-ethylhexyl)phthalate	1.4E-02	100%	1.4E-02	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	01/02/01
Dibenzo(a,h)anthracene (4)	7.3E+00	100%	7.3E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	01/02/01
Hexachlorobenzene	1.6E+00	100%	1.6E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	01/02/01
Indeno(1,2,3-cd)pyrene (4)	7.3E-01	100%	7.3E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	01/02/01
PCBs							
Aroclor-1254	2.0E+00	100%	2.0E+00	$(mg/kg\text{-}day)^{-1}$	B2	EPA(5)	09/96
Inorganics							
Antimony	NA	NA	NA	NA	NA	NA	NA
Arsenic	1.5E+00	100%	1.5E+00	$(mg/kg\text{-}day)^{-1}$	A	IRIS	01/02/01
Barium	NA	NA	NA	NA	D	IRIS	01/02/01
Cadmium	NA	NA	NA	NA	B1	IRIS	01/02/01
Chromium VI	NA	NA	NA	NA	A	IRIS	01/02/01
Lead	NA	NA	NA	NA	B2	IRIS	01/02/01
Manganese	NA	NA	NA	NA	D	IRIS	01/02/01
Thallium	NA	NA	NA	NA	D	IRIS	01/02/01
Vanadium	NA	NA	NA	NA	NA	NA	NA

Notes:

IRIS = Integrated Risk Information System

HEAST= Health Effects Assessment Summary Tables

(1) - USEPA 1998.

(2) - CSFdermal = CSForal/Oral to Dermal Adjustment Factor.

(3) - For IRIS values, the date IRIS was searched.
For HEAST values, the date of HEAST.

(4) - USEPA 1993.

(5) - USEPA 1996.

NA = Not Applicable

IRIS = Integrated Risk Information System

HEAST= Health Effects Assessment Summary Tables

EPA IX = USEPA Region IX Preliminary Remediation Goals Table, Noverhber 1, 2000.

EPA Group:

A - Human carcinogen

B1 - Probable human carcinogen - indicates that limited human data are available

B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans

C - Possible human carcinogen

D - Not classifiable as a human carcinogen

E - Evidence of noncarcinogenicity

TABLE 4.4
VALUES USED FOR DAILY INTAKE CALCULATIONS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: All Soil
Exposure Medium: All Soil
Exposure Point: Torpedo Shops (Site 7)
Receptor Population: Child Residnts
Receptor Age: Child

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	Chemical concentration in soil	mg/kg	95% UCL	EPA, 1994	95% UCL	EPA, 1994	Intake (mg/kg/day) =
	IR-S	Ingestion Rate	mg/day	200	EPA, 1994	100	EPA, 1994	
	CF3	Conversion Factor 3	kg/mg	1.0E-06	- -	1.0E-06	- -	$\frac{Cs \times IRS \times CF3 \times FI \times EF \times ED}{BW \times AT}$
	FI	Fraction Ingested	unitless	1	EPA, 1993	1	EPA, 1993	
	EF	Exposure Frequency	days/year	150	EPA, 1994	150	EPA, 1994	
	ED	Exposure Duration	years	6	EPA, 1994	2	EPA, 1994	
	BW	Body Weight	kg	15	EPA, 1994	15	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	EPA, 1989	730	EPA, 1989	
Dermal	CS	Chemical concentration in soil	mg/kg	95% UCL	EPA, 1994	95% UCL	EPA, 1994	Dermally Absorbed Dose (mg/kg/day) =
	CF3	Conversion Factor 3	kg/mg	1.0E-06	- -	1.0E-06	- -	$\frac{Cs \times CF3 \times SA \times SSAF \times DABS \times EF \times ED}{BW \times AT}$
	SA	Skin Surface Available for Contact	cm2	2,094	EPA, 1992	2,094	EPA, 1992	
	SSAF	Soil to Skin Adherence Factor	mg/cm2/event	0.2	EPA, 1998	0.06	EPA, 1998	
	DABS	Absorption Factor	unitless	See Text	See Text	See Text	See Text	
	EF	Exposure Frequency	days/year	150	EPA, 1994	150	EPA, 1994	
	ED	Exposure Duration	years	6	EPA, 1994	2	EPA, 1994	
	BW	Body Weight	kg	15	EPA, 1994	15	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	EPA, 1989	730	EPA, 1989	

Sources:
EPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.
EPA, 1992: Dermal Exposure Assessment: Principles and Applications.
EPA, 1994: US EPA Region I Risk Updates, Number 2.
EPA, 1998: Risk Assessment Guidance for Superfund, Supplemental Guidance, Dermal Risk Assessment, Interim Guidance.
Atlantic 1992: Phase I Remedial Investigation Naval Submarine Base - New London, Connecticut, August.

TABLE 4.5
VALUES USED FOR DAILY INTAKE CALCULATIONS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: All Soil
Exposure Medium: All Soil
Exposure Point: Torpedo Shops (Site 7)
Receptor Population: Adult Residnts
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	Chemical concentration in soil	mg/kg	95% UCL	EPA, 1994	95% UCL	EPA, 1994	Intake (mg/kg/day) =
	IR-S	Ingestion Rate	mg/day	100	EPA, 1994	50	EPA, 1994	
	CF3	Conversion Factor 3	kg/mg	1.0E-06	- -	1.0E-06	- -	$\frac{Cs \times IRS \times CF3 \times FI \times EF \times ED}{BW \times AT}$
	FI	Fraction Ingested	unitless	1	EPA, 1994	1	EPA, 1994	
	EF	Exposure Frequency	days/year	150	EPA, 1994	150	EPA, 1994	
	ED	Exposure Duration	years	24	EPA, 1994	7	EPA, 1994	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	EPA, 1989	2,555	EPA, 1989	
Dermal	CS	Chemical concentration in soil	mg/kg	95% UCL	EPA, 1994	95% UCL	EPA, 1994	Dermally Absorbed Dose (mg/kg/day) =
	CF3	Conversion Factor 3	kg/mg	1.0E-06	- -	1.0E-06	- -	$\frac{Cs \times CF3 \times SA \times SSAF \times DABS \times EF \times ED}{BW \times AT}$
	SA	Skin Surface Available for Contact	cm2	3,800	EPA, 1992	3,800	EPA, 1992	
	SSAF	Soil to Skin Adherence Factor	mg/cm2/event	0.07	EPA, 1998	0.01	EPA, 1998	
	DABS	Absorption Factor	unitless	See Text	See Text	See Text	See Text	
	EF	Exposure Frequency	days/year	150	EPA, 1994	150	EPA, 1994	
	ED	Exposure Duration	years	24	EPA, 1994	7	EPA, 1994	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	EPA, 1989	2,555	EPA, 1989	

Notes:
(1) - Professinal judgement.
Sources:
EPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.
EPA, 1992: Dermal Exposure Assessment: Principles and Applications.
EPA, 1994: US EPA Region I Risk Updates, Number 2.
EPA, 1998: Risk Assessment Guidance for Superfund, Supplemental Guidance, Dermal Risk Assessment, Interim Guidance.
Atlantic 1992: Phase I Remedial Investigation Naval Submarine Base - New London, Connecticut, August.

TABLE 4.6
VALUES USED FOR DAILY INTAKE CALCULATIONS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Torpedo Shops (Site 7)
Receptor Population: Adult Residnts
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CGW	Chemical Concentration in Groundwater	mg/L	Maximum	EPA, 1994	Average	EPA, 1994	Chronic Daily Intake (CDI) (mg/kg/day) =
	IR-GW	Ingestion Rate of Groundwater	L/day	2	EPA, 1994	1.4	EPA, 1994	
	EF	Exposure Frequency	days/year	350	EPA, 1994	234	EPA, 1994	$\frac{CW \times IRGW \times EF \times ED}{BW \times AT}$
	ED	Exposure Duration	years	30	EPA, 1994	9	EPA, 1994	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	10,950	EPA, 1989	3,285	EPA, 1989	
Dermal	DAevent	Absorbed dose per event	mg/cm2-event	See Text	See Text	See Text	See Text	Dermally Absorbed Dose (mg/kg/day)
	SA	Skin Surface Available for Contact	cm2	20,000	EPA, 1992	20,000	EPA, 1992	
	EV	Event Frequency	events/day	1	EPA, 1994	1	EPA, 1994	$= \frac{DAevent \times EV \times EF \times ED \times SA}{BW \times AT}$
	ET	Exposure Time	hours/event	0.25	EPA, 1992	0.167	EPA, 1992	
	EF	Exposure Frequency	days/year	350	EPA, 1994	234	EPA, 1994	
	ED	Exposure Duration	years	30	EPA, 1994	9	EPA, 1994	See text for calculation of DAevent.
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	10,950	EPA, 1989	3,285	EPA, 1989	

Notes:
(1) - Professinal judgement.
Sources:
EPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.
EPA, 1992: Dermal Exposure Assessment: Principles and Applications.
EPA, 1994: US EPA Region I Risk Updates, Number 2.
EPA, 1998: Risk Assessment Guidance for Superfund, Supplemental Guidance, Dermal Risk Assessment, Interim Guidance.

TABLE 7.1
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: All Soil
Exposure Medium: All Soil
Exposure Point: Torpedo Shops (Site 7)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	0.412	mg/kg	0.412	mg/kg	M	9.3E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Benzo(a)pyrene	0.406	mg/kg	0.406	mg/kg	M	9.2E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Benzo(b)fluoranthene	0.511	mg/kg	0.511	mg/kg	M	1.2E-06	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Indeno(1,2,3-cd)pyrene	0.373	mg/kg	0.373	mg/kg	M	8.4E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Aroclor-1254	0.215	mg/kg	0.215	mg/kg	M	4.8E-07	mg/kg/day	2.0E-05	mg/kg/day	N/A	N/A	2.4E-02
	Antimony	13.4	mg/kg	13.4	mg/kg	M	3.0E-05	mg/kg/day	4.0E-04	mg/kg/day	N/A	N/A	7.5E-02
	Arsenic	3.00	mg/kg	3.00	mg/kg	M	6.8E-06	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	2.3E-02
	Cadmium	2.71	mg/kg	2.71	mg/kg	M	6.1E-06	mg/kg/day	5.0E-04	mg/kg/day	N/A	N/A	1.2E-02
	Chromium	21.7	mg/kg	21.7	mg/kg	M	4.9E-05	mg/kg/day	3.0E-03	mg/kg/day	N/A	N/A	1.6E-02
	Manganese (soil)	282	mg/kg	282	mg/kg	M	6.4E-04	mg/kg/day	1.4E-01	mg/kg/day	N/A	N/A	4.5E-03
	Thallium	0.403	mg/kg	0.403	mg/kg	M	9.1E-07	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	1.3E-02
	Vanadium	34.3	mg/kg	34.3	mg/kg	M	7.7E-05	mg/kg/day	7.0E-03	mg/kg/day	N/A	N/A	1.1E-02
	(Total)												1.8E-01
Dermal	Benzo(a)anthracene	0.412	mg/kg	0.412	mg/kg	M	1.9E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Benzo(a)pyrene	0.406	mg/kg	0.406	mg/kg	M	1.9E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Benzo(b)fluoranthene	0.511	mg/kg	0.511	mg/kg	M	2.4E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Indeno(1,2,3-cd)pyrene	0.373	mg/kg	0.373	mg/kg	M	1.7E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Aroclor-1254	0.215	mg/kg	0.215	mg/kg	M	7.7E-08	mg/kg/day	2.0E-05	mg/kg/day	N/A	N/A	3.8E-03
	Antimony	13.4	mg/kg	13.4	mg/kg	M	0.0E+00	mg/kg/day	6.0E-05	mg/kg/day	N/A	N/A	- -
	Arsenic	3.00	mg/kg	3.00	mg/kg	M	3.2E-07	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	1.1E-03
	Cadmium	2.71	mg/kg	2.71	mg/kg	M	9.7E-09	mg/kg/day	2.5E-05	mg/kg/day	N/A	N/A	3.9E-04
	Chromium	21.7	mg/kg	21.7	mg/kg	M	0.0E+00	mg/kg/day	7.5E-05	mg/kg/day	N/A	N/A	- -
	Manganese (soil)	282	mg/kg	282	mg/kg	M	0.0E+00	mg/kg/day	5.6E-03	mg/kg/day	N/A	N/A	- -
	Thallium	0.403	mg/kg	0.403	mg/kg	M	0.0E+00	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	- -
	Vanadium	34.3	mg/kg	34.3	mg/kg	M	0.0E+00	mg/kg/day	1.8E-04	mg/kg/day	N/A	N/A	- -
	(Total)												5.3E-03
												Total Hazard Index Across All Exposure Routes/Pathways	1.8E-01

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Subchronic.

TABLE 7.2
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: All Soil
Exposure Medium: All Soil
Exposure Point: Torpedo Shops (Site 7)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	0.412	mg/kg	0.412	mg/kg	M	3.1E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Benzo(a)pyrene	0.406	mg/kg	0.406	mg/kg	M	3.1E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Benzo(b)fluoranthene	0.511	mg/kg	0.511	mg/kg	M	3.8E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Indeno(1,2,3-cd)pyrene	0.373	mg/kg	0.373	mg/kg	M	2.8E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Aroclor-1254	0.215	mg/kg	0.215	mg/kg	M	1.6E-07	mg/kg/day	2.0E-05	mg/kg/day	N/A	N/A	8.1E-03
	Antimony	13.4	mg/kg	13.4	mg/kg	M	1.0E-05	mg/kg/day	4.0E-04	mg/kg/day	N/A	N/A	2.5E-02
	Arsenic	3.00	mg/kg	3.00	mg/kg	M	2.3E-06	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	7.5E-03
	Cadmium	2.71	mg/kg	2.71	mg/kg	M	2.0E-06	mg/kg/day	5.0E-04	mg/kg/day	N/A	N/A	4.1E-03
	Chromium	21.7	mg/kg	21.7	mg/kg	M	1.6E-05	mg/kg/day	3.0E-03	mg/kg/day	N/A	N/A	5.4E-03
	Manganese (soil)	282	mg/kg	282	mg/kg	M	2.1E-04	mg/kg/day	1.4E-01	mg/kg/day	N/A	N/A	1.5E-03
	Thallium	0.403	mg/kg	0.403	mg/kg	M	3.0E-07	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	4.3E-03
	Vanadium	34.3	mg/kg	34.3	mg/kg	M	2.6E-05	mg/kg/day	7.0E-03	mg/kg/day	N/A	N/A	3.7E-03
	(Total)												6.0E-02
Dermal	Benzo(a)anthracene	0.412	mg/kg	0.412	mg/kg	M	1.3E-08	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Benzo(a)pyrene	0.406	mg/kg	0.406	mg/kg	M	1.3E-08	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Benzo(b)fluoranthene	0.511	mg/kg	0.511	mg/kg	M	1.6E-08	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Indeno(1,2,3-cd)pyrene	0.373	mg/kg	0.373	mg/kg	M	1.2E-08	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Aroclor-1254	0.215	mg/kg	0.215	mg/kg	M	5.1E-09	mg/kg/day	2.0E-05	mg/kg/day	N/A	N/A	2.6E-04
	Antimony	13.4	mg/kg	13.4	mg/kg	M	0.0E+00	mg/kg/day	6.0E-05	mg/kg/day	N/A	N/A	- -
	Arsenic	3.00	mg/kg	3.00	mg/kg	M	2.1E-08	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	7.1E-05
	Cadmium	2.71	mg/kg	2.71	mg/kg	M	6.5E-10	mg/kg/day	2.5E-05	mg/kg/day	N/A	N/A	2.6E-05
	Chromium	21.7	mg/kg	21.7	mg/kg	M	0.0E+00	mg/kg/day	7.5E-05	mg/kg/day	N/A	N/A	- -
	Manganese (soil)	282	mg/kg	282	mg/kg	M	0.0E+00	mg/kg/day	5.6E-03	mg/kg/day	N/A	N/A	- -
	Thallium	0.403	mg/kg	0.403	mg/kg	M	0.0E+00	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	- -
	Vanadium	34.3	mg/kg	34.3	mg/kg	M	0.0E+00	mg/kg/day	1.8E-04	mg/kg/day	N/A	N/A	- -
	(Total)												3.5E-04
												Total Hazard Index Across All Exposure Routes/Pathways	6.0E-02

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Subchronic.

TABLE 7.3
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Torpedo Shops (Site 7)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	1,3-Dichlorobenzene	1.73	ug/L	1.73	ug/L	M	1.5E-06	mg/kg/day	9.0E-04	mg/kg/day	N/A	N/A	1.7E-03
	1,4-Dichlorobenzene	90.5	ug/L	90.5	ug/L	M	6.0E-05	mg/kg/day	3.0E-02	mg/kg/day	N/A	N/A	2.0E-03
	Chlorobenzene	165	ug/L	165	ug/L	M	6.7E-05	mg/kg/day	2.0E-02	mg/kg/day	N/A	N/A	3.3E-03
	Benzene	2.00	ug/L	2.00	ug/L	M	4.1E-07	mg/kg/day	3.0E-03	mg/kg/day	N/A	N/A	1.4E-04
	Trichloroethene	23.0	ug/L	23.0	ug/L	M	4.2E-06	mg/kg/day	6.0E-03	mg/kg/day	N/A	N/A	6.9E-04
	Bis(2-ethylhexyl)phthalate	190	ug/L	190	ug/L	M	3.4E-04	mg/kg/day	2.0E-02	mg/kg/day	N/A	N/A	1.7E-02
	Hexachlorobenzene	3.00	ug/L	3.00	ug/L	M	1.5E-05	mg/kg/day	8.0E-04	mg/kg/day	N/A	N/A	1.8E-02
	Arsenic	11.4	ug/L	11.4	ug/L	M	0.0E+00	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	- -
	Barium	434	ug/L	434	ug/L	M	0.0E+00	mg/kg/day	4.9E-03	mg/kg/day	N/A	N/A	- -
	Chromium	127	ug/L	127	ug/L	M	3.0E-06	mg/kg/day	7.5E-05	mg/kg/day	N/A	N/A	4.0E-02
	Lead	3.92	ug/L	3.92	ug/L	M	0.0E+00	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Vanadium	151	ug/L	151	ug/L	M	1.8E-06	mg/kg/day	1.8E-04	mg/kg/day	N/A	N/A	9.9E-03
	(Total)												9.3E-02
												Total Hazard Index Across All Exposure Routes/Pathways	9.3E-02

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Subchronic.

TABLE 7.4
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Torpedo Shops (Site 7)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	1,3-Dichlorobenzene	0.546	ug/L	0.546	ug/L	M	7.7E-07	mg/kg/day	9.0E-04	mg/kg/day	N/A	N/A	8.6E-04
	1,4-Dichlorobenzene	4.25	ug/L	4.25	ug/L	M	3.0E-05	mg/kg/day	3.0E-02	mg/kg/day	N/A	N/A	1.0E-03
	Chlorobenzene	6.82	ug/L	6.82	ug/L	M	3.3E-05	mg/kg/day	2.0E-02	mg/kg/day	N/A	N/A	1.7E-03
	Benzene	0.556	ug/L	0.556	ug/L	M	2.0E-07	mg/kg/day	3.0E-03	mg/kg/day	N/A	N/A	6.8E-05
	Trichloroethene	1.91	ug/L	1.91	ug/L	M	2.1E-06	mg/kg/day	6.0E-03	mg/kg/day	N/A	N/A	3.5E-04
	Bis(2-ethylhexyl)phthalate	16.5	ug/L	16.5	ug/L	M	1.7E-04	mg/kg/day	2.0E-02	mg/kg/day	N/A	N/A	8.6E-03
	Hexachlorobenzene	2.78	ug/L	2.78	ug/L	M	7.3E-06	mg/kg/day	8.0E-04	mg/kg/day	N/A	N/A	9.1E-03
	Arsenic	1.75	ug/L	1.75	ug/L	M	0.0E+00	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	- -
	Barium	45.0	ug/L	45.0	ug/L	M	0.0E+00	mg/kg/day	4.9E-03	mg/kg/day	N/A	N/A	- -
	Chromium	12.2	ug/L	12.2	ug/L	M	1.5E-06	mg/kg/day	7.5E-05	mg/kg/day	N/A	N/A	2.0E-02
	Lead	3.92	ug/L	3.92	ug/L	M	0.0E+00	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Vanadium	10.8	ug/L	10.8	ug/L	M	9.0E-07	mg/kg/day	1.8E-04	mg/kg/day	N/A	N/A	4.9E-03
	(Total)												4.7E-02
												Total Hazard Index Across All Exposure Routes/Pathways	4.7E-02

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Subchronic.

TABLE 7.5
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Torpedo Shops (Site 7)
Receptor Population: Full-Time Employees
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	0.570	mg/kg	0.570	mg/kg	M	3.3E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Dibenzo(a,h)anthracene	0.063	mg/kg	0.063	mg/kg	M	3.7E-08	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Cadmium	4.60	mg/kg	4.60	mg/kg	M	2.7E-06	mg/kg/day	5.0E-04	mg/kg/day	N/A	N/A	5.4E-03
	Manganese (Soil)	300	mg/kg	300	mg/kg	M	1.8E-04	mg/kg/day	1.4E-01	mg/kg/day	N/A	N/A	1.3E-03
	(Total)												6.7E-03
Dermal	Benzo(a)pyrene	0.570	mg/kg	0.570	mg/kg	M	3.3E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Dibenzo(a,h)anthracene	0.063	mg/kg	0.063	mg/kg	M	3.7E-08	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Cadmium	4.60	mg/kg	4.60	mg/kg	M	2.1E-08	mg/kg/day	2.5E-05	mg/kg/day	N/A	N/A	8.2E-04
	Manganese (Soil)	300	mg/kg	300	mg/kg	M	0.0E+00	mg/kg/day	5.6E-03	mg/kg/day	N/A	N/A	- -
	(Total)												8.2E-04
												Total Hazard Index Across All Exposure Routes/Pathways	7.5E-03

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Chronic.

TABLE 7.6
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Torpedo Shops (Site 7)
Receptor Population: Full-Time Employees
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	0.375	mg/kg	0.375	mg/kg	M	1.1E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Dibenzo(a,h)anthracene	0.122	mg/kg	0.122	mg/kg	M	3.6E-08	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Cadmium	2.41	mg/kg	2.41	mg/kg	M	7.1E-07	mg/kg/day	5.0E-04	mg/kg/day	N/A	N/A	1.4E-03
	Manganese (Soil)	194	mg/kg	194	mg/kg	M	5.7E-05	mg/kg/day	1.4E-01	mg/kg/day	N/A	N/A	4.1E-04
	(Total)												1.8E-03
Dermal	Benzo(a)pyrene	0.375	mg/kg	0.375	mg/kg	M	2.2E-08	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Dibenzo(a,h)anthracene	0.122	mg/kg	0.122	mg/kg	M	7.0E-09	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Cadmium	2.41	mg/kg	2.41	mg/kg	M	1.1E-09	mg/kg/day	2.5E-05	mg/kg/day	N/A	N/A	4.3E-05
	Manganese (Soil)	194	mg/kg	194	mg/kg	M	0.0E+00	mg/kg/day	5.6E-03	mg/kg/day	N/A	N/A	- -
	(Total)												4.3E-05
												Total Hazard Index Across All Exposure Routes/Pathways	1.9E-03

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Chronic.

TABLE 7.7
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: All Soil
Exposure Medium: All Soil
Exposure Point: Torpedo Shops (Site 7)
Receptor Population: Child Residnts
Receptor Age: Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	0.412	mg/kg	0.412	mg/kg	M	2.3E-06	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Benzo(a)pyrene	0.406	mg/kg	0.406	mg/kg	M	2.2E-06	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Benzo(b)fluoranthene	0.511	mg/kg	0.511	mg/kg	M	2.8E-06	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Indeno(1,2,3-cd)pyrene	0.373	mg/kg	0.373	mg/kg	M	2.0E-06	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Aroclor-1254	0.215	mg/kg	0.215	mg/kg	M	1.2E-06	mg/kg/day	2.0E-05	mg/kg/day	N/A	N/A	5.9E-02
	Antimony	13.4	mg/kg	13.4	mg/kg	M	7.3E-05	mg/kg/day	4.0E-04	mg/kg/day	N/A	N/A	1.8E-01
	Arsenic	3.00	mg/kg	3.00	mg/kg	M	1.6E-05	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	5.5E-02
	Cadmium	2.71	mg/kg	2.71	mg/kg	M	1.5E-05	mg/kg/day	5.0E-04	mg/kg/day	N/A	N/A	3.0E-02
	Chromium	21.7	mg/kg	21.7	mg/kg	M	1.2E-04	mg/kg/day	3.0E-03	mg/kg/day	N/A	N/A	4.0E-02
	Manganese (soil)	282	mg/kg	282	mg/kg	M	1.5E-03	mg/kg/day	1.4E-01	mg/kg/day	N/A	N/A	1.1E-02
	Thallium	0.403	mg/kg	0.403	mg/kg	M	2.2E-06	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	3.2E-02
	Vanadium	34.3	mg/kg	34.3	mg/kg	M	1.9E-04	mg/kg/day	7.0E-03	mg/kg/day	N/A	N/A	2.7E-02
	(Total)												4.4E-01
Dermal	Benzo(a)anthracene	0.412	mg/kg	0.412	mg/kg	M	6.1E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Benzo(a)pyrene	0.406	mg/kg	0.406	mg/kg	M	6.1E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Benzo(b)fluoranthene	0.511	mg/kg	0.511	mg/kg	M	7.6E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Indeno(1,2,3-cd)pyrene	0.373	mg/kg	0.373	mg/kg	M	5.6E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Aroclor-1254	0.215	mg/kg	0.215	mg/kg	M	2.5E-07	mg/kg/day	2.0E-05	mg/kg/day	N/A	N/A	1.2E-02
	Antimony	13.4	mg/kg	13.4	mg/kg	M	0.0E+00	mg/kg/day	6.0E-05	mg/kg/day	N/A	N/A	- -
	Arsenic	3.00	mg/kg	3.00	mg/kg	M	1.0E-06	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	3.4E-03
	Cadmium	2.71	mg/kg	2.71	mg/kg	M	3.1E-08	mg/kg/day	2.5E-05	mg/kg/day	N/A	N/A	1.2E-03
	Chromium	21.7	mg/kg	21.7	mg/kg	M	0.0E+00	mg/kg/day	7.5E-05	mg/kg/day	N/A	N/A	- -
	Manganese (soil)	282	mg/kg	282	mg/kg	M	0.0E+00	mg/kg/day	5.6E-03	mg/kg/day	N/A	N/A	- -
	Thallium	0.403	mg/kg	0.403	mg/kg	M	0.0E+00	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	- -
	Vanadium	34.3	mg/kg	34.3	mg/kg	M	0.0E+00	mg/kg/day	1.8E-04	mg/kg/day	N/A	N/A	- -
	(Total)												1.7E-02
												Total Hazard Index Across All Exposure Routes/Pathways	4.5E-01

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Chronic.

TABLE 7.8
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: All Soil
Exposure Medium: All Soil
Exposure Point: Torpedo Shops (Site 7)
Receptor Population: Child Residnts
Receptor Age: Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	0.412	mg/kg	0.412	mg/kg	M	1.1E-06	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Benzo(a)pyrene	0.406	mg/kg	0.406	mg/kg	M	1.1E-06	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Benzo(b)fluoranthene	0.511	mg/kg	0.511	mg/kg	M	1.4E-06	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Indeno(1,2,3-cd)pyrene	0.373	mg/kg	0.373	mg/kg	M	1.0E-06	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Aroclor-1254	0.215	mg/kg	0.215	mg/kg	M	5.9E-07	mg/kg/day	2.0E-05	mg/kg/day	N/A	N/A	2.9E-02
	Antimony	13.4	mg/kg	13.4	mg/kg	M	3.7E-05	mg/kg/day	4.0E-04	mg/kg/day	N/A	N/A	9.2E-02
	Arsenic	3.00	mg/kg	3.00	mg/kg	M	8.2E-06	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	2.7E-02
	Cadmium	2.71	mg/kg	2.71	mg/kg	M	7.4E-06	mg/kg/day	5.0E-04	mg/kg/day	N/A	N/A	1.5E-02
	Chromium	21.7	mg/kg	21.7	mg/kg	M	5.9E-05	mg/kg/day	3.0E-03	mg/kg/day	N/A	N/A	2.0E-02
	Manganese (soil)	282	mg/kg	282	mg/kg	M	7.7E-04	mg/kg/day	1.4E-01	mg/kg/day	N/A	N/A	5.5E-03
	Thallium	0.403	mg/kg	0.403	mg/kg	M	1.1E-06	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	1.6E-02
	Vanadium	34.3	mg/kg	34.3	mg/kg	M	9.4E-05	mg/kg/day	7.0E-03	mg/kg/day	N/A	N/A	1.3E-02
	(Total)												2.2E-01
Dermal	Benzo(a)anthracene	0.412	mg/kg	0.412	mg/kg	M	1.8E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Benzo(a)pyrene	0.406	mg/kg	0.406	mg/kg	M	1.8E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Benzo(b)fluoranthene	0.511	mg/kg	0.511	mg/kg	M	2.3E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Indeno(1,2,3-cd)pyrene	0.373	mg/kg	0.373	mg/kg	M	1.7E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Aroclor-1254	0.215	mg/kg	0.215	mg/kg	M	7.4E-08	mg/kg/day	2.0E-05	mg/kg/day	N/A	N/A	3.7E-03
	Antimony	13.4	mg/kg	13.4	mg/kg	M	0.0E+00	mg/kg/day	6.0E-05	mg/kg/day	N/A	N/A	- -
	Arsenic	3.00	mg/kg	3.00	mg/kg	M	3.1E-07	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	1.0E-03
	Cadmium	2.71	mg/kg	2.71	mg/kg	M	9.3E-09	mg/kg/day	2.5E-05	mg/kg/day	N/A	N/A	3.7E-04
	Chromium	21.7	mg/kg	21.7	mg/kg	M	0.0E+00	mg/kg/day	7.5E-05	mg/kg/day	N/A	N/A	- -
	Manganese (soil)	282	mg/kg	282	mg/kg	M	0.0E+00	mg/kg/day	5.6E-03	mg/kg/day	N/A	N/A	- -
	Thallium	0.403	mg/kg	0.403	mg/kg	M	0.0E+00	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	- -
	Vanadium	34.3	mg/kg	34.3	mg/kg	M	0.0E+00	mg/kg/day	1.8E-04	mg/kg/day	N/A	N/A	- -
	(Total)												5.1E-03
												Total Hazard Index Across All Exposure Routes/Pathways	2.2E-01

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Chronic.

TABLE 7.9
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: All Soil
Exposure Medium: All Soil
Exposure Point: Torpedo Shops (Site 7)
Receptor Population: Adult Residnts
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	0.412	mg/kg	0.412	mg/kg	M	2.4E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Benzo(a)pyrene	0.406	mg/kg	0.406	mg/kg	M	2.4E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Benzo(b)fluoranthene	0.511	mg/kg	0.511	mg/kg	M	3.0E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Indeno(1,2,3-cd)pyrene	0.373	mg/kg	0.373	mg/kg	M	2.2E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Aroclor-1254	0.215	mg/kg	0.215	mg/kg	M	1.3E-07	mg/kg/day	2.0E-05	mg/kg/day	N/A	N/A	6.3E-03
	Antimony	13.4	mg/kg	13.4	mg/kg	M	7.8E-06	mg/kg/day	4.0E-04	mg/kg/day	N/A	N/A	2.0E-02
	Arsenic	3.00	mg/kg	3.00	mg/kg	M	1.8E-06	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	5.9E-03
	Cadmium	2.71	mg/kg	2.71	mg/kg	M	1.6E-06	mg/kg/day	5.0E-04	mg/kg/day	N/A	N/A	3.2E-03
	Chromium	21.7	mg/kg	21.7	mg/kg	M	1.3E-05	mg/kg/day	3.0E-03	mg/kg/day	N/A	N/A	4.2E-03
	Manganese (soil)	282	mg/kg	282	mg/kg	M	1.7E-04	mg/kg/day	1.4E-01	mg/kg/day	N/A	N/A	1.2E-03
	Thallium	0.403	mg/kg	0.403	mg/kg	M	2.4E-07	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	3.4E-03
	Vanadium	34.3	mg/kg	34.3	mg/kg	M	2.0E-05	mg/kg/day	7.0E-03	mg/kg/day	N/A	N/A	2.9E-03
	(Total)												4.7E-02
Dermal	Benzo(a)anthracene	0.412	mg/kg	0.412	mg/kg	M	8.4E-08	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Benzo(a)pyrene	0.406	mg/kg	0.406	mg/kg	M	8.2E-08	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Benzo(b)fluoranthene	0.511	mg/kg	0.511	mg/kg	M	1.0E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Indeno(1,2,3-cd)pyrene	0.373	mg/kg	0.373	mg/kg	M	7.6E-08	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Aroclor-1254	0.215	mg/kg	0.215	mg/kg	M	3.4E-08	mg/kg/day	2.0E-05	mg/kg/day	N/A	N/A	1.7E-03
	Antimony	13.4	mg/kg	13.4	mg/kg	M	0.0E+00	mg/kg/day	6.0E-05	mg/kg/day	N/A	N/A	- -
	Arsenic	3.00	mg/kg	3.00	mg/kg	M	1.4E-07	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	4.7E-04
	Cadmium	2.71	mg/kg	2.71	mg/kg	M	4.2E-09	mg/kg/day	2.5E-05	mg/kg/day	N/A	N/A	1.7E-04
	Chromium	21.7	mg/kg	21.7	mg/kg	M	0.0E+00	mg/kg/day	7.5E-05	mg/kg/day	N/A	N/A	- -
	Manganese (soil)	282	mg/kg	282	mg/kg	M	0.0E+00	mg/kg/day	5.6E-03	mg/kg/day	N/A	N/A	- -
	Thallium	0.403	mg/kg	0.403	mg/kg	M	0.0E+00	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	- -
	Vanadium	34.3	mg/kg	34.3	mg/kg	M	0.0E+00	mg/kg/day	1.8E-04	mg/kg/day	N/A	N/A	- -
	(Total)												2.3E-03
												Total Hazard Index Across All Exposure Routes/Pathways	4.9E-02

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Chronic.

TABLE 7.10
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: All Soil
Exposure Medium: All Soil
Exposure Point: Torpedo Shops (Site 7)
Receptor Population: Adult Residnts
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)anthracene	0.412	mg/kg	0.412	mg/kg	M	1.2E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Benzo(a)pyrene	0.406	mg/kg	0.406	mg/kg	M	1.2E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Benzo(b)fluoranthene	0.511	mg/kg	0.511	mg/kg	M	1.5E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Indeno(1,2,3-cd)pyrene	0.373	mg/kg	0.373	mg/kg	M	1.1E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Aroclor-1254	0.215	mg/kg	0.215	mg/kg	M	6.3E-08	mg/kg/day	2.0E-05	mg/kg/day	N/A	N/A	3.2E-03
	Antimony	13.4	mg/kg	13.4	mg/kg	M	3.9E-06	mg/kg/day	4.0E-04	mg/kg/day	N/A	N/A	9.8E-03
	Arsenic	3.00	mg/kg	3.00	mg/kg	M	8.8E-07	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	2.9E-03
	Cadmium	2.71	mg/kg	2.71	mg/kg	M	8.0E-07	mg/kg/day	5.0E-04	mg/kg/day	N/A	N/A	1.6E-03
	Chromium	21.7	mg/kg	21.7	mg/kg	M	6.4E-06	mg/kg/day	3.0E-03	mg/kg/day	N/A	N/A	2.1E-03
	Manganese (soil)	282	mg/kg	282	mg/kg	M	8.3E-05	mg/kg/day	1.4E-01	mg/kg/day	N/A	N/A	5.9E-04
	Thallium	0.403	mg/kg	0.403	mg/kg	M	1.2E-07	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	1.7E-03
	Vanadium	34.3	mg/kg	34.3	mg/kg	M	1.0E-05	mg/kg/day	7.0E-03	mg/kg/day	N/A	N/A	1.4E-03
	(Total)												2.3E-02
Dermal	Benzo(a)anthracene	0.412	mg/kg	0.412	mg/kg	M	1.2E-08	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Benzo(a)pyrene	0.406	mg/kg	0.406	mg/kg	M	1.2E-08	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Benzo(b)fluoranthene	0.511	mg/kg	0.511	mg/kg	M	1.5E-08	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Indeno(1,2,3-cd)pyrene	0.373	mg/kg	0.373	mg/kg	M	1.1E-08	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Aroclor-1254	0.215	mg/kg	0.215	mg/kg	M	4.8E-09	mg/kg/day	2.0E-05	mg/kg/day	N/A	N/A	2.4E-04
	Antimony	13.4	mg/kg	13.4	mg/kg	M	0.0E+00	mg/kg/day	6.0E-05	mg/kg/day	N/A	N/A	- -
	Arsenic	3.00	mg/kg	3.00	mg/kg	M	2.0E-08	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	6.7E-05
	Cadmium	2.71	mg/kg	2.71	mg/kg	M	6.1E-10	mg/kg/day	2.5E-05	mg/kg/day	N/A	N/A	2.4E-05
	Chromium	21.7	mg/kg	21.7	mg/kg	M	0.0E+00	mg/kg/day	7.5E-05	mg/kg/day	N/A	N/A	- -
	Manganese (soil)	282	mg/kg	282	mg/kg	M	0.0E+00	mg/kg/day	5.6E-03	mg/kg/day	N/A	N/A	- -
	Thallium	0.403	mg/kg	0.403	mg/kg	M	0.0E+00	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	- -
	Vanadium	34.3	mg/kg	34.3	mg/kg	M	0.0E+00	mg/kg/day	1.8E-04	mg/kg/day	N/A	N/A	- -
	(Total)												3.3E-04
												Total Hazard Index Across All Exposure Routes/Pathways	2.4E-02

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Chronic.

TABLE 7.11
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Torpedo Shops (Site 7)
Receptor Population: Adult Residnts
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	1,3-Dichlorobenzene	1.73	ug/L	1.73	ug/L	M	4.7E-05	mg/kg/day	0.0009	mg/kg/day	N/A	N/A	5.3E-02
	1,4-Dichlorobenzene	90.5	ug/L	90.5	ug/L	M	2.5E-03	mg/kg/day	0.03	mg/kg/day	N/A	N/A	8.3E-02
	Chlorobenzene	165	ug/L	165	ug/L	M	4.5E-03	mg/kg/day	0.02	mg/kg/day	N/A	N/A	2.3E-01
	Benzene	2.00	ug/L	2.00	ug/L	M	5.5E-05	mg/kg/day	0.003	mg/kg/day	N/A	N/A	1.8E-02
	Trichloroethene	23.0	ug/L	23.0	ug/L	M	6.3E-04	mg/kg/day	0.006	mg/kg/day	N/A	N/A	1.1E-01
	Bis(2-ethylhexyl)phthalate	190	ug/L	190	ug/L	M	5.2E-03	mg/kg/day	0.02	mg/kg/day	N/A	N/A	2.6E-01
	Hexachlorobenzene	3.00	ug/L	3.00	ug/L	M	8.2E-05	mg/kg/day	0.0008	mg/kg/day	N/A	N/A	1.0E-01
	Arsenic	11.4	ug/L	11.4	ug/L	M	3.1E-04	mg/kg/day	0.0003	mg/kg/day	N/A	N/A	1.0E+00
	Barium	434	ug/L	434	ug/L	M	1.2E-02	mg/kg/day	0.07	mg/kg/day	N/A	N/A	1.7E-01
	Chromium	127	ug/L	127	ug/L	M	3.5E-03	mg/kg/day	0.003	mg/kg/day	N/A	N/A	1.2E+00
	Lead	3.92	ug/L	3.92	ug/L	M	1.1E-04	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Vanadium	151	ug/L	151	ug/L	M	4.1E-03	mg/kg/day	0.007	mg/kg/day	N/A	N/A	5.9E-01
													3.8E+00
Dermal	1,3-Dichlorobenzene	1.73	ug/L	1.73	ug/L	M	3.4E-05	mg/kg/day	9.0E-04	mg/kg/day	N/A	N/A	3.7E-02
	1,4-Dichlorobenzene	90.5	ug/L	90.5	ug/L	M	1.3E-03	mg/kg/day	3.0E-02	mg/kg/day	N/A	N/A	4.2E-02
	Chlorobenzene	165	ug/L	165	ug/L	M	1.2E-03	mg/kg/day	2.0E-02	mg/kg/day	N/A	N/A	6.2E-02
	Benzene	2.00	ug/L	2.00	ug/L	M	6.3E-06	mg/kg/day	3.0E-03	mg/kg/day	N/A	N/A	2.1E-03
	Trichloroethene	23.0	ug/L	23.0	ug/L	M	8.0E-05	mg/kg/day	6.0E-03	mg/kg/day	N/A	N/A	1.3E-02
	Bis(2-ethylhexyl)phthalate	190	ug/L	190	ug/L	M	7.9E-03	mg/kg/day	2.0E-02	mg/kg/day	N/A	N/A	3.9E-01
	Hexachlorobenzene	3.00	ug/L	3.00	ug/L	M	3.4E-04	mg/kg/day	8.0E-04	mg/kg/day	N/A	N/A	4.2E-01
	Arsenic	11.4	ug/L	11.4	ug/L	M	0.0E+00	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	- -
	Barium	434	ug/L	434	ug/L	M	0.0E+00	mg/kg/day	4.9E-03	mg/kg/day	N/A	N/A	- -
	Chromium	127	ug/L	127	ug/L	M	1.7E-05	mg/kg/day	7.5E-05	mg/kg/day	N/A	N/A	2.3E-01
	Lead	3.92	ug/L	3.92	ug/L	M	0.0E+00	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Vanadium	151	ug/L	151	ug/L	M	1.0E-05	mg/kg/day	1.8E-04	mg/kg/day	N/A	N/A	5.7E-02
	(Total)												1.3E+00
												Total Hazard Index Across All Exposure Routes/Pathways	5.1E+00

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Chronic.

TABLE 7.12
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Torpedo Shops (Site 7)
Receptor Population: Adult Residnts
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	1,3-Dichlorobenzene	0.546	ug/L	0.546	ug/L	M	7.0E-06	mg/kg/day	0.0009	mg/kg/day	N/A	N/A	7.8E-03
	1,4-Dichlorobenzene	4.25	ug/L	4.25	ug/L	M	5.4E-05	mg/kg/day	0.03	mg/kg/day	N/A	N/A	1.8E-03
	Chlorobenzene	6.82	ug/L	6.82	ug/L	M	8.7E-05	mg/kg/day	0.02	mg/kg/day	N/A	N/A	4.4E-03
	Benzene	0.556	ug/L	0.556	ug/L	M	7.1E-06	mg/kg/day	0.003	mg/kg/day	N/A	N/A	2.4E-03
	Trichloroethene	1.91	ug/L	1.91	ug/L	M	2.4E-05	mg/kg/day	0.006	mg/kg/day	N/A	N/A	4.1E-03
	Bis(2-ethylhexyl)phthalate	16.5	ug/L	16.5	ug/L	M	2.1E-04	mg/kg/day	0.02	mg/kg/day	N/A	N/A	1.1E-02
	Hexachlorobenzene	2.78	ug/L	2.78	ug/L	M	3.6E-05	mg/kg/day	0.0008	mg/kg/day	N/A	N/A	4.4E-02
	Arsenic	1.75	ug/L	1.75	ug/L	M	2.2E-05	mg/kg/day	0.0003	mg/kg/day	N/A	N/A	7.5E-02
	Barium	45.0	ug/L	45.0	ug/L	M	5.8E-04	mg/kg/day	0.07	mg/kg/day	N/A	N/A	8.2E-03
	Chromium	12.2	ug/L	12.2	ug/L	M	1.6E-04	mg/kg/day	0.003	mg/kg/day	N/A	N/A	5.2E-02
	Lead	3.92	ug/L	3.92	ug/L	M	5.0E-05	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Vanadium	10.8	ug/L	10.8	ug/L	M	1.4E-04	mg/kg/day	0.007	mg/kg/day	N/A	N/A	2.0E-02
													2.3E-01
Dermal	1,3-Dichlorobenzene	0.546	ug/L	0.546	ug/L	M	2.3E-05	mg/kg/day	9.0E-04	mg/kg/day	N/A	N/A	2.5E-02
	1,4-Dichlorobenzene	4.25	ug/L	4.25	ug/L	M	8.5E-04	mg/kg/day	3.0E-02	mg/kg/day	N/A	N/A	2.8E-02
	Chlorobenzene	6.82	ug/L	6.82	ug/L	M	8.3E-04	mg/kg/day	2.0E-02	mg/kg/day	N/A	N/A	4.1E-02
	Benzene	0.556	ug/L	0.556	ug/L	M	4.2E-06	mg/kg/day	3.0E-03	mg/kg/day	N/A	N/A	1.4E-03
	Trichloroethene	1.91	ug/L	1.91	ug/L	M	5.4E-05	mg/kg/day	6.0E-03	mg/kg/day	N/A	N/A	8.9E-03
	Bis(2-ethylhexyl)phthalate	16.5	ug/L	16.5	ug/L	M	5.3E-03	mg/kg/day	2.0E-02	mg/kg/day	N/A	N/A	2.6E-01
	Hexachlorobenzene	2.78	ug/L	2.78	ug/L	M	2.2E-04	mg/kg/day	8.0E-04	mg/kg/day	N/A	N/A	2.8E-01
	Arsenic	1.75	ug/L	1.75	ug/L	M	0.0E+00	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	- -
	Barium	45.0	ug/L	45.0	ug/L	M	0.0E+00	mg/kg/day	4.9E-03	mg/kg/day	N/A	N/A	- -
	Chromium	12.2	ug/L	12.2	ug/L	M	1.2E-05	mg/kg/day	7.5E-05	mg/kg/day	N/A	N/A	1.6E-01
	Lead	3.92	ug/L	3.92	ug/L	M	0.0E+00	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Vanadium	10.8	ug/L	10.8	ug/L	M	6.9E-06	mg/kg/day	1.8E-04	mg/kg/day	N/A	N/A	3.8E-02
	(Total)												8.4E-01
												Total Hazard Index Across All Exposure Routes/Pathways	1.1E+00

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Chronic.

TABLE 8.1
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: All Soil
Exposure Medium: All Soil
Exposure Point: Torpedo Shops (Site 7)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	0.412	mg/kg	0.412	mg/kg	M	1.3E-08	mg/kg/day	7.3E-01	(mg/kg/day) -1	9.7E-09
	Benzo(a)pyrene	0.406	mg/kg	0.406	mg/kg	M	1.3E-08	mg/kg/day	7.3E+00	(mg/kg/day) -1	9.5E-08
	Benzo(b)fluoranthene	0.511	mg/kg	0.511	mg/kg	M	1.6E-08	mg/kg/day	7.3E-01	(mg/kg/day) -1	1.2E-08
	Indeno(1,2,3-cd)pyrene	0.373	mg/kg	0.373	mg/kg	M	1.2E-08	mg/kg/day	7.3E-01	(mg/kg/day) -1	8.8E-09
	Aroclor-1254	0.215	mg/kg	0.215	mg/kg	M	6.9E-09	mg/kg/day	2.0E+00	(mg/kg/day) -1	1.4E-08
	Antimony	13.4	mg/kg	13.4	mg/kg	M	4.3E-07	mg/kg/day	NA	(mg/kg/day) -1	- -
	Arsenic	3.00	mg/kg	3.00	mg/kg	M	9.7E-08	mg/kg/day	1.5E+00	(mg/kg/day) -1	1.4E-07
	Cadmium	2.71	mg/kg	2.71	mg/kg	M	8.7E-08	mg/kg/day	NA	(mg/kg/day) -1	- -
	Chromium	21.7	mg/kg	21.7	mg/kg	M	7.0E-07	mg/kg/day	NA	(mg/kg/day) -1	- -
	Manganese (soil)	282	mg/kg	282	mg/kg	M	9.1E-06	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	0.403	mg/kg	0.403	mg/kg	M	1.3E-08	mg/kg/day	NA	(mg/kg/day) -1	- -
	Vanadium	34.3	mg/kg	34.3	mg/kg	M	1.1E-06	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										2.8E-07
Dermal	Benzo(a)anthracene	0.412	mg/kg	0.412	mg/kg	M	2.7E-09	mg/kg/day	7.3E-01	(mg/kg/day) -1	2.0E-09
	Benzo(a)pyrene	0.406	mg/kg	0.406	mg/kg	M	2.7E-09	mg/kg/day	7.3E+00	(mg/kg/day) -1	2.0E-08
	Benzo(b)fluoranthene	0.511	mg/kg	0.511	mg/kg	M	3.4E-09	mg/kg/day	7.3E-01	(mg/kg/day) -1	2.5E-09
	Indeno(1,2,3-cd)pyrene	0.373	mg/kg	0.373	mg/kg	M	2.5E-09	mg/kg/day	7.3E-01	(mg/kg/day) -1	1.8E-09
	Aroclor-1254	0.215	mg/kg	0.215	mg/kg	M	1.1E-09	mg/kg/day	2.0E+00	(mg/kg/day) -1	2.2E-09
	Antimony	13.4	mg/kg	13.4	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Arsenic	3.00	mg/kg	3.00	mg/kg	M	4.6E-09	mg/kg/day	1.5E+00	(mg/kg/day) -1	6.9E-09
	Cadmium	2.71	mg/kg	2.71	mg/kg	M	1.4E-10	mg/kg/day	NA	(mg/kg/day) -1	- -
	Chromium	21.7	mg/kg	21.7	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Manganese (soil)	282	mg/kg	282	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	0.403	mg/kg	0.403	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Vanadium	34.3	mg/kg	34.3	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										3.5E-08
										Total Risk Across All Exposure Routes/Pathways	3.2E-07

(1) *Medium-Specific (M) EPC selected for risk calculation.*

TABLE 8.2
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: All Soil
Exposure Medium: All Soil
Exposure Point: Torpedo Shops (Site 7)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	0.412	mg/kg	0.412	mg/kg	M	4.4E-09	mg/kg/day	7.3E-01	(mg/kg/day) -1	3.2E-09
	Benzo(a)pyrene	0.406	mg/kg	0.406	mg/kg	M	4.4E-09	mg/kg/day	7.3E+00	(mg/kg/day) -1	3.2E-08
	Benzo(b)fluoranthene	0.511	mg/kg	0.511	mg/kg	M	5.5E-09	mg/kg/day	7.3E-01	(mg/kg/day) -1	4.0E-09
	Indeno(1,2,3-cd)pyrene	0.373	mg/kg	0.373	mg/kg	M	4.0E-09	mg/kg/day	7.3E-01	(mg/kg/day) -1	2.9E-09
	Aroclor-1254	0.215	mg/kg	0.215	mg/kg	M	2.3E-09	mg/kg/day	2.0E+00	(mg/kg/day) -1	4.6E-09
	Antimony	13.4	mg/kg	13.4	mg/kg	M	1.4E-07	mg/kg/day	NA	(mg/kg/day) -1	- -
	Arsenic	3.00	mg/kg	3.00	mg/kg	M	3.2E-08	mg/kg/day	1.5E+00	(mg/kg/day) -1	4.8E-08
	Cadmium	2.71	mg/kg	2.71	mg/kg	M	2.9E-08	mg/kg/day	NA	(mg/kg/day) -1	- -
	Chromium	21.7	mg/kg	21.7	mg/kg	M	2.3E-07	mg/kg/day	NA	(mg/kg/day) -1	- -
	Manganese (soil)	282	mg/kg	282	mg/kg	M	3.0E-06	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	0.403	mg/kg	0.403	mg/kg	M	4.3E-09	mg/kg/day	NA	(mg/kg/day) -1	- -
	Vanadium	34.3	mg/kg	34.3	mg/kg	M	3.7E-07	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										9.5E-08
Dermal	Benzo(a)anthracene	0.412	mg/kg	0.412	mg/kg	M	1.8E-10	mg/kg/day	7.3E-01	(mg/kg/day) -1	1.3E-10
	Benzo(a)pyrene	0.406	mg/kg	0.406	mg/kg	M	1.8E-10	mg/kg/day	7.3E+00	(mg/kg/day) -1	1.3E-09
	Benzo(b)fluoranthene	0.511	mg/kg	0.511	mg/kg	M	2.3E-10	mg/kg/day	7.3E-01	(mg/kg/day) -1	1.6E-10
	Indeno(1,2,3-cd)pyrene	0.373	mg/kg	0.373	mg/kg	M	1.6E-10	mg/kg/day	7.3E-01	(mg/kg/day) -1	1.2E-10
	Aroclor-1254	0.215	mg/kg	0.215	mg/kg	M	7.3E-11	mg/kg/day	2.0E+00	(mg/kg/day) -1	1.5E-10
	Antimony	13.4	mg/kg	13.4	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Arsenic	3.00	mg/kg	3.00	mg/kg	M	3.1E-10	mg/kg/day	1.5E+00	(mg/kg/day) -1	4.6E-10
	Cadmium	2.71	mg/kg	2.71	mg/kg	M	9.2E-12	mg/kg/day	NA	(mg/kg/day) -1	- -
	Chromium	21.7	mg/kg	21.7	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Manganese (soil)	282	mg/kg	282	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	0.403	mg/kg	0.403	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Vanadium	34.3	mg/kg	34.3	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										2.3E-09
										Total Risk Across All Exposure Routes/Pathways	9.7E-08

(1) Medium-Specific (M) EPC selected for risk calculation.

TABLE 8.3
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Torpedo Shops (Site 7)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	1,3-Dichlorobenzene	1.73	ug/L	1.73	ug/L	M	2.2E-08	mg/kg/day	NA	(mg/kg/day) -1	- -
	1,4-Dichlorobenzene	90.5	ug/L	90.5	ug/L	M	8.5E-07	mg/kg/day	2.4E-02	(mg/kg/day) -1	2.0E-08
	Chlorobenzene	165	ug/L	165	ug/L	M	9.5E-07	mg/kg/day	NA	(mg/kg/day) -1	- -
	Benzene	2.00	ug/L	2.00	ug/L	M	5.8E-09	mg/kg/day	5.5E-02	(mg/kg/day) -1	3.2E-10
	Trichloroethene	23.0	ug/L	23.0	ug/L	M	6.0E-08	mg/kg/day	1.1E-02	(mg/kg/day) -1	6.5E-10
	Bis(2-ethylhexyl)phthalate	190	ug/L	190	ug/L	M	4.9E-06	mg/kg/day	1.4E-02	(mg/kg/day) -1	6.8E-08
	Hexachlorobenzene	3.00	ug/L	3.00	ug/L	M	2.1E-07	mg/kg/day	1.6E+00	(mg/kg/day) -1	3.3E-07
	Arsenic	11.4	ug/L	11.4	ug/L	M	0.0E+00	mg/kg/day	1.5E+00	(mg/kg/day) -1	0.0E+00
	Barium	434	ug/L	434	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Chromium	127	ug/L	127	ug/L	M	4.3E-08	mg/kg/day	NA	(mg/kg/day) -1	- -
	Lead	3.92	ug/L	3.92	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Vanadium	151	ug/L	151	ug/L	M	2.6E-08	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										4.2E-07
										Total Risk Across All Exposure Routes/Pathways	4.2E-07

(1) Medium-Specific (M) EPC selected for risk calculation.

TABLE 8.4
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Torpedo Shops (Site 7)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	1,3-Dichlorobenzene	0.546	ug/L	0.546	ug/L	M	2.4E-09	mg/kg/day	NA	(mg/kg/day) -1	- -
	1,4-Dichlorobenzene	4.25	ug/L	4.25	ug/L	M	1.3E-08	mg/kg/day	2.4E-02	(mg/kg/day) -1	3.2E-10
	Chlorobenzene	6.82	ug/L	6.82	ug/L	M	1.2E-08	mg/kg/day	NA	(mg/kg/day) -1	- -
	Benzene	0.556	ug/L	0.556	ug/L	M	4.6E-10	mg/kg/day	5.5E-02	(mg/kg/day) -1	2.5E-11
	Trichloroethene	1.91	ug/L	1.91	ug/L	M	1.5E-09	mg/kg/day	1.1E-02	(mg/kg/day) -1	1.7E-11
	Bis(2-ethylhexyl)phthalate	16.5	ug/L	16.5	ug/L	M	1.5E-07	mg/kg/day	1.4E-02	(mg/kg/day) -1	2.1E-09
	Hexachlorobenzene	2.78	ug/L	2.78	ug/L	M	6.1E-08	mg/kg/day	1.6E+00	(mg/kg/day) -1	9.8E-08
	Arsenic	1.75	ug/L	1.75	ug/L	M	0.0E+00	mg/kg/day	1.5E+00	(mg/kg/day) -1	0.0E+00
	Barium	45.0	ug/L	45.0	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Chromium	12.2	ug/L	12.2	ug/L	M	1.0E-09	mg/kg/day	NA	(mg/kg/day) -1	- -
	Lead	3.92	ug/L	3.92	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Vanadium	10.8	ug/L	10.8	ug/L	M	4.6E-10	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										1.0E-07
										Total Risk Across All Exposure Routes/Pathways	1.0E-07

(1) Medium-Specific (M) EPC selected for risk calculation.

TABLE 8.5
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Torpedo Shops (Site 7)
Receptor Population: Full-Time Employees
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	0.570	mg/kg	0.570	mg/kg	M	1.2E-07	mg/kg/day	7.3E+00	(mg/kg/day) -1	8.7E-07
	Dibenzo(a,h)anthracene	0.063	mg/kg	0.063	mg/kg	M	1.3E-08	mg/kg/day	7.3E+00	(mg/kg/day) -1	9.6E-08
	Cadmium	4.60	mg/kg	4.60	mg/kg	M	9.6E-07	mg/kg/day	NA	(mg/kg/day) -1	- -
	Manganese (Soil)	300	mg/kg	300	mg/kg	M	6.3E-05	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										9.7E-07
Dermal	Benzo(a)pyrene	0.570	mg/kg	0.570	mg/kg	M	1.2E-07	mg/kg/day	7.3E+00	(mg/kg/day) -1	8.6E-07
	Dibenzo(a,h)anthracene	0.063	mg/kg	0.063	mg/kg	M	1.3E-08	mg/kg/day	7.3E+00	(mg/kg/day) -1	9.5E-08
	Cadmium	4.60	mg/kg	4.60	mg/kg	M	7.3E-09	mg/kg/day	NA	(mg/kg/day) -1	- -
	Manganese (Soil)	300	mg/kg	300	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										9.6E-07
										Total Risk Across All Exposure Routes/Pathways	1.9E-06

(1) Medium-Specific (M) EPC selected for risk calculation.

TABLE 8.6
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Torpedo Shops (Site 7)
Receptor Population: Full-Time Employees
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	0.375	mg/kg	0.375	mg/kg	M	9.4E-09	mg/kg/day	7.3E+00	(mg/kg/day) -1	6.9E-08
	Dibenzo(a,h)anthracene	0.122	mg/kg	0.122	mg/kg	M	3.1E-09	mg/kg/day	7.3E+00	(mg/kg/day) -1	2.2E-08
	Cadmium	2.41	mg/kg	2.41	mg/kg	M	6.1E-08	mg/kg/day	NA	(mg/kg/day) -1	- -
	Manganese (Soil)	194	mg/kg	194	mg/kg	M	4.9E-06	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										9.1E-08
Dermal	Benzo(a)pyrene	0.375	mg/kg	0.375	mg/kg	M	1.9E-09	mg/kg/day	7.3E+00	(mg/kg/day) -1	1.4E-08
	Dibenzo(a,h)anthracene	0.122	mg/kg	0.122	mg/kg	M	6.0E-10	mg/kg/day	7.3E+00	(mg/kg/day) -1	4.4E-09
	Cadmium	2.41	mg/kg	2.41	mg/kg	M	9.2E-11	mg/kg/day	NA	(mg/kg/day) -1	- -
	Manganese (Soil)	194	mg/kg	194	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										1.8E-08
										Total Risk Across All Exposure Routes/Pathways	1.1E-07

(1) Medium-Specific (M) EPC selected for risk calculation.

TABLE 8.7
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: All Soil
Exposure Medium: All Soil
Exposure Point: Torpedo Shops (Site 7)
Receptor Population: Child Residnts
Receptor Age: Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	0.412	mg/kg	0.412	mg/kg	M	1.9E-07	mg/kg/day	7.3E-01	(mg/kg/day) -1	1.4E-07
	Benzo(a)pyrene	0.406	mg/kg	0.406	mg/kg	M	1.9E-07	mg/kg/day	7.3E+00	(mg/kg/day) -1	1.4E-06
	Benzo(b)fluoranthene	0.511	mg/kg	0.511	mg/kg	M	2.4E-07	mg/kg/day	7.3E-01	(mg/kg/day) -1	1.8E-07
	Indeno(1,2,3-cd)pyrene	0.373	mg/kg	0.373	mg/kg	M	1.8E-07	mg/kg/day	7.3E-01	(mg/kg/day) -1	1.3E-07
	Aroclor-1254	0.215	mg/kg	0.215	mg/kg	M	1.0E-07	mg/kg/day	2.0E+00	(mg/kg/day) -1	2.0E-07
	Antimony	13.4	mg/kg	13.4	mg/kg	M	6.3E-06	mg/kg/day	NA	(mg/kg/day) -1	- -
	Arsenic	3.00	mg/kg	3.00	mg/kg	M	1.4E-06	mg/kg/day	1.5E+00	(mg/kg/day) -1	2.1E-06
	Cadmium	2.71	mg/kg	2.71	mg/kg	M	1.3E-06	mg/kg/day	NA	(mg/kg/day) -1	- -
	Chromium	21.7	mg/kg	21.7	mg/kg	M	1.0E-05	mg/kg/day	NA	(mg/kg/day) -1	- -
	Manganese (soil)	282	mg/kg	282	mg/kg	M	1.3E-04	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	0.403	mg/kg	0.403	mg/kg	M	1.9E-07	mg/kg/day	NA	(mg/kg/day) -1	- -
	Vanadium	34.3	mg/kg	34.3	mg/kg	M	1.6E-05	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										4.2E-06
Dermal	Benzo(a)anthracene	0.412	mg/kg	0.412	mg/kg	M	5.3E-08	mg/kg/day	7.3E-01	(mg/kg/day) -1	3.8E-08
	Benzo(a)pyrene	0.406	mg/kg	0.406	mg/kg	M	5.2E-08	mg/kg/day	7.3E+00	(mg/kg/day) -1	3.8E-07
	Benzo(b)fluoranthene	0.511	mg/kg	0.511	mg/kg	M	6.5E-08	mg/kg/day	7.3E-01	(mg/kg/day) -1	4.8E-08
	Indeno(1,2,3-cd)pyrene	0.373	mg/kg	0.373	mg/kg	M	4.8E-08	mg/kg/day	7.3E-01	(mg/kg/day) -1	3.5E-08
	Aroclor-1254	0.215	mg/kg	0.215	mg/kg	M	2.1E-08	mg/kg/day	2.0E+00	(mg/kg/day) -1	4.2E-08
	Antimony	13.4	mg/kg	13.4	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Arsenic	3.00	mg/kg	3.00	mg/kg	M	8.8E-08	mg/kg/day	1.5E+00	(mg/kg/day) -1	1.3E-07
	Cadmium	2.71	mg/kg	2.71	mg/kg	M	2.7E-09	mg/kg/day	NA	(mg/kg/day) -1	- -
	Chromium	21.7	mg/kg	21.7	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Manganese (soil)	282	mg/kg	282	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	0.403	mg/kg	0.403	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Vanadium	34.3	mg/kg	34.3	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										6.7E-07
										Total Risk Across All Exposure Routes/Pathways	4.8E-06

(1) Medium-Specific (M) EPC selected for risk calculation.

TABLE 8.8
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: All Soil
Exposure Medium: All Soil
Exposure Point: Torpedo Shops (Site 7)
Receptor Population: Child Residnts
Receptor Age: Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	0.412	mg/kg	0.412	mg/kg	M	3.2E-08	mg/kg/day	7.3E-01	(mg/kg/day) -1	2.4E-08
	Benzo(a)pyrene	0.406	mg/kg	0.406	mg/kg	M	3.2E-08	mg/kg/day	7.3E+00	(mg/kg/day) -1	2.3E-07
	Benzo(b)fluoranthene	0.511	mg/kg	0.511	mg/kg	M	4.0E-08	mg/kg/day	7.3E-01	(mg/kg/day) -1	2.9E-08
	Indeno(1,2,3-cd)pyrene	0.373	mg/kg	0.373	mg/kg	M	2.9E-08	mg/kg/day	7.3E-01	(mg/kg/day) -1	2.1E-08
	Aroclor-1254	0.215	mg/kg	0.215	mg/kg	M	1.7E-08	mg/kg/day	2.0E+00	(mg/kg/day) -1	3.4E-08
	Antimony	13.4	mg/kg	13.4	mg/kg	M	1.0E-06	mg/kg/day	NA	(mg/kg/day) -1	- -
	Arsenic	3.00	mg/kg	3.00	mg/kg	M	2.3E-07	mg/kg/day	1.5E+00	(mg/kg/day) -1	3.5E-07
	Cadmium	2.71	mg/kg	2.71	mg/kg	M	2.1E-07	mg/kg/day	NA	(mg/kg/day) -1	- -
	Chromium	21.7	mg/kg	21.7	mg/kg	M	1.7E-06	mg/kg/day	NA	(mg/kg/day) -1	- -
	Manganese (soil)	282	mg/kg	282	mg/kg	M	2.2E-05	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	0.403	mg/kg	0.403	mg/kg	M	3.2E-08	mg/kg/day	NA	(mg/kg/day) -1	- -
	Vanadium	34.3	mg/kg	34.3	mg/kg	M	2.7E-06	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										6.9E-07
Dermal	Benzo(a)anthracene	0.412	mg/kg	0.412	mg/kg	M	5.3E-09	mg/kg/day	7.3E-01	(mg/kg/day) -1	3.8E-09
	Benzo(a)pyrene	0.406	mg/kg	0.406	mg/kg	M	5.2E-09	mg/kg/day	7.3E+00	(mg/kg/day) -1	3.8E-08
	Benzo(b)fluoranthene	0.511	mg/kg	0.511	mg/kg	M	6.5E-09	mg/kg/day	7.3E-01	(mg/kg/day) -1	4.8E-09
	Indeno(1,2,3-cd)pyrene	0.373	mg/kg	0.373	mg/kg	M	4.8E-09	mg/kg/day	7.3E-01	(mg/kg/day) -1	3.5E-09
	Aroclor-1254	0.215	mg/kg	0.215	mg/kg	M	2.1E-09	mg/kg/day	2.0E+00	(mg/kg/day) -1	4.2E-09
	Antimony	13.4	mg/kg	13.4	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Arsenic	3.00	mg/kg	3.00	mg/kg	M	8.8E-09	mg/kg/day	1.5E+00	(mg/kg/day) -1	1.3E-08
	Cadmium	2.71	mg/kg	2.71	mg/kg	M	2.7E-10	mg/kg/day	NA	(mg/kg/day) -1	- -
	Chromium	21.7	mg/kg	21.7	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Manganese (soil)	282	mg/kg	282	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	0.403	mg/kg	0.403	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Vanadium	34.3	mg/kg	34.3	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										6.7E-08
										Total Risk Across All Exposure Routes/Pathways	7.6E-07

(1) Medium-Specific (M) EPC selected for risk calculation.

TABLE 8.9
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: All Soil
Exposure Medium: All Soil
Exposure Point: Torpedo Shops (Site 7)
Receptor Population: Adult Residnts
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	0.412	mg/kg	0.412	mg/kg	M	8.3E-08	mg/kg/day	7.3E-01	(mg/kg/day) -1	6.1E-08
	Benzo(a)pyrene	0.406	mg/kg	0.406	mg/kg	M	8.2E-08	mg/kg/day	7.3E+00	(mg/kg/day) -1	6.0E-07
	Benzo(b)fluoranthene	0.511	mg/kg	0.511	mg/kg	M	1.0E-07	mg/kg/day	7.3E-01	(mg/kg/day) -1	7.5E-08
	Indeno(1,2,3-cd)pyrene	0.373	mg/kg	0.373	mg/kg	M	7.5E-08	mg/kg/day	7.3E-01	(mg/kg/day) -1	5.5E-08
	Aroclor-1254	0.215	mg/kg	0.215	mg/kg	M	4.3E-08	mg/kg/day	2.0E+00	(mg/kg/day) -1	8.6E-08
	Antimony	13.4	mg/kg	13.4	mg/kg	M	2.7E-06	mg/kg/day	NA	(mg/kg/day) -1	- -
	Arsenic	3.00	mg/kg	3.00	mg/kg	M	6.0E-07	mg/kg/day	1.5E+00	(mg/kg/day) -1	9.1E-07
	Cadmium	2.71	mg/kg	2.71	mg/kg	M	5.5E-07	mg/kg/day	NA	(mg/kg/day) -1	- -
	Chromium	21.7	mg/kg	21.7	mg/kg	M	4.4E-06	mg/kg/day	NA	(mg/kg/day) -1	- -
	Manganese (soil)	282	mg/kg	282	mg/kg	M	5.7E-05	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	0.403	mg/kg	0.403	mg/kg	M	8.1E-08	mg/kg/day	NA	(mg/kg/day) -1	- -
	Vanadium	34.3	mg/kg	34.3	mg/kg	M	6.9E-06	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										1.8E-06
Dermal	Benzo(a)anthracene	0.412	mg/kg	0.412	mg/kg	M	2.9E-08	mg/kg/day	7.3E-01	(mg/kg/day) -1	2.1E-08
	Benzo(a)pyrene	0.406	mg/kg	0.406	mg/kg	M	2.8E-08	mg/kg/day	7.3E+00	(mg/kg/day) -1	2.1E-07
	Benzo(b)fluoranthene	0.511	mg/kg	0.511	mg/kg	M	3.6E-08	mg/kg/day	7.3E-01	(mg/kg/day) -1	2.6E-08
	Indeno(1,2,3-cd)pyrene	0.373	mg/kg	0.373	mg/kg	M	2.6E-08	mg/kg/day	7.3E-01	(mg/kg/day) -1	1.9E-08
	Aroclor-1254	0.215	mg/kg	0.215	mg/kg	M	1.1E-08	mg/kg/day	2.0E+00	(mg/kg/day) -1	2.3E-08
	Antimony	13.4	mg/kg	13.4	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Arsenic	3.00	mg/kg	3.00	mg/kg	M	4.8E-08	mg/kg/day	1.5E+00	(mg/kg/day) -1	7.2E-08
	Cadmium	2.71	mg/kg	2.71	mg/kg	M	1.5E-09	mg/kg/day	NA	(mg/kg/day) -1	- -
	Chromium	21.7	mg/kg	21.7	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Manganese (soil)	282	mg/kg	282	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	0.403	mg/kg	0.403	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Vanadium	34.3	mg/kg	34.3	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										3.7E-07
										Total Risk Across All Exposure Routes/Pathways	2.1E-06

(1) Medium-Specific (M) EPC selected for risk calculation.

TABLE 8.10
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: All Soil
Exposure Medium: All Soil
Exposure Point: Torpedo Shops (Site 7)
Receptor Population: Adult Residnts
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)anthracene	0.412	mg/kg	0.412	mg/kg	M	1.2E-08	mg/kg/day	7.3E-01	(mg/kg/day) -1	8.8E-09
	Benzo(a)pyrene	0.406	mg/kg	0.406	mg/kg	M	1.2E-08	mg/kg/day	7.3E+00	(mg/kg/day) -1	8.7E-08
	Benzo(b)fluoranthene	0.511	mg/kg	0.511	mg/kg	M	1.5E-08	mg/kg/day	7.3E-01	(mg/kg/day) -1	1.1E-08
	Indeno(1,2,3-cd)pyrene	0.373	mg/kg	0.373	mg/kg	M	1.1E-08	mg/kg/day	7.3E-01	(mg/kg/day) -1	8.0E-09
	Aroclor-1254	0.215	mg/kg	0.215	mg/kg	M	6.3E-09	mg/kg/day	2.0E+00	(mg/kg/day) -1	1.3E-08
	Antimony	13.4	mg/kg	13.4	mg/kg	M	3.9E-07	mg/kg/day	NA	(mg/kg/day) -1	- -
	Arsenic	3.00	mg/kg	3.00	mg/kg	M	8.8E-08	mg/kg/day	1.5E+00	(mg/kg/day) -1	1.3E-07
	Cadmium	2.71	mg/kg	2.71	mg/kg	M	8.0E-08	mg/kg/day	NA	(mg/kg/day) -1	- -
	Chromium	21.7	mg/kg	21.7	mg/kg	M	6.4E-07	mg/kg/day	NA	(mg/kg/day) -1	- -
	Manganese (soil)	282	mg/kg	282	mg/kg	M	8.3E-06	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	0.403	mg/kg	0.403	mg/kg	M	1.2E-08	mg/kg/day	NA	(mg/kg/day) -1	- -
	Vanadium	34.3	mg/kg	34.3	mg/kg	M	1.0E-06	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										2.6E-07
Dermal	Benzo(a)anthracene	0.412	mg/kg	0.412	mg/kg	M	1.2E-09	mg/kg/day	7.3E-01	(mg/kg/day) -1	8.7E-10
	Benzo(a)pyrene	0.406	mg/kg	0.406	mg/kg	M	1.2E-09	mg/kg/day	7.3E+00	(mg/kg/day) -1	8.6E-09
	Benzo(b)fluoranthene	0.511	mg/kg	0.511	mg/kg	M	1.5E-09	mg/kg/day	7.3E-01	(mg/kg/day) -1	1.1E-09
	Indeno(1,2,3-cd)pyrene	0.373	mg/kg	0.373	mg/kg	M	1.1E-09	mg/kg/day	7.3E-01	(mg/kg/day) -1	7.9E-10
	Aroclor-1254	0.215	mg/kg	0.215	mg/kg	M	4.8E-10	mg/kg/day	2.0E+00	(mg/kg/day) -1	9.6E-10
	Antimony	13.4	mg/kg	13.4	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Arsenic	3.00	mg/kg	3.00	mg/kg	M	2.0E-09	mg/kg/day	1.5E+00	(mg/kg/day) -1	3.0E-09
	Cadmium	2.71	mg/kg	2.71	mg/kg	M	6.1E-11	mg/kg/day	NA	(mg/kg/day) -1	- -
	Chromium	21.7	mg/kg	21.7	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Manganese (soil)	282	mg/kg	282	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	0.403	mg/kg	0.403	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Vanadium	34.3	mg/kg	34.3	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										1.5E-08
										Total Risk Across All Exposure Routes/Pathways	2.7E-07

(1) Medium-Specific (M) EPC selected for risk calculation.

TABLE 8.11
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Torpedo Shops (Site 7)
Receptor Population: Adult Residnts
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	1,3-Dichlorobenzene	1.73	ug/L	1.73	ug/L	M	2.0E-05	mg/kg/day	NA	(mg/kg/day) -1	- -
	1,4-Dichlorobenzene	90.5	ug/L	90.5	ug/L	M	1.1E-03	mg/kg/day	0.024	(mg/kg/day) -1	2.6E-05
	Chlorobenzene	165	ug/L	165	ug/L	M	1.9E-03	mg/kg/day	NA	(mg/kg/day) -1	- -
	Benzene	2.00	ug/L	2.00	ug/L	M	2.3E-05	mg/kg/day	0.055	(mg/kg/day) -1	1.3E-06
	Trichloroethene	23.0	ug/L	23.0	ug/L	M	2.7E-04	mg/kg/day	0.011	(mg/kg/day) -1	3.0E-06
	Bis(2-ethylhexyl)phthalate	190	ug/L	190	ug/L	M	2.2E-03	mg/kg/day	0.014	(mg/kg/day) -1	3.1E-05
	Hexachlorobenzene	3.00	ug/L	3.00	ug/L	M	3.5E-05	mg/kg/day	1.6	(mg/kg/day) -1	5.6E-05
	Arsenic	11.4	ug/L	11.4	ug/L	M	1.3E-04	mg/kg/day	1.5	(mg/kg/day) -1	2.0E-04
	Barium	434	ug/L	434	ug/L	M	5.1E-03	mg/kg/day	NA	(mg/kg/day) -1	- -
	Chromium	127	ug/L	127	ug/L	M	1.5E-03	mg/kg/day	NA	(mg/kg/day) -1	- -
	Lead	3.92	ug/L	3.92	ug/L	M	4.6E-05	mg/kg/day	NA	(mg/kg/day) -1	- -
	Vanadium	151	ug/L	151	ug/L	M	1.8E-03	mg/kg/day	NA	(mg/kg/day) -1	- -
											3.2E-04
Dermal	1,3-Dichlorobenzene	1.73	ug/L	1.73	ug/L	M	1.4E-05	mg/kg/day	NA	(mg/kg/day) -1	- -
	1,4-Dichlorobenzene	90.5	ug/L	90.5	ug/L	M	5.5E-04	mg/kg/day	2.4E-02	(mg/kg/day) -1	1.3E-05
	Chlorobenzene	165	ug/L	165	ug/L	M	5.3E-04	mg/kg/day	NA	(mg/kg/day) -1	- -
	Benzene	2.00	ug/L	2.00	ug/L	M	2.7E-06	mg/kg/day	5.5E-02	(mg/kg/day) -1	1.5E-07
	Trichloroethene	23.0	ug/L	23.0	ug/L	M	3.4E-05	mg/kg/day	1.1E-02	(mg/kg/day) -1	3.8E-07
	Bis(2-ethylhexyl)phthalate	190	ug/L	190	ug/L	M	3.4E-03	mg/kg/day	1.4E-02	(mg/kg/day) -1	4.7E-05
	Hexachlorobenzene	3.00	ug/L	3.00	ug/L	M	1.4E-04	mg/kg/day	1.6E+00	(mg/kg/day) -1	2.3E-04
	Arsenic	11.4	ug/L	11.4	ug/L	M	0.0E+00	mg/kg/day	1.5E+00	(mg/kg/day) -1	0.0E+00
	Barium	434	ug/L	434	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Chromium	127	ug/L	127	ug/L	M	7.5E-06	mg/kg/day	NA	(mg/kg/day) -1	- -
	Lead	3.92	ug/L	3.92	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Vanadium	151	ug/L	151	ug/L	M	4.4E-06	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										2.9E-04
										Total Risk Across All Exposure Routes/Pathways	6.1E-04

(1) Medium-Specific (M) EPC selected for risk calculation.

TABLE 8.12
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Torpedo Shops (Site 7)
Receptor Population: Adult Residnts
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	1,3-Dichlorobenzene	0.546	ug/L	0.546	ug/L	M	9.0E-07	mg/kg/day	NA	(mg/kg/day) -1	- -
	1,4-Dichlorobenzene	4.25	ug/L	4.25	ug/L	M	7.0E-06	mg/kg/day	0.024	(mg/kg/day) -1	1.7E-07
	Chlorobenzene	6.82	ug/L	6.82	ug/L	M	1.1E-05	mg/kg/day	NA	(mg/kg/day) -1	- -
	Benzene	0.556	ug/L	0.556	ug/L	M	9.2E-07	mg/kg/day	0.055	(mg/kg/day) -1	5.0E-08
	Trichloroethene	1.91	ug/L	1.91	ug/L	M	3.1E-06	mg/kg/day	0.011	(mg/kg/day) -1	3.5E-08
	Bis(2-ethylhexyl)phthalate	16.5	ug/L	16.5	ug/L	M	2.7E-05	mg/kg/day	0.014	(mg/kg/day) -1	3.8E-07
	Hexachlorobenzene	2.78	ug/L	2.78	ug/L	M	4.6E-06	mg/kg/day	1.6	(mg/kg/day) -1	7.3E-06
	Arsenic	1.75	ug/L	1.75	ug/L	M	2.9E-06	mg/kg/day	1.5	(mg/kg/day) -1	4.3E-06
	Barium	45.0	ug/L	45.0	ug/L	M	7.4E-05	mg/kg/day	NA	(mg/kg/day) -1	- -
	Chromium	12.2	ug/L	12.2	ug/L	M	2.0E-05	mg/kg/day	NA	(mg/kg/day) -1	- -
	Lead	3.92	ug/L	3.92	ug/L	M	6.5E-06	mg/kg/day	NA	(mg/kg/day) -1	- -
	Vanadium	10.8	ug/L	10.8	ug/L	M	1.8E-05	mg/kg/day	NA	(mg/kg/day) -1	- -
											1.2E-05
Dermal	1,3-Dichlorobenzene	0.546	ug/L	0.546	ug/L	M	7.5E-07	mg/kg/day	NA	(mg/kg/day) -1	- -
	1,4-Dichlorobenzene	4.25	ug/L	4.25	ug/L	M	4.2E-06	mg/kg/day	2.4E-02	(mg/kg/day) -1	1.0E-07
	Chlorobenzene	6.82	ug/L	6.82	ug/L	M	3.6E-06	mg/kg/day	NA	(mg/kg/day) -1	- -
	Benzene	0.556	ug/L	0.556	ug/L	M	1.2E-07	mg/kg/day	5.5E-02	(mg/kg/day) -1	6.7E-09
	Trichloroethene	1.91	ug/L	1.91	ug/L	M	4.7E-07	mg/kg/day	1.1E-02	(mg/kg/day) -1	5.1E-09
	Bis(2-ethylhexyl)phthalate	16.5	ug/L	16.5	ug/L	M	4.8E-05	mg/kg/day	1.4E-02	(mg/kg/day) -1	6.7E-07
	Hexachlorobenzene	2.78	ug/L	2.78	ug/L	M	2.0E-05	mg/kg/day	1.6E+00	(mg/kg/day) -1	3.1E-05
	Arsenic	1.75	ug/L	1.75	ug/L	M	0.0E+00	mg/kg/day	1.5E+00	(mg/kg/day) -1	0.0E+00
	Barium	45.0	ug/L	45.0	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Chromium	12.2	ug/L	12.2	ug/L	M	9.6E-08	mg/kg/day	NA	(mg/kg/day) -1	- -
	Lead	3.92	ug/L	3.92	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Vanadium	10.8	ug/L	10.8	ug/L	M	4.2E-08	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										3.2E-05
										Total Risk Across All Exposure Routes/Pathways	4.4E-05

(1) Medium-Specific (M) EPC selected for risk calculation.

TABLE 9.1
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
All Soil	All Soil	Torpedo Shops (Site 7)	Benzo(a)anthracene	9.7E-09	- -	2.0E-09	1.2E-08	Benzo(a)anthracene	NA	- -	- -	- -	- -
			Benzo(a)pyrene	9.5E-08	- -	2.0E-08	1.2E-07	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Benzo(b)fluoranthene	1.2E-08	- -	2.5E-09	1.4E-08	Benzo(b)fluoranthene	NA	- -	- -	- -	- -
			Indeno(1,2,3-cd)pyrene	8.8E-09	- -	1.8E-09	1.1E-08	Indeno(1,2,3-cd)pyrene	NA	- -	- -	- -	- -
			Aroclor-1254	1.4E-08	- -	2.2E-09	1.6E-08	Aroclor-1254	Immune	2.4E-02	- -	3.8E-03	2.8E-02
			Antimony	- -	- -	- -	- -	Antimony	Blood	7.5E-02	- -	- -	7.5E-02
			Arsenic	1.4E-07	- -	6.9E-09	1.5E-07	Arsenic	Skin	2.3E-02	- -	1.1E-03	2.4E-02
			Cadmium	- -	- -	- -	- -	Cadmium	Kidney	1.2E-02	- -	3.9E-04	1.3E-02
			Chromium	- -	- -	- -	- -	Chromium	None Specified	1.6E-02	- -	- -	1.6E-02
			Manganese (soil)	- -	- -	- -	- -	Manganese (soil)	CNS	4.5E-03	- -	- -	4.5E-03
			Thallium	- -	- -	- -	- -	Thallium	None Specified	1.3E-02	- -	- -	1.3E-02
			Vanadium	- -	- -	- -	- -	Vanadium	None Specified	1.1E-02	- -	- -	1.1E-02
			(Total)	2.8E-07	- -	3.5E-08	3.2E-07	(Total)		1.8E-01	- -	5.3E-03	1.8E-01
Groundwater	Groundwater	Torpedo Shops (Site 7)	1,3-Dichlorobenzene	- -	- -	- -	- -	1,3-Dichlorobenzene	None Specified	- -	- -	1.7E-03	1.7E-03
			1,4-Dichlorobenzene	- -	- -	2.0E-08	2.0E-08	1,4-Dichlorobenzene	None Specified	- -	- -	2.0E-03	2.0E-03
			Chlorobenzene	- -	- -	- -	- -	Chlorobenzene	Liver	- -	- -	3.3E-03	3.3E-03
			Benzene	- -	- -	3.2E-10	3.2E-10	Benzene	None Specified	- -	- -	1.4E-04	1.4E-04
			Trichloroethene	- -	- -	6.5E-10	6.5E-10	Trichloroethene	Liver	- -	- -	6.9E-04	6.9E-04
			Bis(2-ethylhexyl)phthalate	- -	- -	6.8E-08	6.8E-08	Bis(2-ethylhexyl)phthalate	Liver	- -	- -	1.7E-02	1.7E-02
			Hexachlorobenzene	- -	- -	3.3E-07	3.3E-07	Hexachlorobenzene	Liver	- -	- -	1.8E-02	1.8E-02
			Arsenic	- -	- -	- -	- -	Arsenic	Skin	- -	- -	- -	- -
			Barium	- -	- -	- -	- -	Barium	CVS, Fetus	- -	- -	- -	- -
			Chromium	- -	- -	- -	- -	Chromium	None Specified	- -	- -	4.0E-02	4.0E-02
			Lead	- -	- -	- -	- -	Lead	NA	- -	- -	- -	- -
			Vanadium	- -	- -	- -	- -	Vanadium	None Specified	- -	- -	9.9E-03	9.9E-03
			(Total)	- -	- -	4.2E-07	4.2E-07	(Total)		- -	- -	9.3E-02	9.3E-02

Total Risk Across Surface/Subsurface Soil	3.2E-07
Total Risk Across Groundwater	4.2E-07
Total Risk Across All Media and All Exposure Routes	7.4E-07

Total Hazard Index Across All Media and All Exposure Routes	2.8E-01

Total Skin HI	2.4E-02
Total Liver HI	3.9E-02
Total CNS HI	4.5E-03
Total CVS HI	- -
Total Fetus HI	- -

TABLE 9.2
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
All Soil	All Soil	Torpedo Shops (Site 7)	Benzo(a)anthracene	3.2E-09	- -	1.3E-10	3.4E-09	Benzo(a)anthracene	NA	- -	- -	- -	- -
			Benzo(a)pyrene	3.2E-08	- -	1.3E-09	3.3E-08	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Benzo(b)fluoranthene	4.0E-09	- -	1.6E-10	4.2E-09	Benzo(b)fluoranthene	NA	- -	- -	- -	- -
			Indeno(1,2,3-cd)pyrene	2.9E-09	- -	1.2E-10	3.0E-09	Indeno(1,2,3-cd)pyrene	NA	- -	- -	- -	- -
			Aroclor-1254	4.6E-09	- -	1.5E-10	4.8E-09	Aroclor-1254	Immune	8.1E-03	- -	2.6E-04	8.3E-03
			Antimony	- -	- -	- -	- -	Antimony	Blood	2.5E-02	- -	- -	2.5E-02
			Arsenic	4.8E-08	- -	4.6E-10	4.9E-08	Arsenic	Skin	7.5E-03	- -	7.1E-05	7.6E-03
			Cadmium	- -	- -	- -	- -	Cadmium	Kidney	4.1E-03	- -	2.6E-05	4.1E-03
			Chromium	- -	- -	- -	- -	Chromium	None Specified	5.4E-03	- -	- -	5.4E-03
			Manganese (soil)	- -	- -	- -	- -	Manganese (soil)	CNS	1.5E-03	- -	- -	1.5E-03
			Thallium	- -	- -	- -	- -	Thallium	None Specified	4.3E-03	- -	- -	4.3E-03
			Vanadium	- -	- -	- -	- -	Vanadium	None Specified	3.7E-03	- -	- -	3.7E-03
			(Total)	9.5E-08	- -	2.3E-09	9.7E-08	(Total)		6.0E-02	- -	3.5E-04	6.0E-02
Groundwater	Groundwater	Torpedo Shops (Site 7)	1,3-Dichlorobenzene	- -	- -	- -	- -	1,3-Dichlorobenzene	None Specified	- -	- -	8.6E-04	8.6E-04
			1,4-Dichlorobenzene	- -	- -	3.2E-10	3.2E-10	1,4-Dichlorobenzene	None Specified	- -	- -	1.0E-03	1.0E-03
			Chlorobenzene	- -	- -	- -	- -	Chlorobenzene	Liver	- -	- -	1.7E-03	1.7E-03
			Benzene	- -	- -	2.5E-11	2.5E-11	Benzene	None Specified	- -	- -	6.8E-05	6.8E-05
			Trichloroethene	- -	- -	1.7E-11	1.7E-11	Trichloroethene	Liver	- -	- -	3.5E-04	3.5E-04
			Bis(2-ethylhexyl)phthalate	- -	- -	2.1E-09	2.1E-09	Bis(2-ethylhexyl)phthalate	Liver	- -	- -	8.6E-03	8.6E-03
			Hexachlorobenzene	- -	- -	9.8E-08	9.8E-08	Hexachlorobenzene	Liver	- -	- -	9.1E-03	9.1E-03
			Arsenic	- -	- -	- -	- -	Arsenic	Skin	- -	- -	- -	- -
			Barium	- -	- -	- -	- -	Barium	CVS, Fetus	- -	- -	- -	- -
			Chromium	- -	- -	- -	- -	Chromium	None Specified	- -	- -	2.0E-02	2.0E-02
			Lead	- -	- -	- -	- -	Lead	NA	- -	- -	- -	- -
			Vanadium	- -	- -	- -	- -	Vanadium	None Specified	- -	- -	4.9E-03	4.9E-03
			(Total)	- -	- -	1.0E-07	1.0E-07	(Total)		- -	- -	4.7E-02	4.7E-02

Total Risk Across Surface/Subsurface Soil	9.7E-08
Total Risk Across Groundwater	1.0E-07
Total Risk Across All Media and All Exposure Routes	2.0E-07

Total Hazard Index Across All Media and All Exposure Routes	1.1E-01

Total Skin HI	7.6E-03
Total Liver HI	2.0E-02
Total CNS HI	1.5E-03
Total CVS HI	- -
Total Fetus HI	- -

TABLE 9.3
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Full-Time Employees
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Torpedo Shops (Site 7)	Benzo(a)pyrene	8.7E-07	- -	8.6E-07	1.7E-06	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Dibenzo(a,h)anthracene	9.6E-08	- -	9.5E-08	1.9E-07	Dibenzo(a,h)anthracene	NA	- -	- -	- -	- -
			Cadmium	- -	- -	- -	- -	Cadmium	Kidney	5.4E-03	- -	8.2E-04	6.2E-03
			Manganese (Soil)	- -	- -	- -	- -	Manganese (Soil)	CNS	1.3E-03	- -	- -	1.3E-03
			(Total)	9.7E-07	- -	9.6E-07	1.9E-06	(Total)		6.7E-03	- -	8.2E-04	7.5E-03
						Total Risk Across Soil	1.9E-06					Total Hazard Index Across All Media and All Exposure Routes	7.5E-03
						Total Risk Across All Media and All Exposure Routes	1.9E-06						

Total Kidney HI	6.2E-03
Total CNS HI	1.3E-03

TABLE 9.4
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Full-Time Employees
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Torpedo Shops (Site 7)	Benzo(a)pyrene	6.9E-08	- -	1.4E-08	8.2E-08	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Dibenzo(a,h)anthracene	2.2E-08	- -	4.4E-09	2.7E-08	Dibenzo(a,h)anthracene	NA	- -	- -	- -	- -
			Cadmium	- -	- -	- -	- -	Cadmium	Kidney	1.4E-03	- -	4.3E-05	1.5E-03
			Manganese (Soil)	- -	- -	- -	- -	Manganese (Soil)	CNS	4.1E-04	- -	- -	4.1E-04
			(Total)	9.1E-08	- -	1.8E-08	1.1E-07	(Total)		1.8E-03	- -	4.3E-05	1.9E-03
						Total Risk Across Soil	1.1E-07					Total Hazard Index Across All Media and All Exposure Routes	1.9E-03
						Total Risk Across All Media and All Exposure Routes	1.1E-07						

Total Kidney HI	1.5E-03
Total CNS HI	4.1E-04

TABLE 9.5
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Child Residnts
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
All Soil	All Soil	Torpedo Shops (Site 7)	Benzo(a)anthracene	1.4E-07	- -	3.8E-08	1.8E-07	Benzo(a)anthracene	NA	- -	- -	- -	- -
			Benzo(a)pyrene	1.4E-06	- -	3.8E-07	1.8E-06	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Benzo(b)fluoranthene	1.8E-07	- -	4.8E-08	2.2E-07	Benzo(b)fluoranthene	NA	- -	- -	- -	- -
			Indeno(1,2,3-cd)pyrene	1.3E-07	- -	3.5E-08	1.6E-07	Indeno(1,2,3-cd)pyrene	NA	- -	- -	- -	- -
			Aroclor-1254	2.0E-07	- -	4.2E-08	2.4E-07	Aroclor-1254	Immune	5.9E-02	- -	1.2E-02	7.1E-02
			Antimony	- -	- -	- -	- -	Antimony	Blood	1.8E-01	- -	- -	1.8E-01
			Arsenic	2.1E-06	- -	1.3E-07	2.2E-06	Arsenic	Skin	5.5E-02	- -	3.4E-03	5.8E-02
			Cadmium	- -	- -	- -	- -	Cadmium	Kidney	3.0E-02	- -	1.2E-03	3.1E-02
			Chromium	- -	- -	- -	- -	Chromium	None Specified	4.0E-02	- -	- -	4.0E-02
			Manganese (soil)	- -	- -	- -	- -	Manganese (soil)	CNS	1.1E-02	- -	- -	1.1E-02
			Thallium	- -	- -	- -	- -	Thallium	None Specified	3.2E-02	- -	- -	3.2E-02
			Vanadium	- -	- -	- -	- -	Vanadium	None Specified	2.7E-02	- -	- -	2.7E-02
			(Total)	4.2E-06	- -	6.7E-07	4.8E-06	(Total)		4.4E-01	- -	1.7E-02	4.5E-01
			Total Risk Across Surface/Subsurface Soil				4.8E-06	Total Hazard Index Across All Media and All Exposure Routes					4.5E-01
			Total Risk Across All Media and All Exposure Routes				4.8E-06						

Total Immune HI	7.1E-02
Total CNS HI	1.1E-02
Total Blood HI	1.8E-01
Total Kidney HI	3.1E-02

TABLE 9.6
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Child Residnts
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
All Soil	All Soil	Torpedo Shops (Site 7)	Benzo(a)anthracene	2.4E-08	- -	3.8E-09	2.7E-08	Benzo(a)anthracene	NA	- -	- -	- -	- -
			Benzo(a)pyrene	2.3E-07	- -	3.8E-08	2.7E-07	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Benzo(b)fluoranthene	2.9E-08	- -	4.8E-09	3.4E-08	Benzo(b)fluoranthene	NA	- -	- -	- -	- -
			Indeno(1,2,3-cd)pyrene	2.1E-08	- -	3.5E-09	2.5E-08	Indeno(1,2,3-cd)pyrene	NA	- -	- -	- -	- -
			Aroclor-1254	3.4E-08	- -	4.2E-09	3.8E-08	Aroclor-1254	Immune	2.9E-02	- -	3.7E-03	3.3E-02
			Antimony	- -	- -	- -	- -	Antimony	Blood	9.2E-02	- -	- -	9.2E-02
			Arsenic	3.5E-07	- -	1.3E-08	3.7E-07	Arsenic	Skin	2.7E-02	- -	1.0E-03	2.8E-02
			Cadmium	- -	- -	- -	- -	Cadmium	Kidney	1.5E-02	- -	3.7E-04	1.5E-02
			Chromium	- -	- -	- -	- -	Chromium	None Specified	2.0E-02	- -	- -	2.0E-02
			Manganese (soil)	- -	- -	- -	- -	Manganese (soil)	CNS	5.5E-03	- -	- -	5.5E-03
			Thallium	- -	- -	- -	- -	Thallium	None Specified	1.6E-02	- -	- -	1.6E-02
			Vanadium	- -	- -	- -	- -	Vanadium	None Specified	1.3E-02	- -	- -	1.3E-02
			(Total)	6.9E-07	- -	6.7E-08	7.6E-07	(Total)		2.2E-01	- -	5.1E-03	2.2E-01
			Total Risk Across Surface/Subsurface Soil				7.6E-07	Total Hazard Index Across All Media and All Exposure Routes					2.2E-01
			Total Risk Across All Media and All Exposure Routes				7.6E-07						

Total Immune HI	3.3E-02
Total CNS HI	5.5E-03
Total Blood HI	9.2E-02
Total Kidney HI	1.5E-02

TABLE 9.7
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Adult Residnts
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
All Soil	All Soil	Torpedo Shops (Site 7)	Benzo(a)anthracene	6.1E-08	- -	2.1E-08	8.1E-08	Benzo(a)anthracene	NA	- -	- -	- -	- -
			Benzo(a)pyrene	6.0E-07	- -	2.1E-07	8.0E-07	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Benzo(b)fluoranthene	7.5E-08	- -	2.6E-08	1.0E-07	Benzo(b)fluoranthene	NA	- -	- -	- -	- -
			Indeno(1,2,3-cd)pyrene	5.5E-08	- -	1.9E-08	7.4E-08	Indeno(1,2,3-cd)pyrene	NA	- -	- -	- -	- -
			Aroclor-1254	8.6E-08	- -	2.3E-08	1.1E-07	Aroclor-1254	Immune	6.3E-03	- -	1.7E-03	8.0E-03
			Antimony	- -	- -	- -	- -	Antimony	Blood	2.0E-02	- -	- -	2.0E-02
			Arsenic	9.1E-07	- -	7.2E-08	9.8E-07	Arsenic	Skin	5.9E-03	- -	4.7E-04	6.3E-03
			Cadmium	- -	- -	- -	- -	Cadmium	Kidney	3.2E-03	- -	1.7E-04	3.4E-03
			Chromium	- -	- -	- -	- -	Chromium	None Specified	4.2E-03	- -	- -	4.2E-03
			Manganese (soil)	- -	- -	- -	- -	Manganese (soil)	CNS	1.2E-03	- -	- -	1.2E-03
			Thallium	- -	- -	- -	- -	Thallium	None Specified	3.4E-03	- -	- -	3.4E-03
			Vanadium	- -	- -	- -	- -	Vanadium	None Specified	2.9E-03	- -	- -	2.9E-03
			(Total)	1.8E-06	- -	3.7E-07	2.1E-06	(Total)		4.7E-02	- -	2.3E-03	4.9E-02
Groundwater	Groundwater	Torpedo Shops (Site 7)	1,3-Dichlorobenzene	- -	- -	- -	- -	1,3-Dichlorobenzene	None Specified	5.3E-02	5.3E-02	3.7E-02	1.4E-01
			1,4-Dichlorobenzene	2.6E-05	2.6E-05	1.3E-05	6.4E-05	1,4-Dichlorobenzene	None Specified	8.3E-02	8.3E-02	4.2E-02	2.1E-01
			Chlorobenzene	- -	- -	- -	- -	Chlorobenzene	Liver	2.3E-01	2.3E-01	6.2E-02	5.1E-01
			Benzene	1.3E-06	1.3E-06	1.5E-07	2.7E-06	Benzene	None Specified	1.8E-02	1.8E-02	2.1E-03	3.9E-02
			Trichloroethene	3.0E-06	3.0E-06	3.8E-07	6.3E-06	Trichloroethene	Liver	1.1E-01	1.1E-01	1.3E-02	2.2E-01
			Bis(2-ethylhexyl)phthalate	3.1E-05	- -	4.7E-05	7.9E-05	Bis(2-ethylhexyl)phthalate	Liver	2.6E-01	- -	3.9E-01	6.5E-01
			Hexachlorobenzene	5.6E-05	- -	2.3E-04	2.9E-04	Hexachlorobenzene	Liver	1.0E-01	- -	4.2E-01	5.2E-01
			Arsenic	2.0E-04	- -	- -	2.0E-04	Arsenic	Skin	1.0E+00	- -	- -	1.0E+00
			Barium	- -	- -	- -	- -	Barium	CVS, Fetus	1.7E-01	- -	- -	1.7E-01
			Chromium	- -	- -	- -	- -	Chromium	None Specified	1.2E+00	- -	2.3E-01	1.4E+00
			Lead	- -	- -	- -	- -	Lead	NA	- -	- -	- -	- -
			Vanadium	- -	- -	- -	- -	Vanadium	None Specified	5.9E-01	- -	5.7E-02	6.5E-01
			(Total)	3.2E-04	3.0E-05	2.9E-04	6.4E-04	(Total)		3.8E+00	4.8E-01	1.3E+00	5.6E+00

Total Risk Across Surface/Subsurface Soil	2.1E-06
Total Risk Across Groundwater	6.4E-04
Total Risk Across All Media and All Exposure Routes	6.4E-04

Total Hazard Index Across All Media and All Exposure Routes	5.6E+00

Total Skin HI	1.0E+00
Total Liver HI	1.9E+00
Total CNS HI	1.2E-03
Total CVS HI	1.7E-01
Total Fetus HI	1.7E-01

TABLE 9.8
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Adult Residnts
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
All Soil	All Soil	Torpedo Shops (Site 7)	Benzo(a)anthracene	8.8E-09	- -	8.7E-10	9.7E-09	Benzo(a)anthracene	NA	- -	- -	- -	- -
			Benzo(a)pyrene	8.7E-08	- -	8.6E-09	9.6E-08	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Benzo(b)fluoranthene	1.1E-08	- -	1.1E-09	1.2E-08	Benzo(b)fluoranthene	NA	- -	- -	- -	- -
			Indeno(1,2,3-cd)pyrene	8.0E-09	- -	7.9E-10	8.8E-09	Indeno(1,2,3-cd)pyrene	NA	- -	- -	- -	- -
			Aroclor-1254	1.3E-08	- -	9.6E-10	1.4E-08	Aroclor-1254	Immune	3.2E-03	- -	2.4E-04	3.4E-03
			Antimony	- -	- -	- -	- -	Antimony	Blood	9.8E-03	- -	- -	9.8E-03
			Arsenic	1.3E-07	- -	3.0E-09	1.4E-07	Arsenic	Skin	2.9E-03	- -	6.7E-05	3.0E-03
			Cadmium	- -	- -	- -	- -	Cadmium	Kidney	1.6E-03	- -	2.4E-05	1.6E-03
			Chromium	- -	- -	- -	- -	Chromium	None Specified	2.1E-03	- -	- -	2.1E-03
			Manganese (soil)	- -	- -	- -	- -	Manganese (soil)	CNS	5.9E-04	- -	- -	5.9E-04
			Thallium	- -	- -	- -	- -	Thallium	None Specified	1.7E-03	- -	- -	1.7E-03
			Vanadium	- -	- -	- -	- -	Vanadium	None Specified	1.4E-03	- -	- -	1.4E-03
			(Total)	2.6E-07	- -	1.5E-08	2.7E-07	(Total)		2.3E-02	- -	3.3E-04	2.4E-02
Groundwater	Groundwater	Torpedo Shops (Site 7)	1,3-Dichlorobenzene	- -	- -	- -	- -	1,3-Dichlorobenzene	None Specified	7.8E-03	7.8E-03	2.5E-02	4.1E-02
			1,4-Dichlorobenzene	1.7E-07	1.7E-07	1.0E-07	4.4E-07	1,4-Dichlorobenzene	None Specified	1.8E-03	1.8E-03	2.8E-02	3.2E-02
			Chlorobenzene	- -	- -	- -	- -	Chlorobenzene	Liver	4.4E-03	4.4E-03	4.1E-02	5.0E-02
			Benzene	5.0E-08	5.0E-08	6.7E-09	1.1E-07	Benzene	None Specified	2.4E-03	2.4E-03	1.4E-03	6.1E-03
			Trichloroethene	3.5E-08	3.5E-08	5.1E-09	7.4E-08	Trichloroethene	Liver	4.1E-03	4.1E-03	8.9E-03	1.7E-02
			Bis(2-ethylhexyl)phthalate	3.8E-07	- -	6.7E-07	1.1E-06	Bis(2-ethylhexyl)phthalate	Liver	1.1E-02	- -	2.6E-01	2.7E-01
			Hexachlorobenzene	7.3E-06	- -	3.1E-05	3.9E-05	Hexachlorobenzene	Liver	4.4E-02	- -	2.8E-01	3.3E-01
			Arsenic	4.3E-06	- -	- -	4.3E-06	Arsenic	Skin	7.5E-02	- -	- -	7.5E-02
			Barium	- -	- -	- -	- -	Barium	CVS, Fetus	8.2E-03	- -	- -	8.2E-03
			Chromium	- -	- -	- -	- -	Chromium	None Specified	5.2E-02	- -	1.6E-01	2.1E-01
			Lead	- -	- -	- -	- -	Lead	NA	- -	- -	- -	- -
			Vanadium	- -	- -	- -	- -	Vanadium	None Specified	2.0E-02	- -	3.8E-02	5.8E-02
			(Total)	1.2E-05	2.5E-07	3.2E-05	4.5E-05	(Total)		2.3E-01	2.0E-02	8.4E-01	1.1E+00

Total Risk Across Surface/Subsurface Soil	2.7E-07
Total Risk Across Groundwater	4.5E-05
Total Risk Across All Media and All Exposure Routes	4.5E-05

Total Hazard Index Across All Media and All Exposure Routes	1.1E+00

Total Skin HI	7.8E-02
Total Liver HI	6.7E-01
Total CNS HI	5.9E-04
Total CVS HI	8.2E-03
Total Fetus HI	8.2E-03

TABLE 10.1
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
All Soil	All Soil	Torpedo Shops (Site 7)	Benzo(a)anthracene	9.7E-09	- -	2.0E-09	1.2E-08	Benzo(a)anthracene	NA	- -	- -	- -	- -
			Benzo(a)pyrene	9.5E-08	- -	2.0E-08	1.2E-07	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Benzo(b)fluoranthene	1.2E-08	- -	2.5E-09	1.4E-08	Benzo(b)fluoranthene	NA	- -	- -	- -	- -
			Indeno(1,2,3-cd)pyrene	8.8E-09	- -	1.8E-09	1.1E-08	Indeno(1,2,3-cd)pyrene	NA	- -	- -	- -	- -
			Aroclor-1254	1.4E-08	- -	2.2E-09	1.6E-08	Aroclor-1254	Immune	2.4E-02	- -	3.8E-03	2.8E-02
			Antimony	- -	- -	- -	- -	Antimony	Blood	7.5E-02	- -	- -	7.5E-02
			Arsenic	1.4E-07	- -	6.9E-09	1.5E-07	Arsenic	Skin	2.3E-02	- -	1.1E-03	2.4E-02
			Cadmium	- -	- -	- -	- -	Cadmium	Kidney	1.2E-02	- -	3.9E-04	1.3E-02
			Chromium	- -	- -	- -	- -	Chromium	None Specified	1.6E-02	- -	- -	1.6E-02
			Manganese (soil)	- -	- -	- -	- -	Manganese (soil)	CNS	4.5E-03	- -	- -	4.5E-03
			Thallium	- -	- -	- -	- -	Thallium	None Specified	1.3E-02	- -	- -	1.3E-02
			Vanadium	- -	- -	- -	- -	Vanadium	None Specified	1.1E-02	- -	- -	1.1E-02
			(Total)	2.8E-07	- -	3.5E-08	3.2E-07	(Total)		1.8E-01	- -	5.3E-03	1.8E-01
Groundwater	Groundwater	Torpedo Shops (Site 7)	1,3-Dichlorobenzene	- -	- -	- -	- -	1,3-Dichlorobenzene	None Specified	- -	- -	1.7E-03	1.7E-03
			1,4-Dichlorobenzene	- -	- -	2.0E-08	2.0E-08	1,4-Dichlorobenzene	None Specified	- -	- -	2.0E-03	2.0E-03
			Chlorobenzene	- -	- -	- -	- -	Chlorobenzene	Liver	- -	- -	3.3E-03	3.3E-03
			Benzene	- -	- -	3.2E-10	3.2E-10	Benzene	None Specified	- -	- -	1.4E-04	1.4E-04
			Trichloroethene	- -	- -	6.5E-10	6.5E-10	Trichloroethene	Liver	- -	- -	6.9E-04	6.9E-04
			Bis(2-ethylhexyl)phthalate	- -	- -	6.8E-08	6.8E-08	Bis(2-ethylhexyl)phthalate	Liver	- -	- -	1.7E-02	1.7E-02
			Hexachlorobenzene	- -	- -	3.3E-07	3.3E-07	Hexachlorobenzene	Liver	- -	- -	1.8E-02	1.8E-02
			Arsenic	- -	- -	- -	- -	Arsenic	Skin	- -	- -	- -	- -
			Barium	- -	- -	- -	- -	Barium	CVS, Fetus	- -	- -	- -	- -
			Chromium	- -	- -	- -	- -	Chromium	None Specified	- -	- -	4.0E-02	4.0E-02
			Lead	- -	- -	- -	- -	Lead	NA	- -	- -	- -	- -
			Vanadium	- -	- -	- -	- -	Vanadium	None Specified	- -	- -	9.9E-03	9.9E-03
			(Total)	- -	- -	4.2E-07	4.2E-07	(Total)		- -	- -	9.3E-02	9.3E-02

Total Risk Across Surface/Subsurface Soil	3.2E-07
Total Risk Across Groundwater	4.2E-07
Total Risk Across All Media and All Exposure Routes	7.4E-07

Total Hazard Index Across All Media and All Exposure Routes	2.8E-01

Total Skin HI	2.4E-02
Total Liver HI	3.9E-02
Total CNS HI	4.5E-03
Total CVS HI	- -
Total Fetus HI	- -

TABLE 10.2
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
All Soil	All Soil	Torpedo Shops (Site 7)	Benzo(a)anthracene	3.2E-09	- -	1.3E-10	3.4E-09	Benzo(a)anthracene	NA	- -	- -	- -	- -
			Benzo(a)pyrene	3.2E-08	- -	1.3E-09	3.3E-08	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Benzo(b)fluoranthene	4.0E-09	- -	1.6E-10	4.2E-09	Benzo(b)fluoranthene	NA	- -	- -	- -	- -
			Indeno(1,2,3-cd)pyrene	2.9E-09	- -	1.2E-10	3.0E-09	Indeno(1,2,3-cd)pyrene	NA	- -	- -	- -	- -
			Aroclor-1254	4.6E-09	- -	1.5E-10	4.8E-09	Aroclor-1254	Immune	8.1E-03	- -	2.6E-04	8.3E-03
			Antimony	- -	- -	- -	- -	Antimony	Blood	2.5E-02	- -	- -	2.5E-02
			Arsenic	4.8E-08	- -	4.6E-10	4.9E-08	Arsenic	Skin	7.5E-03	- -	7.1E-05	7.6E-03
			Cadmium	- -	- -	- -	- -	Cadmium	Kidney	4.1E-03	- -	2.6E-05	4.1E-03
			Chromium	- -	- -	- -	- -	Chromium	None Specified	5.4E-03	- -	- -	5.4E-03
			Manganese (soil)	- -	- -	- -	- -	Manganese (soil)	CNS	1.5E-03	- -	- -	1.5E-03
			Thallium	- -	- -	- -	- -	Thallium	None Specified	4.3E-03	- -	- -	4.3E-03
			Vanadium	- -	- -	- -	- -	Vanadium	None Specified	3.7E-03	- -	- -	3.7E-03
			(Total)	9.5E-08	- -	2.3E-09	9.7E-08	(Total)		6.0E-02	- -	3.5E-04	6.0E-02
Groundwater	Groundwater	Torpedo Shops (Site 7)	1,3-Dichlorobenzene	- -	- -	- -	- -	1,3-Dichlorobenzene	None Specified	- -	- -	8.6E-04	8.6E-04
			1,4-Dichlorobenzene	- -	- -	3.2E-10	3.2E-10	1,4-Dichlorobenzene	None Specified	- -	- -	1.0E-03	1.0E-03
			Chlorobenzene	- -	- -	- -	- -	Chlorobenzene	Liver	- -	- -	1.7E-03	1.7E-03
			Benzene	- -	- -	2.5E-11	2.5E-11	Benzene	None Specified	- -	- -	6.8E-05	6.8E-05
			Trichloroethene	- -	- -	1.7E-11	1.7E-11	Trichloroethene	Liver	- -	- -	3.5E-04	3.5E-04
			Bis(2-ethylhexyl)phthalate	- -	- -	2.1E-09	2.1E-09	Bis(2-ethylhexyl)phthalate	Liver	- -	- -	8.6E-03	8.6E-03
			Hexachlorobenzene	- -	- -	9.8E-08	9.8E-08	Hexachlorobenzene	Liver	- -	- -	9.1E-03	9.1E-03
			Arsenic	- -	- -	- -	- -	Arsenic	Skin	- -	- -	- -	- -
			Barium	- -	- -	- -	- -	Barium	CVS, Fetus	- -	- -	- -	- -
			Chromium	- -	- -	- -	- -	Chromium	None Specified	- -	- -	2.0E-02	2.0E-02
			Lead	- -	- -	- -	- -	Lead	NA	- -	- -	- -	- -
			Vanadium	- -	- -	- -	- -	Vanadium	None Specified	- -	- -	4.9E-03	4.9E-03
			(Total)	- -	- -	1.0E-07	1.0E-07	(Total)		- -	- -	4.7E-02	4.7E-02

Total Risk Across Surface/Subsurface Soil	9.7E-08
Total Risk Across Groundwater	1.0E-07
Total Risk Across All Media and All Exposure Routes	2.0E-07

Total Hazard Index Across All Media and All Exposure Routes	1.1E-01

Total Skin HI	7.6E-03
Total Liver HI	2.0E-02
Total CNS HI	1.5E-03
Total CVS HI	- -
Total Fetus HI	- -

TABLE 10.3
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Full-Time Employees
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Torpedo Shops (Site 7)	Benzo(a)pyrene	8.7E-07	- -	8.6E-07	1.7E-06	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Dibenzo(a,h)anthracene	9.6E-08	- -	9.5E-08	1.9E-07	Dibenzo(a,h)anthracene	NA	- -	- -	- -	- -
			(Total)	9.7E-07	- -	9.6E-07	1.9E-06	(Total)		- -	- -	- -	- -
						Total Risk Across Soil	1.9E-06					Total Hazard Index Across All Media and All Exposure Routes	- -
						Total Risk Across All Media and All Exposure Routes	1.9E-06						

TABLE 10.4
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Full-Time Employees
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Torpedo Shops (Site 7)	Benzo(a)pyrene	6.9E-08	- -	1.4E-08	8.2E-08	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Dibenzo(a,h)anthracene	2.2E-08	- -	4.4E-09	2.7E-08	Dibenzo(a,h)anthracene	NA	- -	- -	- -	- -
			(Total)	9.1E-08	- -	1.8E-08	1.1E-07	(Total)		- -	- -	- -	- -
						Total Risk Across Soil	1.1E-07					Total Hazard Index Across All Media and All Exposure Routes	- -
						Total Risk Across All Media and All Exposure Routes	1.1E-07						

TABLE 10.5
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Child Residnts
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
All Soil	All Soil	Torpedo Shops (Site 7)	Benzo(a)pyrene	1.4E-06	- -	3.8E-07	1.8E-06	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Arsenic	2.1E-06	- -	1.3E-07	2.2E-06	Arsenic	Skin	5.5E-02	- -	3.4E-03	5.8E-02
			(Total)	3.5E-06	- -	5.1E-07	4.0E-06	(Total)		5.5E-02	- -	3.4E-03	5.8E-02
			Total Risk Across Surface/Subsurface Soil				4.0E-06	Total Hazard Index Across All Media and All Exposure Routes					5.8E-02
			Total Risk Across All Media and All Exposure Routes				4.0E-06						
								Total Skin HI					5.8E-02

TABLE 10.6
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Child Residnts
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
All Soil	All Soil	Torpedo Shops (Site 7)	Benzo(a)anthracene	2.4E-08	- -	3.8E-09	2.7E-08	Benzo(a)anthracene	NA	- -	- -	- -	- -
			Benzo(a)pyrene	2.3E-07	- -	3.8E-08	2.7E-07	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Benzo(b)fluoranthene	2.9E-08	- -	4.8E-09	3.4E-08	Benzo(b)fluoranthene	NA	- -	- -	- -	- -
			Indeno(1,2,3-cd)pyrene	2.1E-08	- -	3.5E-09	2.5E-08	Indeno(1,2,3-cd)pyrene	NA	- -	- -	- -	- -
			Aroclor-1254	3.4E-08	- -	4.2E-09	3.8E-08	Aroclor-1254	Immune	2.9E-02	- -	3.7E-03	3.3E-02
			Antimony	- -	- -	- -	- -	Antimony	Blood	9.2E-02	- -	- -	9.2E-02
			Arsenic	3.5E-07	- -	1.3E-08	3.7E-07	Arsenic	Skin	2.7E-02	- -	1.0E-03	2.8E-02
			Cadmium	- -	- -	- -	- -	Cadmium	Kidney	1.5E-02	- -	3.7E-04	1.5E-02
			Chromium	- -	- -	- -	- -	Chromium	None Specified	2.0E-02	- -	- -	2.0E-02
			Manganese (soil)	- -	- -	- -	- -	Manganese (soil)	CNS	5.5E-03	- -	- -	5.5E-03
			Thallium	- -	- -	- -	- -	Thallium	None Specified	1.6E-02	- -	- -	1.6E-02
			Vanadium	- -	- -	- -	- -	Vanadium	None Specified	1.3E-02	- -	- -	1.3E-02
			(Total)	6.9E-07	- -	6.7E-08	7.6E-07	(Total)		2.2E-01	- -	5.1E-03	2.2E-01
			Total Risk Across Surface/Subsurface Soil				7.6E-07	Total Hazard Index Across All Media and All Exposure Routes					2.2E-01
			Total Risk Across All Media and All Exposure Routes				7.6E-07						

Total Immune HI	3.3E-02
Total CNS HI	5.5E-03
Total Blood HI	9.2E-02
Total Kidney HI	1.5E-02

TABLE 10.7
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Adult Residnts
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
All Soil	All Soil	Torpedo Shops (Site 7)	Benzo(a)anthracene	6.1E-08	- -	2.1E-08	8.1E-08	Benzo(a)anthracene	NA	- -	- -	- -	- -
			Benzo(a)pyrene	6.0E-07	- -	2.1E-07	8.0E-07	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Benzo(b)fluoranthene	7.5E-08	- -	2.6E-08	1.0E-07	Benzo(b)fluoranthene	NA	- -	- -	- -	- -
			Indeno(1,2,3-cd)pyrene	5.5E-08	- -	1.9E-08	7.4E-08	Indeno(1,2,3-cd)pyrene	NA	- -	- -	- -	- -
			Aroclor-1254	8.6E-08	- -	2.3E-08	1.1E-07	Aroclor-1254	Immune	6.3E-03	- -	1.7E-03	8.0E-03
			Antimony	- -	- -	- -	- -	Antimony	Blood	2.0E-02	- -	- -	2.0E-02
			Arsenic	9.1E-07	- -	7.2E-08	9.8E-07	Arsenic	Skin	5.9E-03	- -	4.7E-04	6.3E-03
			Cadmium	- -	- -	- -	- -	Cadmium	Kidney	3.2E-03	- -	1.7E-04	3.4E-03
			Chromium	- -	- -	- -	- -	Chromium	None Specified	4.2E-03	- -	- -	4.2E-03
			Manganese (soil)	- -	- -	- -	- -	Manganese (soil)	CNS	1.2E-03	- -	- -	1.2E-03
			Thallium	- -	- -	- -	- -	Thallium	None Specified	3.4E-03	- -	- -	3.4E-03
			Vanadium	- -	- -	- -	- -	Vanadium	None Specified	2.9E-03	- -	- -	2.9E-03
			(Total)	1.8E-06	- -	3.7E-07	2.1E-06	(Total)		4.7E-02	- -	2.3E-03	4.9E-02
Groundwater	Groundwater	Torpedo Shops (Site 7)	1,4-Dichlorobenzene	2.6E-05	2.6E-05	1.3E-05	6.4E-05	1,4-Dichlorobenzene	None Specified	8.3E-02	8.3E-02	4.2E-02	2.1E-01
			Benzene	1.3E-06	1.3E-06	1.5E-07	2.7E-06	Benzene	None Specified	1.8E-02	1.8E-02	2.1E-03	3.9E-02
			Trichloroethene	3.0E-06	3.0E-06	3.8E-07	6.3E-06	Trichloroethene	Liver	1.1E-01	1.1E-01	1.3E-02	2.2E-01
			Bis(2-ethylhexyl)phthalate	3.1E-05	- -	4.7E-05	7.9E-05	Bis(2-ethylhexyl)phthalate	Liver	2.6E-01	- -	3.9E-01	6.5E-01
			Hexachlorobenzene	5.6E-05	- -	2.3E-04	2.9E-04	Hexachlorobenzene	Liver	1.0E-01	- -	4.2E-01	5.2E-01
			Arsenic	2.0E-04	- -	- -	2.0E-04	Arsenic	Skin	1.0E+00	- -	- -	1.0E+00
			Chromium	- -	- -	- -	- -	Chromium	None Specified	1.2E+00	- -	2.3E-01	1.4E+00
			(Total)	3.2E-04	3.0E-05	2.9E-04	6.4E-04	(Total)		2.8E+00	2.1E-01	1.1E+00	4.1E+00

Total Risk Across Surface/Subsurface Soil	2.1E-06
Total Risk Across Groundwater	6.4E-04
Total Risk Across All Media and All Exposure Routes	6.4E-04

Total Hazard Index Across All Media and All Exposure Routes	4.1E+00
Total Skin HI	1.0E+00
Total Liver HI	1.4E+00
Total CNS HI	1.2E-03
Total Immune HI	8.0E-03
Total None Specified HI	1.6E+00

TABLE 10.8
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Adult Residnts
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
All Soil	All Soil	Torpedo Shops (Site 7)	Benzo(a)anthracene	8.8E-09	- -	8.7E-10	9.7E-09	Benzo(a)anthracene	NA	- -	- -	- -	- -
			Benzo(a)pyrene	8.7E-08	- -	8.6E-09	9.6E-08	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Benzo(b)fluoranthene	1.1E-08	- -	1.1E-09	1.2E-08	Benzo(b)fluoranthene	NA	- -	- -	- -	- -
			Indeno(1,2,3-cd)pyrene	8.0E-09	- -	7.9E-10	8.8E-09	Indeno(1,2,3-cd)pyrene	NA	- -	- -	- -	- -
			Aroclor-1254	1.3E-08	- -	9.6E-10	1.4E-08	Aroclor-1254	Immune	3.2E-03	- -	2.4E-04	3.4E-03
			Antimony	- -	- -	- -	- -	Antimony	Blood	9.8E-03	- -	- -	9.8E-03
			Arsenic	1.3E-07	- -	3.0E-09	1.4E-07	Arsenic	Skin	2.9E-03	- -	6.7E-05	3.0E-03
			Cadmium	- -	- -	- -	- -	Cadmium	Kidney	1.6E-03	- -	2.4E-05	1.6E-03
			Chromium	- -	- -	- -	- -	Chromium	None Specified	2.1E-03	- -	- -	2.1E-03
			Manganese (soil)	- -	- -	- -	- -	Manganese (soil)	CNS	5.9E-04	- -	- -	5.9E-04
			Thallium	- -	- -	- -	- -	Thallium	None Specified	1.7E-03	- -	- -	1.7E-03
			Vanadium	- -	- -	- -	- -	Vanadium	None Specified	1.4E-03	- -	- -	1.4E-03
			(Total)	2.6E-07	- -	1.5E-08	2.7E-07	(Total)		2.3E-02	- -	3.3E-04	2.4E-02
Groundwater	Groundwater	Torpedo Shops (Site 7)	Bis(2-ethylhexyl)phthalate	3.8E-07	- -	6.7E-07	1.1E-06	Bis(2-ethylhexyl)phthalate	Liver	1.1E-02	- -	2.6E-01	2.7E-01
			Hexachlorobenzene	7.3E-06	- -	3.1E-05	3.9E-05	Hexachlorobenzene	Liver	4.4E-02	- -	2.8E-01	3.3E-01
			Arsenic	4.3E-06	- -	- -	4.3E-06	Arsenic	Skin	7.5E-02	- -	- -	7.5E-02
			(Total)	1.2E-05	- -	3.2E-05	4.4E-05	(Total)		1.3E-01	- -	5.4E-01	6.7E-01

Total Risk Across Surface/Subsurface Soil	2.7E-07
Total Risk Across Groundwater	4.4E-05
Total Risk Across All Media and All Exposure Routes	4.4E-05

Total Hazard Index Across All Media and All Exposure Routes	7.0E-01
Total Skin HI	7.8E-02
Total Liver HI	6.0E-01
Total CNS HI	5.9E-04
Total Immune HI	3.4E-03
Total None Specified HI	5.2E-03

GROSS POINT LANDFILL (SITE 8)

TABLE 1
SELECTION OF EXPOSURE PATHWAYS
GOSS COVE LANDFILL (SITE 8)
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current/Future	Groundwater	Groundwater	Overburden/Bedrock Aquifer	Construction Workers	Adult	Ingestion Dermal	On-Site On-Site	Quant. Quant.	Construction workers may have dermal contact with groundwater during excavation activities.
				Full-time Employees	Adult	Ingestion Dermal	On-Site On-Site	None None	Full-time employees are not exposed to groundwater.
				Trespassers	Adolescents	Ingestion Dermal	On-Site On-Site	None None	Trespassers do not have contact with groundwater.
				Residents	Adult	Ingestion Dermal	On-Site On-Site	Quant. Quant.	Groundwater may be used as a potable water source in the future.
					Child	Ingestion Dermal	On-Site On-Site	None None	Exposures to a child resident are less than those for an adult resident
		Air	Overburden/Bedrock Aquifer	Construction Workers	Adult	Inhalation	On-site	None	Construction workers exposure via volatilization is expected to be insignificant due to dilution with outdoor air.
				Full-time Employees	Adult	Inhalation	On-site	None	Full-time employees are not exposed to groundwater.
				Trespassers	Adolescents	Inhalation	On-Site	None	Trespassers do not have contact with site groundwater.
				Residents	Adult	Inhalation	On-site	None	On-site residents may be exposed to volatile emissions from groundwater while showering.
					Child	Inhalation	On-site	None	Exposures to a child resident are less than those for an adult resident

TABLE 2.1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - GROUNDWATER
DIRECT CONTACT EXPOSURE SCENARIOS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Goss Point Landfill (Site 8)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Risk-Based COPC Screening Level(5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection(6)
Volatile Organics																
71-43-2	BENZENE	2		2		ug/L	S8MW02S01	1/8	1 - 25	2	N/A	0.35 C	1 5 5	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
156-59-2	CIS-1,2-DICHLOROETHENE	33		33		ug/L	S8MW02D01	1/8	1 - 25	33	N/A	6.1 N	70 70 70	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
100-41-4	ETHYLBENZENE	2		108		ug/L	S8MW0301	5/8	1	108	N/A	130 N	700 700 700	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
	M+P-XYLENES	1	J	284		ug/L	S8MW0301	5/8	2	284	N/A	140 (7) N	530 10000 N/A	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
95-47-6	O-XYLENE	2		136		ug/L	S8MW0301	5/8	1	136	N/A	140 (7) N	530 10000 N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
127-18-4	TETRACHLOROETHENE	31		31		ug/L	S8MW02D01	1/8	1 - 25	1440	N/A	1.1 C	5 5 5	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
108-88-3	TOLUENE	2		31		ug/L	S8MW0301	2/8	1	31	N/A	72 N	1000 1000 1000	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
156-60-5	TRANS-1,2-DICHLOROETHENE	7		7		ug/L	S8MW02D01	1/8	1 - 25	7	N/A	12 N	100 100 100	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
79-01-6	TRICHLOROETHENE	25		25		ug/L	S8MW02D01	1/8	1 - 25	25	N/A	1.6 C	5 5 5	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
75-01-4	VINYL CHLORIDE	1		1		ug/L	S8MW02D01	1/8	1 - 25	1	N/A	0.041 C	2 2 2	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
1330-20-7	XYLENES, TOTAL	5		454		ug/L	S8MW0301	5/8	1	454	N/A	140 N	530 10000 10000	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
Semivolatile Organics																
90-12-0	1-METHYLNAPHTHALENE	1.3		19	J	ug/L	S8MW0301	3/8	0.5	19	N/A	0.62 (8) N	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
105-67-9	2,4-DIMETHYLPHENOL	14		240		ug/L	S8MW0301	2/8	5	240	N/A	73 N	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
91-57-6	2-METHYLNAPHTHALENE	0.82		15	J	ug/L	S8MW0301	3/8	0.5	15	N/A	0.62 (8) N	49 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
95-48-7	2-METHYLPHENOL	99		99		ug/L	S8MW0301	1/8	5	99	N/A	180 N	350 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
106-44-5	4-METHYLPHENOL	6		27		ug/L	S8MW0301	2/8	5	27	N/A	18 N	35 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
83-32-9	ACENAPHTHENE	0.85	J	7.9	J	ug/L	S8MW0301	4/8	0.5	7.9	N/A	37 N	420 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL

TABLE 2.1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - GROUNDWATER
DIRECT CONTACT EXPOSURE SCENARIOS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Goss Point Landfill (Site 8)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Risk-Based COPC Screening Level(5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection(6)
120-12-7	ANTHRACENE	0.11		1.4	J	ug/L	S8MW02S01.	7/8	0.05	1.4	N/A	180 N	2000 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
56-55-3	BENZO(A)ANTHRACENE	0.02	J	1.4	J	ug/L	S8MW0301	7/8	0.05	1.4	N/A	0.092 C	0.06 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
50-32-8	BENZO(A)PYRENE	0.02	J	2.1	J	ug/L	S8MW0301	6/8	0.05	2.1	N/A	0.0092 C	0.2 0.2 N/A	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
205-99-2	BENZO(B)FLUORANTHENE	0.05	J	2.4	J	ug/L	S8MW0301	6/8	0.1	2.4	N/A	0.092 C	0.08 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
191-24-2	BENZO(G,H,I)PERYLENE	0.12		2.4	J	ug/L	S8MW0301	5/8	0.1	2.4	N/A	18 (9) N	210 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
207-08-9	BENZO(K)FLUORANTHENE	0.05		1.1	J	ug/L	S8MW0301	5/8	0.05	1.1	N/A	0.92 C	0.5 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
218-01-9	CHRYSENE	0.03	J	1.9	J	ug/L	S8MW0301	7/8	0.05	1.9	N/A	9.2 C	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
53-70-3	DIBENZO(A,H)ANTHRACENE	0.06	J	0.46	J	ug/L	S8MW0301	3/8	0.1	0.46	N/A	0.0092 C	0.5 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
206-44-0	FLUORANTHENE	0.19		5.2	J	ug/L	S8MW0301	8/8	N/A	5.2	N/A	150 N	280 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
86-73-7	FLUORENE	0.11		5.8	J	ug/L	S8MW0301	7/8	0.1	5.8	N/A	24 N	280 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
193-39-5	INDENO(1,2,3-CD)PYRENE	0.02	J	1.4	J	ug/L	S8MW0301	6/8	0.05	1.4	N/A	0.092 C	0.5 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
91-20-3	NAPHTHALENE	1.5	J	56	J	ug/L	S8MW0301	4/8	0.5	56	N/A	0.62 N	280 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
85-01-8	PHENANTHRENE	0.03	J	11	J	ug/L	S8MW0301	8/8	N/A	11	N/A	18 (9) N	200 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
108-95-2	PHENOL	5	J	6		ug/L	S8MW0301	2/8	5	6	N/A	2200 N	4000 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
129-00-0	PYRENE	0.29		5.4	J	ug/L	S8MW0301	8/8	N/A	5.4	N/A	18 N	200 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
Total Metals																
7440-36-0	ANTIMONY	10.4		10.4		ug/L	S8MW02S01	1/8	2.6	10.4	2.90	1.5 N	6 6 6	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
7440-38-2	ARSENIC	2.3	J	14.5	J	ug/L	S8MW02D01	6/8	2.3	14.5	1.92	0.045 C	50 50 50	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL

TABLE 2.1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - GROUNDWATER
DIRECT CONTACT EXPOSURE SCENARIOS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Goss Point Landfill (Site 8)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Risk-Based COPC Screening Level(5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection(6)
7440-39-3	BARIUM	43.9	J	1180		ug/L	S8MW0401	7/8	14.1 - 41.4	1180	227	260 N	1000 2000 2000	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
7440-70-2	CALCIUM	32800	J	265000		ug/L	S8MW06D01	8/8	N/A	265000	188000	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT
7440-47-3	CHROMIUM	7.6	J	50.5		ug/L	S8MW02S01	4/8	6.2	50.5	49.9	110 (10) N	50 100 N/A	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
7440-48-4	COBALT	10.1	J	10.1	J	ug/L	S8MW06D01	1/8	4.2	10.1	48.6	220 N	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL, BKG
7440-50-8	COPPER	22.2		35.4		ug/L	S8MW02S01	2/8	6.8	35.4	107	140 N	1300 1300 N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL, BKG
7439-89-6	IRON	338		14500		ug/L	S8MW02D01	8/8	N/A	14500	28200	1100 N	N/A 300 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	EPAI, BKG
7439-92-1	LEAD	2.5	J	53.1		ug/L	S8MW02S01	3/8	1.8	53.1	6.63	NA	15 15 N/A	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
7439-95-4	MAGNESIUM	25400		1210000		ug/L	S8MW06D01	8/8	N/A	1210000	191000	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT
7439-96-5	MANGANESE	30.9	J	4210		ug/L	S8MW06D01	8/8	N/A	4210	11700	88 N	N/A 50 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	BKG
7440-02-0	NICKEL	11.7	J	28.7		ug/L	S8MW02S01	3/8	9.2	28.7	32.2	73 N	100 N/A 100	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL, BKG
7440-09-7	POTASSIUM	20000		250000		ug/L	S8MW06D01	8/8	N/A	250000	70800	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT
7440-23-5	SODIUM	189000		9290000		ug/L	S8MW05S01	8/8	N/A	9290000	1900000	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT
7440-62-2	VANADIUM	6.6	J	6.6	J	ug/L	S8MW06D01	1/8	6.3	6.6	10.2	26 N	50 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL, BKG
7440-66-6	ZINC	63.5		170		ug/L	S8MW02S01	2/8	10.4 - 40	170	131	1100 N	5000 5000 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	BSL
Dissolved Metals																
7440-36-0	ANTIMONY, FILTERED	2.6	J	2.6	J	ug/L	S8MW05S01-F	1/1	N/A	2.6	2.01	1.5 N	6 6 6	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
7440-38-2	ARSENIC, FILTERED	2.8	J	2.8	J	ug/L	S8MW05S01-F	1/1	N/A	2.8	2.55	0.045 C	50 50 50	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
7440-39-3	BARIUM, FILTERED	46.9		46.9		ug/L	S8MW05S01-F	1/1	N/A	46.9	124	260 N	1000 2000 2000	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL, BKG

TABLE 2.1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - GROUNDWATER
DIRECT CONTACT EXPOSURE SCENARIOS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Goss Point Landfill (Site 8)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Risk-Based COPC Screening Level(5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection(6)
7440-70-2	CALCIUM, FILTERED	144000		144000		ug/L	S8MW05S01-F	1/1	N/A	144000	152000	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT, BKG
7439-95-4	MAGNESIUM, FILTERED	464000		464000		ug/L	S8MW05S01-F	1/1	N/A	464000	150000	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT
7439-96-5	MANGANESE, FILTERED	90.2	J	90.2	J	ug/L	S8MW05S01-F	1/1	N/A	90.2	9400	88 N	N/A 50 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	BKG
7440-09-7	POTASSIUM, FILTERED	154000		154000		ug/L	S8MW05S01-F	1/1	N/A	154000	60000	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT
7440-23-5	SODIUM, FILTERED	4770000		4770000		ug/L	S8MW05S01-F	1/1	N/A	4770000	1580000	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT
7440-62-2	VANADIUM, FILTERED	9.2	J	9.2	J	ug/L	S8MW05S01-F	1/1	N/A	9.2	9.90	26 N	50 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL, BKG
Miscellaneous Parameters																
000-09-0	TOTAL DISSOLVED SOLIDS	97.5	J	27042		mg/L	S8MW06D01	9/9	N/A	27042	6260	N/A	N/A 500 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	NV
000-08-9	TOTAL SUSPENDED SOLIDS	8		38		mg/L	S8MW06D01	5/9	5,000	38	236	N/A	N/A N/A N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	BKG

A shaded value indicates that the concentration used for screening exceeds the criterion or background value.
A shaded chemical name indicates that the chemical has been selected as a COPC .
S8MW09S01 is located upgradient of the site and therefore was not used in COC selection or the human health risk assessment.

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 95% Upper Tolerance Limit (UTL) of site background data
5 The risk-based COPC screening level for tap water use is presented. The value is based on a target hazard quotient of 0.1 for noncarcinogens (denoted with a "N" flag) or an incremental cancer risk of 1E-6 for carcinogens (denoted with a "C" flag) (USEPA, Region IX, November 2000).
6 The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level and/or an ARAR/TBC(s).
7 Value is for total xylenes.
8 Naphthalene is used as a surrogate for 1-methylnaphthalene and 2-methylnaphthalene.
9 Pyrene is used as a surrogate for benzo(g,h,i)perylene and phenanthrene.
10 Value is for hexavalent chromium.

Associated Samples:

S8MW0101	S8MW05S01
S8MW02D01	S8MW05S01-F
S8MW02S01	S8MW06D01
S8MW0301	S8MW06S01
S8MW0401	S8MW06S01-D

Definitions:
ARAR/TBC - Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogen
COC = Chemical of Concern
J = Estimated Value
N = Noncarcinogen
N/A = Not Applicable.
FED-MCL = Federal Maximum Contaminant Level (USEPA, August 2000)
FED-SMCL = Federal Secondary Maximum Contaminant Level (USEPA, August 2000)
FED-AL = Federal Action Level (USEPA, August 2000)
CTDEP-RSR = Connecticut DEP Remediation Standard Regulations, 1996.
CTDEP-MCL = Connecticut Maximum Contaminant Level

Rationale Codes:
For Selection as a COC:
ASL = Above COC Screening Level/ARAR/TBC

For Elimination as a COC:
BKG = Within Background Levels
BSL = Below COC Screening Level/ARAR/TBC
NUT = Essential Nutrient
NTX = No Toxicity Information
EPAI - USEPA Region one does not advocate evaluation of this chemical
NV = Miscellaneous parameters are not evaluated in human health risk assessments

TABLE 2.2
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - GROUNDWATER
MIGRATION PATHWAYS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Goss Cove Landfill (Site 8)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Surface Water Protection Criteria (5)	Volatilization Criteria(6)	COPC Flag	Rationale for Contaminant Deletion or Selection(7)
Volatile Organics															
71-43-2	BENZENE	2		2		ug/L	S8MW02S01	1/8	1 - 25	2	N/A	710	215	NO	BSL
156-59-2	CIS-1,2-DICHLOROETHENE	33		33		ug/L	S8MW02D01	1/8	1 - 25	33	N/A	N/A	N/A	NO	NTX
100-41-4	ETHYLBENZENE	2		108		ug/L	S8MW0301	5/8	1	108	N/A	580000	50000	NO	BSL
	M+P-XYLENES	1	J	284		ug/L	S8MW0301	5/8	2	284	N/A	N/A	21300	NO	BSL
95-47-6	O-XYLENE	2		136		ug/L	S8MW0301	5/8	1	136	N/A	N/A	21300	NO	NTX
127-18-4	TETRACHLOROETHENE	31		31		ug/L	S8MW02D01	1/8	1 - 25	1440	N/A	88	1500	YES	ASL
108-88-3	TOLUENE	2		31		ug/L	S8MW0301	2/8	1	31	N/A	4000000	23500	NO	BSL
156-60-5	TRANS-1,2-DICHLOROETHENE	7		7		ug/L	S8MW02D01	1/8	1 - 25	7	N/A	N/A	N/A	NO	NTX
79-01-6	TRICHLOROETHENE	25		25		ug/L	S8MW02D01	1/8	1 - 25	25	N/A	2340	219	NO	BSL
75-01-4	VINYL CHLORIDE	1		1		ug/L	S8MW02D01	1/8	1 - 25	1	N/A	15750	2	NO	BSL
1330-20-7	XYLENES, TOTAL	5		454		ug/L	S8MW0301	5/8	1	454	N/A	N/A	21300	NO	BSL
Semivolatile Organics															
90-12-0	1-METHYLNAPHTHALENE	1.3		19	J	ug/L	S8MW0301	3/8	0.5	19	N/A	N/A	N/A	NO	NTX
105-67-9	2,4-DIMETHYLPHENOL	14		240		ug/L	S8MW0301	2/8	5	240	N/A	N/A	N/A	NO	NTX
91-57-6	2-METHYLNAPHTHALENE	0.82		15	J	ug/L	S8MW0301	3/8	0.5	15	N/A	N/A	N/A	NO	NTX
95-48-7	2-METHYLPHENOL	99		99		ug/L	S8MW0301	1/8	5	99	N/A	N/A	N/A	NO	NTX
106-44-5	4-METHYLPHENOL	6		27		ug/L	S8MW0301	2/8	5	27	N/A	N/A	N/A	NO	NTX
83-32-9	ACENAPHTHENE	0.85	J	7.9	J	ug/L	S8MW0301	4/8	0.5	7.9	N/A	0.3	N/A	YES	ASL
120-12-7	ANTHRACENE	0.11		1.4	J	ug/L	S8MW02S01,	7/8	0.05	1.4	N/A	1100000	N/A	NO	BSL
56-55-3	BENZO(A)ANTHRACENE	0.02	J	1.4	J	ug/L	S8MW0301	7/8	0.05	1.4	N/A	0.3	N/A	YES	ASL
50-32-8	BENZO(A)PYRENE	0.02	J	2.1	J	ug/L	S8MW0301	6/8	0.05	2.1	N/A	0.3	N/A	YES	ASL
205-99-2	BENZO(B)FLUORANTHENE	0.05	J	2.4	J	ug/L	S8MW0301	6/8	0.1	2.4	N/A	0.3	N/A	YES	ASL
191-24-2	BENZO(G,H,I)PERYLENE	0.12		2.4	J	ug/L	S8MW0301	5/8	0.1	2.4	N/A	N/A	N/A	NO	NTX
207-08-9	BENZO(K)FLUORANTHENE	0.05		1.1	J	ug/L	S8MW0301	5/8	0.05	1.1	N/A	0.3	N/A	YES	ASL
218-01-9	CHRYSENE	0.03	J	1.9	J	ug/L	S8MW0301	7/8	0.05	1.9	N/A	N/A	N/A	NO	NTX
53-70-3	DIBENZO(A,H)ANTHRACENE	0.06	J	0.46	J	ug/L	S8MW0301	3/8	0.1	0.46	N/A	N/A	N/A	NO	NTX
206-44-0	FLUORANTHENE	0.19		5.2	J	ug/L	S8MW0301	8/8	N/A	5.2	N/A	3700	N/A	NO	BSL
86-73-7	FLUORENE	0.11		5.8	J	ug/L	S8MW0301	7/8	0.1	5.8	N/A	140000	N/A	NO	BSL
193-39-5	INDENO(1,2,3-CD)PYRENE	0.02	J	1.4	J	ug/L	S8MW0301	6/8	0.05	1.4	N/A	N/A	N/A	NO	NTX
91-20-3	NAPHTHALENE	1.5	J	56	J	ug/L	S8MW0301	4/8	0.5	56	N/A	N/A	N/A	NO	NTX
85-01-8	PHENANTHRENE	0.03	J	11	J	ug/L	S8MW0301	8/8	N/A	11	N/A	0.3	N/A	YES	ASL
108-95-2	PHENOL	5	J	6		ug/L	S8MW0301	2/8	5	6	N/A	92000000	N/A	NO	BSL
129-00-0	PYRENE	0.29		5.4	J	ug/L	S8MW0301	8/8	N/A	5.4	N/A	110000	N/A	NO	BSL
Total Metals															
7440-36-0	ANTIMONY	10.4		10.4		ug/L	S8MW02S01	1/8	2.6	10.4	2.9	86000	N/A	NO	BSL
7440-38-2	ARSENIC	2.3	J	14.5	J	ug/L	S8MW02D01	6/8	2.3	14.5	1.92	4	N/A	YES	ASL
7440-39-3	BARIUM	43.9	J	1180		ug/L	S8MW0401	7/8	14.1 - 41.4	1180	227	N/A	N/A	NO	NTX
7440-70-2	CALCIUM	32800	J	265000		ug/L	S8MW06D01	8/8	N/A	265000	188000	N/A	N/A	NO	NTX
7440-47-3	CHROMIUM	7.6	J	50.5		ug/L	S8MW02S01	4/8	6.2	50.5	49.9	N/A	N/A	NO	NTX
7440-48-4	COBALT	10.1	J	10.1	J	ug/L	S8MW06D01	1/8	4.2	10.1	48.6	N/A	N/A	NO	BKG
7440-50-8	COPPER	22.2		35.4		ug/L	S8MW02S01	2/8	6.8	35.4	107	48	N/A	NO	BSL, BKG
7439-89-6	IRON	338		14500		ug/L	S8MW02D01	8/8	N/A	14500	28200	N/A	N/A	NO	BKG
7439-92-1	LEAD	2.5	J	53.1		ug/L	S8MW02S01	3/8	1.8	53.1	6.63	13	N/A	YES	ASL
7439-95-4	MAGNESIUM	25400		1210000		ug/L	S8MW06D01	8/8	N/A	1210000	191000	N/A	N/A	NO	NTX
7439-96-5	MANGANESE	30.9	J	4210		ug/L	S8MW06D01	8/8	N/A	4210	11700	N/A	N/A	NO	BKG
7440-02-0	NICKEL	11.7	J	28.7		ug/L	S8MW02S01	3/8	9.2	28.7	32.2	880	N/A	NO	BSL, BKG
7440-09-7	POTASSIUM	20000		250000		ug/L	S8MW06D01	8/8	N/A	250000	70800	N/A	N/A	NO	NTX
7440-23-5	SODIUM	189000		9290000		ug/L	S8MW05S01	8/8	N/A	9290000	1900000	N/A	N/A	NO	NTX
7440-62-2	VANADIUM	6.6	J	6.6	J	ug/L	S8MW06D01	1/8	6.3	6.6	10.2	N/A	N/A	NO	BKG
7440-66-6	ZINC	63.5		170		ug/L	S8MW02S01	2/8	10.4 - 40	170	131	123	N/A	YES	ASL

TABLE 2.2
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - GROUNDWATER
MIGRATION PATHWAYS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Goss Cove Landfill (Site 8)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Surface Water Protection Criteria (5)	Volatilization Criteria(6)	COPC Flag	Rationale for Contaminant Deletion or Selection(7)
Dissolved Metals															
7440-36-0	ANTIMONY, FILTERED	2.6	J	2.6	J	ug/L	S8MW05S01-F	1/1	N/A	2.6	2.01	86000	N/A	NO	BSL
7440-38-2	ARSENIC, FILTERED	2.8	J	2.8	J	ug/L	S8MW05S01-F	1/1	N/A	2.8	2.55	4	N/A	NO	BSL
7440-39-3	BARIUM, FILTERED	46.9		46.9		ug/L	S8MW05S01-F	1/1	N/A	46.9	124	N/A	N/A	NO	BKG
7440-70-2	CALCIUM, FILTERED	144000		144000		ug/L	S8MW05S01-F	1/1	N/A	144000	152000	N/A	N/A	NO	BKG
7439-95-4	MAGNESIUM, FILTERED	464000		464000		ug/L	S8MW05S01-F	1/1	N/A	464000	150000	N/A	N/A	NO	NTX
7439-96-5	MANGANESE, FILTERED	90.2	J	90.2	J	ug/L	S8MW05S01-F	1/1	N/A	90.2	9400	N/A	N/A	NO	BKG
7440-09-7	POTASSIUM, FILTERED	154000		154000		ug/L	S8MW05S01-F	1/1	N/A	154000	60000	N/A	N/A	NO	NTX
7440-23-5	SODIUM, FILTERED	4770000		4770000		ug/L	S8MW05S01-F	1/1	N/A	4770000	1580000	N/A	N/A	NO	NTX
7440-62-2	VANADIUM, FILTERED	9.2	J	9.2	J	ug/L	S8MW05S01-F	1/1	N/A	9.2	9.9	N/A	N/A	NO	BKG
Miscellaneous Parameters															
000-09-0	TOTAL DISSOLVED SOLIDS	97.5	J	27042		mg/L	S8MW06D01	9/9	N/A	27042	6260	N/A	N/A	NO	NTX
000-08-9	TOTAL SUSPENDED SOLIDS	8		38		mg/L	S8MW06D01	5/9	5000	38	236	N/A	N/A	NO	BKG

A shaded value indicates that the concentration used for screening exceeds the criterion or background value.
A shaded chemical name indicates that the chemical has been selected as a COPC.
S8MW09S01 is located upgradient of the site and therefore was not used in COC selection or the human health risk assessment.

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 95% Upper Tolerance Limit (UTL) of site background data
5 Connecticut DEP Surface Water Protection criteria.
6 Connecticut DEP Volatilization criteria for residential exposures.
7 The chemical is selected as a COPC if the maximum detected concentration exceeds the CTDEP surface water protection or volatilization criteria.

Associated Samples:

S8MW0101	S8MW05S01
S8MW02D01	S8MW05S01-F
S8MW02S01	S8MW06D01
S8MW0301	S8MW06S01
S8MW0401	S8MW06S01-D

Definitions:
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogen
COC = Chemical of Concern
J = Estimated Value
N = Noncarcinogen
NA = Not Applicable.

Rationale Codes:
For Selection as a COPC:
ASL = Above COPC Screening Level/ARAR/TBC

For Elimination as a COPC:
BKG = Within Background Levels
BSL = Below COPC Screening Level/ARAR/TBC
NTX = No Toxicity Information

TABLE 3.1
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Gross Cove Landfill (Site 8)

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency Exposure		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Benzene	ug/L	2.00	4.46	2		ug/L	2	max	1	2.00	average	1
cis-1,2-Dichloroethene	ug/L	6.06	12.3	33		ug/L	33	max	1	6.06	average	1
Tetrachloroethene	ug/L	5.81	462	31		ug/L	31	max	1	5.81	average	1
Trichloroethene	ug/L	5.06	9.99	25		ug/L	25	max	1	5.06	average	1
Vinyl Chloride	ug/L	2.06	4.36	1		ug/L	1	max	1	2.06	average	1
Xylenes, Total	ug/L	68.3	153	454		ug/L	454	max	1	68.3	average	1
1-Methylnaphthalene	ug/L	3.44	6.97	19	J	ug/L	19	max	1	3.44	average	1
2,4-Dimethylphenol	ug/L	33.6	79.0	240		ug/L	240	max	1	33.6	average	1
2-Methylnaphthalene	ug/L	2.66	5.43	15	J	ug/L	15	max	1	2.66	average	1
4-Methylphenol	ug/L	6.00	10.6	27		ug/L	27	max	1	6.00	average	1
Benzo(a)anthracene	ug/L	0.402	0.657	1.4	J	ug/L	1.4	max	1	0.402	average	1
Benzo(a)pyrene	ug/L	0.514	0.896	2.1	J	ug/L	2.1	max	1	0.514	average	1
Benzo(b)fluoranthene	ug/L	0.750	1.07	2.4	J	ug/L	2.4	max	1	0.750	average	1
Benzo(k)fluoranthene	ug/L	0.263	0.462	1.1	J	ug/L	1.1	max	1	0.263	average	1
Dibenzo(a,h)anthracene	ug/L	0.108	0.185	0.46	J	ug/L	0.46	max	1	0.108	average	1
Indeno(1,2,3-cd)pyrene	ug/L	0.361	0.617	1.4	J	ug/L	1.4	max	1	0.361	average	1
Naphthalene	ug/L	10.3	20.7	56	J	ug/L	56	max	1	10.3	average	1
Antimony	ug/L	2.44	4.19	10.4		ug/L	10.4	max	1	2.44	average	1
Arsenic	ug/L	5.24	7.52	14.5		ug/L	14.5	max	1	5.24	average	1
Barium	ug/L	386	604	1180		ug/L	1180	max	1	386	average	1
Chromium	ug/L	14.0	22.7	50.5		ug/L	50.5	max	1	14.0	average	1
Lead	ug/L	11.3	21.5	53.1		ug/L	11.3	average	2	11.3	average	2

Notes:

[1] - The maximum detected and average concentration is used for the RME and CTE sceanrios, respectively per EPA Region I guidance.

[2] - IEUBK require the use of the average concentration as the exposure point concentration.

TABLE 4.1
VALUES USED FOR DAILY INTAKE CALCULATIONS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Gross Cove Landfill (Site 8)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Dermal	DAevent	Absorbed dose per event	mg/cm2-event	See Text	See Text	See Text	See Text	Dermally Absorbed Dose (mg/kg/day)
	SA	Skin Surface Available for Contact	cm2	3800	EPA, 1992	3800	EPA, 1992	
	EV	Event Frequency	events/day	1	EPA, 1994	1	EPA, 1994	$= \frac{DAevent \times EV \times EF \times ED \times SA}{BW \times AT}$
	ET	Exposure Time	hours/event	4	(1)	2	(1)	
	EF	Exposure Frequency	days/year	20	Atlantic, 1992	10	Atlantic, 1992	
	ED	Exposure Duration	years	1	Atlantic, 1992	1	Atlantic, 1992	See text for calculation of DAevent.
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	365	EPA, 1989	365	EPA, 1989	

Notes:
(1) - Professinal judgement.
Sources:
EPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.
EPA, 1992: Dermal Exposure Assessment: Principles and Applications.
EPA, 1994: US EPA Region I Risk Updates, Number 2.
EPA, 1998: Risk Assessment Guidance for Superfund, Supplemental Guidance, Dermal Risk Assessment, Interim Guidance.
Atlantic 1992: Phase I Remedial Investigation Naval Submarine Base - New London, Connecticut, August.

TABLE 5.1
NON-CANCER TOXICITY DATA -- ORAL/DERMAL
NSB-NLON, GROTON, CONNECTICUT

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal RfD (2)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ (3) (MM/DD/YY)
Volatile Organic Compounds										
cis-1,2-Dichloroethene	Chronic	1.0E-02	mg/kg/day	100%	1.0E-02	mg/kg/day	Blood	3000	HEAST	7/97
	Subchronic	1.0E-01	mg/kg/day	100%	1.0E-01	mg/kg/day	Blood	300	HEAST	7/97
Benzene	Chronic	3.0E-03	mg/kg/day	100%	3.0E-03	mg/kg/day	None Specified	NA	EPA IX	11/1/00
	Subchronic	3.0E-03	mg/kg/day	100%	3.0E-03	mg/kg/day	None Specified	NA	Chronic	11/1/00
Tetrachloroethane	Chronic	1.0E-02	mg/kg/day	100%	1.0E-02	mg/kg/day	Liver	1000/1	IRIS	01/02/01
	Subchronic	1.0E-02	mg/kg/day	100%	1.0E-02	mg/kg/day	Liver	1000/1	Chronic	01/02/01
Trichloroethene	Chronic	6.0E-03	mg/kg/day	100%	6.0E-03	mg/kg/day	Liver	NA	EPA IX	11/1/00
	Subchronic	6.0E-03	mg/kg/day	100%	6.0E-03	mg/kg/day	Liver	NA	Chronic	11/1/00
Vinyl Chloride	Chronic	3.0E-03	mg/kg/day	100%	3.0E-03	mg/kg/day	Liver	30/1	IRIS	01/02/01
	Subchronic	3.0E-03	mg/kg/day	100%	3.0E-03	mg/kg/day	Liver	30/1	Chronic	01/02/01
Xylenes	Chronic	2.0E+00	mg/kg/day	100%	2.0E+00	mg/kg/day	Body Weight	100/1	IRIS	01/02/01
	Subchronic	2.0E+00	mg/kg/day	100%	2.0E+00	mg/kg/day	Body Weight	100/1	Chronic	01/02/01
Semivolatile Organic Compounds										
1-Methylnaphthalene (4)	Chronic	2.0E-02	mg/kg/day	100%	2.0E-02	mg/kg/day	Body Weight	3000/1	IRIS	01/02/01
	Subchronic	2.0E-02	mg/kg/day	100%	2.0E-02	mg/kg/day	Body Weight	3000/1	Chronic	01/02/01
2,4-Dimethylphenol	Chronic	2.0E-02	mg/kg/day	100%	2.0E-02	mg/kg/day	CNS, Blood	3000/1	IRIS	01/02/01
	Subchronic	2.0E-01	mg/kg/day	100%	2.0E-01	mg/kg/day	CNS, Blood	300	HEAST	9/97
2-Methylnaphthalene	Chronic	2.0E-02	mg/kg/day	100%	2.0E-02	mg/kg/day	Body Weight	NA	EPA III	10/05/00
	Subchronic	2.0E-02	mg/kg/day	100%	2.0E-02	mg/kg/day	Body Weight	NA	Chronic	10/05/00
4-Methylphenol	Chronic	5.0E-03	mg/kg/day	100%	5.0E-03	mg/kg/day	CNS	1000	HEAST	9/97
	Subchronic	5.0E-03	mg/kg/day	100%	5.0E-03	mg/kg/day	CNS	1000	HEAST	9/97
Benzo(a)anthracene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	Chronic	2.0E-02	mg/kg/day	100%	2.0E-02	mg/kg/day	Body Weight	3000/1	IRIS	01/02/01
	Subchronic	2.0E-02	mg/kg/day	100%	2.0E-02	mg/kg/day	Body Weight	3000/1	Chronic	01/02/01
Inorganics										
Antimony	Chronic	4.0E-04	mg/kg/day	15%	6.0E-05	mg/kg/day	Blood	1000/1	IRIS	01/02/01
	Subchronic	4.0E-04	mg/kg/day	15%	6.0E-05	mg/kg/day	Blood	1000	HEAST	7/97
Arsenic	Chronic	3.0E-04	mg/kg/day	100%	3.0E-04	mg/kg/day	Skin	3/1	IRIS	01/02/01
	Subchronic	3.0E-04	mg/kg/day	100%	3.0E-04	mg/kg/day	Skin	3	HEAST	7/97
Barium	Chronic	7.0E-02	mg/kg/day	7%	4.9E-03	mg/kg/day	CVS	3/1	IRIS	01/02/01
	Subchronic	7.0E-02	mg/kg/day	7%	4.9E-03	mg/kg/day	CVS	3	HEAST	7/97
Chromium VI	Chronic	3.0E-03	mg/kg/day	2.5%	7.5E-05	mg/kg/day	None Specified	300/3	IRIS	01/02/01
	Subchronic	2.0E-02	mg/kg/day	2.5%	5.0E-04	mg/kg/day	None Specified	100	HEAST	7/97
Lead	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 5.1
NON-CANCER TOXICITY DATA -- ORAL/DERMAL
NSB-NLON, GROTON, CONNECTICUT

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal RfD (2)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ (3) (MM/DD/YY)

Notes:
(1) - USEPA 2000.
(2) - RfDdermal = RfDoral x Oral to Dermal Adjustment Factor.
(3) For IRIS values date that IRIS was searched.
For HEAST values, the date of HEAST.
FOR EPA IX, date of PRG Table.
(4) - Naphthalene is used as a surrogate.
NA = Not Applicable.
IRIS = Integrated Risk Information System.
HEAST= Health Effects Assessment Summary Tables.
EPA IX = USEPA Region IX Preliminary Remediation Goals Table, November 1, 2000.
EPA III = USEPA Region III Risk-based Concentration Table, October 5, 2000.

CNS = Central Nervous System
CVS = Cardiovascular System
Chronic = No subchronic value available, chronic value is presented.

TABLE 6.1
CANCER TOXICITY DATA -- ORAL/DERMAL
NSB-NLON, GROTON, CONNECTICUT

Chemical of Potential Concern	Oral Cancer Slope Factor	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal Cancer Slope Factor (2)	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (3) (MM/DD/YY)
Volatile Organic Compounds							
cis-1,2-Dichloroethene	NA	NA	NA	NA	D	IRIS	01/02/01
Benzene	5.5E-02	100%	5.5E-02	$(mg/kg\text{-}day)^{-1}$	A	IRIS	01/02/01
Tetrachloroethane	5.2E-02	100%	5.2E-02	$(mg/kg\text{-}day)^{-1}$	NA	EPA IX	11/01/00
Trichloroethene	1.1E-02	100%	1.1E-02	$(mg/kg\text{-}day)^{-1}$	NA	EPA IX	11/01/00
Vinyl Chloride	7.2E-01	100%	7.2E-01	$(mg/kg\text{-}day)^{-1}$	A	IRIS	01/02/01
Xylenes	NA	NA	NA	NA	D	IRIS	01/02/01
Semivolatile Organic Compounds							
1-Methylnaphthalene	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	NA	NA	NA	NA	C	IRIS	01/02/01
Benzo(a)anthracene (4)	7.3E-01	100%	7.3E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	01/02/01
Benzo(a)pyrene	7.3E+00	100%	7.3E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	01/02/01
Benzo(b)fluoranthene (4)	7.3E-01	100%	7.3E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	01/02/01
Benzo(k)fluoranthene (4)	7.3E-02	100%	7.3E-02	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	01/02/01
Dibenzo(a,h)anthracene (4)	7.3E+00	100%	7.3E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	01/02/01
Indeno(1,2,3-cd)pyrene (4)	7.3E-01	100%	7.3E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	01/02/01
Naphthalene	NA	NA	NA	NA	C	IRIS	01/02/01
Inorganics							
Antimony	NA	NA	NA	NA	NA	NA	NA
Arsenic	1.5E+00	100%	1.5E+00	$(mg/kg\text{-}day)^{-1}$	A	IRIS	01/02/01
Barium	NA	NA	NA	NA	D	IRIS	01/02/01
Chromium VI	NA	NA	NA	NA	A	IRIS	01/02/01
Lead	NA	NA	NA	NA	B2	IRIS	01/02/01

Notes:

IRIS = Integrated Risk Information System

HEAST= Health Effects Assessment Summary Tables

(1) - USEPA 2000.

(2) - CSFdermal = CSForal/Oral to Dermal Adjustment Factor.

(3) - For IRIS values, the date IRIS was searched.
For HEAST values, the date of HEAST.

(4) - USEPA 1993.

NA = Not Applicable

IRIS = Integrated Risk Information System

HEAST= Health Effects Assessment Summary Tables

EPA 'SEPA Region IX Preliminary Remediation Goals Table, November 1, 2000.

EPA Group:

A - Human carcinogen

B1 - Probable human carcinogen - indicates that limited human data are available

B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans

C - Possible human carcinogen

D - Not classifiable as a human carcinogen

E - Evidence of noncarcinogenicity

TABLE 4.1
VALUES USED FOR DAILY INTAKE CALCULATIONS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Gross Cove Landfill (Site 8)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Dermal	DAevent	Absorbed dose per event	mg/cm2-event	See Text	See Text	See Text	See Text	Dermally Absorbed Dose (mg/kg/day)
	SA	Skin Surface Available for Contact	cm2	3800	EPA, 1992	3800	EPA, 1992	$= \frac{DAevent \times EV \times EF \times ED \times SA}{BW \times AT}$
	EV	Event Frequency	events/day	1	EPA, 1994	1	EPA, 1994	
	ET	Exposure Time	hours/event	4	(1)	2	(1)	
	EF	Exposure Frequency	days/year	20	Atlantic, 1992	10	Atlantic, 1992	
	ED	Exposure Duration	years	1	Atlantic, 1992	1	Atlantic, 1992	See text for calculation of DAevent.
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	365	EPA, 1989	365	EPA, 1989	

Notes:
(1) - Professinal judgement.
Sources:
EPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.
EPA, 1992: Dermal Exposure Assessment: Principles and Applications.
EPA, 1994: US EPA Region I Risk Updates, Number 2.
EPA, 1998: Risk Assessment Guidance for Superfund, Supplemental Guidance, Dermal Risk Assessment, Interim Guidance.
Atlantic 1992: Phase I Remedial Investigation Naval Submarine Base - New London, Connecticut, August.

TABLE 7.1
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Gross Cove Landfill (Site 8)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Benzene	2.00	ug/L	2.00	ug/L	M	4.1E-07	mg/kg/day	3.0E-03	mg/kg/day	N/A	N/A	1.4E-04
	cis-1,2-Dichloroethene	33.0	ug/L	33.0	ug/L	M	6.1E-06	mg/kg/day	1.0E-02	mg/kg/day	N/A	N/A	6.1E-04
	Tetrachloroethene	31	ug/L	31	ug/L	M	1.8E-05	mg/kg/day	1.0E-02	mg/kg/day	N/A	N/A	1.8E-03
	Trichloroethene	25.0	ug/L	25.0	ug/L	M	4.5E-06	mg/kg/day	6.0E-03	mg/kg/day	N/A	N/A	7.5E-04
	Vinyl Chloride	1.00	ug/L	1.00	ug/L	M	7.6E-08	mg/kg/day	3.0E-03	mg/kg/day	N/A	N/A	2.5E-05
	Xylenes, Total	454	ug/L	454	ug/L	M	3.2E-04	mg/kg/day	2.0E+00	mg/kg/day	N/A	N/A	1.6E-04
	1-Methylnaphthalene	19.0	ug/L	19.0	ug/L	M	3.5E-05	mg/kg/day	2.0E-02	mg/kg/day	N/A	N/A	1.8E-03
	2,4-Dimethylphenol	240	ug/L	240	ug/L	M	4.0E-05	mg/kg/day	2.0E-02	mg/kg/day	N/A	N/A	2.0E-03
	2-Methylnaphthalene	15.0	ug/L	15.0	ug/L	M	2.9E-05	mg/kg/day	2.0E-02	mg/kg/day	N/A	N/A	1.5E-03
	4-Methylphenol	27.0	ug/L	27.0	ug/L	M	3.0E-06	mg/kg/day	5.0E-03	mg/kg/day	N/A	N/A	6.0E-04
	Benzo(a)anthracene	1.40	ug/L	1.40	ug/L	M	1.7E-05	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Benzo(a)pyrene	2.10	ug/L	2.10	ug/L	M	4.3E-05	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Benzo(b)fluoranthene	2.40	ug/L	2.40	ug/L	M	1.5E-04	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Benzo(k)fluoranthene	1.10	ug/L	1.10	ug/L	M	7.0E-05	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Dibenzo(a,h)anthracene	0.460	ug/L	0.460	ug/L	M	2.5E-05	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Indeno(1,2,3-cd)pyrene	1.40	ug/L	1.40	ug/L	M	5.1E-05	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Naphthalene	56.0	ug/L	56.0	ug/L	M	3.8E-05	mg/kg/day	2.0E-02	mg/kg/day	N/A	N/A	1.9E-03
	Antimony	10.4	ug/L	10.4	ug/L	M	0.0E+00	mg/kg/day	6.0E-05	mg/kg/day	N/A	N/A	- -
	Arsenic	14.5	ug/L	14.5	ug/L	M	0.0E+00	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	- -
	Barium	1180	ug/L	1180	ug/L	M	0.0E+00	mg/kg/day	4.9E-03	mg/kg/day	N/A	N/A	- -
	Chromium	50.5	ug/L	50.5	ug/L	M	1.2E-06	mg/kg/day	7.5E-05	mg/kg/day	N/A	N/A	1.6E-02
	Lead	11.3	ug/L	11.3	ug/L	M	0.0E+00	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	(Total)												2.7E-02
												Total Hazard Index Across All Exposure Routes/Pathways	2.7E-02

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Subchronic.

TABLE 7.2
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Gross Cove Landfill (Site 8)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Benzene	2.20	ug/L	2.20	ug/L	M	2.0E-07	mg/kg/day	3.0E-03	mg/kg/day	N/A	N/A	6.8E-05
	cis-1,2-Dichloroethene	6.06	ug/L	6.06	ug/L	M	3.0E-06	mg/kg/day	1.0E-02	mg/kg/day	N/A	N/A	3.0E-04
	Tetrachloroethene	6	ug/L	6	ug/L	M	9.0E-06	mg/kg/day	1.0E-02	mg/kg/day	N/A	N/A	9.0E-04
	Trichloroethene	5.06	ug/L	5.06	ug/L	M	2.3E-06	mg/kg/day	6.0E-03	mg/kg/day	N/A	N/A	3.8E-04
	Vinyl Chloride	2.06	ug/L	2.06	ug/L	M	3.8E-08	mg/kg/day	3.0E-03	mg/kg/day	N/A	N/A	1.3E-05
	Xylenes, Total	68.3	ug/L	68.3	ug/L	M	1.6E-04	mg/kg/day	2.0E+00	mg/kg/day	N/A	N/A	8.1E-05
	1-Methylnaphthalene	3.44	ug/L	3.44	ug/L	M	1.8E-05	mg/kg/day	2.0E-02	mg/kg/day	N/A	N/A	8.8E-04
	2,4-Dimethylphenol	33.6	ug/L	33.6	ug/L	M	2.0E-05	mg/kg/day	2.0E-02	mg/kg/day	N/A	N/A	9.9E-04
	2-Methylnaphthalene	2.66	ug/L	2.66	ug/L	M	1.5E-05	mg/kg/day	2.0E-02	mg/kg/day	N/A	N/A	7.3E-04
	4-Methylphenol	6.00	ug/L	6.00	ug/L	M	1.5E-06	mg/kg/day	5.0E-03	mg/kg/day	N/A	N/A	3.0E-04
	Benzo(a)anthracene	0.402	ug/L	0.402	ug/L	M	8.5E-06	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Benzo(a)pyrene	0.514	ug/L	0.514	ug/L	M	2.2E-05	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Benzo(b)fluoranthene	0.750	ug/L	0.750	ug/L	M	7.6E-05	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Benzo(k)fluoranthene	0.263	ug/L	0.263	ug/L	M	3.5E-05	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Dibenzo(a,h)anthracene	0.108	ug/L	0.108	ug/L	M	1.2E-05	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Indeno(1,2,3-cd)pyrene	0.361	ug/L	0.361	ug/L	M	2.6E-05	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Naphthalene	10.28	ug/L	10.28	ug/L	M	1.9E-05	mg/kg/day	2.0E-02	mg/kg/day	N/A	N/A	9.5E-04
	Antimony	2.44	ug/L	2.44	ug/L	M	0.0E+00	mg/kg/day	6.0E-05	mg/kg/day	N/A	N/A	- -
	Arsenic	5.24	ug/L	5.24	ug/L	M	0.0E+00	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	- -
	Barium	386	ug/L	386	ug/L	M	0.0E+00	mg/kg/day	4.9E-03	mg/kg/day	N/A	N/A	- -
	Chromium	14.0	ug/L	14.0	ug/L	M	6.0E-07	mg/kg/day	7.5E-05	mg/kg/day	N/A	N/A	8.0E-03
	Lead	11.3	ug/L	11.3	ug/L	M	0.0E+00	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	(Total)												1.4E-02
												Total Hazard Index Across All Exposure Routes/Pathways	1.4E-02

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Subchronic.

TABLE 8.1
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Gross Cove Landfill (Site 8)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Benzene	2.00	ug/L	2.00	ug/L	M	5.8E-09	mg/kg/day	5.5E-02	(mg/kg/day) -1	3.2E-10
	cis-1,2-Dichloroethene	33.0	ug/L	33.0	ug/L	M	8.7E-08	mg/kg/day	NA	(mg/kg/day) -1	- -
	Tetrachloroethene	31	ug/L	31	ug/L	M	2.6E-07	mg/kg/day	5.2E-02	(mg/kg/day) -1	1.3E-08
	Trichloroethene	25.0	ug/L	25.0	ug/L	M	6.5E-08	mg/kg/day	1.1E-02	(mg/kg/day) -1	7.1E-10
	Vinyl Chloride	1.00	ug/L	1.00	ug/L	M	1.1E-09	mg/kg/day	7.2E-01	(mg/kg/day) -1	7.8E-10
	Xylenes, Total	454	ug/L	454	ug/L	M	4.6E-06	mg/kg/day	NA	(mg/kg/day) -1	- -
	1-Methylnaphthalene	19.0	ug/L	19.0	ug/L	M	5.0E-07	mg/kg/day	NA	(mg/kg/day) -1	- -
	2,4-Dimethylphenol	240	ug/L	240	ug/L	M	5.7E-07	mg/kg/day	NA	(mg/kg/day) -1	- -
	2-Methylnaphthalene	15.0	ug/L	15.0	ug/L	M	4.2E-07	mg/kg/day	NA	(mg/kg/day) -1	- -
	4-Methylphenol	27.0	ug/L	27.0	ug/L	M	4.3E-08	mg/kg/day	NA	(mg/kg/day) -1	- -
	Benzo(a)anthracene	1.40	ug/L	1.40	ug/L	M	2.4E-07	mg/kg/day	7.3E-01	(mg/kg/day) -1	1.8E-07
	Benzo(a)pyrene	2.10	ug/L	2.10	ug/L	M	6.2E-07	mg/kg/day	7.3E+00	(mg/kg/day) -1	4.5E-06
	Benzo(b)fluoranthene	2.40	ug/L	2.40	ug/L	M	2.2E-06	mg/kg/day	7.3E-01	(mg/kg/day) -1	1.6E-06
	Benzo(k)fluoranthene	1.10	ug/L	1.10	ug/L	M	1.0E-06	mg/kg/day	7.3E-02	(mg/kg/day) -1	7.3E-08
	Dibenzo(a,h)anthracene	0.460	ug/L	0.460	ug/L	M	3.5E-07	mg/kg/day	7.3E+00	(mg/kg/day) -1	2.6E-06
	Indeno(1,2,3-cd)pyrene	1.40	ug/L	1.40	ug/L	M	7.3E-07	mg/kg/day	7.3E-01	(mg/kg/day) -1	5.4E-07
	Naphthalene	56.0	ug/L	56.0	ug/L	M	5.4E-07	mg/kg/day	NA	(mg/kg/day) -1	- -
	Antimony	10.4	ug/L	10.4	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Arsenic	14.5	ug/L	14.5	ug/L	M	0.0E+00	mg/kg/day	1.5E+00	(mg/kg/day) -1	0.0E+00
	Barium	1180	ug/L	1180	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Chromium	50.5	ug/L	50.5	ug/L	M	1.7E-08	mg/kg/day	NA	(mg/kg/day) -1	- -
	Lead	11.3	ug/L	11.3	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										9.5E-06
										Total Risk Across All Exposure Routes/Pathways	9.5E-06

(1) Medium-Specific (M) selected for risk calculation.

TABLE 8.2
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Gross Cove Landfill (Site 8)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Benzene	2.20	ug/L	2.20	ug/L	M	1.8E-09	mg/kg/day	5.5E-02	(mg/kg/day) -1	1.0E-10
	cis-1,2-Dichloroethene	6.06	ug/L	6.06	ug/L	M	4.7E-09	mg/kg/day	NA	(mg/kg/day) -1	- -
	Tetrachloroethene	6	ug/L	6	ug/L	M	1.6E-08	mg/kg/day	5.2E-02	(mg/kg/day) -1	8.4E-10
	Trichloroethene	5.06	ug/L	5.06	ug/L	M	4.1E-09	mg/kg/day	1.1E-02	(mg/kg/day) -1	4.5E-11
	Vinyl Chloride	2.06	ug/L	2.06	ug/L	M	6.2E-10	mg/kg/day	7.2E-01	(mg/kg/day) -1	4.4E-10
	Xylenes, Total	68.3	ug/L	68.3	ug/L	M	2.2E-07	mg/kg/day	NA	(mg/kg/day) -1	- -
	1-Methylnaphthalene	3.44	ug/L	3.44	ug/L	M	3.2E-08	mg/kg/day	NA	(mg/kg/day) -1	- -
	2,4-Dimethylphenol	33.6	ug/L	33.6	ug/L	M	2.4E-08	mg/kg/day	NA	(mg/kg/day) -1	- -
	2-Methylnaphthalene	2.66	ug/L	2.66	ug/L	M	2.7E-08	mg/kg/day	NA	(mg/kg/day) -1	- -
	4-Methylphenol	6.00	ug/L	6.00	ug/L	M	2.8E-09	mg/kg/day	NA	(mg/kg/day) -1	- -
	Benzo(a)anthracene	0.402	ug/L	0.402	ug/L	M	2.5E-08	mg/kg/day	7.3E-01	(mg/kg/day) -1	1.8E-08
	Benzo(a)pyrene	0.514	ug/L	0.514	ug/L	M	5.3E-08	mg/kg/day	7.3E+00	(mg/kg/day) -1	3.9E-07
	Benzo(b)fluoranthene	0.750	ug/L	0.750	ug/L	M	2.4E-07	mg/kg/day	7.3E-01	(mg/kg/day) -1	1.8E-07
	Benzo(k)fluoranthene	0.263	ug/L	0.263	ug/L	M	8.4E-08	mg/kg/day	7.3E-02	(mg/kg/day) -1	6.2E-09
	Dibenzo(a,h)anthracene	0.108	ug/L	0.108	ug/L	M	1.7E-08	mg/kg/day	7.3E+00	(mg/kg/day) -1	1.3E-07
	Indeno(1,2,3-cd)pyrene	0.361	ug/L	0.361	ug/L	M	4.0E-08	mg/kg/day	7.3E-01	(mg/kg/day) -1	2.9E-08
	Naphthalene	10.28	ug/L	10.28	ug/L	M	3.2E-08	mg/kg/day	NA	(mg/kg/day) -1	- -
	Antimony	2.44	ug/L	2.44	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Arsenic	5.24	ug/L	5.24	ug/L	M	0.0E+00	mg/kg/day	1.5E+00	(mg/kg/day) -1	0.0E+00
	Barium	386	ug/L	386	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Chromium	14.0	ug/L	14.0	ug/L	M	1.2E-09	mg/kg/day	NA	(mg/kg/day) -1	- -
	Lead	11.3	ug/L	11.3	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										7.5E-07
										Total Risk Across All Exposure Routes/Pathways	7.5E-07

(1) Medium-Specific (M) selected for risk calculation.

TABLE 9.1
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Gross Cove Landfill (Site 8)	Benzene	- -	- -	3.2E-10	3.2E-10	Benzene	None Specified	- -	- -	1.4E-04	1.4E-04
			cis-1,2-Dichloroethene	- -	- -	- -	- -	cis-1,2-Dichloroethene	Blood	- -	- -	6.1E-04	6.1E-04
			Tetrachloroethene	- -	- -	1.3E-08	1.3E-08	Tetrachloroethene	Liver	- -	- -	1.8E-03	1.8E-03
			Trichloroethene	- -	- -	7.1E-10	7.1E-10	Trichloroethene	Liver	- -	- -	7.5E-04	7.5E-04
			Vinyl Chloride	- -	- -	7.8E-10	7.8E-10	Vinyl Chloride	Liver	- -	- -	2.5E-05	2.5E-05
			Xylenes, Total	- -	- -	- -	- -	Xylenes, Total	Body Weight	- -	- -	1.6E-04	1.6E-04
			1-Methylnaphthalene	- -	- -	- -	- -	1-Methylnaphthalene	Body Weight	- -	- -	1.8E-03	1.8E-03
			2,4-Dimethylphenol	- -	- -	- -	- -	2,4-Dimethylphenol	CNS, Blood	- -	- -	2.0E-03	2.0E-03
			2-Methylnaphthalene	- -	- -	- -	- -	2-Methylnaphthalene	Body Weight	- -	- -	1.5E-03	1.5E-03
			4-Methylphenol	- -	- -	- -	- -	4-Methylphenol	CNS	- -	- -	6.0E-04	6.0E-04
			Benzo(a)anthracene	- -	- -	1.8E-07	1.8E-07	Benzo(a)anthracene	NA	- -	- -	- -	- -
			Benzo(a)pyrene	- -	- -	4.5E-06	4.5E-06	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Benzo(b)fluoranthene	- -	- -	1.6E-06	1.6E-06	Benzo(b)fluoranthene	NA	- -	- -	- -	- -
			Benzo(k)fluoranthene	- -	- -	7.3E-08	7.3E-08	Benzo(k)fluoranthene	NA	- -	- -	- -	- -
			Dibenzo(a,h)anthracene	- -	- -	2.6E-06	2.6E-06	Dibenzo(a,h)anthracene	NA	- -	- -	- -	- -
			Indeno(1,2,3-cd)pyrene	- -	- -	5.4E-07	5.4E-07	Indeno(1,2,3-cd)pyrene	NA	- -	- -	- -	- -
			Naphthalene	- -	- -	- -	- -	Naphthalene	Body Weight	- -	- -	1.9E-03	1.9E-03
			Antimony	- -	- -	- -	- -	Antimony	Blood	- -	- -	- -	- -
			Arsenic	- -	- -	- -	- -	Arsenic	Skin	- -	- -	- -	- -
			Barium	- -	- -	- -	- -	Barium	CVS, Fetus	- -	- -	- -	- -
			Chromium	- -	- -	- -	- -	Chromium	None Specified	- -	- -	1.6E-02	1.6E-02
			Lead	- -	- -	- -	- -	Lead	NA	- -	- -	- -	- -
			(Total)	- -	- -	9.5E-06	9.5E-06	(Total)		- -	- -	2.7E-02	2.7E-02
						Total Risk Across Groundwater	9.5E-06					Total Hazard Index Across All Media and All Exposure Routes	2.7E-02
						Total Risk Across All Media and All Exposure Routes	9.5E-06						

Total Blood HI	6.1E-04
Total Liver HI	2.6E-03
Total CNS HI	2.6E-03
Total Skin HI	- -

TABLE 9.2
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Gross Cove Landfill (Site 8)	Benzene	- -	- -	1.0E-10	1.0E-10	Benzene	None Specified	- -	- -	6.8E-05	6.8E-05
			cis-1,2-Dichloroethene	- -	- -	- -	- -	cis-1,2-Dichloroethene	Blood	- -	- -	3.0E-04	3.0E-04
			Tetrachloroethene	- -	- -	8.4E-10	8.4E-10	Tetrachloroethene	Liver	- -	- -	9.0E-04	9.0E-04
			Trichloroethene	- -	- -	4.5E-11	4.5E-11	Trichloroethene	Liver	- -	- -	3.8E-04	3.8E-04
			Vinyl Chloride	- -	- -	4.4E-10	4.4E-10	Vinyl Chloride	Liver	- -	- -	1.3E-05	1.3E-05
			Xylenes, Total	- -	- -	- -	- -	Xylenes, Total	Body Weight	- -	- -	8.1E-05	8.1E-05
			1-Methylnaphthalene	- -	- -	- -	- -	1-Methylnaphthalene	Body Weight	- -	- -	8.8E-04	8.8E-04
			2,4-Dimethylphenol	- -	- -	- -	- -	2,4-Dimethylphenol	CNS, Blood	- -	- -	9.9E-04	9.9E-04
			2-Methylnaphthalene	- -	- -	- -	- -	2-Methylnaphthalene	Body Weight	- -	- -	7.3E-04	7.3E-04
			4-Methylphenol	- -	- -	- -	- -	4-Methylphenol	CNS	- -	- -	3.0E-04	3.0E-04
			Benzo(a)anthracene	- -	- -	1.8E-08	1.8E-08	Benzo(a)anthracene	NA	- -	- -	- -	- -
			Benzo(a)pyrene	- -	- -	3.9E-07	3.9E-07	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Benzo(b)fluoranthene	- -	- -	1.8E-07	1.8E-07	Benzo(b)fluoranthene	NA	- -	- -	- -	- -
			Benzo(k)fluoranthene	- -	- -	6.2E-09	6.2E-09	Benzo(k)fluoranthene	NA	- -	- -	- -	- -
			Dibenzo(a,h)anthracene	- -	- -	1.3E-07	1.3E-07	Dibenzo(a,h)anthracene	NA	- -	- -	- -	- -
			Indeno(1,2,3-cd)pyrene	- -	- -	2.9E-08	2.9E-08	Indeno(1,2,3-cd)pyrene	NA	- -	- -	- -	- -
			Naphthalene	- -	- -	- -	- -	Naphthalene	Body Weight	- -	- -	9.5E-04	9.5E-04
			Antimony	- -	- -	- -	- -	Antimony	Blood	- -	- -	- -	- -
			Arsenic	- -	- -	- -	- -	Arsenic	Skin	- -	- -	- -	- -
			Barium	- -	- -	- -	- -	Barium	CVS, Fetus	- -	- -	- -	- -
			Chromium	- -	- -	- -	- -	Chromium	None Specified	- -	- -	8.0E-03	8.0E-03
			Lead	- -	- -	- -	- -	Lead	NA	- -	- -	- -	- -
			(Total)	- -	- -	7.5E-07	7.5E-07	(Total)		- -	- -	1.4E-02	1.4E-02
			Total Risk Across Groundwater				7.5E-07	Total Hazard Index Across All Media and All Exposure Routes					1.4E-02
			Total Risk Across All Media and All Exposure Routes				7.5E-07						

Total Blood HI	3.0E-04
Total Liver HI	1.3E-03
Total CNS HI	1.3E-03
Total Skin HI	- -

TABLE 10.1
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Gross Cove Landfill (Site 8)	Benzo(a)pyrene	- -	- -	4.5E-06	4.5E-06	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Benzo(b)fluoranthene	- -	- -	1.6E-06	1.6E-06	Benzo(b)fluoranthene	NA	- -	- -	- -	- -
			Dibenzo(a,h)anthracene	- -	- -	2.6E-06	2.6E-06	Dibenzo(a,h)anthracene	NA	- -	- -	- -	- -
			(Total)	- -	- -	8.7E-06	8.7E-06	(Total)		- -	- -	- -	- -
			Total Risk Across Groundwater				8.7E-06	Total Hazard Index Across All Media and All Exposure Routes					- -
			Total Risk Across All Media and All Exposure Routes				8.7E-06						

TABLE 10.2
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Gross Cove Landfill (Site 8)	Benzene	- -	- -	1.0E-10	1.0E-10	Benzene	None Specified	- -	- -	6.8E-05	6.8E-05
			cis-1,2-Dichloroethene	- -	- -	- -	- -	cis-1,2-Dichloroethene	Blood	- -	- -	3.0E-04	3.0E-04
			Tetrachloroethene	- -	- -	8.4E-10	8.4E-10	Tetrachloroethene	Liver	- -	- -	9.0E-04	9.0E-04
			Trichloroethene	- -	- -	4.5E-11	4.5E-11	Trichloroethene	Liver	- -	- -	3.8E-04	3.8E-04
			Vinyl Chloride	- -	- -	4.4E-10	4.4E-10	Vinyl Chloride	Liver	- -	- -	1.3E-05	1.3E-05
			Xylenes, Total	- -	- -	- -	- -	Xylenes, Total	Body Weight	- -	- -	8.1E-05	8.1E-05
			1-Methylnaphthalene	- -	- -	- -	- -	1-Methylnaphthalene	Body Weight	- -	- -	8.8E-04	8.8E-04
			2,4-Dimethylphenol	- -	- -	- -	- -	2,4-Dimethylphenol	CNS, Blood	- -	- -	9.9E-04	9.9E-04
			2-Methylnaphthalene	- -	- -	- -	- -	2-Methylnaphthalene	Body Weight	- -	- -	7.3E-04	7.3E-04
			4-Methylphenol	- -	- -	- -	- -	4-Methylphenol	CNS	- -	- -	3.0E-04	3.0E-04
			Benzo(a)anthracene	- -	- -	1.8E-08	1.8E-08	Benzo(a)anthracene	NA	- -	- -	- -	- -
			Benzo(a)pyrene	- -	- -	3.9E-07	3.9E-07	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Benzo(b)fluoranthene	- -	- -	1.8E-07	1.8E-07	Benzo(b)fluoranthene	NA	- -	- -	- -	- -
			Benzo(k)fluoranthene	- -	- -	6.2E-09	6.2E-09	Benzo(k)fluoranthene	NA	- -	- -	- -	- -
			Dibenzo(a,h)anthracene	- -	- -	1.3E-07	1.3E-07	Dibenzo(a,h)anthracene	NA	- -	- -	- -	- -
			Indeno(1,2,3-cd)pyrene	- -	- -	2.9E-08	2.9E-08	Indeno(1,2,3-cd)pyrene	NA	- -	- -	- -	- -
			Naphthalene	- -	- -	- -	- -	Naphthalene	Body Weight	- -	- -	9.5E-04	9.5E-04
			Antimony	- -	- -	- -	- -	Antimony	Blood	- -	- -	- -	- -
			Arsenic	- -	- -	- -	- -	Arsenic	Skin	- -	- -	- -	- -
			Barium	- -	- -	- -	- -	Barium	CVS, Fetus	- -	- -	- -	- -
			Chromium	- -	- -	- -	- -	Chromium	None Specified	- -	- -	8.0E-03	8.0E-03
			Lead	- -	- -	- -	- -	Lead	NA	- -	- -	- -	- -
			(Total)	- -	- -	7.5E-07	7.5E-07	(Total)		- -	- -	1.4E-02	1.4E-02
			Total Risk Across Groundwater				7.5E-07	Total Hazard Index Across All Media and All Exposure Routes					1.4E-02
			Total Risk Across All Media and All Exposure Routes				7.5E-07						

Total Blood HI	3.0E-04
Total Liver HI	1.3E-03
Total CNS HI	1.3E-03
Total Skin HI	- -

SPENT ACID STORAGE AND DISPOSAL AREA (SITE 15)

TABLE 1
SELECTION OF EXPOSURE PATHWAYS
SPENT ACID STORAGE AND DISPOSAL AREA (SITE 15)
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current/Future	Groundwater	Groundwater	Overburden/Bedrock Aquifer	Construction Workers	Adult	Ingestion Dermal	On-Site On-Site	Quant. Quant.	Construction workers may have dermal contact with groundwater during excavation activities.
				Full-time Employees	Adult	Ingestion Dermal	On-Site On-Site	None None	Full-time employees are not exposed to groundwater.
				Trespassers	Adolescents	Ingestion Dermal	On-Site On-Site	None None	Trespassers do not have contact with groundwater.
				Residents	Adult	Ingestion Dermal	On-Site On-Site	Quant. Quant.	Groundwater may be used as a potable water source in the future.
					Child	Ingestion Dermal	On-Site On-Site	None None	Exposures to a child resident are less than those for an adult resident
		Air	Overburden/Bedrock Aquifer	Construction Workers	Adult	Inhalation	On-site	None	Construction workers exposure via volatilization is expected to be insignificant due to dilution with outdoor air.
				Full-time Employees	Adult	Inhalation	On-site	None	Full-time employees are not exposed to groundwater.
				Trespassers	Adolescents	Inhalation	On-Site	None	Trespassers do not have contact with site groundwater.
				Residents	Adult	Inhalation	On-site	None	On-site residents may be exposed to volatile emissions from groundwater while showering.
					Child	Inhalation	On-site	None	Exposures to a child resident are less than those for an adult resident

TABLE 2.1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - GROUNDWATER
DIRECT CONTACT EXPOSURE SCENARIOS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Spent Acid Storage and Disposal Area (Site 15)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Risk-Based COPC Screening Level(5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection(6)
Volatile Organics																
79-01-6	TRICHLOROETHENE	2.32	J	16		ug/L	S15MW3S01	3/4	1	16	N/A	1.6 C	5 5 5	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
Semivolatile Organics																
120-12-7	ANTHRACENE	0.02	J	0.02	J	ug/L	S15MW3S01	1/4	0.05	0.02	N/A	180 N	2000 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
206-44-0	FLUORANTHENE	0.09	J	0.09	J	ug/L	S15MW3S01	1/4	0.1	0.09	N/A	150 N	280 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
129-00-0	PYRENE	0.06		0.06		ug/L	S15MW3S01	1/4	0.05	0.06	N/A	18 N	200 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
Total Metals																
7429-90-5	ALUMINUM	1650		4200		ug/L	S15MW1D01	3/4	683	4200	3560	3600 N	N/A 50 to 200 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	EPAI
7440-41-7	BERYLLIUM	1.2	J	1.4		ug/L	S15MW2S01-D	1/4	0.72	1.4	ND	7.3 N	4 4 4	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
7440-43-9	CADMIUM	0.99		3.4		ug/L	S15MW2S01-D	2/4	0.25	3.4	ND	1.8 N	5 5 5	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
7440-70-2	CALCIUM	6740		22500		ug/L	S15MW3S01	4/4	N/A	22500	188000	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT, BKG
7440-47-3	CHROMIUM	7.9	J	121		ug/L	S15MW1S01	4/4	N/A	121	49.9	110 (7)	50 100 N/A	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
7440-50-8	COPPER	12.6	J	36.6		ug/L	S15MW2S01	3/4	6.8	36.6	107	140 N	1300 1300 N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL, BKG
7439-89-6	IRON	1430		8600		ug/L	S15MW3S01	3/4	247 - 250	8600	28200	1100 N	N/A 300 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	BKG, EPAI
7439-92-1	LEAD	2.8	J	24.7		ug/L	S15MW1S01	4/4	N/A	24.7	6.63	N/A	15 15 N/A	CTDEP RSR FED-AL CTDEP-MCL	YES	ASL
7439-95-4	MAGNESIUM	1290		8080		ug/L	S15MW1D01	4/4	N/A	8080	191000	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT, BKG
7439-96-5	MANGANESE	31.3		871		ug/L	S15MW1D01	4/4	N/A	871	11700	88 N	N/A 50 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	BKG
7440-02-0	NICKEL	77.6		77.6		ug/L	S15MW1S01	1/4	13.8 - 34.4	77.6	32.2	73 N	100 100 100	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
7440-09-7	POTASSIUM	1600		6610		ug/L	S15MW1D01	4/4	N/A	6610	70800	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT, BKG
7440-22-4	SILVER	79.1	J	615	J	ug/L	S15MW2S01	3/3	5.9	615	ND	18 N	36 100 50	CTDEP RSR FED-SMCL CTDEP-MCL	YES	ASL

TABLE 2.1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - GROUNDWATER
DIRECT CONTACT EXPOSURE SCENARIOS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Spent Acid Storage and Disposal Area (Site 15)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Risk-Based COPC Screening Level(5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection(6)
7440-23-5	SODIUM	24800		59800		ug/L	S15MW1D01	4/4	N/A	59800	1900000	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT, BKG
7440-66-6	ZINC	296		349		ug/L	S15MW2S01-D	1/4	24.4 - 42	349	131	1100 N	5000 5000 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	BSL
Miscellaneous Parameters																
000-09-0	TOTAL DISSOLVED SOLIDS	146	J	276	J	mg/L	S15MW1D01	3/4	10	276	6260	N/A	N/A 500 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	BSL, BKG
000-08-9	TOTAL SUSPENDED SOLIDS	5	J	80	J	mg/L	S15MW1D01	3/4	5	80	236	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BKG

A shaded value indicates that the concentration used for screening exceeds the criterion or background value.
A shaded chemical name indicates that the chemical has been selected as a COC .

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 95% Upper Tolerance Limit (UTL) of site background data
5 The risk-based COPC screening level for tap water use is presented. The value is based on a target hazard quotient of 0.1 for noncarcinogens (denoted with a "N" flag) or an incremental cancer risk of 1E-6 for carcinogens (denoted with a "C" flag) (USEPA, Region IX, November 2000).
6 The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level and/or an ARAR/TBC(s).
7 Value is for hexavalent chromium.

Associated Samples:
S15MW1D01
S15MW1S01
S15MW2S01
S15MW2S01-D
S15MW3S01

Definitions:
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogen
COC = Chemical of Concern
J = Estimated Value
N = Noncarcinogen
N/A = Not Applicable.
FED-MCL = Federal Maximum Contaminant Level (USEPA, August 2000)
FED-SMCL = Federal Secondary Maximum Contaminant Level (USEPA, August 2000)
FED-AL = Federal Action Level (USEPA, August 2000)
CTDEP-RSR = Connecticut DEP Remediation Standard Regulations, 1996.
CTDEP-MCL = Connecticut Maximum Contaminant Level

Rationale Codes:
For Selection as a COC:
ASL = Above COC Screening Level/ARAR/TBC

For Elimination as a COC:
BKG = Within Background Levels
BSL = Below COC Screening Level/ARAR/TBC
NUT = Essential Nutrient
NTX = No Toxicity Information
EPAI = USEPA Region one does not advocate evaluation of this chemical.

TABLE 2.2
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - GROUNDWATER
MIGRATION PATHWAYS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Spent Acid Storage and Disposal Area (Site 15)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	CTDEP Surface Water Criteria(5)	CTDEP Vol. Criteria(6)	COPC Flag	Rationale for Contaminant Deletion or Selection(7)
Volatile Organics															
79-01-6	TRICHLOROETHENE	2.32	J	16		ug/L	S15MW3S01	3/4	1	16	N/A	2340	219	NO	BSL
Semivolatile Organics															
120-12-7	ANTHRACENE	0.02	J	0.02	J	ug/L	S15MW3S01	1/4	0.05	0.02	N/A	1100000	N/A	NO	BSL
206-44-0	FLUORANTHENE	0.09	J	0.09	J	ug/L	S15MW3S01	1/4	0.1	0.09	N/A	3700	N/A	NO	BSL
129-00-0	PYRENE	0.06		0.06		ug/L	S15MW3S01	1/4	0.05	0.06	N/A	110000	N/A	NO	BSL
Total Metals															
7429-90-5	ALUMINUM	1650		4200		ug/L	S15MW1D01	3/4	683	4200	3560	N/A	NA	NO	NTX
7440-41-7	BERYLLIUM	1.2	J	1.4		ug/L	S15MW2S01-D	1/4	0.72	1.4	ND	4	NA	NO	BSL
7440-43-9	CADMIUM	0.99		3.4		ug/L	S15MW2S01-D	2/4	0.25	3.4	ND	6	NA	NO	BSL
7440-70-2	CALCIUM	6740		22500		ug/L	S15MW3S01	4/4	N/A	22500	188000	N/A	NA	NO	BKG
7440-47-3	CHROMIUM	7.9	J	121		ug/L	S15MW1S01	4/4	N/A	121	49.9	N/A	NA	NO	NTX
7440-50-8	COPPER	12.6	J	36.6		ug/L	S15MW2S01	3/4	6.8	36.6	107	48	NA	NO	BSL, BKG
7439-89-6	IRON	1430		8600		ug/L	S15MW3S01	3/4	247 - 250	8600	28200	N/A	NA	NO	BKG
7439-92-1	LEAD	2.8	J	24.7		ug/L	S15MW1S01	4/4	N/A	24.7	6.63	13	NA	YES	ASL
7439-95-4	MAGNESIUM	1290		8080		ug/L	S15MW1D01	4/4	N/A	8080	191000	N/A	NA	NO	BKG
7439-96-5	MANGANESE	31.3		871		ug/L	S15MW1D01	4/4	N/A	871	11700	N/A	NA	NO	BKG
7440-02-0	NICKEL	77.6		77.6		ug/L	S15MW1S01	1/4	13.8 - 34.4	77.6	32.2	880	NA	NO	BSL
7440-09-7	POTASSIUM	1600		6610		ug/L	S15MW1D01	4/4	N/A	6610	70800	N/A	NA	NO	BKG
7440-22-4	SILVER	79.1	J	615	J	ug/L	S15MW2S01	3/3	5.9	615	ND	12	NA	YES	ASL
7440-23-5	SODIUM	24800		59800		ug/L	S15MW1D01	4/4	N/A	59800	1900000	N/A	NA	NO	BKG
7440-66-6	ZINC	296		349		ug/L	S15MW2S01-D	1/4	24.4 - 42	349	131	123	NA	YES	ASL
Miscellaneous Parameters															
000-09-0	TOTAL DISSOLVED SOLIDS	146	J	276	J	mg/L	S15MW1D01	3/4	10	276	6260	N/A	NA	NO	BKG
000-08-9	TOTAL SUSPENDED SOLIDS	5	J	80	J	mg/L	S15MW1D01	3/4	5	80	236	N/A	NA	NO	BKG

A shaded value indicates that the concentration used for screening exceeds the criterion or background value.
A shaded chemical name indicates that the chemical has been selected as a COPC.

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 95% Upper Tolerance Limit (UTL) of site background data
5 Connecticut DEP Surface Water Protection criteria.
6 Connecticut DEP Volatilization criteria for residential exposures.
7 The chemical is selected as a COPC if the maximum detected concentration exceeds the CTDEP surface water protection or volatilization criteria.

Associated Samples:
S15MW1D01
S15MW1S01
S15MW2S01
S15MW2S01-D
S15MW3S01

Definitions:
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogen
COC = Chemical of Concern
J = Estimated Value
N = Noncarcinogen
NA = Not Applicable

Rationale Codes:
For Selection as a COPC:
ASL = Above COPC Screening Level/ARAR/TBC

For Elimination as a COPC:
BKG = Within Background Levels
BSL = Below COPC Screening Level/ARAR/TBC
NTX = No Toxicity Information

TABLE 3.1
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point:Spent Acid Storage Area (Site 15)

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency Exposure		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Trichloroethene	ug/L	5.51	13.8	16		ug/L	16	max	1	5.51	average	1
Cadmium	ug/L	1.11	2.82	3		ug/L	3.2	max	1	1.11	average	1
Chromium	ug/L	53.6	108	121		ug/L	121	max	1	53.6	average	1
Lead	ug/L	11.6	23.6	24.7		ug/L	11.6	average	2	11.6	average	2
Nickel	ug/L	29.0	67.5	78		ug/L	77.6	max	1	29.0	average	1
Silver	ug/L	303	773	615	J	ug/L	615	max	1	303	average	1

Notes:
[1] - The maximum detected and average concentration is used for the RME and CTE sceanrios, respectively per EPA Region I guidance.
[2] - IEUBK require the use of the average concentration as the exposure point concentration.

TABLE 4.1
VALUES USED FOR DAILY INTAKE CALCULATIONS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Spent Acid Storage Area (Site 15)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Dermal	DAevent	Absorbed dose per event	mg/cm2-event	See Text	See Text	See Text	See Text	Dermally Absorbed Dose (mg/kg/day)
	SA	Skin Surface Available for Contact	cm2	3800	EPA, 1992	3800	EPA, 1992	$= \frac{DAevent \times EV \times EF \times ED \times SA}{BW \times AT}$
	EV	Event Frequency	events/day	1	EPA, 1994	1	EPA, 1994	
	ET	Exposure Time	hours/event	4	(1)	2	(1)	
	EF	Exposure Frequency	days/year	20	Atlantic, 1992	10	Atlantic, 1992	
	ED	Exposure Duration	years	1	Atlantic, 1992	1	Atlantic, 1992	See text for calculation of DAevent.
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	365	EPA, 1989	365	EPA, 1989	

Notes:
(1) - Professinal judgement.
Sources:
EPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.
EPA, 1992: Dermal Exposure Assessment: Principles and Applications.
EPA, 1994: US EPA Region I Risk Updates, Number 2.
EPA, 1998: Risk Assessment Guidance for Superfund, Supplemental Guidance, Dermal Risk Assessment, Interim Guidance.
Atlantic 1992: Phase I Remedial Investigation Naval Submarine Base - New London, Connecticut, August.

TABLE 4.2
VALUES USED FOR DAILY INTAKE CALCULATIONS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Spent Acid Storage Area (Site 15)
Receptor Population: Adult Residents
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CGW	Chemical Concentration in Groundwater	mg/L	Maximum	EPA, 1994	Average	EPA, 1994	Chronic Daily Intake (CDI) (mg/kg/day) =
	IR-GW	Ingestion Rate of Groundwater	L/day	2	EPA, 1994	1.4	EPA, 1994	
	EF	Exposure Frequency	days/year	350	EPA, 1994	234	EPA, 1994	$\frac{CW \times IRGW \times EF \times ED}{BW \times AT}$
	ED	Exposure Duration	years	30	EPA, 1994	9	EPA, 1994	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	10,950	EPA, 1989	3,285	EPA, 1989	
Dermal	DAevent	Absorbed dose per event	mg/cm2-event	See Text	See Text	See Text	See Text	Dermally Absorbed Dose (mg/kg/day)
	SA	Skin Surface Available for Contact	cm2	20,000	EPA, 1992	20,000	EPA, 1992	
	EV	Event Frequency	events/day	1	EPA, 1994	1	EPA, 1994	$= \frac{DAevent \times EV \times EF \times ED \times SA}{BW \times AT}$
	ET	Exposure Time	hours/event	0.25	EPA, 1992	0.167	EPA, 1992	
	EF	Exposure Frequency	days/year	350	EPA, 1994	234	EPA, 1994	
	ED	Exposure Duration	years	30	EPA, 1994	9	EPA, 1994	See text for calculation of DAevent.
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	10,950	EPA, 1989	3,285	EPA, 1989	

Notes:
(1) - Professinal judgement.
Sources:
EPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.
EPA, 1992: Dermal Exposure Assessment: Principles and Applications.
EPA, 1994: US EPA Region I Risk Updates, Number 2.
EPA, 1998: Risk Assessment Guidance for Superfund, Supplemental Guidance, Dermal Risk Assessment, Interim Guidance.

TABLE 5.1
NON-CANCER TOXICITY DATA -- ORAL/DERMAL
NSB-NLON, GROTON, CONNECTICUT

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal RfD (2)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ (3) (MM/DD/YY)
Volatile Organic Compounds										
Trichloroethene	Chronic	6.0E-03	mg/kg/day	100%	6.0E-03	mg/kg/day	Liver	NA	EPA IX	11/1/00
	Subchronic	6.0E-03	mg/kg/day	100%	6.0E-03	mg/kg/day	Liver	NA	Chronic	11/1/00
Inorganics										
Cadmium	Chronic	5.0E-04	mg/kg/day	5%	2.5E-05	mg/kg/day	Kidney	10/1	IRIS	01/02/01
	Subchronic	5.0E-04	mg/kg/day	5%	2.5E-05	mg/kg/day	Kidney	10/1	Chronic	01/02/01
Chromium VI	Chronic	3.0E-03	mg/kg/day	2.5%	7.5E-05	mg/kg/day	None Specified	300/3	IRIS	01/02/01
	Subchronic	2.0E-02	mg/kg/day	2.5%	5.0E-04	mg/kg/day	None Specified	100	HEAST	7/97
Lead	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	Chronic	2.0E-02	mg/kg/day	4%	8.0E-04	mg/kg/day	Body Weigtht	300/1	IRIS	01/02/01
	Subchronic	2.0E-02	mg/kg/day	4%	8.0E-04	mg/kg/day	Body Weigtht	300	HEAST	7/97
Silver	Chronic	5.0E-03	mg/kg/day	4%	2.0E-04	mg/kg/day	Skin	3/1	IRIS	01/02/01
	Subchronic	5.0E-03	mg/kg/day	4%	2.0E-04	mg/kg/day	Skin	3	HEAST	7/97

Notes.
(1) - USEPA 2000.
(2) - RfDdermal = RfDoral x Oral to Dermal Adjustment Factor.
(3) For IRIS values date that IRIS was searched.
For HEAST values, the date of HEAST.
FOR EPA IX, date of PRG Table.
NA = Not Applicable.
IRIS = Integrated Risk Information System.
HEAST= Health Effects Assessment Summary Tables.
EPA IX = USEPA Region IX Preliminary Remediation Goals Table, November 1, 2000.
Chronic = No subchronic value available, chronic value is presented.

TABLE 6.1
CANCER TOXICITY DATA -- ORAL/DERMAL
NSB-NLON, GROTON, CONNECTICUT

Chemical of Potential Concern	Oral Cancer Slope Factor	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal Cancer Slope Factor (2)	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (3) (MM/DD/YY)
Volatile Organic Compounds							
Trichloroethene	1.1E-02	100%	1.1E-02	$(mg/kg\text{-}day)^{-1}$	NA	EPA IX	11/01/00
Inorganics							
Cadmium	NA	NA	NA	NA	B1	IRIS	01/02/01
Chromium VI	NA	NA	NA	NA	A	IRIS	01/02/01
Lead	NA	NA	NA	NA	B2	IRIS	01/02/01
Nickel	NA	NA	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	D	IRIS	01/02/01

Notes:

IRIS = Integrated Risk Information System

HEAST= Health Effects Assessment Summary Tables

(1) - USEPA 1998.

(2) - CSFdermal = CSForal/Oral to Dermal Adjustment Factor.

(3) - For IRIS values, the date IRIS was searched.
For HEAST values, the date of HEAST.

NA = Not Applicable

IRIS = Integrated Risk Information System

HEAST= Health Effects Assessment Summary Tables

EPA IX = USEPA Region IX Preliminary Remediation Goals Table, November 1, 2000.

EPA Group:

A - Human carcinogen

B1 - Probable human carcinogen - indicates that limited human data are available

B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans

C - Possible human carcinogen

D - Not classifiable as a human carcinogen

E - Evidence of noncarcinogenicity

TABLE 7.1
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Spent Acid Storage Area (Site 15)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Trichloroethene	16.0	ug/L	16.0	ug/L	M	2.9E-06	mg/kg/day	6.0E-03	mg/kg/day	N/A	N/A	4.8E-04
	Cadmium	3.20	ug/L	3.20	ug/L	M	3.8E-08	mg/kg/day	2.5E-05	mg/kg/day	N/A	N/A	1.5E-03
	Chromium	121	ug/L	121	ug/L	M	2.9E-06	mg/kg/day	7.5E-05	mg/kg/day	N/A	N/A	3.8E-02
	Lead	11.6	ug/L	11.6	ug/L	M	0.0E+00	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Nickel	77.6	ug/L	77.6	ug/L	M	0.0E+00	mg/kg/day	8.0E-04	mg/kg/day	N/A	N/A	- -
	Silver	615	ug/L	615	ug/L	M	0.0E+00	mg/kg/day	2.0E-04	mg/kg/day	N/A	N/A	- -
	(Total)												4.0E-02
												Total Hazard Index Across All Exposure Routes/Pathways	4.0E-02

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Subchronic.

TABLE 7.2
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Spent Acid Storage Area (Site 15)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Trichloroethene	5.51	ug/L	5.51	ug/L	M	1.4E-06	mg/kg/day	6.0E-03	mg/kg/day	N/A	N/A	2.4E-04
	Cadmium	1.11	ug/L	1.11	ug/L	M	1.9E-08	mg/kg/day	2.5E-05	mg/kg/day	N/A	N/A	7.6E-04
	Chromium	53.6	ug/L	53.6	ug/L	M	1.4E-06	mg/kg/day	7.5E-05	mg/kg/day	N/A	N/A	1.9E-02
	Lead	11.6	ug/L	11.6	ug/L	M	0.0E+00	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Nickel	29.0	ug/L	29.0	ug/L	M	0.0E+00	mg/kg/day	8.0E-04	mg/kg/day	N/A	N/A	- -
	Silver	303	ug/L	303	ug/L	M	0.0E+00	mg/kg/day	2.0E-04	mg/kg/day	N/A	N/A	- -
	(Total)												2.0E-02
												Total Hazard Index Across All Exposure Routes/Pathways	2.0E-02

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Subchronic.

TABLE 7.3
CALCULATION OF NON-CANGER HAZARDS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Spent Acid Storage Area (Site 15)
Receptor Population: Adult Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Trichloroethene	16.0	ug/L	16.0	ug/L	M	4.4E-04	mg/kg/day	0.006	mg/kg/day	N/A	N/A	7.3E-02
	Cadmium	3.20	ug/L	3.20	ug/L	M	8.8E-05	mg/kg/day	0.0005	mg/kg/day	N/A	N/A	1.8E-01
	Chromium	121	ug/L	121	ug/L	M	3.3E-03	mg/kg/day	0.003	mg/kg/day	N/A	N/A	1.1E+00
	Lead	11.6	ug/L	11.6	ug/L	M	3.2E-04	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Nickel	77.6	ug/L	77.6	ug/L	M	2.1E-03	mg/kg/day	0.02	mg/kg/day	N/A	N/A	1.1E-01
	Silver	615	ug/L	615	ug/L	M	1.7E-02	mg/kg/day	0.005	mg/kg/day	N/A	N/A	3.4E+00
													4.8E+00
Dermal	Trichloroethene	16.0	ug/L	16.0	ug/L	M	5.6E-05	mg/kg/day	6.0E-03	mg/kg/day	N/A	N/A	9.3E-03
	Cadmium	3.20	ug/L	3.20	ug/L	M	2.2E-07	mg/kg/day	2.5E-05	mg/kg/day	N/A	N/A	8.8E-03
	Chromium	121	ug/L	121	ug/L	M	1.7E-05	mg/kg/day	7.5E-05	mg/kg/day	N/A	N/A	2.2E-01
	Lead	11.6	ug/L	11.6	ug/L	M	0.0E+00	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Nickel	77.6	ug/L	77.6	ug/L	M	0.0E+00	mg/kg/day	8.0E-04	mg/kg/day	N/A	N/A	- -
	Silver	615	ug/L	615	ug/L	M	0.0E+00	mg/kg/day	2.0E-04	mg/kg/day	N/A	N/A	- -
	(Total)												2.4E-01
												Total Hazard Index Across All Exposure Routes/Pathways	5.1E+00

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Subchronic.

TABLE 7.4
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Spent Acid Storage Area (Site 15)
Receptor Population: Adult Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Trichloroethene	5.51	ug/L	5.51	ug/L	M	7.1E-05	mg/kg/day	0.006	mg/kg/day	N/A	N/A	1.2E-02
	Cadmium	1.11	ug/L	1.11	ug/L	M	1.4E-05	mg/kg/day	0.0005	mg/kg/day	N/A	N/A	2.8E-02
	Chromium	53.6	ug/L	53.6	ug/L	M	6.9E-04	mg/kg/day	0.003	mg/kg/day	N/A	N/A	2.3E-01
	Lead	11.6	ug/L	11.6	ug/L	M	1.5E-04	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Nickel	29.0	ug/L	29.0	ug/L	M	3.7E-04	mg/kg/day	0.02	mg/kg/day	N/A	N/A	1.9E-02
	Silver	303	ug/L	303	ug/L	M	3.9E-03	mg/kg/day	0.005	mg/kg/day	N/A	N/A	7.8E-01
													1.1E+00
Dermal	Trichloroethene	5.51	ug/L	5.51	ug/L	M	3.7E-05	mg/kg/day	6.0E-03	mg/kg/day	N/A	N/A	6.2E-03
	Cadmium	1.11	ug/L	1.11	ug/L	M	1.5E-07	mg/kg/day	2.5E-05	mg/kg/day	N/A	N/A	5.9E-03
	Chromium	53.6	ug/L	53.6	ug/L	M	1.1E-05	mg/kg/day	7.5E-05	mg/kg/day	N/A	N/A	1.5E-01
	Lead	11.6	ug/L	11.6	ug/L	M	0.0E+00	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Nickel	29.0	ug/L	29.0	ug/L	M	0.0E+00	mg/kg/day	8.0E-04	mg/kg/day	N/A	N/A	- -
	Silver	303	ug/L	303	ug/L	M	0.0E+00	mg/kg/day	2.0E-04	mg/kg/day	N/A	N/A	- -
	(Total)												1.6E-01
												Total Hazard Index Across All Exposure Routes/Pathways	1.2E+00

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Subchronic.

TABLE 8.1
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Spent Acid Storage Area (Site 15)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Trichloroethene	16.0	ug/L	16:0	ug/L	M	4.1E-08	mg/kg/day	1.1E-02	(mg/kg/day) -1	4.6E-10
	Cadmium	3.20	ug/L	3.20	ug/L	M	5.4E-10	mg/kg/day	NA	(mg/kg/day) -1	- -
	Chromium	121	ug/L	121	ug/L	M	4.1E-08	mg/kg/day	NA	(mg/kg/day) -1	- -
	Lead	11.6	ug/L	11.6	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Nickel	77.6	ug/L	77.6	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Silver	615	ug/L	615	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										4.6E-10
										Total Risk Across All Exposure Routes/Pathways	4.6E-10

(1) Medium-Specific (M) EPC selected for risk calculation.

TABLE 8.2
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Spent Acid Storage Area (Site 15)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Trichloroethene	5.51	ug/L	5.51	ug/L	M	4.4E-09	mg/kg/day	1.1E-02	(mg/kg/day) -1	4.9E-11
	Cadmium	1.11	ug/L	1.11	ug/L	M	4.7E-11	mg/kg/day	NA	(mg/kg/day) -1	- -
	Chromium	53.6	ug/L	53.6	ug/L	M	4.6E-09	mg/kg/day	NA	(mg/kg/day) -1	- -
	Lead	11.6	ug/L	11.6	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Nickel	29.0	ug/L	29.0	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Silver	303	ug/L	303	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										4.9E-11
										Total Risk Across All Exposure Routes/Pathways	4.9E-11

(1) Medium-Specific (M) EPC selected for risk calculation.

TABLE 8.3
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Spent Acid Storage Area (Site 15)
Receptor Population: Adult Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Trichloroethene	16.0	ug/L	16.0	ug/L	M	1.9E-04	mg/kg/day	0.011	(mg/kg/day) -1	2.1E-06
	Cadmium	3.20	ug/L	3.20	ug/L	M	3.8E-05	mg/kg/day	NA	(mg/kg/day) -1	- -
	Chromium	121	ug/L	121	ug/L	M	1.4E-03	mg/kg/day	NA	(mg/kg/day) -1	- -
	Lead	11.6	ug/L	11.6	ug/L	M	1.4E-04	mg/kg/day	NA	(mg/kg/day) -1	- -
	Nickel	77.6	ug/L	77.6	ug/L	M	9.1E-04	mg/kg/day	NA	(mg/kg/day) -1	- -
	Silver	615	ug/L	615	ug/L	M	7.2E-03	mg/kg/day	NA	(mg/kg/day) -1	- -
											2.1E-06
Dermal	Trichloroethene	16.0	ug/L	16.0	ug/L	M	2.4E-05	mg/kg/day	1.1E-02	(mg/kg/day) -1	2.6E-07
	Cadmium	3.20	ug/L	3.20	ug/L	M	9.4E-08	mg/kg/day	NA	(mg/kg/day) -1	- -
	Chromium	121	ug/L	121	ug/L	M	7.1E-06	mg/kg/day	NA	(mg/kg/day) -1	- -
	Lead	11.6	ug/L	11.6	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Nickel	77.6	ug/L	77.6	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Silver	615	ug/L	615	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										2.6E-07
										Total Risk Across All Exposure Routes/Pathways	2.3E-06

(1) Medium-Specific (M) EPC selected for risk calculation.

TABLE 8.4
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Spent Acid Storage Area (Site 15)
Receptor Population: Adult Residents
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Trichloroethene	5.51	ug/L	5.51	ug/L	M	9.1E-06	mg/kg/day	0.011	(mg/kg/day) -1	1.0E-07
	Cadmium	1.11	ug/L	1.11	ug/L	M	1.8E-06	mg/kg/day	NA	(mg/kg/day) -1	- -
	Chromium	53.6	ug/L	53.6	ug/L	M	8.8E-05	mg/kg/day	NA	(mg/kg/day) -1	- -
	Lead	11.6	ug/L	11.6	ug/L	M	1.9E-05	mg/kg/day	NA	(mg/kg/day) -1	- -
	Nickel	29.0	ug/L	29.0	ug/L	M	4.8E-05	mg/kg/day	NA	(mg/kg/day) -1	- -
	Silver	303	ug/L	303	ug/L	M	5.0E-04	mg/kg/day	NA	(mg/kg/day) -1	- -
											1.0E-07
Dermal	Trichloroethene	5.51	ug/L	5.51	ug/L	M	1.3E-06	mg/kg/day	1.1E-02	(mg/kg/day) -1	1.5E-08
	Cadmium	1.11	ug/L	1.11	ug/L	M	4.4E-09	mg/kg/day	NA	(mg/kg/day) -1	- -
	Chromium	53.6	ug/L	53.6	ug/L	M	4.2E-07	mg/kg/day	NA	(mg/kg/day) -1	- -
	Lead	11.6	ug/L	11.6	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Nickel	29.0	ug/L	29.0	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Silver	303	ug/L	303	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										1.5E-08
										Total Risk Across All Exposure Routes/Pathways	1.1E-07

(1) Medium-Specific (M) EPC selected for risk calculation.

TABLE 9.1
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Spent Acid Storage Area (Site 15)	Trichloroethene	- -	- -	4.6E-10	4.6E-10	Trichloroethene	Liver	- -	- -	4.8E-04	4.8E-04
			Cadmium	- -	- -	- -	- -	Cadmium	Kidney	- -	- -	1.5E-03	1.5E-03
			Chromium	- -	- -	- -	- -	Chromium	None Specified	- -	- -	3.8E-02	3.8E-02
			Lead	- -	- -	- -	- -	Lead	NA	- -	- -	- -	- -
			Nickel	- -	- -	- -	- -	Nickel	Body Weigtht	- -	- -	- -	- -
			Silver	- -	- -	- -	- -	Silver	Skin	- -	- -	- -	- -
			(Total)	- -	- -	4.6E-10	4.6E-10	(Total)		- -	- -	4.0E-02	4.0E-02
			Total Risk Across Groundwater				4.6E-10	Total Hazard Index Across All Media and All Exposure Routes					4.0E-02
			Total Risk Across All Media and All Exposure Routes				4.6E-10						

Total Skin HI	- -
Total Liver HI	4.8E-04
Total Kidney HI	1.5E-03
Total Body Weight HI	- -

TABLE 9.2
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Spent Acid Storage Area (Site 15)	Trichloroethene	- -	- -	4.9E-11	4.9E-11	Trichloroethene	Liver	- -	- -	2.4E-04	2.4E-04
			Cadmium	- -	- -	- -	- -	Cadmium	Kidney	- -	- -	7.6E-04	7.6E-04
			Chromium	- -	- -	- -	- -	Chromium	None Specified	- -	- -	1.9E-02	1.9E-02
			Lead	- -	- -	- -	- -	Lead	NA	- -	- -	- -	- -
			Nickel	- -	- -	- -	- -	Nickel	Body Weigtht	- -	- -	- -	- -
			Silver	- -	- -	- -	- -	Silver	Skin	- -	- -	- -	- -
			(Total)	- -	- -	4.9E-11	4.9E-11	(Total)		- -	- -	2.0E-02	2.0E-02
			Total Risk Across Groundwater				4.9E-11	Total Hazard Index Across All Media and All Exposure Routes					2.0E-02
			Total Risk Across All Media and All Exposure Routes				4.9E-11						

Total Skin HI	- -
Total Liver HI	2.4E-04
Total Kidney HI	7.6E-04
Total Body Weight HI	- -

TABLE 9.3
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Adult Residents
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Spent Acid Storage Area (Site 15)	Trichloroethene	2.1E-06	2.1E-06	2.6E-07	4.4E-06	Trichloroethene	Liver	7.3E-02	7.3E-02	9.3E-03	1.6E-01
			Cadmium	- -	- -	- -	- -	Cadmium	Kidney	1.8E-01	- -	8.8E-03	1.8E-01
			Chromium	- -	- -	- -	- -	Chromium	None Specified	1.1E+00	- -	2.2E-01	1.3E+00
			Lead	- -	- -	- -	- -	Lead	NA	- -	- -	- -	- -
			Nickel	- -	- -	- -	- -	Nickel	Body Weigtht	1.1E-01	- -	- -	1.1E-01
			Silver	- -	- -	- -	- -	Silver	Skin	3.4E+00	- -	- -	3.4E+00
			(Total)	2.1E-06	2.1E-06	2.6E-07	4.4E-06	(Total)		4.8E+00	7.3E-02	2.4E-01	5.1E+00
			Total Risk Across Groundwater				4.4E-06	Total Hazard Index Across All Media and All Exposure Routes					5.1E+00
			Total Risk Across All Media and All Exposure Routes				4.4E-06						

Total Skin HI	3.4E+00
Total Liver HI	1.6E-01
Total Kidney HI	1.8E-01
Total Body Weight HI	1.1E-01

Notes:
(1) - Inhalation risk is assumed to be equal to risk from ingestion for volatiles.

TABLE 9.4
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Adult Residents
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Spent Acid Storage Area (Site 15)	Trichloroethene	1.0E-07	1.0E-07	1.5E-08	2.1E-07	Trichloroethene	Liver	1.2E-02	1.2E-02	6.2E-03	3.0E-02
			Cadmium	- -	- -	- -	- -	Cadmium	Kidney	2.8E-02	- -	5.9E-03	3.4E-02
			Chromium	- -	- -	- -	- -	Chromium	None Specified	2.3E-01	- -	1.5E-01	3.8E-01
			Lead	- -	- -	- -	- -	Lead	NA	- -	- -	- -	- -
			Nickel	- -	- -	- -	- -	Nickel	Body Weigtht	1.9E-02	- -	- -	1.9E-02
			Silver	- -	- -	- -	- -	Silver	Skin	7.8E-01	- -	- -	7.8E-01
			(Total)	1.0E-07	1.0E-07	1.5E-08	2.1E-07	(Total)		1.1E+00	1.2E-02	1.6E-01	1.2E+00
						Total Risk Across Groundwater	2.1E-07					Total Hazard Index Across All Media and All Exposure Routes	1.2E+00
						Total Risk Across All Media and All Exposure Routes	2.1E-07						

Notes:
(1) - Inhalation risk is assumed to be equal to risk from ingestion for volatiles.

Total Skin HI	7.8E-01
Total Liver HI	3.0E-02
Total Kidney HI	3.4E-02
Total Body Weight HI	1.9E-02

TABLE 10.1
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Spent Acid Storage Area (Site 15)	Trichloroethene	- -	- -	4.6E-10	4.6E-10	Trichloroethene	Liver	- -	- -	4.8E-04	4.8E-04
			Cadmium	- -	- -	- -	- -	Cadmium	Kidney	- -	- -	1.5E-03	1.5E-03
			Chromium	- -	- -	- -	- -	Chromium	None Specified	- -	- -	3.8E-02	3.8E-02
			Lead	- -	- -	- -	- -	Lead	NA	- -	- -	- -	- -
			Nickel	- -	- -	- -	- -	Nickel	Body Weigtht	- -	- -	- -	- -
			Silver	- -	- -	- -	- -	Silver	Skin	- -	- -	- -	- -
			(Total)	- -	- -	4.6E-10	4.6E-10	(Total)		- -	- -	4.0E-02	4.0E-02
			Total Risk Across Groundwater				4.6E-10		Total Hazard Index Across All Media and All Exposure Routes				4.0E-02
			Total Risk Across All Media and All Exposure Routes				4.6E-10						

Total Skin HI	- -
Total Liver HI	4.8E-04
Total Kidney HI	1.5E-03
Total Body Weight HI	- -

TABLE 10.2
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Spent Acid Storage Area (Site 15)	Trichloroethene	- -	- -	4.9E-11	4.9E-11	Trichloroethene	Liver	- -	- -	2.4E-04	2.4E-04
			Cadmium	- -	- -	- -	- -	Cadmium	Kidney	- -	- -	7.6E-04	7.6E-04
			Chromium	- -	- -	- -	- -	Chromium	None Specified	- -	- -	1.9E-02	1.9E-02
			Lead	- -	- -	- -	- -	Lead	NA	- -	- -	- -	- -
			Nickel	- -	- -	- -	- -	Nickel	Body Weigtht	- -	- -	- -	- -
			Silver	- -	- -	- -	- -	Silver	Skin	- -	- -	- -	- -
			(Total)	- -	- -	4.9E-11	4.9E-11	(Total)		- -	- -	2.0E-02	2.0E-02
			Total Risk Across Groundwater				4.9E-11	Total Hazard Index Across All Media and All Exposure Routes					2.0E-02
			Total Risk Across All Media and All Exposure Routes				4.9E-11						

Total Skin HI	- -
Total Liver HI	2.4E-04
Total Kidney HI	7.6E-04
Total Body Weight HI	- -

TABLE 10.3
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Adult Residents
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Spent Acid Storage Area (Site 15)	Trichloroethene	2.1E-06	2.1E-06	2.6E-07	4.4E-06	Trichloroethene	Liver	7.3E-02	7.3E-02	9.3E-03	1.6E-01
			Chromium	--	--	--	--	Chromium	None Specified	1.1E+00	--	2.2E-01	1.3E+00
			Silver	--	--	--	--	Silver	Skin	3.4E+00	--	--	3.4E+00
			(Total)	2.1E-06	2.1E-06	2.6E-07	4.4E-06	(Total)		4.5E+00	7.3E-02	2.3E-01	4.9E+00
			Total Risk Across Groundwater				4.4E-06	Total Hazard Index Across All Media and All Exposure Routes					4.9E+00
			Total Risk Across All Media and All Exposure Routes				4.4E-06						

Total Skin HI	3.4E+00
Total Liver HI	1.6E-01
Total None Specified HI	1.3E+00

Notes:
(1) - Inhalation risk is assumed to be equal to risk from ingestion for volatiles.

TABLE 10.4
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Adult Residents
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Spent Acid Storage Area (Site 15)	Trichloroethene	1.0E-07	1.0E-07	1.5E-08	2.1E-07	Trichloroethene	Liver	1.2E-02	1.2E-02	6.2E-03	3.0E-02
			Cadmium	- -	- -	- -	- -	Cadmium	Kidney	2.8E-02	- -	5.9E-03	3.4E-02
			Chromium	- -	- -	- -	- -	Chromium	None Specified	2.3E-01	- -	1.5E-01	3.8E-01
			Lead	- -	- -	- -	- -	Lead	NA	- -	- -	- -	- -
			Nickel	- -	- -	- -	- -	Nickel	Body Weigtht	1.9E-02	- -	- -	1.9E-02
			Silver	- -	- -	- -	- -	Silver	Skin	7.8E-01	- -	- -	7.8E-01
			(Total)	1.0E-07	1.0E-07	1.5E-08	2.1E-07	(Total)		1.1E+00	1.2E-02	1.6E-01	1.2E+00
						Total Risk Across Groundwater	2.1E-07					Total Hazard Index Across All Media and All Exposure Routes	1.2E+00
						Total Risk Across All Media and All Exposure Routes	2.1E-07						

Notes:
(1) - Inhalation risk is assumed to be equal to risk from ingestion for volatiles.

Total Skin HI	7.8E-01
Total Liver HI	3.0E-02
Total Kidney HI	3.4E-02
Total Body Weight HI	1.9E-02

HOSPITAL INCINERATORS (SITE 16)

TABLE 1
SELECTION OF EXPOSURE PATHWAYS
HOSPITAL INCINERATORS (SITE 16)
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current/Future	Surface Soil	Surface Soil	Surface Soil	Construction Workers	Adult	Ingestion Dermal	On-Site On-Site	Quant Quant	Construction workers may have contact with surface soil during excavation activities.
				Full-time Employees	Adult	Ingestion Dermal	On-Site On-Site	Quant Quant	Full-time employees may contact surface soil during normal work activities.
				Trespassers	Adolescents	Ingestion Dermal	On-Site On-Site	Quant Quant	Trespassers may be exposed to surface soil while at the site.
		Air	Surface Soil	Construction Workers	Adult	Inhalation	On-site	None	No COCs were identified in surface soil for the inhalation pathway.
				Full-time Employees	Adult	Inhalation	On-site	None	No COCs were identified in surface soil for the inhalation pathway.
				Trespassers	Adolescents	Inhalation	On-Site	None	No COCs were identified in surface soil for the inhalation pathway.
	Subsurface Soil	Subsurface Soil	Subsurface Soil	Construction Workers	Adult	Ingestion Dermal	On-Site On-Site	Quant Quant	Construction workers may have contact with subsurface soil during excavation activities.
				Full-time Employees	Adult	Ingestion Dermal	On-Site On-Site	None None	Full-time employees are not exposed to subsurface soil.
				Trespassers	Adolescents	Ingestion Dermal	On-Site On-Site	None None	Trespassers are not exposed to subsurface soil.
		Air	Subsurface Soil	Construction Workers	Adult	Inhalation	On-site	Quant	Construction workers may be exposed to fugitive dust and volatile emissions during construction activities.
				Full-time Employees	Adult	Inhalation	On-site	None	Full-time employees are not exposed to subsurface soil.
				Trespassers	Adolescents	Inhalation	On-Site	None	Trespassers are not exposed to subsurface soil.
Future	Surface Soil	Surface Soil	Surface Soil	Residents	Child	Ingestion Dermal	On-Site On-Site	Quant Quant	Child residents may contact surface soil.
					Adult	Ingestion Dermal	On-Site On-Site	Quant Quant	Adult residents may contact surface soil.
		Air	Surface Soil	Residents	Child	Inhalation	On-site	Quant	Child residents may be exposed to fugitive dust and volatile emissions from surface soil.
					Adult	Inhalation	On-site	Quant	Adult residents may be exposed to fugitive dust and volatile emissions from surface soil.
		Subsurface Soil	Subsurface Soil	Residents	Child	Ingestion Dermal	On-Site On-Site	Quant Quant	Child residents may contact subsurface soil that has been brought to the surface.
					Adult	Ingestion Dermal	On-Site On-Site	Quant Quant	Adult residents may contact subsurface soil that has been brought to the surface.
		Air	Subsurface Soil	Residents	Child	Inhalation	On-site	Quant	Child residents may be exposed to fugitive dust and volatile emissions from subsurface soil that has been brought to the surface.
					Adult	Inhalation	On-site	Quant	Adult residents may be exposed to fugitive dust and volatile emissions from subsurface soil that has been brought to the surface.

TABLE 2.1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SURFACE SOIL
DIRECT CONTACT EXPOSURE SCENARIOS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Hospital Incinerator (Site 16)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Risk-Based COC Screening Level(5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COC Flag	Rationale for Contaminant Deletion or Selection(6)
Dioxins/Furans																
35822-46-9	1,2,3,4,6,7,8-HPCDD	0.000007		0.00012		mg/kg	S16SB070001	5/7	0.0000019 - 0.0000031	1.2E-04	NA	3.9E-04 C	NA	SSL-INH CTRESSOIL	NO	BSL
67562-39-4	1,2,3,4,6,7,8-HPCDF	0.00000041		0.0000054		mg/kg	S16SS01	5/7	0.00000021 - 0.00000033	5.4E-06	NA	3.9E-04 C	NA	SSL-INH CTRESSOIL	NO	BSL
57117-41-6	1,2,3,7,8-PECDF	0.00000021		0.00000021		mg/kg	S16SB050001	1/7	0.00000011 - 0.00000037	2.1E-07	NA	7.8E-05 C	NA	SSL-INH CTRESSOIL	NO	BSL
57117-31-4	2,3,4,7,8-PECDF	0.00000036		0.00000036		mg/kg	S16SB050001	1/7	0.00000011 - 0.00000038	3.6E-07	NA	7.8E-06 C	NA	SSL-INH CTRESSOIL	NO	BSL
51207-31-9	2,3,7,8-TCDF	0.0000018		0.0000018		mg/kg	S16SB050001	1/7	0.00000013 - 0.00000058	1.8E-06	NA	3.9E-05 C	NA	SSL-INH CTRESSOIL	NO	BSL
3268-87-9	OCDD	0.00011		0.029		mg/kg	S16SB070001	7/7	---	2.9E-02	NA	3.9E-02 C	NA	SSL-INH CTRESSOIL	NO	BSL
39001-02-0	OCDF	0.0000029		0.000012	J	mg/kg	S16SS01	3/7	0.00000013 - 0.0000003	1.2E-05	NA	3.9E-02 C	NA	SSL-INH CTRESSOIL	NO	BSL
37871-00-4	TOTAL HPCDD	0.00002		0.00022		mg/kg	S16SB070001	5/7	0.0000019 - 0.0000031	2.2E-04	NA	NA	NA	SSL-INH CTRESSOIL	NO	NTX
38998-75-3	TOTAL HPCDF	0.00000041		0.0000054		mg/kg	S16SS01	5/7	0.00000021 - 0.00000033	5.4E-06	NA	NA	NA	SSL-INH CTRESSOIL	NO	NTX
55684-94-1	TOTAL HXCDF	0.0000021		0.0000031		mg/kg	S16SB010001	2/7	0.0000001 - 0.0000011	3.1E-06	NA	NA	NA	SSL-INH CTRESSOIL	NO	NTX
30402-15-4	TOTAL PECDF	0.0000023		0.000004		mg/kg	S16SB050001	2/7	0.00000011 - 0.0000002	4.0E-06	NA	NA	NA	SSL-INH CTRESSOIL	NO	NTX
41903-57-5	TOTAL TCDD	0.00000054	J	0.00000054	J	mg/kg	S16SB030001	1/7	0.00000016 - 0.00000065	5.4E-07	NA	NA	NA	SSL-INH CTRESSOIL	NO	NTX
55722-27-5	TOTAL TCDF	0.0000009		0.0000022		mg/kg	S16SB050001	2/7	0.00000013 - 0.00000058	2.2E-06	NA	NA	NA	SSL-INH CTRESSOIL	NO	NTX
Volatile Organics																
78-93-3	2-BUTANONE	0.003	J	0.005	J	mg/kg	S16SB030001	5/7	0.01 - 0.012	0.005	NA	730 N	NA 500	SSL-INH CTRESSOIL	NO	BSL
67-64-1	ACETONE	0.037		0.18	J	mg/kg	S16SS01	2/7	0.01 - 0.067	0.18	NA	160 N	100000 500	SSL-INH CTRESSOIL	NO	BSL
108-88-3	TOLUENE	0.001	J	0.003	J	mg/kg	S16SB030001	4/7	0.005 - 0.006	0.003	NA	52 N	650 500	SSL-INH CTRESSOIL	NO	BSL
Semivolatile Organics																
208-96-8	ACENAPHTHYLENE	0.044	J	0.099	J	mg/kg	S16SB050001	2/7	0.17 - 0.2	0.099	NA	370 (7) N	NA 1000	SSL-INH CTRESSOIL	NO	BSL
120-12-7	ANTHRACENE	0.025	J	0.025	J	mg/kg	S16SS01	1/7	0.17 - 0.85	0.025	NA	2200 N	NA 1000	SSL-INH CTRESSOIL	NO	BSL
56-55-3	BENZO(A)ANTHRACENE	0.022	J	0.41	J	mg/kg	S16SB050001	5/7	0.19 - 0.2	0.41	NA	0.62 C	NA 1	SSL-INH CTRESSOIL	NO	BSL
50-32-8	BENZO(A)PYRENE	0.02	J	0.33	J	mg/kg	S16SB050001	5/7	0.19 - 0.2	0.33	NA	0.062 C	NA 1	SSL-INH CTRESSOIL	YES	ASL
205-99-2	BENZO(B)FLUORANTHENE	0.05	J	0.26	J	mg/kg	S16SB050001	4/7	0.17 - 0.2	0.26	NA	0.62 C	NA 1	SSL-INH CTRESSOIL	NO	BSL
191-24-2	BENZO(G,H,I)PERYLENE	0.024	J	0.36	J	mg/kg	S16SB050001	5/7	0.19 - 0.2	0.36	NA	230 (8) N	NA 1000	SSL-INH CTRESSOIL	NO	BSL
207-08-9	BENZO(K)FLUORANTHENE	0.039	J	0.28	J	mg/kg	S16SB050001	4/7	0.17 - 0.2	0.28	NA	6.2 C	NA 8.4	SSL-INH CTRESSOIL	NO	BSL

TABLE 2.1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SURFACE SOIL
DIRECT CONTACT EXPOSURE SCENARIOS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Hospital Incinerator (Site 16)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Risk-Based COC Screening Level(5)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COC Flag	Rationale for Contaminant Deletion or Selection(6)
65-85-0	BENZOIC ACID	0.18	J	0.18	J	mg/kg	S16SS01	1/1	---	0.18	NA	10000	N	NA 1000	SSL-INH CTRESSOIL	NO	BSL
85-68-7	BUTYL BENZYL PHTHALATE	0.02	J	0.02	J	mg/kg	S16SB060001	1/7	0.17 - 0.85	0.02	NA	1200	N	930 1000	SSL-INH CTRESSOIL	NO	BSL
218-01-9	CHRYSENE	0.026	J	0.52	J	mg/kg	S16SB050001	5/7	0.19 - 0.2	0.52	NA	62	C	NA 84	SSL-INH CTRESSOIL	NO	BSL
53-70-3	DIBENZO(A,H)ANTHRACENE	0.049	J	0.049	J	mg/kg	S16SS01	1/7	0.17 - 0.85	0.049	NA	0.062	C	NA 1	SSL-INH CTRESSOIL	NO	BSL
206-44-0	FLUORANTHENE	0.041	J	0.63	J	mg/kg	S16SB050001	5/7	0.19 - 0.2	0.63	NA	230	N	NA 1000	SSL-INH CTRESSOIL	NO	BSL
193-39-5	INDENO(1,2,3-CD)PYRENE	0.02	J	0.28	J	mg/kg	S16SB050001	5/7	0.19 - 0.2	0.28	NA	0.62	C	NA 1	SSL-INH CTRESSOIL	NO	BSL
85-01-8	PHENANTHRENE	0.035	J	0.23	J	mg/kg	S16SB050001	5/7	0.19 - 0.2	0.23	NA	230 (8)	N	NA 1000	SSL-INH CTRESSOIL	NO	BSL
129-00-0	PYRENE	0.047	J	0.72	J	mg/kg	S16SB050001	5/7	0.19 - 0.2	0.72	NA	230	N	NA 1000	SSL-INH CTRESSOIL	NO	BSL
Pesticides/PCBs																	
72-54-8	4,4'-DDD	0.0024		0.0024		mg/kg	S16SB070001	1/7	0.00076 - 0.0016	0.0024	NA	2.4	C	NA 2.6	SSL-INH CTRESSOIL	NO	BSL
72-55-9	4,4'-DDE	0.0022	J	0.0047	J	mg/kg	S16SB070001	2/7	0.0014 - 0.0016	0.0047	NA	1.7	C	NA 1.8	SSL-INH CTRESSOIL	NO	BSL
50-29-3	4,4'-DDT	0.0015	J	0.0041		mg/kg	S16SB070001	3/6	0.0014 - 0.0016	0.0041	NA	1.7	C	NA 1.8	SSL-INH CTRESSOIL	NO	BSL
5103-71-9	ALPHA-CHLORDANE	0.00051	J	0.00051	J	mg/kg	S16SB070001	1/7	0.00039 - 0.00085	0.00051	NA	1.6	C	20 0.49	SSL-INH CTRESSOIL	NO	BSL
12672-29-6	AROCLOR-1248	0.006	J	0.006	J	mg/kg	S16SB070001	1/7	0.007 - 0.0083	0.006	NA	0.22	C	NA 1	SSL-INH CTRESSOIL	NO	BSL
12789-03-6	GAMMA-CHLORDANE	0.0042		0.0042		mg/kg	S16SB070001	1/7	0.00039 - 0.00085	0.0042	NA	1.6	C	20 0.49	SSL-INH CTRESSOIL	NO	BSL
Inorganics																	
7429-90-5	ALUMINUM	4400		21000		mg/kg	S16SB070001	7/7	---	21000	17600	7600	N	NA NA	SSL-INH CTRESSOIL	NO	EPAI
7440-36-0	ANTIMONY	0.71	J	0.71	J	mg/kg	S16SB070001	1/7	0.48 - 1	0.71	2.05	3.1	N	NA 27	SSL-INH CTRESSOIL	NO	BSL
7440-38-2	ARSENIC	1.7		8.5		mg/kg	S16SS01	7/7	---	8.5	3.6	0.39	C	750 10	SSL-INH CTRESSOIL	YES	ASL
7440-39-3	BARIUM	27		47		mg/kg	S16SS01	7/7	---	47	39	540	N	690000 4700	SSL-INH CTRESSOIL	NO	BSL
7440-41-7	BERYLLIUM	0.23	J	0.27		mg/kg	S16SB050001	2/7	0.35 - 0.74	0.27	0.72	15	N	1300 2	SSL-INH CTRESSOIL	NO	BSL,BKG
7440-70-2	CALCIUM	560	J	47000	J	mg/kg	S16SB060001	7/7	---	47000	314	NA		NA NA	SSL-INH CTRESSOIL	NO	NUT
7440-47-3	CHROMIUM	4.9		23		mg/kg	S16SB080001	5/7	8.9 - 9.7	23	19.3	30 (9)	C	270 100	SSL-INH CTRESSOIL	NO	BSL
7440-48-4	COBALT	4.9		7.8		mg/kg	S16SS01	3/7	4.6 - 9.1	7.8	7	470	N	NA NA	SSL-INH CTRESSOIL	NO	BSL

TABLE 2.1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SURFACE SOIL
DIRECT CONTACT EXPOSURE SCENARIOS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Hospital Incinerator (Site 16)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Risk-Based COC Screening Level(5)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COC Flag	Rationale for Contaminant Deletion or Selection(6)
7440-50-8	COPPER	7.3		200		mg/kg	S16SS01	7/7	---	200	17.9	290	N	NA 2500	SSL-INH CTRESSOIL	NO	BSL
7439-89-6	IRON	5600	J	18000	J	mg/kg	S16SB070001	7/7	---	18000	16800	2300	N	NA NA	SSL-INH CTRESSOIL	NO	EPAI
7439-92-1	LEAD	3.5		35		mg/kg	S16SB050001	7/7	---	35	17.5	400 (10)	N	NA 500	SSL-INH CTRESSOIL	NO	BSL
7439-95-4	MAGNESIUM	1500		3900		mg/kg	S16SB080001	7/7	---	3900	2460	NA		NA NA	SSL-INH CTRESSOIL	NO	NUT
7439-96-5	MANGANESE	100	J	400		mg/kg	S16SS01	7/7	---	400	172	180	N	NA NA	SSL-INH CTRESSOIL	YES	ASL
7440-02-0	NICKEL	6.2		38		mg/kg	S16SS01	3/7	5.1 - 13	38	5	160	N	13000 1400	SSL-INH CTRESSOIL	NO	BSL
7440-09-7	POTASSIUM	670		1700		mg/kg	S16SS01	7/7	---	1700	669	NA		NA NA	SSL-INH CTRESSOIL	NO	NUT
7440-22-4	SILVER	1.3	J	4.9		mg/kg	S16SB070001, S16SS01	7/7	---	4.9	0.385	39	N	NA 340	SSL-INH CTRESSOIL	NO	BSL
7440-23-5	SODIUM	210		210		mg/kg	S16SB060001	1/7	41 - 180	210	16.56	NA		NA NA	SSL-INH CTRESSOIL	NO	NUT
7440-28-0	THALLIUM	0.49	J	1.2	J	mg/kg	S16SS01	6/7	0.44	1.2	0.105	0.52	N	NA 5.4	SSL-INH CTRESSOIL	YES	ASL
7440-62-2	VANADIUM	11		40		mg/kg	S16SB070001	6/7	24	40	33.3	55	N	NA 470	SSL-INH CTRESSOIL	NO	BSL
7440-66-6	ZINC	24		1300		mg/kg	S16SS01	7/7	---	1300	25.6	2300	N	NA 20000	SSL-INH CTRESSOIL	NO	BSL

A shaded value indicates that the concentration used for screening exceeds the criterion or background value.
A shaded chemical name indicates that the chemical has been selected as a COC.

Footnotes

1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 Atlantic Environmental Services, April 1995. Background concentrations of Inorganics in Soil - Naval Submarine Base - New London. If the maximum detected concentration of an inorganic is less than the background concentration, then that metal is not selected as a COC.
5 The risk-based COC screening level for residential land use is presented. The value is based on a target hazard quotient of 0.1 for noncarcinogens (denoted with a "N" flag) or an incremental cancer risk of 1E-6 for carcinogens (denoted with a "C" flag) (USEPA, Region IX, October 1999).
6 The chemical is selected as a COC if the maximum detected concentration exceeds the risk-based COC screening level and/or an ARAR/TBC(s).
7 Acenaphthene is used as a surrogate for acenaphthylene.

Definitions

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogen
COC = Chemical of Concern
J = Estimated Value
N = Noncarcinogen
NA = Not Applicable
SSL-INH = Soil Screening Level for transfers from soil to air (Inhalation) (USEPA, May 1996)
CTRESSOIL - CTDEP direct contact criteria for residential exposures to soil.

Rationale Codes

For Selection as a COC:
ASL = Above COC Screening Level/ARAR/TBC

TABLE 2.1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - SURFACE SOIL
DIRECT CONTACT EXPOSURE SCENARIOS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Hospital Incinerator (Site 16)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Risk-Based COC Screening Level(5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COC Flag	Rationale for Contaminant Deletion or Selection(6)

8 Pyrene is used as a surrogate for benzo(g,h,i)perylene and phenanthrene.
9 Hexavalent Chromium.
10 OSWER soil screening level for residential land use (USEPA, July 1994).

For Elimination as a COC:
BKG = Within Background Levels
BSL = Below COC Screening Level/ARAR/TBC
NUT = Essential Nutrient
NTX = No criteria available
EPAI = USEPA Region one does not advocate evaluation of this chemical.

Associated Samples:

S16SB010001	S16SB070001
S16SB030001	S16SB080001
S16SB050001	S16SS01
S16SB060001	

TABLE 2.2
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
MIGRATION PATHWAYS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Hospital Incinerator (Site 16)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	EPA SSL-Soil to GW(5)	CTDEP Mobility Criteria(6)	CTDEP Soil Vapor Volatilization(6)	COPC Flag	Rationale for Contaminant Deletion or Selection(7)
Dioxins/Furans																
35822-46-9	1,2,3,4,6,7,8-HPCDD	0.000007		0.00012		mg/kg	S16SB070001	5/7	0.0000019 - 0.0000031	1.2E-04	NA	5.60E-04	4.67E-06 (8)	NA	YES	ASL
67562-39-4	1,2,3,4,6,7,8-HPCDF	0.00000041		0.0000054		mg/kg	S16SS01	5/7	0.00000021 - 0.00000033	5.4E-06	NA	5.60E-04	4.67E-06 (8)	NA	YES	ASL
57117-41-6	1,2,3,7,8-PECDF	0.00000021		0.00000021		mg/kg	S16SB050001	1/7	0.00000011 - 0.00000037	2.1E-07	NA	1.12E-04	9.34E-07 (8)	NA	NO	BSL
57117-31-4	2,3,4,7,8-PECDF	0.00000036		0.00000036		mg/kg	S16SB050001	1/7	0.00000011 - 0.00000038	3.6E-07	NA	1.12E-05	9.34E-08 (8)	NA	YES	ASL
51207-31-9	2,3,7,8-TCDF	0.0000018		0.0000018		mg/kg	S16SB050001	1/7	0.00000013 - 0.00000058	1.8E-06	NA	5.60E-05	4.67E-07 (8)	NA	YES	ASL
3268-87-9	OCDD	0.00011		0.029		mg/kg	S16SB070001	7/7	---	2.9E-02	NA	5.60E-02	4.67E-04 (8)	NA	YES	ASL
39001-02-0	OCDF	0.0000029		0.000012	J	mg/kg	S16SS01	3/7	0.00000013 - 0.0000003	1.2E-05	NA	5.60E-02	4.67E-04 (8)	NA	NO	BSL
37871-00-4	TOTAL HPCDD	0.00002		0.00022		mg/kg	S16SB070001	5/7	0.0000019 - 0.0000031	2.2E-04	NA	NA	NA	NA	NO	NTX
38998-75-3	TOTAL HPCDF	0.00000041		0.0000054		mg/kg	S16SS01	5/7	0.00000021 - 0.00000033	5.4E-06	NA	NA	NA	NA	NO	NTX
55684-94-1	TOTAL HXCDF	0.0000021		0.0000031		mg/kg	S16SB010001	2/7	0.0000001 - 0.0000011	3.1E-06	NA	NA	NA	NA	NO	NTX
30402-15-4	TOTAL PECDF	0.0000023		0.000004		mg/kg	S16SB050001	2/7	0.00000011 - 0.0000002	4.0E-06	NA	NA	NA	NA	NO	NTX
41903-57-5	TOTAL TCDD	0.00000054	J	0.00000054	J	mg/kg	S16SB030001	1/7	0.00000016 - 0.00000065	5.4E-07	NA	NA	NA	NA	NO	NTX
55722-27-5	TOTAL TCDF	0.0000009		0.0000022		mg/kg	S16SB050001	2/7	0.00000013 - 0.00000058	2.2E-06	NA	NA	NA	NA	NO	NTX
Volatile Organics																
78-93-3	2-BUTANONE	0.003	J	0.005	J	mg/kg	S16SB030001	5/7	0.01 - 0.012	0.005	NA	NA	80	2400	NO	BSL
67-64-1	ACETONE	0.037		0.18	J	mg/kg	S16SS01	2/7	0.01 - 0.067	0.18	NA	16	140	2400	NO	BSL
108-88-3	TOLUENE	0.001	J	0.003	J	mg/kg	S16SB030001	4/7	0.005 - 0.006	0.003	NA	12	67	760	NO	BSL
Semivolatile Organics																
208-96-8	ACENAPHTHYLENE	0.044	J	0.099	J	mg/kg	S16SB050001	2/7	0.17 - 0.2	0.099	NA	NA	84	NA	NO	BSL
120-12-7	ANTHRACENE	0.025	J	0.025	J	mg/kg	S16SS01	1/7	0.17 - 0.85	0.025	NA	12000	400	NA	NO	BSL
56-55-3	BENZO(A)ANTHRACENE	0.022	J	0.41	J	mg/kg	S16SB050001	5/7	0.19 - 0.2	0.41	NA	2	1	NA	NO	BSL
50-32-8	BENZO(A)PYRENE	0.02	J	0.33	J	mg/kg	S16SB050001	5/7	0.19 - 0.2	0.33	NA	8	1	NA	NO	BSL
205-99-2	BENZO(B)FLUORANTHENE	0.05	J	0.26	J	mg/kg	S16SB050001	4/7	0.17 - 0.2	0.26	NA	NA	1	NA	NO	BSL
191-24-2	BENZO(G,H,I)PERYLENE	0.024	J	0.36	J	mg/kg	S16SB050001	5/7	0.19 - 0.2	0.36	NA	4200(9)	42	NA	NO	BSL
207-08-9	BENZO(K)FLUORANTHENE	0.039	J	0.28	J	mg/kg	S16SB050001	4/7	0.17 - 0.2	0.28	NA	49	1	NA	NO	BSL
65-85-0	BENZOIC ACID	0.18	J	0.18	J	mg/kg	S16SS01	1/1	---	0.18	NA	400	10000	NA	NO	BSL
85-68-7	BUTYL BENZYL PHTHALATE	0.02	J	0.02	J	mg/kg	S16SB060001	1/7	0.17 - 0.85	0.02	NA	930	NA	NA	NO	BSL
218-01-9	CHRYSENE	0.026	J	0.52	J	mg/kg	S16SB050001	5/7	0.19 - 0.2	0.52	NA	160	1	NA	NO	BSL
53-70-3	DIBENZO(A,H)ANTHRACENE	0.049	J	0.049	J	mg/kg	S16SS01	1/7	0.17 - 0.85	0.049	NA	2	1	NA	NO	BSL
206-44-0	FLUORANTHENE	0.041	J	0.63	J	mg/kg	S16SB050001	5/7	0.19 - 0.2	0.63	NA	4300	56	NA	NO	BSL
193-39-5	INDENO(1,2,3-CD)PYRENE	0.02	J	0.28	J	mg/kg	S16SB050001	5/7	0.19 - 0.2	0.28	NA	14	1	NA	NO	BSL
85-01-8	PHENANTHRENE	0.035	J	0.23	J	mg/kg	S16SB050001	5/7	0.19 - 0.2	0.23	NA	4200(9)	40	NA	NO	BSL
129-00-0	PYRENE	0.047	J	0.72	J	mg/kg	S16SB050001	5/7	0.19 - 0.2	0.72	NA	4200	40	NA	NO	BSL
Pesticides/PCBs																
72-54-8	4,4'-DDD	0.0024		0.0024		mg/kg	S16SB070001	1/7	0.00076 - 0.0016	0.0024	NA	16	NA	NA	NO	BSL
72-55-9	4,4'-DDE	0.0022	J	0.0047	J	mg/kg	S16SB070001	2/7	0.0014 - 0.0016	0.0047	NA	54	NA	NA	NO	BSL
50-29-3	4,4'-DDT	0.0015	J	0.0041		mg/kg	S16SB070001	3/6	0.0014 - 0.0016	0.0041	NA	32	NA	NA	NO	BSL
5103-71-9	ALPHA-CHLORDANE	0.00051	J	0.00051	J	mg/kg	S16SB070001	1/7	0.00039 - 0.00085	0.00051	NA	10	0.066	NA	NO	BSL
12672-29-6	AROCLOR-1248	0.006	J	0.006	J	mg/kg	S16SB070001	1/7	0.007 - 0.0083	0.006	NA	NA	0.005	NA	YES	ASL
12789-03-6	GAMMA-CHLORDANE	0.0042		0.0042		mg/kg	S16SB070001	1/7	0.00039 - 0.00085	0.0042	NA	10	0.066	NA	NO	BSL
Inorganics																
7429-90-5	ALUMINUM	4400		21000		mg/kg	S16SB070001	7/7	---	21000	17600	NA	NA(10)	NA	NO	NTX
7440-36-0	ANTIMONY	0.71	J	0.71	J	mg/kg	S16SB070001	1/7	0.48 - 1	0.71	2.05	5	NA(10)	NA	NO	BSL
7440-38-2	ARSENIC	1.7		8.5		mg/kg	S16SS01	7/7	---	8.5	3.6	29	NA(10)	NA	NO	BSL
7440-39-3	BARIUM	27		47		mg/kg	S16SS01	7/7	---	47	39	1600	NA(10)	NA	NO	BSL
7440-41-7	BERYLLIUM	0.23	J	0.27		mg/kg	S16SB050001	2/7	0.35 - 0.74	0.27	0.72	63	NA(10)	NA	NO	BSL,BKG
7440-70-2	CALCIUM	560	J	47000	J	mg/kg	S16SB060001	7/7	---	47000	314	NA	NA(10)	NA	NO	NUT
7440-47-3	CHROMIUM	4.9		23		mg/kg	S16SB080001	5/7	8.9 - 9.7	23	19.3	38	NA(10)	NA	NO	BSL

TABLE 2.2
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
MIGRATION PATHWAYS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Hospital Incinerator (Site 16)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	EPA SSL-Soil to GW(5)	CTDEP Mobility Criteria(6)	CTDEP Soil Vapor Volatilization(6)	COPC Flag	Rationale for Contaminant Deletion or Selection(7)
7440-48-4	COBALT	4.9		7.8		mg/kg	S16SS01	3/7	4.6 - 9.1	7.8	7	NA	NA(10)	NA	NO	NTX
7440-50-8	COPPER	7.3		200		mg/kg	S16SS01	7/7	---	200	17.9	NA	NA(10)	NA	NO	NTX
7439-89-6	IRON	5600	J	18000	J	mg/kg	S16SB070001	7/7	---	18000	16800	NA	NA(10)	NA	NO	BKG
7439-92-1	LEAD	3.5		35		mg/kg	S16SB050001	7/7	---	35	17.5	NA	NA(10)	NA	NO	NTX
7439-95-4	MAGNESIUM	1500		3900		mg/kg	S16SB080001	7/7	---	3900	2460	NA	NA(10)	NA	NO	NUT
7439-96-5	MANGANESE	100	J	400		mg/kg	S16SS01	7/7	---	400	172	NA	NA(10)	NA	NO	NTX
7440-02-0	NICKEL	6.2		38		mg/kg	S16SS01	3/7	5.1 - 13	38	5	130	NA(10)	NA	NO	BSL
7440-09-7	POTASSIUM	670		1700		mg/kg	S16SS01	7/7	---	1700	669	NA	NA(10)	NA	NO	NUT
7440-22-4	SILVER	1.3	J	4.9		mg/kg	S16SB070001, S16SS01	7/7	---	4.9	0.385	34	NA(10)	NA	NO	BSL
7440-23-5	SODIUM	210		210		mg/kg	S16SB060001	1/7	41 - 180	210	16.56	NA	NA(10)	NA	NO	NUT
7440-28-0	THALLIUM	0.49	J	1.2	J	mg/kg	S16SS01	6/7	0.44	1.2	0.105	0.7	NA(10)	NA	YES	ASL
7440-62-2	VANADIUM	11		40		mg/kg	S16SB070001	6/7	24	40	33.3	6000	NA(10)	NA	NO	BSL
7440-66-6	ZINC	24		1300		mg/kg	S16SS01	7/7	---	1300	25.6	12000	NA(10)	NA	NO	BSL

A shaded value indicates that the concentration used for screening exceeds the criterion or background value.
A shaded chemical name indicates that the chemical has been selected as a COC .

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 Atlantic Environmental Services, April 1995. Background concentrations of Inorganics in Soil - Naval Submarine Base - New London. If the maximum detected concentration of an inorganic is less than the background concentration, then that metal is not selected as a COC.
5 USEPA Soil Screening Level Guidance, May 1996.
6 CTDEP Remediation Standard Regulations, 1996.
7 The chemical is selected as a COC if the maximum detected concentration exceeds the risk-based COC screening level and/or an ARAR/TBC(s).
9 Pyrene is used as a surrogate for benzo(g,h,i)perylene and phenanthrene
8 TTNUS, April 14, 1999. Toxicity criteria not available. Toxicity criteria for 2,3,7,8-TCDD used in conjunction with toxicity equivalent factor (TEF) (EPA/625/3-89/016, March 1989) to calculate a value.
10 See Table 2.3

Associated Samples:

S16SB010001
S16SB030001
S16SB050001
S16SB060001
S16SB070001
S16SB080001
S16SS01

Definitions:

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogen
COC = Chemical of Concern
J = Estimated Value
N = Noncarcinogen
NA = Not Applicable

Rationale Codes:

For Selection as a COC:
ASL = Above COC Screening Level/ARAR/TBC

For Elimination as a COC:
BKG = Within Background Levels
NTX = No criteria available.

TABLE 2.3
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
MIGRATION PATHWAYS - SPLP RESULTS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Hospital Incinerator (Site 16)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	CTDEP Mobility Criteria	COPC Flag	Rationale for Contaminant Deletion or Selection(5)
Inorganics														
7429-90-5	ALUMINUM	500		1200		ug/L	S16SB070001-SO-P	5/7	66 - 370	1200	NA	NA	NO	BSL
7440-70-2	CALCIUM	840	J	26000	J	ug/L	S16SB060001-SO-P	3/7	870 - 2500	26000	NA	NA	NO	NTX
7440-47-3	CHROMIUM	7.1	J	7.1	J	ug/L	S16SS01-SO-P	1/7	8.4	7.1	NA	0.5	YES	ASL
7440-50-8	COPPER	34		34		ug/L	S16SS01-SO-P	1/7	5.4	34	NA	13	YES	ASL
7439-89-6	IRON	490		800		ug/L	S16SB070001-SO-P	5/7	22 - 84	800	NA	NA	NO	NTX
7439-92-1	LEAD	2.5	J	3.1	J	ug/L	S16SS01-SO-P	2/7	2.1	3.1	NA	0.15	YES	ASL
7439-95-4	MAGNESIUM	200		530		ug/L	S16SS01-SO-P	7/7	---	530	NA	NA	NO	NTX
7439-96-5	MANGANESE	8.7		19		ug/L	S16SB080001-SO-P	3/7	3.5 - 24	19	NA	NA	NO	NTX
7440-09-7	POTASSIUM	1700		1700		ug/L	S16SS01-SO-P	1/7	540 - 2100	1700	NA	NA	NO	NTX
7440-62-2	VANADIUM	4.8	J	21		ug/L	S16SB060001-SO-P	2/7	4.4 - 6.3	21	NA	0.5	YES	ASL

A shaded value indicates that the concentration used for screening exceeds the criterion or background value.
A shaded chemical name indicates that the chemical has been selected as a COC .

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 SPLP analysis was not performed on background samples.
5 The chemical is selected as a COC if the maximum detected concentration exceeds the risk-based COC screening level.

Associated Samples:

S16SB010001-SO-P
S16SB030001-SO-P
S16SB050001-SO-P
S16SB060001-SO-P
S16SB070001-SO-P
S16SB080001-SO-P
S16SS01-SO-P

Definitions:

C = Carcinogen
COC = Chemical of Concern
J = Estimated Value
N = Noncarcinogen
NA = Not Applicable

Rationale Codes:

For Selection as a COC:
ASL = Above COC Screening Level

For Elimination as a COC:
NTX = No criteria available

TABLE 2.4
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
DIRECT CONTACT EXPOSURE PATHWAYS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil
Exposure Point: Hospital Incinerator (Site 16)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Risk-Based COPC Screening Level(5)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection(6)
Dioxins/Furans																	
35822-46-9	1,2,3,4,6,7,8-HPCDD	0.000024		0.000024		mg/kg	S16SB080405-SO	1/1	---	0.000024	NA	0.00039	C	NA NA	SSL-INH CTRESSOIL	NO	BSL
3268-87-9	OCDD	0.0064		0.0064		mg/kg	S16SB080405-SO	1/1	---	0.0064	NA	0.039	C	NA NA	SSL-INH CTRESSOIL	NO	BSL
37871-00-4	TOTAL HPCDD	0.000043		0.000043		mg/kg	S16SB080405-SO	1/1	---	0.000043	NA	NA		NA NA	SSL-INH CTRESSOIL	NO	NTX
Volatile Organics																	
74-83-9	BROMOMETHANE	0.032	J	0.032	J	mg/kg	S16SB080405-SO	1/1	---	0.032	NA	3.9		10 95	SSL-INH CTRESSOIL	NO	BSL
74-87-3	CHLOROMETHANE	0.091	J	0.091	J	mg/kg	S16SB080405-SO	1/1	---	0.091	NA	1.2		NA 47	SSL-INH CTRESSOIL	NO	BSL
108-88-3	TOLUENE	0.004	J	0.004	J	mg/kg	S16SB080405-SO	1/1	---	0.004	NA	52	N	650 500	SSL-INH CTRESSOIL	NO	BSL
Inorganics																	
7429-90-5	ALUMINUM	8100		8100		mg/kg	S16SB080405-SO	1/1	---	8100	17600	7600	N	NA NA	SSL-INH CTRESSOIL	NO	BKG, EPAI
7440-38-2	ARSENIC	4.4		4.4		mg/kg	S16SB080405-SO	1/1	---	4.4	3.6	0.39	C	750 10	SSL-INH CTRESSOIL	NO	ASL
7440-39-3	BARIUM	34		34		mg/kg	S16SB080405-SO	1/1	---	34	57.2	540	N	690000 4700	SSL-INH CTRESSOIL	NO	BSL,BKG
7440-70-2	CALCIUM	1500	J	1500	J	mg/kg	S16SB080405-SO	1/1	---	1500	499	NA		NA NA	SSL-INH CTRESSOIL	NO	NUT
7440-47-3	CHROMIUM	15		15		mg/kg	S16SB080405-SO	1/1	---	15	21.5	30(7)	C	270 100	SSL-INH CTRESSOIL	NO	BSL,BKG
7440-50-8	COPPER	14		14		mg/kg	S16SB080405-SO	1/1	---	14	25.6	290	N	NA 2500	SSL-INH CTRESSOIL	NO	BSL,BKG
7439-89-6	IRON	10000	J	10000	J	mg/kg	S16SB080405-SO	1/1	---	10000	17200	2300	N	NA NA	SSL-INH CTRESSOIL	NO	BKG, EPAI
7439-92-1	LEAD	3.8		3.8		mg/kg	S16SB080405-SO	1/1	---	3.8	17.5	400(8)	N	NA 500	SSL-INH CTRESSOIL	NO	BSL,BKG
7439-95-4	MAGNESIUM	2500		2500		mg/kg	S16SB080405-SO	1/1	---	2500	3650	NA		NA NA	SSL-INH CTRESSOIL	NO	NUT
7439-96-5	MANGANESE	180	J	180	J	mg/kg	S16SB080405-SO	1/1	---	180	188	180	N	NA NA	SSL-INH CTRESSOIL	NO	BSL,BKG
7440-09-7	POTASSIUM	1200		1200		mg/kg	S16SB080405-SO	1/1	---	1200	2580	NA		NA NA	SSL-INH CTRESSOIL	NO	NUT
7440-22-4	SILVER	2.6		2.6		mg/kg	S16SB080405-SO	1/1	---	2.6	0.385	39	N	NA 340	SSL-INH CTRESSOIL	NO	BSL
7440-28-0	THALLIUM	0.44	J	0.44	J	mg/kg	S16SB080405-SO	1/1	---	0.44	0.29	0.52	N	NA 5.4	SSL-INH CTRESSOIL	NO	BSL
7440-62-2	VANADIUM	20		20		mg/kg	S16SB080405-SO	1/1	---	20	35.1	55	N	NA 470	SSL-INH CTRESSOIL	NO	BSL,BKG

TABLE 2.4
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
DIRECT CONTACT EXPOSURE PATHWAYS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil
Exposure Point: Hospital Incinerator (Site 16)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Risk-Based COPC Screening Level(5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection(6)

A shaded value indicates that the concentration used for screening exceeds the criterion or background value.
A shaded chemical name indicates that the chemical has been selected as a COPC.

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 Atlantic Environmental Services, April 1995. Background concentrations of Inorganics in Soil - Naval Submarine Base - New London. If the maximum detected concentration of an inorganic is less than the background concentration, then that metal is not selected as a COC.
5 The risk-based COPC screening level for residential land use is presented. The value is based on a target hazard quotient of 0.1 for noncarcinogens (denoted with a "N" flag) or an incremental cancer risk of 1E-6 for carcinogens (denoted with a "C" flag) (USEPA, Region IX, October 1999).
6 The chemical is selected as a COC if the maximum detected concentration exceeds the risk-based COC screening level and/or an ARAR/TBC(s).
7 Hexavalent Chromium.
8 OSWER soil screening level for residential land use (USEPA, July 1994).

Associated Samples:
S16SB080405-SO

Definitions:
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogen
COC = Chemical of Concern
J = Estimated Value
N = Noncarcinogen
NA = Not Applicable
SSL-INH = Soil Screening Level for transfers from soil to air (Inhalation) (USEPA, May 1996)
CTRESSOIL - CTDEP direct contact criteria for residential exposure to soil

Rationale Codes:
For Selection as a COC:
ASL = Above COC Screening Level/ARAR/TBC

For Elimination as a COC:
BKG = Within Background Levels
BSL = Below COC Screening Level/ARAR/TBC
NUT = Essential Nutrient
NTX = No criteria available
EPAI = USEPA Region one does not advocate evaluation of this chemical.

TABLE 2.5
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
MIGRATION PATHWAYS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil
Exposure Point: Hospital Incinerator (Site 16)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	EPA SSL-Soil to GW(5)	CTDEP Mobility Criteria(6)	CTDEP Soil Vapor Volatilization(6)	COPC Flag	Rationale for Contaminant Deletion or Selection(7)
Dioxins/Furans																
35822-46-9	1,2,3,4,6,7,8-HPCDD	0.000024		0.000024		mg/kg	S16SB080405-SO	1/1	---	2.4E-05	NA	5.60E-04	4.67E-06 (8)	NA	YES	ASL
3268-87-9	OCDD	0.0064		0.0064		mg/kg	S16SB080405-SO	1/1	---	6.4E-03	NA	5.60E-02	4.67E-05 (8)	NA	YES	ASL
37871-00-4	TOTAL HPCDD	0.000043		0.000043		mg/kg	S16SB080405-SO	1/1	---	4.3E-05	NA	NA	NA	NA	NO	NTX
Volatile Organics																
74-83-9	BROMOMETHANE	0.032	J	0.032	J	mg/kg	S16SB080405-SO	1/1	---	0.032	NA	0.2	2	NA	NO	BSL
74-87-3	CHLOROMETHANE	0.091	J	0.091	J	mg/kg	S16SB080405-SO	1/1	---	0.091	NA	NA	NA	NA	NO	NTX
108-88-3	TOLUENE	0.004	J	0.004	J	mg/kg	S16SB080405-SO	1/1	---	0.004	NA	12	67	760	NO	BSL
Inorganics																
7429-90-5	ALUMINUM	8100		8100		mg/kg	S16SB080405-SO	1/1	---	8100	17600	NA	NA(9)	NA	NO	BKG
7440-38-2	ARSENIC	4.4		4.4		mg/kg	S16SB080405-SO	1/1	---	4.4	3.6	29	NA(9)	NA	NO	BSL
7440-39-3	BARIUM	34		34		mg/kg	S16SB080405-SO	1/1	---	34	57.2	1600	NA(9)	NA	NO	BSL,BKG
7440-70-2	CALCIUM	1500	J	1500	J	mg/kg	S16SB080405-SO	1/1	---	1500	499	NA	NA(9)	NA	NO	NUT
7440-47-3	CHROMIUM	15		15		mg/kg	S16SB080405-SO	1/1	---	15	21.5	38	NA(9)	NA	NO	BSL,BKG
7440-50-8	COPPER	14		14		mg/kg	S16SB080405-SO	1/1	---	14	25.6	NA	NA(9)	NA	NO	BKG
7439-89-6	IRON	10000	J	10000	J	mg/kg	S16SB080405-SO	1/1	---	10000	17200	NA	NA(9)	NA	NO	BKG
7439-92-1	LEAD	3.8		3.8		mg/kg	S16SB080405-SO	1/1	---	3.8	17.5	NA	NA(9)	NA	NO	BKG
7439-95-4	MAGNESIUM	2500		2500		mg/kg	S16SB080405-SO	1/1	---	2500	3650	NA	NA(9)	NA	NO	NUT, BKG
7439-96-5	MANGANESE	180	J	180	J	mg/kg	S16SB080405-SO	1/1	---	180	188	NA	NA(9)	NA	NO	BKG
7440-09-7	POTASSIUM	1200		1200		mg/kg	S16SB080405-SO	1/1	---	1200	3580	NA	NA(9)	NA	NO	NUT, BKG
7440-22-4	SILVER	2.6		2.6		mg/kg	S16SB080405-SO	1/1	---	2.6	0.385	34	NA(9)	NA	NO	BSL
7440-28-0	THALLIUM	0.44	J	0.44	J	mg/kg	S16SB080405-SO	1/1	---	0.44	0.29	0.7	NA(9)	NA	NO	BSL
7440-62-2	VANADIUM	20		20		mg/kg	S16SB080405-SO	1/1	---	20	35.1	6000	NA(9)	NA	NO	BSL,BKG

A shaded value indicates that the concentration used for screening exceeds the criterion or background value.
A shaded chemical name indicates that the chemical has been selected as a COC.

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 Atlantic Environmental Services, April 1995. Background concentrations of Inorganics in Soil - Naval Submarine Base - New London. If the maximum detected concentration of an inorganic is less than the background concentration, then that metal is not selected as a COC.
5 USEPA Soil Screening Level Guidance, May 1996.
6 CTDEP Remediation Standard Regulations, 1996.
7 The chemical is selected as a COC if the maximum detected concentration exceeds the risk-based COC screening level and/or an ARAR/TBC(s).
8 TTNUS, April 14, 1999. Toxicity criteria not available. Toxicity criteria for 2,3,7,8-TCDD used in conjunction with toxicity equivalent factor (TEF) (EPA/625/3-89/016, March 1989) to calculate a value.
9 See Table 2.5

Associated Samples:
S16SB080405-SO

Definitions:

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogen
COC = Chemical of Concern
J = Estimated Value
N = Noncarcinogen
NA = Not Applicable
SSL-MIGR = Soil Screening Level for transfers from soil to groundwater for Dilution and Attenuation Factor of 1 (USEPA, May 1996)

For Selection as a COC:
ASL = Above COC Screening Level/ARAR/TBC

For Elimination as a COC:
BKG = Within Background Levels
BSL = Below COC Screening Level/ARAR/TBC
NUT = Essential Nutrient
NTX = No criteria available.

TABLE 2.6
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
MIGRATION PATHWAYS - SPLP RESULTS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil
Exposure Point: Hospital Incinerator (Site 16)

CAS Number	CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	CTDEP Mobility Criteria	COPC Flag
Inorganics	Inorganics													
7439-95-4	7439-95-4	MAGNESIUM	150		150		ug/L	S16SB080405-SO-P	1/1	---	150	NA	NA	NO
7439-96-5	7439-96-5	MANGANESE	24		24		ug/L	S16SB080405-SO-P	1/1	---	24	NA	NA	NO

A shaded value indicates that the concentration used for screening exceeds the criterion or background value.
A shaded chemical name indicates that the chemical has been selected as a COC.

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 SPLP analysis was not performed on background samples.
5 The chemical is selected as a COC if the maximum detected concentration exceeds the risk-based COC screening level and/or an ARAR/TBC(s).

Associated Samples:
S16SB080405-SO-P

Definitions:
C = Carcinogen
COC = Chemical of Concern
J = Estimated Value
N = Noncarcinogen
NA = Not Applicable

Rationale Codes:
For Selection as a COC:
ASL = Above COC Screening Level

For Elimination as a COC:
NTX = No criteria available

TABLE 3.1
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
HOSPITAL INCINERATOR (SITE 16)
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Hospital Incinerator (Site 16)

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency Exposure		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Benzo(a)pyrene	mg/kg	0.119	0.200	0.33	J	mg/kg	0.33	max	1	0.119	avg	1
Arsenic	mg/kg	4.03	5.72	8.5		mg/kg	8.5	max	1	4.03	avg	1
Manganese	mg/kg	173	250	400		mg/kg	400	max	1	173	avg	1
Thallium	mg/kg	0.609	0.826	1.2	J	mg/kg	1.2	max	1	0.609	avg	1

Notes:
1 There were less than 10 samples taken; therefore, the maximum concentration was used for RME and average concentration was used for CTE.

TABLE 3.2
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
HOSPITAL INCINERATOR (SITE 16)
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Hospital Incinerator (Site 16)

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency Exposure		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Benzo(a)pyrene	mg/kg	0.115	0.184	0.33	J	mg/kg	0.33	max	1	0.115	avg	1
Arsenic	mg/kg	4.08	5.50	8.5		mg/kg	8.5	max	1	4.08	avg	1
Manganese	mg/kg	174	239	400		mg/kg	400	max	1	174	avg	1
Thallium	mg/kg	0.588	0.776	1.2	J	mg/kg	1.2	max	1	0.588	avg	1

Notes:
1 There were less than 10 samples taken; therefore, the maximum concentration was used for RME and average concentration was used for CTE.

TABLE 4.1
VALUES USED FOR DAILY INTAKE CALCULATIONS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Hospital Incinerators (Site 16)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	Chemical concentration in soil	mg/kg	95% UCL	EPA, 1994	95% UCL	EPA, 1994	Intake (mg/kg/day) =
	IR-S	Ingestion Rate	mg/day	480	EPA, 1994	240	(1)	$\frac{Cs \times IRS \times CF3 \times FI \times EF \times ED}{BW \times AT}$
	CF3	Conversion Factor 3	kg/mg	1.0E-06	- -	1.0E-06	- -	
	FI	Fraction Ingested	unitless	1	EPA, 1994	1	EPA, 1994	
	EF	Exposure Frequency	days/year	120	Atlantic, 1992	80	Atlantic, 1992	
	ED	Exposure Duration	years	1	Atlantic, 1992	1	Atlantic, 1992	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	365	EPA, 1989	365	EPA, 1989	
Dermal	CS	Chemical concentration in soil	mg/kg	95% UCL	EPA, 1994	95% UCL	EPA, 1994	Dermally Absorbed Dose (mg/kg/day) =
	CF3	Conversion Factor 3	kg/mg	1.0E-06	- -	1.0E-06	- -	$\frac{Cs \times CF3 \times SA \times SSAF \times DABS \times EF \times ED}{BW \times AT}$
	SA	Skin Surface Available for Contact	cm2	3,800	EPA, 1989	3,800	EPA, 1989	
	SSAF	Soil to Skin Adherence Factor	mg/cm2/event	0.2	EPA, 1998	0.02	EPA, 1998	
	DABS	Absorption Factor	unitless	See Text	See Text	See Text	See Text	
	EF	Exposure Frequency	days/year	120	Atlantic, 1992	80	Atlantic, 1992	
	ED	Exposure Duration	years	1	Atlantic, 1992	1	Atlantic, 1992	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	365	EPA, 1989	365	EPA, 1989	

Notes:
(1) - Professinal judgement.
Sources:
EPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.
EPA, 1992: Dermal Exposure Assessment: Principles and Applications.
EPA, 1994: US EPA Region I Risk Updates, Number 2.
EPA, 1998: Risk Assessment Guidance for Superfund, Supplemental Guidance, Dermal Risk Assessment, Interim Guidance.
Atlantic 1992: Phase I Remedial Investigation Naval Submarine Base - New London, Connecticut, August.

TABLE 4.2
VALUES USED FOR DAILY INTAKE CALCULATIONS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Hospital Incinerators (Site 16)
Receptor Population: Full-Time Employees
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	Chemical concentration in soil	mg/kg	95% UCL	EPA, 1994	95% UCL	EPA, 1994	Intake (mg/kg/day) =
	IR-S	Ingestion Rate	mg/day	100	EPA, 1994	50	EPA, 1994	$\frac{Cs \times IRS \times CF3 \times FI \times EF \times ED}{BW \times AT}$
	CF3	Conversion Factor 3	kg/mg	1.0E-06	- -	1.0E-06	- -	
	FI	Fraction Ingested	unitless	1	EPA, 1994	1	EPA, 1994	
	EF	Exposure Frequency	days/year	150	EPA, 1994	150	EPA, 1994	
	ED	Exposure Duration	years	25	EPA, 1994	6	Atlantic, 1992	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	9125	EPA, 1989	2190	EPA, 1989	
Dermal	CS	Chemical concentration in soil	mg/kg	95% UCL	EPA, 1994	95% UCL	EPA, 1994	Dermally Absorbed Dose (mg/kg/day) =
	CF3	Conversion Factor 3	kg/mg	1.0E-06	- -	1.0E-06	- -	$\frac{Cs \times CF3 \times SA \times SSAF \times DABS \times EF \times ED}{BW \times AT}$
	SA	Skin Surface Available for Contact	cm2	3,800	EPA, 1989	3,800	EPA, 1989	
	SSAF	Soil to Skin Adherence Factor	mg/cm2/event	0.2	EPA, 1998	0.02	EPA, 1998	
	DABS	Absorption Factor	unitless	See Text	See Text	See Text	See Text	
	EF	Exposure Frequency	days/year	150	EPA, 1994	150	EPA, 1994	
	ED	Exposure Duration	years	25	EPA, 1994	6	Atlantic, 1992	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	9,125	EPA, 1989	2,190	EPA, 1989	

Notes:
(1) - Professinal judgement.
Sources:
EPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.
EPA, 1992: Dermal Exposure Assessment: Principles and Applications.
EPA, 1994: US EPA Region I Risk Updates, Number 2.
EPA, 1998: Risk Assessment Guidance for Superfund, Supplemental Guidance, Dermal Risk Assessment, Interim Guidance.
Atlantic 1992: Phase I Remedial Investigation Naval Submarine Base - New London, Connecticut, August.

TABLE 4.3
VALUES USED FOR DAILY INTAKE CALCULATIONS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Hospital Incinerators (Site 16)
Receptor Population: Older Child Trespasser
Receptor Age: Adolescent

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	Chemical concentration in soil	mg/kg	95% UCL	EPA, 1994	95% UCL	EPA, 1994	Intake (mg/kg/day) =
	IR-S	Ingestion Rate	mg/day	100	EPA, 1994	50	EPA, 1994	
	CF3	Conversion Factor 3	kg/mg	1.0E-06	- -	1.0E-06	- -	$\frac{Cs \times IRS \times CF3 \times FI \times EF \times ED}{BW \times AT}$
	FI	Fraction Ingested	unitless	1	EPA, 1994	1	EPA, 1994	
	EF	Exposure Frequency	days/year	120	Atlantic, 1992	52	Atlantic, 1992	
	ED	Exposure Duration	years	10	(1)	3	(1)	
	BW	Body Weight	kg	43	EPA, 1989	43	EPA, 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	3,650	EPA, 1989	1,095	EPA, 1989	
Dermal	CS	Chemical concentration in soil	mg/kg	95% UCL	EPA, 1994	95% UCL	EPA, 1994	Dermally Absorbed Dose (mg/kg/day) =
	CF3	Conversion Factor 3	kg/mg	1.0E-06	- -	1.0E-06	- -	$\frac{Cs \times CF3 \times SA \times SSAF \times DABS \times EF \times ED}{BW \times AT}$
	SA	Skin Surface Available for Contact	cm2	3,150	EPA, 1989	3,150	EPA, 1989	
	SSAF	Soil to Skin Adherence Factor	mg/cm2/event	0.2	EPA, 1998	0.06	EPA, 1998	
	DABS	Absorption Factor	unitless	See Text	See Text	See Text	See Text	
	EF	Exposure Frequency	days/year	120	Atlantic, 1992	52	Atlantic, 1992	
	ED	Exposure Duration	years	10	(1)	3	(1)	
	BW	Body Weight	kg	43	EPA, 1989	43	EPA, 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	3,650	EPA, 1989	1,095	EPA, 1989	

Notes:
(1) - Professinal judgement.
Sources:
EPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.
EPA, 1992: Dermal Exposure Assessment: Principles and Applications.
EPA, 1994: US EPA Region I Risk Updates, Number 2.
EPA, 1998: Risk Assessment Guidance for Superfund, Supplemental Guidance, Dermal Risk Assessment, Interim Guidance.

TABLE 4.4
VALUES USED FOR DAILY INTAKE CALCULATIONS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Hospital Incinerators (Site 16)
Receptor Population: Child Residnts
Receptor Age: Child

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	Chemical concentration in soil	mg/kg	95% UCL	EPA, 1994	95% UCL	EPA, 1994	Intake (mg/kg/day) =
	IR-S	Ingestion Rate	mg/day	200	EPA, 1994	100	EPA, 1994	
	CF3	Conversion Factor 3	kg/mg	1.0E-06	- -	1.0E-06	- -	$\frac{Cs \times IRS \times CF3 \times FI \times EF \times ED}{BW \times AT}$
	FI	Fraction Ingested	unitless	1	EPA, 1993	1	EPA, 1993	
	EF	Exposure Frequency	days/year	150	EPA, 1994	150	EPA, 1994	
	ED	Exposure Duration	years	6	EPA, 1994	2	EPA, 1994	
	BW	Body Weight	kg	15	EPA, 1994	15	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	EPA, 1989	730	EPA, 1989	
Dermal	CS	Chemical concentration in soil	mg/kg	95% UCL	EPA, 1994	95% UCL	EPA, 1994	Dermally Absorbed Dose (mg/kg/day) =
	CF3	Conversion Factor 3	kg/mg	1.0E-06	- -	1.0E-06	- -	$\frac{Cs \times CF3 \times SA \times SSAF \times DABS \times EF \times ED}{BW \times AT}$
	SA	Skin Surface Available for Contact	cm2	2,094	EPA, 1992	2,094	EPA, 1992	
	SSAF	Soil to Skin Adherence Factor	mg/cm2/event	0.2	EPA, 1998	0.06	EPA, 1998	
	DABS	Absorption Factor	unitless	See Text	See Text	See Text	See Text	
	EF	Exposure Frequency	days/year	150	EPA, 1994	150	EPA, 1994	
	ED	Exposure Duration	years	6	EPA, 1994	2	EPA, 1994	
	BW	Body Weight	kg	15	EPA, 1994	15	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	EPA, 1989	730	EPA, 1989	

Sources:
EPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.
EPA, 1992: Dermal Exposure Assessment: Principles and Applications.
EPA, 1994: US EPA Region I Risk Updates, Number 2.
EPA, 1998: Risk Assessment Guidance for Superfund, Supplemental Guidance, Dermal Risk Assessment, Interim Guidance.
Atlantic 1992: Phase I Remedial Investigation Naval Submarine Base - New London, Connecticut, August.

TABLE 4.5
VALUES USED FOR DAILY INTAKE CALCULATIONS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Surface/Subsurfacec Soil
Exposure Medium: Surface/Subsurfacec Soil
Exposure Point: Hospital Incinerators (Site 16)
Receptor Population: Adult Residnts
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	Chemical concentration in soil	mg/kg	95% UCL	EPA, 1994	95% UCL	EPA, 1994	Intake (mg/kg/day) =
	IR-S	Ingestion Rate	mg/day	100	EPA, 1994	50	EPA, 1994	
	CF3	Conversion Factor 3	kg/mg	1.0E-06	- -	1.0E-06	- -	$\frac{Cs \times IRS \times CF3 \times FI \times EF \times ED}{BW \times AT}$
	FI	Fraction Ingested	unitless	1	EPA, 1994	1	EPA, 1994	
	EF	Exposure Frequency	days/year	150	EPA, 1994	150	EPA, 1994	
	ED	Exposure Duration	years	24	EPA, 1994	7	EPA, 1994	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	EPA, 1989	2,555	EPA, 1989	
Dermal	CS	Chemical concentration in soil	mg/kg	95% UCL	EPA, 1994	95% UCL	EPA, 1994	Dermally Absorbed Dose (mg/kg/day) =
	CF3	Conversion Factor 3	kg/mg	1.0E-06	- -	1.0E-06	- -	$\frac{Cs \times CF3 \times SA \times SSAF \times DABS \times EF \times ED}{BW \times AT}$
	SA	Skin Surface Available for Contact	cm2	3,800	EPA, 1992	3,800	EPA, 1992	
	SSAF	Soil to Skin Adherence Factor	mg/cm2/event	0.07	EPA, 1998	0.01	EPA, 1998	
	DABS	Absorption Factor	unitless	See Text	See Text	See Text	See Text	
	EF	Exposure Frequency	days/year	150	EPA, 1994	150	EPA, 1994	
	ED	Exposure Duration	years	24	EPA, 1994	7	EPA, 1994	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	EPA, 1989	2,555	EPA, 1989	

Notes:
(1) - Professinal judgement.
Sources:
EPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.
EPA, 1992: Dermal Exposure Assessment: Principles and Applications.
EPA, 1994: US EPA Region I Risk Updates, Number 2.
EPA, 1998: Risk Assessment Guidance for Superfund, Supplemental Guidance, Dermal Risk Assessment, Interim Guidance.
Atlantic 1992: Phase I Remedial Investigation Naval Submarine Base - New London, Connecticut, August.

TABLE 5.1
NON-CANCER TOXICITY DATA -- ORAL/DERMAL
NSB-NLON, GROTON, CONNECTICUT

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal RfD (2)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ (3) (MM/DD/YY)
Semivolatile Organic Compounds										
Benzo(a)pyrene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics										
Arsenic	Chronic	3.0E-04	mg/kg/day	100%	3.0E-04	mg/kg/day	Skin	3/1	IRIS	01/02/01
	Subchronic	3.0E-04	mg/kg/day	100%	3.0E-04	mg/kg/day	Skin	3	HEAST	7/97
Manganese (Soil)	Chronic	1.4E-01	mg/kg/day	4%	5.6E-03	mg/kg/day	CNS	1/1	IRIS	01/02/01
	Subchronic	1.4E-01	mg/kg/day	4%	5.6E-03	mg/kg/day	CNS	1	HEAST	7/97
Thallium	Chronic	7.0E-05	mg/kg/day	100%	7.0E-05	mg/kg/day	None Specified	NA	EPA IX	11/01/00
	Subchronic	7.0E-05	mg/kg/day	100%	7.0E-05	mg/kg/day	None Specified	NA	Chronic	11/01/00

Notes:

(1) - USEPA 2000.

(2) - RfDdermal = RfDoral x Oral to Dermal Adjustment Factor.

(3) For IRIS values date that IRIS was searched.
For HEAST values, the date of HEAST.
FOR EPAIII, date of RBC Table.

NA = Not Applicable.

IRIS = Integrated Risk Information System.

HEAST= Health Effects Assessment Summary Tables.

EPA IX = USEPA Region IX Preliminary Remediation Goals Table, November 1, 2000.

Chronic = No subchronic value available, chronic value is presented.

CNS = Central Nervous System

TABLE 6.1
CANCER TOXICITY DATA -- ORAL/DERMAL
NSB-NLON, GROTON, CONNECTICUT

Chemical of Potential Concern	Oral Cancer Slope Factor	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal Cancer Slope Factor (2)	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (3) (MM/DD/YY)
Semivolatile Organic Compounds							
Benzo(a)pyrene	7.3E+00	100%	7.3E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	01/02/01
Inorganics							
Arsenic	1.5E+00	100%	1.5E+00	$(mg/kg\text{-}day)^{-1}$	A	IRIS	01/02/01
Manganese	NA	NA	NA	NA	D	IRIS	01/02/01
Thallium	NA	NA	NA	NA	D	IRIS	01/02/01

Notes:

IRIS = Integrated Risk Information System

(1) - USEPA 2000b.

(2) - CSFdermal = CSForal/Oral to Dermal Adjustment Factor.

(3) - For IRIS values, the date IRIS was searched.

NA = Not Applicable

IRIS = Integrated Risk Information System

EPA Group:

A - Human carcinogen

B1 - Probable human carcinogen - indicates that limited human data are available

B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans

C - Possible human carcinogen

D - Not classifiable as a human carcinogen

E - Evidence of noncarcinogenicity

TABLE 7.1
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Hospital Incinerators (Site 16)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	0.330	mg/kg	0.330	mg/kg	M	7.4E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Arsenic	8.50	mg/kg	8.50	mg/kg	M	1.9E-05	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	6.4E-02
	Manganese (Soil)	400	mg/kg	400	mg/kg	M	9.0E-04	mg/kg/day	1.4E-01	mg/kg/day	N/A	N/A	6.4E-03
	Thallium	1.20	mg/kg	1.20	mg/kg	M	2.7E-06	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	3.9E-02
	(Total)												1.1E-01
Dermal	Benzo(a)pyrene	0.330	mg/kg	0.330	mg/kg	M	1.5E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Arsenic	8.50	mg/kg	8.50	mg/kg	M	9.1E-07	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	3.0E-03
	Manganese (Soil)	400	mg/kg	400	mg/kg	M	0.0E+00	mg/kg/day	5.6E-03	mg/kg/day	N/A	N/A	- -
	Thallium	1.20	mg/kg	1.20	mg/kg	M	0.0E+00	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	- -
	(Total)												3.0E-03
												Total Hazard Index Across All Exposure Routes/Pathways	1.1E-01

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Subchronic.

TABLE 7.2
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Hospital Incinerators (Site 16)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	0.115	mg/kg	0.115	mg/kg	M	8.6E-08	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Arsenic	4.08	mg/kg	4.08	mg/kg	M	3.1E-06	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	1.0E-02
	Manganese (Soil)	174	mg/kg	174	mg/kg	M	1.3E-04	mg/kg/day	1.4E-01	mg/kg/day	N/A	N/A	9.3E-04
	Thallium	0.588	mg/kg	0.588	mg/kg	M	4.4E-07	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	6.3E-03
	(Total)												1.7E-02
Dermal	Benzo(a)pyrene	0.115	mg/kg	0.115	mg/kg	M	3.6E-09	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Arsenic	4.08	mg/kg	4.08	mg/kg	M	2.9E-08	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	9.7E-05
	Manganese (Soil)	174	mg/kg	174	mg/kg	M	0.0E+00	mg/kg/day	5.6E-03	mg/kg/day	N/A	N/A	- -
	Thallium	0.588	mg/kg	0.588	mg/kg	M	0.0E+00	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	- -
	(Total)												9.7E-05
												Total Hazard Index Across All Exposure Routes/Pathways	1.8E-02

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Subchronic.

TABLE 7.3
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Hospital Incinerators (Site 16)
Receptor Population: Full-Time Employees
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	0.330	mg/kg	0.330	mg/kg	M	1.9E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Arsenic	8.50	mg/kg	8.50	mg/kg	M	5.0E-06	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	1.7E-02
	Manganese (Soil)	400	mg/kg	400	mg/kg	M	2.3E-04	mg/kg/day	1.4E-01	mg/kg/day	N/A	N/A	1.7E-03
	Thallium	1.20	mg/kg	1.20	mg/kg	M	7.0E-07	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	1.0E-02
	(Total)												2.8E-02
Dermal	Benzo(a)pyrene	0.330	mg/kg	0.330	mg/kg	M	1.9E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Arsenic	8.50	mg/kg	8.50	mg/kg	M	1.1E-06	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	3.8E-03
	Manganese (Soil)	400	mg/kg	400	mg/kg	M	0.0E+00	mg/kg/day	5.6E-03	mg/kg/day	N/A	N/A	- -
	Thallium	1.20	mg/kg	1.20	mg/kg	M	0.0E+00	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	- -
	(Total)												3.8E-03
												Total Hazard Index Across All Exposure Routes/Pathways	3.2E-02

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Chronic.

TABLE 7.4
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Hospital Incinerators (Site 16)
Receptor Population: Full-Time Employees
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	0.119	mg/kg	0.119	mg/kg	M	3.5E-08	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Arsenic	4.03	mg/kg	4.03	mg/kg	M	1.2E-06	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	3.9E-03
	Manganese (Soil)	173	mg/kg	173	mg/kg	M	5.1E-05	mg/kg/day	1.4E-01	mg/kg/day	N/A	N/A	3.6E-04
	Thallium	0.609	mg/kg	0.609	mg/kg	M	1.8E-07	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	2.6E-03
	(Total)												6.9E-03
Dermal	Benzo(a)pyrene	0.119	mg/kg	0.119	mg/kg	M	6.9E-09	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Arsenic	4.03	mg/kg	4.03	mg/kg	M	5.4E-08	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	1.8E-04
	Manganese (Soil)	173	mg/kg	173	mg/kg	M	0.0E+00	mg/kg/day	5.6E-03	mg/kg/day	N/A	N/A	- -
	Thallium	0.609	mg/kg	0.609	mg/kg	M	0.0E+00	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	- -
	(Total)												1.8E-04
												Total Hazard Index Across All Exposure Routes/Pathways	7.0E-03

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Chronic.

TABLE 7.5
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Hospital Incinerators (Site 16)
Receptor Population: Older Child Trespasser
Receptor Age: Adolescent

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	0.330	mg/kg	0.330	mg/kg	M	2.5E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Arsenic	8.50	mg/kg	8.50	mg/kg	M	6.5E-06	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	2.2E-02
	Manganese (Soil)	400	mg/kg	400	mg/kg	M	3.1E-04	mg/kg/day	1.4E-01	mg/kg/day	N/A	N/A	2.2E-03
	Thallium	1.20	mg/kg	1.20	mg/kg	M	9.2E-07	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	1.3E-02
	(Total)												3.7E-02
Dermal	Benzo(a)pyrene	0.330	mg/kg	0.330	mg/kg	M	2.1E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Arsenic	8.50	mg/kg	8.50	mg/kg	M	1.2E-06	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	4.1E-03
	Manganese (Soil)	400	mg/kg	400	mg/kg	M	0.0E+00	mg/kg/day	5.6E-03	mg/kg/day	N/A	N/A	- -
	Thallium	1.20	mg/kg	1.20	mg/kg	M	0.0E+00	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	- -
	(Total)												4.1E-03
												Total Hazard Index Across All Exposure Routes/Pathways	4.1E-02

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Chronic.

TABLE 7.6
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Hospital Incinerators (Site 16)
Receptor Population: Older Child Trespasser
Receptor Age: Adolescent

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	0.119	mg/kg	0.119	mg/kg	M	2.0E-08	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Arsenic	4.03	mg/kg	4.03	mg/kg	M	6.7E-07	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	2.2E-03
	Manganese (Soil)	173	mg/kg	173	mg/kg	M	2.9E-05	mg/kg/day	1.4E-01	mg/kg/day	N/A	N/A	2.0E-04
	Thallium	0.609	mg/kg	0.609	mg/kg	M	1.0E-07	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	1.4E-03
	(Total)												3.9E-03
Dermal	Benzo(a)pyrene	0.119	mg/kg	0.119	mg/kg	M	9.7E-09	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Arsenic	4.03	mg/kg	4.03	mg/kg	M	7.6E-08	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	2.5E-04
	Manganese (Soil)	173	mg/kg	173	mg/kg	M	0.0E+00	mg/kg/day	5.6E-03	mg/kg/day	N/A	N/A	- -
	Thallium	0.609	mg/kg	0.609	mg/kg	M	0.0E+00	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	- -
	(Total)												2.5E-04
												Total Hazard Index Across All Exposure Routes/Pathways	4.1E-03

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Chronic.

TABLE 7.7
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Hospital Incinerators (Site 16)
Receptor Population: Child Residnts
Receptor Age: Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	0.330	mg/kg	0.330	mg/kg	M	1.8E-06	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Arsenic	8.50	mg/kg	8.50	mg/kg	M	4.7E-05	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	1.6E-01
	Manganese (Soil)	400	mg/kg	400	mg/kg	M	2.2E-03	mg/kg/day	1.4E-01	mg/kg/day	N/A	N/A	1.6E-02
	Thallium	1.20	*mg/kg*	1.20	*mg/kg*	M	6.6E-06	*mg/kg/day*	7.0E-05	*mg/kg/day*	N/A	N/A	9.4E-02
	(Total)												2.6E-01
Dermal	Benzo(a)pyrene	0.330	mg/kg	0.330	mg/kg	M	4.9E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Arsenic	8.50	mg/kg	8.50	mg/kg	M	2.9E-06	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	9.8E-03
	Manganese (Soil)	400	mg/kg	400	mg/kg	M	0.0E+00	mg/kg/day	5.6E-03	mg/kg/day	N/A	N/A	- -
	Thallium	1.20	mg/kg	1.20	mg/kg	M	0.0E+00	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	- -
	(Total)												9.8E-03
												Total Hazard Index Across All Exposure Routes/Pathways	2.7E-01

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) *Chronic.*

TABLE 7.8
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Hospital Incinerators (Site 16)
Receptor Population: Child Residnts
Receptor Age: Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	0.115	mg/kg	0.115	mg/kg	M	3.1E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Arsenic	4.08	mg/kg	4.08	mg/kg	M	1.1E-05	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	3.7E-02
	Manganese (Soil)	174	mg/kg	174	mg/kg	M	4.8E-04	mg/kg/day	1.4E-01	mg/kg/day	N/A	N/A	3.4E-03
	Thallium	0.588	mg/kg	0.588	mg/kg	M	1.6E-06	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	2.3E-02
	(Total)												6.4E-02
Dermal	Benzo(a)pyrene	0.115	mg/kg	0.115	mg/kg	M	5.1E-08	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Arsenic	4.08	mg/kg	4.08	mg/kg	M	4.2E-07	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	1.4E-03
	Manganese (Soil)	174	mg/kg	174	mg/kg	M	0.0E+00	mg/kg/day	5.6E-03	mg/kg/day	N/A	N/A	- -
	Thallium	0.588	mg/kg	0.588	mg/kg	M	0.0E+00	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	- -
	(Total)												1.4E-03
												Total Hazard Index Across All Exposure Routes/Pathways	6.5E-02

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Chronic.

TABLE 7.9
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Surface/Subsurfacec Soil
Exposure Medium: Surface/Subsurfacec Soil
Exposure Point: Hospital Incinerators (Site 16)
Receptor Population: Adult Residnts
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	0.330	mg/kg	0.330	mg/kg	M	1.9E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Arsenic	8.50	mg/kg	8.50	mg/kg	M	5.0E-06	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	1.7E-02
	Manganese (Soil)	400	mg/kg	400	mg/kg	M	2.3E-04	mg/kg/day	1.4E-01	mg/kg/day	N/A	N/A	1.7E-03
	Thallium	1.20	mg/kg	1.20	mg/kg	M	7.0E-07	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	1.0E-02
	(Total)												2.8E-02
Dermal	Benzo(a)pyrene	0.330	mg/kg	0.330	mg/kg	M	6.7E-08	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Arsenic	8.50	mg/kg	8.50	mg/kg	M	4.0E-07	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	1.3E-03
	Manganese (Soil)	400	mg/kg	400	mg/kg	M	0.0E+00	mg/kg/day	5.6E-03	mg/kg/day	N/A	N/A	- -
	Thallium	1.20	mg/kg	1.20	mg/kg	M	0.0E+00	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	- -
	(Total)												1.3E-03
												Total Hazard Index Across All Exposure Routes/Pathways	3.0E-02

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Chronic.

TABLE 7.10
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Surface/Subsurfacec Soil
Exposure Medium: Surface/Subsurfacec Soil
Exposure Point: Hospital Incinerators (Site 16)
Receptor Population: Adult Residnts
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Benzo(a)pyrene	0.115	mg/kg	0.115	mg/kg	M	3.4E-08	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Arsenic	4.08	mg/kg	4.08	mg/kg	M	1.2E-06	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	4.0E-03
	Manganese (Soil)	174	mg/kg	174	mg/kg	M	5.1E-05	mg/kg/day	1.4E-01	mg/kg/day	N/A	N/A	3.6E-04
	Thallium	0.588	mg/kg	0.588	mg/kg	M	1.7E-07	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	2.5E-03
	(Total)												6.8E-03
Dermal	Benzo(a)pyrene	0.115	mg/kg	0.115	mg/kg	M	3.3E-09	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Arsenic	4.08	mg/kg	4.08	mg/kg	M	2.7E-08	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	9.1E-05
	Manganese (Soil)	174	mg/kg	174	mg/kg	M	0.0E+00	mg/kg/day	5.6E-03	mg/kg/day	N/A	N/A	- -
	Thallium	0.588	mg/kg	0.588	mg/kg	M	0.0E+00	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	- -
	(Total)												9.1E-05
												Total Hazard Index Across All Exposure Routes/Pathways	6.9E-03

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Chronic.

TABLE 8.1
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Hospital Incinerators (Site 16)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	0.330	mg/kg	0.330	mg/kg	M	1.1E-08	mg/kg/day	7.3E+00	(mg/kg/day) -1	7.8E-08
	Arsenic	8.50	mg/kg	8.50	mg/kg	M	2.7E-07	mg/kg/day	1.5E+00	(mg/kg/day) -1	4.1E-07
	Manganese (Soil)	400	mg/kg	400	mg/kg	M	1.3E-05	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	1.20	mg/kg	1.20	mg/kg	M	3.9E-08	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										4.9E-07
Dermal	Benzo(a)pyrene	0.330	mg/kg	0.330	mg/kg	M	2.2E-09	mg/kg/day	7.3E+00	(mg/kg/day) -1	1.6E-08
	Arsenic	8.50	mg/kg	8.50	mg/kg	M	1.3E-08	mg/kg/day	1.5E+00	(mg/kg/day) -1	2.0E-08
	Manganese (Soil)	400	mg/kg	400	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	1.20	mg/kg	1.20	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										3.5E-08
										Total Risk Across All Exposure Routes/Pathways	5.2E-07

(1) Medium-Specific (M) EPC selected for hazard calculation.

TABLE 8.2
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Hospital Incinerators (Site 16)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	0.115	mg/kg	0.115	mg/kg	M	1.2E-09	mg/kg/day	7.3E+00	(mg/kg/day) -1	9.0E-09
	Arsenic	4.08	mg/kg	4.08	mg/kg	M	4.4E-08	mg/kg/day	1.5E+00	(mg/kg/day) -1	6.6E-08
	Manganese (Soil)	174	mg/kg	174	mg/kg	M	1.9E-06	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	0.588	mg/kg	0.588	mg/kg	M	6.3E-09	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										7.5E-08
Dermal	Benzo(a)pyrene	0.115	mg/kg	0.115	mg/kg	M	5.1E-11	mg/kg/day	7.3E+00	(mg/kg/day) -1	3.7E-10
	Arsenic	4.08	mg/kg	4.08	mg/kg	M	4.2E-10	mg/kg/day	1.5E+00	(mg/kg/day) -1	6.2E-10
	Manganese (Soil)	174	mg/kg	174	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	0.588	mg/kg	0.588	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										9.9E-10
										Total Risk Across All Exposure Routes/Pathways	7.6E-08

(1) Medium-Specific (M) EPC selected for hazard calculation.

TABLE 8.3
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Hospital Incinerators (Site 16)
Receptor Population: Full-Time Employees
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	0.330	mg/kg	0.330	mg/kg	M	6.9E-08	mg/kg/day	7.3E+00	(mg/kg/day) -1	5.1E-07
	Arsenic	8.50	mg/kg	8.50	mg/kg	M	1.8E-06	mg/kg/day	1.5E+00	(mg/kg/day) -1	2.7E-06
	Manganese (Soil)	400	mg/kg	400	mg/kg	M	8.4E-05	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	1.20	mg/kg	1.20	mg/kg	M	2.5E-07	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										3.2E-06
Dermal	Benzo(a)pyrene	0.330	mg/kg	0.330	mg/kg	M	6.8E-08	mg/kg/day	7.3E+00	(mg/kg/day) -1	5.0E-07
	Arsenic	8.50	mg/kg	8.50	mg/kg	M	4.1E-07	mg/kg/day	1.5E+00	(mg/kg/day) -1	6.1E-07
	Manganese (Soil)	400	mg/kg	400	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	1.20	mg/kg	1.20	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										1.1E-06
										Total Risk Across All Exposure Routes/Pathways	4.3E-06

(1) Medium-Specific (M) EPC selected for hazard calculation.

TABLE 8.4
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Hospital Incinerators (Site 16)
Receptor Population: Full-Time Employees
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	0.119	mg/kg	0.119	mg/kg	M	3.0E-09	mg/kg/day	7.3E+00	(mg/kg/day) -1	2.2E-08
	Arsenic	4.03	mg/kg	4.03	mg/kg	M	1.0E-07	mg/kg/day	1.5E+00	(mg/kg/day) -1	1.5E-07
	Manganese (Soil)	173	mg/kg	173	mg/kg	M	4.3E-06	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	0.609	mg/kg	0.609	mg/kg	M	1.5E-08	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										1.7E-07
Dermal	Benzo(a)pyrene	0.119	mg/kg	0.119	mg/kg	M	5.9E-10	mg/kg/day	7.3E+00	(mg/kg/day) -1	4.3E-09
	Arsenic	4.03	mg/kg	4.03	mg/kg	M	4.6E-09	mg/kg/day	1.5E+00	(mg/kg/day) -1	6.9E-09
	Manganese (Soil)	173	mg/kg	173	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	0.609	mg/kg	0.609	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										1.1E-08
										Total Risk Across All Exposure Routes/Pathways	1.9E-07

(1) Medium-Specific (M) EPC selected for hazard calculation.

TABLE 8.5
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Hospital Incinerators (Site 16)
Receptor Population: Older Child Trespasser
Receptor Age: Adolescent

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	0.330	mg/kg	0.330	mg/kg	M	3.6E-08	mg/kg/day	7.3E+00	(mg/kg/day) -1	2.6E-07
	Arsenic	8.50	mg/kg	8.50	mg/kg	M	9.3E-07	mg/kg/day	1.5E+00	(mg/kg/day) -1	1.4E-06
	Manganese (Soil)	400	mg/kg	400	mg/kg	M	4.4E-05	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	1.20	mg/kg	1.20	mg/kg	M	1.3E-07	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										1.7E-06
Dermal	Benzo(a)pyrene	0.330	mg/kg	0.330	mg/kg	M	3.0E-08	mg/kg/day	7.3E+00	(mg/kg/day) -1	2.2E-07
	Arsenic	8.50	mg/kg	8.50	mg/kg	M	1.8E-07	mg/kg/day	1.5E+00	(mg/kg/day) -1	2.6E-07
	Manganese (Soil)	400	mg/kg	400	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	1.20	mg/kg	1.20	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										4.8E-07
										Total Risk Across All Exposure Routes/Pathways	2.1E-06

(1) Medium-Specific (M) EPC selected for hazard calculation.

TABLE 8.6
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Hospital Incinerators (Site 16)
Receptor Population: Older Child Trespasser
Receptor Age: Adolescent

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	0.119	mg/kg	0.119	mg/kg	M	8.5E-10	mg/kg/day	7.3E+00	(mg/kg/day) -1	6.2E-09
	Arsenic	4.03	mg/kg	4.03	mg/kg	M	2.9E-08	mg/kg/day	1.5E+00	(mg/kg/day) -1	4.3E-08
	Manganese (Soil)	173	mg/kg	173	mg/kg	M	1.2E-06	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	0.609	mg/kg	0.609	mg/kg	M	4.3E-09	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										4.9E-08
Dermal	Benzo(a)pyrene	0.119	mg/kg	0.119	mg/kg	M	4.2E-10	mg/kg/day	7.3E+00	(mg/kg/day) -1	3.0E-09
	Arsenic	4.03	mg/kg	4.03	mg/kg	M	3.2E-09	mg/kg/day	1.5E+00	(mg/kg/day) -1	4.9E-09
	Manganese (Soil)	173	mg/kg	173	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	0.609	mg/kg	0.609	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										7.9E-09
										Total Risk Across All Exposure Routes/Pathways	5.7E-08

(1) Medium-Specific (M) EPC selected for hazard calculation.

TABLE 8.7
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Hospital Incinerators (Site 16)
Receptor Population: Child Residnts
Receptor Age: Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	0.330	mg/kg	0.330	mg/kg	M	1.5E-07	mg/kg/day	7.3E+00	(mg/kg/day) -1	1.1E-06
	Arsenic	8.50	mg/kg	8.50	mg/kg	M	4.0E-06	mg/kg/day	1.5E+00	(mg/kg/day) -1	6.0E-06
	Manganese (Soil)	400	mg/kg	400	mg/kg	M	1.9E-04	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	1.20	mg/kg	1.20	mg/kg	M	5.6E-07	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										7.1E-06
Dermal	Benzo(a)pyrene	0.330	mg/kg	0.330	mg/kg	M	4.2E-08	mg/kg/day	7.3E+00	(mg/kg/day) -1	3.1E-07
	Arsenic	8.50	mg/kg	8.50	mg/kg	M	2.5E-07	mg/kg/day	1.5E+00	(mg/kg/day) -1	3.8E-07
	Manganese (Soil)	400	mg/kg	400	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	1.20	mg/kg	1.20	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										6.8E-07
										Total Risk Across All Exposure Routes/Pathways	7.8E-06

(1) Medium-Specific (M) EPC selected for hazard calculation.

TABLE 8.8
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Hospital Incinerators (Site 16)
Receptor Population: Child Residnts
Receptor Age: Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	0.115	mg/kg	0.115	mg/kg	M	9.0E-09	mg/kg/day	7.3E+00	(mg/kg/day) -1	6.6E-08
	Arsenic	4.08	mg/kg	4.08	mg/kg	M	3.2E-07	mg/kg/day	1.5E+00	(mg/kg/day) -1	4.8E-07
	Manganese (Soil)	174	mg/kg	174	mg/kg	M	1.4E-05	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	0.588	mg/kg	0.588	mg/kg	M	4.6E-08	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										5.4E-07
Dermal	Benzo(a)pyrene	0.115	mg/kg	0.115	mg/kg	M	1.5E-09	mg/kg/day	7.3E+00	(mg/kg/day) -1	1.1E-08
	Arsenic	4.08	mg/kg	4.08	mg/kg	M	1.2E-08	mg/kg/day	1.5E+00	(mg/kg/day) -1	1.8E-08
	Manganese (Soil)	174	mg/kg	174	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	0.588	mg/kg	0.588	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										2.9E-08
										Total Risk Across All Exposure Routes/Pathways	5.7E-07

(1) Medium-Specific (M) EPC selected for hazard calculation.

TABLE 8.9
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Surface/Subsurfacec Soil
Exposure Medium: Surface/Subsurfacec Soil
Exposure Point: Hospital Incinerators (Site 16)
Receptor Population: Adult Residnts
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	0.330	mg/kg	0.330	mg/kg	M	6.6E-08	mg/kg/day	7.3E+00	(mg/kg/day) -1	4.8E-07
	Arsenic	8.50	mg/kg	8.50	mg/kg	M	1.7E-06	mg/kg/day	1.5E+00	(mg/kg/day) -1	2.6E-06
	Manganese (Soil)	400	mg/kg	400	mg/kg	M	8.1E-05	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	1.20	mg/kg	1.20	mg/kg	M	2.4E-07	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										3.1E-06
Dermal	Benzo(a)pyrene	0.330	mg/kg	0.330	mg/kg	M	2.3E-08	mg/kg/day	7.3E+00	(mg/kg/day) -1	1.7E-07
	Arsenic	8.50	mg/kg	8.50	mg/kg	M	1.4E-07	mg/kg/day	1.5E+00	(mg/kg/day) -1	2.0E-07
	Manganese (Soil)	400	mg/kg	400	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	1.20	mg/kg	1.20	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										3.7E-07
										Total Risk Across All Exposure Routes/Pathways	3.4E-06

(1) Medium-Specific (M) EPC selected for hazard calculation.

TABLE 8.10
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Surface/Subsurfacec Soil
Exposure Medium: Surface/Subsurfacec Soil
Exposure Point: Hospital Incinerators (Site 16)
Receptor Population: Adult Residnts
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Benzo(a)pyrene	0.115	mg/kg	0.115	mg/kg	M	3.4E-09	mg/kg/day	7.3E+00	(mg/kg/day) -1	2.5E-08
	Arsenic	4.08	mg/kg	4.08	mg/kg	M	1.2E-07	mg/kg/day	1.5E+00	(mg/kg/day) -1	1.8E-07
	Manganese (Soil)	174	mg/kg	174	mg/kg	M	5.1E-06	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	0.588	mg/kg	0.588	mg/kg	M	1.7E-08	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										2.0E-07
Dermal	Benzo(a)pyrene	0.115	mg/kg	0.115	mg/kg	M	3.3E-10	mg/kg/day	7.3E+00	(mg/kg/day) -1	2.4E-09
	Arsenic	4.08	mg/kg	4.08	mg/kg	M	2.7E-09	mg/kg/day	1.5E+00	(mg/kg/day) -1	4.1E-09
	Manganese (Soil)	174	mg/kg	174	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	0.588	mg/kg	0.588	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										6.5E-09
										Total Risk Across All Exposure Routes/Pathways	2.1E-07

(1) Medium-Specific (M) EPC selected for hazard calculation.

TABLE 9.1
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface/Subsurface Soil	Surface/Subsurface Soil	Hospital Incinerators (Site 16)	Benzo(a)pyrene	7.8E-08	- -	1.6E-08	9.4E-08	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Arsenic	4.1E-07	- -	2.0E-08	4.3E-07	Arsenic	Skin	6.4E-02	- -	3.0E-03	6.7E-02
			Manganese (Soil)	- -	- -	- -	- -	Manganese (Soil)	CNS	6.4E-03	- -	- -	6.4E-03
			Thallium	- -	- -	- -	- -	Thallium	None Specified	3.9E-02	- -	- -	3.9E-02
			(Total)	4.9E-07	- -	3.5E-08	5.2E-07	(Total)		1.1E-01	- -	3.0E-03	1.1E-01
			Total Risk Across Surface/Subsurface Soil				5.2E-07	Total Hazard Index Across All Media and All Exposure Routes					1.1E-01
			Total Risk Across All Media and All Exposure Routes				5.2E-07						

Total Skin HI	6.7E-02
Total None Specified HI	3.9E-02
Total CNS HI	6.4E-03

TABLE 9.2
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface/Subsurface Soil	Surface/Subsurface Soil	Hospital Incinerators (Site 16)	Benzo(a)pyrene	9.0E-09	- -	3.7E-10	9.4E-09	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Arsenic	6.6E-08	- -	6.2E-10	6.6E-08	Arsenic	Skin	1.0E-02	- -	9.7E-05	1.0E-02
			Manganese (Soil)	- -	- -	- -	- -	Manganese (Soil)	CNS	9.3E-04	- -	- -	9.3E-04
			Thallium	- -	- -	- -	- -	Thallium	None Specified	6.3E-03	- -	- -	6.3E-03
			(Total)	7.5E-08	- -	9.9E-10	7.6E-08	(Total)		1.7E-02	- -	9.7E-05	1.8E-02
			Total Risk Across Surface/Subsurface Soil				7.6E-08	Total Hazard Index Across All Media and All Exposure Routes					1.8E-02
			Total Risk Across All Media and All Exposure Routes				7.6E-08						

Total Skin HI	1.0E-02
Total None Specified HI	6.3E-03
Total CNS HI	9.3E-04

TABLE 9.3
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Full-Time Employees
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Hospital Incinerators (Site 16)	Benzo(a)pyrene	5.1E-07	- -	5.0E-07	1.0E-06	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Arsenic	2.7E-06	- -	6.1E-07	3.3E-06	Arsenic	Skin	1.7E-02	- -	3.8E-03	2.0E-02
			Manganese (Soil)	- -	- -	- -	- -	Manganese (Soil)	CNS	1.7E-03	- -	- -	1.7E-03
			Thallium	- -	- -	- -	- -	Thallium	None Specified	1.0E-02	- -	- -	1.0E-02
			(Total)	3.2E-06	- -	1.1E-06	4.3E-06	(Total)		2.8E-02	- -	3.8E-03	3.2E-02
						Total Risk Across Soil	4.3E-06					Total Hazard Index Across All Media and All Exposure Routes	3.2E-02
						Total Risk Across All Media and All Exposure Routes	4.3E-06						

Total Skin HI	2.0E-02
Total None Specified HI	1.0E-02
Total CNS HI	1.7E-03

TABLE 9.4
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Full-Time Employees
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Hospital Incinerators (Site 16)	Benzo(a)pyrene	2.2E-08	- -	4.3E-09	2.6E-08	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Arsenic	1.5E-07	- -	6.9E-09	1.6E-07	Arsenic	Skin	3.9E-03	- -	1.8E-04	4.1E-03
			Manganese (Soil)	- -	- -	- -	- -	Manganese (Soil)	CNS	3.6E-04	- -	- -	3.6E-04
			Thallium	- -	- -	- -	- -	Thallium	None Specified	2.6E-03	- -	- -	2.6E-03
			(Total)	1.7E-07	- -	1.1E-08	1.9E-07	(Total)		6.9E-03	- -	1.8E-04	7.0E-03
						Total Risk Across Soil	1.9E-07					Total Hazard Index Across All Media and All Exposure Routes	7.0E-03
						Total Risk Across All Media and All Exposure Routes	1.9E-07						

Total Skin HI	4.1E-03
Total None Specified HI	2.6E-03
Total CNS HI	3.6E-04

TABLE 9.5
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Older Child Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Hospital Incinerators (Site 16)	Benzo(a)pyrene	2.6E-07	- -	2.2E-07	4.8E-07	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Arsenic	1.4E-06	- -	2.6E-07	1.7E-06	Arsenic	Skin	2.2E-02	- -	4.1E-03	2.6E-02
			Manganese (Soil)	- -	- -	- -	- -	Manganese (Soil)	CNS	2.2E-03	- -	- -	2.2E-03
			Thallium	- -	- -	- -	- -	Thallium	None Specified	1.3E-02	- -	- -	1.3E-02
			(Total)	1.7E-06	- -	4.8E-07	2.1E-06	(Total)		3.7E-02	- -	4.1E-03	4.1E-02
							Total Risk Across Soil 2.1E-06						Total Hazard Index Across All Media and All Exposure Routes 4.1E-02
							Total Risk Across All Media and All Exposure Routes 2.1E-06						

Total Skin HI	2.6E-02
Total None Specified HI	1.3E-02
Total CNS HI	2.2E-03

TABLE 9.6
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Older Child Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Hospital Incinerators (Site 16)	Benzo(a)pyrene	6.2E-09	- -	3.0E-09	9.2E-09	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Arsenic	4.3E-08	- -	4.9E-09	4.8E-08	Arsenic	Skin	2.2E-03	- -	2.5E-04	2.5E-03
			Manganese (Soil)	- -	- -	- -	- -	Manganese (Soil)	CNS	2.0E-04	- -	- -	2.0E-04
			Thallium	- -	- -	- -	- -	Thallium	None Specified	1.4E-03	- -	- -	1.4E-03
			(Total)	4.9E-08	- -	7.9E-09	5.7E-08	(Total)		3.9E-03	- -	2.5E-04	4.1E-03
						Total Risk Across Soil	5.7E-08					Total Hazard Index Across All Media and All Exposure Routes	4.1E-03
						Total Risk Across All Media and All Exposure Routes	5.7E-08						

Total Skin HI	2.5E-03
Total None Specified HI	1.4E-03
Total CNS HI	2.0E-04

TABLE 9.7
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Child Residnts
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface/Subsurface Soil	Surface/Subsurface Soil	Hospital Incinerators (Site 16)	Benzo(a)pyrene	1.1E-06	- -	3.1E-07	1.4E-06	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Arsenic	6.0E-06	- -	3.8E-07	6.4E-06	Arsenic	Skin	1.6E-01	- -	9.8E-03	1.7E-01
			Manganese (Soil)	- -	- -	- -	- -	Manganese (Soil)	CNS	1.6E-02	- -	- -	1.6E-02
			Thallium	- -	- -	- -	- -	Thallium	None Specified	9.4E-02	- -	- -	9.4E-02
			(Total)	7.1E-06	- -	6.8E-07	7.8E-06	(Total)		2.6E-01	- -	9.8E-03	2.7E-01
			Total Risk Across Surface/Subsurface Soil				7.8E-06	Total Hazard Index Across All Media and All Exposure Routes					2.7E-01
			Total Risk Across All Media and All Exposure Routes				7.8E-06						

Total Skin HI	1.7E-01
Total None Specified HI	9.4E-02
Total CNS HI	1.6E-02

TABLE 9.8
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Child Residnts
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface/Subsurface Soil	Surface/Subsurface Soil	Hospital Incinerators (Site 16)	Benzo(a)pyrene	6.6E-08	- -	1.1E-08	7.6E-08	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Arsenic	4.8E-07	- -	1.8E-08	5.0E-07	Arsenic	Skin	3.7E-02	- -	1.4E-03	3.9E-02
			Manganese (Soil)	- -	- -	- -	- -	Manganese (Soil)	CNS	3.4E-03	- -	- -	3.4E-03
			Thallium	- -	- -	- -	- -	Thallium	None Specified	2.3E-02	- -	- -	2.3E-02
			(Total)	5.4E-07	- -	2.9E-08	5.7E-07	(Total)		6.4E-02	- -	1.4E-03	6.5E-02
			Total Risk Across Surface/Subsurface Soil				5.7E-07	Total Hazard Index Across All Media and All Exposure Routes					6.5E-02
			Total Risk Across All Media and All Exposure Routes				5.7E-07						

Total Skin HI	3.9E-02
Total None Specified HI	2.3E-02
Total CNS HI	3.4E-03

TABLE 9.9
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Adult Residnts
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface/Subsurfacec Soil	Surface/Subsurfacec Soil	Hospital Incinerators (Site 16)	Benzo(a)pyrene	4.8E-07	- -	1.7E-07	6.5E-07	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Arsenic	2.6E-06	- -	2.0E-07	2.8E-06	Arsenic	Skin	1.7E-02	- -	1.3E-03	1.8E-02
			Manganese (Soil)	- -	- -	- -	- -	Manganese (Soil)	CNS	1.7E-03	- -	- -	1.7E-03
			Thallium	- -	- -	- -	- -	Thallium	None Specified	1.0E-02	- -	- -	1.0E-02
			(Total)	3.1E-06	- -	3.7E-07	3.4E-06	(Total)		2.8E-02	- -	1.3E-03	3.0E-02
			Total Risk Across Surface/Subsurface Soil				3.4E-06	Total Hazard Index Across All Media and All Exposure Routes					3.0E-02
			Total Risk Across All Media and All Exposure Routes				3.4E-06						

Total Skin HI	1.8E-02
Total None Specified HI	1.0E-02
Total CNS HI	1.7E-03

TABLE 9.10
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Adult Residnts
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface/Subsurfacec Soil	Surface/Subsurfacec Soil	Hospital Incinerators (Site 16)	Benzo(a)pyrene	2.5E-08	- -	2.4E-09	2.7E-08	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Arsenic	1.8E-07	- -	4.1E-09	1.8E-07	Arsenic	Skin	4.0E-03	- -	9.1E-05	4.1E-03
			Manganese (Soil)	- -	- -	- -	- -	Manganese (Soil)	CNS	3.6E-04	- -	- -	3.6E-04
			Thallium	- -	- -	- -	- -	Thallium	None Specified	2.5E-03	- -	- -	2.5E-03
			(Total)	2.0E-07	- -	6.5E-09	2.1E-07	(Total)		6.8E-03	- -	9.1E-05	6.9E-03
			Total Risk Across Surface/Subsurface Soil				2.1E-07	Total Hazard Index Across All Media and All Exposure Routes					6.9E-03
			Total Risk Across All Media and All Exposure Routes				2.1E-07						

Total Skin HI	4.1E-03
Total None Specified HI	2.5E-03
Total CNS HI	3.6E-04

TABLE 10.1
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface/Subsurface Soil	Surface/Subsurface Soil	Hospital Incinerators (Site 16)	Benzo(a)pyrene	7.8E-08	- -	1.6E-08	9.4E-08	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Arsenic	4.1E-07	- -	2.0E-08	4.3E-07	Arsenic	Skin	6.4E-02	- -	3.0E-03	6.7E-02
			Manganese (Soil)	- -	- -	- -	- -	Manganese (Soil)	CNS	6.4E-03	- -	- -	6.4E-03
			Thallium	- -	- -	- -	- -	Thallium	None Specified	3.9E-02	- -	- -	3.9E-02
			(Total)	4.9E-07	- -	3.5E-08	5.2E-07	(Total)		1.1E-01	- -	3.0E-03	1.1E-01
			Total Risk Across Surface/Subsurface Soil				5.2E-07	Total Hazard Index Across All Media and All Exposure Routes					1.1E-01
			Total Risk Across All Media and All Exposure Routes				5.2E-07						

Total Skin HI	6.7E-02
Total None Specified HI	3.9E-02
Total CNS HI	6.4E-03

TABLE 10.2
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface/Subsurface Soil	Surface/Subsurface Soil	Hospital Incinerators (Site 16)	Benzo(a)pyrene	9.0E-09	- -	3.7E-10	9.4E-09	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Arsenic	6.6E-08	- -	6.2E-10	6.6E-08	Arsenic	Skin	1.0E-02	- -	9.7E-05	1.0E-02
			Manganese (Soil)	- -	- -	- -	- -	Manganese (Soil)	CNS	9.3E-04	- -	- -	9.3E-04
			Thallium	- -	- -	- -	- -	Thallium	None Specified	6.3E-03	- -	- -	6.3E-03
			(Total)	7.5E-08	- -	9.9E-10	7.6E-08	(Total)		1.7E-02	- -	9.7E-05	1.8E-02
			Total Risk Across Surface/Subsurface Soil				7.6E-08		Total Hazard Index Across All Media and All Exposure Routes				1.8E-02
			Total Risk Across All Media and All Exposure Routes				7.6E-08						

Total Skin HI	1.0E-02
Total None Specified HI	6.3E-03
Total CNS HI	9.3E-04

TABLE 10.3
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Full-Time Employees
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Hospital Incinerators (Site 16)	Benzo(a)pyrene	5.1E-07	- -	5.0E-07	1.0E-06	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Arsenic	2.7E-06	- -	6.1E-07	3.3E-06	Arsenic	Skin	1.7E-02	- -	3.8E-03	2.0E-02
			(Total)	3.2E-06	- -	1.1E-06	4.3E-06	(Total)		1.7E-02	- -	3.8E-03	2.0E-02
						Total Risk Across Soil	4.3E-06					Total Hazard Index Across All Media and All Exposure Routes	2.0E-02
						Total Risk Across All Media and All Exposure Routes	4.3E-06						
												Total Skin HI	2.0E-02

TABLE 10.4
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Full-Time Employees
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Hospital Incinerators (Site 16)	Benzo(a)pyrene	2.2E-08	- -	4.3E-09	2.6E-08	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Arsenic	1.5E-07	- -	6.9E-09	1.6E-07	Arsenic	Skin	3.9E-03	- -	1.8E-04	4.1E-03
			Manganese (Soil)	- -	- -	- -	- -	Manganese (Soil)	CNS	3.6E-04	- -	- -	3.6E-04
			Thallium	- -	- -	- -	- -	Thallium	None Specified	2.6E-03	- -	- -	2.6E-03
			(Total)	1.7E-07	- -	1.1E-08	1.9E-07	(Total)		6.9E-03	- -	1.8E-04	7.0E-03
						Total Risk Across Soil	1.9E-07					Total Hazard Index Across All Media and All Exposure Routes	7.0E-03
						Total Risk Across All Media and All Exposure Routes	1.9E-07						

Total Skin HI	4.1E-03
Total None Specified HI	2.6E-03
Total CNS HI	3.6E-04

TABLE 10 5
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Older Child Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Hospital Incinerators (Site 16)	Arsenic	1.4E-06	- -	2.6E-07	1.7E-06	Arsenic	Skin	2.2E-02	- -	4.1E-03	2.6E-02
			(Total)	1.4E-06	- -	2.6E-07	1.7E-06	(Total)		2.2E-02	- -	4.1E-03	2.6E-02
						Total Risk Across Soil	1.7E-06					Total Hazard Index Across All Media and All Exposure Routes	2.6E-02
						Total Risk Across All Media and All Exposure Routes	1.7E-06						
												Total Skin HI	2.6E-02

TABLE 10.6
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Older Child Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Hospital Incinerators (Site 16)	Benzo(a)pyrene	6.2E-09	- -	3.0E-09	9.2E-09	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Arsenic	4.3E-08	- -	4.9E-09	4.8E-08	Arsenic	Skin	2.2E-03	- -	2.5E-04	2.5E-03
			Manganese (Soil)	- -	- -	- -	- -	Manganese (Soil)	CNS	2.0E-04	- -	- -	2.0E-04
			Thallium	- -	- -	- -	- -	Thallium	None Specified	1.4E-03	- -	- -	1.4E-03
			(Total)	4.9E-08	- -	7.9E-09	5.7E-08	(Total)		3.9E-03	- -	2.5E-04	4.1E-03
						Total Risk Across Soil	5.7E-08					Total Hazard Index Across All Media and All Exposure Routes	4.1E-03
						Total Risk Across All Media and All Exposure Routes	5.7E-08						

Total Skin HI	2.5E-03
Total None Specified HI	1.4E-03
Total CNS HI	2.0E-04

TABLE 10.7
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Child Residnts
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface/Subsurface Soil	Surface/Subsurface Soil	Hospital Incinerators (Site 16)	Benzo(a)pyrene	1.1E-06	- -	3.1E-07	1.4E-06	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Arsenic	6.0E-06	- -	3.8E-07	6.4E-06	Arsenic	Skin	1.6E-01	- -	9.8E-03	1.7E-01
			(Total)	7.1E-06	- -	6.8E-07	7.8E-06	(Total)		1.6E-01	- -	9.8E-03	1.7E-01
			Total Risk Across Surface/Subsurface Soil				7.8E-06	Total Hazard Index Across All Media and All Exposure Routes					1.7E-01
			Total Risk Across All Media and All Exposure Routes				7.8E-06						
								Total Skin HI					1.7E-01

TABLE 10.8
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Child Residnts
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface/Subsurface Soil	Surface/Subsurface Soil	Hospital Incinerators (Site 16)	Benzo(a)pyrene	6.6E-08	- -	1.1E-08	7.6E-08	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Arsenic	4.8E-07	- -	1.8E-08	5.0E-07	Arsenic	Skin	3.7E-02	- -	1.4E-03	3.9E-02
			Manganese (Soil)	- -	- -	- -	- -	Manganese (Soil)	CNS	3.4E-03	- -	- -	3.4E-03
			Thallium	- -	- -	- -	- -	Thallium	None Specified	2.3E-02	- -	- -	2.3E-02
			(Total)	5.4E-07	- -	2.9E-08	5.7E-07	(Total)		6.4E-02	- -	1.4E-03	6.5E-02
			Total Risk Across Surface/Subsurface Soil				5.7E-07	Total Hazard Index Across All Media and All Exposure Routes					6.5E-02
			Total Risk Across All Media and All Exposure Routes				5.7E-07						

Total Skin HI	3.9E-02
Total None Specified HI	2.3E-02
Total CNS HI	3.4E-03

TABLE 10.9
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Adult Residnts
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
All Soil	All Soil	Hospital Incinerators (Site 16)	Arsenic	2.6E-06	- -	2.0E-07	2.8E-06	Arsenic	Skin	1.7E-02	- -	1.3E-03	1.8E-02
			(Total)	2.6E-06	- -	2.0E-07	2.8E-06	(Total)		1.7E-02	- -	1.3E-03	1.8E-02
			Total Risk Across Surface/Subsurface Soil				2.8E-06	Total Hazard Index Across All Media and All Exposure Routes					1.8E-02
			Total Risk Across All Media and All Exposure Routes				2.8E-06						

Total Skin HI 1.8E-02

TABLE 10.10
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Adult Residnts
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface/Subsurfacec Soil	Surface/Subsurfacec Soil	Hospital Incinerators (Site 16)	Benzo(a)pyrene	2.5E-08	- -	2.4E-09	2.7E-08	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Arsenic	1.8E-07	- -	4.1E-09	1.8E-07	Arsenic	Skin	4.0E-03	- -	9.1E-05	4.1E-03
			Manganese (Soil)	- -	- -	- -	- -	Manganese (Soil)	CNS	3.6E-04	- -	- -	3.6E-04
			Thallium	- -	- -	- -	- -	Thallium	None Specifiec	2.5E-03	- -	- -	2.5E-03
			(Total)	2.0E-07	- -	6.5E-09	2.1E-07	(Total)		6.8E-03	- -	9.1E-05	6.9E-03
			Total Risk Across Surface/Subsurface Soil				2.1E-07	Total Hazard Index Across All Media and All Exposure Routes					6.9E-03
			Total Risk Across All Media and All Exposure Routes				2.1E-07						

Total Skin HI	4.1E-03
Total None Specified HI	2.5E-03
Total CNS HI	3.6E-04

SOLVENT STORAGE AREA (SITE 18)

TABLE 1
SELECTION OF EXPOSURE PATHWAYS
SOLVENT STORAGE AREA (SITE 18)
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current/Future	Surface Soil	Surface Soil	Surface Soil	Construction Workers	Adult	Ingestion Dermal	On-Site On-Site	Quant Quant	Construction workers may have contact with surface soil during excavation activities.
				Full-time Employees	Adult	Ingestion Dermal	On-Site On-Site	Quant Quant	Full-time employees may contact surface soil during normal work activities.
				Trespassers	Adolescents	Ingestion Dermal	On-Site On-Site	Quant Quant	Trespassers may be exposed to surface soil while at the site.
		Air	Surface Soil	Construction Workers	Adult	Inhalation	On-site	Quant	Construction workers may be exposed to fugitive dust and volatile emissions during construction activities.
				Full-time Employees	Adult	Inhalation	On-site	Quant	Full-time employees may be exposed to fugitive dust and volatile emissions during work activities.
				Trespassers	Adolescents	Inhalation	On-Site	Quant	Trespassers may be exposed to fugitive dust and volatile emissions from soil.
	Subsurface Soil	Subsurface Soil	Subsurface Soil	Construction Workers	Adult	Ingestion Dermal	On-Site On-Site	Quant Quant	Construction workers may have contact with subsurface soil during excavation activities.
				Full-time Employees	Adult	Ingestion Dermal	On-Site On-Site	None None	Full-time employees are not exposed to subsurface soil.
				Trespassers	Adolescents	Ingestion Dermal	On-Site On-Site	None None	Trespassers are not exposed to subsurface soil.
		Air	Subsurface Soil	Construction Workers	Adult	Inhalation	On-site	Quant	Construction workers may be exposed to fugitive dust and volatile emissions during construction activities.
				Full-time Employees	Adult	Inhalation	On-site	None	Full-time employees are not exposed to subsurface soil.
				Trespassers	Adolescents	Inhalation	On-Site	None	Trespassers are not exposed to subsurface soil.
Future	Surface Soil	Surface Soil	Surface Soil	Residents	Child	Ingestion Dermal	On-Site On-Site	Quant Quant	Child residents may contact surface soil.
					Adult	Ingestion Dermal	On-Site On-Site	Quant Quant	Adult residents may contact surface soil.
		Air	Surface Soil	Residents	Child	Inhalation	On-site	Quant	Child residents may be exposed to fugitive dust and volatile emissions from surface soil.
					Adult	Inhalation	On-site	Quant	Adult residents may be exposed to fugitive dust and volatile emissions from surface soil.
		Subsurface Soil	Subsurface Soil	Residents	Child	Ingestion Dermal	On-Site On-Site	Quant Quant	Child residents may contact subsurface soil that has been brought to the surface.
					Adult	Ingestion Dermal	On-Site On-Site	Quant Quant	Adult residents may contact subsurface soil that has been brought to the surface.
		Air	Subsurface Soil	Residents	Child	Inhalation	On-site	Quant	Child residents may be exposed to fugitive dust and volatile emissions from subsurface soil that has been brought to the surface.
					Adult	Inhalation	On-site	Quant	Adult residents may be exposed to fugitive dust and volatile emissions from subsurface soil that has been brought to the surface.

TABLE 1
SELECTION OF EXPOSURE PATHWAYS
SOLVENT STORAGE AREA (SITE 18)
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current/Future	Groundwater	Groundwater	Overburden Aquifer	Construction Workers	Adult	Ingestion Dermal	On-Site On-Site	None Quant	Construction workers may have dermal contact with groundwater during excavation activities.
				Full-time Employees	Adult	Ingestion Dermal	On-Site On-Site	Quant None	Groundwater may be used as a drinking water source in the future.
				Trespassers	Adolescents	Ingestion Dermal	On-Site On-Site	None None	Trespassers do not have contact with groundwater.
				Residents	Adult	Ingestion Dermal	On-Site On-Site	Quant Quant	Groundwater may be used as a potable water source in the future.
					Child	Ingestion Dermal	On-Site On-Site	None None	Exposures to a child resident are less than those for an adult resident
		Air	Overburden Aquifer	Construction Workers	Adult	Inhalation	On-site	Quant	Construction workers may be exposed to chemicals that have volatilized from groundwater during excavation activities.
				Full-time Employees	Adult	Inhalation	On-site	None	Full-time employees are not exposed to chemicals volatiliizing from groundwater.
				Trespassers	Adolescents	Inhalation	On-Site	None	Trespassers do not have contact with site groundwater.
				Residents	Adult	Inhalation	On-site	Quant	On-site residents may be exposed to volatile emmissions from groundwater while showering or via vapor intrusion.
					Child	Inhalation	On-site	None	Exposures to a child resident are less than those for an adult resident

TABLE 2.1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
DIRECT CONTACT EXPOSURE SCENARIOS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Solvent Storage Area (Site 18)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Risk-Based COPC Screening Level(5)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection(6)
Volatile Organics																	
78-93-3	2-BUTANONE	0.002	J	0.004	J	mg/kg	S18SB020001-SO, S18SB030001-SO	3/3	---	0.002	NA	730	N	NA 500	SSL-INH CTRESSOIL	NO	BSL
108-88-3	TOLUENE	0.001	J	0.006	J	mg/kg	S18SB050001-SO	5/5	---	0.001	NA	52	N	650 500	SSL-INH CTRESSOIL	NO	BSL
Semivolatile Organics																	
83-32-9	ACENAPHTHENE	0.026	J	0.026	J	mg/kg	S18SB010001-SO	1/5	0.18 - 0.2	0.026	NA	370	N	NA 1000	SSL-INH CTRESSOIL	NO	BSL
120-12-7	ANTHRACENE	0.033	J	0.033	J	mg/kg	S18SB010001-SO	1/5	0.18 - 0.2	0.033	NA	2200	N	NA 1000	SSL-INH CTRESSOIL	NO	BSL
56-55-3	BENZO(A)ANTHRACENE	0.071	J	0.071	J	mg/kg	S18SB010001-SO	1/5	0.18 - 0.2	0.071	NA	0.62	C	NA 1	SSL-INH CTRESSOIL	NO	BSL
50-32-8	BENZO(A)PYRENE	0.054	J	0.054	J	mg/kg	S18SB010001-SO	1/5	0.18 - 0.2	0.054	NA	0.062	C	NA 1	SSL-INH CTRESSOIL	NO	BSL
205-99-2	BENZO(B)FLUORANTHENE	0.051	J	0.051	J	mg/kg	S18SB010001-SO	1/5	0.18 - 0.2	0.051	NA	0.62	C	NA 1	SSL-INH CTRESSOIL	NO	BSL
191-24-2	BENZO(G,H,I)PERYLENE	0.068	J	0.068	J	mg/kg	S18SB010001-SO	1/5	0.18 - 0.2	0.068	NA	230(7)	N	NA 1000	SSL-INH CTRESSOIL	NO	BSL
207-08-9	BENZO(K)FLUORANTHENE	0.051	J	0.051	J	mg/kg	S18SB010001-SO	1/5	0.18 - 0.2	0.051	NA	6.2	C	NA 8.4	SSL-INH CTRESSOIL	NO	BSL
86-74-8	CARBAZOLE	0.027	J	0.027	J	mg/kg	S18SB010001-SO	1/5	0.18 - 0.2	0.027	NA	2.4	N	NA 31	SSL-INH CTRESSOIL	NO	BSL
218-01-9	CHRYSENE	0.074	J	0.074	J	mg/kg	S18SB010001-SO	1/5	0.18 - 0.2	0.074	NA	62	C	NA 84	SSL-INH CTRESSOIL	NO	BSL
206-44-0	FLUORANTHENE	0.17	J	0.17	J	mg/kg	S18SB010001-SO	1/5	0.18 - 0.2	0.17	NA	230	N	NA 1000	SSL-INH CTRESSOIL	NO	BSL
86-73-7	FLUORENE	0.024	J	0.024	J	mg/kg	S18SB010001-SO	1/5	0.18 - 0.2	0.024	NA	260	N	NA 1000	SSL-INH CTRESSOIL	NO	BSL
193-39-5	INDENO(1,2,3-CD)PYRENE	0.061	J	0.061	J	mg/kg	S18SB010001-SO	1/5	0.18 - 0.2	0.061	NA	0.62	C	NA 1	SSL-INH CTRESSOIL	NO	BSL
91-20-3	NAPHTHALENE	0.019	J	0.019	J	mg/kg	S18SB010001-SO	1/5	0.18 - 0.2	0.019	NA	5.6	N	NA 1000	SSL-INH CTRESSOIL	NO	BSL
85-01-8	PHENANTHRENE	0.15	J	0.15	J	mg/kg	S18SB010001-SO	1/5	0.18 - 0.2	0.15	NA	230(7)	N	NA 1000	SSL-INH CTRESSOIL	NO	BSL
129-00-0	PYRENE	0.13	J	0.13	J	mg/kg	S18SB010001-SO	1/5	0.18 - 0.2	0.13	NA	230	N	NA 1000	SSL-INH CTRESSOIL	NO	BSL
Inorganics																	
7429-90-5	ALUMINUM	6500		15000		mg/kg	S18SB030001-SO, S18SB040001-SO	5/5	---	15000	17600	7600	N	NA NA	SSL-INH CTRESSOIL	NO	EPAI, BKG
7440-36-0	ANTIMONY	0.73	J	0.73	J	mg/kg	S18SB050001-SO	1/5	0.6 - 0.67	0.73	2.05	3.1	N	NA 27	SSL-INH CTRESSOIL	NO	BSL
7440-38-2	ARSENIC	1.9		4		mg/kg	S18SB030001-SO	5/5	---	4	3.6	0.39	C	750 10	SSL-INH CTRESSOIL	YES	ASL
7440-39-3	BARIUM	24		38		mg/kg	S18SB040001-SO	5/5	---	38	39	540	N	690000 4700	SSL-INH CTRESSOIL	NO	BSL,BKG
7440-70-2	CALCIUM	480	J	1400	J	mg/kg	S18SB020001-SO	4/5	180	1400	314	NA		NA NA	SSL-INH CTRESSOIL	NO	NUT
7440-47-3	CHROMIUM	9.5		19		mg/kg	S18SB030001-SO	5/5	---	19	19.3	30(8)	C	270 100	SSL-INH CTRESSOIL	NO	BSL,BKG
7440-50-8	COPPER	4.2		12		mg/kg	S18SB020001-SO	5/5	---	12	17.9	290	N	NA 2500	SSL-INH CTRESSOIL	NO	BSL,BKG

TABLE 2.1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
DIRECT CONTACT EXPOSURE SCENARIOS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Solvent Storage Area (Site 18)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Risk-Based COPC Screening Level(5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection(6)
7439-89-6	IRON	7500	J	13000	J	mg/kg	S18SB030001-SO, S18SB040001-SO	5/5	---	13000	16800	2300 N	NA NA	SSL-INH CTRESSOIL	NO	EPAI, BKG
7439-92-1	LEAD	2.5		430		mg/kg	S18SB050001-SO	5/5	---	430	17.5	400	NA 500	SSL-INH CTRESSOIL	YES	ASL
7439-95-4	MAGNESIUM	1400		2800		mg/kg	S18SB030001-SO	5/5	---	2800	2460	NA	NA NA	SSL-INH CTRESSOIL	NO	NUT
7439-96-5	MANGANESE	82	J	130	J	mg/kg	S18SB020001-SO	5/5	---	130	172	180 N	NA NA	SSL-INH CTRESSOIL	NO	BSL,BKG
7440-09-7	POTASSIUM	330		1300		mg/kg	S18SB020001-SO	5/5	---	1300	669	NA	NA NA	SSL-INH CTRESSOIL	NO	NUT
7440-22-4	SILVER	1.5	J	3.4		mg/kg	S18SB030001-SO	5/5	---	3.4	0.385	39 N	NA 340	SSL-INH CTRESSOIL	NO	BSL
7440-28-0	THALLIUM	0.43	J	0.64	J	mg/kg	S18SB030001-SO	3/5	0.48 - 0.49	0.64	0.105	0.52 N	NA 5.4	SSL-INH CTRESSOIL	YES	ASL
7440-62-2	VANADIUM	16		33		mg/kg	S18SB030001-SO	5/5	---	33	33.3	55 N	NA 470	SSL-INH CTRESSOIL	NO	BSL,BKG
7440-66-6	ZINC	22		38		mg/kg	S18SB040001-SO	3/5	19 - 21	38	25.6	2300 N	NA 20000	SSL-INH CTRESSOIL	NO	BSL

A shaded value indicates that the concentration used for screening exceeds the criterion or background value.
A shaded chemical name indicates that the chemical has been selected as a COC.

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 Atlantic Environmental Services, April 1995. Background concentrations of Inorganics in Soil - Naval Submarine Base - New London. If the maximum detected concentration of an inorganic is less than the background concentration, then that metal is not selected as a COC.
5 The risk-based COPC screening level for residential land use is presented. The value is based on a target hazard quotient of 0.1 for noncarcinogens (denoted with a "N" flag) or an incremental cancer risk of 1E-6 for carcinogens (denoted with a "C" flag) (USEPA, Region IX, October 1999).
6 The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level and/or an ARAR/TBC(s).
7 Pyrene is used as a surrogate for 2-methylnaphthalene, benzo(g,h,i)perylene, and phenanthrene.
8 Hexavalent Chromium.
9 OSWER soil screening level for residential land use (USEPA, July 1994).

Associated Samples:

S18SB010001-SO
S18SB020001-SO
S18SB030001-SO
S18SB040001-SO
S18SB050001-SO

Definitions:

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogen
COC = Chemical of Concern
J = Estimated Value
N = Noncarcinogen
NA = Not Applicable
SSL-INH = Soil Screening Level for transfers from soil to air (Inhalation) (USEPA, May 1996)
CTRESSOIL - CTDEP direct contact criteria for residential exposures.

Rationale Codes:

For Selection as a COC:
ASL = Above COC Screening Level/ARAR/TBC

For Elimination as a COPC:
BKG = Within Background Levels
BSL = Below COC Screening Level/ARAR/TBC
NUT = Essential Nutrient
EPAI = USEPA Region one does not advocate evaluation of this chemical.

TABLE 2.2
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
MIGRATION PATHWAYS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Solvent Storage Area (Site 18)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	EPA SSL-Soil to GW(5)	CTDEP Mobility Criteria(6)	CTDEP Soil Vapor Volatilization(6)	COPC Flag	Rationale for Contaminant Deletion or Selection(7)
Volatile Organics																
78-93-3	2-BUTANONE	0.002	J	0.004	J	mg/kg	S18SB020001-SO, S18SB030001-SO	3/3	---	0.004	NA	NA	80	2400	NO	BSL
108-88-3	TOLUENE	0.001	J	0.006	J	mg/kg	S18SB050001-SO	5/5	---	0.006	NA	12	67	760	NO	BSL
Semivolatile Organics																
83-32-9	ACENAPHTHENE	0.026	J	0.026	J	mg/kg	S18SB010001-SO	1/5	0.18 - 0.2	0.026	NA	570	84	NA	NO	BSL
120-12-7	ANTHRACENE	0.033	J	0.033	J	mg/kg	S18SB010001-SO	1/5	0.18 - 0.2	0.033	NA	12000	400	NA	NO	BSL
56-55-3	BENZO(A)ANTHRACENE	0.071	J	0.071	J	mg/kg	S18SB010001-SO	1/5	0.18 - 0.2	0.071	NA	2	1	NA	NO	BSL
50-32-8	BENZO(A)PYRENE	0.054	J	0.054	J	mg/kg	S18SB010001-SO	1/5	0.18 - 0.2	0.054	NA	8	1	NA	NO	BSL
205-99-2	BENZO(B)FLUORANTHENE	0.051	J	0.051	J	mg/kg	S18SB010001-SO	1/5	0.18 - 0.2	0.051	NA	NA	1	NA	NO	BSL
191-24-2	BENZO(G,H,I)PERYLENE	0.068	J	0.068	J	mg/kg	S18SB010001-SO	1/5	0.18 - 0.2	0.068	NA	4200(8)	42	NA	NO	BSL
207-08-9	BENZO(K)FLUORANTHENE	0.051	J	0.051	J	mg/kg	S18SB010001-SO	1/5	0.18 - 0.2	0.051	NA	49	1	NA	NO	BSL
86-74-8	CARBAZOLE	0.027	J	0.027	J	mg/kg	S18SB010001-SO	1/5	0.18 - 0.2	0.027	NA	0.6	1	NA	NO	BSL
218-01-9	CHRYSENE	0.074	J	0.074	J	mg/kg	S18SB010001-SO	1/5	0.18 - 0.2	0.074	NA	160	1	NA	NO	BSL
206-44-0	FLUORANTHENE	0.17	J	0.17	J	mg/kg	S18SB010001-SO	1/5	0.18 - 0.2	0.17	NA	4300	56	NA	NO	BSL
86-73-7	FLUORENE	0.024	J	0.024	J	mg/kg	S18SB010001-SO	1/5	0.18 - 0.2	0.024	NA	560	56	NA	NO	BSL
193-39-5	INDENO(1,2,3-CD)PYRENE	0.061	J	0.061	J	mg/kg	S18SB010001-SO	1/5	0.18 - 0.2	0.061	NA	14	1	NA	NO	BSL
91-20-3	NAPHTHALENE	0.019	J	0.019	J	mg/kg	S18SB010001-SO	1/5	0.18 - 0.2	0.019	NA	84	56	NA	NO	BSL
85-01-8	PHENANTHRENE	0.15	J	0.15	J	mg/kg	S18SB010001-SO	1/5	0.18 - 0.2	0.15	NA	4200(8)	40	NA	NO	BSL
129-00-0	PYRENE	0.13	J	0.13	J	mg/kg	S18SB010001-SO	1/5	0.18 - 0.2	0.13	NA	4200	40	NA	NO	BSL
Inorganics																
7429-90-5	ALUMINUM	6500		15000		mg/kg	S18SB030001-SO, S18SB040001-SO	5/5	---	15000	17600	NA	NA(9)	NA	NO	BKG
7440-36-0	ANTIMONY	0.73	J	0.73	J	mg/kg	S18SB050001-SO	1/5	0.6 - 0.67	0.73	2.05	5	NA(9)	NA	NO	BSL
7440-38-2	ARSENIC	1.9		4		mg/kg	S18SB030001-SO	5/5	---	4	3.6	29	NA(9)	NA	NO	BSL
7440-39-3	BARIUM	24		38		mg/kg	S18SB040001-SO	5/5	---	38	39	1600	NA(9)	NA	NO	BSL,BKG
7440-70-2	CALCIUM	480	J	1400	J	mg/kg	S18SB020001-SO	4/5	180	1400	314	NA	NA(9)	NA	NO	NUT
7440-47-3	CHROMIUM	9.5		19		mg/kg	S18SB030001-SO	5/5	---	19	19.3	38	NA(9)	NA	NO	BSL,BKG
7440-50-8	COPPER	4.2		12		mg/kg	S18SB020001-SO	5/5	---	12	17.9	NA	NA(9)	NA	NO	BKG
7439-89-6	IRON	7500	J	13000	J	mg/kg	S18SB030001-SO, S18SB040001-SO	5/5	---	13000	16800	NA	NA(9)	NA	NO	BKG
7439-92-1	LEAD	2.5		430		mg/kg	S18SB050001-SO	5/5	---	430	17.5	NA	NA(9)	NA	NO	NTX
7439-95-4	MAGNESIUM	1400		2800		mg/kg	S18SB030001-SO	5/5	---	2800	2460	NA	NA(9)	NA	NO	NTX
7439-96-5	MANGANESE	82	J	130	J	mg/kg	S18SB020001-SO	5/5	---	130	172	NA	NA(9)	NA	NO	BKG
7440-09-7	POTASSIUM	330		1300		mg/kg	S18SB020001-SO	5/5	---	1300	669	NA	NA(9)	NA	NO	BSL
7440-22-4	SILVER	1.5	J	3.4		mg/kg	S18SB030001-SO	5/5	---	3.4	0.385	34	NA(9)	NA	NO	NTX
7440-28-0	THALLIUM	0.43	J	0.64	J	mg/kg	S18SB030001-SO	3/5	0.48 - 0.49	0.64	0.105	0.7	NA(9)	NA	NO	BSL
7440-62-2	VANADIUM	16		33		mg/kg	S18SB030001-SO	5/5	---	33	33.3	6000	NA(9)	NA	NO	BSL,BKG
7440-66-6	ZINC	22		38		mg/kg	S18SB040001-SO	3/5	19 - 21	38	25.6	12000	NA(9)	NA	NO	BSL

A shaded value indicates that the concentration used for screening exceeds the criterion or background value.
A shaded chemical name indicates that the chemical has been selected as a COPC.

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.

Definitions:
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogen
COC = Chemical of Concern
J = Estimated Value

TABLE 2.2
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
MIGRATION PATHWAYS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Solvent Storage Area (Site 18)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	EPA SSL-Soil to GW(5)	CTDEP Mobility Criteria(6)	CTDEP Soil Vapor Volatilization(6)	COPC Flag	Rationale for Contaminant Deletion or Selection(7)

4 Atlantic Environmental Services, April 1995. Background concentrations of Inorganics in Soil - Naval Submarine Base - New London. If the maximum detected concentration of an inorganic is less than the background concentration, then that metal is not selected as a COC.
5 USEPA Soil Screening Guidance, May 1996.
6 CTDEP Remediation Standard Regulations, 1996.
7 The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level and/or an ARAR/TBC(s).
8 Pyrene is used as a surrogate for benzo(g,h,i)perylene and phenanthrene
9 Mobilization criteria for inorganics developed to be compared to TCLP or SPLP

N = Noncarcinogen
NA = Not Applicable

Rationale Codes:
For Selection as a COC:
ASL = Above COC Screening Level/ARAR/TBC

For Elimination as a COC:
BKG = Within Background Levels

Associated Samples:
S18SB010001-SO
S18SB020001-SO
S18SB030001-SO
S18SB040001-SO
S18SB050001-SO

TABLE 2.3
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
MIGRATION PATHWAYS - SPLP RESULTS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Solvent Storage Area (Site 18)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	CTDEP Mobility Criteria(5)	COPC Flag	Rationale for Contaminant Deletion or Selection(6)
Inorganics														
7440-36-0	ANTIMONY	86		86		ug/L	S18SB050001-SO-P	1/5	2.7	86	NA	60	YES	ASL
7439-95-4	MAGNESIUM	120		120		ug/L	S18SB010001-SO-P, S18SB020001-SO-P	2/5	110 - 250	120	NA	NA	NO	NTX
7440-09-7	POTASSIUM	6600		6600		ug/L	S18SB030001-SO-P	1/5	360 - 510	6600	NA	NA	NO	NTX
7440-22-4	SILVER	18		18		ug/L	S18SB030001-SO-P	1/5	5.7	18	NA	360	NO	BSL

A shaded value indicates that the concentration used for screening exceeds the criterion or background value.
A shaded chemical name indicates that the chemical has been selected as a COC .

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 SPLP analysis was not performed on background samples.
5 CTDEP Remediation Standard Regulations, 1996.
6 The chemical is selected as a COC if the maximum detected concentration exceeds the risk-based COC screening level.

Associated Samples:

S18SB010001-SO-P
S18SB020001-SO-P
S18SB030001-SO-P
S18SB040001-SO-P
S18SB050001-SO-P

Definitions:

C = Carcinogen
COC = Chemical of Potential Concern
J = Estimated Value
N = Noncarcinogen
NA = Not available

Rationale Codes:

For Selection as a COC:
ASL = Above COC Screening Level

For Elimination as a COC:
BSL = Below COC Screening Level
NTX = No criteria available

TABLE 2.4
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
DIRECT CONTACT EXPOSURE SCENARIOS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil
Exposure Point: Solvent Storage Area (Site 18)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Risk-Based COC Screening Level(5)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COC Flag	Rationale for Contaminant Deletion or Selection(6)
Volatile Organics																	
75-09-2	METHYLENE CHLORIDE	0.067	J	0.067	J	mg/kg	S18SB020405-SO-D	1/5	0.005 - 0.027	0.067	NA	8.9	C	13 82	SSL-INH CTRESSOIL	NO	BSL
108-88-3	TOLUENE	0.001	J	0.002	J	mg/kg	S18SB020405-SO	3/5	0.005 - 0.006	0.002	NA	52	N	650 500	SSL-INH CTRESSOIL	NO	BSL
Semivolatile Organics																	
56-55-3	BENZO(A)ANTHRACENE	0.026	J	0.026	J	mg/kg	S18SB010506-SO	1/5	0.18 - 0.2	0.026	NA	0.62	C	NA 1	SSL-INH CTRESSOIL	NO	BSL
50-32-8	BENZO(A)PYRENE	0.022	J	0.022	J	mg/kg	S18SB010506-SO	1/5	0.18 - 0.2	0.022	NA	0.062	C	NA 1	SSL-INH CTRESSOIL	NO	BSL
205-99-2	BENZO(B)FLUORANTHENE	0.022	J	0.022	J	mg/kg	S18SB010506-SO	1/5	0.18 - 0.2	0.022	NA	0.62	C	NA 1	SSL-INH CTRESSOIL	NO	BSL
191-24-2	BENZO(G,H,I)PERYLENE	0.029	J	0.029	J	mg/kg	S18SB010506-SO	1/5	0.18 - 0.2	0.029	NA	230	N	NA 1000	SSL-INH CTRESSOIL	NO	BSL
207-08-9	BENZO(K)FLUORANTHENE	0.021	J	0.021	J	mg/kg	S18SB010506-SO	1/5	0.18 - 0.2	0.021	NA	6.2	C	NA 8.4	SSL-INH CTRESSOIL	NO	BSL
218-01-9	CHRYSENE	0.03	J	0.03	J	mg/kg	S18SB010506-SO	1/5	0.18 - 0.2	0.03	NA	62	C	NA 84	SSL-INH CTRESSOIL	NO	BSL
206-44-0	FLUORANTHENE	0.066	J	0.066	J	mg/kg	S18SB010506-SO	1/5	0.18 - 0.2	0.066	NA	230	N	NA 1000	SSL-INH CTRESSOIL	NO	BSL
193-39-5	INDENO(1,2,3-CD)PYRENE	0.025	J	0.025	J	mg/kg	S18SB010506-SO	1/5	0.18 - 0.2	0.025	NA	0.62	C	NA 1	SSL-INH CTRESSOIL	NO	BSL
85-01-8	PHENANTHRENE	0.051	J	0.051	J	mg/kg	S18SB010506-SO	1/5	0.18 - 0.2	0.051	NA	230	N	NA 1000	SSL-INH CTRESSOIL	NO	BSL
129-00-0	PYRENE	0.049	J	0.049	J	mg/kg	S18SB010506-SO	1/5	0.18 - 0.2	0.049	NA	230	N	NA 1000	SSL-INH CTRESSOIL	NO	BSL
Inorganics																	
7429-90-5	ALUMINUM	1400		8100		mg/kg	S18SB040708-SO	5/5	---	8100	17600	7600	N	NA NA	SSL-INH CTRESSOIL	NO	BKG, EPAI
7440-38-2	ARSENIC	0.75	J	1.2	J	mg/kg	S18SB020405-SO	3/5	0.58 - 0.65	1.2	3.6	0.39	C	750 10	SSL-INH CTRESSOIL	NO	BKG
7440-39-3	BARIUM	18		43		mg/kg	S18SB040708-SO	4/5	7.7	43	57.2	540	N	690000 4700	SSL-INH CTRESSOIL	NO	BSL,BKG
7440-70-2	CALCIUM	440	J	1100	J	mg/kg	S18SB020405-SO, S18SB010506-SO	5/5	---	1100	499	NA		NA NA	SSL-INH CTRESSOIL	NO	NUT
7440-47-3	CHROMIUM	3.5	J	10		mg/kg	S18SB020405-SO	4/5	1.6	10	21.5	30(8)	C	270 100	SSL-INH CTRESSOIL	NO	BSL,BKG
7440-50-8	COPPER	4		11		mg/kg	S18SB010506-SO	5/5	---	11	25.6	290	N	NA 2500	SSL-INH CTRESSOIL	NO	BSL,BKG
7439-89-6	IRON	1700	J	8500	J	mg/kg	S18SB040708-SO	5/5	---	8500	17200	2300	N	NA NA	SSL-INH CTRESSOIL	NO	BKG, EPAI
7439-92-1	LEAD	0.95	J	2.4		mg/kg	S18SB010506-SO	4/5	0.39	2.4	17.5	400(9)		NA 500	SSL-INH CTRESSOIL	NO	BSL,BKG
7439-95-4	MAGNESIUM	360		2400		mg/kg	S18SB010506-SO	5/5	---	2400	3650	NA		NA NA	SSL-INH CTRESSOIL	NO	NUT,BKG
7439-96-5	MANGANESE	33	J	220	J	mg/kg	S18SB040708-SO	5/5	---	220	188	180	N	NA NA	SSL-INH CTRESSOIL	YES	ASL
7440-09-7	POTASSIUM	300		1900		mg/kg	S18SB050405-SO	5/5	---	1900	2580	NA		NA NA	SSL-INH CTRESSOIL	NO	NUT,BKG

TABLE 2.4
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
DIRECT CONTACT EXPOSURE SCENARIOS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil
Exposure Point: Solvent Storage Area (Site 18)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Risk-Based COC Screening Level(5)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COC Flag	Rationale for Contaminant Deletion or Selection(6)
7440-22-4	SILVER	1.3	J	2.2	J	mg/kg	S18SB040708-SO	3/5	1.1 - 1.2	2.2	0.385	39	N	NA 340	SSL-INH CTRESSOIL	NO	BSL
7440-28-0	THALLIUM	0.75	J	0.75	J	mg/kg	S18SB040708-SO	1/5	0.39 - 0.43	0.75	0.29	0.52	N	NA 5.4	SSL-INH CTRESSOIL	YES	ASL
7440-62-2	VANADIUM	14		17		mg/kg	S18SB010506-SO, S18SB040708-SO	4/5	4.1 - 6.3	17	35.1	55	N	NA 470	SSL-INH CTRESSOIL	NO	BSL,BKG
7440-66-6	ZINC	22		30		mg/kg	S18SB010506-SO	2/5	7.2 - 19	30	31.3	2300	N	NA 20000	SSL-INH CTRESSOIL	NO	BSL,BKG

A shaded value indicates that the concentration used for screening exceeds the criterion or background value.
A shaded chemical name indicates that the chemical has been selected as a COC .

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 Atlantic Environmental Services, April 1995. Background concentrations of Inorganics in Soil - Naval Submarine Base - New London. If the maximum detected concentration of an inorganic is less than the background concentration, then that metal is not selected as a COC.
5 The risk-based COC screening level for residential land use is presented. The value is based on a target hazard quotient of 0.1 for noncarcinogens (denoted with a "N" flag) or an incremental cancer risk of 1E-6 for carcinogens (denoted with a "C" flag) (USEPA, Region IX, October 1999).
6 The chemical is selected as a COC if the maximum detected concentration exceeds the risk-based COC screening level and/or an ARAR/TBC(s).
7 Pyrene is used as a surrogate for benzo(g,h,i)perylene and phenanthrene.
8 Hexavalent Chromium.
9 OSWER soil screening level for residential land use (USEPA, July 1994).

Associated Samples:

S18SB010506-SO	S18SB030708-SO
S18SB020405-SO	S18SB040708-SO
S18SB020405-SO-D	S18SB050405-SO

Definitions:

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogen
COC = Chemical of Potential Concern
J = Estimated Value
N = Noncarcinogen
NA = Not Applicable
SSL-INH = Soil Screening Level for transfers from soil to air (Inhalation) (USEPA, May 1996)
CTRESSOIL - CTDEP direct contact criteria for residential exposures.

Rationale Codes:

For Selection as a COC:
ASL = Above COC Screening Level/ARAR/TBC

For Elimination as a COC:
BKG = Within Background Levels
BSL = Below COC Screening Level/ARAR/TBC
NUT = Essential Nutrient
EPAI = USEPA Region one does not advocate evaluation of this chemical.

TABLE 2.5
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
MIGRATION PATHWAYS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil
Exposure Point: Solvent Storage Area (Site 18)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	EPA SSL-Soil to GW(5)	CTDEP Mobility Criteria(6)	CTDEP Soil Vapor Volatilization(6)	COC Flag	Rationale for Contaminant Deletion or Selection(7)
Volatile Organics																
75-09-2	METHYLENE CHLORIDE	0.067	J	0.067	J	mg/kg	S18SB020405-SO-D	1/5	0.005 - 0.027	0.067	NA	0.02	1	1200	YES	ASL
108-88-3	TOLUENE	0.001	J	0.002	J	mg/kg	S18SB020405-SO	3/5	0.005 - 0.006	0.002	NA	12	67	760	NO	BSL
Semivolatile Organics																
56-55-3	BENZO(A)ANTHRACENE	0.026	J	0.026	J	mg/kg	S18SB010506-SO	1/5	0.18 - 0.2	0.026	NA	2	1	NA	NO	BSL
50-32-8	BENZO(A)PYRENE	0.022	J	0.022	J	mg/kg	S18SB010506-SO	1/5	0.18 - 0.2	0.022	NA	8	1	NA	NO	BSL
205-99-2	BENZO(B)FLUORANTHENE	0.022	J	0.022	J	mg/kg	S18SB010506-SO	1/5	0.18 - 0.2	0.022	NA	5	1	NA	NO	BSL
191-24-2	BENZO(G,H,I)PERYLENE	0.029	J	0.029	J	mg/kg	S18SB010506-SO	1/5	0.18 - 0.2	0.029	NA	4200(8)	42	NA	NO	BSL
207-08-9	BENZO(K)FLUORANTHENE	0.021	J	0.021	J	mg/kg	S18SB010506-SO	1/5	0.18 - 0.2	0.021	NA	49	1	NA	NO	BSL
218-01-9	CHRYSENE	0.03	J	0.03	J	mg/kg	S18SB010506-SO	1/5	0.18 - 0.2	0.03	NA	160	1	NA	NO	BSL
206-44-0	FLUORANTHENE	0.066	J	0.066	J	mg/kg	S18SB010506-SO	1/5	0.18 - 0.2	0.066	NA	4300	56	NA	NO	BSL
193-39-5	INDENO(1,2,3-CD)PYRENE	0.025	J	0.025	J	mg/kg	S18SB010506-SO	1/5	0.18 - 0.2	0.025	NA	14	1	NA	NO	BSL
85-01-8	PHENANTHRENE	0.051	J	0.051	J	mg/kg	S18SB010506-SO	1/5	0.18 - 0.2	0.051	NA	4200(8)	40	NA	NO	BSL
129-00-0	PYRENE	0.049	J	0.049	J	mg/kg	S18SB010506-SO	1/5	0.18 - 0.2	0.049	NA	4200	40	NA	NO	BSL
Inorganics																
7429-90-5	ALUMINUM	1400		8,100		mg/kg	S18SB040708-SO	5/5	---	8,100	17,600	NA	NA(9)	NA	NO	BKG
7440-38-2	ARSENIC	0.75	J	1.2	J	mg/kg	S18SB020405-SO	3/5	0.58 - 0.65	1.2	3.60	29	NA(9)	NA	NO	BSL,BKG
7440-39-3	BARIUM	18		43		mg/kg	S18SB040708-SO	4/5	7.7	43	57.2	1600	NA(9)	NA	NO	BSL,BKG
7440-70-2	CALCIUM	440	J	1,100	J	mg/kg	S18SB020405-SO, S18SB010506-SO	5/5	---	1100	499	NA	NA(9)	NA	NO	NUT
7440-47-3	CHROMIUM	3.5	J	10		mg/kg	S18SB020405-SO	4/5	1.6	10	21.5	38	NA(9)	NA	NO	BSL,BKG
7440-50-8	COPPER	4		11		mg/kg	S18SB010506-SO	5/5	---	11	25.6	NA	NA(9)	NA	NO	BKG
7439-89-6	IRON	1700	J	8,500	J	mg/kg	S18SB040708-SO	5/5	---	8,500	17,200	NA	NA(9)	NA	NO	BKG
7439-92-1	LEAD	0.95	J	2.4		mg/kg	S18SB010506-SO	4/5	0.39	2.4	17.5	NA	NA(9)	NA	NO	BKG
7439-95-4	MAGNESIUM	360		2400		mg/kg	S18SB010506-SO	5/5	---	2400	3,650	NA	NA(9)	NA	NO	NUT,BKG
7439-96-5	MANGANESE	33	J	220	J	mg/kg	S18SB040708-SO	5/5	---	220	188	NA	NA(9)	NA	NO	BSL
7440-09-7	POTASSIUM	300		1900		mg/kg	S18SB050405-SO	5/5	---	1900	2,580	NA	NA(9)	NA	NO	NUT,BKG
7440-22-4	SILVER	1.3	J	2.2	J	mg/kg	S18SB040708-SO	3/5	1.1 - 1.2	2.2	0.385	34	NA(9)	NA	NO	BSL
7440-28-0	THALLIUM	0.75	J	0.75	J	mg/kg	S18SB040708-SO	1/5	0.39 - 0.43	0.75	0.29	0.7	NA(9)	NA	YES	ASL
7440-62-2	VANADIUM	14		17		mg/kg	S18SB010506-SO, S18SB040708-SO	4/5	4.1 - 6.3	17	35.1	6000	NA(9)	NA	NO	BSL,BKG
7440-66-6	ZINC	22		30		mg/kg	S18SB010506-SO	2/5	7.2 - 19	30	31.3	12000	NA(9)	NA	NO	BSL,BKG

A shaded value indicates that the concentration used for screening exceeds the criterion or background value.
A shaded chemical name indicates that the chemical has been selected as a COC.

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 Atlantic Environmental Services, April 1995. Background concentrations of Inorganics in Soil - Naval Submarine Base - New London. If the maximum detected concentration of an inorganic is less than the background concentration, then that metal is not selected as a COC.
5 USEPA Soil Screening Level Guidance, May 1996, DAF = 20.
6 CTDEP Remediation Standard Regulations, 1996.
7 The chemical is selected as a COC if the maximum detected concentration exceeds the risk-based COC screening level and/or an ARAR/TBC(s).

Definitions:

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogen
COC = Chemical of Potential Concern
J = Estimated Value
N = Noncarcinogen
NA = Not Applicable

Rationale Codes:

For Selection as a COC:
ASL = Above COC Screening Level/ARAR/TBC

TABLE 2.5
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
MIGRATION PATHWAYS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil
Exposure Point: Solvent Storage Area (Site 18)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	EPA SSL-Soil to GW(5)	CTDEP Mobility Criteria(6)	CTDEP Soil Vapor Volatilization(6)	COC Flag	Rationale for Contaminant Deletion or Selection(7)

8 Pyrene is used as a surrogate for benzo(g,h,i)perylene and phenanthrene
9 Mobilization criteria for inorganics developed to be compared to TCLP or SPLP

For Elimination as a COC
BKG = Within Background Levels

Associated Samples:

S18SB010506-SO	S18SB030708-SO
S18SB020405-SO	S18SB040708-SO
S18SB020405-SO-D	S18SB050405-SO

TABLE 2.6
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
MIGRATION PATHWAYS - SPLP RESULTS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Subsurface Soil
Exposure Medium: Surface Soil
Exposure Point: Solvent Storage Area (Site 18)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	CTDEP Mobility Criteria(5)	COPC Flag	Rationale for Contaminant Deletion or Selection(6)
Inorganics														
7439-95-4	MAGNESIUM	120		950		ug/L	S18SB010506-SO-P	2/5	110	950	NA	NA	NO	NTX
7439-96-5	MANGANESE	19		46		ug/L	S18SB010506-SO-P	2/5	3.5 - 7.5	46	NA	NA	NO	NTX
7440-22-4	SILVER	8.3		8.3		ug/L	S18SB020405-SO-P-D	1/5	5.7	8.3	NA	360	NO	BSL

A shaded value indicates that the concentration used for screening exceeds the criterion or background value.
A shaded chemical name indicates that the chemical has been selected as a COC .

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 SPLP analysis was not performed on background samples.
5 CTDEP Remediation Standard Regulations, 1996.
6 The chemical is selected as a COC if the maximum detected concentration exceeds the risk-based COC screening level.

Associated Samples:

S18SB010506-SO-P	S18SB030708-SO-P
S18SB020405-SO-P	S18SB040708-SO-P
S18SB020405-SO-P-D	S18SB050405-SO-P

Definitions:

C = Carcinogen
COC = Chemical of Potential Concern
J = Estimated Value
N = Noncarcinogen
NA = Not Applicable

Rationale Codes:

For Selection as a COC:
ASL = Above COC Screening Level

For Elimination as a COC:
BSL = Below COC Screening Level
NTX = No criteria available

TABLE 2.7
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
DIRECT CONTACT EXPOSURE SCENARIOS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Solvent Storage Area (Site 18)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Risk-Based COPC Screening Level(5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection(6)
Total Metals																
7429-90-5	ALUMINUM	880		880		ug/L	S18TW0401	1/2	189 - 211	880	3560	3600 N	N/A 50 to 200 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	EPAI, BKG
7440-41-7	BERYLLIUM	0.79	J	0.79	J	ug/L	S18TW0401	1/2	0.6	0.79	ND	7.3 N	4 4 4	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
7440-70-2	CALCIUM	9640		25200		ug/L	S18TW0201-D	2/2	---	25200	188000	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT, BKG
7439-89-6	IRON	306		1030		ug/L	S18TW0401	2/2	---	1030	28200	1100 N	N/A 300 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	EPA1, BKG
7439-95-4	MAGNESIUM	2630		2630		ug/L	S18TW0401	1/2	1590 - 1650	2630	191000	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT, BKG
7439-96-5	MANGANESE	111		322		ug/L	S18TW0401	2/2	---	322	11700	88 N	N/A 50 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	BKG
7440-09-7	POTASSIUM	2570		2570		ug/L	S18TW0401	1/2	1660 - 1670	2570	70800	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT, BKG
7440-23-5	SODIUM	9570		15100		ug/L	S18TW0401	2/2	---	15100	1900000	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT, BKG
Miscellaneous Parameters																
000-09-0	TOTAL DISSOLVED SOLIDS	111		174		mg/L	S18TW0201-D	2/2	---	174	6260	N/A	N/A 500 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	NV
000-08-9	TOTAL SUSPENDED SOLIDS	39		39		mg/L	S18TW0401	1/2	5	39	236	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NTX

A shaded value indicates that the concentration used for screening exceeds the criterion or background value.
A shaded chemical name indicates that the chemical has been selected as a COPC .

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 95% Upper Tolerance Limit (UTL) of site background data
5 The risk-based COPC screening level for tap water use is presented. The value is based on a target hazard quotient of 0.1 for noncarcinogens (denoted with a "N" flag) or an incremental cancer risk of 1E-6 for carcinogens (denoted with a "C" flag) (USEPA, Region IX, November 2000).
6 The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level and/or an ARAR/TBC(s)

Associated Samples:
S18TW0201
S18TW0201-D
S18TW0401

Definitions:
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogen
COC = Chemical of Concern
J = Estimated Value
N = Noncarcinogen
N/A = Not Applicable.
FED-MCL = Federal Maximum Contaminant Level (USEPA, August 2000)
FED-SMCL = Federal Secondary Maximum Contaminant Level (USEPA, August 2000)
FED-AL = Federal Action Level (USEPA, August 2000)
CTDEP-RSR = Connecticut DEP Remediation Standard Regulations, 1996.
CTDEP-MCL = Connecticut Maximum Contaminant Level

Rationale Codes:
For Selection as a COC:
ASL = Above COC Screening Level/ARAR/TBC

For Elimination as a COC:
BKG = Within Background Levels

TABLE 2.7
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
DIRECT CONTACT EXPOSURE SCENARIOS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Solvent Storage Area (Site 18)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Risk-Based COPC Screening Level(5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection(6)

BSL = Below COC Screening Level/ARAR/TBC
NUT = Essential Nutrient
NTX = No Toxicity Information
EPAI = USEPA Region one does not advocate evaluation of this chemical.

TABLE 2.8
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
MIGRATION PATHWAYS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Solvent Storage Area (Site 18)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	CTDEP Surface Water Criteria(5)	CTDEP Vol. Criteria(6)	COPC Flag	Rationale for Contaminant Deletion or Selection(6)
Total Metals															
7429-90-5	ALUMINUM	880		880		ug/L	S18TW0401	1/2	189 - 211	880	3560	N/A	N/A	NO	BKG
7440-41-7	BERYLLIUM	0.79	J	0.79	J	ug/L	S18TW0401	1/2	0.6	0.79	ND	4	NA	NO	BSL
7440-70-2	CALCIUM	9640		25200		ug/L	S18TW0201-D	2/2	---	25200	188000	N/A	N/A	NO	NTX, BKG
7439-89-6	IRON	306		1030		ug/L	S18TW0401	2/2	---	1030	28200	N/A	N/A	NO	NTX, BKG
7439-95-4	MAGNESIUM	2630		2630		ug/L	S18TW0401	1/2	1590 - 1650	2630	191000	N/A	N/A	NO	NTX, BKG
7439-96-5	MANGANESE	111		322		ug/L	S18TW0401	2/2	---	322	11700	N/A	N/A	NO	NTX, BKG
7440-09-7	POTASSIUM	2570		2570		ug/L	S18TW0401	1/2	1660 - 1670	2570	70800	N/A	N/A	NO	NTX, BKG
7440-23-5	SODIUM	9570		15100		ug/L	S18TW0401	2/2	---	15100	1900000	N/A	N/A	NO	NTX, BKG
Miscellaneous Parameters															
000-09-0	TOTAL DISSOLVED SOLIDS	111		174		mg/L	S18TW0201-D	2/2	---	174	6260	N/A	N/A	NO	NTX, BKG
000-08-9	TOTAL SUSPENDED SOLIDS	39		39		mg/L	S18TW0401	1/2	5	39	236	N/A	N/A	NO	NTX, BKG

A shaded value indicates that the concentration used for screening exceeds the criterion or background value.
A shaded chemical name indicates that the chemical has been selected as a COPC .

Footnotes:
1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 95% Upper Tolerance Limit (UTL) of site background data
5 Connecticut DEP Surface Water Protection criteria.
6 Connecticut DEP Volatilization criteria for residential exposures.
7 The chemical is selected as a COPC if the maximum detected concentration exceeds the CTDEP surface water protection or volatilization criteria.

Associated Samples:
S18TW0201
S18TW0201-D
S18TW0401

Definitions:
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogen
COC = Chemical of Concern
J = Estimated Value
N = Noncarcinogen
NA = Not Applicable.

Rationale Codes:
For Selection as a COPC:
ASL = Above COPC Screening Level/ARAR/TBC

For Elimination as a COPC:
BKG = Within Background Levels
BSL = Below COPC Screening Level/ARAR/TBC
NTX = No Toxicity Information

TABLE 3.1
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
SOLVENT STORAGE AREA (SITE 18)
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Solvent Storage Area (Site 18)

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency Exposure		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Arsenic	mg/kg	2.76	3.54	4		mg/kg	4	max	1	2.76	avg	1
Lead	mg/kg	93.7	273	430		mg/kg	93.7	avg	2	93.7	avg	2
Thallium	mg/kg	0.419	0.588	0.64	J	mg/kg	0.64	max	1	0.419	avg	1

Notes:
1 - There were less than 10 samples taken; therefore, the maximum concentration was used for RME and average concentration was used for CTE.
2 - Average concentration is used as the exposure point concentration per USEPA guidance (USEPA, 1994, 1996)

TABLE 3.2
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
SOLVENT STORAGE AREA (SITE 18)
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil
Exposure Point: Solvent Storage Area (Site 18)

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency Exposure		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Arsenic	mg/kg	1.67	2.41	4		mg/kg	1.67	max	1	1.67	max	1
Lead	mg/kg	47.6	126	430		mg/kg	47.6	avg	2	47.6	avg	2
Manganese	mg/kg	124	154	220		mg/kg	124	max	1	124	max	1
Thallium	mg/kg	0.367	0.488	0.75	J	mg/kg	0.367	max	1	0.367	max	1

Notes:
1 - There were less than 10 samples taken; therefore, the maximum concentration was used for RME and average concentration was used for CTE.
2 - Average concentration is used as the exposure point concentration per USEPA guidance (USEPA, 1994, 1996)

TABLE 4.1
VALUES USED FOR DAILY INTAKE CALCULATIONS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: All Soil
Exposure Medium: All Soil
Exposure Point: Solvent Storage Area (Site 18)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	Chemical concentration in soil	mg/kg	95% UCL	EPA, 1994	95% UCL	EPA, 1994	Intake (mg/kg/day) =
	IR-S	Ingestion Rate	mg/day	480	EPA, 1994	240	(1)	$\frac{Cs \times IRS \times CF3 \times FI \times EF \times ED}{BW \times AT}$
	CF3	Conversion Factor 3	kg/mg	1.0E-06	- -	1.0E-06	- -	
	FI	Fraction Ingested	unitless	1	EPA, 1994	1	EPA, 1994	
	EF	Exposure Frequency	days/year	120	Atlantic, 1992	80	Atlantic, 1992	
	ED	Exposure Duration	years	1	Atlantic, 1992	1	Atlantic, 1992	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	365	EPA, 1989	365	EPA, 1989	
Dermal	CS	Chemical concentration in soil	mg/kg	95% UCL	EPA, 1994	95% UCL	EPA, 1994	Dermally Absorbed Dose (mg/kg/day) =
	CF3	Conversion Factor 3	kg/mg	1.0E-06	- -	1.0E-06	- -	$\frac{Cs \times CF3 \times SA \times SSAF \times DABS \times EF \times ED}{BW \times AT}$
	SA	Skin Surface Available for Contact	cm2	3,800	EPA, 1989	3,800	EPA, 1989	
	SSAF	Soil to Skin Adherence Factor	mg/cm2/event	0.2	EPA, 1998	0.02	EPA, 1998	
	DABS	Absorption Factor	unitless	See Text	See Text	See Text	See Text	
	EF	Exposure Frequency	days/year	120	Atlantic, 1992	80	Atlantic, 1992	
	ED	Exposure Duration	years	1	Atlantic, 1992	1	Atlantic, 1992	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	365	EPA, 1989	365	EPA, 1989	

Notes:
(1) - Professinal judgement.
Sources:
EPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.
EPA, 1992: Dermal Exposure Assessment: Principles and Applications.
EPA, 1994: US EPA Region I Risk Updates, Number 2.
EPA, 1998: Risk Assessment Guidance for Superfund, Supplemental Guidance, Dermal Risk Assessment, Interim Guidance.
Atlantic 1992: Phase I Remedial Investigation Naval Submarine Base - New London, Connecticut, August.

TABLE 4.2
VALUES USED FOR DAILY INTAKE CALCULATIONS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Solvent Storage Area (Site 18)
Receptor Population: Full-Time Employees
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	Chemical concentration in soil	mg/kg	95% UCL	EPA, 1994	95% UCL	EPA, 1994	Intake (mg/kg/day) =
	IR-S	Ingestion Rate	mg/day	100	EPA, 1994	50	EPA, 1994	$\frac{Cs \times IRS \times CF3 \times FI \times EF \times ED}{BW \times AT}$
	CF3	Conversion Factor 3	kg/mg	1.0E-06	- -	1.0E-06	- -	
	FI	Fraction Ingested	unitless	1	EPA, 1994	1	EPA, 1994	
	EF	Exposure Frequency	days/year	150	EPA, 1994	150	EPA, 1994	
	ED	Exposure Duration	years	25	EPA, 1994	6	Atlantic, 1992	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	9125	EPA, 1989	2190	EPA, 1989	
Dermal	CS	Chemical concentration in soil	mg/kg	95% UCL	EPA, 1994	95% UCL	EPA, 1994	Dermally Absorbed Dose (mg/kg/day) =
	CF3	Conversion Factor 3	kg/mg	1.0E-06	- -	1.0E-06	- -	$\frac{Cs \times CF3 \times SA \times SSAF \times DABS \times EF \times ED}{BW \times AT}$
	SA	Skin Surface Available for Contact	cm2	3,800	EPA, 1989	3,800	EPA, 1989	
	SSAF	Soil to Skin Adherence Factor	mg/cm2/event	0.2	EPA, 1998	0.02	EPA, 1998	
	DABS	Absorption Factor	unitless	See Text	See Text	See Text	See Text	
	EF	Exposure Frequency	days/year	150	EPA, 1994	150	EPA, 1994	
	ED	Exposure Duration	years	25	EPA, 1994	6	Atlantic, 1992	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	9,125	EPA, 1989	2,190	EPA, 1989	

Notes:
(1) - Professinal judgement.
Sources:
EPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.
EPA, 1992: Dermal Exposure Assessment: Principles and Applications.
EPA, 1994: US EPA Region I Risk Updates, Number 2.
EPA, 1998: Risk Assessment Guidance for Superfund, Supplemental Guidance, Dermal Risk Assessment, Interim Guidance.

TABLE 4.3
VALUES USED FOR DAILY INTAKE CALCULATIONS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Solvent Storage Area (Site 18)
Receptor Population: Older Child Trespasser
Receptor Age: Adolescent

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	Chemical concentration in soil	mg/kg	95% UCL	EPA, 1994	95% UCL	EPA, 1994	Intake (mg/kg/day) =
	IR-S	Ingestion Rate	mg/day	100	EPA, 1994	50	EPA, 1994	
	CF3	Conversion Factor 3	kg/mg	1.0E-06	- -	1.0E-06	- -	$\frac{Cs \times IRS \times CF3 \times FI \times EF \times ED}{BW \times AT}$
	FI	Fraction Ingested	unitless	1	EPA, 1994	1	EPA, 1994	
	EF	Exposure Frequency	days/year	120	Atlantic, 1992	52	Atlantic, 1992	
	ED	Exposure Duration	years	10	(1)	3	(1)	
	BW	Body Weight	kg	43	EPA, 1989	43	EPA, 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	3,650	EPA, 1989	1,095	EPA, 1989	
Dermal	CS	Chemical concentration in soil	mg/kg	95% UCL	EPA, 1994	95% UCL	EPA, 1994	Dermally Absorbed Dose (mg/kg/day) =
	CF3	Conversion Factor 3	kg/mg	1.0E-06	- -	1.0E-06	- -	$\frac{Cs \times CF3 \times SA \times SSAF \times DABS \times EF \times ED}{BW \times AT}$
	SA	Skin Surface Available for Contact	cm2	3,150	EPA, 1989	3,150	EPA, 1989	
	SSAF	Soil to Skin Adherence Factor	mg/cm2/event	0.2	EPA, 1998	0.06	EPA, 1998	
	DABS	Absorption Factor	unitless	See Text	See Text	See Text	See Text	
	EF	Exposure Frequency	days/year	120	Atlantic, 1992	52	Atlantic, 1992	
	ED	Exposure Duration	years	10	(1)	3	(1)	
	BW	Body Weight	kg	43	EPA, 1989	43	EPA, 1989	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	3,650	EPA, 1989	1,095	EPA, 1989	

Notes:
(1) - Professinal judgement.
Sources:
EPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.
EPA, 1992: Dermal Exposure Assessment: Principles and Applications.
EPA, 1994: US EPA Region I Risk Updates, Number 2.
EPA, 1998: Risk Assessment Guidance for Superfund, Supplemental Guidance, Dermal Risk Assessment, Interim Guidance.

TABLE 4.4
VALUES USED FOR DAILY INTAKE CALCULATIONS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: All Soil
Exposure Medium: All Soil
Exposure Point: Solvent Storage Area (Site 18)
Receptor Population: Child Residnts
Receptor Age: Child

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	Chemical concentration in soil	mg/kg	95% UCL	EPA, 1994	95% UCL	EPA, 1994	Intake (mg/kg/day) =
	IR-S	Ingestion Rate	mg/day	200	EPA, 1994	100	EPA, 1994	$\frac{Cs \times IRS \times CF3 \times FI \times EF \times ED}{BW \times AT}$
	CF3	Conversion Factor 3	kg/mg	1.0E-06	- -	1.0E-06	- -	
	FI	Fraction Ingested	unitless	1	EPA, 1993	1	EPA, 1993	
	EF	Exposure Frequency	days/year	150	EPA, 1994	150	EPA, 1994	
	ED	Exposure Duration	years	6	EPA, 1994	2	EPA, 1994	
	BW	Body Weight	kg	15	EPA, 1994	15	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	EPA, 1989	730	EPA, 1989	
Dermal	CS	Chemical concentration in soil	mg/kg	95% UCL	EPA, 1994	95% UCL	EPA, 1994	Dermally Absorbed Dose (mg/kg/day) =
	CF3	Conversion Factor 3	kg/mg	1.0E-06	- -	1.0E-06	- -	$\frac{Cs \times CF3 \times SA \times SSAF \times DABS \times EF \times ED}{BW \times AT}$
	SA	Skin Surface Available for Contact	cm2	2,094	EPA, 1992	2,094	EPA, 1992	
	SSAF	Soil to Skin Adherence Factor	mg/cm2/event	0.2	EPA, 1998	0.06	EPA, 1998	
	DABS	Absorption Factor	unitless	See Text	See Text	See Text	See Text	
	EF	Exposure Frequency	days/year	150	EPA, 1994	150	EPA, 1994	
	ED	Exposure Duration	years	6	EPA, 1994	2	EPA, 1994	
	BW	Body Weight	kg	15	EPA, 1994	15	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	EPA, 1989	730	EPA, 1989	

Sources:
EPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.
EPA, 1992: Dermal Exposure Assessment: Principles and Applications.
EPA, 1994: US EPA Region I Risk Updates, Number 2.
EPA, 1998: Risk Assessment Guidance for Superfund, Supplemental Guidance, Dermal Risk Assessment, Interim Guidance.
Atlantic 1992: Phase I Remedial Investigation Naval Submarine Base - New London, Connecticut, August.

TABLE 4.5
VALUES USED FOR DAILY INTAKE CALCULATIONS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: All Soil
Exposure Medium: All Soil
Exposure Point: Solvent Storage Area (Site 18)
Receptor Population: Adult Residnts
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	Chemical concentration in soil	mg/kg	95% UCL	EPA, 1994	95% UCL	EPA, 1994	Intake (mg/kg/day) =
	IR-S	Ingestion Rate	mg/day	100	EPA, 1994	50	EPA, 1994	$\frac{Cs \times IRS \times CF3 \times FI \times EF \times ED}{BW \times AT}$
	CF3	Conversion Factor 3	kg/mg	1.0E-06	- -	1.0E-06	- -	
	FI	Fraction Ingested	unitless	1	EPA, 1994	1	EPA, 1994	
	EF	Exposure Frequency	days/year	150	EPA, 1994	150	EPA, 1994	
	ED	Exposure Duration	years	24	EPA, 1994	7	EPA, 1994	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	EPA, 1989	2,555	EPA, 1989	
Dermal	CS	Chemical concentration in soil	mg/kg	95% UCL	EPA, 1994	95% UCL	EPA, 1994	Dermally Absorbed Dose (mg/kg/day) =
	CF3	Conversion Factor 3	kg/mg	1.0E-06	- -	1.0E-06	- -	$\frac{Cs \times CF3 \times SA \times SSAF \times DABS \times EF \times ED}{BW \times AT}$
	SA	Skin Surface Available for Contact	cm2	3,800	EPA, 1992	3,800	EPA, 1992	
	SSAF	Soil to Skin Adherence Factor	mg/cm2/event	0.07	EPA, 1998	0.01	EPA, 1998	
	DABS	Absorption Factor	unitless	See Text	See Text	See Text	See Text	
	EF	Exposure Frequency	days/year	150	EPA, 1994	150	EPA, 1994	
	ED	Exposure Duration	years	24	EPA, 1994	7	EPA, 1994	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	EPA, 1989	2,555	EPA, 1989	

Notes:
(1) - Professinal judgement.
Sources:
EPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.
EPA, 1992: Dermal Exposure Assessment: Principles and Applications.
EPA, 1994: US EPA Region I Risk Updates, Number 2.
EPA, 1998: Risk Assessment Guidance for Superfund, Supplemental Guidance, Dermal Risk Assessment, Interim Guidance.
Atlantic 1992: Phase I Remedial Investigation Naval Submarine Base - New London, Connecticut, August.

TABLE 5.1
NON-CANCER TOXICITY DATA -- ORAL/DERMAL
NSB-NLON, GROTON, CONNECTICUT

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal RfD (2)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ (3) (MM/DD/YY)
Inorganics										
Arsenic	Chronic	3.0E-04	mg/kg/day	100%	3.0E-04	mg/kg/day	Skin	3/1	IRIS	01/02/01
	Subchronic	3.0E-04	mg/kg/day	100%	3.0E-04	mg/kg/day	Skin	3	HEAST	7/97
Lead	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese (Soil)	Chronic	1.4E-01	mg/kg/day	4%	5.6E-03	mg/kg/day	CNS	1/1	IRIS	01/02/01
	Subchronic	1.4E-01	mg/kg/day	4%	5.6E-03	mg/kg/day	CNS	1	HEAST	7/97
Thallium	Chronic	7.0E-05	mg/kg/day	100%	7.0E-05	mg/kg/day	None Specified	NA	EPA IX	11/1/00
	Subchronic	7.0E-05	mg/kg/day	100%	7.0E-05	mg/kg/day	None Specified	NA	Chronic	11/1/00

Notes:
(1) - USEPA 1998.
(2) - RfDdermal = RfDoral x Oral to Dermal Adjustment Factor.
(3) For IRIS values date that IRIS was searched.
For HEAST values, the date of HEAST.
FOR EPA IX, date of PRG Table.
NA = Not Applicable.
IRIS = Integrated Risk Information System.
HEAST= Health Effects Assessment Summary Tables.
EPA IX = USEPA Region IX Preliminary Remediation Goals Table, November 1, 2000.

CNS = Central Nervous System
Chronic = No subchronic value available, chronic value is presented

TABLE 6.1
CANCER TOXICITY DATA -- ORAL/DERMAL
NSB-NLON, GROTON, CONNECTICUT

Chemical of Potential Concern	Oral Cancer Slope Factor	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal Cancer Slope Factor (2)	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (3) (MM/DD/YY)
Inorganics							
Arsenic	1.5E+00	100%	1.5E+00	$(mg/kg\text{-}day)^{-1}$	A	IRIS	01/02/01
Lead	NA	NA	NA	NA	B2	IRIS	01/02/01
Manganese	NA	NA	NA	NA	D	IRIS	01/02/01
Thallium	NA	NA	NA	NA	D	IRIS	01/02/01

Notes:

IRIS = Integrated Risk Information System

HEAST= Health Effects Assessment Summary Tables

(1) - USEPA 1998.

(2) - CSFdermal = CSForal/Oral to Dermal Adjustment Factor.

(3) - For IRIS values, the date IRIS was searched.
For HEAST values, the date of HEAST.

NA = Not Applicable

IRIS = Integrated Risk Information System

HEAST= Health Effects Assessment Summary Tables

EPA Group:

A - Human carcinogen

B1 - Probable human carcinogen - indicates that limited human data are available

B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans

C - Possible human carcinogen

D - Not classifiable as a human carcinogen

E - Evidence of noncarcinogenicity

TABLE 7.1
CALCULATION OF NON-CANÇER HAZARDS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: All Soil
Exposure Medium: All Soil
Exposure Point: Solvent Storage Area (Site 18)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Arsenic	4.00	mg/kg	4.00	mg/kg	M	9.0E-06	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	3.0E-02
	Lead	47.6	mg/kg	47.6	mg/kg	M	1.1E-04	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Manganese (soil)	154	mg/kg	154	mg/kg	M	3.5E-04	mg/kg/day	1.4E-01	mg/kg/day	N/A	N/A	2.5E-03
	Thallium	0.549	mg/kg	0.549	mg/kg	M	1.2E-06	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	1.8E-02
	(Total)												5.0E-02
Dermal	Arsenic	4.00	mg/kg	4.00	mg/kg	M	4.3E-07	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	1.4E-03
	Lead	47.6	mg/kg	47.6	mg/kg	M	0.0E+00	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Manganese (soil)	154	mg/kg	154	mg/kg	M	0.0E+00	mg/kg/day	5.6E-03	mg/kg/day	N/A	N/A	- -
	Thallium	0.549	mg/kg	0.549	mg/kg	M	0.0E+00	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	- -
	(Total)												1.4E-03
												Total Hazard Index Across All Exposure Routes/Pathways	5.2E-02

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Subchronic.

TABLE 7.2
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: All Soil
Exposure Medium: All Soil
Exposure Point: Solvent Storage Area (Site 18)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Arsenic	4.00	mg/kg	4.00	mg/kg	M	3.0E-06	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	1.0E-02
	Lead	47.6	mg/kg	47.6	mg/kg	M	3.6E-05	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Manganese (soil)	154	mg/kg	154	mg/kg	M	1.2E-04	mg/kg/day	1.4E-01	mg/kg/day	N/A	N/A	8.3E-04
	Thallium	0.549	mg/kg	0.549	mg/kg	M	4.1E-07	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	5.9E-03
	(Total)												1.7E-02
Dermal	Arsenic	4.00	mg/kg	4.00	mg/kg	M	2.9E-08	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	9.5E-05
	Lead	47.6	mg/kg	47.6	mg/kg	M	0.0E+00	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Manganese (soil)	154	mg/kg	154	mg/kg	M	0.0E+00	mg/kg/day	5.6E-03	mg/kg/day	N/A	N/A	- -
	Thallium	0.549	mg/kg	0.549	mg/kg	M	0.0E+00	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	- -
	(Total)												9.5E-05
												Total Hazard Index Across All Exposure Routes/Pathways	1.7E-02

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Subchronic.

TABLE 7.3
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Solvent Storage Area (Site 18)
Receptor Population: Full-Time Employees
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Arsenic	4.00	mg/kg	4.00	mg/kg	M	2.3E-06	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	7.8E-03
	Lead	93.7	mg/kg	93.7	mg/kg	M	5.5E-05	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Thallium	0.640	mg/kg	0.640	mg/kg	M	3.8E-07	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	5.4E-03
	(Total)												1.3E-02
Dermal	Arsenic	4.00	mg/kg	4.00	mg/kg	M	5.4E-07	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	1.8E-03
	Lead	93.7	mg/kg	93.7	mg/kg	M	0.0E+00	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Thallium	0.640	mg/kg	0.640	mg/kg	M	0.0E+00	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	- -
	(Total)												1.8E-03
												Total Hazard Index Across All Exposure Routes/Pathways	1.5E-02

(1) M - Medium-Specific.
(2) Chronic.

TABLE 7.4
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Solvent Storage Area (Site 18)
Receptor Population: Full-Time Employees
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Arsenic	2.76	mg/kg	2.76	mg/kg	M	8.1E-07	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	2.7E-03
	Lead	93.7	mg/kg	93.7	mg/kg	M	2.7E-05	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Thallium	0.419	mg/kg	0.419	mg/kg	M	1.2E-07	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	1.8E-03
	(Total)												4.5E-03
Dermal	Arsenic	2.76	mg/kg	2.76	mg/kg	M	3.7E-08	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	1.2E-04
	Lead	93.7	mg/kg	93.7	mg/kg	M	0.0E+00	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Thallium	0.419	mg/kg	0.419	mg/kg	M	0.0E+00	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	- -
	(Total)												1.2E-04
												Total Hazard Index Across All Exposure Routes/Pathways	4.6E-03

(1) M - Medium-Specific.
(2) Chronic.

TABLE 7.5
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Solvent Storage Area (Site 18)
Receptor Population: Older Child Trespasser
Receptor Age: Adolescent

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Arsenic	4.00	mg/kg	4.00	mg/kg	M	3.1E-06	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	1.0E-02
	Lead	93.7	mg/kg	93.7	mg/kg	M	7.2E-05	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Thallium	0.640	mg/kg	0.640	mg/kg	M	4.9E-07	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	7.0E-03
	(Total)												1.7E-02
Dermal	Arsenic	4.00	mg/kg	4.00	mg/kg	M	5.8E-07	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	1.9E-03
	Lead	93.7	mg/kg	93.7	mg/kg	M	0.0E+00	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Thallium	0.640	mg/kg	0.640	mg/kg	M	0.0E+00	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	- -
	(Total)												1.9E-03
												Total Hazard Index Across All Exposure Routes/Pathways	1.9E-02

(1) M - Medium-Specific.
(2) Chronic.

TABLE 7.6
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Solvent Storage Area (Site 18)
Receptor Population: Older Child Trespasser
Receptor Age: Adolescent

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Arsenic	2.76	mg/kg	2.76	mg/kg	M	4.6E-07	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	1.5E-03
	Lead	93.7	mg/kg	93.7	mg/kg	M	1.6E-05	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Thallium	0.419	mg/kg	0.419	mg/kg	M	6.9E-08	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	9.9E-04
	(Total)												2.5E-03
Dermal	Arsenic	2.76	mg/kg	2.76	mg/kg	M	5.2E-08	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	1.7E-04
	Lead	93.7	mg/kg	93.7	mg/kg	M	0.0E+00	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Thallium	0.419	mg/kg	0.419	mg/kg	M	0.0E+00	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	- -
	(Total)												1.7E-04
												Total Hazard Index Across All Exposure Routes/Pathways	2.7E-03

(1) M - Medium-Specific.
(2) Chronic.

TABLE 7.7
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: All Soil
Exposure Medium: All Soil
Exposure Point: Solvent Storage Area (Site 18)
Receptor Population: Child Residnts
Receptor Age: Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Arsenic	4.00	mg/kg	4.00	mg/kg	M	2.2E-05	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	7.3E-02
	Lead	47.6	mg/kg	47.6	mg/kg	M	2.6E-04	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Manganese (soil)	154	mg/kg	154	mg/kg	M	8.4E-04	mg/kg/day	1.4E-01	mg/kg/day	N/A	N/A	6.0E-03
	Thallium	0.549	mg/kg	0.549	mg/kg	M	3.0E-06	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	4.3E-02
	(Total)												1.2E-01
Dermal	Arsenic	4.00	mg/kg	4.00	mg/kg	M	1.4E-06	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	4.6E-03
	Lead	47.6	mg/kg	47.6	mg/kg	M	0.0E+00	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Manganese (soil)	154	mg/kg	154	mg/kg	M	0.0E+00	mg/kg/day	5.6E-03	mg/kg/day	N/A	N/A	- -
	Thallium	0.549	mg/kg	0.549	mg/kg	M	0.0E+00	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	- -
	(Total)												4.6E-03
												Total Hazard Index Across All Exposure Routes/Pathways	1.3E-01

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Chronic.

TABLE 7.8
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: All Soil
Exposure Medium: All Soil
Exposure Point: Solvent Storage Area (Site 18)
Receptor Population: Child Residnts
Receptor Age: Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Arsenic	4.00	mg/kg	4.00	mg/kg	M	1.1E-05	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	3.7E-02
	Lead	47.6	mg/kg	47.6	mg/kg	M	1.3E-04	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Manganese (soil)	154	mg/kg	154	mg/kg	M	4.2E-04	mg/kg/day	1.4E-01	mg/kg/day	N/A	N/A	3.0E-03
	Thallium	0.549	mg/kg	0.549	mg/kg	M	1.5E-06	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	2.1E-02
	(Total)												6.1E-02
Dermal	Arsenic	4.00	mg/kg	4.00	mg/kg	M	4.1E-07	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	1.4E-03
	Lead	47.6	mg/kg	47.6	mg/kg	M	0.0E+00	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Manganese (soil)	154	mg/kg	154	mg/kg	M	0.0E+00	mg/kg/day	5.6E-03	mg/kg/day	N/A	N/A	- -
	Thallium	0.549	mg/kg	0.549	mg/kg	M	0.0E+00	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	- -
	(Total)												1.4E-03
												Total Hazard Index Across All Exposure Routes/Pathways	6.2E-02

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Chronic.

TABLE 7.9
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: All Soil
Exposure Medium: All Soil
Exposure Point: Solvent Storage Area (Site 18)
Receptor Population: Adult Residnts
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Arsenic	4.00	mg/kg	4.00	mg/kg	M	2.3E-06	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	7.8E-03
	Lead	47.6	mg/kg	47.6	mg/kg	M	2.8E-05	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Manganese (soil)	154	mg/kg	154	mg/kg	M	9.0E-05	mg/kg/day	1.4E-01	mg/kg/day	N/A	N/A	6.5E-04
	Thallium	0.549	mg/kg	0.549	mg/kg	M	3.2E-07	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	4.6E-03
	(Total)												1.3E-02
Dermal	Arsenic	4.00	mg/kg	4.00	mg/kg	M	1.9E-07	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	6.2E-04
	Lead	47.6	mg/kg	47.6	mg/kg	M	0.0E+00	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Manganese (soil)	154	mg/kg	154	mg/kg	M	0.0E+00	mg/kg/day	5.6E-03	mg/kg/day	N/A	N/A	- -
	Thallium	0.549	mg/kg	0.549	mg/kg	M	0.0E+00	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	- -
	(Total)												6.2E-04
												Total Hazard Index Across All Exposure Routes/Pathways	1.4E-02

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Subchronic.

TABLE 7.10
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: All Soil
Exposure Medium: All Soil
Exposure Point: Solvent Storage Area (Site 18)
Receptor Population: Adult Residnts
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Arsenic	4.00	mg/kg	4.00	mg/kg	M	1.2E-06	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	3.9E-03
	Lead	47.6	mg/kg	47.6	mg/kg	M	1.4E-05	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Manganese (soil)	154	mg/kg	154	mg/kg	M	4.5E-05	mg/kg/day	1.4E-01	mg/kg/day	N/A	N/A	3.2E-04
	Thallium	0.549	mg/kg	0.549	mg/kg	M	1.6E-07	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	2.3E-03
	(Total)												6.5E-03
Dermal	Arsenic	4.00	mg/kg	4.00	mg/kg	M	2.7E-08	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	8.9E-05
	Lead	47.6	mg/kg	47.6	mg/kg	M	0.0E+00	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Manganese (soil)	154	mg/kg	154	mg/kg	M	0.0E+00	mg/kg/day	5.6E-03	mg/kg/day	N/A	N/A	- -
	Thallium	0.549	mg/kg	0.549	mg/kg	M	0.0E+00	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	- -
	(Total)												8.9E-05
												Total Hazard Index Across All Exposure Routes/Pathways	6.6E-03

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Subchronic.

TABLE 8.1
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: All Soil
Exposure Medium: All Soil
Exposure Point: Solvent Storage Area (Site 18)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Arsenic	4.00	mg/kg	4.00	mg/kg	M	1.3E-07	mg/kg/day	1.5E+00	(mg/kg/day) -1	1.9E-07
	Lead	47.6	mg/kg	47.6	mg/kg	M	1.5E-06	mg/kg/day	NA	(mg/kg/day) -1	- -
	Manganese (soil)	154	mg/kg	154	mg/kg	M	5.0E-06	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	0.549	mg/kg	0.549	mg/kg	M	1.8E-08	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										1.9E-07
Dermal	Arsenic	4.00	mg/kg	4.00	mg/kg	M	6.1E-09	mg/kg/day	1.5E+00	(mg/kg/day) -1	9.2E-09
	Lead	47.6	mg/kg	47.6	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Manganese (soil)	154	mg/kg	154	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	0.549	mg/kg	0.549	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										9.2E-09
										Total Risk Across All Exposure Routes/Pathways	2.0E-07

(1) Medium-Specific (M) EPC selected for risk calculation.

TABLE 8.2
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: All Soil
Exposure Medium: All Soil
Exposure Point: Solvent Storage Area (Site 18)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Arsenic	4.00	mg/kg	4.00	mg/kg	M	4.3E-08	mg/kg/day	1.5E+00	(mg/kg/day) -1	6.4E-08
	Lead	47.6	mg/kg	47.6	mg/kg	M	5.1E-07	mg/kg/day	NA	(mg/kg/day) -1	- -
	Manganese (soil)	154	mg/kg	154	mg/kg	M	1.7E-06	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	0.549	mg/kg	0.549	mg/kg	M	5.9E-09	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										6.4E-08
Dermal	Arsenic	4.00	mg/kg	4.00	mg/kg	M	4.1E-10	mg/kg/day	1.5E+00	(mg/kg/day) -1	6.1E-10
	Lead	47.6	mg/kg	47.6	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Manganese (soil)	154	mg/kg	154	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	0.549	mg/kg	0.549	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										6.1E-10
										Total Risk Across All Exposure Routes/Pathways	6.5E-08

(1) Medium-Specific (M) EPC selected for risk calculation.

TABLE 8.3
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Solvent Storage Area (Site 18)
Receptor Population: Full-Time Employees
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Arsenic	4.00	mg/kg	4.00	mg/kg	M	8.4E-07	mg/kg/day	1.5E+00	(mg/kg/day) -1	1.3E-06
	Lead	93.7	mg/kg	93.7	mg/kg	M	2.0E-05	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	0.640	mg/kg	0.640	mg/kg	M	1.3E-07	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										1.3E-06
Dermal	Arsenic	4.00	mg/kg	4.00	mg/kg	M	1.9E-07	mg/kg/day	1.5E+00	(mg/kg/day) -1	2.9E-07
	Lead	93.7	mg/kg	93.7	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	0.640	mg/kg	0.640	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										2.9E-07
										Total Risk Across All Exposure Routes/Pathways	1.5E-06

(1) M - Medium-Specific.

TABLE 8.4
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Solvent Storage Area (Site 18)
Receptor Population: Full-Time Employees
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Arsenic	2.76	mg/kg	2.76	mg/kg	M	6.9E-08	mg/kg/day	1.5E+00	(mg/kg/day) -1	1.0E-07
	Lead	93.7	mg/kg	93.7	mg/kg	M	2.4E-06	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	0.419	mg/kg	0.419	mg/kg	M	1.1E-08	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										1.0E-07
Dermal	Arsenic	2.76	mg/kg	2.76	mg/kg	M	3.2E-09	mg/kg/day	1.5E+00	(mg/kg/day) -1	4.7E-09
		93.7	mg/kg	93.7	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	0.419	mg/kg	0.419	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										4.7E-09
										Total Risk Across All Exposure Routes/Pathways	1.1E-07

(1) M - Medium-Specific.

TABLE 8.5
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Solvent Storage Area (Site 18)
Receptor Population: Older Child Trespasser
Receptor Age: Adolescent

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Arsenic	4.00	mg/kg	4.00	mg/kg	M	4.4E-07	mg/kg/day	1.5E+00	(mg/kg/day) -1	6.6E-07
	Lead	93.7	mg/kg	93.7	mg/kg	M	1.0E-05	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	0.640	mg/kg	0.640	mg/kg	M	7.0E-08	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										6.6E-07
Dermal	Arsenic	4.00	mg/kg	4.00	mg/kg	M	8.3E-08	mg/kg/day	1.5E+00	(mg/kg/day) -1	1.2E-07
	Lead	93.7	mg/kg	93.7	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	0.640	mg/kg	0.640	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										1.2E-07
										Total Risk Across All Exposure Routes/Pathways	7.8E-07

(1) M - Medium-Specific.

TABLE 8.6
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Solvent Storage Area (Site 18)
Receptor Population: Older Child Trespasser
Receptor Age: Adolescent

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Arsenic	2.76	mg/kg	2.76	mg/kg	M	2.0E-08	mg/kg/day	1.5E+00	(mg/kg/day) -1	2.9E-08
	Lead	93.7	mg/kg	93.7	mg/kg	M	6.6E-07	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	0.419	mg/kg	0.419	mg/kg	M	3.0E-09	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										2.9E-08
Dermal	Arsenic	2.76	mg/kg	2.76	mg/kg	M	2.2E-09	mg/kg/day	1.5E+00	(mg/kg/day) -1	3.3E-09
	Lead	93.7	mg/kg	93.7	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	0.419	mg/kg	0.419	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										3.3E-09
										Total Risk Across All Exposure Routes/Pathways	3.3E-08

(1) M - Medium-Specific.

TABLE 8.7
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: All Soil
Exposure Medium: All Soil
Exposure Point: Solvent Storage Area (Site 18)
Receptor Population: Child Residnts
Receptor Age: Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Arsenic	4.00	mg/kg	4.00	mg/kg	M	1.9E-06	mg/kg/day	1.5E+00	(mg/kg/day) -1	2.8E-06
	Lead	47.6	mg/kg	47.6	mg/kg	M	2.2E-05	mg/kg/day	NA	(mg/kg/day) -1	- -
	Manganese (soil)	154	mg/kg	154	mg/kg	M	7.2E-05	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	0.549	mg/kg	0.549	mg/kg	M	2.6E-07	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										2.8E-06
Dermal	Arsenic	4.00	mg/kg	4.00	mg/kg	M	1.2E-07	mg/kg/day	1.5E+00	(mg/kg/day) -1	1.8E-07
	Lead	47.6	mg/kg	47.6	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Manganese (soil)	154	mg/kg	154	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	0.549	mg/kg	0.549	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										1.8E-07
										Total Risk Across All Exposure Routes/Pathways	3.0E-06

(1) Medium-Specific (M) EPC selected for risk calculation.

TABLE 8.8
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: All Soil
Exposure Medium: All Soil
Exposure Point: Solvent Storage Area (Site 18)
Receptor Population: Child Residnts
Receptor Age: Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Arsenic	4.00	mg/kg	4.00	mg/kg	M	3.1E-07	mg/kg/day	1.5E+00	(mg/kg/day) -1	4.7E-07
	Lead	47.6	mg/kg	47.6	mg/kg	M	3.7E-06	mg/kg/day	NA	(mg/kg/day) -1	- -
	Manganese (soil)	154	mg/kg	154	mg/kg	M	1.2E-05	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	0.549	mg/kg	0.549	mg/kg	M	4.3E-08	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										4.7E-07
Dermal	Arsenic	4.00	mg/kg	4.00	mg/kg	M	1.2E-08	mg/kg/day	1.5E+00	(mg/kg/day) -1	1.8E-08
	Lead	47.6	mg/kg	47.6	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Manganese (soil)	154	mg/kg	154	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	0.549	mg/kg	0.549	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										1.8E-08
										Total Risk Across All Exposure Routes/Pathways	4.9E-07

(1) Medium-Specific (M) EPC selected for risk calculation.

TABLE 8.9
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: All Soil
Exposure Medium: All Soil
Exposure Point: Solvent Storage Area (Site 18)
Receptor Population: Adult Residnts
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Arsenic	4.00	mg/kg	4.00	mg/kg	M	8.1E-07	mg/kg/day	1.5E+00	(mg/kg/day) -1	1.2E-06
	Lead	47.6	mg/kg	47.6	mg/kg	M	9.6E-06	mg/kg/day	NA	(mg/kg/day) -1	- -
	Manganese (soil)	154	mg/kg	154	mg/kg	M	3.1E-05	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	0.549	mg/kg	0.549	mg/kg	M	1.1E-07	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										1.2E-06
Dermal	Arsenic	4.00	mg/kg	4.00	mg/kg	M	6.4E-08	mg/kg/day	1.5E+00	(mg/kg/day) -1	9.6E-08
	Lead	47.6	mg/kg	47.6	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Manganese (soil)	154	mg/kg	154	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	0.549	mg/kg	0.549	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										9.6E-08
										Total Risk Across All Exposure Routes/Pathways	1.3E-06

(1) Medium-Specific (M) EPC selected for risk calculation.

TABLE 8.10
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: All Soil
Exposure Medium: All Soil
Exposure Point: Solvent Storage Area (Site 18)
Receptor Population: Adult Residnts
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Arsenic	4.00	mg/kg	4.00	mg/kg	M	1.2E-07	mg/kg/day	1.5E+00	(mg/kg/day) -1	1.8E-07
	Lead	47.6	mg/kg	47.6	mg/kg	M	1.4E-06	mg/kg/day	NA	(mg/kg/day) -1	- -
	Manganese (soil)	154	mg/kg	154	mg/kg	M	4.5E-06	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	0.549	mg/kg	0.549	mg/kg	M	1.6E-08	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										1.8E-07
Dermal	Arsenic	4.00	mg/kg	4.00	mg/kg	M	2.7E-09	mg/kg/day	1.5E+00	(mg/kg/day) -1	4.0E-09
	Lead	47.6	mg/kg	47.6	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Manganese (soil)	154	mg/kg	154	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	0.549	mg/kg	0.549	mg/kg	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										4.0E-09
										Total Risk Across All Exposure Routes/Pathways	1.8E-07

(1) Medium-Specific (M) EPC selected for risk calculation.

TABLE 9.1
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
All Soil	All Soil	Solvent Storage Area (Site 18)	Arsenic	1.9E-07	- -	9.2E-09	2.0E-07	Arsenic	Skin	3.0E-02	- -	1.4E-03	3.1E-02
			Lead	- -	- -	- -	- -	Lead	NA	- -	- -	- -	- -
			Manganese (soil)	- -	- -	- -	- -	Manganese (soil)	CNS	2.5E-03	- -	- -	2.5E-03
			Thallium	- -	- -	- -	- -	Thallium	None Specified	1.8E-02	- -	- -	1.8E-02
			(Total)	1.9E-07	- -	9.2E-09	2.0E-07	(Total)		5.0E-02	- -	1.4E-03	5.2E-02
			Total Risk Across Surface/Subsurface Soil				2.0E-07	Total Hazard Index Across All Media and All Exposure Routes					5.2E-02
			Total Risk Across All Media and All Exposure Routes				2.0E-07						

Total Skin HI	3.1E-02
Total CNS HI	2.5E-03
Total None Specified HI	1.8E-02

TABLE 9.2
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
All Soil	All Soil	Solvent Storage Area (Site 18)	Arsenic	6.4E-08	- -	6.1E-10	6.5E-08	Arsenic	Skin	1.0E-02	- -	9.5E-05	1.0E-02
			Lead	- -	- -	- -	- -	Lead	NA	- -	- -	- -	- -
			Manganese (soil)	- -	- -	- -	- -	Manganese (soil)	CNS	8.3E-04	- -	- -	8.3E-04
			Thallium	- -	- -	- -	- -	Thallium	None Specified	5.9E-03	- -	- -	5.9E-03
			(Total)	6.4E-08	- -	6.1E-10	6.5E-08	(Total)		1.7E-02	- -	9.5E-05	1.7E-02
			Total Risk Across Surface/Subsurface Soil				6.5E-08	Total Hazard Index Across All Media and All Exposure Routes					1.7E-02
			Total Risk Across All Media and All Exposure Routes				6.5E-08						

Total Skin HI	1.0E-02
Total CNS HI	8.3E-04
Total None Specified HI	5.9E-03

TABLE 9.3
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Full-Time Employees
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Solvent Storage Area (Site 18)	Arsenic	1.3E-06	- -	2.9E-07	1.5E-06	Arsenic	Skin	7.8E-03	- -	1.8E-03	9.6E-03
			Lead	- -	- -	- -	- -	Lead	NA	- -	- -	- -	- -
			Thallium	- -	- -	- -	- -	Thallium	None Specified	5.4E-03	- -	- -	5.4E-03
			(Total)	1.3E-06	- -	2.9E-07	1.5E-06	(Total)		1.3E-02	- -	1.8E-03	1.5E-02
						Total Risk Across Soil	1.5E-06					Total Hazard Index Across All Media and All Exposure Routes	1.5E-02
						Total Risk Across All Media and All Exposure Routes	1.5E-06						
												Total None Specified HI	5.4E-03

TABLE 9.4
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Full-Time Employees
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Solvent Storage Area (Site 18)	Arsenic	1.0E-07	- -	4.7E-09	1.1E-07	Arsenic	Skin	2.7E-03	- -	1.2E-04	2.8E-03
			Lead	- -	- -	- -	- -	Lead	NA	- -	- -	- -	- -
			Thallium	- -	- -	- -	- -	Thallium	None Specified	1.8E-03	- -	- -	1.8E-03
			(Total)	1.0E-07	- -	4.7E-09	1.1E-07	(Total)		4.5E-03	- -	1.2E-04	4.6E-03
						Total Risk Across Soil	1.1E-07					Total Hazard Index Across All Media and All Exposure Routes	4.6E-03
						Total Risk Across All Media and All Exposure Routes	1.1E-07						
												Total None Specified HI	1.8E-03

TABLE 9.5
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Older Child Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Solvent Storage Area (Site 18)	Arsenic	6.6E-07	- -	1.2E-07	7.8E-07	Arsenic	Skin	1.0E-02	- -	1.9E-03	1.2E-02
			Lead	- -	- -	- -	- -	Lead	NA	- -	- -	- -	- -
			Thallium	- -	- -	- -	- -	Thallium	None Specified	7.0E-03	- -	- -	7.0E-03
			(Total)	6.6E-07	- -	1.2E-07	7.8E-07	(Total)		1.7E-02	- -	1.9E-03	1.9E-02
						Total Risk Across Soil	7.8E-07					Total Hazard Index Across All Media and All Exposure Routes	1.9E-02
						Total Risk Across All Media and All Exposure Routes	7.8E-07						
												Total None Specified HI	7.0E-03

TABLE 9.6
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Older Child Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Solvent Storage Area (Site 18)	Arsenic	2.9E-08	- -	3.3E-09	3.3E-08	Arsenic	Skin	1.5E-03	- -	1.7E-04	1.7E-03
			Lead	- -	- -	- -	- -	Lead	NA	- -	- -	- -	- -
			Thallium	- -	- -	- -	- -	Thallium	None Specified	9.9E-04	- -	- -	9.9E-04
			(Total)	2.9E-08	- -	3.3E-09	3.3E-08	(Total)		2.5E-03	- -	1.7E-04	2.7E-03
						Total Risk Across Soil	3.3E-08					Total Hazard Index Across All Media and All Exposure Routes	2.7E-03
						Total Risk Across All Media and All Exposure Routes	3.3E-08						
												Total None Specified HI	9.9E-04

TABLE 9.7
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Child Residnts
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
All Soil	All Soil	Solvent Storage Area (Site 18)	Arsenic	2.8E-06	- -	1.8E-07	3.0E-06	Arsenic	Skin	7.3E-02	- -	4.6E-03	7.8E-02
			Lead	- -	- -	- -	- -	Lead	NA	- -	- -	- -	- -
			Manganese (soil)	- -	- -	- -	- -	Manganese (soil)	CNS	6.0E-03	- -	- -	6.0E-03
			Thallium	- -	- -	- -	- -	Thallium	None Specified	4.3E-02	- -	- -	4.3E-02
			(Total)	2.8E-06	- -	1.8E-07	3.0E-06	(Total)		1.2E-01	- -	4.6E-03	1.3E-01
			Total Risk Across Surface/Subsurface Soil				3.0E-06	Total Hazard Index Across All Media and All Exposure Routes					1.3E-01
			Total Risk Across All Media and All Exposure Routes				3.0E-06						

Total None Specified HI	4.3E-02
Total Skin HI	7.8E-02
Total CNS HI	6.0E-03

TABLE 9.8
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Child Residnts
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
All Soil	All Soil	Solvent Storage Area (Site 18)	Arsenic	4.7E-07	- -	1.8E-08	4.9E-07	Arsenic	Skin	3.7E-02	- -	1.4E-03	3.8E-02
			Lead	- -	- -	- -	- -	Lead	NA	- -	- -	- -	- -
			Manganese (soil)	- -	- -	- -	- -	Manganese (soil)	CNS	3.0E-03	- -	- -	3.0E-03
			Thallium	- -	- -	- -	- -	Thallium	None Specified	2.1E-02	- -	- -	2.1E-02
			(Total)	4.7E-07	- -	1.8E-08	4.9E-07	(Total)		6.1E-02	- -	1.4E-03	6.2E-02
			Total Risk Across Surface/Subsurface Soil				4.9E-07	Total Hazard Index Across All Media and All Exposure Routes					6.2E-02
			Total Risk Across All Media and All Exposure Routes				4.9E-07						

Total None Specified HI	2.1E-02
Total Skin HI	3.8E-02
Total CNS HI	3.0E-03

TABLE 9.9
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Adult Residnts
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
All Soil	All Soil	Solvent Storage Area (Site 18)	Arsenic	1.2E-06	- -	9.6E-08	1.3E-06	Arsenic	Skin	7.8E-03	- -	6.2E-04	8.5E-03
			Lead	- -	- -	- -	- -	Lead	NA	- -	- -	- -	- -
			Manganese (soil)	- -	- -	- -	- -	Manganese (soil)	CNS	6.5E-04	- -	- -	6.5E-04
			Thallium	- -	- -	- -	- -	Thallium	None Specified	4.6E-03	- -	- -	4.6E-03
			(Total)	1.2E-06	- -	9.6E-08	1.3E-06	(Total)		1.3E-02	- -	6.2E-04	1.4E-02
			Total Risk Across Surface/Subsurface Soil				1.3E-06	Total Hazard Index Across All Media and All Exposure Routes					1.4E-02
			Total Risk Across All Media and All Exposure Routes				1.3E-06						

Total Skin HI	8.5E-03
Total CNS HI	6.5E-04
Total None Specified HI	4.6E-03

TABLE 9.10
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Adult Residnts
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
All Soil	All Soil	Solvent Storage Area (Site 18)	Arsenic	1.8E-07	- -	4.0E-09	1.8E-07	Arsenic	Skin	3.9E-03	- -	8.9E-05	4.0E-03
			Lead	- -	- -	- -	- -	Lead	NA	- -	- -	- -	- -
			Manganese (soil)	- -	- -	- -	- -	Manganese (soil)	CNS	3.2E-04	- -	- -	3.2E-04
			Thallium	- -	- -	- -	- -	Thallium	None Specified	2.3E-03	- -	- -	2.3E-03
			(Total)	1.8E-07	- -	4.0E-09	1.8E-07	(Total)		6.5E-03	- -	8.9E-05	6.6E-03
			Total Risk Across Surface/Subsurface Soil				1.8E-07	Total Hazard Index Across All Media and All Exposure Routes					6.6E-03
			Total Risk Across All Media and All Exposure Routes				1.8E-07						

Total Skin HI	4.0E-03
Total CNS HI	3.2E-04
Total None Specified HI	2.3E-03

TABLE 10.1
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
All Soil	All Soil	Solvent Storage Area (Site 18)	Arsenic	1.9E-07	- -	9.2E-09	2.0E-07	Arsenic	Skin	3.0E-02	- -	1.4E-03	3.1E-02
			Lead	- -	- -	- -	- -	Lead	NA	- -	- -	- -	- -
			Manganese (soil)	- -	- -	- -	- -	Manganese (soil)	CNS	2.5E-03	- -	- -	2.5E-03
			Thallium	- -	- -	- -	- -	Thallium	None Specified	1.8E-02	- -	- -	1.8E-02
			(Total)	1.9E-07	- -	9.2E-09	2.0E-07	(Total)		5.0E-02	- -	1.4E-03	5.2E-02
			Total Risk Across Surface/Subsurface Soil				2.0E-07	Total Hazard Index Across All Media and All Exposure Routes					5.2E-02
			Total Risk Across All Media and All Exposure Routes				2.0E-07						

Total Skin HI	3.1E-02
Total CNS HI	2.5E-03
Total None Specified HI	1.8E-02

TABLE 10.2
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
All Soil	All Soil	Solvent Storage Area (Site 18)	Arsenic	6.4E-08	- -	6.1E-10	6.5E-08	Arsenic	Skin	1.0E-02	- -	9.5E-05	1.0E-02
			Lead	- -	- -	- -	- -	Lead	NA	- -	- -	- -	- -
			Manganese (soil)	- -	- -	- -	- -	Manganese (soil)	CNS	8.3E-04	- -	- -	8.3E-04
			Thallium	- -	- -	- -	- -	Thallium	None Specified	5.9E-03	- -	- -	5.9E-03
			(Total)	6.4E-08	- -	6.1E-10	6.5E-08	(Total)		1.7E-02	- -	9.5E-05	1.7E-02
			Total Risk Across Surface/Subsurface Soil				6.5E-08	Total Hazard Index Across All Media and All Exposure Routes					1.7E-02
			Total Risk Across All Media and All Exposure Routes				6.5E-08						

Total Skin HI	1.0E-02
Total CNS HI	8.3E-04
Total None Specified HI	5.9E-03

TABLE 10.3
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Full-Time Employees
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Solvent Storage Area (Site 18)	Arsenic	1.3E-06	- -	2.9E-07	1.5E-06	Arsenic	Skin	7.8E-03	- -	1.8E-03	9.6E-03
			Lead	- -	- -	- -	- -	Lead	NA	- -	- -	- -	- -
			Thallium	- -	- -	- -	- -	Thallium	None Specified	5.4E-03	- -	- -	5.4E-03
			(Total)	1.3E-06	- -	2.9E-07	1.5E-06	(Total)		1.3E-02	- -	1.8E-03	1.5E-02
							Total Risk Across Soil 1.5E-06						Total Hazard Index Across All Media and All Exposure Routes 1.5E-02
							Total Risk Across All Media and All Exposure Routes 1.5E-06						
													Total None Specified HI 5.4E-03

TABLE 10.4
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Full-Time Employees
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Solvent Storage Area (Site 18)	Arsenic	1.0E-07	- -	4.7E-09	1.1E-07	Arsenic	Skin	2.7E-03	- -	1.2E-04	2.8E-03
			Thallium	- -	- -	- -	- -	Thallium	None Specified	1.8E-03	- -	- -	1.8E-03
			(Total)	1.0E-07	- -	4.7E-09	1.1E-07	(Total)		4.5E-03	- -	1.2E-04	4.6E-03
						Total Risk Across Soil	1.1E-07					Total Hazard Index Across All Media and All Exposure Routes	4.6E-03
						Total Risk Across All Media and All Exposure Routes	1.1E-07						
												Total None Specified HI	1.8E-03

TABLE 10.5
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Older Child Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Solvent Storage Area (Site 18)	Arsenic	6.6E-07	- -	1.2E-07	7.8E-07	Arsenic	Skin	1.0E-02	- -	1.9E-03	1.2E-02
			Lead	- -	- -	- -	- -	Lead	NA	- -	- -	- -	- -
			Thallium	- -	- -	- -	- -	Thallium	None Specified	7.0E-03	- -	- -	7.0E-03
			(Total)	6.6E-07	- -	1.2E-07	7.8E-07	(Total)		1.7E-02	- -	1.9E-03	1.9E-02
						Total Risk Across Soil	7.8E-07					Total Hazard Index Across All Media and All Exposure Routes	1.9E-02
						Total Risk Across All Media and All Exposure Routes	7.8E-07						
												Total None Specified HI	7.0E-03

TABLE 10.6
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Older Child Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Solvent Storage Area (Site 18)	Arsenic	2.9E-08	- -	3.3E-09	3.3E-08	Arsenic	Skin	1.5E-03	- -	1.7E-04	1.7E-03
			Lead	- -	- -	- -	- -	Lead	NA	- -	- -	- -	- -
			Thallium	- -	- -	- -	- -	Thallium	None Specified	9.9E-04	- -	- -	9.9E-04
			(Total)	2.9E-08	- -	3.3E-09	3.3E-08	(Total)		2.5E-03	- -	1.7E-04	2.7E-03
						Total Risk Across Soil	3.3E-08					Total Hazard Index Across All Media and All Exposure Routes	2.7E-03
						Total Risk Across All Media and All Exposure Routes	3.3E-08						
												Total None Specified HI	9.9E-04

TABLE 10.7
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Child Residnts
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
All Soil	All Soil	Solvent Storage Area (Site 18)	Arsenic	2.8E-06	- -	1.8E-07	3.0E-06	Arsenic	Skin	7.3E-02	- -	4.6E-03	7.8E-02
			(Total)	2.8E-06	- -	1.8E-07	3.0E-06	(Total)		7.3E-02	- -	4.6E-03	7.8E-02
			Total Risk Across Surface/Subsurface Soil				3.0E-06	Total Hazard Index Across All Media and All Exposure Routes					7.8E-02
			Total Risk Across All Media and All Exposure Routes				3.0E-06						

TABLE 10.8
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Child Residnts
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
All Soil	All Soil	Solvent Storage Area (Site 18)	Arsenic	4.7E-07	- -	1.8E-08	4.9E-07	Arsenic	Skin	3.7E-02	- -	1.4E-03	3.8E-02
			Lead	- -	- -	- -	- -	Lead	NA	- -	- -	- -	- -
			Manganese (soil)	- -	- -	- -	- -	Manganese (soil)	CNS	3.0E-03	- -	- -	3.0E-03
			Thallium	- -	- -	- -	- -	Thallium	None Specified	2.1E-02	- -	- -	2.1E-02
			(Total)	4.7E-07	- -	1.8E-08	4.9E-07	(Total)		6.1E-02	- -	1.4E-03	6.2E-02
			Total Risk Across Surface/Subsurface Soil				4.9E-07	Total Hazard Index Across All Media and All Exposure Routes					6.2E-02
			Total Risk Across All Media and All Exposure Routes				4.9E-07						

Total None Specified HI	2.1E-02
Total Skin HI	3.8E-02
Total CNS HI	3.0E-03

TABLE 10.9
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Adult Residnts
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
All Soil	All Soil	Solvent Storage Area (Site 18)	Arsenic	1.2E-06	- -	9.6E-08	1.3E-06	Arsenic	Skin	7.8E-03	- -	6.2E-04	8.5E-03
			Lead	- -	- -	- -	- -	Lead	NA	- -	- -	- -	- -
			Manganese (soil)	- -	- -	- -	- -	Manganese (soil)	CNS	6.5E-04	- -	- -	6.5E-04
			Thallium	- -	- -	- -	- -	Thallium	None Specified	4.6E-03	- -	- -	4.6E-03
			(Total)	1.2E-06	- -	9.6E-08	1.3E-06	(Total)		1.3E-02	- -	6.2E-04	1.4E-02
			Total Risk Across Surface/Subsurface Soil				1.3E-06	Total Hazard Index Across All Media and All Exposure Routes					1.4E-02
			Total Risk Across All Media and All Exposure Routes				1.3E-06						

Total Skin HI	8.5E-03
Total CNS HI	6.5E-04
Total None Specified HI	4.6E-03

TABLE 9.10
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Adult Residnts
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
All Soil	All Soil	Solvent Storage Area (Site 18)	Arsenic	1.8E-07	- -	4.0E-09	1.8E-07	Arsenic	Skin	3.9E-03	- -	8.9E-05	4.0E-03
			Lead	- -	- -	- -	- -	Lead	NA	- -	- -	- -	- -
			Manganese (soil)	- -	- -	- -	- -	Manganese (soil)	CNS	3.2E-04	- -	- -	3.2E-04
			Thallium	- -	- -	- -	- -	Thallium	None Specified	2.3E-03	- -	- -	2.3E-03
			(Total)	1.8E-07	- -	4.0E-09	1.8E-07	(Total)		6.5E-03	- -	8.9E-05	6.6E-03
			Total Risk Across Surface/Subsurface Soil				1.8E-07	Total Hazard Index Across All Media and All Exposure Routes					6.6E-03
			Total Risk Across All Media and All Exposure Routes				1.8E-07						

Total Skin HI	4.0E-03
Total CNS HI	3.2E-04
Total None Specified HI	2.3E-03

AREA A WEAPONS CENTER (SITE 20)

TABLE 1
SELECTION OF EXPOSURE PATHWAYS
AREA A WEAPONS CENTER (SITE 20)
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current/Future	Groundwater	Groundwater	Overburden/Bedrock Aquifer	Construction Workers	Adult	Ingestion Dermal	On-Site On-Site	Quant Quant	Construction workers may have dermal contact with groundwater during excavation activities.
				Full-time Employees	Adult	Ingestion Dermal	On-Site On-Site	None None	Full-time employees are not exposed to groundwater.
				Trespassers	Adolescents	Ingestion Dermal	On-Site On-Site	None None	Trespassers do not have contact with groundwater.
				Residents	Adult	Ingestion Dermal	On-Site On-Site	Quant Quant	Groundwater may be used as a potable water source in the future.
					Child	Ingestion Dermal	On-Site On-Site	None None	Exposures to a child resident are less than those for an adult resident
		Air	Overburden/Bedrock Aquifer	Construction Workers	Adult	Inhalation	On-site	None	Construction workers exposure via volatilization is expected to be insignificant due to dilution with outdoor air.
				Full-time Employees	Adult	Inhalation	On-site	None	Full-time employees are not exposed to groundwater.
				Trespassers	Adolescents	Inhalation	On-Site	None	Trespassers do not have contact with site groundwater.
				Residents	Adult	Inhalation	On-site	Quant	On-site residents may be exposed to volatile emissions from groundwater while showering.
					Child	Inhalation	On-site	None	Exposures to a child resident are less than those for an adult resident

TABLE 2.1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - GROUNDWATER
DIRECT CONTACT EXPOSURE SCENARIOS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Weapons Center (Site 20)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Risk-Based COPC Screening Level(5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection(6)
Volatile Organics																
108-10-1	4-METHYL-2-PENTANONE	1.29	J	1.29	J	ug/L	S202WCMW2S01	1/4	5	1.29	NA	16 N	7 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
79-01-6	TRICHLOROETHENE	3.8	J	5.02	J	ug/L	S202WCMW2S01	2/4	1	5.02	NA	1.6 C	5 5 5	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
Semivolatile Organics																
106-44-5	4-METHYLPHENOL	9		9		ug/L	S202WCMW3S01	1/4	5	9	NA	18 N	35 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
56-55-3	BENZO(A)ANTHRACENE	0.04	J	0.04	J	ug/L	S202WCMW2S01	1/4	0.05	0.04	NA	0.092 C	0.06 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
50-32-8	BENZO(A)PYRENE	0.05		0.05		ug/L	S202WCMW2S01	1/4	0.05	0.05	NA	0.0092 C	0.2 0.2 N/A	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
205-99-2	BENZO(B)FLUORANTHENE	0.08	J	0.08	J	ug/L	S202WCMW2S01	1/4	0.1	0.08	NA	0.092 C	0.08 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
191-24-2	BENZO(G,H,I)PERYLENE	0.07	J	0.07	J	ug/L	S202WCMW2S01	1/4	0.1	0.07	NA	18 (7) N	210 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
207-08-9	BENZO(K)FLUORANTHENE	0.03	J	0.03	J	ug/L	S202WCMW2S01	1/4	0.05	0.03	NA	0.92 C	0.5 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
218-01-9	CHRYSENE	0.05	J	0.05	J	ug/L	S202WCMW2S01	1/4	0.05	0.05	NA	9.2 C	4.8 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
206-44-0	FLUORANTHENE	0.13		0.13		ug/L	S202WCMW2S01	1/4	0.1	0.13	NA	150 N	280 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
193-39-5	INDENO(1,2,3-CD)PYRENE	0.07		0.07		ug/L	S202WCMW2S01	1/4	0.05	0.07	NA	0.092 C	0.5 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
85-01-8	PHENANTHRENE	0.04	J	0.04	J	ug/L	S202WCMW2S01	1/4	0.05	0.04	NA	18 (7) N	200 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
129-00-0	PYRENE	0.11		0.11		ug/L	S202WCMW2S01	1/4	0.05	0.11	NA	18 N	200 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
Total Metals																
7440-36-0	ANTIMONY	3.5	J	3.5	J	ug/L	S202WCMW3S01	1/4	2.6	3.5	2.90	1.5 N	6 6 6	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
7440-38-2	ARSENIC	4.1	J	15.1		ug/L	S202WCMW1S01	2/4	2.3	15.1	1.92	0.045 C	50 50 50	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
7440-39-3	BARIUM	83.5		83.5		ug/L	S202WCMW3S01	1/4	38.2 - 90	83.5	227	260 N	1000 2000 2000	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL, BKG
7440-70-2	CALCIUM	22500		160000		ug/L	S202WCMW3S01	4/4	0	160000	188000	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT, BKG

TABLE 2.1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - GROUNDWATER
DIRECT CONTACT EXPOSURE SCENARIOS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Weapons Center (Site 20)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Risk-Based COPC Screening Level(5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection(6)
7440-47-3	CHROMIUM	26.9		29.2		ug/L	S202WCMW3S01	2/4	6.2	29.2	49.9	110 (8) N	50 100 N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL, BKG
7440-48-4	COBALT	18.8		18.8		ug/L	S202WCMW3S01	1/4	5.3 - 12	18.8	48.6	220 N	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL, BKG
7440-50-8	COPPER	9.1	J	66.6		ug/L	S202WCMW1S01	2/4	6.8	66.6	107	140 N	1300 1300 N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL, BKG
7439-89-6	IRON	14900		40200		ug/L	S202WCMW1S01	3/4	188	40200	28200	1100 N	N/A 300 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	EPAI
7439-92-1	LEAD	8.9		8.9		ug/L	S202WCMW1S01	1/4	1.8	8.9	6.63	N/A	15 15 N/A	CTDEP RSR FED-AL CTDEP-MCL	NO	BSL
7439-95-4	MAGNESIUM	2640		138000		ug/L	S202WCMW3S01	4/4	0	138000	191000	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT, BKG
7439-96-5	MANGANESE	887		2170		ug/L	S202WCMW1S01	3/4	17.2	2170	11700	88 N	N/A 50 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	BKG
7440-02-0	NICKEL	13.7	J	102		ug/L	S202WCMW1S01	2/4	9.2	102	32.2	73 N	100 100 100	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
7440-09-7	POTASSIUM	1440		100000		ug/L	S202WCMW3S01	4/4	0	100000	70800	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT
7440-22-4	SILVER	114	J	326	J	ug/L	S202WCMW1S01	2/4	5.2 - 6	326	ND	18 N	36 100 50	CTDEP RSR FED-SMCL CTDEP-MCL	YES	ASL
7440-23-5	SODIUM	9530		1220000	J	ug/L	S202WCMW3S01	4/4	0	1220000	1900000	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT, BKG
7440-28-0	THALLIUM	3.8	J	3.8	J	ug/L	S202WCMW3S01	1/4	3	3.8	ND	2.4 N	5 2 2	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
7440-62-2	VANADIUM	10.2	J	10.2	J	ug/L	S202WCMW3S01	1/4	6.3 - 10.4	10.2	10.2	26 N	50 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL, BKG
7440-66-6	ZINC	245		245		ug/L	S202WCMW1S01	1/4	13.5 - 24.6	245	131	1100 N	5000 5000 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	BSL
Dissolved Metals																
7440-70-2	CALCIUM, FILTERED	348	J	348	J	ug/L	S202WCMW3S01-F	1/1	0	348	152000	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT, BKG
7440-66-6	ZINC, FILTERED	53.4		53.4		ug/L	S202WCMW3S01-F	1/1	0	53.4	109	1100 N	5000 5000 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	BSL, BKG
Miscellaneous Parameters																
000-09-0	TOTAL DISSOLVED SOLIDS	135		5142	J	mg/L	S202WCMW3S01	4/4	0	5142	6260	N/A	N/A 500 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	BKG

TABLE 2.1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - GROUNDWATER
DIRECT CONTACT EXPOSURE SCENARIOS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Weapons Center (Site 20)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Risk-Based COPC Screening Level(5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection(6)
000-08-9	TOTAL SUSPENDED SOLIDS	8		2788	J	mg/L	S202WCMW3S01	2/4	5	2788	236	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NTX

A shaded value indicates that the concentration used for screening exceeds the criterion or background value.
A shaded chemical name indicates that the chemical has been selected as a COPC .

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 95% Upper Tolerance Limit (UTL) of site background data
5 The risk-based COPC screening level for tap water use is presented The value is based on a target hazard quotient of 0.1 for noncarcinogens (denoted with a "N" flag) or an incremental cancer risk of 1E-6 for carcinogens (denoted with a "C" flag) (USEPA, Region IX, November 2000).
6 The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level and/or an ARAR/TBC(s).
7 Pyrene is used as a surrogate for benzo(g,h,i)perylene and phenanthrene.
8 Value is for hexavalent chromium.

Associated Samples:
S202WCMW1S01
S202WCMW2S01
S202WCMW3S01
S202WCMW3S01-F
S202WMW4D01

Definitions:
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogen
COC = Chemical of Concern
J = Estimated Value
N = Noncarcinogen
N/A = Not Applicable.
FED-MCL = Federal Maximum Contaminant Level (USEPA, August 2000)
FED-SMCL = Federal Secondary Maximum Contaminant Level (USEPA, August 2000)
FED-AL = Federal Action Level (USEPA, August 2000)
CTDEP-RSR = Connecticut DEP Remediation Standard Regulations, 1996.
CTDEP-MCL = Connecticut Maximum Contaminant Level

Rationale Codes:
For Selection as a COC:
ASL = Above COC Screening Level/ARAR/TBC

For Elimination as a COC:
BKG = Within Background Levels
BSL = Below COC Screening Level/ARAR/TBC
NUT = Essential Nutrient
NTX = No Toxicity Information

TABLE 2.2
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - GROUNDWATER MIGRATION PATHWAYS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Weapons Center (Site 20)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	CTDEP Surface Water Criteria(5)	CTDEP Vol. Criteria(6)	COPC Flag	Rationale for Contaminant Deletion or Selection(7)
Volatile Organics															
108-10-1	4-METHYL-2-PENTANONE	1.29	J	1.29	J	ug/L	S202WCMW2S01	1/4	5	1.29	N/A	N/A	N/A	NO	NTX
79-01-6	TRICHLOROETHENE	3.8	J	5.02	J	ug/L	S202WCMW2S01	2/4	1	5.02	N/A	2340	219	NO	BSL
Semivolatile Organics															
106-44-5	4-METHYLPHENOL	9		9		ug/L	S202WCMW3S01	1/4	5	9	N/A	N/A	N/A	NO	NTX
56-55-3	BENZO(A)ANTHRACENE	0.04	J	0.04	J	ug/L	S202WCMW2S01	1/4	0.05	0.04	N/A	0.3	N/A	NO	BSL
50-32-8	BENZO(A)PYRENE	0.05		0.05		ug/L	S202WCMW2S01	1/4	0.05	0.05	N/A	0.3	N/A	NO	BSL
205-99-2	BENZO(B)FLUORANTHENE	0.08	J	0.08	J	ug/L	S202WCMW2S01	1/4	0.1	0.08	N/A	0.3	N/A	NO	BSL
191-24-2	BENZO(G,H,I)PERYLENE	0.07	J	0.07	J	ug/L	S202WCMW2S01	1/4	0.1	0.07	N/A	N/A	N/A	NO	NTX
207-08-9	BENZO(K)FLUORANTHENE	0.03	J	0.03	J	ug/L	S202WCMW2S01	1/4	0.05	0.03	N/A	0.3	N/A	NO	BSL
218-01-9	CHRYSENE	0.05	J	0.05	J	ug/L	S202WCMW2S01	1/4	0.05	0.05	N/A	N/A	N/A	NO	NTX
206-44-0	FLUORANTHENE	0.13		0.13		ug/L	S202WCMW2S01	1/4	0.1	0.13	N/A	3700	N/A	NO	BSL
193-39-5	INDENO(1,2,3-CD)PYRENE	0.07		0.07		ug/L	S202WCMW2S01	1/4	0.05	0.07	N/A	N/A	N/A	NO	NTX
85-01-8	PHENANTHRENE	0.04	J	0.04	J	ug/L	S202WCMW2S01	1/4	0.05	0.04	N/A	0.3	N/A	NO	BSL
129-00-0	PYRENE	0.11		0.11		ug/L	S202WCMW2S01	1/4	0.05	0.11	N/A	110000	N/A	NO	BSL
Total Metals															
7440-36-0	ANTIMONY	3.5	J	3.5	J	ug/L	S202WCMW3S01	1/4	2.6	3.5	2.90	86000	N/A	NO	BSL
7440-38-2	ARSENIC	4.1	J	15.1		ug/L	S202WCMW1S01	2/4	2.3	15.1	1.92	4	N/A	YES	ASL
7440-39-3	BARIUM	83.5		83.5		ug/L	S202WCMW3S01	1/4	38.2 - 90	83.5	227	N/A	N/A	NO	BKG
7440-70-2	CALCIUM	22500		160000		ug/L	S202WCMW3S01	4/4	N/A	160000	188000	N/A	N/A	NO	BKG
7440-47-3	CHROMIUM	26.9		29.2		ug/L	S202WCMW3S01	2/4	6.2	29.2	49.9	N/A	N/A	NO	BKG
7440-48-4	COBALT	18.8		18.8		ug/L	S202WCMW3S01	1/4	5.3 - 12	18.8	48.6	N/A	N/A	NO	BKG
7440-50-8	COPPER	9.1	J	66.6		ug/L	S202WCMW1S01	2/4	6.8	66.6	107	48	N/A	NO	BKG
7439-89-6	IRON	14900		40200		ug/L	S202WCMW1S01	3/4	188	40200	28200	N/A	N/A	NO	NTX
7439-92-1	LEAD	8.9		8.9		ug/L	S202WCMW1S01	1/4	1.8	8.9	6.63	13	N/A	NO	BSL
7439-95-4	MAGNESIUM	2640		138000		ug/L	S202WCMW3S01	4/4	N/A	138000	191000	N/A	N/A	NO	BKG
7439-96-5	MANGANESE	887		2170		ug/L	S202WCMW1S01	3/4	17.2	2170	11700	N/A	N/A	NO	BKG
7440-02-0	NICKEL	13.7	J	102		ug/L	S202WCMW1S01	2/4	9.2	102	32.2	880	N/A	NO	BSL
7440-09-7	POTASSIUM	1440		100000		ug/L	S202WCMW3S01	4/4	N/A	100000	70800	N/A	N/A	NO	NTX
7440-22-4	SILVER	114	J	326	J	ug/L	S202WCMW1S01	2/4	5.2 - 6	326	ND	12	N/A	YES	ASL
7440-23-5	SODIUM	9530		1220000	J	ug/L	S202WCMW3S01	4/4	N/A	1220000	1900000	N/A	N/A	NO	BKG
7440-28-0	THALLIUM	3.8	J	3.8	J	ug/L	S202WCMW3S01	1/4	3	3.8	ND	63	N/A	NO	BSL
7440-62-2	VANADIUM	10.2	J	10.2	J	ug/L	S202WCMW3S01	1/4	6.3 - 10.4	10.2	10.2	N/A	N/A	NO	NTX
7440-66-6	ZINC	245		245		ug/L	S202WCMW1S01	1/4	13.5 - 24.6	245	131	123	N/A	YES	ASL
Dissolved Metals															
7440-70-2	CALCIUM, FILTERED	348	J	348	J	ug/L	S202WCMW3S01-F	1/1	N/A	348	152000	N/A	N/A	NO	BKG
7440-66-6	ZINC, FILTERED	53.4		53.4		ug/L	S202WCMW3S01-F	1/1	N/A	53.4	109	123	N/A	NO	BSL, BKG
Miscellaneous Parameters															
000-09-0	TOTAL DISSOLVED SOLIDS	135		5142	J	mg/L	S202WCMW3S01	4/4	N/A	5142	6260	N/A	N/A	NO	BKG
000-08-9	TOTAL SUSPENDED SOLIDS	8		2788	J	mg/L	S202WCMW3S01	2/4	5	2788	236	N/A	N/A	NO	NTX

TABLE 2.2
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - GROUNDWATER
MIGRATION PATHWAYS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Weapons Center (Site 20)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	CTDEP Surface Water Criteria(5)	CTDEP Vol. Criteria(6)	COPC Flag	Rationale for Contaminant Deletion or Selection(7)

A shaded value indicates that the concentration used for screening exceeds the criterion or background value.
A shaded chemical name indicates that the chemical has been selected as a COPC .

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 95% Upper Tolerance Limit (UTL) of site background data
5 Connecticut DEP Surface Water Protection criteria.
6 Connecticut DEP Volatilization criteria for residential exposures.
7 The chemical is selected as a COPC if the maximum detected concentration exceeds the CTDEP surface water protection or volatilization criteria.

Associated Samples:
S202WCMW1S01
S202WCMW2S01
S202WCMW3S01
S202WCMW3S01-F
S202WMW4D01

Definitions:
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogen
COC = Chemical of Concern
J = Estimated Value
N = Noncarcinogen
NA = Not Applicable.

Rationale Codes:
For Selection as a COPC:
ASL = Above COPC Screening Level/ARAR/TBC

For Elimination as a COPC:
BKG = Within Background Levels
BSL = Below COPC Screening Level/ARAR/TBC
NTX = No Toxicity Information

TABLE 3.1
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Weapons Center (Site 20)

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency Exposure		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Trichloroethene	ug/L	2.46	5.17	5.02		ug/L	5.02	max	1	2.46	average	1
Benzo(a)pyrene	ug/L	0.031	0.046	0.05		ug/L	0.05	max	1	0.031	average	1
Antimony	ug/L	1.85	3.14	3.5		ug/L	3.5	max	1	1.85	average	1
Arsenic	ug/L	5.38	13.2	15.1		ug/L	15.1	max	1	5.38	average	1
Nickel	ug/L	31.2	87.0	102		ug/L	102	max	1	31.2	average	1
Silver	ug/L	111	291	326		ug/L	326	max	1	111	average	1
Thallium	ug/L	2.08	3.43	3.8		ug/L	3.8	max	1	2.08	average	1

Notes:
[1] - The maximum detected and average concentration is used for the RME and CTE sceanrios, respectively per EPA Region I guidance.
[2] - IEUBK require the use of the average concentration as the exposure point concentration.

TABLE 4.1
VALUES USED FOR DAILY INTAKE CALCULATIONS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Weapons Center (Site 20)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Dermal	DAevent	Absorbed dose per event	mg/cm2-event	See Text	See Text	See Text	See Text	Dermally Absorbed Dose (mg/kg/day)
	SA	Skin Surface Available for Contact	cm2	3800	EPA, 1992	3800	EPA, 1992	
	EV	Event Frequency	events/day	1	EPA, 1994	1	EPA, 1994	$= \frac{DAevent \times EV \times EF \times ED \times SA}{BW \times AT}$
	ET	Exposure Time	hours/event	4	(1)	2	(1)	
	EF	Exposure Frequency	days/year	20	Atlantic, 1992	10	Atlantic, 1992	
	ED	Exposure Duration	years	1	Atlantic, 1992	1	Atlantic, 1992	See text for calculation of DAevent.
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	365	EPA, 1989	365	EPA, 1989	

Notes:
(1) - Professinal judgement.
Sources:
EPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.
EPA, 1992: Dermal Exposure Assessment: Principles and Applications.
EPA, 1994: US EPA Region I Risk Updates, Number 2.
EPA, 1998: Risk Assessment Guidance for Superfund, Supplemental Guidance, Dermal Risk Assessment, Interim Guidance.
Atlantic 1992: Phase I Remedial Investigation Naval Submarine Base - New London, Connecticut, August.

TABLE 4.2
VALUES USED FOR DAILY INTAKE CALCULATIONS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Weapons Center (Site 20)
Receptor Population: Adult Residnts
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CGW	Chemical Concentration in Groundwater	mg/L	Maximum	EPA, 1994	Average	EPA, 1994	Chronic Daily Intake (CDI) (mg/kg/day) =
	IR-GW	Ingestion Rate of Groundwater	L/day	2	EPA, 1994	1.4	EPA, 1994	
	EF	Exposure Frequency	days/year	350	EPA, 1994	234	EPA, 1994	$\frac{CW \times IRGW \times EF \times ED}{BW \times AT}$
	ED	Exposure Duration	years	30	EPA, 1994	9	EPA, 1994	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	10,950	EPA, 1989	3,285	EPA, 1989	
Dermal	DAevent	Absorbed dose per event	mg/cm2-event	See Text	See Text	See Text	See Text	Dermally Absorbed Dose (mg/kg/day)
	SA	Skin Surface Available for Contact	cm2	20,000	EPA, 1992	20,000	EPA, 1992	
	EV	Event Frequency	events/day	1	EPA, 1994	1	EPA, 1994	$= \frac{DAevent \times EV \times EF \times ED \times SA}{BW \times AT}$
	ET	Exposure Time	hours/event	0.25	EPA, 1992	0.167	EPA, 1992	
	EF	Exposure Frequency	days/year	350	EPA, 1994	234	EPA, 1994	
	ED	Exposure Duration	years	30	EPA, 1994	9	EPA, 1994	See text for calculation of DAevent.
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	10,950	EPA, 1989	3,285	EPA, 1989	

Notes:
(1) - Professinal judgement.
Sources:
EPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.
EPA, 1992: Dermal Exposure Assessment: Principles and Applications.
EPA, 1994: US EPA Region I Risk Updates, Number 2.
EPA, 1998: Risk Assessment Guidance for Superfund, Supplemental Guidance, Dermal Risk Assessment, Interim Guidance.

TABLE 5.1
NON-CANCER TOXICITY DATA -- ORAL/DERMAL
NSB-NLON, GROTON, CONNECTICUT

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal RfD (2)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ (3) (MM/DD/YY)
Volatile Organic Compounds										
Trichloroethene	Chronic	6.0E-03	mg/kg/day	100%	6.0E-03	mg/kg/day	Liver	NA	EPA IX	11/01/00
	Subchronic	6.0E-03	mg/kg/day	100%	6.0E-03	mg/kg/day	Liver	NA	Chronic	11/01/00
Semivolatile Organic Compounds										
Benzo(a)pyrene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics										
Antimony	Chronic	4.0E-04	mg/kg/day	15%	6.0E-05	mg/kg/day	Blood	1000/1	IRIS	01/02/01
	Subchronic	4.0E-04	mg/kg/day	15%	6.0E-05	mg/kg/day	Blood	1000	HEAST	7/97
Arsenic	Chronic	3.0E-04	mg/kg/day	100%	3.0E-04	mg/kg/day	Skin	3/1	IRIS	01/02/01
	Subchronic	3.0E-04	mg/kg/day	100%	3.0E-04	mg/kg/day	Skin	3	HEAST	7/97
Nickel	Chronic	2.0E-02	mg/kg/day	4%	8.0E-04	mg/kg/day	Body Weigtht	300/1	IRIS	01/02/01
	Subchronic	2.0E-02	mg/kg/day	4%	8.0E-04	mg/kg/day	Body Weigtht	300	HEAST	7/97
Selenium	Chronic	5.0E-03	mg/kg/day	100%	5.0E-03	mg/kg/day	Body Weigtht	3/1	IRIS	01/02/01
	Subchronic	5.0E-03	mg/kg/day	100%	5.0E-03	mg/kg/day	Body Weigtht	3	HEAST	7/97
Silver	Chronic	5.0E-03	mg/kg/day	4%	2.0E-04	mg/kg/day	Skin	3/1	IRIS	01/02/01
	Subchronic	5.0E-03	mg/kg/day	4%	2.0E-04	mg/kg/day	Skin	3	HEAST	7/97
Thallium	Chronic	7.0E-05	mg/kg/day	100%	7.0E-05	mg/kg/day	None Specified	NA	EPA IX	11/01/00
	Subchronic	7.0E-05	mg/kg/day	100%	7.0E-05	mg/kg/day	None Specified	NA	Chronic	11/01/00

Notes:
(1) - USEPA 2000.
(2) - RfDdermal = RfDoral x Oral to Dermal Adjustment Factor.
(3) For IRIS values date that IRIS was searched.
For HEAST values, the date of HEAST.
FOR EPA IX, date of PRG Table.
NA = Not Applicable.
IRIS = Integrated Risk Information System.
HEAST= Health Effects Assessment Summary Tables.
EPA IX = USEPA Region IX Preliminary Remediation Goals Table, November 1, 2000.
Chronic = No subchronic value available, chronic value is presented.

TABLE 6.1
CANCER TOXICITY DATA -- ORAL/DERMAL
NSB-NLON, GROTON, CONNECTICUT

Chemical of Potential Concern	Oral Cancer Slope Factor	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal Cancer Slope Factor (2)	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (3) (MM/DD/YY)
Volatile Organic Compounds							
Trichloroethene	1.1E-02	100%	1.1E-02	$(mg/kg\text{-}day)^{-1}$	NA	EPA IX	11/01/00
Semivolatile Organic Compounds							
Benzo(a)pyrene	7.3E+00	100%	7.3E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	01/02/01
Inorganics							
Antimony	NA	NA	NA	NA	NA	NA	NA
Arsenic	1.5E+00	100%	1.5E+00	$(mg/kg\text{-}day)^{-1}$	A	IRIS	01/02/01
Nickel	NA	NA	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	D	IRIS	01/02/01
Thallium	NA	NA	NA	NA	D	IRIS	01/02/01

Notes:

IRIS = Integrated Risk Information System

HEAST= Health Effects Assessment Summary Tables

(1) - USEPA 1998.

(2) - CSFdermal = CSForal/Oral to Dermal Adjustment Factor.

(3) - For IRIS values, the date IRIS was searched.
For HEAST values, the date of HEAST.

NA = Not Applicable

IRIS = Integrated Risk Information System

HEAST= Health Effects Assessment Summary Tables

EPA IX = USEPA Region IX Preliminary Remediation Goals Table, November 1, 2000.

EPA Group:

A - Human carcinogen

B1 - Probable human carcinogen - indicates that limited human data are available

B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans

C - Possible human carcinogen

D - Not classifiable as a human carcinogen

E - Evidence of noncarcinogenicity

TABLE 7.1
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Weapons Center (Site 20)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Trichloroethene	5.02	ug/L	5.02	ug/L	M	9.1E-07	mg/kg/day	6.0E-03	mg/kg/day	N/A	N/A	1.5E-04
	Benzo(a)pyrene	0.050	ug/L	0.050	ug/L	M	1.0E-06	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Antimony	3.50	ug/L	3.50	ug/L	M	0.0E+00	mg/kg/day	6.0E-05	mg/kg/day	N/A	N/A	- -
	Arsenic	15.1	ug/L	15.1	ug/L	M	0.0E+00	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	- -
	Nickel	102	ug/L	102	ug/L	M	0.0E+00	mg/kg/day	8.0E-04	mg/kg/day	N/A	N/A	- -
	Silver	326	ug/L	326	ug/L	M	0.0E+00	mg/kg/day	2.0E-04	mg/kg/day	N/A	N/A	- -
	Thallium	3.80	ug/L	3.80	ug/L	M	0.0E+00	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	- -
	(Total)												1.5E-04
												Total Hazard Index Across All Exposure Routes/Pathways	1.5E-04

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Subchronic.

TABLE 7.2
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Weapons Center (Site 20)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Trichloroethene	2.46	ug/L	2.46	ug/L	M	4.5E-07	mg/kg/day	6.0E-03	mg/kg/day	N/A	N/A	7.6E-05
	Benzo(a)pyrene	0.031	ug/L	0.031	ug/L	M	5.1E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Antimony	1.85	ug/L	1.85	ug/L	M	0.0E+00	mg/kg/day	6.0E-05	mg/kg/day	N/A	N/A	- -
	Arsenic	5.38	ug/L	5.38	ug/L	M	0.0E+00	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	- -
	Nickel	31.2	ug/L	31.2	ug/L	M	0.0E+00	mg/kg/day	8.0E-04	mg/kg/day	N/A	N/A	- -
	Silver	111	ug/L	111	ug/L	M	0.0E+00	mg/kg/day	2.0E-04	mg/kg/day	N/A	N/A	- -
	Thallium	2.08	ug/L	2.08	ug/L	M	0.0E+00	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	- -
	(Total)												7.6E-05
												Total Hazard Index Across All Exposure Routes/Pathways	7.6E-05

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Subchronic.

TABLE 7.3
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Weapons Center (Site 20)
Receptor Population: Adult Residnts
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Trichloroethene	5.02	ug/L	5.02	ug/L	M	1.4E-04	mg/kg/day	6.0E-03	mg/kg/day	N/A	N/A	2.3E-02
	Benzo(a)pyrene	0.050	ug/L	0.050	ug/L	M	1.4E-06	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Antimony	3.50	ug/L	3.50	ug/L	M	9.6E-05	mg/kg/day	4.0E-04	mg/kg/day	N/A	N/A	2.4E-01
	Arsenic	15.1	ug/L	15.1	ug/L	M	4.1E-04	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	1.4E+00
	Nickel	102	ug/L	102	ug/L	M	2.8E-03	mg/kg/day	2.0E-02	mg/kg/day	N/A	N/A	1.4E-01
	Silver	326	ug/L	326	ug/L	M	8.9E-03	mg/kg/day	5.0E-03	mg/kg/day	N/A	N/A	1.8E+00
	Thallium	3.80	ug/L	3.80	ug/L	M	1.0E-04	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	1.5E+00
													5.1E+00
Dermal	Trichloroethene	5.02	ug/L	5.02	ug/L	M	1.7E-05	mg/kg/day	6.0E-03	mg/kg/day	N/A	N/A	2.9E-03
	Benzo(a)pyrene	0.050	ug/L	0.050	ug/L	M	2.4E-05	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Antimony	3.50	ug/L	3.50	ug/L	M	0.0E+00	mg/kg/day	6.0E-05	mg/kg/day	N/A	N/A	- -
	Arsenic	15.1	ug/L	15.1	ug/L	M	0.0E+00	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	- -
	Nickel	102	ug/L	102	ug/L	M	0.0E+00	mg/kg/day	8.0E-04	mg/kg/day	N/A	N/A	- -
	Silver	326	ug/L	326	ug/L	M	0.0E+00	mg/kg/day	2.0E-04	mg/kg/day	N/A	N/A	- -
	Thallium	3.80	ug/L	3.80	ug/L	M	0.0E+00	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	- -
	(Total)												2.9E-03
												Total Hazard Index Across All Exposure Routes/Pathways	5.1E+00

(1) Medium-Specific (M) selected for hazard calculation.
(2) Chronic.

TABLE 7.4
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Weapons Center (Site 20)
Receptor Population: Adult Residnts
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Trichloroethene	2.46	ug/L	2.46	ug/L	M	3.1E-05	mg/kg/day	6.0E-03	mg/kg/day	N/A	N/A	5.2E-03
	Benzo(a)pyrene	0.031	ug/L	0.031	ug/L	M	4.0E-07	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Antimony	1.85	ug/L	1.85	ug/L	M	2.4E-05	mg/kg/day	4.0E-04	mg/kg/day	N/A	N/A	5.9E-02
	Arsenic	5.38	ug/L	5.38	ug/L	M	6.9E-05	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	2.3E-01
	Nickel	31.2	ug/L	31.2	ug/L	M	4.0E-04	mg/kg/day	2.0E-02	mg/kg/day	N/A	N/A	2.0E-02
	Silver	111	ug/L	111	ug/L	M	1.4E-03	mg/kg/day	5.0E-03	mg/kg/day	N/A	N/A	2.9E-01
	Thallium	2.08	ug/L	2.08	ug/L	M	2.7E-05	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	3.8E-01
													9.8E-01
Dermal	Trichloroethene	2.46	ug/L	2.46	ug/L	M	1.2E-05	mg/kg/day	6.0E-03	mg/kg/day	N/A	N/A	1.9E-03
	Benzo(a)pyrene	0.031	ug/L	0.031	ug/L	M	1.6E-05	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	Antimony	1.85	ug/L	1.85	ug/L	M	0.0E+00	mg/kg/day	6.0E-05	mg/kg/day	N/A	N/A	- -
	Arsenic	5.38	ug/L	5.38	ug/L	M	0.0E+00	mg/kg/day	3.0E-04	mg/kg/day	N/A	N/A	- -
	Nickel	31.2	ug/L	31.2	ug/L	M	0.0E+00	mg/kg/day	8.0E-04	mg/kg/day	N/A	N/A	- -
	Silver	111	ug/L	111	ug/L	M	0.0E+00	mg/kg/day	2.0E-04	mg/kg/day	N/A	N/A	- -
	Thallium	2.08	ug/L	2.08	ug/L	M	0.0E+00	mg/kg/day	7.0E-05	mg/kg/day	N/A	N/A	- -
	(Total)												1.9E-03
												Total Hazard Index Across All Exposure Routes/Pathways	9.8E-01

(1) Medium-Specific (M) selected for hazard calculation.
(2) Chronic.

TABLE 8.1
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Weapons Center (Site 20)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Trichloroethene	5.02	ug/L	5.02	ug/L	M	1.3E-08	mg/kg/day	1.1E-02	(mg/kg/day) -1	1.4E-10
	Benzo(a)pyrene	0.050	ug/L	0.050	ug/L	M	1.5E-08	mg/kg/day	7.3E+00	(mg/kg/day) -1	1.1E-07
	Antimony	3.50	ug/L	3.50	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Arsenic	15.1	ug/L	15.1	ug/L	M	0.0E+00	mg/kg/day	1.5E+00	(mg/kg/day) -1	0.0E+00
	Nickel	102	ug/L	102	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Silver	326	ug/L	326	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	3.80	ug/L	3.80	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										1.1E-07
										Total Risk Across All Exposure Routes/Pathways	1.1E-07

(1) Medium-Specific (M) EPC selected for risk calculation.

TABLE 8.2
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Weapons Center (Site 20)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Trichloroethene	2.46	ug/L	2.46	ug/L	M	2.0E-09	mg/kg/day	1.1E-02	(mg/kg/day) -1	2.2E-11
	Benzo(a)pyrene	0.031	ug/L	0.031	ug/L	M	3.3E-09	mg/kg/day	7.3E+00	(mg/kg/day) -1	2.4E-08
	Antimony	1.85	ug/L	1.85	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Arsenic	5.38	ug/L	5.38	ug/L	M	0.0E+00	mg/kg/day	1.5E+00	(mg/kg/day) -1	0.0E+00
	Nickel	31.2	ug/L	31.2	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Silver	111	ug/L	111	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	2.08	ug/L	2.08	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										2.4E-08
										Total Risk Across All Exposure Routes/Pathways	2.4E-08

(1) Medium-Specific (M) EPC selected for risk calculation.

TABLE 8.3
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Weapons Center (Site 20)
Receptor Population: Adult Residnts
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Trichloroethene	5.02	ug/L	5.02	ug/L	M	5.9E-05	mg/kg/day	0.011	(mg/kg/day) -1	6.5E-07
	Benzo(a)pyrene	0.050	ug/L	0.050	ug/L	M	5.9E-07	mg/kg/day	7.3	(mg/kg/day) -1	4.3E-06
	Antimony	3.50	ug/L	3.50	ug/L	M	4.1E-05	mg/kg/day	NA	(mg/kg/day) -1	- -
	Arsenic	15.1	ug/L	15.1	ug/L	M	1.8E-04	mg/kg/day	1.5	(mg/kg/day) -1	2.7E-04
	Nickel	102	ug/L	102	ug/L	M	1.2E-03	mg/kg/day	NA	(mg/kg/day) -1	- -
	Silver	326	ug/L	326	ug/L	M	3.8E-03	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	3.80	ug/L	3.80	ug/L	M	4.5E-05	mg/kg/day	NA	(mg/kg/day) -1	- -
											2.7E-04
Dermal	Trichloroethene	5.02	ug/L	5.02	ug/L	M	7.5E-06	mg/kg/day	1.1E-02	(mg/kg/day) -1	8.2E-08
	Benzo(a)pyrene	0.050	ug/L	0.050	ug/L	M	1.0E-05	mg/kg/day	7.3E+00	(mg/kg/day) -1	7.4E-05
	Antimony	3.50	ug/L	3.50	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Arsenic	15.1	ug/L	15.1	ug/L	M	0.0E+00	mg/kg/day	1.5E+00	(mg/kg/day) -1	0.0E+00
	Nickel	102	ug/L	102	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Silver	326	ug/L	326	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	3.80	ug/L	3.80	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										7.4E-05
										Total Risk Across All Exposure Routes/Pathways	3.5E-04

(1) Medium-Specific (M) EPC selected for risk calculation.

TABLE 8.4
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Area A Weapons Center (Site 20)
Receptor Population: Adult Residnts
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Trichloroethene	2.46	ug/L	2.46	ug/L	M	4.0E-06	mg/kg/day	0.011	(mg/kg/day) -1	4.5E-08
	Benzo(a)pyrene	0.031	ug/L	0.031	ug/L	M	5.2E-08	mg/kg/day	7.3	(mg/kg/day) -1	3.8E-07
	Antimony	1.85	ug/L	1.85	ug/L	M	3.0E-06	mg/kg/day	NA	(mg/kg/day) -1	- -
	Arsenic	5.38	ug/L	5.38	ug/L	M	8.9E-06	mg/kg/day	1.5	(mg/kg/day) -1	1.3E-05
	Nickel	31.2	ug/L	31.2	ug/L	M	5.1E-05	mg/kg/day	NA	(mg/kg/day) -1	- -
	Silver	111	ug/L	111	ug/L	M	1.8E-04	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	2.08	ug/L	2.08	ug/L	M	3.4E-06	mg/kg/day	NA	(mg/kg/day) -1	- -
											1.4E-05
Dermal	Trichloroethene	2.46	ug/L	2.46	ug/L	M	6.0E-07	mg/kg/day	1.1E-02	(mg/kg/day) -1	6.6E-09
	Benzo(a)pyrene	0.031	ug/L	0.031	ug/L	M	1.0E-06	mg/kg/day	7.3E+00	(mg/kg/day) -1	7.6E-06
	Antimony	1.85	ug/L	1.85	ug/L	M	7.3E-09	mg/kg/day	NA	(mg/kg/day) -1	- -
	Arsenic	5.38	ug/L	5.38	ug/L	M	2.1E-08	mg/kg/day	1.5E+00	(mg/kg/day) -1	3.2E-08
	Nickel	31.2	ug/L	31.2	ug/L	M	2.5E-08	mg/kg/day	NA	(mg/kg/day) -1	- -
	Silver	111	ug/L	111	ug/L	M	2.6E-07	mg/kg/day	NA	(mg/kg/day) -1	- -
	Thallium	2.08	ug/L	2.08	ug/L	M	8.2E-09	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										7.6E-06
										Total Risk Across All Exposure Routes/Pathways	2.1E-05

(1) Medium-Specific (M) EPC selected for risk calculation.

TABLE 9.1
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Area A Weapons Center (Site 20)	Trichloroethene	- -	- -	1.4E-10	1.4E-10	Trichloroethene	Liver	- -	- -	1.5E-04	1.5E-04
			Benzo(a)pyrene	- -	- -	1.1E-07	1.1E-07	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Antimony	- -	- -	- -	- -	Antimony	Blood	- -	- -	- -	- -
			Arsenic	- -	- -	- -	- -	Arsenic	Skin	- -	- -	- -	- -
			Nickel	- -	- -	- -	- -	Nickel	Body Weigtht	- -	- -	- -	- -
			Silver	- -	- -	- -	- -	Silver	Skin	- -	- -	- -	- -
			Thallium	- -	- -	- -	- -	Thallium	None Specified	- -	- -	- -	- -
			(Total)	- -	- -	1.1E-07	1.1E-07	(Total)		- -	- -	1.5E-04	1.5E-04
						Total Risk Across Groundwater	1.1E-07					Total Hazard Index Across All Media and All Exposure Routes	1.5E-04
						Total Risk Across All Media and All Exposure Routes	1.1E-07						

Total Skin HI	- -
Total Liver HI	1.5E-04
Total Blood HI	- -
Total Body Weight HI	- -

TABLE 9.2
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Area A Weapons Center (Site 20)	Trichloroethene	- -	- -	2.2E-11	2.2E-11	Trichloroethene	Liver	- -	- -	7.6E-05	7.6E-05
			Benzo(a)pyrene	- -	- -	2.4E-08	2.4E-08	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Antimony	- -	- -	- -	- -	Antimony	Blood	- -	- -	- -	- -
			Arsenic	- -	- -	- -	- -	Arsenic	Skin	- -	- -	- -	- -
			Nickel	- -	- -	- -	- -	Nickel	Body Weigtht	- -	- -	- -	- -
			Silver	- -	- -	- -	- -	Silver	Skin	- -	- -	- -	- -
			Thallium	- -	- -	- -	- -	Thallium	None Specified	- -	- -	- -	- -
			(Total)	- -	- -	2.4E-08	2.4E-08	(Total)		- -	- -	7.6E-05	7.6E-05
			Total Risk Across Groundwater				2.4E-08		Total Hazard Index Across All Media and All Exposure Routes				7.6E-05
			Total Risk Across All Media and All Exposure Routes				2.4E-08						

Total Skin HI	- -
Total Liver HI	7.6E-05
Total Blood HI	- -
Total Body Weight HI	- -

TABLE 9.3
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Adult Residnts
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Area A Weapons Center (Site 20)	Trichloroethene	6.5E-07	6.5E-07	8.2E-08	1.4E-06	Trichloroethene	Liver	2.3E-02	2.3E-02	2.9E-03	4.9E-02
			Benzo(a)pyrene	4.3E-06	- -	7.4E-05	7.8E-05	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Antimony	- -	- -	- -	- -	*Antimony*	*Blood*	2.4E-01	- -	- -	2.4E-01
			Arsenic	2.7E-04	- -	- -	2.7E-04	Arsenic	Skin	1.4E+00	- -	- -	1.4E+00
			Nickel	- -	- -	- -	- -	Nickel	Body Weigtht	1.4E-01	- -	- -	1.4E-01
			Silver	- -	- -	- -	- -	Silver	Skin	1.8E+00	- -	- -	1.8E+00
			Thallium	- -	- -	- -	- -	Thallium	None Specified	1.5E+00	- -	- -	1.5E+00
			(Total)	2.7E-04	6.5E-07	7.4E-05	3.5E-04	(Total)		5.1E+00	2.3E-02	2.9E-03	5.1E+00
						Total Risk Across Groundwater	3.5E-04					Total Hazard Index Across All Media and All Exposure Routes	5.1E+00
						Total Risk Across All Media and All Exposure Routes	3.5E-04						

Total Skin HI	3.2E+00
Total Liver HI	4.9E-02
Total Blood HI	2.4E-01
Total Body Weight HI	1.4E-01

TABLE 9.4
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Adult Residnts
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Area A Weapons Center (Site 20)	Trichloroethene	4.5E-08	4.5E-08	6.6E-09	9.6E-08	Trichloroethene	Liver	5.2E-03	5.2E-03	1.9E-03	1.2E-02
			Benzo(a)pyrene	3.8E-07	- -	7.6E-06	8.0E-06	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Antimony	- -	- -	- -	- -	Antimony	Blood	5.9E-02	- -	- -	5.9E-02
			Arsenic	1.3E-05	- -	3.2E-08	1.3E-05	Arsenic	Skin	2.3E-01	- -	- -	2.3E-01
			Nickel	- -	- -	- -	- -	Nickel	Body Weigtht	2.0E-02	- -	- -	2.0E-02
			Silver	- -	- -	- -	- -	Silver	Skin	2.9E-01	- -	- -	2.9E-01
			Thallium	- -	- -	- -	- -	Thallium	None Specified	3.8E-01	- -	- -	3.8E-01
			(Total)	1.4E-05	4.5E-08	7.6E-06	2.1E-05	(Total)		9.8E-01	5.2E-03	1.9E-03	9.9E-01
						Total Risk Across Groundwater	2.1E-05					Total Hazard Index Across All Media and All Exposure Routes	9.9E-01
						Total Risk Across All Media and All Exposure Routes	2.1E-05						

TABLE 10.1
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Area A Weapons Center (Site 20)	Trichloroethene	--	--	1.4E-10	1.4E-10	Trichloroethene	Liver	--	--	1.5E-04	1.5E-04
			Benzo(a)pyrene	--	--	1.1E-07	1.1E-07	Benzo(a)pyrene	NA	--	--	--	--
			Antimony	--	--	--	--	Antimony	Blood	--	--	--	--
			Arsenic	--	--	--	--	Arsenic	Skin	--	--	--	--
			Nickel	--	--	--	--	Nickel	Body Weigtht	--	--	--	--
			Silver	--	--	--	--	Silver	Skin	--	--	--	--
			Thallium	--	--	--	--	Thallium	None Specified	--	--	--	--
			(Total)	--	--	1.1E-07	1.1E-07	(Total)		--	--	1.5E-04	1.5E-04
			Total Risk Across Groundwater				1.1E-07	Total Hazard Index Across All Media and All Exposure Routes					1.5E-04
			Total Risk Across All Media and All Exposure Routes				1.1E-07						

Total Skin HI	--
Total Liver HI	1.5E-04
Total Blood HI	--
Total Body Weight HI	--

TABLE 10.2
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Area A Weapons Center (Site 20)	Trichloroethene	- -	- -	2.2E-11	2.2E-11	Trichloroethene	Liver	- -	- -	7.6E-05	7.6E-05
			Benzo(a)pyrene	- -	- -	2.4E-08	2.4E-08	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Antimony	- -	- -	- -	- -	Antimony	Blood	- -	- -	- -	- -
			Arsenic	- -	- -	- -	- -	Arsenic	Skin	- -	- -	- -	- -
			Nickel	- -	- -	- -	- -	Nickel	Body Weigtht	- -	- -	- -	- -
			Silver	- -	- -	- -	- -	Silver	Skin	- -	- -	- -	- -
			Thallium	- -	- -	- -	- -	Thallium	None Specified	- -	- -	- -	- -
			(Total)	- -	- -	2.4E-08	2.4E-08	(Total)		- -	- -	7.6E-05	7.6E-05
			Total Risk Across Groundwater				2.4E-08		Total Hazard Index Across All Media and All Exposure Routes				7.6E-05
			Total Risk Across All Media and All Exposure Routes				2.4E-08						

Total Skin HI	- -
Total Liver HI	7.6E-05
Total Blood HI	- -
Total Body Weight HI	- -

TABLE 10.3
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Adult Residnts
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Area A Weapons Center (Site 20)	Benzo(a)pyrene	4.3E-06	- -	7.4E-05	7.8E-05	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Arsenic	2.7E-04	- -	- -	2.7E-04	Arsenic	Skin	1.4E+00	- -	- -	1.4E+00
			Silver	- -	- -	- -	- -	Silver	Skin	1.8E+00	- -	- -	1.8E+00
			Thallium	- -	- -	- -	- -	Thallium	None Specified	1.5E+00	- -	- -	1.5E+00
			(Total)	2.7E-04	- -	7.4E-05	3.4E-04	(Total)		4.7E+00	- -	- -	4.7E+00

Total Risk Across Groundwater 3.4E-04
Total Risk Across All Media and All Exposure Routes 3.4E-04

Total Hazard Index Across All Media and All Exposure Routes 4.7E+00

Total Skin HI 3.2E+00
Total None Specified HI 1.5E+00

TABLE 10.4
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Adult Residnts
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Area A Weapons Center (Site 20)	Benzo(a)pyrene	3.8E-07	- -	7.6E-06	8.0E-06	Benzo(a)pyrene	NA	- -	- -	- -	- -
			Arsenic	1.3E-05	- -	3.2E-08	1.3E-05	Arsenic	Skin	2.3E-01	- -	- -	2.3E-01
			(Total)	1.4E-05	- -	7.6E-06	2.1E-05	(Total)		2.3E-01	- -	- -	2.3E-01
			Total Risk Across Groundwater				2.1E-05	Total Hazard Index Across All Media and All Exposure Routes					2.3E-01
			Total Risk Across All Media and All Exposure Routes				2.1E-05						

TANK FARM (SITE 23)

TABLE 1
SELECTION OF EXPOSURE PATHWAYS
TANK FARM (SITE 23)
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current/Future	Groundwater	Groundwater	Overburden/Bedrock Aquifer	Construction Workers	Adult	Ingestion Dermal	On-Site On-Site	Quant. Quant.	Construction workers may have dermal contact with groundwater during excavation activities.
				Full-time Employees	Adult	Ingestion Dermal	On-Site On-Site	None None	Full-time employees are not exposed to groundwater.
				Trespassers	Adolescents	Ingestion Dermal	On-Site On-Site	None None	Trespassers do not have contact with groundwater.
				Residents	Adult	Ingestion Dermal	On-Site On-Site	None None	Residential land usage it not expected to occur at Site 23.
					Child	Ingestion Dermal	On-Site On-Site	None None	Residential land usage it not expected to occur at Site 23.
		Air	Overburden/Bedrock Aquifer	Construction Workers	Adult	Inhalation	On-site	None	Construction workers exposure via volatilization is expected to be insignificant due to dilution with outdoor air.
				Full-time Employees	Adult	Inhalation	On-site	None	Full-time employees are not exposed to groundwater.
				Trespassers	Adolescents	Inhalation	On-Site	None	Trespassers do not have contact with site groundwater.
				Residents	Adult	Inhalation	On-site	None	Residential land usage it not expected to occur at Site 23.
					Child	Inhalation	On-site	None	Residential land usage it not expected to occur at Site 23.

TABLE 2.1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - GROUNDWATER
DIRECT CONTACT EXPOSURE SCENARIOS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Tank Farm (Site 23)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Risk-Based COPC Screening Level(5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection(6)
Volatile Organics																
	M+P-XYLENES	2		2		ug/L	S23MW02S01	1/10	2	2	N/A	140 (7) N	530 10000 10000	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
95-47-6	O-XYLENE	3		3		ug/L	S23MW02S01	1/10	1	3	N/A	140 (7) N	530 10000 10000	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
127-18-4	TETRACHLOROETHENE	3		3		ug/L	S23MW03D01	1/10	1	3	N/A	1.1 C	5 5 5	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
1330-20-7	XYLENES, TOTAL	5		5		ug/L	S23MW02S01	1/10	1	5	N/A	140 N	530 10000 10000	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
Dissolved Gases																
74-82-8	METHANE	1		920		ug/L	S23MW02S01	7/10	1	920	N/A	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NTX
Semivolatile Organics																
91-20-3	NAPHTHALENE	1.4		1.4		ug/L	S23MW02S01	1/10	0.5 - 5	1.4	N/A	0.62 N	280 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	YES	ASL
Total Metals																
7429-90-5	ALUMINUM	890		2030		ug/L	S23MW02S01	2/10	50.5 - 591	2030	3560	3600 N	N/A 50 to 200 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	EPAI, BKG
7440-38-2	ARSENIC	4.7		4.7		ug/L	S23HNUS1101	1/10	2.3	4.7	1.92	N/A	50 50 50	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
7440-39-3	BARIUM	27.2		176		ug/L	S23MW02S01	4/10	18 - 37	176	227	260 N	1000 2000 2000	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL, BKG
7440-43-9	CADMIUM	0.63		0.63		ug/L	S23HNUS2001	1/10	0.25	0.63	ND	1.8 N	5 5 5	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
7440-70-2	CALCIUM	6270		94100		ug/L	S23MW03D01	10/10	N/A	94100	188000	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT, BKG
7440-47-3	CHROMIUM	10.2	J	43.2		ug/L	S23MW02S01	4/10	6.2	43.2	49.9	110 (8) N	50 100 N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL, BKG
7440-48-4	COBALT	4.5	J	6.4	J	ug/L	S23MW02S01,	4/10	4.2 - 5.2	6.4	48.6	220 N	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL, BKG
7440-50-8	COPPER	6.8	J	10.7	J	ug/L	S23MW02S01	2/10	6.8	10.7	107	140 N	1300 1300 N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL, BKG
7439-89-6	IRON	202		24800		ug/L	S23MW02S01	9/10	175	24800	28200	1100 N	N/A 300 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	EPAI, BKG
7439-92-1	LEAD	1.9	J	31.2		ug/L	S23MW02S01	5/10	1.8	31.2	6.63	N/A	15 15 N/A	CTDEP RSR FED-AL CTDEP-MCL	YES	ASL

TABLE 2.1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - GROUNDWATER
DIRECT CONTACT EXPOSURE SCENARIOS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Tank Farm (Site 23)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Risk-Based COPC Screening Level(5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection(6)
7439-95-4	MAGNESIUM	1610		7840		ug/L	S23MW02S01	9/10	544	7840	191000	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT, BKG
7439-96-5	MANGANESE	41.4	J	3380		ug/L	S23MW02S01	8/10	8.8 - 12.1	3380	11700	88 N	N/A 50 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	BKG
7440-02-0	NICKEL	10	J	33.5		ug/L	S23MW02S01	2/10	9.2 - 9.9	33.5	32.2	73 N	100 100 100	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
7440-09-7	POTASSIUM	1170		7790		ug/L	S23MW02S01	10/10	N/A	7790	70800	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT, BKG
7440-23-5	SODIUM	7790	J	99200	J	ug/L	S23HNUS201	10/10	N/A	99200	1900000	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT, BKG
7440-62-2	VANADIUM	6.4	J	6.4	J	ug/L	S23MW03D01	1/10	6.3 - 8.2	6.4	10.2	26 N	50 N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL, BKG
7440-66-6	ZINC	68.4		68.4		ug/L	S23MW02S01	1/10	10.9 - 43.1	68.4	131	1100 N	5000 5000 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	BSL, BKG
Dissolved Metals																
7440-38-2	ARSENIC, FILTERED	3.1	J	3.1	J	ug/L	S23MW02S01-F	1/2	2.3	3.1	2.55	N/A	50 50 50	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
7440-39-3	BARIUM, FILTERED	33.8		150		ug/L	S23MW02S01-F	2/2	N/A	150	124	260 N	1000 2000 2000	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL
7440-70-2	CALCIUM, FILTERED	33000		45100		ug/L	S23MW02S01-F	2/2	N/A	45100	152000	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL, BKG
7439-89-6	IRON, FILTERED	4410		15400		ug/L	S23MW02S01-F	2/2	N/A	15400	25300	1100 N	N/A 300 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	EPAI, BKG
7439-92-1	LEAD, FILTERED	10		10		ug/L	S23MW02S01-F	1/2	1.8	10	2.52	N/A	15 15 N/A	CTDEP RSR FED-AL CTDEP-MCL	NO	BSL
7439-95-4	MAGNESIUM, FILTERED	3770		5830		ug/L	S23MW02S01-F	2/2	N/A	5830	150000	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	BSL, BKG
7439-96-5	MANGANESE, FILTERED	977		2650		ug/L	S23MW02S01-F	2/2	N/A	2650	9400	170 N	N/A 50 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	BKG
7440-09-7	POTASSIUM, FILTERED	5500		7340		ug/L	S23MW02S01-F	2/2	N/A	7340	60000	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT, BKG
7440-23-5	SODIUM, FILTERED	49300		82600	J	ug/L	S23HNUS201-F	2/2	N/A	82600	1580000	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NUT, BKG
Miscellaneous Parameters																
E-14506	ALKALINITY	18000		348000		mg/L	S23MW03D01	10/10	N/A	348000	1950	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NTX

TABLE 2.1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - GROUNDWATER
DIRECT CONTACT EXPOSURE SCENARIOS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Tank Farm (Site 23)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	Risk-Based COPC Screening Level(5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection(6)
7664-41-7	AMMONIA	160	J	540	J	mg/L	S23HNUS201	3/3	N/A	540	ND	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NTX
7664-41-7	AMMONIA, AS NITROGEN	130	J	6900	J	mg/L	S23MW02S01	6/7	100	6900	ND	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NTX
000-02-0	CHLORIDE	6550		124000		mg/L	S23MW02S01	10/10	N/A	124000	4540	N/A	N/A 250 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	NV
E-11778	HARDNESS as CaCO3	22300		257000		mg/L	S23MW03D01	10/10	N/A	257000	ND	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NTX
14808-79-8	SULFATE	7600		47200		mg/L	S23HNUS2001	10/10	N/A	47200	45.2	N/A	N/A 250 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	NV
000-09-0	TOTAL DISSOLVED SOLIDS	66200		519000	J	mg/L	S23MW02S01	10/10	N/A	519000	6260	N/A	N/A 500 N/A	CTDEP RSR FED-SMCL CTDEP-MCL	NO	NV
7440-44-0	TOTAL ORGANIC CARBON	1000	J	9000		mg/L	S23MW04S01	10/10	N/A	9000	37.7	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NTX
000-08-9	TOTAL SUSPENDED SOLIDS	6000	J	169000	J	mg/L	S23MW02S01	6/10	5000	169000	236	N/A	N/A N/A N/A	CTDEP RSR FED-MCL CTDEP-MCL	NO	NTX

A shaded value indicates that the concentration used for screening exceeds the criterion or background value.
A shaded chemical name indicates that the chemical has been selected as a COPC .

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 95% Upper Tolerance Limit (UTL) of site background data
5 The risk-based COPC screening level for tap water use is presented. The value is based on a target hazard quotient of 0.1 for noncarcinogens (denoted with a "N" flag) or an incremental cancer risk of 1E-6 for carcinogens (denoted with a "C" flag) (USEPA, Region IX, November 2000).
6 The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level and/or an ARAR/TBC(s).
7 Value is for total xylenes.
8 Value is for hexavalent chromium.

Associated Samples:

S23HNUS1101	S23MW02D01	S23MW04S01
S23HNUS1301	S23MW02D01-D	
S23HNUS2001	S23MW02S01	
S23HNUS201	S23MW02S01-F	
S23HNUS201-F	S23MW03D01	
S23HNUS501	S23MW04D01	

Definitions:
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogen
COC = Chemical of Concern
J = Estimated Value
N = Noncarcinogen
N/A = Not Applicable.
FED-MCL = Federal Maximum Contaminant Level (USEPA, August 2000)
FED-SMCL = Federal Secondary Maximum Contaminant Level (USEPA, August 2000)
FED-AL = Federal Action Level (USEPA, August 2000)
CTDEP-RSR = Connecticut DEP Remediation Standard Regulations, 1996.
CTDEP-MCL = Connecticut Maximum Contaminant Level

Rationale Codes:
For Selection as a COC:
ASL = Above COC Screening Level/ARAR/TBC

For Elimination as a COC:
BKG = Within Background Levels
BSL = Below COC Screening Level/ARAR/TBC
NUT = Essential Nutrient
NTX = No Toxicity Information
EPAI = USEPA Region one does not advocate evaluation of this chemical.

TABLE 2.2
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - GROUNDWATER
MIGRATION PATHWAYS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Tank Farm (Site 23)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	CTDEP Surface Water Criteria(5)	CTDEP Vol. Criteria(6)	COPC Flag	Rationale for Contaminant Deletion or Selection(6)
Volatile Organics															
	M+P-XYLENES	2		2		ug/L	S23MW02S01	1/10	2	2	NA	NA	21300	NO	BSL
95-47-6	O-XYLENE	3		3		ug/L	S23MW02S01	1/10	1	3	NA	NA	21300	NO	BSL
127-18-4	TETRACHLOROETHENE	3		3		ug/L	S23MW03D01	1/10	1	3	NA	88	1500	NO	BSL
1330-20-7	XYLENES, TOTAL	5		5		ug/L	S23MW02S01	1/10	1	5	NA	NA	21300	NO	BSL
Dissolved Gases															
74-82-8	METHANE	1		920		ug/L	S23MW02S01	7/10	1	920	NA	N/A	N/A	NO	NTX
Semivolatile Organics															
91-20-3	NAPHTHALENE	1.4		1.4		ug/L	S23MW02S01	1/10	0.5 - 5	1.4	NA	N/A	N/A	NO	NTX
Total Metals															
7429-90-5	ALUMINUM	890		2030		ug/L	S23MW02S01	2/10	50.5 - 591	2030	3560	N/A	N/A	NO	BKG
7440-38-2	ARSENIC	4.7		4.7		ug/L	S23HNUS1101	1/10	2.3	4.7	1.92	4	N/A	YES	ASL
7440-39-3	BARIUM	27.2		176		ug/L	S23MW02S01	4/10	18 - 37	176	227	N/A	N/A	NO	BKG
7440-43-9	CADMIUM	0.63		0.63		ug/L	S23HNUS2001	1/10	0.25	0.63	ND	6	N/A	NO	BSL
7440-70-2	CALCIUM	6270		94100		ug/L	S23MW03D01	10/10	N/A	94100	188000	N/A	N/A	NO	BKG
7440-47-3	CHROMIUM	10.2	J	43.2		ug/L	S23MW02S01	4/10	6.2	43.2	49.9	N/A	N/A	NO	BKG
7440-48-4	COBALT	4.5	J	6.4	J	ug/L	S23MW02S01,	4/10	4.2 - 5.2	6.4	48.6	N/A	N/A	NO	BKG
7440-50-8	COPPER	6.8	J	10.7	J	ug/L	S23MW02S01	2/10	6.8	10.7	107	48	N/A	NO	BSL, BKG
7439-89-6	IRON	202		24800		ug/L	S23MW02S01	9/10	175	24800	28200	N/A	N/A	NO	BKG
7439-92-1	LEAD	1.9	J	31.2		ug/L	S23MW02S01	5/10	1.8	31.2	6.63	13	N/A	YES	ASL
7439-95-4	MAGNESIUM	1610		7840		ug/L	S23MW02S01	9/10	544	7840	191000	N/A	N/A	NO	BKG
7439-96-5	MANGANESE	41.4	J	3380		ug/L	S23MW02S01	8/10	8.8 - 12.1	3380	11700	N/A	N/A	NO	BKG
7440-02-0	NICKEL	10	J	33.5		ug/L	S23MW02S01	2/10	9.2 - 9.9	33.5	32.2	880	N/A	NO	BSL
7440-09-7	POTASSIUM	1170		7790		ug/L	S23MW02S01	10/10	N/A	7790	70800	N/A	N/A	NO	BKG
7440-23-5	SODIUM	7790	J	99200	J	ug/L	S23HNUS201	10/10	N/A	99200	1900000	N/A	N/A	NO	BKG
7440-62-2	VANADIUM	6.4	J	6.4	J	ug/L	S23MW03D01	1/10	6.3 - 8.2	6.4	10.2	N/A	N/A	NO	BKG
7440-66-6	ZINC	68.4		68.4		ug/L	S23MW02S01	1/10	10.9 - 43.1	68.4	131	123	N/A	NO	BSL, BKG
Dissolved Metals															
7440-38-2	ARSENIC, FILTERED	3.1	J	3.1	J	ug/L	S23MW02S01-F	1/2	2.3	3.1	2.55	4	N/A	NO	BSL
7440-39-3	BARIUM, FILTERED	33.8		150		ug/L	S23MW02S01-F	2/2	N/A	150	124	N/A	N/A	NO	NTX
7440-70-2	CALCIUM, FILTERED	33000		45100		ug/L	S23MW02S01-F	2/2	N/A	45100	152000	N/A	N/A	NO	BKG
7439-89-6	IRON, FILTERED	4410		15400		ug/L	S23MW02S01-F	2/2	N/A	15400	25300	N/A	N/A	NO	BKG
7439-92-1	LEAD, FILTERED	10		10		ug/L	S23MW02S01-F	1/2	1.8	10	2.52	13	N/A	NO	BSL
7439-95-4	MAGNESIUM, FILTERED	3770		5830		ug/L	S23MW02S01-F	2/2	N/A	5830	150000	N/A	N/A	NO	BKG
7439-96-5	MANGANESE, FILTERED	977		2650		ug/L	S23MW02S01-F	2/2	N/A	2650	9400	N/A	N/A	NO	BKG
7440-09-7	POTASSIUM, FILTERED	5500		7340		ug/L	S23MW02S01-F	2/2	N/A	7340	60000	N/A	N/A	NO	BKG
7440-23-5	SODIUM, FILTERED	49300		82600	J	ug/L	S23HNUS201-F	2/2	N/A	82600	1580000	N/A	N/A	NO	BKG
Miscellaneous Parameters															
E-14506	ALKALINITY	18000		348000		mg/L	S23MW03D01	10/10	N/A	348000	1950	N/A	N/A	NO	NTX
7664-41-7	AMMONIA	160	J	540	J	mg/L	S23HNUS201	3/3	N/A	540	ND	N/A	N/A	NO	NTX
7664-41-7	AMMONIA, AS NITROGEN	130	J	6900	J	mg/L	S23MW02S01	6/7	100	6900	ND	N/A	N/A	NO	NTX
000-02-0	CHLORIDE	6550		124000		mg/L	S23MW02S01	10/10	N/A	124000	4540	N/A	N/A	NO	NTX
E-11778	HARDNESS as CaCO3	22300		257000		mg/L	S23MW03D01	10/10	N/A	257000	ND	N/A	N/A	NO	NTX
14808-79-8	SULFATE	7600		47200		mg/L	S23HNUS2001	10/10	N/A	47200	45.2	N/A	N/A	NO	NTX
000-09-0	TOTAL DISSOLVED SOLIDS	66200		519000	J	mg/L	S23MW02S01	10/10	N/A	519000	6260	N/A	N/A	NO	NTX
7440-44-0	TOTAL ORGANIC CARBON	1000	J	9000		mg/L	S23MW04S01	10/10	N/A	9000	37.7	N/A	N/A	NO	NTX
000-08-9	TOTAL SUSPENDED SOLIDS	6000	J	169000	J	mg/L	S23MW02S01	6/10	5000	169000	236	N/A	N/A	NO	NTX

TABLE 2.2
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - GROUNDWATER MIGRATION PATHWAYS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Tank Farm (Site 23)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (1)	Range of Nondetects(2)	Concentration Used for Screening(3)	Background Value(4)	CTDEP Surface Water Criteria(5)	CTDEP Vol. Criteria(6)	COPC Flag	Rationale for Contaminant Deletion or Selection(6)

A shaded value indicates that the concentration used for screening exceeds the criterion or background value.
A shaded chemical name indicates that the chemical has been selected as a COPC .

Footnotes:

1 Sample and duplicate are counted as two separate samples when determining the minimum and maximum detected concentrations.
2 Values presented are sample-specific quantitation limits.
3 The maximum detected concentration is used for screening purposes.
4 95% Upper Tolerance Limit (UTL) of site background data
5 Connecticut DEP Surface Water Protection criteria.
6 Connecticut DEP Volatilization criteria for residential exposures.
7 The chemical is selected as a COPC if the maximum detected concentration exceeds the CTDEP surface water protection or volatilization criteria.

Associated Samples:

S23HNUS1101	S23MW02D01	S23MW04S01
S23HNUS1301	S23MW02D01-D	
S23HNUS2001	S23MW02S01	
S23HNUS201	S23MW02S01-F	
S23HNUS201-F	S23MW03D01	
S23HNUS501	S23MW04D01	

Definitions:

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogen
COC = Chemical of Concern
J = Estimated Value
N = Noncarcinogen
NA = Not Applicable.

Rationale Codes:

For Selection as a COPC:
ASL = Above COPC Screening Level/ARAR/TBC

For Elimination as a COPC:
BKG = Within Background Levels
BSL = Below COPC Screening Level/ARAR/TBC
NTX = No Toxicity Information

TABLE 3.1
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Tank Farm (Site 23)

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency Exposure		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Tetrachloroethene	ug/L	0.750	1.21	3		ug/L	3	max	1	0.750	average	1
Naphthalene	ug/L	0.590	1.03	1.4		ug/L	1.4	max	1	0.590	average	1
Lead	ug/L	6.11	11.7	31.2		ug/L	6.11	average	2	6.11	average	2

Notes:
Notes:
[1] - The maximum detected and average concentration is used for the RME and CTE sceanrios, respectively per EPA Region I guidance.
[2] - IEUBK require the use of the average concentration as the exposure point concentration.

TABLE 4.1
VALUES USED FOR DAILY INTAKE CALCULATIONS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Tank Farm (Site 23)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Dermal	DAevent	Absorbed dose per event	mg/cm2-event	See Text	See Text	See Text	See Text	Dermally Absorbed Dose (mg/kg/day)
	SA	Skin Surface Available for Contact	cm2	3800	EPA, 1992	3800	EPA, 1992	$= \frac{DAevent \times EV \times EF \times ED \times SA}{BW \times AT}$
	EV	Event Frequency	events/day	1	EPA, 1994	1	EPA, 1994	
	ET	Exposure Time	hours/event	4	(1)	2	(1)	
	EF	Exposure Frequency	days/year	20	Atlantic, 1992	10	Atlantic, 1992	
	ED	Exposure Duration	years	1	Atlantic, 1992	1	Atlantic, 1992	See text for calculation of DAevent.
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	365	EPA, 1989	365	EPA, 1989	

Notes:
(1) - Professinal judgement.
Sources:
EPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.
EPA, 1992: Dermal Exposure Assessment: Principles and Applications.
EPA, 1994: US EPA Region I Risk Updates, Number 2.
EPA, 1998: Risk Assessment Guidance for Superfund, Supplemental Guidance, Dermal Risk Assessment, Interim Guidance.
Atlantic 1992: Phase I Remedial Investigation Naval Submarine Base - New London, Connecticut, August.

TABLE 4.2
VALUES USED FOR DAILY INTAKE CALCULATIONS
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Tank Farm (Site 23)
Receptor Population: Adult Residnts
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CGW	Chemical Concentration in Groundwater	mg/L	Maximum	EPA, 1994	Average	EPA, 1994	Chronic Daily Intake (CDI) (mg/kg/day) =
	IR-GW	Ingestion Rate of Groundwater	L/day	2	EPA, 1994	1 4	EPA, 1994	
	EF	Exposure Frequency	days/year	350	EPA, 1994	234	EPA, 1994	$\frac{CW \times IRGW \times EF \times ED}{BW \times AT}$
	ED	Exposure Duration	years	30	EPA, 1994	9	EPA, 1994	
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	10,950	EPA, 1989	3,285	EPA, 1989	
Dermal	DAevent	Absorbed dose per event	mg/cm2-event	See Text	See Text	See Text	See Text	Dermally Absorbed Dose (mg/kg/day)
	SA	Skin Surface Available for Contact	cm2	20,000	EPA, 1992	20,000	EPA, 1992	
	EV	Event Frequency	events/day	1	EPA, 1994	1	EPA, 1994	$= \frac{DAevent \times EV \times EF \times ED \times SA}{BW \times AT}$
	ET	Exposure Time	hours/event	0.25	EPA, 1992	0.167	EPA, 1992	
	EF	Exposure Frequency	days/year	350	EPA, 1994	234	EPA, 1994	
	ED	Exposure Duration	years	30	EPA, 1994	9	EPA, 1994	See text for calculation of DAevent.
	BW	Body Weight	kg	70	EPA, 1994	70	EPA, 1994	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	10,950	EPA, 1989	3,285	EPA, 1989	

Notes:
(1) - Professinal judgement.
Sources:
EPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.
EPA, 1992: Dermal Exposure Assessment: Principles and Applications.
EPA, 1994: US EPA Region I Risk Updates, Number 2.
EPA, 1998: Risk Assessment Guidance for Superfund, Supplemental Guidance, Dermal Risk Assessment, Interim Guidance.

TABLE 5.1
NON-CANCER TOXICITY DATA -- ORAL/DERMAL
NSB-NLON, GROTON, CONNECTICUT

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal RfD (2)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ (3) (MM/DD/YY)
Volatile Organic Compounds										
Tetrachloroethane	Chronic	1.0E-02	mg/kg/day	100%	1.0E-02	mg/kg/day	Liver	1000/1	IRIS	01/02/01
	Subchronic	1.0E-02	mg/kg/day	100%	1.0E-02	mg/kg/day	Liver	1000/1	Chronic	01/02/01
Semivolatile Organic Compounds										
Naphthalene	Chronic	2.0E-02	mg/kg/day	100%	2.0E-02	mg/kg/day	Body Weight	3000/1	IRIS	01/02/01
	Subchronic	2.0E-02	mg/kg/day	100%	2.0E-02	mg/kg/day	Body Weight	3000/1	Chronic	01/02/01
Inorganics										
Lead	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
(1) - USEPA 2000.
(2) - RfDdermal = RfDoral x Oral to Dermal Adjustment Factor.
(3) For IRIS values date that IRIS was searched.
NA = Not Applicable.
IRIS = Integrated Risk Information System.
Chronic = No subchronic value available, chronic value is presented.

TABLE 6.1
CANCER TOXICITY DATA -- ORAL/DERMAL
NSB-NLON, GROTON, CONNECTICUT

Chemical of Potential Concern	Oral Cancer Slope Factor	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal Cancer Slope Factor (2)	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (3) (MM/DD/YY)
Volatile Organic Compounds							
Tetrachloroethane	5.2E-02	100%	5.2E-02	$(mg/kg\text{-}day)^{-1}$	NA	EPA IX	11/01/00
Semivolatile Organic Compounds							
Naphthalene	NA	NA	NA	NA	C	IRIS	01/02/01
Inorganics							
Lead	NA	NA	NA	NA	B2	IRIS	01/02/01

Notes:

IRIS = Integrated Risk Information System

HEAST= Health Effects Assessment Summary Tables

(1) - USEPA 2000.

(2) - CSFdermal = CSForal/Oral to Dermal Adjustment Factor.

(3) - For IRIS values, the date IRIS was searched.

NA = Not Applicable

IRIS = Integrated Risk Information System

HEAST= Health Effects Assessment Summary Tables

EPA IX = USEPA Region IX Preliminary Remediation Goals Table, November 1, 2000.

EPA Group:

A - Human carcinogen

B1 - Probable human carcinogen - indicates that limited human data are available

B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans

C - Possible human carcinogen

D - Not classifiable as a human carcinogen

E - Evidence of noncarcinogenicity

TABLE 7.1
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Tank Farm (Site 23)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Tetrachloroethene	3.00	ug/L	3.00	ug/L	M	1.7E-06	mg/kg/day	1.0E-02	mg/kg/day	N/A	N/A	1.7E-04
	Naphthalene	1.40	ug/L	1.40	ug/L	M	9.5E-07	mg/kg/day	2.0E-02	mg/kg/day	N/A	N/A	4.7E-05
	Lead	6.11	ug/L	6.11	ug/L	M	0.0E+00	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	(Total)												2.2E-04
												Total Hazard Index Across All Exposure Routes/Pathways	2.2E-04

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Subchronic.

TABLE 7.2
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Tank Farm (Site 23)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Tetrachloroethene	0.750	ug/L	0.750	ug/L	M	8.7E-07	mg/kg/day	1.0E-02	mg/kg/day	N/A	N/A	8.7E-05
	Naphthalene	0.590	ug/L	0.590	ug/L	M	4.7E-07	mg/kg/day	2.0E-02	mg/kg/day	N/A	N/A	2.4E-05
	Lead	6.11	ug/L	6.11	ug/L	M	0.0E+00	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	(Total)												1.1E-04
												Total Hazard Index Across All Exposure Routes/Pathways	1.1E-04

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Subchronic.

TABLE 7.3
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Tank Farm (Site 23)
Receptor Population: Adult Residnts
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Tetrachloroethene	3.00	ug/L	3.00	ug/L	M	8.2E-05	mg/kg/day	1.0E-02	mg/kg/day	N/A	N/A	8.2E-03
	Naphthalene	1.40	ug/L	1.40	ug/L	M	3.8E-05	mg/kg/day	2.0E-02	mg/kg/day	N/A	N/A	1.9E-03
	Lead	6.11	ug/L	6.11	ug/L	M	1.7E-04	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
													1.0E-02
Dermal	Tetrachloroethene	3.00	ug/L	3.00	ug/L	M	3.8E-05	mg/kg/day	1.0E-02	mg/kg/day	N/A	N/A	3.8E-03
	Naphthalene	1.40	ug/L	1.40	ug/L	M	1.9E-05	mg/kg/day	2.0E-02	mg/kg/day	N/A	N/A	9.7E-04
	Lead	6.11	ug/L	6.11	ug/L	M	0.0E+00	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	(Total)												4.8E-03
												Total Hazard Index Across All Exposure Routes/Pathways	1.5E-02

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Chronic.

TABLE 7.4
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Tank Farm (Site 23)
Receptor Population: Adult Residnts
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation (1)	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose (2)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Tetrachloroethene	0.750	ug/L	0.750	ug/L	M	9.6E-06	mg/kg/day	1.0E-02	mg/kg/day	N/A	N/A	9.6E-04
	Naphthalene	0.590	ug/L	0.590	ug/L	M	7.6E-06	mg/kg/day	2.0E-02	mg/kg/day	N/A	N/A	3.8E-04
	Lead	6.11	ug/L	6.11	ug/L	M	7.8E-05	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
													1.3E-03
Dermal	Tetrachloroethene	0.750	ug/L	0.750	ug/L	M	2.5E-05	mg/kg/day	1.0E-02	mg/kg/day	N/A	N/A	2.5E-03
	Naphthalene	0.590	ug/L	0.590	ug/L	M	1.3E-05	mg/kg/day	2.0E-02	mg/kg/day	N/A	N/A	6.5E-04
	Lead	6.11	ug/L	6.11	ug/L	M	0.0E+00	mg/kg/day	NA	mg/kg/day	N/A	N/A	- -
	(Total)												3.2E-03
												Total Hazard Index Across All Exposure Routes/Pathways	4.5E-03

(1) Medium-Specific (M) EPC selected for hazard calculation.
(2) Chronic.

TABLE 8.1
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Tank Farm (Site 23)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Tetrachloroethene	3.00	ug/L	3.00	ug/L	M	2.5E-08	mg/kg/day	5.2E-02	(mg/kg/day) -1	1.3E-09
	Naphthalene	1.40	ug/L	1.40	ug/L	M	1.4E-08	mg/kg/day	NA	(mg/kg/day) -1	- -
	Lead	6.11	ug/L	6.11	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										1.3E-09
										Total Risk Across All Exposure Routes/Pathways	1.3E-09

(1) Medium-Specific (M) EPC selected for risk calculation.

TABLE 8.2
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Tank Farm (Site 23)
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Dermal	Tetrachloroethene	0.750	ug/L	0.750	ug/L	M	2.1E-09	mg/kg/day	5.2E-02	(mg/kg/day) -1	1.1E-10
	Naphthalene	0.590	ug/L	0.590	ug/L	M	1.8E-09	mg/kg/day	NA	(mg/kg/day) -1	- -
	Lead	6.11	ug/L	6.11	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										1.1E-10
										Total Risk Across All Exposure Routes/Pathways	1.1E-10

(1) Medium-Specific (M) EPC selected for risk calculation.

TABLE 8.3
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Tank Farm (Site 23)
Receptor Population: Adult Residnts
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Tetrachloroethene	3.00	ug/L	3.00	ug/L	M	3.5E-05	mg/kg/day	0.052	(mg/kg/day) -1	1.8E-06
	Naphthalene	1.40	ug/L	1.40	ug/L	M	1.6E-05	mg/kg/day	NA	(mg/kg/day) -1	- -
	Lead	6.11	ug/L	6.11	ug/L	M	7.2E-05	mg/kg/day	NA	(mg/kg/day) -1	- -
											1.8E-06
Dermal	Tetrachloroethene	3.00	ug/L	3.00	ug/L	M	1.6E-05	mg/kg/day	5.2E-02	(mg/kg/day) -1	8.5E-07
	Naphthalene	1.40	ug/L	1.40	ug/L	M	8.3E-06	mg/kg/day	NA	(mg/kg/day) -1	- -
	Lead	6.11	ug/L	6.11	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										8.5E-07
										Total Risk Across All Exposure Routes/Pathways	2.7E-06

(1) Medium-Specific (M) EPC selected for risk calculation.

TABLE 8.4
CALCULATION OF CANCER RISKS
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: Tank Farm (Site 23)
Receptor Population: Adult Residnts
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Risk Calculation (1)	Intake (Cancer)	Intake (Cancer) Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk
Ingestion	Tetrachloroethene	0.750	ug/L	0.750	ug/L	M	1.2E-06	mg/kg/day	0.052	(mg/kg/day) -1	6.4E-08
	Naphthalene	0.590	ug/L	0.590	ug/L	M	9.7E-07	mg/kg/day	NA	(mg/kg/day) -1	- -
	Lead	6.11	ug/L	6.11	ug/L	M	1.0E-05	mg/kg/day	NA	(mg/kg/day) -1	- -
											6.4E-08
Dermal	Tetrachloroethene	0.750	ug/L	0.750	ug/L	M	6.7E-07	mg/kg/day	5.2E-02	(mg/kg/day) -1	3.5E-08
	Naphthalene	0.590	ug/L	0.590	ug/L	M	5.7E-07	mg/kg/day	NA	(mg/kg/day) -1	- -
	Lead	6.11	ug/L	6.11	ug/L	M	0.0E+00	mg/kg/day	NA	(mg/kg/day) -1	- -
	(Total)										3.5E-08
										Total Risk Across All Exposure Routes/Pathways	9.9E-08

(1) Medium-Specific (M) EPC selected for risk calculation.

TABLE 9.1
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tank Farm (Site 23)	Tetrachloroethene	- -	- -	1.3E-09	1.3E-09	Tetrachloroethene	Liver	- -	- -	1.7E-04	1.7E-04
			Naphthalene	- -	- -	- -	- -	Naphthalene	Body Weight	- -	- -	4.7E-05	4.7E-05
			Lead	- -	- -	- -	- -	Lead	NA	- -	- -	- -	- -
			(Total)	- -	- -	1.3E-09	1.3E-09	(Total)		- -	- -	2.2E-04	2.2E-04
						Total Risk Across Groundwater	1.3E-09					Total Hazard Index Across All Media and All Exposure Routes	2.2E-04
						Total Risk Across All Media and All Exposure Routes	1.3E-09						

Total Body Weigh HI	4.7E-05
Total Liver HI	1.7E-04

TABLE 9.2
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tank Farm (Site 23)	Tetrachloroethene	- -	- -	1.1E-10	1.1E-10	Tetrachloroethene	Liver	- -	- -	8.7E-05	8.7E-05
			Naphthalene	- -	- -	- -	- -	Naphthalene	Body Weight	- -	- -	2.4E-05	2.4E-05
			Lead	- -	- -	- -	- -	Lead	NA	- -	- -	- -	- -
			(Total)	- -	- -	1.1E-10	1.1E-10	(Total)		- -	- -	1.1E-04	1.1E-04
						Total Risk Across Groundwater	1.1E-10					Total Hazard Index Across All Media and All Exposure Routes	1.1E-04
						Total Risk Across All Media and All Exposure Routes	1.1E-10						

Total Body Weigh HI	2.4E-05
Total Liver HI	8.7E-05

TABLE 9.3
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Adult Residnts
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tank Farm (Site 23)	Tetrachloroethene	1.8E-06	1.8E-06	8.5E-07	4.5E-06	Tetrachloroethene	Liver	8.2E-03	8.2E-03	3.8E-03	2.0E-02
			Naphthalene	- -	- -	- -	- -	Naphthalene	Body Weight	1.9E-03	- -	9.7E-04	2.9E-03
			Lead	- -	- -	- -	- -	Lead	NA	- -	- -	- -	- -
			(Total)	1.8E-06	1.8E-06	8.5E-07	4.5E-06	(Total)		1.0E-02	8.2E-03	4.8E-03	2.3E-02
							Total Risk Across Groundwater 4.5E-06						Total Hazard Index Across All Media and All Exposure Routes 2.3E-02
							Total Risk Across All Media and All Exposure Routes 4.5E-06						

Total Body Weigh HI 2.9E-03
Total Liver HI 2.0E-02

Notes:
(1) - Inhalation risk is assumed to be equal to risk from ingestion for volatiles.

TABLE 9.4
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Adult Residnts
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tank Farm (Site 23)	Tetrachloroethene	6.4E-08	6.4E-08	3.5E-08	1.6E-07	Tetrachloroethene	Liver	9.6E-04	9.6E-04	2.5E-03	4.5E-03
			Naphthalene	- -	- -	- -	- -	Naphthalene	Body Weight	3.8E-04	- -	6.5E-04	1.0E-03
			Lead	- -	- -	- -	- -	Lead	NA	- -	- -	- -	- -
			(Total)	6.4E-08	6.4E-08	3.5E-08	1.6E-07	(Total)		1.3E-03	9.6E-04	3.2E-03	5.5E-03
						Total Risk Across Groundwater	1.6E-07					Total Hazard Index Across All Media and All Exposure Routes	5.5E-03
						Total Risk Across All Media and All Exposure Routes	1.6E-07						

Notes:
(1) - Inhalation risk is assumed to be equal to risk from ingestion for volatiles.

Total Body Weigh HI	1.0E-03
Total Liver HI	4.5E-03

TABLE 10.1
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tank Farm (Site 23)	Tetrachloroethene	- -	- -	1.3E-09	1.3E-09	Tetrachloroethene	Liver	- -	- -	1.7E-04	1.7E-04
			Naphthalene	- -	- -	- -	- -	Naphthalene	Body Weight	- -	- -	4.7E-05	4.7E-05
			Lead	- -	- -	- -	- -	Lead	NA	- -	- -	- -	- -
			(Total)	- -	- -	1.3E-09	1.3E-09	(Total)		- -	- -	2.2E-04	2.2E-04
						Total Risk Across Groundwater	1.3E-09					Total Hazard Index Across All Media and All Exposure Routes	2.2E-04
						Total Risk Across All Media and All Exposure Routes	1.3E-09						

Total Body Weigh HI	4.7E-05
Total Liver HI	1.7E-04

TABLE 10.2
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tank Farm (Site 23)	Tetrachloroethene	- -	- -	1.1E-10	1.1E-10	Tetrachloroethene	Liver	- -	- -	8.7E-05	8.7E-05
			Naphthalene	- -	- -	- -	- -	Naphthalene	Body Weight	- -	- -	2.4E-05	2.4E-05
			Lead	- -	- -	- -	- -	Lead	NA	- -	- -	- -	- -
			(Total)	- -	- -	1.1E-10	1.1E-10	(Total)		- -	- -	1.1E-04	1.1E-04
						Total Risk Across Groundwater	1.1E-10					Total Hazard Index Across All Media and All Exposure Routes	1.1E-04
						Total Risk Across All Media and All Exposure Routes	1.1E-10						

Total Body Weigh HI	2.4E-05
Total Liver HI	8.7E-05

TABLE 10.3
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Adult Residnts
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tank Farm (Site 23)	Tetrachloroethene	1.8E-06	1.8E-06	8.5E-07	4.5E-06	Tetrachloroethene	Liver	8.2E-03	8.2E-03	3.8E-03	2.0E-02
			(Total)	1.8E-06	1.8E-06	8.5E-07	4.5E-06	(Total)		8.2E-03	8.2E-03	3.8E-03	2.0E-02
						Total Risk Across Groundwater	4.5E-06					Total Hazard Index Across All Media and All Exposure Routes	2.0E-02
						Total Risk Across All Media and All Exposure Routes	4.5E-06						

Total Body Weigh HI: - -
Total Liver HI: - -

Notes:
(1) - Inhalation risk is assumed to be equal to risk from ingestion for volatiles.

TABLE 10.4
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NSB-NLON, GROTON, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Adult Residnts
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tank Farm (Site 23)	Tetrachloroethene	6.4E-08	6.4E-08	3.5E-08	1.6E-07	Tetrachloroethene	Liver	9.6E-04	9.6E-04	2.5E-03	4.5E-03
			Naphthalene	- -	- -	- -	- -	Naphthalene	Body Weight	3.8E-04	- -	6.5E-04	1.0E-03
			Lead	- -	- -	- -	- -	Lead	NA	- -	- -	- -	- -
			(Total)	6.4E-08	6.4E-08	3.5E-08	1.6E-07	(Total)		1.3E-03	9.6E-04	3.2E-03	5.5E-03
						Total Risk Across Groundwater	1.6E-07					Total Hazard Index Across All Media and All Exposure Routes	5.5E-03
						Total Risk Across All Media and All Exposure Routes	1.6E-07						

Notes:
(1) - Inhalation risk is assumed to be equal to risk from ingestion for volatiles.

Total Body Weigh HI	1.0E-03
Total Liver HI	4.5E-03

APPENDIX C.6

LEAD MODELING RESULTS

TORPEDO SHOP (SITE 7)

IEUBK MODEL - Exposure to Lead (Page 1 of 2)
SITE NAME: Site 7
LOCATION: NSB-NLON, Groton, Connecticut
DATE: December 18, 2000

LEAD MODEL Version 0.99d

AIR CONCENTRATION: 0.100 ug Pb/m3 DEFAULT
Indoor AIR Pb Conc: 30.0 percent of outdoor.
Other AIR Parameters:

Age	Time Outdoors (hr)	Vent. Rate (m3/day)	Lung Abs. (%)
0-1	1.0	2.0	32.0
1-2	2.0	3.0	32.0
2-3	3.0	5.0	32.0
3-4	4.0	5.0	32.0
4-5	4.0	5.0	32.0
5-6	4.0	7.0	32.0
6-7	4.0	7.0	32.0

DIET: DEFAULT

DRINKING WATER Conc: 3.92 ug Pb/L
WATER Consumption: DEFAULT

SOIL & DUST:
Soil: constant conc.
Dust: constant conc.

Age	Soil (ug Pb/g)	House Dust (ug Pb/g)
0-1	8.5	8.5
1-2	8.5	8.5
2-3	8.5	8.5
3-4	8.5	8.5
4-5	8.5	8.5
5-6	8.5	8.5
6-7	8.5	8.5

Additional Dust Sources: None DEFAULT

PAINT Intake: 0.00 ug Pb/day DEFAULT

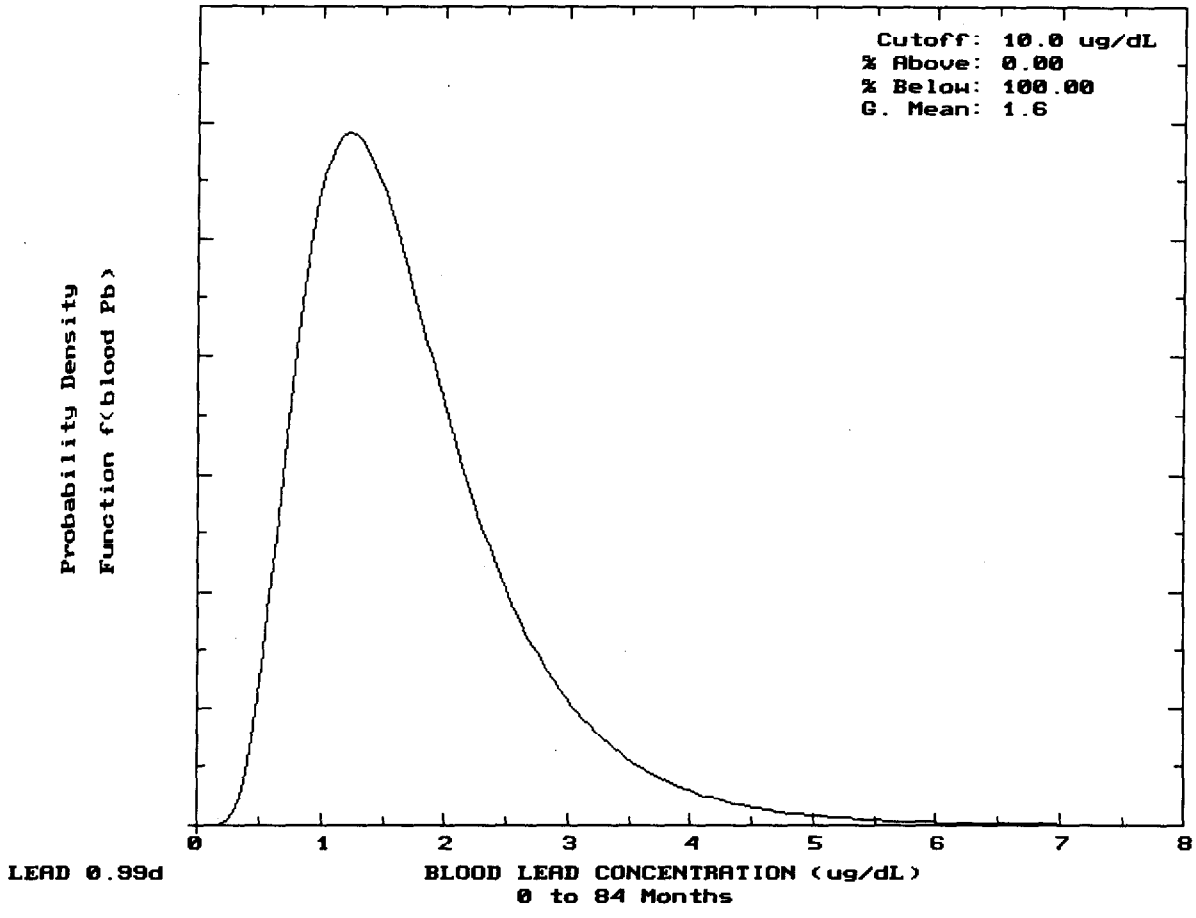
MATERNAL CONTRIBUTION: Infant Model
Maternal Blood Conc: 2.50 ug Pb/dL

CALCULATED BLOOD Pb and Pb UPTAKES:

YEAR	Blood Level (ug/dL)	Total Uptake (ug/day)	Soil+Dust Uptake (ug/day)
0.5-1:	1.8	3.27	0.21
1-2:	1.8	4.10	0.33
2-3:	1.7	4.52	0.33
3-4:	1.6	4.45	0.33
4-5:	1.5	4.31	0.25
5-6:	1.4	4.53	0.22
6-7:	1.4	4.86	0.21

YEAR	Diet Uptake (ug/day)	Water Uptake (ug/day)	Paint Uptake (ug/day)	Air Uptake (ug/day)
0.5-1:	2.67	0.38	0.00	0.02
1-2:	2.79	0.95	0.00	0.03
2-3:	3.14	0.99	0.00	0.06
3-4:	3.03	1.01	0.00	0.07
4-5:	2.94	1.05	0.00	0.07
5-6:	3.10	1.11	0.00	0.09
6-7:	3.43	1.13	0.00	0.09

IEUBK MODEL - Exposure to Lead (Page 2 of 2)
SITE NAME: Site 7
LOCATION: NSB-NLON, Groton, Connecticut
DATE: December 18, 2000



SPENT ACID STORAGE AND DISPOSAL AREA (SITE 15)

IEUBK MODEL - Exposure to Lead (Page 1 of 2)
SITE NAME: Site 15
LOCATION: NSB-NLON, Groton, Connecticut
DATE: December 15, 2000

LEAD MODEL Version 0.99d

AIR CONCENTRATION: 0.100 ug Pb/m3 DEFAULT
Indoor AIR Pb Conc: 30.0 percent of outdoor.
Other AIR Parameters:

Age	Time Outdoors (hr)	Vent. Rate (m3/day)	Lung Abs. (%)
0-1	1.0	2.0	32.0
1-2	2.0	3.0	32.0
2-3	3.0	5.0	32.0
3-4	4.0	5.0	32.0
4-5	4.0	5.0	32.0
5-6	4.0	7.0	32.0
6-7	4.0	7.0	32.0

DIET: DEFAULT

DRINKING WATER Conc: 11.60 ug Pb/L
WATER Consumption: DEFAULT

SOIL & DUST:
Soil: constant conc.
Dust: constant conc.

Age	Soil (ug Pb/g)	House Dust (ug Pb/g)
0-1	200.0	200.0
1-2	200.0	200.0
2-3	200.0	200.0
3-4	200.0	200.0
4-5	200.0	200.0
5-6	200.0	200.0
6-7	200.0	200.0

Additional Dust Sources: None DEFAULT

PAINT Intake: 0.00 ug Pb/day DEFAULT

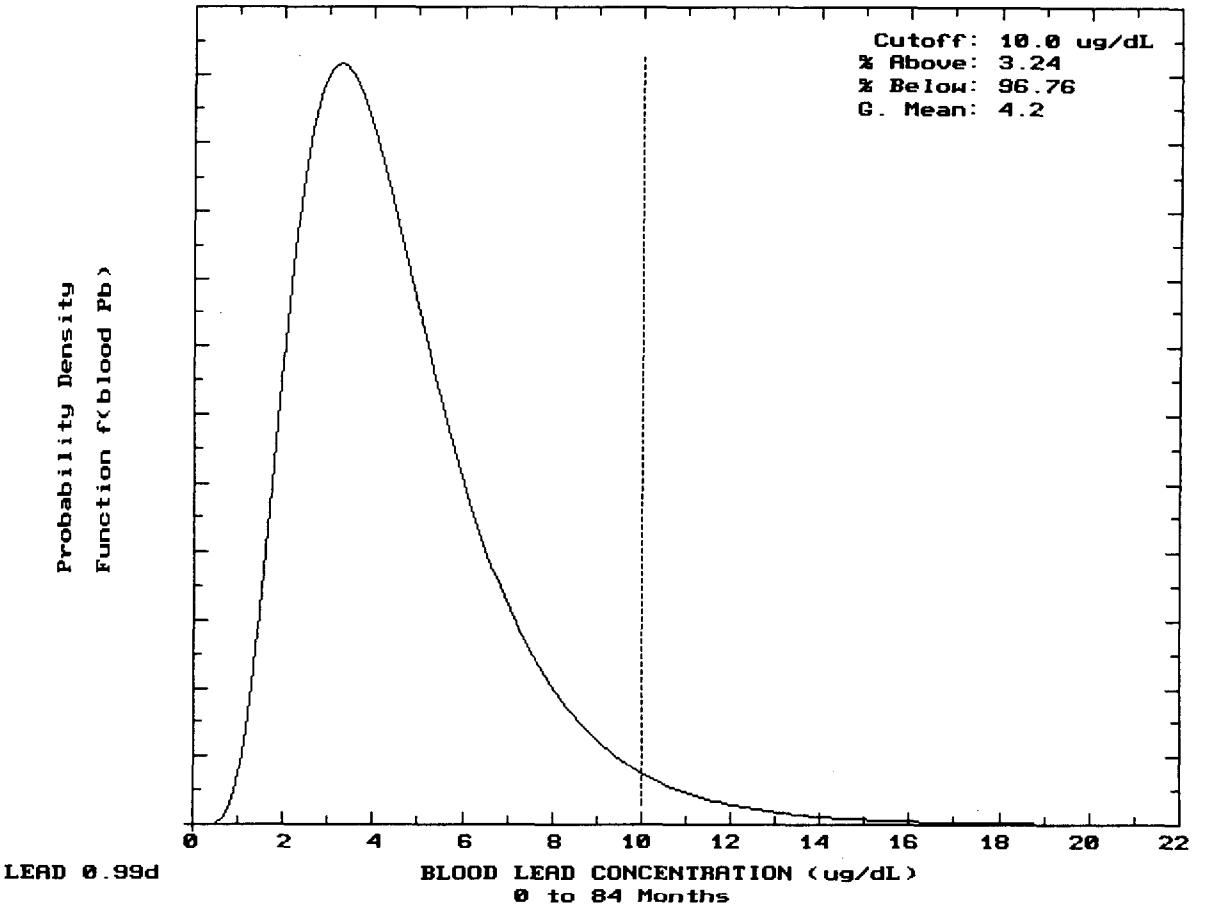
MATERNAL CONTRIBUTION: Infant Model
Maternal Blood Conc: 2.50 ug Pb/dL

CALCULATED BLOOD Pb and Pb UPTAKES:

YEAR	Blood Level (ug/dL)	Total Uptake (ug/day)	Soil+Dust Uptake (ug/day)
0.5-1:	4.5	8.23	4.64
1-2:	5.1	12.48	7.26
2-3:	4.9	13.09	7.35
3-4:	4.6	13.21	7.45
4-5:	4.0	11.52	5.63
5-6:	3.6	11.39	5.11
6-7:	3.3	11.52	4.85

YEAR	Diet Uptake (ug/day)	Water Uptake (ug/day)	Paint Uptake (ug/day)	Air Uptake (ug/day)
0.5-1:	2.52	1.06	0.00	0.02
1-2:	2.59	2.60	0.00	0.03
2-3:	2.94	2.74	0.00	0.06
3-4:	2.87	2.83	0.00	0.07
4-5:	2.82	3.00	0.00	0.07
5-6:	3.00	3.18	0.00	0.09
6-7:	3.33	3.25	0.00	0.09

IEUBK MODEL - Exposure to Lead (Page 2 of 2)
SITE NAME: Site 15
LOCATION: NSB-NLON, Groton, Connecticut
DATE: December 15, 2000



SOLVENT STORAGE AREA (SITE 18)

IEUBK MODEL - Exposure to Lead (Page 1 of 2)
SITE NAME: Site 18
LOCATION: NSB-NLON, Groton, Connecticut
DATE: December 18, 2000

LEAD MODEL Version 0.99d

AIR CONCENTRATION: 0.100 ug Pb/m3 DEFAULT
Indoor AIR Pb Conc: 30.0 percent of outdoor.
Other AIR Parameters:

Age	Time Outdoors (hr)	Vent. Rate (m3/day)	Lung Abs. (%)
0-1	1.0	2.0	32.0
1-2	2.0	3.0	32.0
2-3	3.0	5.0	32.0
3-4	4.0	5.0	32.0
4-5	4.0	5.0	32.0
5-6	4.0	7.0	32.0
6-7	4.0	7.0	32.0

DIET: DEFAULT

DRINKING WATER Conc: 4.00 ug Pb/L DEFAULT
WATER Consumption: DEFAULT

SOIL & DUST:
Soil: constant conc.
Dust: constant conc.

Age	Soil (ug Pb/g)	House Dust (ug Pb/g)
0-1	47.6	47.6
1-2	47.6	47.6
2-3	47.6	47.6
3-4	47.6	47.6
4-5	47.6	47.6
5-6	47.6	47.6
6-7	47.6	47.6

Additional Dust Sources: None DEFAULT

PAINT Intake: 0.00 ug Pb/day DEFAULT

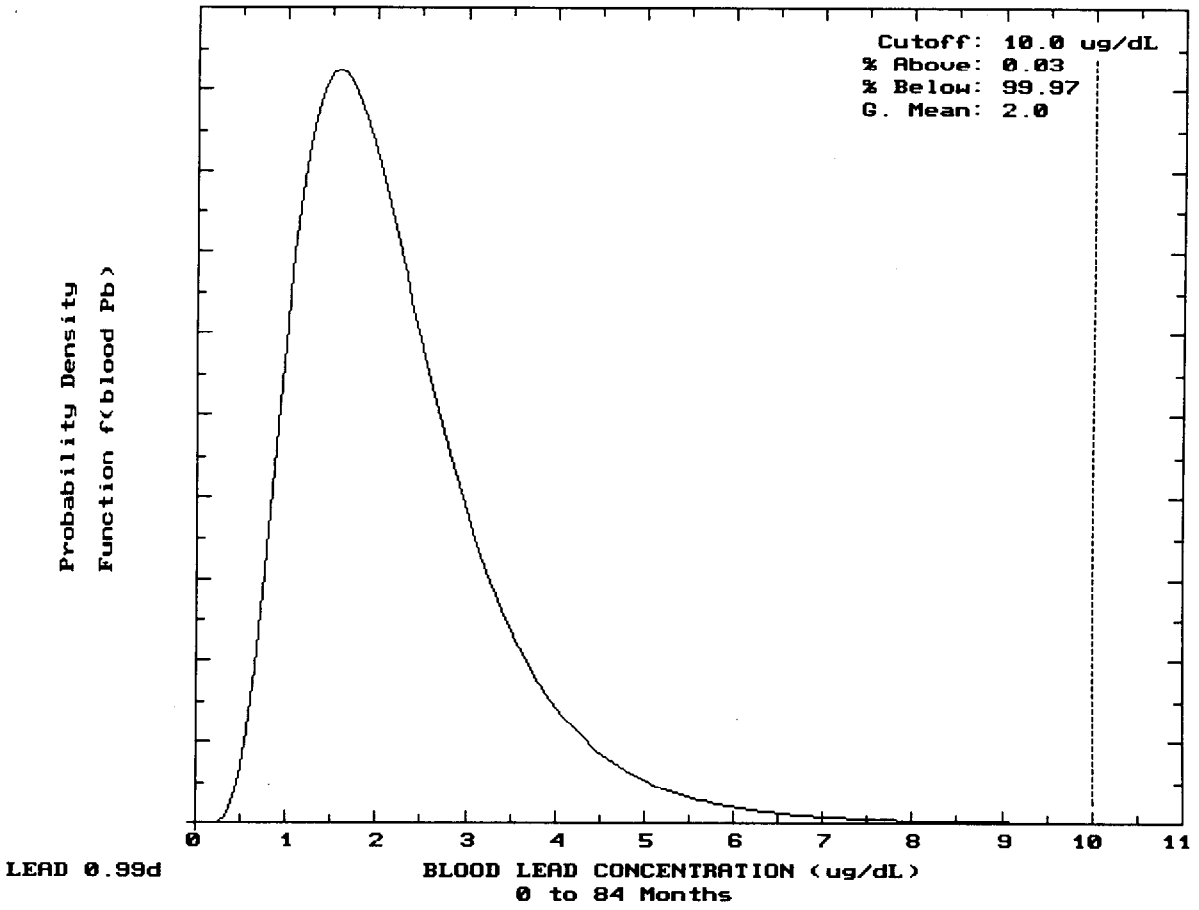
MATERNAL CONTRIBUTION: Infant Model
Maternal Blood Conc: 2.50 ug Pb/dL

CALCULATED BLOOD Pb and Pb UPTAKES:

YEAR	Blood Level (ug/dL)	Total Uptake (ug/day)	Soil+Dust Uptake (ug/day)
0.5-1:	2.3	4.20	1.16
1-2:	2.4	5.58	1.84
2-3:	2.2	6.01	1.84
3-4:	2.1	5.95	1.86
4-5:	1.9	5.44	1.39
5-6:	1.7	5.56	1.25
6-7:	1.6	5.84	1.18

YEAR	Diet Uptake (ug/day)	Water Uptake (ug/day)	Paint Uptake (ug/day)	Air Uptake (ug/day)
0.5-1:	2.64	0.38	0.00	0.02
1-2:	2.75	0.95	0.00	0.03
2-3:	3.10	1.00	0.00	0.06
3-4:	3.01	1.02	0.00	0.07
4-5:	2.92	1.07	0.00	0.07
5-6:	3.09	1.13	0.00	0.09
6-7:	3.41	1.15	0.00	0.09

IEUBK MODEL - Exposure to Lead (Page 2 of 2)
SITE NAME: Site 18
LOCATION: NSB-NLON, Groton, Connecticut
DATE: December 18, 2000



TANK FARM (SITE 23)

IEUBK MODEL - Exposure to Lead (Page 1 of 2)
SITE NAME: Site 23
LOCATION: NSB-NLON, Groton, Connecticut
DATE: December 15, 2000

LEAD MODEL Version 0.99d

AIR CONCENTRATION: 0.100 ug Pb/m3 DEFAULT
Indoor AIR Pb Conc: 30.0 percent of outdoor.
Other AIR Parameters:

Age	Time Outdoors (hr)	Vent. Rate (m3/day)	Lung Abs. (%)
0-1	1.0	2.0	32.0
1-2	2.0	3.0	32.0
2-3	3.0	5.0	32.0
3-4	4.0	5.0	32.0
4-5	4.0	5.0	32.0
5-6	4.0	7.0	32.0
6-7	4.0	7.0	32.0

DIET: DEFAULT

DRINKING WATER Conc: 6.10 ug Pb/L
WATER Consumption: DEFAULT

SOIL & DUST:
Soil: constant conc.
Dust: constant conc.

Age	Soil (ug Pb/g)	House Dust (ug Pb/g)
0-1	200.0	200.0
1-2	200.0	200.0
2-3	200.0	200.0
3-4	200.0	200.0
4-5	200.0	200.0
5-6	200.0	200.0
6-7	200.0	200.0

Additional Dust Sources: None DEFAULT

PAINT Intake: 0.00 ug Pb/day DEFAULT

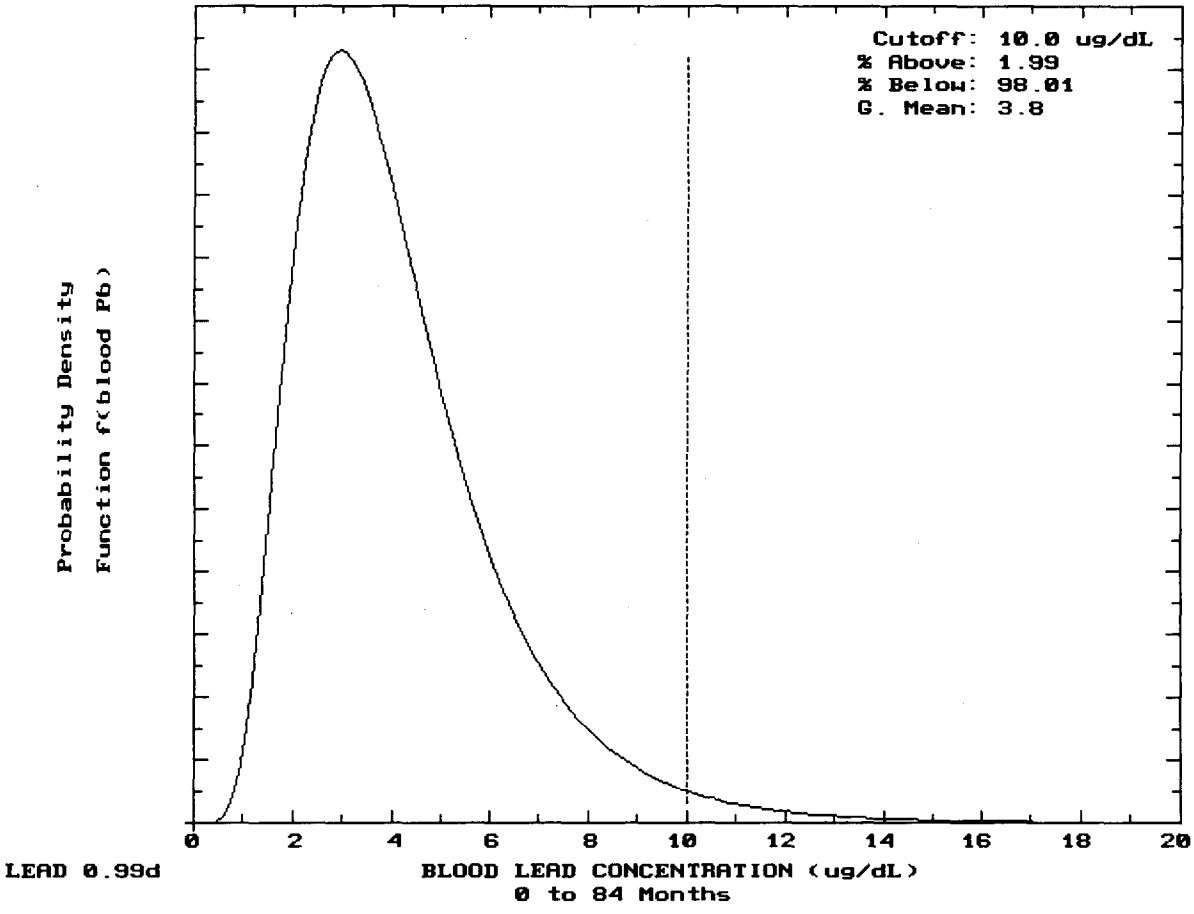
MATERNAL CONTRIBUTION: Infant Model
Maternal Blood Conc: 2.50 ug Pb/dL

CALCULATED BLOOD Pb and Pb UPTAKES:

YEAR	Blood Level (ug/dL)	Total Uptake (ug/day)	Soil+Dust Uptake (ug/day)
0.5-1:	4.2	7.78	4.67
1-2:	4.7	11.36	7.33
2-3:	4.4	11.90	7.41
3-4:	4.2	11.96	7.51
4-5:	3.6	10.17	5.68
5-6:	3.1	9.95	5.15
6-7:	2.9	10.04	4.88

YEAR	Diet Uptake (ug/day)	Water Uptake (ug/day)	Paint Uptake (ug/day)	Air Uptake (ug/day)
0.5-1:	2.53	0.56	0.00	0.02
1-2:	2.61	1.38	0.00	0.03
2-3:	2.97	1.45	0.00	0.06
3-4:	2.89	1.50	0.00	0.07
4-5:	2.84	1.59	0.00	0.07
5-6:	3.02	1.69	0.00	0.09
6-7:	3.35	1.72	0.00	0.09

IEUBK MODEL - Exposure to Lead (Page 2 of 2)
SITE NAME: Site 23
LOCATION: NSB-NLON, Groton, Connecticut
DATE: December 15, 2000



APPENDIX D

HISTORICAL ANALYTICAL DATA SUMMARIES

D.1 COPC SCREENING – GROUNDWATER SAMPLES-OVERBURDEN WELLS, SITE 2A – AREA A LANDFILL

D.2 COPC SCREENING – GROUNDWATER SAMPLES-BEDROCK WELLS, SITE 2A – AREA A LANDFILL

D.3 COPC SCREENING – GROUNDWATER SAMPLES-OVERBURDEN WELLS, SITE 2B – AREA A WETLAND

D.4 COPC SCREENING – GROUNDWATER SAMPLES-BEDROCK WELLS, SITE 2B – AREA A WETLAND

D.5 COPC SCREENING – GROUNDWATER SAMPLES-OVERBURDEN WELLS, SITE 3 – AREA A DOWNSTREAM WATERCOURSES AND OBDA

D.6 COPC SCREENING – GROUNDWATER SAMPLES-BEDROCK WELLS, SITE 3 – AREA A DOWNSTREAM WATERCOURSES AND OBDA

D.7 COPC SCREENING – SOIL SAMPLES, SITE 7 – TORPEDO SHOPS

D.8 COPC SCREENING – TCLP SOIL SAMPLES, SITE 7 – TORPEDO SHOPS

D.9 COPC SCREENING – GROUNDWATER SAMPLES-OVERBURDEN WELLS, SITE 7 – TORPEDO SHOPS

D.10 COPC SCREENING – GROUNDWATER SAMPLES-BEDROCK WELLS, SITE 7 – TORPEDO SHOPS

D.11 COPC SCREENING – GROUNDWATER SAMPLES-OVERBURDEN WELLS, SITE 14 – OBDANE

D.12 COPC SCREENING – GROUNDWATER SAMPLES-OVERBURDEN WELLS, SITE 20 – AREA A WEAPONS CENTER

D.13 COPC SCREENING – GROUNDWATER SAMPLES-BEDROCK WELLS, SITE 20 – AREA A WEAPONS CENTER

D.14 COPC SCREENING – GROUNDWATER SAMPLES-OVERBURDEN WELLS, SITE 8 – GOSS COVE LANDFILL

D.15 COPC SCREENING – GROUNDWATER SAMPLES-BEDROCK WELLS, SITE 8 – GOSS COVE LANDFILL

D.16 COPC SCREENING – GROUNDWATER SAMPLES-OVERBURDEN WELLS, SITE 15 – SASDA

D.17 COPC SCREENING – GROUNDWATER SAMPLES-OVERBURDEN WELLS, SITE 23 – FUEL FARM (INCLUDING SITE 9 – OT-5 OILY WASTEWATER TANK)

APPENDIX D.1

COPC SCREENING – GROUNDWATER SAMPLES-
OVERBURDEN WELLS, SITE 2A – AREA A LANDFILL

COPC SCREENING - GROUNDWATER SAMPLES - OVERBURDEN WELLS
SITE 2A - AREA A LANDFILL[1]
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

Analyte	Frequency of Detection	Minimum Concen-tration	Maximum Concen-tration	Range of Nondetects	95% UCL	Maximum Concentration		COPC Screening Level (2)	Federal MCL (3)	State MCL (4)	State Remediation Standards[5]		Offsite Wells Concentration Range (6)	Select as COPC? (7)
						Sample Number	Location				Groundwater Protection	Surface Water Protection		
VOLATILE ORGANICS (ug/L)														
1,2-Dichloroethene (total)	1/28	2 J	2 J	5 - 100	2	2LGW13S	2LMW13S	5.5	70/100	70/100	63	14000	ND	N
4-Methyl-2-pentanone	8/28	3 J	11	10 - 100	11	2LPW1S-4	2LPW1S	290	-	-	350	-	ND	N
Acetone	1/28	10 J	10 J	10 - 110	10	2LGW9S	2LMW9S	370	-	-	700	-	ND	N
Benzene	3/28	6 J	32 J	5 - 10	32	2LGW18S-2	2LMW18S	0.36	5	5	1	710	ND	Y
Carbon Disulfide	3/28	1 J	3 J	5 - 100	3	2LGW7S-2	2LMW7S	100	-	-	700	-	ND	N
Chlorobenzene	3/28	140	1200	5 - 10	1200	2LGW18S-2	2LMW18S	3.5	100	100	100	420000	ND	Y
Chloroform	1/28	16 J	16 J	5 - 25	16	2LGW18S-2	2LMW18S	0.15	100/80	100	6	14100	ND	Y
Ethylbenzene	12/28	2 J	120	5 - 10	120	121390-2LMW18S	2LMW18S	130	700	700	700	580000	ND	N
Methylene Chloride	5/28	6.5	22	5 - 100	22	2LPW1S-3/ 2LPW1S-4	2LPW1S/ 2LPW1S	4.1	5	5	5	48000	4	Y
Toluene	9/28	1 J	2 J	5 - 100	2	2LGW18S/ 2LPW1S-1/ 2LPW1S-3/ 2LPW1S-5/ 2LPW1S-6/ 2LPW1S-8	2LMW18S/ 2LPW1S/ 2LPW1S/ 2LPW1S/ 2LPW1S/ 2LPW1S	75	1000	1000	1000	4000000	ND	N
Xylenes, Total	14/28	2 J	840	5 - 10	840	121390-2LMW18S	2LMW18S	1200	10000	10000	530	-	2	Y
SEMIVOLATILE ORGANICS (ug/L)														
1,2,4-Trichlorobenzene	3/23	7 J	72 J	10	72	121390-2LMW18S-D	2LMW18S	19	70	70	70	-	ND	Y
1,2-Dichlorobenzene	2/23	8 J	14 J	10	14	121390-2LMW18S-D	2LMW18S	6.4	600	600	600	170000	ND	Y
1,3-Dichlorobenzene	3/23	7 J	33 J	10	33	121390-2LMW18S-D	2LMW18S	1.4	600	-	210	26000	ND	Y
1,4-Dichlorobenzene	3/23	14	140 J	10	140	121390-2LMW18S-D	2LMW18S	0.47	75	75	75	26000	ND	Y
2,4-Dichlorophenol	1/23	2 J	2 J	10	2	2LGW18S-2	2LMW18S	11	-	-	20	15800	ND	N
2,4-Dimethylphenol	3/23	0.8 J	19 J	10	19	121390-2LMW18S	2LMW18S	73	-	-	140	-	ND	N
2,4-Dinitrotoluene	1/23	7 J	7 J	10	7	2LGW7S	2LMW7S	7.3	-	-	14	270	ND	N
2-Chlorophenol	2/23	4 J	12	10	12	2LGW18S-2	2LMW18S	18	-	-	36	46000	ND	N
2-Methylnaphthalene	6/23	0.8 J	6 J	10	6	2LGW18S	2LMW18S	150	-	-	280	-	ND	N
4-Chloro-3-methylphenol	1/23	8 J	8 J	10	8	2LGW18S-2	2LMW18S	-	-	-	-	-	ND	N
4-Methylphenol	6/23	0.5 J	22 J	10	22	121390-2LMW18S-D	2LMW18S	18	-	-	35	-	ND	Y
Acenaphthene	5/23	0.5 J	1 J	10	1	2LGW18S/ 2LGW7S/ 2LGW9S	2LMW18S/ 2LMW7S/ 2LMW9S	220	-	-	420	27000	ND	N
Anthracene	1/23	0.5 J	0.5 J	10	0.5	2LGW18S-2	2LMW18S	1100	-	-	2000	1100000	ND	N
Benzoic Acid	6/23	1 J	14 J	10 - 50	14	2LGW18S	2LMW18S	15000	-	-	28000	-	ND	N
Bis(2-Ethylhexyl)phthalate	7/23	1	62 J	10	62	2LGW7S-2	2LMW7S	4.8	6	6	2	59	3	Y
Butylbenzyl Phthalate	1/23	1 J	1 J	10	1	2LGW8S	2LMW8S	730	-	-	1000	52000	ND	N
Carbazole	4/18	0.5 J	2 J	10	2	2LGW18S	2LMW18S	3.3	-	-	1.8	29	ND	Y
Di-n-butyl phthalate	2/23	0.8 J	1 J	10	1	2LGW9S	2LMW9S	370	-	-	700	120000	ND	N
Dibenzofuran	1/23	0.6 J	0.6 J	10	0.6	2LPW1S-1	2LPW1S	2.4	-	-	28	-	ND	N
Diethyl Phthalate	5/23	1 J	17 J	10	17	121390-2LMW18S-D	2LMW18S	2900	-	-	5600	2400000	ND	N
Fluorene	5/23	0.8 J	1 J	10	1	2LGW18S/ 2LGW7S	2LMW18S/ 2LMW7S	150	-	-	280	140000	ND	N
N-Nitrosodiphenylamine	1/23	1 J	1 J	10	1	2LGW18S-2	2LMW18S	14	-	-	7.1	480	ND	N
Naphthalene	11/23	1 J	42	10	42	2LGW18S	2LMW18S	150	-	-	280	-	ND	N

COPC SCREENING - GROUNDWATER SAMPLES - OVERBURDEN WELLS
SITE 2A - AREA A LANDFILL[1]
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

Analyte	Frequency of Detection	Minimum Concen-tration	Maximum Concen-tration	Range of Nondetects	95% UCL	Maximum Concentration		COPC Screening Level (2)	Federal MCL (3)	State MCL (4)	State Remediation Standards[5]		Offsite Wells Concentration Range (6)	Select as COPC? (7)
						Sample Number	Location				Groundwater Protection	Surface Water Protection		
Phenanthrene	3/23	1 J	1 J	10	1	2LPW1S-1/ 2LPW1S-7/ 2LPW1S-8	2LPW1S/ 2LPW1S/ 2LPW1S	-	-	-	200	0.3	ND	Y
PESTICIDES/PCBs (ug/L)														
Aroclor-1016	1/10	7.5 J	7.5 J	0.1 - 10	7.5	2LGW18S-2	2LMW18S	0.096	0.5	0.5	0.5	0.5	ND	Y
Aroclor-1254	1/10	130	150	0.1 - 10	150	121390-2LMW18S	2LMW18S	0.0033	0.5	0.5	0.5	0.5	ND	Y
Aroclor-1260	2/10	290 J	710	0.1 - 1	710	2LGW18S	2LMW18S	0.033	0.5	0.5	0.5	0.5	ND	Y
INORGANICS (ug/L)														
Aluminum	8/22	51.1	89300	30 - 116	89300	2LGW13S	2LMW13S	-	50 to 200	-	-	-	15.4 - 3360	N[8]
Aluminum, Filtered	2/17	12.8	62.5	10 - 116	47.8	2LGW18S2DISS	2LMW18S	-	50 to 200	-	-	-	-	N[8]
Antimony, Filtered	3/17	13.7 J	34.1	12 - 19.9	34.1	2LGW13S DISS	2LMW13S	1.5	6	6	6	86000	-	Y
Arsenic	10/22	2.3 J	37	2 - 20	37	2LGW7S-2	2LMW7S	0.045	50	50	50	4	0.64	Y
Arsenic, Filtered	8/17	2.3 J	7.3 J	2 - 20	7.3	2LGW13S DISS	2LMW13S	0.045	50	50	50	4	-	Y
Barium	22/22	18.5	956	-	956	2LPW1S-8	2LPW1S	260	2000	2000	1000	-	2.8 - 183	Y
Barium, Filtered	15/17	29.2	924	5 - 48	924	2LPW1S-8 DISS	2LPW1S	260	2000	2000	1000	-	-	Y
Beryllium	3/22	1.1 J	4.2	1	4.2	2LGW13S	2LMW13S	73	4	4	4	4	0.33 - 0.41	Y
Beryllium, Filtered	2/17	1.2 J	1.2 J	1	1.2	2LPW1S-1 DISS/ 2LPW1S-7 DISS	2LPW1S/ 2LPW1S	73	4	4	4	4	-	N
Boron	7/17	52.5 J	3010 J	38.5 - 719	3010	2LGW7S-2	2LMW7S	330	-	-	630	-	9.3 - 126	Y
Boron, Filtered	10/17	39.3	2670	35.7 - 131	2670	2LGW7S2DISS	2LMW7S	330	-	-	630	-	-	Y
Cadmium	2/20	3.8	29.1	2 - 3	29.1	121390-2LMW18S	2LMW18S	1.8	5	5	5	6	1.9 - 26.3	Y
Calcium	22/22	10800	174000	-	86099	2LGW18S	2LMW18S	-	-	-	-	-	3110 - 46000	N[9]
Calcium, Filtered	16/17	19200	161000	157	85942	2LGW18S DISS	2LMW18S	-	-	-	-	-	-	N[9]
Chromium	8/22	3.2 J	142	3 - 5.4	142	2LGW13S	2LMW13S	18	100	100	50	110	2.7 - 6.7	Y
Chromium, Filtered	1/17	6.7	6.7	3 - 6	6.7	2LGW18S2DISS	2LMW18S	18	100	100	50	110	-	N
Cobalt	5/22	3.5 J	35.5	3 - 14.4	35.5	2LGW13S	2LMW13S	220	-	-	420	-	1.9 - 6	N
Cobalt, Filtered	3/17	4.5	14.4	3 - 10.4	14.4	2LGW18S2DISS	2LMW18S	220	-	-	420	-	-	N
Copper	12/22	2.5	125	2 - 5.8	125	2LGW13S	2LMW13S	150	1300	-	1300	48	1.6 - 2160	N[8]
Copper, Filtered	6/18	2.7	30.1 J	2 - 5	30.1	2LGW7S2DISS	2LMW7S	150	1300	-	1300	48	-	N[8]
Iron	22/22	55.1 J	193000	-	193000	121390-2LMW18S-D/ 2LGW18S-2	2LMW18S/ 2LMW18S	1100	300	-	-	-	4.8 - 21800	N[8]
Iron, Filtered	16/17	46.4	193000	12.1	193000	2LGW18S2DISS	2LMW18S	1100	300	-	-	-	-	N[8]
Lead	8/23	3	84	1 - 10	84	2LGW18S-2	2LMW18S	-	15	-	15	13	1 - 264	Y
Lead, Filtered	3/18	2.4 J	20.6	1 - 10	20.6	2LPW1S DISS	2LPW1S	-	15	-	15	13	-	Y
Magnesium	22/22	2440	563000	-	107150	2LGW7S-2	2LMW7S	-	-	-	-	-	654 - 5810	N[9]
Magnesium, Filtered	16/17	4630	451000	106	451000	2LGW7S2DISS	2LMW7S	-	-	-	-	-	-	N[9]
Manganese	22/22	126	2570	-	1077	2LGW13S	2LMW13S	84	50	5000	50	-	0.89 - 2130	Y
Manganese, Filtered	17/17	9.1	2010	-	2010	2LGW20S2DISS-D	2LMW20S	84	50	5000	50	-	-	Y
Mercury	2/22	0.32 J	0.32 J	0.2	0.32	2LGW13S/ 2LGW18S-2	2LMW13S/ 2LMW18S	1.1	2	2	2	0.4	0.13 - 1.3	N
Mercury, Filtered	1/17	0.29	0.29	0.2	0.29	2LGW8S DISS	2LMW8S	1.1	2	2	2	0.4	-	N
Nickel	8/23	9.3	79.5	7 - 21.4	79.5	2LGW13S	2LMW13S	73	100	100	100	880	5 - 17.5	Y
Nickel, Filtered	4/18	9 J	24.9	7 - 28	24.9	2LGW18S2DISS	2LMW18S	73	100	100	100	880	-	N
Potassium	22/22	1300	208000	-	83576	2LGW7S-2	2LMW7S	-	-	-	-	-	290 - 17900	N[9]
Potassium, Filtered	15/17	2220	172000	1000 - 2500	157443	2LGW7S2DISS	2LMW7S	-	-	-	-	-	-	N[9]

COPC SCREENING - GROUNDWATER SAMPLES - OVERBURDEN WELLS
SITE 2A - AREA A LANDFILL[1]
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

Analyte	Frequency of Detection	Minimum Concen-tration	Maximum Concen-tration	Range of Nondetects	95% UCL	Maximum Concentration		COPC Screening Level (2)	Federal MCL (3)	State MCL (4)	State Remediation Standards[5]		Offsite Wells Concentration Range (6)	Select as COPC? (7)
						Sample Number	Location				Groundwater Protection	Surface Water Protection		
Selenium	4/22	1 J	2.9 J	1 - 30	2.9	010391-2LMW7S/ 121390-2LMW18S	2LMW7S/ 2LMW18S	18	50	50	50	50	1 - 4.1	N
Sodium	22/22	10700	7280000	-	7280000	2LPW1S-8	2LPW1S	-	-	28000	-	-	3160 - 97700	N[9]
Sodium, Filtered	16/17	17200	6960000	104	6960000	2LPW1S-1 DISS	2LPW1S	-	-	28000	-	-	-	N[9]
Thallium	1/16	2 J	3.7 J	1 - 20	3.7	2LGW20S-2-D	2LMW20S	0.26	2	2	5	63	1.2 - 4.3	Y
Thallium, Filtered	1/15	4.15 J	5.8 J	1 - 20	5.8	2LGW20S2DISS	2LMW20S	0.26	2	2	5	63	-	Y
Vanadium	6/22	4.5 J	182	3 - 20	182	2LGW13S	2LMW13S	26	-	-	50	-	33.1	Y
Vanadium, Filtered	3/17	2.3 J	5.6	1 - 11.4	5.6	2LGW8S DISS	2LMW8S	26	-	-	50	-	-	N
Zinc	17/23	2.8 J	612	2 - 26.3	612	121390-2LMW18S-D	2LMW18S	1100	5000	-	5000	123	4.5 - 445	Y
Zinc, Filtered	10/18	2.3 J	74	2 - 10.1	65	2LGW18S2DISS	2LMW18S	1100	5000	-	5000	123	-	N
MISCELLANEOUS PARAMETERS (mg/L)														
Ammonia, As Nitrogen	3/3	6.79	10.2	-	10.2	2LPW1S-1	2LPW1S	-	-	-	-	-	NA	N[10]
Biochemical Oxygen Demand	1/3	4.1	4.1	2 - 3	4.1	2LPW1S-1	2LPW1S	-	-	-	-	-	NA	N[10]
Chemical Oxygen Demand	3/3	839	9440	-	9440	2LPW1S-8	2LPW1S	-	-	-	-	-	NA	N[10]
Hardness As CaCO3	15/15	64	2900	-	1451	2LGW7S-2	2LMW7S	-	-	-	-	-	NA	N[10]
Oil & Grease (ug/L)	3/3	600	1100	-	1100	2LPW1S-7	2LPW1S	-	-	-	-	-	NA	N[10]
Total Organic Carbon	3/3	7.2	13.4	-	13.4	2LPW1S-1	2LPW1S	-	-	-	-	-	NA	N[10]
Total Phosphorus	2/3	0.11	0.12	0.1	0.12	2LPW1S-7	2LPW1S	-	-	-	-	-	NA	N[10]
Total Suspended Solids	3/3	33	38	-	38	2LPW1S-1	2LPW1S	-	-	-	-	-	NA	N[10]

1 Includes samples 010291-2LMW17S, 010291-2LMW9S, 010391-2LMW7S, 121390-2LMW18S, 121390-2LMW18S-D, 121490-2LMW8S, 2LGW13S, 2LGW13S DISS, 2LGW17S, 2LGW17S DISS, 2LGW17S-2, 2LGW17S2DISS, 2LGW18S, 2LGW18S DISS, 2LGW18S-2, 2LGW18S2DISS, 2LGW19S, 2LGW19S DISS, 2LGW19S-2, 2LGW19S2DISS, 2LGW1S-X, 2LGW20S, 2LGW20S DISS, 2LGW20S-2, 2LGW20S-2-D, 2LGW20S2DISS, 2LGW20S2DISS-D, 2LGW7S, 2LGW7S DISS, 2LGW7S-2, 2LGW7S2DISS, 2LGW8S, 2LGW8S DISS, 2LGW8S-2, 2LGW8S2DISS, 2LGW9S, 2LGW9S DISS, 2LPW1S, 2LPW1S DISS, 2LPW1S-1, 2LPW1S-1 DISS, 2LPW1S-2, 2LPW1S-3, 2LPW1S-4, 2LPW1S-5, 2LPW1S-6, 2LPW1S-7, 2LPW1S-7 DISS, 2LPW1S-8, 2LPW1S-8 DISS.
2 Based on current USEPA Region III guidance (USEPA Region III, April 1, 1998). Tap Water Ingestion Value for noncarcinogens is based on a target hazard quotient of 0.1. Value for carcinogens is based on a cancer risk of 1E-6.
3 Maximum Contaminant Level. (USEPA, October 1996).
4 Title 19, Health and Safety, the Public Health Code of the State of Connecticut, Chapter II Environmental Health.
5 CTDEP, January 1996.
6 Atlantic, July 1994.
7 Contaminant of Potential Concern; Yes (Y) indicates the maximum concentration exceeds one or more criteria; Unless otherwise indicated, No (N) indicates the maximum does not exceed any of the criteria.
8 USEPA Region I does not advocate quantitative evaluation of this chemical.
9 Essential nutrient; not evaluated for COPC screening.
10 Not applicable for COPC screening.
- Not available or Not applicable.
NA Not analyzed.
ND Not detected.

APPENDIX D.2

COPC SCREENING – GROUNDWATER SAMPLES-
BEDROCK WELLS,
SITE 2A – AREA A LANDFILL

COPC SCREENING - GROUNDWATER SAMPLES - BEDROCK WELLS
SITE 2A - AREA A LANDFILL[1]
BASEWIDE GRONDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

Analyte	Frequency of Detection	Minimum Concen-tration	Maximum Concen-tration	Range of Nondetects	95% UCL	Maximum Concentration		COPC Screening Level (2)	Federal MCL (3)	State MCL (4)	State Remediation Standards[5]		Offsite Wells Concentration Range (6)	Select as COPC? (7)
						Sample Number	Location				Groundwater Protection	Surface Water Protection		
VOLATILE ORGANICS (ug/L)														
1,1,2,2-Tetrachloroethane	4/24	1 J	140	5 - 10	140	011091-2LMW13D	2LMW13D	0.053	-	-	0.5	110	ND	Y
1,2-Dichloroethene (total)	3/24	1 J	2 J	5 - 10	2	2LGW13D	2LMW13D	5.5	70/100	70/100	63	14000	ND	N
4-Methyl-2-pentanone	1/24	49	49	10	49	2LGW17D-2	2LMW17D	290	-	-	350	4400000	ND	N
Carbon Disulfide	2/24	1 J	1 J	5 - 10	1	2LGW14D/ 2LGW17D-2	2LMW14D/ 2LMW17D	100	-	-	700	840000	ND	N
Chlorobenzene	1/24	6 J	6 J	5 - 10	6	2LGW18D-2	2LMW18D	3.5	100	100	100	420000	ND	Y
Methylene Chloride	1/24	1 J	1 J	5 - 45	1	2LGW13D-2	2LMW13D	4.1	5	5	5	48000	4	N
Tetrachloroethene	1/24	3 J	3 J	5 - 10	3	2LGW13D-2	2LMW13D	1.1	5	5	5	88	ND	Y
Trichloroethene	3/24	4 J	23	5 - 10	23	2LGW13D-2	2LMW13D	1.6	5	5	5	2340	ND	Y
Xylenes, Total	2/24	2 J	2 J	5 - 10	2	2LGW17D-2/ 2LGW19D	2LMW17D/ 2LMW19D	1200	10000	10000	530	1400000	2	N
SEMIVOLATILE ORGANICS (ug/L)														
4-Methylphenol	1/24	6 J	6 J	10	6	2LGW17D-2	2LMW17D	18	-	-	35	32000	ND	N
Benzoic Acid	5/24	0.5 J	2 J	50	2	2LGW13D-2 2LGW18D/ 2LGW20D-2	2LMW13D 2LMW18D/ 2LMW20D	15000	-	-	28000	28000000	ND	N
Bis(2-Ethylhexyl)phthalate	4/24	3 J	10 J	10 - 17	10	2LGW7D-2	2LMW7D	4.8	6	6	2	59	3	Y
Butylbenzyl Phthalate	1/24	0.5 J	0.5 J	10 - 20	0.5	2LGW8D-2	2LMW8D	730	-	-	1000	52000	ND	N
Di-n-butyl phthalate	1/24	1 J	1 J	10 - 20	1	2LGW9D-2	2LMW9D	370	-	-	700	120000	ND	N
Di-n-octyl phthalate	1/24	2 J	2 J	10 - 20	2	2LGW19D	2LMW19D	73	-	-	100	230	ND	N
Diethyl Phthalate	2/24	0.6 J	120	10	120	2LGW17D-2	2LMW17D	2900	-	-	5600	2400000	ND	N
Phenol	4/24	0.7 J	6 J	10	6	2LGW17D-2	2LMW17D	2200	-	-	4000	92000000	ND	N
INORGANICS (ug/L)														
Aluminum	10/24	24 J	3340 J	30 - 240	3340	2LGW19D	2LMW19D	-	50 to 200	-	-	-	15.4 - 3360	N[8]
Aluminum, Filtered	2/17	15	16.7	13 - 135	16.7	2LGW8D2DISS	2LMW8D	-	50 to 200	-	-	-	-	N[8]
Antimony	1/24	20.6 J	20.6 J	3 - 25	20.6	2LGW18D	2LMW18D	1.5	6	6	6	86000	ND	Y
Antimony, Filtered	1/17	19.4	19.4	12 - 15.4	19.4	2LGW8D2DISS	2LMW8D	1.5	6	6	6	86000	-	Y
Arsenic	11/24	2.3	7 J	2 - 5	2.8	2LGW17D-2	2LMW17D	0.045	50	50	50	4	0.64	Y
Arsenic, Filtered	4/17	2.8 J	3.6 J	1 - 5	3.6	2LGW7D2DISS	2LMW7D	0.045	50	50	50	4	-	Y
Barium	23/24	8.7 J	281	15	146.4	2LGW19D	2LMW19D	260	2000	2000	1000	940000	2.8 - 183	Y
Barium, Filtered	15/17	32.6	265	5 - 6	126.6	2LGW19D-2DISS	2LMW19D	260	2000	2000	1000	940000	-	Y
Beryllium	1/24	1.5 J	1.5 J	1	1.5	2LGW19D	2LMW19D	73	4	4	4	4	0.33 - 0.41	N
Beryllium, Filtered	1/17	1.4 J	1.4 J	1	1.4	2LGW19D DISS	2LMW19D	73	4	4	4	4	-	N
Boron	3/17	57.8 J	177	16.4 - 113	177	2LGW9D	2LMW9D	330	-	-	630	49000	9.3 - 126	N
Boron, Filtered	6/17	11.8 J	186 J	13 - 80.6	186	2LGW9D DISS	2LMW9D	330	-	-	630	49000	-	N
Cadmium	7/24	1.7 J	44.8 J	1 - 3	44.8	011091-2LMW13D	2LMW13D	1.8	5	5	5	6	1.9 - 26.3	Y
Cadmium, Filtered	1/17	2.1 J	2.1 J	1 - 3	2.1	2LGW18D DISS	2LMW18D	1.8	5	5	5	6	-	Y
Calcium	24/24	13900	94100	-	41873	2LGW19D-2	2LMW19D	-	-	-	-	-	3110 - 46000	N[9]
Calcium, Filtered	17/17	19900	97800	-	50067	2LGW19D-2DISS	2LMW19D	-	-	-	-	-	-	N[9]
Chromium	4/24	2.3	32.5	3 - 5	32.5	2LGW19D	2LMW19D	18	100	100	50	110	2.7 - 6.7	Y
Chromium, Filtered	1/17	3.9	3.9	3 - 5.3	3.9	2LGW18D2DISS	2LMW18D	18	100	100	50	110	-	N
Cobalt	3/24	3.2	24.8	3 - 18	24.8	2LGW20D-2	2LMW20D	220	-	-	420	160000	1.9 - 6	N
Copper	12/24	5	42.7	2 - 10.2	10	2LGW19D	2LMW19D	150	1300	-	1300	48	1.6 - 2160	N[8]
Copper, Filtered	1/17	4.8	4.8	2 - 5	4.8	2LGW8D2DISS	2LMW8D	150	1300	-	1300	48	-	N[8]
Iron	24/24	28.1 J	83900	-	83900	2LGW7D-2	2LMW7D	1100	300	-	-	-	4.8 - 21800	N[8]

COPC SCREENING - GROUNDWATER SAMPLES - BEDROCK WELLS
SITE 2A - AREA A LANDFILL[1]
BASEWIDE GRONDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

Analyte	Frequency of Detection	Minimum Concen-tration	Maximum Concen-tration	Range of Nondetects	95% UCL	Maximum Concentration		COPC Screening Level (2)	Federal MCL (3)	State MCL (4)	State Remediation Standards[5]		Offsite Wells Concentration Range (6)	Select as COPC? (7)
						Sample Number	Location				Groundwater Protection	Surface Water Protection		
Iron, Filtered	16/17	22.7	42700	20	42700	2LGW18D2DISS	2LMW18D	1100	300	-	-	-	-	N[8]
Lead	7/24	2.6 J	21.6 J	2 - 3.9	21.6	2LGW19D	2LMW19D	-	15	-	15	13	1 - 264	Y
Lead, Filtered	1/17	2.6 J	2.6 J	1 - 2	2.6	2LGW9D2DISS	2LMW9D	-	15	-	15	13	-	N
Magnesium	24/24	2120	37100	-	37100	2LGW9D-2	2LMW9D	-	-	-	-	-	654 - 5810	N[9]
Magnesium, Filtered	17/17	2730	38400	-	38400	2LGW9D2DISS	2LMW9D	-	-	-	-	-	-	N[9]
Manganese	24/24	57.5 J	1360	-	724.8	2LGW14D	2LMW14D	84	50	5000	50	430000	0.89 - 2130	Y
Manganese, Filtered	17/17	12.1	1350	-	1350	2LGW14D DISS	2LMW14D	84	50	5000	50	430000	-	Y
Mercury	1/24	0.36 J	0.36 J	0.2	0.36	2LGW17D-2	2LMW17D	1.1	2	2	2	0.4	0.13 - 1.3	N
Mercury, Filtered	1/17	0.2	0.2	0.2	0.2	2LGW19D DISS	2LMW19D	1.1	2	2	2	0.4	-	N
Nickel	7/24	13.7	80.9	7 - 59.2	80.9	2LGW19D	2LMW19D	73	100	100	100	880	5 - 17.5	Y
Nickel, Filtered	4/17	3.9	34.9	7 - 14.5	34.9	2LGW19D DISS	2LMW19D	73	100	100	100	880	-	N
Potassium	23/24	865 J	16900	1020	7513	2LGW9D	2LMW9D	-	-	-	-	-	290 - 17900	N[9]
Potassium, Filtered	15/17	1450	17100	701 - 2450	9567	2LGW9D DISS	2LMW9D	-	-	-	-	-	-	N[9]
Selenium	2/24	1 J	1.5	1 - 5	1.5	011091-2LMW9D	2LMW9D	18	50	50	50	50	1 - 4.1	N
Selenium, Filtered	1/17	3	3	1 - 5	3	2LGW19D DISS	2LMW19D	18	50	50	50	50	-	N
Silver	2/24	2.5 J	3.5 J	1 - 7	3.5	2LGW19D	2LMW19D	18	100	50	36	12	2 - 5.8	N
Sodium	24/24	10600	365000	-	135762	2LGW9D	2LMW9D	-	-	28000	-	-	3160 - 97700	N[9]
Sodium, Filtered	17/17	12300	378000	-	179339	2LGW9D DISS	2LMW9D	-	-	28000	-	-	-	N[9]
Thallium	1/15	4 J	4 J	1.1 - 20	4	2LGW13D-2	2LMW13D	0.26	2	2	5	63	1.2 - 4.3	Y
Vanadium, Filtered	1/17	6.3	6.3	1 - 5	6.3	2LGW14D DISS	2LMW14D	26	-	-	50	-	-	N
Zinc	15/24	2.8 J	112 J	2 - 21.2	31.8	2LGW19D	2LMW19D	1100	5000	-	5000	123	4.5 - 445	N
Zinc, Filtered	10/17	2.4 J	19.4	2 - 20.4	12.2	2LGW14D DISS	2LMW14D	1100	5000	-	5000	123	-	N
MISCELLANEOUS PARAMETERS (mg/L)														
Hardness As CaCO3	17/17	72	304	-	190	2LGW19D-2	2LMW19D	-	-	-	-	-	NA	N[10]

1 Includes samples 010891-2LMW17D, 010891-2LMW7D, 010891-2LMW7D-D, 011091-2LMW13D, 011091-2LMW9D, 121390-2LMW18D, 121790-2LMW14D, 121790-2LMW8D, 2LGW13D, 2LGW13D DISS, 2LGW13D-2, 2LGW13D2DISS, 2LGW14D, 2LGW14D DISS, 2LGW17D, 2LGW17D DISS, 2LGW17D-2, 2LGW17D2DISS, 2LGW18D, 2LGW18D DISS, 2LGW18D-2, 2LGW18D2DISS, 2LGW19D, 2LGW19D DISS, 2LGW19D-2, 2LGW19D-2DISS, 2LGW20D, 2LGW20D DISS, 2LGW20D-2, 2LGW20D2DISS, 2LGW7D, 2LGW7D DISS, 2LGW7D-2, 2LGW7D2DISS, 2LGW8D, 2LGW8D DISS, 2LGW8D-2, 2LGW8D2DISS, 2LGW9D, 2LGW9D DISS, 2LGW9D-2, 2LGW9D2DISS.
2 Based on current USEPA Region III guidance (USEPA Region III, April 1, 1998). Tap Water Ingestion Value for noncarcinogens is based on a target hazard quotient of 0.1. Value for carcinogens is based on a cancer risk of 1E-6.
3 *Maximum Contaminant Level. (USEPA, October 1996).*
4 Title 19, Health and Safety, the Public Health Code of the State of Connecticut, Chapter II Environmental Health.
5 CTDEP, January 1996.
6 Atlantic, July 1994.
7 Contaminant of Potential Concern; Yes (Y) indicates the maximum concentration exceeds one or more criteria; Unless otherwise indicated, No (N) indicates the maximum does not exceed any of the criteria.
8 *USEPA Region I does not advocate quantitative evaluation of this chemical.*
9 Essential nutrient; not evaluated for COPC screening.
10 Not applicable for COPC screening.
\- Not available or Not applicable.
NA Not analyzed.
ND Not detected.

APPENDIX D.3

COPC SCREENING – GROUNDWATER SAMPLES-
OVERBURDEN WELLS, SITE 2B – AREA A WETLAND

COPC SCREENING - GROUNDWATER SAMPLES - OVERBURDEN WELLS
SITE 2B - AREA A WETLAND[1]
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

Analyte	Frequency of Detection	Minimum Concen-tration	Maximum Concen-tration	Range of Nondetects	95% UCL	Maximum Concentration		COPC Screening Level (2)	Federal MCL (3)	State MCL (4)	State Remediation Standards[5]		Offsite Wells Concentration Range (6)	Select as COPC? (7)
						Sample Number	Location				Groundwater Protection	Surface Water Protection		
VOLATILE ORGANICS (ug/L)														
Carbon Disulfide	1/10	2 J	2 J	5 - 10	2	2WGW21S	2WMW21S	100	-	-	700	-	ND	N
Xylenes, Total	1/10	1 J	1 J	5 - 10	1	121490-2WMW5S	2WMW5S	1200	10000	10000	530	-	2	N
SEMIVOLATILE ORGANICS (ug/L)														
Benzoic Acid	1/10	0.8 J	0.8 J	25 - 50	0.8	2WGW6S	2WMW6S	15000	-	-	28000	-	ND	N
Di-n-butyl phthalate	1/10	1 J	1 J	10	1	2WGW3S	2WMW3S	370	-	-	700	120000	ND	N
Diethyl Phthalate	1/10	1 J	1 J	10	1	2WGW3S	2WMW3S	2900	-	-	5600	2400000	ND	N
INORGANICS (ug/L)														
Aluminum	8/10	39.6	4160	30 - 53.1	4160	2WGW21S-2	2WMW21S	-	50 to 200	-	-	-	15.4 - 3360	N[8]
Aluminum, Filtered	4/7	28.9	2180	14 - 37.3	2180	2WGW6S DISS	2WMW6S	-	50 to 200	-	-	-	-	N[8]
Arsenic	6/9	4.9 J	109 J	2 - 3	109	2WGW21S	2WMW21S	0.045	50	50	50	4	0.64	Y
Arsenic, Filtered	5/7	3.2 J	138	2	138	2WGW21S DISS	2WMW21S	0.045	50	50	50	4	-	Y
Barium	10/10	17.8	754 J	-	754	2WGW5S	2WMW5S	260	2000	2000	1000	-	2.8 - 183	Y
Barium, Filtered	7/7	15.9	707	-	707	2WGW3S DISS	2WMW3S	260	2000	2000	1000	-	-	Y
Beryllium	3/10	1	1.6 J	1	1.6	2WGW6S	2WMW6S	73	4	4	4	4	0.33 - 0.41	N
Beryllium, Filtered	2/7	1.2 J	2.3	1	2.3	2WGW6S DISS	2WMW6S	73	4	4	4	4	-	N
Boron	7/7	90.7 J	3260 J	-	3260	2WGW21S	2WMW21S	330	-	-	630	-	9.3 - 126	Y
Boron, Filtered	7/7	96.8	3340 J	-	3340	2WGW21S DISS	2WMW21S	330	-	-	630	-	-	Y
Cadmium	5/9	3.9 J	10.6	1 - 3	10.6	121190-2WMW3S	2WMW3S	1.8	5	5	5	6	1.9 - 26.3	Y
Cadmium, Filtered	2/5	5.2	30.6 J	2 - 3.2	30.6	2WGW3S DISS	2WMW3S	1.8	5	5	5	6	-	Y
Calcium	10/10	18700	296000	-	254840	2WGW21S-2	2WMW21S	-	-	-	-	-	3110 - 46000	N[9]
Calcium, Filtered	7/7	27600	291000	-	291000	2WGW21S2DISS	2WMW21S	-	-	-	-	-	-	N[9]
Chromium	3/10	2.9	13.8 J	3 - 5	13.8	2WGW21S-2	2WMW21S	18	100	100	50	110	2.7 - 6.7	N
Cobalt	6/10	2.1	20.7	4 - 19.9	12.4	2WGW6S	2WMW6S	220	-	-	420	-	1.9 - 6	N
Cobalt, Filtered	1/7	17.7	17.7	3 - 29.2	17.7	2WGW5S2DISS	2WMW5S	220	-	-	420	-	-	N
Copper	6/10	3 J	44.6 J	1.1 - 9.5	44.6	2WGW21S-2	2WMW21S	150	1300	-	1300	48	1.6 - 2160	N[8]
Copper, Filtered	1/7	37 J	37 J	2 - 12	37	2WGW21S2DISS	2WMW21S	150	1300	-	1300	48	-	N[8]
Cyanide	1/3	5	5	5	5	121490-2WMW5S	2WMW5S	73	200	200	200	52	1.2 - 15.5	N
Iron	10/10	394	131000 J	-	64377	2WGW5S	2WMW5S	1100	300	-	-	-	4.8 - 21800	N[8]
Iron, Filtered	6/7	114 J	123000 J	89.5	71045	2WGW3S DISS	2WMW3S	1100	300	-	-	-	-	N[8]
Lead	5/10	1.3 J	3.3	2 - 15.1	3.3	2WGW5S-2	2WMW5S	-	15	-	15	13	1 - 264	N
Magnesium	10/10	4350	1080000	-	1080000	2WGW21S-2	2WMW21S	-	-	-	-	-	654 - 5810	N[9]
Magnesium, Filtered	7/7	5870	1050000	-	1050000	2WGW21S2DISS	2WMW21S	-	-	-	-	-	-	N[9]
Manganese	10/10	648	9270	-	9270	2WGW5S-2	2WMW5S	84	50	5000	50	-	0.89 - 2130	Y
Manganese, Filtered	7/7	657	9360	-	7233	2WGW5S2DISS	2WMW5S	84	50	5000	50	-	-	Y
Nickel	2/10	39.7 J	48	7 - 25.6	48	2WGW6S	2WMW6S	73	100	100	100	880	5 - 17.5	N
Nickel, Filtered	2/7	12.1 J	12.8 J	7 - 45.5	12.8	2WGW5S DISS	2WMW5S	73	100	100	100	880	-	N
Potassium	10/10	5510	815000 J	-	815000	2WGW21S	2WMW21S	-	-	-	-	-	290 - 17900	N[9]
Potassium, Filtered	7/7	6590	843000 J	-	843000	2WGW21S DISS	2WMW21S	-	-	-	-	-	-	N[9]
Selenium	2/10	2.2 J	2.3 J	1 - 5	1.9	121190-2WMW3S	2WMW3S	18	50	50	50	50	1 - 4.1	N

COPC SCREENING - GROUNDWATER SAMPLES - OVERBURDEN WELLS
SITE 2B - AREA A WETLAND[1]
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

Analyte	Frequency of Detection	Minimum Concen-tration	Maximum Concen-tration	Range of Nondetects	95% UCL	Maximum Concentration		COPC Screening Level (2)	Federal MCL (3)	State MCL (4)	State Remediation Standards[5]		Offsite Wells Concentration Range (6)	Select as COPC? (7)
						Sample Number	Location				Groundwater Protection	Surface Water Protection		
Silver	1/10	1.5 J	1.5 J	2 - 7	1.5	2WGW3S-2	2WMW3S	18	100	50	36	12	2 - 5.8	N
Silver, Filtered	2/7	4.5	9.8 J	2 - 2.4	9.8	2WGW3S DISS	2WMW3S	18	100	50	36	12	-	N
Sodium	10/10	21200	8500000	-	8500000	2WGW21S-2	2WMW21S	-	-	28000	-	-	3160 - 97700	N[9]
Sodium, Filtered	7/7	21300	8180000	-	8180000	2WGW21S2DISS	2WMW21S	-	-	28000	-	-	-	N[9]
Thallium	2/7	8.6 J	15.2 J	1 - 10	9.5	2WGW21S	2WMW21S	0.26	2	2	5	63	1.2 - 4.3	Y
Thallium, Filtered	2/6	1.4 J	7 J	1 - 20	7	2WGW5S2DISS	2WMW5S	0.26	2	2	5	63	-	Y
Vanadium	3/10	2.7	26 J	3.3 - 20	26	2WGW21S	2WMW21S	26	-	-	50	-	33.1	N
Vanadium, Filtered	1/7	32 J	32 J	3 - 11.3	32	2WGW21S DISS	2WMW21S	26	-	-	50	-	-	Y
Zinc	5/10	8.3	182	2 - 7	182	2WGW6S	2WMW6S	1100	5000	-	5000	123	4.5 - 445	Y
Zinc, Filtered	3/7	3 J	183	2 - 6.1	183	2WGW6S DISS	2WMW6S	1100	5000	-	5000	123	-	Y
MISCELLANEOUS PARAMETERS (mg/L)														
Hardness as CaCO3	7/7	96	6150	-	6150	2WGW21S-2	2WMW21S	-	-	-	-	-	NA	N[10]

1 Includes samples 010291-2WMW6S, 121190-2WMW3S, 121490-2WMW5S, 2WGW21S, 2WGW21S DISS, 2WGW21S-2, 2WGW21S2DISS, 2WGW3S, 2WGW3S DISS, 2WGW3S-2, 2WGW3S2DISS, 2WGW5S, 2WGW5S DISS, 2WGW5S-2, 2WGW5S2DISS, 2WGW6S, 2WGW6S DISS.
2 Based on current USEPA Region III guidance (USEPA Region III, April 1, 1998). Tap Water Ingestion Value for noncarcinogens is based on a target hazard quotient of 0.1. Value for carcinogens is based on a cancer risk of 1E-6.
3 Maximum Contaminant Level. (USEPA, October 1996).
4 Title 19, Health and Safety, the Public Health Code of the State of Connecticut, Chapter II Environmental Health.
5 CTDEP, January 1996.
6 Atlantic, July 1994.
7 Contaminant of Potential Concern; Yes (Y) indicates the maximum concentration exceeds one or more criteria; Unless otherwise indicated, No (N) indicates the maximum does not exceed any of the criteria.
8 USEPA Region I does not advocate quantitative evaluation of this chemical.
9 Essential nutrient; not evaluated for COPC screening.
10 Not applicable for COPC screening.
\- Not available or Not applicable.
NA Not analyzed.
ND Not detected.

APPENDIX D.4

COPC SCREENING – GROUNDWATER SAMPLES-BEDROCK WELLS, SITE 2B – AREA A WETLAND

COPC SCREENING - GROUNDWATER SAMPLES - BEDROCK WELLS
SITE 2B - AREA A WETLAND[1]
BASEWIDE ROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

Analyte	Frequency of Detection	Minimum Concen-tration	Maximum Concen-tration	Range of Nondetects	95% UCL	Maximum Concentration Sample Number	Maximum Concentration Location	COPC Screening Level (2)	Federal MCL (3)	State MCL (4)	State Remediation Standards[5] Groundwater Protection	State Remediation Standards[5] Surface Water Protection	Offsite Wells Concentration Range (6)	Select as COPC? (7)
SEMIVOLATILE ORGANICS (ug/L)								1						
2-Methylphenol	1/16	2 J	2 J	10	2	2WGW22D-2	2WMW22D	180	-	-	350	-	ND	N
4-Methylphenol	1/16	3 J	3 J	10	3	2WGW22D-2	2WMW22D	18	-	-	35	-	ND	N
Benzoic Acid	5/16	0.5 J	12 J	25 - 50	12	011191-2WMW3D	2WMW3D	15000	-	-	28000	-	ND	N
Bis(2-Ethylhexyl)phthalate	3/16	11	31 J	10	31	2WGW6D-2-D	2WMW6D	4.8	6	6	2	59	3	Y
Di-n-octyl phthalate	2/16	0.6 J	3 J	10	3	2WGW3D	2WMW3D	73	-	-	100	-	ND	N
Diethyl Phthalate	1/16	1 J	1 J	10	1	2WGW3D	2WMW3D	2900	-	-	5600	2400000	ND	N
Phenol	1/16	14	14	10	14	2WGW22D-2	2WMW22D	2200	-	-	4000	92000000	ND	N
INORGANICS (ug/L)														
Aluminum	8/16	71.7	9910	30 - 306	5736.7	2WGW6D	2WMW6D	-	50 to 200	-	-	-	15.4 - 3360	N[8]
Aluminum, Filtered	2/12	69.5	7520	14 - 120	7520	2WGW6D DISS	2WMW6D	-	50 to 200	-	-	-	-	N[8]
Antimony, Filtered	1/11	9.7 J	13.4 J	12 - 15	13.4	2WGW6D2DISS-D	2WMW6D	1.5	6	6	6	86000	-	Y
Arsenic	6/16	1.9 J	6.5 J	2 - 5	3.3	2WGW6D-2	2WMW6D	0.045	50	50	50	4	0.64	Y
Arsenic, Filtered	4/12	2.4	5.5	2 - 6.1	5.5	2WGW5D DISS	2WMW5D	0.045	50	50	50	4	-	Y
Barium	16/16	15.5 J	904 J	-	348.9	2WGW3D	2WMW3D	260	2000	2000	1000	-	2.8 - 183	Y
Barium, Filtered	12/12	13.9	805	-	376.2	2WGW3D DISS	2WMW3D	260	2000	2000	1000	-	-	Y
Beryllium	1/16	3.6	3.6	1	3.6	2WGW6D	2WMW6D	73	4	4	4	4	0.33 - 0.41	N
Beryllium, Filtered	1/12	4.2	4.2	1 - 1.3	4.2	2WGW6D DISS	2WMW6D	73	4	4	4	4	-	Y
Boron	5/11	89.7 J	403	21.3 - 43	403	2WGW6D	2WMW6D	330	-	-	630	-	9.3 - 126	Y
Boron, Filtered	6/12	61.1	400	21.2 - 50	384.5	2WGW6D DISS	2WMW6D	330	-	-	630	-	-	Y
Cadmium	4/16	1.2 J	10.9 J	2 - 4.8	10.9	2WGW3D	2WMW3D	1.8	5	5	5	6	1.9 - 26.3	Y
Cadmium, Filtered	1/12	18.1	18.1	2 - 4.5	18.1	2WGW3D DISS	2WMW3D	1.8	5	5	5	6	-	Y
Calcium	16/16	5920	127000	-	78631	2WGW6D	2WMW6D	-	-	-	-	-	3110 - 46000	N[9]
Calcium, Filtered	12/12	5980	130000	-	82925	2WGW6D DISS	2WMW6D	-	-	-	-	-	-	N[9]
Chromium	2/16	3.5 J	4.9	3 - 5	4.9	2WGW3D-2	2WMW3D	18	100	100	50	110	2.7 - 6.7	N
Cobalt	6/16	3.1	37.5	3 - 5	37.5	2WGW6D	2WMW6D	220	-	-	420	-	1.9 - 6	N
Cobalt, Filtered	2/12	17.7	40.9	3 - 19.3	40.9	2WGW6D DISS	2WMW6D	220	-	-	420	-	-	N
Copper	7/16	2.8 J	10.6	2 - 17.2	10.6	2WGW2D-2	2WMW2D	150	1300	-	1300	48	1.6 - 2160	N[8]
Copper, Filtered	1/12	3.7 J	3.7 J	2 - 5	3.7	2WGW2D2DISS	2WMW2D	150	1300	-	1300	48	-	N[8]
Iron	15/16	85.1 J	108000 J	105	108000	2WGW3D	2WMW3D	1100	300	-	-	-	4.8 - 21800	N[8]
Iron, Filtered	8/12	1120 J	73600 J	18.6 - 58.2	73600	2WGW3D DISS	2WMW3D	1100	300	-	-	-	-	N[8]
Lead	9/16	2	32.7	1 - 10	12.5	2WGW2D-2	2WMW2D	-	15	-	15	13	1 - 264	Y
Lead, Filtered	7/12	1.6 J	13.3	2	13.3	2WGW2D2DISS	2WMW2D	-	15	-	15	13	-	Y
Magnesium	16/16	1340 J	131000 J	-	82014	2WGW3D	2WMW3D	-	-	-	-	-	654 - 5810	N[9]
Magnesium, Filtered	12/12	1340	130000	-	75871	2WGW3D DISS	2WMW3D	-	-	-	-	-	-	N[9]
Manganese	16/16	2.3	7160	-	7160	2WGW5D-2	2WMW5D	84	50	5000	50	-	0.89 - 2130	Y
Manganese, Filtered	12/12	6.8	7090	-	7090	2WGW5D2DISS	2WMW5D	84	50	5000	50	-	-	Y
Nickel	5/16	9.3 J	116	7 - 15.2	116	2WGW6D	2WMW6D	73	100	100	100	880	5 - 17.5	Y
Nickel, Filtered	2/12	6.95 J	101	7 - 11	101	2WGW6D DISS	2WMW6D	73	100	100	100	880	-	Y
Potassium	14/16	557 J	44700 J	1650 - 2290	25506	2WGW3D	2WMW3D	-	-	-	-	-	290 - 17900	N[9]
Potassium, Filtered	10/12	488	42500 J	1230 - 2510	28739	2WGW3D DISS	2WMW3D	-	-	-	-	-	-	N[9]
Selenium	3/16	3 J	5.1 J	1 - 5	5.1	2WGW6D-2-D	2WMW6D	18	50	50	50	50	1 - 4.1	N
Silver, Filtered	1/12	3.9 J	3.9 J	2	3.9	2WGW3D DISS	2WMW3D	18	100	50	36	12	-	N

COPC SCREENING - GROUNDWATER SAMPLES - BEDROCK WELLS
SITE 2B - AREA A WETLAND[1]
BASEWIDE ROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

Analyte	Frequency of Detection	Minimum Concen-tration	Maximum Concen-tration	Range of Nondetects	95% UCL	Maximum Concentration		COPC Screening Level (2)	Federal MCL (3)	State MCL (4)	State Remediation Standards[5]		Offsite Wells Concentration Range (6)	Select as COPC? (7)
						Sample Number	Location				Groundwater Protection	Surface Water Protection		
Sodium	16/16	7580	1290000 J	-	827208	2WGW3D	2WMW3D	-	-	28000	-	-	3160 - 97700	N[9]
Sodium, Filtered	12/12	7560	1280000 J	-	1020228	2WGW3D DISS	2WMW3D	-	-	28000	-	-	-	N[9]
Thallium	3/14	4.25 J	9 J	1 - 20	7.5	2WGW5D-2	2WMW5D	0.26	2	2	5	63	1.2 - 4.3	Y
Thallium, Filtered	2/11	1.3 J	8.8 J	1 - 20	5.5	2WGW5D2DISS	2WMW5D	0.26	2	2	5	63	-	Y
Vanadium	1/16	4.7	4.7	3 - 20	4.7	2WGW3D-2	2WMW3D	26	-	-	50	-	33.1	N
Zinc	12/16	6.8 J	274	12 - 26.7	59.8	2WGW6D	2WMW6D	1100	5000	-	5000	123	4.5 - 445	Y
Zinc, Filtered	6/12	5.2	262	4.4 - 21.6	82.5	2WGW6D DISS	2WMW6D	1100	5000	-	5000	123	-	Y
MISCELLANEOUS PARAMETERS (mg/L)														
Hardness As CaCO3	12/12	18	840	-	505	2WGW3D	2WMW3D	-	-	-	-	-	NA	N[10]
Hardness As CaCO3, Filtered	3/3	16	124	-	124	2WGW21D DISS	2WMW21D	-	-	-	-	-	NA	N[10]

1 Includs samples 011191-2WMW3D, 011491-2WMW2D, 011591-2WMW1D, 121890-2WMW6D, 2WGW21D, 2WGW21D DISS, 2WGW21D-2, 2WGW21D2DISS, 2WGW22D, 2WGW22D DISS, 2WGW22D-2, 2WGW22D2DISS, 2WGW2D, 2WGW2D DISS, 2WGW2D-2, 2WGW2DDISS, 2WGW3D, 2WGW3D DISS, 2WGW3D-2, 2WGW3D2DISS, 2WGW5D, 2WGW5D DISS, 2WGW5D-2, 2WGW5D2DISS, 2WGW6D. 2WGW6D DISS. 2WGW6D-2. 2WGW6D-2-D. 2WGW6D2DISS. 2WGW6D2DISS-D.
2 Based on current USEPA Region III guidance (USEPA Region III, April 1, 1998). Tap Water Ingestion Value for noncarcinogens is based on a target hazard quotient of 0.1. Value for carcinogens is based on a cancer risk of 1E-6.
3 Maximum Contaminant Level. (USEPA, October 1996).
4 Title 19, Health and Safety, the Public Health Code of the State of Connecticut, Chapter II Environmental Health.
5 CTDEP, January 1996. See Table 1-3 for further details regarding surrogate and/or calculated values.
6 Atlantic, July 1994.
7 Contaminant of Potential Concern; Yes (Y) indicates the maximum concentration exceeds one or more criteria; Unless otherwise indicated, No (N) indicates the maximum does not exceed any of the criteria.
8 USEPA Region I does not advocate quantitative evaluation of this chemical.
9 Essential nutrient; not evaluated for COPC screening.
10 Not applicable for COPC screening.
\- Not available or Not applicable.
NA Not analyzed.
ND Not detected.

APPENDIX D.5

COPC SCREENING – GROUNDWATER SAMPLES-OVERBURDEN WELLS, SITE 3 – AREA A DOWNSTREAM WATERCOURSES AND OBDA

COPC SCREENING - GROUNDWATER SAMPLES - OVERBURDEN WELLS
SITE 3 - AREA A DOWNSTREAM WATERCOURSES AND OBDA[1]
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

Analyte	Frequency of Detection	Minimum Concen-tration	Maximum Concen-tration	Range of Nondetects	95% UCL	Maximum Concentration		COPC Screening Level (2)	Federal MCL (3)	State MCL (4)	State Remediation Standards[5]		Offsite Wells Concentration Range (6)	Select as COPC? (7)
						Sample Number	Location				Groundwater Protection	Surface Water Protection		
VOLATILE ORGANICS (ug/L)														
1,2-Dichloroethene (total)	2/25	11 J	28	5 - 10	28	2DGW29S	2DMW29S	5.5	70/100	70/100	63	14000	ND	Y
Benzene	1/25	1 J	1 J	5 - 10	1	2DGW26S-2	2DMW26S	0.36	5	5	1	710	ND	Y
Bromodichloromethane	1/25	2 J	2 J	5 - 10	2	2DGW29S-2	2DMW29S	0.17	100/80	100	0.56	660	ND	Y
Chloroform	3/25	5 J	12 J	5 - 10	12	2DGW29S-2	2DMW29S	0.15	100/80	100	6	14100	ND	Y
Chloromethane	1/25	2 J	2 J	10	2	2DGW26D	2DMW26D	1.5	-	-	2.7	9400	27	Y
Methylene Chloride	1/25	11	11	5 - 10	11	2DGW29S-2/ 2DGW29S-2-D	2DMW29S/ 2DMW29S	4.1	5	5	5	48000	4	Y
Vinyl Chloride	2/25	29 J	130	10	130	2DGW29S	2DMW29S	0.019	2	2	2	15750	ND	Y
SEMIVOLATILE ORGANICS (ug/L)														
Benzoic Acid	3/24	0.6 J	0.7 J	50	0.7	2DGW29S	2DMW29S	15000	-	-	28000	-	ND	N
Bis(2-Ethylhexyl)phthalate	3/25	6 J	59 J	10	59	2DGW26D-2	2DMW26D	4.8	6	6	2	59	3	Y
Diethyl Phthalate	1/24	0.7 J	0.7 J	10	0.7	2DGW25S	2DMW25S	2900	-	-	5600	2400000	ND	N
INORGANICS (ug/L)														
Aluminum	13/25	153	97400	14 - 442	97400	2DGW30S-2	2DMW30S	-	50 to 200	-	-	-	15.4 - 3360	N[8]
Aluminum, Filtered	4/22	138	4050	10 - 82.6	4050	2DGW24S DISS	2DMW24S	-	50 to 200	-	-	-	-	N[8]
Arsenic	10/20	1.4 J	23.9	2 - 5	23.9	2DGW30S-2	2DMW30S	0.045	50	50	50	4	0.64	Y
Arsenic, Filtered	3/22	2.7 J	6	2 - 5	6	2DGW29S2DISS-D	2DMW29S	0.045	50	50	50	4	-	Y
Barium	25/25	10.4 J	835	-	195	2DGW30S-2	2DMW30S	260	2000	2000	1000	-	2.8 - 183	Y
Barium, Filtered	22/22	10.6	363	-	91.7	2DGW27S DISS	2DMW27S	260	2000	2000	1000	-	-	Y
Beryllium	3/25	1	4.4	1 - 2.4	4.4	2DGW30S-2	2DMW30S	73	4	4	4	4	0.33 - 0.41	Y
Beryllium, Filtered	1/22	1	1	1	1	2DGW27S DISS	2DMW27S	73	4	4	4	4	-	N
Boron	12/22	45.975	374	26.2 - 57.5	374	3GW12S-2	3MW12S	330	-	-	630	-	9.3 - 126	Y
Boron, Filtered	11/22	57.8 J	359	29.4 - 58.4	359	3GW12S2DISS	3MW12S	330	-	-	630	-	-	Y
Cadmium	4/25	2.8 J	5.5	1 - 2.6	5.5	3GW12S-2	3MW12S	1.8	5	5	5	6	1.9 - 26.3	Y
Cadmium, Filtered	2/22	2.5 J	4.3 J	2 - 2.9	4.3	3GW12S DISS	3MW12S	1.8	5	5	5	6	-	Y
Calcium	25/25	11100	73800	-	42560	3GW12S-2	3MW12S	-	-	-	-	-	3110 - 46000	N[9]
Calcium, Filtered	22/22	8250	73200	-	41218	3GW12S2DISS	3MW12S	-	-	-	-	-	-	N[9]
Chromium	10/25	1.5 J	84.6	3 - 5	84.6	2DGW24S-2	2DMW24S	18	100	100	50	110	2.7 - 6.7	Y
Cobalt	10/25	4.6 J	60.3	1 - 25.6	60.3	2DGW30S-2	2DMW30S	220	-	-	420	-	1.9 - 6	N
Cobalt, Filtered	3/22	6.1 J	27.4	3 - 26.6	27.4	2DGW27S2DISS	2DMW27S	220	-	-	420	-	-	N
Copper	10/25	2.5 J	370 J	1 - 11.5	370	2DGW30S-2	2DMW30S	150	1300	-	1300	48	1.6 - 2160	N[8]
Copper, Filtered	1/22	2.2 J	2.2 J	2 - 16.5	2.2	2DGW30S2DISS	2DMW30S	150	1300	-	1300	48	-	N[8]
Iron	21/25	53.5	121000	8.4 - 25.6	121000	2DGW30S-2	2DMW30S	1100	300	-	-	-	4.8 - 21800	N[8]
Iron, Filtered	14/22	31.9	9690	16.3 - 57.5	9690	2DGW29S2DISS	2DMW29S	1100	300	-	-	-	-	N[8]
Lead	8/25	3.75	220	1 - 5.4	220	2DGW30S-2	2DMW30S	-	15	-	15	13	1 - 264	Y
Lead, Filtered	6/22	1 J	5.8	1 - 2	5.8	2DGW16S2DISS	2DMW16S	-	15	-	15	13	-	N
Magnesium	25/25	1610	62200	-	21596	3GW12S-2	3MW12S	-	-	-	-	-	654 - 5810	N[9]
Magnesium, Filtered	22/22	1610	61000	-	61000	3GW12S DISS	3MW12S	-	-	-	-	-	-	N[9]
Manganese	24/25	5.6	6710	2.7	6710	3GW12S-2	3MW12S	84	50	5000	50	-	0.89 - 2130	Y
Manganese, Filtered	21/22	6.5	6620	4.5	6620	3GW12S2DISS	3MW12S	84	50	5000	50	-	-	Y
Mercury	1/25	1.1	1.1	0.2	1.1	2DGW30S	2DMW30S	1.1	2	2	2	0.4	0.13 - 1.3	Y

COPC SCREENING - GROUNDWATER SAMPLES - OVERBURDEN WELLS
SITE 3 - AREA A DOWNSTREAM WATERCOURSES AND OBDA[1]
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

Analyte	Frequency of Detection	Minimum Concen-tration	Maximum Concen-tration	Range of Nondetects	95% UCL	Maximum Concentration		COPC Screening Level (2)	Federal MCL (3)	State MCL (4)	State Remediation Standards[5]		Offsite Wells Concentration Range (6)	Select as COPC? (7)
						Sample Number	Location				Groundwater Protection	Surface Water Protection		
Nickel	10/25	9.2 J	53.3	7 - 12	53.3	2DGW30S-2	2DMW30S	73	100	100	100	880	5 - 17.5	N
Nickel, Filtered	3/22	9 J	56.3	7 - 12.9	56.3	2DGW27S2DISS	2DMW27S	73	100	100	100	880	-	N
Potassium	25/25	2520	46300	-	46300	2DGW30S-2	2DMW30S	-	-	-	-	-	290 - 17900	N[9]
Potassium, Filtered	21/22	2510	20900	2690	20900	3GW12S DISS	3MW12S	-	-	-	-	-	-	N[9]
Selenium	2/25	3	3.9 J	1 - 5	3.9	2DGW30S-2	2DMW30S	18	50	50	50	50	1 - 4.1	N
Silver	1/25	2.4 J	2.4 J	1 - 7	2.4	2DGW16S-2	2DMW16S	18	100	50	36	12	2 - 5.8	N
Silver, Filtered	1/22	2 J	2 J	2 - 3.7	2	2DGW24S2DISS	2DMW24S	18	100	50	36	12	-	N
Sodium	25/25	24600	569000	-	209204	3GW12S-2	3MW12S	-	-	28000	-	-	3160 - 97700	N[9]
Sodium, Filtered	22/22	24200	564000	-	197527	3GW12S2DISS	3MW12S	-	-	28000	-	-	-	N[9]
Thallium	5/15	3.3 J	10	3 - 10	5.7535	2DGW27S	2DMW27S	0.26	2	2	5	63	1.2 - 4.3	Y
Thallium, Filtered	7/16	5.1 J	7.7 J	1 - 20	6.7549	2DGW26S2DISS	2DMW26S	0.26	2	2	5	63	-	Y
Vanadium	8/25	3.8 J	229	1 - 20	229	2DGW30S-2	2DMW30S	26	-	-	50	-	33.1	Y
Zinc	14/25	4.7	800	2 - 27.6	162	2DGW30S-2	2DMW30S	1100	5000	-	5000	123	4.5 - 445	Y
Zinc, Filtered	6/22	3.9	39.3	2 - 23.7	14	2DGW30S2DISS	2DMW30S	1100	5000	-	5000	123	-	N
MISCELLANEOUS PARAMETERS (mg/L)														
Hardness As CaCO3	19/19	43	456	-	219	3GW12S	3MW12S	-	-	-	-	-	NA	N[10]

1 Includes samples 010291-2DMW11S, 010291-3MW12S, 010391-2DMW16S, 2DGW11S, 2DGW11S DISS, 2DGW11S-2, 2DGW11S2DISS, 2DGW16S, 2DGW16S DISS, 2DGW16S-2, 2DGW16S2DISS, 2DGW24S, 2DGW24S DISS, 2DGW24S-2, 2DGW24S2DISS, 2DGW25S, 2DGW25S DISS, 2DGW25S-2, 2DGW25S2DISS, 2DGW26D, 2DGW26D DISS, 2DGW26D DISS-D, 2DGW26D-2, 2DGW26D-D, 2DGW26D2DISS, 2DGW26S, 2DGW26S DISS, 2DGW26S-2, 2DGW26S2DISS, 2DGW27S, 2DGW27S DISS, 2DGW27S-2, 2DGW27S2DISS, 2DGW28S, 2DGW28S DISS, 2DGW28S-2, 2DGW28S2DISS, 2DGW29S, 2DGW29S DISS, 2DGW29S-2, 2DGW29S-2-D, 2DGW29S2DISS, 2DGW29S2DISS-D, 2DGW30S, 2DGW30S DISS, 2DGW30S-2, 2DGW30S2DISS, 3GW12S, 3GW12S DISS, 3GW12S-2, 3GW12S2DISS.

2 Based on current USEPA Region III guidance (USEPA Region III, April 1, 1998). Tap Water Ingestion Value for noncarcinogens is based on a target hazard quotient of 0.1. Value for carcinogens is based on a cancer risk of 1E-6.

3 Maximum Contaminant Level. (USEPA, October 1996).

4 Title 19, Health and Safety, the Public Health Code of the State of Connecticut, Chapter II Environmental Health.

5 CTDEP, January 1996.

6 Atlantic, July 1994.

7 Contaminant of Potential Concern; Yes (Y) indicates the maximum concentration exceeds one or more criteria; Unless otherwise indicated, No (N) indicates the maximum does not exceed any of the criteria.

8 USEPA Region I does not advocate quantitative evaluation of this chemical.

9 Essential nutrient; not evaluated for COPC screening.

10 Not applicable for COPC screening.

\- Not available or Not applicable.

NA Not analyzed.

ND Not detected.

APPENDIX D.6

COPC SCREENING – GROUNDWATER SAMPLES-
BEDROCK WELLS, SITE 3 –
AREA A DOWNSTREAM WATERCOURSES AND OBDA

COPC SCREENING - GROUNDWATER SAMPLES - BEDROCK WELLS
SITE 3 - AREA A DOWNSTREAM WATERCOURSES AND OBDA[1]
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

Analyte	Frequency of Detection	Minimum Concen-tration	Maximum Concen-tration	Range of Nondetects	95% UCL	Maximum Concentration		COPC Screening Level (2)	Federal MCL (3)	State MCL (4)	State Remediation Standards[5]		Offsite Wells Concentration Range (6)	Select as COPC? (7)
						Sample Number	Location				Groundwater Protection	Surface Water Protection		
VOLATILE ORGANICS (ug/L)														
1,1,2,2-Tetrachloroethane	1/25	7	7	5 - 10	7	011491-2DMW16D	2DMW16D	0.053	-	-	0.5	110	ND	Y
1,2-Dichloroethene (total)	3/25	2 J	13	5 - 10	13	011491-2DMW16D	2DMW16D	5.5	70/100	70/100	63	14000	ND	Y
Chloroform	1/25	3 J	3 J	5 - 10	3	2DGW25D-2	2DMW25D	0.15	100/80	100	6	14100	ND	Y
Methylene Chloride	1/25	7 J	7 J	5 - 37	7	2DGW10D-2	2DMW10D	4.1	5	5	5	48000	4	Y
Trichloroethene	4/25	1 J	17	5 - 10	17	011491-2DMW16D	2DMW16D	1.6	5	5	5	2340	ND	Y
SEMIVOLATILE ORGANICS (ug/L)														
Benzo(a)pyrene	1/25	1 J	1 J	10	1	3GW12D	3MW12D	0.0092	0.2	0.2	0.2	0.3	ND	Y
Benzo(b)fluoranthene	1/25	1 J	1 J	10	1	3GW12D	3MW12D	0.092	-	-	0.08	0.3	ND	Y
Benzo(g,h,i)perylene	1/25	4 J	4 J	10	4	3GW12D	3MW12D	-	-	-	200	0.3	ND	Y
Benzo(k)fluoranthene	1/25	1 J	1 J	10	1	3GW12D	3MW12D	0.92	-	-	0.5	0.3	ND	Y
Benzoic Acid	2/25	0.5 J	0.9 J	50	0.9	2DGW16D	2DMW16D	15000	-	-	28000	-	ND	N
Bis(2-Ethylhexyl)phthalate	5/25	2 J	20 J	10	20	2DGW15D-2-D	2DMW15D	4.8	6	6	2	59	3	Y
Di-n-octyl phthalate	2/25	1 J	5 J	10	5	2DGW27D	2DMW27D	73	-	-	100	230	ND	N
Dibenzo(a,h)anthracene	1/25	3 J	3 J	10	3	3GW12D	3MW12D	0.0092	-	-	0.2	0.3	ND	Y
Diethyl Phthalate	1/24	0.8 J	0.8 J	10	0.8	2DGW25D	2DMW25D	2900	-	-	5600	2400000	ND	N
Indeno(1,2,3-cd)pyrene	1/25	3 J	3 J	10	3	3GW12D	3MW12D	0.092	-	-	0.2	0.3	ND	Y
Phenol	1/25	3 J	3 J	10	3	2DGW24D-2	2DMW24D	2200	-	-	4000	92000000	ND	N
INORGANICS (ug/L)														
Aluminum	14/25	29.15 J	5380	30 - 148	5380	2DGW15D-2-D	2DMW15D	-	50 to 200	-	-	-	15.4 - 3360	N[8]
Aluminum, Filtered	3/20	12.4	136	10 - 82	136	2DGW25D DISS	2DMW25D	-	50 to 200	-	-	-	-	N[8]
Antimony, Filtered	2/20	14.8 J	20.9 J	12 - 15	20.9	2DGW23D DISS	2DMW23D	1.5	6	6	6	86000	-	Y
Arsenic	10/23	2.1 J	5.7 J	1 - 5	3.2	2DGW11D	2DMW11D	0.045	50	50	50	4	0.64	Y
Arsenic, Filtered	7/20	2.7	5.5	1 - 5	5.5	2DGW11D DISS	2DMW11D	0.045	50	50	50	4	-	Y
Barium	23/25	10.3 J	336	8.6 - 38.4	136.9	2DGW15D-2-D	2DMW15D	260	2000	2000	1000	-	2.8 - 183	Y
Barium, Filtered	16/20	7.4	155	5 - 34.6	155	2DGW25D2DISS	2DMW25D	260	2000	2000	1000	-	-	N
Beryllium	1/25	0.75	1	1	1	3GW12D-D	3MW12D	73	4	4	4	4	0.33 - 0.41	N
Beryllium, Filtered	1/20	0.75	1	1 - 1.5	1	3GW12D DISS-D	3MW12D	73	4	4	4	4	-	N
Boron	11/20	59.7 J	350	22 - 50	238.6	3GW12D-D	3MW12D	330	-	-	630	-	9.3 - 126	Y
Boron, Filtered	11/20	53.8	351	34.3 - 54	351	3GW12D2DISS	3MW12D	330	-	-	630	-	-	Y
Cadmium	5/25	2.2 J	16 J	2 - 3	16	010791-3MW12D	3MW12D	1.8	5	5	5	6	1.9 - 26.3	Y
Calcium	25/25	7340	196000	-	77456	011491-2DMW16D	2DMW16D	-	-	-	-	-	3110 - 46000	N[9]
Calcium, Filtered	20/20	8120	176000	-	69157	2DGW16D2DISS	2DMW16D	-	-	-	-	-	-	N[9]
Chromium	8/25	3.8 J	22.1	3 - 13.2	22.1	2DGW15D-2-D	2DMW15D	18	100	100	50	110	2.7 - 6.7	Y
Cobalt	5/25	5 J	38.8	3 - 48.7	38.8	3GW12D-2	3MW12D	220	-	-	420	-	1.9 - 6	N
Copper	15/25	2.9 J	40.2 J	2 - 7.6	40.2	2DGW15D-2-D	2DMW15D	150	1300	-	1300	48	1.6 - 2160	N[8]
Copper, Filtered	2/20	2.2	3.4	2 - 5	3.4	2DGW27D2DISS	2DMW27D	150	1300	-	1300	48	-	N[8]
Iron	25/25	83.4 J	101000	-	101000	2DGW15D-2-D	2DMW15D	1100	300	-	-	-	4.8 - 21800	N[8]
Iron, Filtered	15/20	17.2	35700 J	9.3 - 62.1	35700	3GW12D2DISS	3MW12D	1100	300	-	-	-	-	N[8]
Lead	4/22	1.5 J	9.6	1 - 10	9.6	2DGW27D	2DMW27D	-	15	-	15	13	1 - 264	N
Lead, Filtered	1/20	1.6	2.2 J	1 - 2	2.2	2DGW15D2DISS	2DMW15D	-	15	-	15	13	-	N
Magnesium	25/25	1350	52300	-	52300	3GW12D	3MW12D	-	-	-	-	-	654 - 5810	N[9]
Magnesium, Filtered	20/20	1110	55200	-	55200	3GW12D2DISS	3MW12D	-	-	-	-	-	-	N[9]
Manganese	25/25	44.2	7110	-	7110	3GW12D	3MW12D	84	50	5000	50	-	0.89 - 2130	Y
Manganese, Filtered	20/20	11.1	7630	-	7630	3GW12D2DISS	3MW12D	84	50	5000	50	-	-	Y

COPC SCREENING - GROUNDWATER SAMPLES - BEDROCK WELLS
SITE 3 - AREA A DOWNSTREAM WATERCOURSES AND OBDA[1]
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

Analyte	Frequency of Detection	Minimum Concen-tration	Maximum Concen-tration	Range of Nondetects	95% UCL	Maximum Concentration		COPC Screening Level (2)	Federal MCL (3)	State MCL (4)	State Remediation Standards[5]		Offsite Wells Concentration Range (6)	Select as COPC? (7)
						Sample Number	Location				Groundwater Protection	Surface Water Protection		
Mercury, Filtered	1/20	0.4 J	0.4 J	0.2	0.4	2DGW15D DISS	2DMW15D	1.1	2	2	2	0.4	-	N
Nickel	10/25	8.4 J	61.5	7 - 19.9	18.5	2DGW16D	2DMW16D	73	100	100	100	880	5 - 17.5	N
Nickel, Filtered	1/20	17.1 J	17.1 J	7 - 18.1	17.1	2DGW15D DISS	2DMW15D	73	100	100	100	880	-	N
Potassium	24/25	714	19000	1430	19000	3GW12D/ 3GW12D-D	3MW12D/ 3MW12D	-	-	-	-	-	290 - 17900	N[9]
Potassium, Filtered	19/20	745	19200	1170	19200	3GW12D DISS	3MW12D	-	-	-	-	-	-	N[9]
Selenium	5/22	1.8	6.3 J	1 - 5	6.3	3GW12D-2	3MW12D	18	50	50	50	50	1 - 4.1	N
Silver	4/25	1.8	3.3 J	2 - 7	3.3	3GW12D-D	3MW12D	18	100	50	36	12	2 - 5.8	N
Sodium	24/25	5250	560000	4740	560000	010791-3MW12D	3MW12D	-	-	28000	-	-	3160 - 97700	N[9]
Sodium, Filtered	20/20	4580	3560000	-	948348	2DGW16D2DISS	2DMW16D	-	-	28000	-	-	-	N[9]
Thallium	2/16	5 J	10	1 - 10	10	3GW12D-D	3MW12D	0.26	2	2	5	63	1.2 - 4.3	Y
Thallium, Filtered	1/16	6 J	6 J	1 - 20	6	2DGW10D2DISS	2DMW10D	0.26	2	2	5	63	-	Y
Vanadium	5/25	4.1	13.1	3 - 20	13.1	2DGW15D-2-D	2DMW15D	26	-	-	50	-	33.1	N
Zinc	14/25	3.1 J	75.7	5.7 - 27.8	22.4	2DGW25D-2	2DMW25D	1100	5000	-	5000	123	4.5 - 445	N
Zinc, Filtered	7/20	2.2 J	16.7 J	2 - 20	6.8117	2DGW25D DISS	2DMW25D	1100	5000	-	5000	123	-	N
MISCELLANEOUS PARAMETERS (mg/L)														
Hardness as CaCO3	19/19	28	572	-	317	2DGW16D-2	2DMW16D	-	-	-	-	-	NA	N[10]

1 Includes samples 010791-2DMW10D, 010791-2DMW10D-D, 010791-2DMW11D, 010791-2DMW15D, 010791-3MW12D, 011491-2DMW16D, 2DGW10D, 2DGW10D DISS, 2DGW10D-2, 2DGW10D2DISS, 2DGW11D, 2DGW11D DISS, 2DGW11D-2, 2DGW11D2DISS, 2DGW15D, 2DGW15D DISS, 2DGW15D-2, 2DGW15D-2-D, 2DGW15D2DISS, 2DGW15D2DISS-D, 2DGW16D, 2DGW16D DISS, 2DGW16D-2, 2DGW16D2DISS, 2DGW23D, 2DGW23D DISS, 2DGW23D-2, 2DGW23D-2DISS, 2DGW24D, 2DGW24D DISS, 2DGW24D-2, 2DGW24D2DISS, 2DGW25D, 2DGW25D DISS, 2DGW25D-2, 2DGW25D2DISS, 2DGW27D, 2DGW27D DISS, 2DGW27D-2, 2DGW27D2DISS, 2DGW28D, 2DGW28D DISS, 2DGW28D-2, 2DGW28D2DISS, 3GW12D, 3GW12D DISS, 3GW12D DISS-D, 3GW12D-2, 3GW12D-D, 3GW12D2DISS.
2 Based on current USEPA Region III guidance (USEPA Region III, April 1, 1998). Tap Water Ingestion Value for noncarcinogens is based on a target hazard quotient of 0.1. Value for carcinogens is based on a cancer risk of 1E-6.
3 Maximum Contaminant Level. (USEPA, October 1996).
4 Title 19, Health and Safety, the Public Health Code of the State of Connecticut, Chapter II Environmental Health.
5 CTDEP, January 1996.
6 Atlantic, July 1994.
7 Contaminant of Potential Concern; Yes (Y) indicates the maximum concentration exceeds one or more criteria; Unless otherwise indicated, No (N) indicates the maximum does not exceed any of the criteria.
8 USEPA Region I does not advocate quantitative evaluation of this chemical.
9 Essential nutrient; not evaluated for COPC screening.
10 Not applicable for COPC screening.
\- Not available or Not applicable.
NA Not analyzed.
ND Not detected.

APPENDIX D.7

COPC SCREENING – SOIL SAMPLES, SITE 7 – TORPEDO SHOPS

COPC SCREENING - SOIL SAMPLES
SITE 7 - TORPEDO SHOPS[1]
BASEWIDE GROUNDWATER OPERABLE UNIT
NSB-NLON, GROTON, CONNECTICUT

Analyte	Frequency of Detection	Minimum Concen-tration	Maximum Concen-tration	Range of Nondetects	95% UCL	Maximum Concentration		SSL Migration to Groundwater (2)	State Pollutant Mobility (GB) (3)	Select as COPC? (4)
						Sample Number	Location			
VOLATILE ORGANICS (mg/kg)										
1,1-Dichloroethene	1/27	0.003 J	0.003 J	0.006 - 0.061	0.003	7 SO 4S 0103	7MW4S	0.06	1.4	N
2-Butanone	1/27	0.032	0.032	0.011 - 0.061	0.032	081090-7TB5(6-8)	7TB5	-	80	N
Acetone	4/27	0.011 J	0.17	0.011 - 0.27	0.17	081090-7TB5(6-8)	7TB5	16	140	N
Benzene	1/37	0.004 J	0.004 J	0.0011 - 0.061	0.004	081090-7TB5(6-8)	7TB5	0.03	0.2	N
Carbon Disulfide	2/27	0.003 J	0.005 J	0.006 - 0.061	0.005	081090-7TB5(6-8)	7TB5	32	140	N
Methylene Chloride	14/27	0.003 J	0.42 J	0.006 - 0.023	0.42	7MW8S-0408	7MW8S	0.02	1	Y
Tetrachloroethene	5/27	0.003 J	0.018 J	0.006 - 0.024	0.018	7MW8S-0408	7MW8S	0.06	1	N
Toluene	6/37	0.003 J	0.008 J	0.0011 - 0.061	0.008	7TB160305	7TB16	12	67	N
Xylenes, Total	6/37	0.0005 J	0.011 J	0.0011 - 0.061	0.011	7 SO 4S 0103	7MW4S	190	19.5	N
SEMIVOLATILE ORGANICS (mg/kg)										
2-Methylnaphthalene	3/27	0.023 J	0.17 J	0.35 - 0.5	0.17	7 SO 4S 0103	7MW4S	-	56	N
4-Methylphenol	1/27	0.56	0.56	0.35 - 0.5	0.56	080990-7MW2(2-4)	7MW2S	-	7	N
Acenaphthene	5/27	0.043 J	0.79	0.35 - 0.5	0.79	7 SO 4S 0103	7MW4S	570	84	N
Acenaphthylene	3/27	0.02 J	0.055 J	0.35 - 0.5	0.055	7 SO 10 0103	7TB10	-	84	N
Anthracene	6/27	0.021 J	1.3	0.35 - 0.5	1.3	7 SO 10 0103	7TB10	12000	400	N
Benzo(a)anthracene	9/27	0.036 J	2.7	0.35 - 0.5	2.7	7 SO 10 0103	7TB10	2	1	Y
Benzo(a)pyrene	12/27	0.033 J	1.9	0.35 - 0.5	1.9	7 SO 10 0103	7TB10	8	1	Y
Benzo(b)fluoranthene	11/27	0.021 J	3.2 J	0.35 - 0.5	3.2	7 SO 10 0103	7TB10	5	1	Y
Benzo(g,h,i)perylene	10/27	0.02 J	1.3 J	0.35 - 0.5	1.3	7 SO 4S 0103	7MW4S	-	40	N
Benzo(k)fluoranthene	9/27	0.024 J	0.52	0.35 - 0.5	0.52	7TB12-0204	7TB12	49	1	N
Benzoic Acid	10/27	0.023 J	0.13 J	1.7 - 2.4	0.13	7 SO 4S 0103	7MW4S	400	5600	N
Bis(2-Ethylhexyl)phthalate	4/27	0.13 J	0.74 J	0.17 - 0.5	0.74	081390-7TB3(4-6)	7TB3	3600	11	N
Butylbenzyl Phthalate	1/27	0.026 J	0.026 J	0.35 - 0.5	0.026	7TB7-0406	7TB7	930	200	N
Carbazole	4/18	0.027 J	0.66	0.35 - 0.47	0.66	7 SO 4S 0103	7MW4S	0.6	0.36	Y
Chrysene	11/27	0.025 J	2.4	0.35 - 0.5	2.4	7 SO 10 0103	7TB10	160	0.96	Y
Di-n-butyl phthalate	10/27	0.02 J	0.17 J	0.35 - 0.47	0.17	081490-7TB4(4-6)	7TB4	2300	140	N
Dibenzo(a,h)anthracene	1/27	0.063 J	0.063 J	0.35 - 0.5	0.063	081390-7MW1(0-2)	7MW1D	2	0.005	Y
Dibenzofuran	3/27	0.027 J	0.35 J	0.35 - 0.5	0.35	7 SO 4S 0103	7MW4S	-	5.6	N
Diethyl Phthalate	2/27	0.094 J	14	0.35 - 0.48	14	7MW7S-0103	7MW7S	470	1100	N
Fluoranthene	14/27	0.018 J	3.8 J	0.36 - 0.5	3.8	7 SO 10 0103	7TB10	4300	56	N
Fluorene	5/27	0.043 J	0.71	0.35 - 0.5	0.71	7 SO 4S 0103	7MW4S	560	56	N
Indeno(1,2,3-cd)pyrene	10/27	0.024 J	1.2	0.35 - 0.5	1.2	7 SO 10 0103	7TB10	14	0.005	Y

COPC SCREENING - SOIL SAMPLES
SITE 7 - TORPEDO SHOPS[1]
BASEWIDE GROUNDWATER OPERABLE UNIT
NSB-NLON, GROTON, CONNECTICUT

Analyte	Frequency of Detection	Minimum Concen-tration	Maximum Concen-tration	Range of Nondetects	95% UCL	Maximum Concentration		SSL Migration to Groundwater (2)	State Pollutant Mobility (GB) (3)	Select as COPC? (4)
						Sample Number	Location			
Naphthalene	2/27	0.26 J	0.31 J	0.35 - 0.5	0.31	7 SO 4S 0103	7MW4S	84	56	N
Phenanthrene	10/27	0.025 J	4.3 J	0.35 - 0.5	4.3	7 SO 4S 0103	7MW4S	-	40	N
Pyrene	14/27	0.021 J	4.2 J	0.36 - 0.5	4.2	7 SO 10 0103	7TB10	4200	40	N
PESTICIDES/PCBs (mg/kg)										
4,4'-DDD	4/23	0.0044 J	0.025 J	0.02 - 0.047	0.0168	7MW7S-0103	7MW7S	16	0.029	N
4,4'-DDE	4/23	0.0054 J	0.21	0.02 - 0.047	0.21	081390-7TB3(4-6)	7TB3	54	0.021	Y
4,4'-DDT	5/23	0.0049 J	0.026 J	0.02 - 0.047	0.0167	7TB160305	7TB16	32	0.021	Y
Aroclor-1254	1/23	0.66	0.66	0.2 - 0.47	0.66	080990-7MW2(2-4)	7MW2S	-	0.1	Y
Endosulfan Sulfate	2/23	0.013 J	0.035 J	0.02 - 0.047	0.035	7MW7S-0103	7MW7S	18	8.4	N
Endrin Aldehyde	2/14	0.0055 J	0.0055 J	0.035 - 0.047	0.0055	7TB7-0406/ 7TB8-0202.9	7TB7/ 7TB8	1	0.42	N
Endrin Ketone	1/23	0.0068 J	0.0068 J	0.02 - 0.047	0.0068	7 SO 4S 0103	7MW4S	1	0.42	N
Heptachlor	1/23	0.0047 J	0.0047 J	0.0098 - 0.024	0.0047	7 SO 4S 0103	7MW4S	23	0.013	N
Methoxychlor	1/23	0.032 J	0.032 J	0.098 - 0.24	0.032	7 SO 4S 0103	7MW4S	160	8	N
INORGANICS (mg/kg)										
Aluminum	27/27	3730	20000	-	13301	7 SO 6S 0507	7MW6S	-	-	N[6]
Antimony	12/26	3.4	19.4 J	3 - 18.2	19.4	080990-7TB2(2-4)/ 081390-7MW1(0-2)	7TB2/ 7MW1D	5	1.2	Y
Arsenic	25/27	0.82 J	8.1	1.6 - 4.6	3.19	7MW9S-0608	7MW9S	29	10	N
Barium	27/27	17.4 J	506	-	112.1	7 SO 6S 0507	7MW6S	1600	200	Y
Beryllium	24/27	0.21 J	1	0.2 - 0.23	0.55	080990-7TB1(2-4)-D	7TB1	63	0.8	Y
Cadmium	13/27	0.47 J	5.1	0.4 - 1	5.1	080990-7TB1(2-4)-D	7TB1	8	1	N[5]
Calcium	27/27	600 J	5830	-	1876	081390-7MW1(0-2)	7MW1D	-	-	N[7]
Chromium	27/27	6.8	61.1	-	21.5	7 SO 6S 0507	7MW6S	-	10	Y
Cobalt	22/27	4.7 J	19.2 J	1.8 - 3.9	19.2	7 SO 6S 0507	7MW6S	-	84	N
Copper	27/27	7.6	45	-	24	7TB7-0406	7TB7	-	260	N[6]
Iron	27/27	4580	32900	-	16500	7 SO 6S 0507	7MW6S	-	-	N[6]
Lead	22/27	3.3 J	27.5 J	2.5 - 9.1	13	7TB12-0204	7TB12	-	3	Y
Magnesium	27/27	1510	19500	-	5363	7 SO 6S 0507	7MW6S	-	-	N[7]
Manganese	27/27	60.7	725	-	303	7 SO 6S 0507	7MW6S	-	10	Y
Mercury	5/27	0.11 J	1.2 J	0.1 - 0.14	1.2	7MW10S-0608	7MW10S	2	0.4	Y
Nickel	27/27	5.1	42.1 J	-	14.2	7 SO 6S 0507	7MW6S	130	20	Y

COPC SCREENING - SOIL SAMPLES
SITE 7 - TORPEDO SHOPS[1]
BASEWIDE GROUNDWATER OPERABLE UNIT
NSB-NLON, GROTON, CONNECTICUT

Analyte	Frequency of Detection	Minimum Concen-tration	Maximum Concen-tration	Range of Nondetects	95% UCL	Maximum Concentration		SSL Migration to Groundwater (2)	State Pollutant Mobility (GB) (3)	Select as COPC? (4)
						Sample Number	Location			
Potassium	27/27	575 J	18400 J	-	4366	7 SO 6S 0507	7MW6S	-	-	N[7]
Selenium	1/27	0.77	0.77	0.44 - 0.85	0.77	081090-7TB5(6-8)	7TB5	5	10	N
Silver	11/27	0.5	5.5 J	0.4 - 2.4	5.5	081390-7MW1(0-2)	7MW1D	34	7.2	N
Sodium	26/27	54.8 J	708	103	245.8	7 SO 4S 0103	7MW4S	-	-	N[7]
Thallium	4/27	0.26	1 J	0.2 - 1.2	1	7 SO 6S 0507	7MW6S	0.7	1	Y
Vanadium	22/27	7.7	86.7	14.3 - 38.4	35	7 SO 6S 0507	7MW6S	6000	10	Y
Zinc	27/27	13.8	133 J	-	60.4	7 SO 4S 0103	7MW4S	12000	1000	N
TOTAL PETROLEUM HYDROCARBONS (mg/kg)										
TPH	12/20	28	898 J	11.1 - 14.2	898	7MW8S-0408	7MW8S	-	2500	N
MISCELLANEOUS PARAMETERS (mg/kg)										
Total Organic Carbon	5/5	2740	18800	-	18800	7 SO 4S 0103	7MW4S	-	-	N[8]

1 Includes samples 080990-7MW2(2-4), 080990-7TB1(2-4), 080990-7TB1(2-4)-D, 080990-7TB2(2-4), 081090-7TB5(6-8), 081390-7MW1(0-2), 081390-7TB3(4-6), 081490-7MW3(6-8), 081490-7TB4(4-6), 081490-7TB6(6-8), 7 SO 10 0103, 7 SO 4S 0103, 7 SO 6S 0305, 7 SO 6S 0507, 7MW10S-0608, 7MW11S-0507, 7MW5S-1011, 7MW7S-0103, 7MW8S-0408, 7MW9S-0608, 7MW9S-0608-D, 7TB12-0204, 7TB13-0001, 7TB1301.5 03.5, 7TB14-0507, 7TB15-0608, 7TB160305, 7TB7-0406, 7TB8-0202.9, 7TB8-0202.9-D, 7TB9-0002, B325-SO01-0204, B25-SO01-0406, B325-SO03-0002, B325-SO03-0408, B325-SO04-0406, B325-SO04-0608, B325-SO05-0002, B325-SO05-0406, B325-SO06-0002, B325-SO06-0002-D, B325-SO07-0003, B325SS-0203, B325SW-0203.
2 USEPA Soil Screening Levels (USEPA, May 1996).
3 CTDEP, 1996.
4 Contaminant of Potential Concern; Yes (Y) indicates that the maximum concentration exceeds one or more of the criteria; No (N) indicates that the maximum does not exceed any of the criteria.
5 TCLP extraction followed by analysis for metals was also performed for the soil sample associated with the maximum concentration of this chemical. The resulting TCLP data indicate that pollutant mobility is not anticipated to be of concern for this chemical in the soil matrix in this area (i.e., this chemical was not detected in associated TCLP leachates or was detected at concentrations less than the associated Connecticut pollutant mobility standard for GB areas and the federal toxicity characteristic regulatory level).
6 USEPA Region I does not advocate quantitative evaluation of this chemical.
7 Essential nutrient; not evaluated for COPC selection.
8 Not applicable for COPC screening.
- Not Applicable or Not Available.

APPENDIX D.8

COPC SCREENING – TCLP SOIL SAMPLES, SITE 7 – TORPEDO SHOPS

COPC SCREENING - TCLP SOIL SAMPLES
SITE 7 - TORPEDO SHOPS[1]
NSB-NLON, GROTON, CONNECTICUT

Analyte	Frequency of Detection	Minimum Concen-tration	Maximum Concen-tration	Range of Nondetects	95% UCL	Maximum Concentration		Federal Pollutant Mobility (2)	State Pollutant Mobility (GB) (3)	Select as COPC? (4)
						Sample Number	Location			
TCLP METALS (mg/L)										
Arsenic	7/10	0.13 J	0.38 J	0.05 - 0.1	0.22	081090-7TB5(6-8)-T	7TB5	5	0.5	N
Barium	10/10	0.145	0.49 J	-	0.37	080990-7TB2(2-4)-T	7TB2	100	10	N
Cadmium	1/10	0.0095 J	0.0095 J	0.003 - 0.005	0.0095	081390-7TB3(4-6)-T	7TB3	1	0.05	N
Selenium	2/10	0.11 J	0.14 J	0.01 - 0.1	0.14	080990-7TB2(2-4)-T	7TB2	1	0.5	N

1 Includes samples 080990-7MW2(2-4)-T, 080990-7TB2(2-4)-T, 081090-7TB5(6-8)-T, 081390-7MW1(0-2)-T, 081390-7TB3(4-6)-T, 081490-7MW3(6-8)-T, 081490-7TB4(4-6)-T, 081490-7TB6(6-8)-T, 7MW8S-0408-T, 7TB1(2-4)-D-T, 7TB1(2-4)-T.
2 Federal Toxicity Characteristic Regulatory Level (58 FR 46049).
3 CTDEP, 1996.
4 Contaminant of Potential Concern; Yes (Y) indicates that the maximum concentration exceeds one or more of the criteria; No (N) indicates that the maximum does not exceed any of the criteria.

APPENDIX D.9

COPC SCREENING – GROUNDWATER SAMPLES-
OVERBURDEN WELLS, SITE 7 – TORPEDO SHOPS

COPC SCREENING - GROUNDWATER SAMPLES - OVERBURDEN WELLS
SITE 7 - TORPEDO SHOPS[1]
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

Analyte	Frequency of Detection	Minimum Concen-tration	Maximum Concen-tration	Range of Nondetects	95% UCL	Maximum Concentration Sample Number	Maximum Concentration Location	COPC Screening Level (2)	Federal MCL (3)	State MCL (4)	State Remediation Standards[5] Groundwater Protection	State Remediation Standards[5] Surface Water Protection	Offsite Wells Concentration Range (6)	Select as COPC? (7)
VOLATILE ORGANICS (ug/L)														
1,1,1-Trichloroethane	6/20	2 J	42	5 - 10	42	120690-7MW3	7MW3S	54	200	200	200	62000	ND	N
1,1-Dichloroethane	6/20	2 J	30	10	30	120690-7MW3	7MW3S	80	-	-	70	-	ND	N
1,1-Dichloroethene	4/20	1 J	2 J	5 - 10	2	7GW3D-2/ 7GW3S/ 7GW3S-2	7MW3D/ 7MW3S/ 7MW3S	0.044	7	7	7	96	ND	Y
2-Butanone	1/20	10	10	10	10	7GW8S-2	7MW8S	190	-	-	400	-	ND	N
Carbon Disulfide	2/20	2 J	2 J	5 - 10	2	7GW3S/ 7GW9S-D	7MW3S/ 7MW9S	100	-	-	700	-	ND	N
Chlorobenzene	1/20	3 J	3 J	5 - 10	3	7GW3D-2	7MW3D	3.5	100	100	100	420000	ND	N
Chloroform	1/20	4 J	4 J	5 - 10	4	7GW3S	7MW3S	0.15	100/80	100	6	14100	ND	Y
Methylene Chloride	1/20	4 J	4 J	5 - 14	4	7GW8S-2	7MW8S	4.1	5	5	5	48000	4	N
Trichloroethene	1/20	1 J	1 J	5 - 10	1	7GW3S	7MW3S	1.6	5	5	5	2340	ND	N
SEMIVOLATILE ORGANICS (ug/L)														
1,4-Dichlorobenzene	1/20	2 J	2 J	10	2	7GW3S	7MW3S	0.47	75	75	75	26000	ND	Y
2-Methylnaphthalene	1/20	9 J	9 J	10	9	7GW8S	7MW8S	150	-	-	280	-	ND	N
Acenaphthene	2/20	2 J	4 J	10	4	7GW8S	7MW8S	220	-	-	420	27000	ND	N
Acenaphthylene	1/20	0.5 J	0.5 J	10	0.5	7GW8S-2	7MW8S	-	-	-	420	0.3	ND	Y
Anthracene	1/20	0.8 J	0.8 J	10	0.8	7GW8S	7MW8S	1100	-	-	2000	1100000	ND	N
Benzoic Acid	6/20	0.5 J	2 J	25 - 50	2	7GW10S-2/ 7GW3D	7MW10S/ 7MW3D	15000	-	-	28000	-	ND	N
Bis(2-Ethylhexyl)phthalate	1/20	380	380	10 - 68	380	7GW5S	7MW5S	4.8	6	6	2	59	3	Y
Di-n-butyl phthalate	4/20	0.5 J	2 J	10	2	7GW8S	7MW8S	370	-	-	700	120000	ND	N
Dibenzofuran	2/20	1 J	3 J	10	3	7GW8S	7MW8S	2.4	-	-	28	-	ND	Y
Diethyl Phthalate	1/20	1 J	1 J	10	1	7GW3D	7MW3D	2900	-	-	5600	2400000	ND	N
Fluorene	2/20	2 J	5 J	10	5	7GW8S	7MW8S	150	-	-	280	140000	ND	N
Phenanthrene	1/20	6 J	6 J	10	6	7GW8S	7MW8S	-	-	-	200	0.3	ND	Y
Phenol	1/20	2 J	2 J	10	2	7GW3D	7MW3D	2200	-	-	4000	92000000	ND	N
INORGANICS (ug/L)														
Aluminum	9/20	32.2 J	18500	26.3 - 344	18500	7GW2S-2/ 7GW3D	7MW2S/ 7MW3D	-	50 to 200	-	-	-	15.4 - 3360	N[8]
Antimony	1/18	108 J	108 J	12 - 25	108	120690-7MW3	7MW3S	1.5	6	6	6	86000	ND	Y
Antimony, Filtered	1/16	15.8 J	15.8 J	12 - 19.8	15.8	7GW2S DISS	7MW2S	1.5	6	6	6	86000	-	Y
Arsenic	4/20	2.2 J	8.9 J	2 - 7.4	8.9	7GW3D	7MW3D	0.045	50	50	50	4	0.64	Y
Arsenic, Filtered	3/18	1.55	4.5 J	2 - 5.1	4.5	7GW2S DISS	7MW2S	0.045	50	50	50	4	-	Y
Barium	18/20	10.8 J	256	10.4 - 15	109	7GW3D	7MW3D	260	2000	2000	1000	-	2.8 - 183	N
Barium, Filtered	16/18	9.3	153	6 - 10.1	153	7GW10S2DISS	7MW10S	260	2000	2000	1000	-	-	N
Beryllium	1/20	2.1 J	2.1 J	.1	2.1	7GW3D	7MW3D	73	4	4	4	4	0.33 - 0.41	N
Boron	11/18	12.5 J	185	11.1 - 50	185	7GW3D	7MW3D	330	-	-	630	-	9.3 - 126	N
Boron, Filtered	12/18	9.6	187	36.5 - 50	187	7GW3D DISS	7MW3D	330	-	-	630	-	-	N
Cadmium	3/20	2.6	4	2 - 3	4	120690-7MW3	7MW3S	1.8	5	5	5	6	1.9 - 26.3	Y
Calcium	20/20	6020	45300	-	32360	7GW3D	7MW3D	-	-	-	-	-	3110 - 46000	N[9]
Calcium, Filtered	18/18	5850	44500	-	32325	7GW6S DISS	7MW6S	-	-	-	-	-	-	N[9]
Chromium	3/20	7.1	35.2	3 - 11.3	35.2	7GW3D	7MW3D	18	100	100	50	110	2.7 - 6.7	Y
Cobalt	4/20	4.4 J	28.8 J	3 - 10.3	28.8	7GW3D	7MW3D	220	-	-	420	-	1.9 - 6	N
Cobalt, Filtered	1/18	13.6 J	13.6 J	3 - 11.4	13.6	7GW2S DISS	7MW2S	220	-	-	420	-	-	N

COPC SCREENING - GROUNDWATER SAMPLES - OVERBURDEN WELLS
SITE 7 - TORPEDO SHOPS[1]
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

Analyte	Frequency of Detection	Minimum Concen-tration	Maximum Concen-tration	Range of Nondetects	95% UCL	Maximum Concentration		COPC Screening Level (2)	Federal MCL (3)	State MCL (4)	State Remediation Standards[5]		Offsite Wells Concentration Range (6)	Select as COPC? (7)
						Sample Number	Location				Groundwater Protection	Surface Water Protection		
Copper	7/20	2.3 J	38.9	2 - 6.3	38.9	7GW3D	7MW3D	150	1300	-	1300	48	1.6 - 2160	N[8]
Iron	17/20	140 J	32700	22.3 - 76	32700	7GW2S-2	7MW2S	1100	300	-	-	-	4.8 - 21800	N[8]
Iron, Filtered	13/18	55.9 J	14200	5.3 - 76.8	14200	7GW2S2DISS	7MW2S	1100	300	-	-	-	-	N[8]
Lead	8/20	1.65 J	23	2 - 12.4	23	7GW3D-2	7MW3D	-	15	-	15	13	1 - 264	Y
Lead, Filtered	8/18	2.1 J	8.3 J	2 - 2.2	8.3	7GW11S2DISS	7MW11S	-	15	-	15	13	-	N
Magnesium	20/20	923 J	18200	-	8712	7GW3D	7MW3D	-	-	-	-	-	654 - 5810	N[9]
Magnesium, Filtered	18/18	890	11600	-	11600	7GW3D2DISS	7MW3D	-	-	-	-	-	-	N[9]
Manganese	20/20	8.3	1760	-	906	7GW6S	7MW6S	84	50	5000	50	-	0.89 - 2130	Y
Manganese, Filtered	18/18	1.8 J	1780	-	842	7GW6S DISS	7MW6S	84	50	5000	50	-	-	Y
Nickel	1/20	24.3 J	24.3 J	7 - 13	24.3	7GW3D	7MW3D	73	100	100	100	880	5 - 17.5	N
Nickel, Filtered	1/18	24.9 J	24.9 J	7 - 11	24.9	7GW8S DISS	7MW8S	73	100	100	100	880	-	N
Potassium	19/20	1170 J	11600	3090	6355	7GW3D	7MW3D	-	-	-	-	-	290 - 17900	N[9]
Potassium, Filtered	16/18	1180	8720	2060 - 2760	5736	7GW10S2DISS	7MW10S	-	-	-	-	-	-	N[9]
Silver	1/20	38.9	38.9	2 - 7	38.9	120690-7MW3	7MW3S	18	100	50	36	12	2 - 5.8	Y
Sodium	20/20	3250 J	194000	-	90100	7GW10S-2	7MW10S	-	-	28000	-	-	3160 - 97700	N[9]
Sodium, Filtered	18/18	3240 J	212000	-	95644	7GW10S2DISS	7MW10S	-	-	28000	-	-	-	N[9]
Thallium	3/20	2.8 J	11	1 - 10	11	7GW11S	7MW11S	0.26	2	2	5	63	1.2 - 4.3	Y
Thallium, Filtered	2/18	4.4 J	6.4 J	1 - 10	6.4	7GW3S2DISS-D	7MW3S	0.26	2	2	5	63	-	Y
Vanadium	4/20	7.5	57.5	3 - 20	57.5	7GW3D	7MW3D	26	-	-	50	-	33.1	Y
Zinc	12/20	6.4 J	76.5	2 - 23.8	36.4	7GW3D-2	7MW3D	1100	5000	-	5000	123	4.5 - 445	N
Zinc, Filtered	4/18	5.1 J	46.2	2 - 20.9	46.2	7GW3D2DISS	7MW3D	1100	5000	-	5000	123	-	N
TOTAL PETROLEUM HYDROCARBONS (ug/L)														
Oil & Grease	1/4	600	600	500	600	7GW3D-2	7MW3D	-	-	-	-	-	NA	N[10]
TPH	2/9	700	1200	500	1200	7GW8S	7MW8S	-	-	-	500	-	NA	Y
MISCELLANEOUS PARAMETERS (mg/L)														
Chemical Oxygen Demand	1/4	22	22	10	22	7GW3D-2	7MW3D	-	-	-	-	-	NA	N[10]
Hardness As CaCO3	18/18	20	190	-	120	7GW3D	7MW3D	-	-	-	-	-	NA	N[10]
Hardness As CaCO3, Filtered	4/4	18	152	-	152	7GW6S DISS	7MW6S	-	-	-	-	-	NA	N[10]
Total Phosphorus	2/4	0.22	3.61	0.1	3.61	7GW3D	7MW3D	-	-	-	-	-	NA	N[10]
Total Suspended Solids	4/4	3	7840	-	7840	7GW3D	7MW3D	-	-	-	-	-	NA	N[10]

1 Includes samples 120690-7MW2, 120690-7MW3, 7GW10S, 7GW10S DISS, 7GW10S-2, 7GW10S2DISS, 7GW11S, 7GW11S DISS, 7GW11S-2, 7GW11S2DISS, 7GW2S, 7GW2S DISS, 7GW2S-2, 7GW2S2DISS, 7GW3D, 7GW3D DISS, 7GW3D-2, 7GW3D2DISS, 7GW3S, 7GW3S DISS, 7GW3S-2, 7GW3S-2-D, 7GW3S2DISS, 7GW3S2DISS-D, 7GW5S, 7GW5S DISS, 7GW5S-2, 7GW5S2DISS, 7GW6S, 7GW6S DISS, 7GW6S-2, 7GW6S2DISS, 7GW8S, 7GW8S DISS, 7GW8S-2, 7GW8S2DISS, 7GW9S, 7GW9S DISS, 7GW9S DISS-D, 7GW9S-2, 7GW9S-D, 7GW9S2DISS, B325-GW01, B325-GW03, B325-GW04.
2 Based on current USEPA Region III guidance (USEPA Region III, April 1, 1998). Tap Water Ingestion Value for noncarcinogens is based on a target hazard quotient of 0.1. Value for carcinogens is based on a cancer risk of 1E-6. See Table 1-3 for further details regarding surrogate values.
3 Maximum Contaminant Level. (USEPA, October 1996).
4 Title 19. Health and Safety, the Public Health Code of the State of Connecticut, Chapter II Environmental Health.
5 CTDEP, January 1996.
6 Atlantic, July 1994.
7 Contaminant of Potential Concern; Yes (Y) indicates the maximum concentration exceeds one or more criteria; Unless otherwise indicated, No (N) indicates the maximum does not exceed any of the criteria.
8 USEPA Region I does not advocate quantitative evaluation of this chemical.
9 Essential nutrient; not evaluated for COPC screening.

COPC SCREENING - GROUNDWATER SAMPLES - OVERBURDEN WELLS
SITE 7 - TORPEDO SHOPS[1]
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

Analyte	Frequency of Detection	Minimum Concen-tration	Maximum Concen-tration	Range of Nondetects	95% UCL	Maximum Concentration		COPC Screening Level (2)	Federal MCL (3)	State MCL (4)	State Remediation Standards[5]		Offsite Wells Concentration Range (6)	Select as COPC? (7)
						Sample Number	Location				Groundwater Protection	Surface Water Protection		

10 Not applicable for COPC screening
- Not available or Not applicable.
NA Not analyzed.
ND Not detected.

APPENDIX D.10

COPC SCREENING – GROUNDWATER SAMPLES-
BEDROCK WELLS, SITE 7 – TORPEDO SHOPS

COPC SCREENING - GROUNDWATER SAMPLES - BEDROCK WELLS
SITE 7 - TORPEDO SHOPS[1]
NSB-NLON, GROTON, CONNECTICUT

Analyte	Frequency of Detection	Minimum Concen-tration	Maximum Concen-tration	Range of Nondetects	95% UCL	Maximum Concentration		COPC Screening Level (2)	Federal MCL (3)	State MCL (4)	State Remediation Standards[5]		Offsite Wells Concentration Range (6)	Select as COPC? (7)
						Sample Number	Location				Groundwater Protection	Surface Water Protection		
VOLATILE ORGANICS (ug/L)														
1,1,1-Trichloroethane	1/11	2 J	2 J	5 - 10	2	7GW5D-2	7MW5D	54	200	200	200	62000	ND	N
4-Methyl-2-pentanone	1/11	21	21	10	21	7GW4S	7MW4S	290	-	-	350	-	ND	N
Methylene Chloride	2/11	1 J	1 J	5 - 14	1	7GW2D-2/ 7GW5D-2	7MW2D/ 7MW5D	4.1	5	5	5	48000	4	N
Xylenes, Total	1/12	1.2	1.2	1 - 10	1.2	B325-GW02	B325-MW2	1200	10000	10000	530	-	2	N
SEMIVOLATILE ORGANICS (ug/L)														
Benzoic Acid	1/11	0.7 J	0.7 J	25 - 50	0.7	7GW5D	7MW5D	15000	-	-	28000	-	ND	N
Phenol	1/11	0.8 J	0.8 J	10	0.8	7GW5D	7MW5D	2200	-	-	4000	92000000	ND	N
INORGANICS (ug/L)														
Aluminum	6/11	105	56200	20.3 - 73.5	56200	7GW5D	7MW5D	-	50 to 200	-	-	-	15.4 - 3360	N[8]
Antimony	1/8	13	13	12 - 25	13	7GW5D	7MW5D	1.5	6	6	6	86000	ND	Y
Antimony, Filtered	2/7	15.7	17.1 J	12 - 27.4	14.278	7GW1D DISS	7MW1D	1.5	6	6	6	86000	-	Y
Arsenic	4/11	2.1 J	112	2 - 10.7	112	7GW4S	7MW4S	0.045	50	50	50	4	0.64	Y
Barium	8/11	18.5 J	585	12.3 - 24.5	365	7GW5D	7MW5D	260	2000	2000	1000	-	2.8 - 183	Y
Barium, Filtered	6/10	13.9	82.2	9.3 - 24.2	82.2	7GW5D2DISS	7MW5D	260	2000	2000	1000	-	-	N
Beryllium	2/11	1.5 J	3.3 J	1	3.3	7GW5D	7MW5D	73	4	4	4	4	0.33 - 0.41	N
Boron	2/10	97.6	110	13.6 - 220	110	7GW4S	7MW4S	330	-	-	630	-	9.3 - 126	N
Boron, Filtered	3/10	20	204	10.5 - 50	140	7GW4S2DISS	7MW4S	330	-	-	630	-	-	N
Cadmium	2/11	2.9 J	3	2 - 3	3	7GW5D	7MW5D	1.8	5	5	5	6	1.9 - 26.3	Y
Cadmium, Filtered	1/10	3.1 J	3.1 J	2 - 3	3.1	7GW1D2DISS	7MW1D	1.8	5	5	5	6	-	Y
Calcium	11/11	8880	79600	-	56991	7GW5D-2	7MW5D	-	-	-	-	-	3110 - 46000	N[9]
Calcium, Filtered	10/10	8510	81500	-	46473	7GW5D2DISS	7MW5D	-	-	-	-	-	-	N[9]
Chromium	3/11	6.4 J	104	3 - 5	104	7GW5D	7MW5D	18	100	100	50	110	2.7 - 6.7	Y
Cobalt	3/11	6.2 J	41.7 J	3 - 5	41.7	7GW5D	7MW5D	220	-	-	420	-	1.9 - 6	N
Copper	9/11	7.7 J	797	2 - 6.9	492.6	7GW5D	7MW5D	150	1300	-	1300	48	1.6 - 2160	N[8]
Copper, Filtered	3/10	9.2	11.7	2 - 6.2	11.7	7GW7S DISS	7MW7S	150	1300	-	1300	48	-	N[6]
Iron	7/11	166 J	81800	27.4 - 96.7	81800	7GW1D-2	7MW1D	1100	300	-	-	-	4.8 - 21800	N[8]
Iron, Filtered	4/10	90.8 J	397	9.4 - 67.5	397	7GW4S2DISS	7MW4S	1100	300	-	-	-	-	N[6]
Lead	5/11	2.7 J	84.1	2 - 12.4	35.7	7GW5D	7MW5D	-	15	-	15	13	1 - 264	Y
Lead, Filtered	3/10	2 J	5.9	2	5.9	7GW2D2DISS	7MW2D	-	15	-	15	13	-	N
Magnesium	11/11	821 J	29300	-	17759	7GW5D	7MW5D	-	-	-	-	-	654 - 5810	N[9]
Magnesium, Filtered	10/10	778 J	11700	-	11692	7GW4S2DISS	7MW4S	-	-	-	-	-	-	N[9]
Manganese	11/11	21.8 J	7830	-	7647.7	7GW5D	7MW5D	84	50	5000	50	-	0.89 - 2130	Y
Manganese, Filtered	10/10	12.2 J	3530	-	3530	7GW5D DISS	7MW5D	84	50	5000	50	-	-	Y
Mercury	2/11	0.99	3	0.2	3	7GW5D	7MW5D	1.1	2	2	2	0.4	0.13 - 1.3	Y
Nickel	1/11	94	94	7 - 24.6	94	7GW5D	7MW5D	73	100	100	100	880	5 - 17.5	Y
Nickel, Filtered	2/10	20.2	21	7 - 11	21	7GW5D DISS	7MW5D	73	100	100	100	880	-	N
Potassium	9/11	970 J	29100	2300 - 2810	13128	7GW5D	7MW5D	-	-	-	-	-	290 - 17900	N[9]
Potassium, Filtered	8/10	1080 J	8470	1900 - 2110	5551	7GW4S2DISS	7MW4S	-	-	-	-	-	-	N[9]
Selenium	3/11	1.2 J	18.8	1 - 5	18.8	7GW4S	7MW4S	18	50	50	50	50	1 - 4.1	Y
Silver	1/11	5 J	5 J	2 - 7	5	7GW5D	7MW5D	18	100	50	36	12	2 - 5.8	N
Sodium	11/11	3780 J	146000	-	146000	7GW4S-2	7MW4S	-	-	28000	-	-	3160 - 97700	N[9]
Sodium, Filtered	10/10	3060 J	143000	-	143000	7GW4S2DISS	7MW4S	-	-	28000	-	-	-	N[9]

COPC SCREENING - GROUNDWATER SAMPLES - BEDROCK WELLS
SITE 7 - TORPEDO SHOPS[1]
NSB-NLON, GROTON, CONNECTICUT

Analyte	Frequency of Detection	Minimum Concen-tration	Maximum Concen-tration	Range of Nondetects	95% UCL	Maximum Concentration		COPC Screening Level (2)	Federal MCL (3)	State MCL (4)	State Remediation Standards[5]		Offsite Wells Concentration Range (6)	Select as COPC? (7)
						Sample Number	Location				Groundwater Protection	Surface Water Protection		
Thallium	1/11	10	10	1 - 10	5.5	7GW4S	7MW4S	0.26	2	2	5	63	1.2 - 4.3	Y
Vanadium	3/11	9.1 J	114	3 - 20	54.8	7GW5D	7MW5D	26	-	-	50	-	33.1	Y
Zinc	10/11	18.7 J	412	9.3	336	7GW5D	7MW5D	1100	5000	-	5000	123	4.5 - 445	Y
Zinc, Filtered	6/10	34.1	77.2	8.1 - 16.1	51.1	7GW1D DISS	7MW1D	1100	5000	-	5000	123	-	N
MISCELLANEOUS PARAMETERS (mg/L)														
Ammonia, As Nitrogen	2/4	0.2	0.58	0.1	0.58	7GW5D	7MW5D	-	-	-	-	-	NA	N[10]
Chemical Oxygen Demand	2/4	48	84	10	80	7GW5D-2	7MW5D	-	-	-	-	-	NA	N[10]
Hardness As CaCO3	10/10	26	240	-	160	7GW5D	7MW5D	-	-	-	-	-	NA	N[10]
Hardness As CaCO3, Filtered	3/3	32	156	-	156	7GW4S DISS	7MW4S	-	-	-	-	-	NA	N[10]
Total Organic Carbon	2/4	2.9	6.7	2	6.7	7GW5D	7MW5D	-	-	-	-	-	NA	N[10]
Total Phosphorus	2/4	1.2	7.5	0.1	7.5	7GW5D	7MW5D	-	-	-	-	-	NA	N[10]
Total Suspended Solids	3/4	84	16400	1	16400	7GW5D	7MW5D	-	-	-	-	-	NA	N[10]

1 Includes samples 120790-7MW1, 120790-7MW1-D, 7GW1D, 7GW1D DISS, 7GW1D-2, 7GW1D2DISS, 7GW2D, 7GW2D DISS, 7GW2D-2, 7GW2D2DISS, 7GW4S, 7GW4S DISS, 7GW4S-2, 7GW4S2DISS, 7GW5D, 7GW5D DISS, 7GW5D-2, 7GW5D2DISS, 7GW7S, 7GW7S DISS, 7GW7S-2, 7GW7S2DISS, B325-GW02, B325-GW02-D.
2 Based on current USEPA Region III guidance (USEPA Region III, April 1, 1998). Tap Water Ingestion Value for noncarcinogens is based on a target hazard quotient of 0.1. Value for carcinogens is based on a cancer risk of 1E-6.
3 Maximum Contaminant Level. (USEPA, October 1996).
4 Title 19, Health and Safety, the Public Health Code of the State of Connecticut, Chapter II Environmental Health.
5 CTDEP, January 1996.
6 Atlantic, July 1994.
7 Contaminant of Potential Concern; Yes (Y) indicates the maximum concentration exceeds one or more criteria; Unless otherwise indicated, No (N) indicates the maximum does not exceed any of the criteria.
8 USEPA Region I does not advocate quantitative evaluation of this chemical.
9 Essential nutrient; not evaluated for COPC screening.
10 Not applicable for COPC screening.
- Not available or Not applicable.
NA Not analyzed.
ND Not detected.

APPENDIX D.11

COPC SCREENING – GROUNDWATER SAMPLES-
OVERBURDEN WELLS, SITE 14 – OBDANE

COPC SCREENING - GROUNDWATER SAMPLES - OVERBURDEN WELLS
SITE 14 - OBDANE[1]
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

Analyte	Frequency of Detection	Minimum Concen-tration	Maximum Concen-tration	Range of Nondetects	95% UCL	Maximum Concentration		COPC Screening Level (2)	Federal MCL (3)	State MCL (4)	State Remediation Standards[5]		Offsite Wells Concentration Range (6)	Select as COPC? (7)
						Sample Number	Location				Groundwater Protection	Surface Water Protection		
VOLATILE ORGANICS (ug/L)														
Carbon Disulfide	1/2	1 J	1 J	10	1	14GW1S	14MW1S	100	-	-	700	-	ND	N
SEMIVOLATILE ORGANICS (ug/L)														
Bis(2-Ethylhexyl)phthalate	1/2	1 J	1 J	10	1	14GW1S-2	14MW1S	4.8	6	6	2	59	3	N
INORGANICS (ug/L)														
Aluminum	1/2	171	171	66	171	14GW1S	14MW1S	-	50 to 200	-	-	-	15.4 - 3360	N[8]
Arsenic, Filtered	1/2	2.1	2.1	5	2.1	14GW1S DISS	14MW1S	0.045	50	50	50	4	-	Y
Barium	2/2	35.5	39.3	-	39.3	14GW1S	14MW1S	260	2000	2000	1000	-	2.8 - 183	N
Barium, Filtered	2/2	35.1	37.9	-	37.9	14GW1S DISS	14MW1S	260	2000	2000	1000	-	-	N
Boron	2/2	89.3 J	130	-	130	14GW1S-2	14MW1S	330	-	-	630	-	9.3 - 126	N
Boron, Filtered	2/2	99.8 J	120	-	120	14GW1S2DISS	14MW1S	330	-	-	630	-	-	N
Calcium	2/2	4190	6600	-	6600	14GW1S	14MW1S	-	-	-	-	-	3110 - 46000	N[9]
Calcium, Filtered	2/2	4430	6730	-	6730	14GW1S DISS	14MW1S	-	-	-	-	-	-	N[9]
Cobalt	1/2	7	7	22.6	7	14GW1S-2	14MW1S	220	-	-	420	-	1.9 - 6	N
Iron	2/2	2260	4430	-	4430	14GW1S-2	14MW1S	1100	300	-	-	-	4.8 - 21800	N[8]
Iron, Filtered	2/2	2040	4680 J	-	4680	14GW1S2DISS	14MW1S	1100	300	-	-	-	-	N[8]
Lead, Filtered	1/2	2.2 J	2.2 J	2	2.2	14GW1S2DISS	14MW1S	-	15	-	15	13	-	N
Magnesium	2/2	2780	3700	-	3700	14GW1S	14MW1S	-	-	-	-	-	654 - 5810	N[9]
Magnesium, Filtered	2/2	2820	3600	-	3600	14GW1S DISS	14MW1S	-	-	-	-	-	-	N[9]
Manganese	2/2	458	770	-	770	14GW1S	14MW1S	84	50	5000	50	-	0.89 - 2130	Y
Manganese, Filtered	2/2	476	779	-	779	14GW1S DISS	14MW1S	84	50	5000	50	-	-	Y
Potassium	2/2	4080	4460	-	4460	14GW1S	14MW1S	-	-	-	-	-	290 - 17900	N[9]
Potassium, Filtered	2/2	4390	4510	-	4510	14GW1S DISS	14MW1S	-	-	-	-	-	-	N[9]
Sodium	2/2	43800	45800	-	45800	14GW1S-2	14MW1S	-	-	28000	-	-	3160 - 97700	N[9]
Sodium, Filtered	2/2	44000	47400	-	47400	14GW1S2DISS	14MW1S	-	-	28000	-	-	-	N[9]
Vanadium, Filtered	1/2	8.9	8.9	1	8.9	14GW1S DISS	14MW1S	26	-	-	50	-	-	N
Zinc	1/2	9.1	9.1	9.1	9.1	14GW1S	14MW1S	1100	5000	-	5000	123	4.5 - 445	N
Zinc, Filtered	1/2	6.5	6.5	12.6	6.5	14GW1S DISS	14MW1S	1100	5000	-	5000	123	-	N
MISCELLANEOUS PARAMETERS (mg/L)														
Hardness as CaCO3	2/2	24	32	-	32	14GW1S	14MW1S	-	-	-	-	-	NA	N[10]

1 Includes samples 14GW1S, 14GW1S DISS, 14GW1S-2, 14GW1S2DISS.
2 Based on current USEPA Region III guidance (USEPA Region III, April 1, 1998). Tap Water Ingestion Value for noncarcinogens is based on a target hazard quotient of 0.1. Value for carcinogens is based on a cancer risk of 1E-6.
3 Maximum Contaminant Level. (USEPA, October 1996).
4 Title 19, Health and Safety, the Public Health Code of the State of Connecticut, Chapter II Environmental Health.
5 CTDEP, January 1996.
6 Atlantic, July 1994.
7 Contaminant of Potential Concern; Yes (Y) indicates the maximum concentration exceeds one or more criteria, Unless otherwise indicated, No (N) indicates the maximum does not exceed any of the criteria.
8 USEPA Region I does not advocate quantitative evaluation of this chemical.
9 Essential nutrient; not evaluated for COPC screening.

COPC SCREENING - GROUNDWATER SAMPLES - OVERBURDEN WELLS
SITE 14 - OBDANE[1]
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

10 Not applicable for COPC screening.
- Not available or Not applicable.
NA Not analyzed.
ND Not detected.

APPENDIX D.12

COPC SCREENING – GROUNDWATER SAMPLES-
OVERBURDEN WELLS, SITE 20 – AREA A WEAPONS CENTER

COPC SCREENING - GROUNDWATER SAMPLES - OVERBURDEN WELLS
SITE 20 - WEAPONS CENTER[1]
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

Analyte	Frequency of Detection	Minimum Concen-tration	Maximum Concen-tration	Range of Nondetects	95% UCL	Maximum Concentration		COPC Screening Level (2)	Federal MCL (3)	State MCL (4)	State Remediation Standards[5]		Offsite Wells Concentration Range (6)	Select as COPC? (7)
						Sample Number	Location				Groundwater Protection	Surface Water Protection		
SEMIVOLATILE ORGANICS (ug/L)														
1,3-Dichlorobenzene	1/6	0.6 J	0.6 J	10	0.6	2WCGW1S	2WCMW1S	1.4	600	-	210	26000	ND	N
Benzo(g,h,i)perylene	1/6	1 J	1 J	10	1	2WCGW1S-2	2WCMW1S	-	-	-	200	0.3	ND	Y
Bis(2-Ethylhexyl)phthalate	3/6	2 J	3 J	10 - 42	3	2WCGW1S-2	2WCMW1S	4.8	6	6	2	59	3	Y
Dibenzo(a,h)anthracene	1/6	0.8 J	0.8 J	10	0.8	2WCGW1S-2	2WCMW1S	0.0092	-	-	0.2	0.3	ND	Y
Indeno(1,2,3-cd)pyrene	1/6	1 J	1 J	10	1	2WCGW1S-2	2WCMW1S	0.092	-	-	0.2	0.3	ND	Y
INORGANICS (ug/L)														
Aluminum	4/6	1090 J	9210 J	56.6 - 103	9210	2WCGW3S-2	2WCMW3S	-	50 to 200	-	-	-	15.4 - 3360	N[8]
Antimony, Filtered	1/6	15.2 J	15.2 J	12 - 16.4	15.2	2WCGW3S DISS	2WCMW3S	1.5	6	6	6	86000	-	Y
Arsenic	5/6	4.9 J	19.9 J	5	16.1	2WCGW3S-2	2WCMW3S	0.045	50	50	50	4	0.64	Y
Arsenic, Filtered	5/6	3.1 J	8.4 J	5	7.4	2WCGW3S2DISS	2WCMW3S	0.045	50	50	50	4	-	Y
Barium	6/6	42.3	189 J	-	156	2WCGW1S-2	2WCMW1S	260	2000	2000	1000	-	2.8 - 183	N
Barium, Filtered	6/6	44.3	210 J	-	142.4	2WCGW1S2DISS	2WCMW1S	260	2000	2000	1000	-	-	N
Beryllium	4/6	0.85	1.4 J	1	1.16	2WCGW3S-2	2WCMW3S	73	4	4	4	4	0.33 - 0.41	N
Beryllium, Filtered	1/6	1.2 J	1.2 J	1 - 1.2	1.2	2WCGW3S DISS	2WCMW3S	73	4	4	4	4	-	N
Boron	5/6	82.4	3550 J	75.1	3550	2WCGW1S-2	2WCMW1S	330	-	-	630	-	9.3 - 126	Y
Boron, Filtered	6/6	72.2	3810 J	-	3810	2WCGW3S2DISS	2WCMW3S	330	-	-	630	-	-	Y
Calcium	6/6	26500	264000 J	-	252667	2WCGW3S-2	2WCMW3S	-	-	-	-	-	3110 - 46000	N[9]
Calcium, Filtered	6/6	26400	298000 J	-	256896	2WCGW3S2DISS	2WCMW3S	-	-	-	-	-	-	N[9]
Chromium	4/6	4.2 J	24.9	3 - 4	24.9	2WCGW3S	2WCMW3S	18	100	100	50	110	2.7 - 6.7	Y
Cobalt	5/6	4.8 J	15.5 J	3	13.4382	2WCGW1S	2WCMW1S	220	-	-	420	-	1.9 - 6	N
Copper	4/6	6 J	38.5 J	2 - 5	38.5	2WCGW3S-2	2WCMW3S	150	1300	-	1300	48	1.6 - 2160	N[8]
Copper, Filtered	1/6	23 J	23 J	2 - 7.9	23	2WCGW3S2DISS	2WCMW3S	150	1300	-	1300	48	-	N[8]
Iron	6/6	13800 J	68000	-	58218	2WCGW2S	2WCMW2S	1100	300	-	-	-	4.8 - 21800	N[8]
Iron, Filtered	6/6	4610	69200	-	44812	2WCGW2S DISS	2WCMW2S	1100	300	-	-	-	-	N[8]
Lead	2/6	2.7 J	16.8 J	2 - 5.1	14.9	2WCGW3S-2	2WCMW3S	-	15	-	15	13	1 - 264	Y
Magnesium	6/6	3560	448000 J	-	448000	2WCGW3S-2	2WCMW3S	-	-	-	-	-	654 - 5810	N[9]
Magnesium, Filtered	6/6	3520	471000 J	-	471000	2WCGW3S2DISS	2WCMW3S	-	-	-	-	-	-	N[9]
Manganese	6/6	2800	6500 J	-	5225	2WCGW3S-2	2WCMW3S	84	50	5000	50	-	0.89 - 2130	Y
Manganese, Filtered	6/6	2820	6540 J	-	5503	2WCGW3S2DISS	2WCMW3S	84	50	5000	50	-	-	Y
Nickel	1/6	20 J	20 J	7 - 11	20	2WCGW3S	2WCMW3S	73	100	100	100	880	5 - 17.5	N
Nickel, Filtered	2/6	9.75	14	7 - 11	11.59	2WCGW1S DISS-D	2WCMW1S	73	100	100	100	880	-	N
Potassium	6/6	7150	173000 J	-	173000	2WCGW3S-2	2WCMW3S	-	-	-	-	-	290 - 17900	N[9]
Potassium, Filtered	6/6	7190	182000 J	-	182000	2WCGW3S2DISS	2WCMW3S	-	-	-	-	-	-	N[9]
Silver, Filtered	1/6	3.7	3.7	2	3.7	2WCGW2S DISS	2WCMW2S	18	100	50	36	12	-	N
Sodium	6/6	43900	3570000 J	-	3570000	2WCGW3S-2	2WCMW3S	-	-	28000	-	-	3160 - 97700	N[9]
Sodium, Filtered	6/6	44000	3580000 J	-	3580000	2WCGW3S2DISS	2WCMW3S	-	-	28000	-	-	-	N[9]
Thallium	3/6	5.6 J	13.8 J	1 - 10	13.8	2WCGW2S	2WCMW2S	0.26	2	2	5	63	1.2 - 4.3	Y
Vanadium	3/6	9.8 J	25.3 J	3 - 4	25.3	2WCGW3S-2	2WCMW3S	26	-	-	50	-	33.1	N
Vanadium, Filtered	2/6	2.9 J	3.1 J	1 - 4	3.1	2WCGW3S2DISS	2WCMW3S	26	-	-	50	-	-	N
Zinc	4/6	5.4	52	3.4 - 7.4	37.8	2WCGW3S	2WCMW3S	1100	5000	-	5000	123	4.5 - 445	N
Zinc, Filtered	1/6	14.2 J	14.2 J	2 - 19.6	9.7	2WCGW3S DISS	2WCMW3S	1100	5000	-	5000	123	-	N

COPC SCREENING - GROUNDWATER SAMPLES - OVERBURDEN WELLS
SITE 20 - WEAPONS CENTER[1]
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

Analyte	Frequency of Detection	Minimum Concen-tration	Maximum Concen-tration	Range of Nondetects	95% UCL	Maximum Concentration		COPC Screening Level (2)	Federal MCL (3)	State MCL (4)	State Remediation Standards[5]		Offsite Wells Concentration Range (6)	Select as COPC? (7)
						Sample Number	Location				Groundwater Protection	Surface Water Protection		
MISCELLANEOUS PARAMETERS (mg/L)														
Hardness As CaCO3	6/6	64	4000	-	4000	2WCGW3S-2	2WCMW3S	-	-	-	-	-	NA	N[10]
Hardness As CaCO3, Filtered	2/2	125	436	-	432	2WCGW1S DISS	2WCMW1S	-	-	-	-	-	NA	N[10]

1 Includes samples 2WCGW1S, 2WCGW1S DISS, 2WCGW1S DISS-D, 2WCGW1S-2, 2WCGW1S-D, 2WCGW1S2DISS, 2WCGW2S, 2WCGW2S DISS, 2WCGW2S-2, 2WCGW2S2DISS, 2WCGW3S, 2WCGW3S DISS, 2WCGW3S-2, 2WCGW3S2DISS.
2 Based on current USEPA Region III guidance (USEPA Region III, April 1, 1998). Tap Water Ingestion Value for noncarcinogens is based on a target hazard quotient of 0.1. Value for carcinogens is based on a cancer risk of 1E-6.
3 Maximum Contaminant Level. (USEPA, October 1996).
4 Title 19, Health and Safety, the Public Health Code of the State of Connecticut, Chapter II Environmental Health.
5 CTDEP, January 1996.
6 Atlantic, July 1994.
7 Contaminant of Potential Concern; Yes (Y) indicates the maximum concentration exceeds one or more criteria; Unless otherwise indicated, No (N) indicates the maximum does not exceed any of the criteria.
8 USEPA Region I does not advocate quantitative evaluation of this chemical.
9 Essential nutrient; not evaluated for COPC screening.
10 Not applicable for COPC screening.
- Not available or Not applicable.
NA Not analyzed.
ND Not detected.

APPENDIX D.13

COPC SCREENING – GROUNDWATER SAMPLES-
BEDROCK WELLS, SITE 20 –
AREA A WEAPONS CENTER

COPC SCREENING - GROUNDWATER SAMPLES - BEDROCK WELLS
SITE 20 - WEAPONS CENTER[1]
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

Analyte	Frequency of Detection	Minimum Concen-tration	Maximum Concen-tration	Range of Nondetects	95% UCL	Maximum Concentration Sample Number	Maximum Concentration Location	COPC Screening Level (2)	Federal MCL (3)	State MCL (4)	State Remediation Standards[5] Groundwater Protection	State Remediation Standards[5] Surface Water Protection	Offsite Wells Concentration Range (6)	Select as COPC? (7)
VOLATILE ORGANICS (ug/L)														
1,1,2-Trichloroethane	1/3	2 J	2 J	5 - 10	2	2WGW4D	2WMW4D	0.19	5	5	5	1260	ND	Y
1,2-Dichloroethane	1/3	1 J	1 J	5 - 10	1	2WGW4D	2WMW4D	0.12	5	5	1	2970	ND	Y
2-Butanone	1/3	4 J	4 J	10	4	2WGW4D-2	2WMW4D	190	-	-	400	-	ND	N
2-Hexanone	1/3	12	12	10	12	2WGW4D	2WMW4D	150	-	-	280	-	ND	N
4-Methyl-2-pentanone	1/3	12	12	10	12	2WGW4D	2WMW4D	290	-	-	350	-	ND	N
Trichloroethene	1/3	2 J	2 J	5 - 10	2	2WGW4D	2WMW4D	1.6	5	5	5	2340	ND	Y
SEMIVOLATILE ORGANICS (ug/L)														
Benzoic Acid	1/3	7 J	7 J	50	7	2WGW4D	2WMW4D	15000	-	-	28000	-	ND	N
Bis(2-Ethylhexyl)phthalate	2/3	2 J	2 J	36	2	012491-2WMW4D/ 2WGW4D-2	2WMW4D/ 2WMW4D	4.8	6	6	2	59	3	N
Di-n-octyl phthalate	1/3	2 J	2 J	10	2	2WGW4D	2WMW4D	73	-	-	100	230	ND	N
INORGANICS (ug/L)														
Aluminum	1/3	291	291	30 - 182	291	2WGW4D-2	2WMW4D	-	50 to 200	-	-	-	15.4 - 3360	N[8]
Antimony, Filtered	1/2	16.9	16.9	12.9	16.9	2WGW4D DISS	2WMW4D	1.5	6	6	6	86000	-	Y
Barium	3/3	70.1	135	-	135	2WGW4D-2	2WMW4D	260	2000	2000	1000	-	2.8 - 183	N
Barium, Filtered	2/2	81.9	113	-	113	2WGW4D2DISS	2WMW4D	260	2000	2000	1000	-	-	N
Calcium	3/3	28700	40900	-	40900	2WGW4D-2	2WMW4D	-	-	-	-	-	3110 - 46000	N[9]
Calcium, Filtered	2/2	32400	40700	-	40700	2WGW4D2DISS	2WMW4D	-	-	-	-	-	-	N[9]
Copper	1/3	3.9 J	3.9 J	5	3.9	2WGW4D-2	2WMW4D	150	1300	-	1300	48	1.6 - 2160	N[8]
Iron	3/3	65.2 J	7180	-	7180	2WGW4D-2	2WMW4D	1100	300	-	-	-	4.8 - 21800	N[8]
Lead	1/2	2.7 J	2.7 J	5	2.7	2WGW4D	2WMW4D	-	15	-	15	13	1 - 264	N
Magnesium	3/3	2850	3520	-	3520	2WGW4D-2	2WMW4D	-	-	-	-	-	654 - 5810	N[9]
Magnesium, Filtered	2/2	3110	3460	-	3460	2WGW4D2DISS	2WMW4D	-	-	-	-	-	-	N[9]
Manganese	3/3	31.1	405	-	405	2WGW4D-2	2WMW4D	84	50	5000	50	-	0.89 - 2130	Y
Manganese, Filtered	2/2	33.6	267	-	267	2WGW4D2DISS	2WMW4D	84	50	5000	50	-	-	Y
Nickel	1/3	18.6 J	18.6 J	7 - 11	18.6	012491-2WMW4D	2WMW4D	73	100	100	100	880	5 - 17.5	N
Potassium	3/3	1170	1570	-	1570	2WGW4D-2	2WMW4D	-	-	-	-	-	290 - 17900	N[9]
Potassium, Filtered	1/2	1390	1390	1920	1390	2WGW4D DISS	2WMW4D	-	-	-	-	-	-	N[9]
Selenium	1/3	6 J	6 J	1	6	2WGW4D-2	2WMW4D	18	50	50	50	50	1 - 4.1	N
Sodium	3/3	8270	9020 J	-	9020	012491-2WMW4D	2WMW4D	-	-	28000	-	-	3160 - 97700	N[9]
Sodium, Filtered	2/2	8420	9360	-	9360	2WGW4D2DISS	2WMW4D	-	-	28000	-	-	-	N[9]
Zinc	2/3	8.8 J	15 J	20	15	012491-2WMW4D	2WMW4D	1100	5000	-	5000	123	4.5 - 445	N
MISCELLANEOUS PARAMETERS (mg/L)														
Hardness As CaCO3	2/2	92	118	-	118	2WGW4D-2	2WMW4D	-	-	-	-	-	NA	N[10]
Hardness As CaCO3, Filtered	1/1	94	94	-	94	2WGW4D DISS	2WMW4D	-	-	-	-	-	NA	N[10]

1 Includes samples 012491-2WMW4D, 2WGW4D, 2WGW4D DISS, 2WGW4D-2, 2WGW4D2DISS.
2 Based on current USEPA Region III guidance (USEPA Region III, April 1, 1998). Tap Water Ingestion Value for noncarcinogens is based on a target hazard quotient of 0.1. Value for carcinogens is based on a cancer risk of 1E-6.
3 Maximum Contaminant Level. (USEPA, October 1996).

4 Title 19, Health and Safety, the Public Health Code of the State of Connecticut, Chapter II Environmental Health.
5 CTDEP, January 1996.
6 Atlantic, July 1994.
7 Contaminant of Potential Concern; Yes (Y) indicates the maximum concentration exceeds one or more criteria; Unless otherwise indicated, No (N) indicates the maximum does not exceed any of the criteria.
8 USEPA Region I does not advocate quantitative evaluation of this chemical.
9 Essential nutrient; not evaluated for COPC screening.
10 Not applicable for COPC screening.
- Not available or Not applicable.
NA Not analyzed.
ND Not detected.

APPENDIX D.14

COPC SCREENING – GROUNDWATER SAMPLES-
OVERBURDEN WELLS,
SITE 8 – GOSS COVE LANDFILL

COPC SCREENING - GROUNDWATER SAMPLES - OVERBURDEN WELLS
SITE 8 - GOSS COVE LANDFILL[1]
NSB-NLON, GROTON, CONNECTICUT

Analyte	Frequency of Detection	Minimum Concen-tration	Maximum Concen-tration	Range of Nondetects	95% UCL	Maximum Concentration		COPC Screening Level (2)	Federal MCL (3)	State MCL (4)	State Remediation Standards[5]		Offsite Wells Concentration Range (6)	Select as COPC? (7)
						Sample Number	Location				Groundwater Protection	Surface Water Protection		
VOLATILE ORGANICS (ug/L)														
1,1,1-Trichloroethane	1/27	1 J	1 J	5 - 50	1	8GW6S-2	8MW6S	54	200	200	200	62000	ND	N
1,2-Dichloroethene (total)	9/27	1 J	12 J	10	12	121890-8MW3S	8MW3	5.5	70/100	70/100	63	14000	ND	Y
2-Butanone	1/27	5 J	5 J	10 - 100	5	8GW6D-2	8MW6D	190	-	-	400	-	ND	N
4-Methyl-2-pentanone	3/27	2 J	200	10	200	121890-8MW3S	8MW3	290	-	-	350	-	ND	N
Acetone	1/27	700	700	10 - 28	700	121890-8MW3S	8MW3	370	-	-	700	-	ND	Y
Benzene	8/27	1 J	5 J	5 - 50	5	8GW3	8MW3	0.36	5	5	1	710	ND	Y
Bromodichloromethane	1/27	6 J	6 J	5 - 50	6	8GW6D	8MW6D	0.17	100/80	100	0.56	660	ND	Y
Carbon Disulfide	4/27	1 J	7 J	5 - 50	7	8GW8S-2	8MW8S	100	-	-	700	-	ND	N
Chloroform	1/27	18	18	5 - 50	18	8GW6D	8MW6D	0.15	100/80	100	6	14100	ND	Y
Ethylbenzene	14/27	1 J	120	10	120	121890-8MW3S/ 121890-8MW2S	8MW3/ 8MW2S	130	700	700	700	580000	ND	N
Tetrachloroethene	11/27	1 J	120	5 - 50	120	8GW8S-2	8MW8S	1.1	5	5	5	88	ND	Y
Toluene	5/27	1 J	450	5 - 11	450	121890-8MW3S	8MW3	75	1000	1000	1000	4000000	ND	Y
Trichloroethene	2/27	7 J	8 J	5 - 50	8	8GW2D	8MW2D	1.6	5	5	5	2340	ND	Y
Vinyl Chloride	1/27	5 J	5 J	10 - 100	5	121890-8MW2S	8MW2S	0.019	2	2	2	15750	ND	Y
Xylenes, Total	16/27	2 J	610	10	610	121890-8MW3S	8MW3	1200	10000	10000	530	-	2	Y
SEMIVOLATILE ORGANICS (ug/L)														
2,4-Dimethylphenol	15/25	0.6 J	320	10	320	8GW3	8MW3	73	-	-	140	-	ND	Y
2-Methylnaphthalene	13/25	1 J	12 J	10	12	121890-8MW3S	8MW3	150	-	-	280	-	ND	N
2-Methylphenol	7/25	3 J	140	10	140	121890-8MW3S	8MW3	180	-	-	350	-	ND	N
4-Bromophenyl Phenyl Ether	1/25	2 J	2 J	10 - 50	2	8GW1S	8MW1	-	-	-	-	-	ND	N
4-Methylphenol	8/25	4 J	500	10	500	121890-8MW2S	8MW2S	18	-	-	35	-	ND	Y
Acenaphthene	12/25	0.6 J	11 J	10 - 50	11	121890-8MW2S	8MW2S	220	-	-	420	27000	ND	N
Acenaphthylene	1/25	0.7 J	0.7 J	10 - 50	0.7	8GW6S	8MW6S	-	-	-	420	0.3	ND	Y
Anthracene	6/25	1 J	3 J	10 - 50	3	8GW3	8MW3	1100	-	-	2000	1100000	ND	N
Benzo(a)anthracene	4/25	0.6 J	4 J	10 - 50	4	8GW3	8MW3	0.092	-	-	0.06	0.3	ND	Y
Benzo(a)pyrene	4/25	0.6 J	4 J	10 - 50	4	8GW3	8MW3	0.0092	0.2	0.2	0.2	0.3	ND	Y
Benzo(b)fluoranthene	4/25	1 J	4 J	10 - 50	4	8GW3	8MW3	0.092	-	-	0.08	0.3	ND	Y
Benzo(g,h,i)perylene	3/25	1 J	4 J	10 - 50	4	8GW3	8MW3	-	-	-	200	0.3	ND	Y
Benzo(k)fluoranthene	5/25	0.6 J	5 J	10 - 50	5	8GW3	8MW3	0.92	-	-	0.5	0.3	ND	Y
Benzoic Acid	9/24	0.8 J	21 J	50 - 250	21	8GW6D-2	8MW6D	15000	-	-	28000	-	ND	N
Bis(2-Ethylhexyl)phthalate	9/25	1 J	140	10 - 50	140	8GW8S	8MW8S	4.8	6	6	2	59	3	Y
Butylbenzyl Phthalate	2/25	0.6 J	0.7 J	10 - 50	0.7	8GW5S	8MW5S	730	-	-	1000	52000	ND	N
Carbazole	9/21	0.6 J	16	10	16	8GW3	8MW3	3.3	-	-	1.8	29	ND	Y
Chrysene	5/25	0.8 J	7 J	10 - 50	7	8GW3	8MW3	9.2	-	-	4.8	0.3	ND	Y
Di-n-butyl phthalate	2/25	0.5 J	0.6 J	10 - 50	0.6	8GW5S-D	8MW5S	370	-	-	700	120000	ND	N
Di-n-octyl phthalate	1/25	0.7 J	0.7 J	10 - 50	0.7	8GW3	8MW3	73	-	-	100	-	ND	N
Dibenzo(a,h)anthracene	1/25	0.8 J	0.8 J	10 - 50	0.8	8GW2S	8MW2S	0.0092	-	-	0.2	0.3	ND	Y
Dibenzofuran	9/25	0.8 J	4 J	10 - 50	4	121890-8MW2S/ 121890-8MW3S	8MW2S/ 8MW3	2.4	-	-	28	-	ND	Y
Fluoranthene	13/25	0.6 J	15	10 - 50	15	8GW3	8MW3	150	-	-	280	3700	ND	N
Fluorene	16/25	0.6 J	8 J	10	8	121890-8MW2S	8MW2S	150	-	-	280	140000	ND	N
Indeno(1,2,3-cd)pyrene	3/25	0.9 J	4 J	10 - 50	4	8GW3	8MW3	0.092	-	-	0.2	0.3	ND	Y
N-Nitrosodiphenylamine	1/25	1 J	1 J	10 - 50	1	8GW3	8MW3	14	-	-	7.1	480	ND	N

COPC SCREENING - GROUNDWATER SAMPLES - OVERBURDEN WELLS
SITE 8 - GOSS COVE LANDFILL[1]
NSB-NLON, GROTON, CONNECTICUT

Analyte	Frequency of Detection	Minimum Concen-tration	Maximum Concen-tration	Range of Nondetects	95% UCL	Maximum Concentration		COPC Screening Level (2)	Federal MCL (3)	State MCL (4)	State Remediation Standards[5]		Offsite Wells Concentration Range (6)	Select as COPC? (7)
						Sample Number	Location				Groundwater Protection	Surface Water Protection		
Naphthalene	15/25	2 J	62	10	62	121890-8MW3S	8MW3	150	-	-	280	-	ND	N
Phenanthrene	16/25	0.7 J	14 J	10 - 50	7.5	8GW3/ 121890-8MW2S	8MW3/ 8MW2S	-	-	-	200	0.3	ND	Y
Phenol	6/25	1 J	26	10 - 50	26	121890-8MW2S	8MW2S	2200	-	-	4000	92000000	ND	N
Pyrene	10/25	0.5 J	11	10 - 50	11	8GW3	8MW3	110	-	-	200	110000	ND	N
INORGANICS (ug/L)														
Aluminum	12/25	36.6	53200	10 - 85.5	53200	8GW7S	8MW7S	-	50 to 200	-	-	-	15.4 - 3360	N[8]
Aluminum, Filtered	2/20	16.2 J	9160	10 - 30.9	9160	8GW7S DISS	8MW7S	-	50 to 200	-	-	-	-	N[8]
Antimony	2/24	17.8 J	157 J	2 - 25	157	8GW7S	8MW7S	1.5	6	6	6	86000	ND	Y
Antimony, Filtered	4/20	4.55	53.5	5 - 35.9	53.5	8GW7S DISS	8MW7S	1.5	6	6	6	86000	-	Y
Arsenic	13/25	2.3 J	29.8 J	1 - 20	8.6481	8GW2D	8MW2D	0.045	50	50	50	4	0.64	Y
Arsenic, Filtered	10/20	2.5 J	44.9 J	1 - 20	44.9	8GW2D DISS	8MW2D	0.045	50	50	50	4	-	Y
Barium	25/25	30.8 J	1340 J	-	1340	8GW4-2	8MW4	260	2000	2000	1000	-	2.8 - 183	Y
Barium, Filtered	20/20	30	1380	-	1380	8GW42DISS	8MW4	260	2000	2000	1000	-	-	Y
Beryllium	1/25	3.2	3.2	1	3.2	8GW7S	8MW7S	73	4	4	4	4	0.33 - 0.41	N
Beryllium, Filtered	1/20	1.6 J	1.6 J	1	1.6	8GW7S DISS	8MW7S	73	4	4	4	4	-	N
Boron	20/20	59.4	3360	-	3360	8GW6D	8MW6D	330	-	-	630	-	9.3 - 126	Y
Boron, Filtered	20/20	63.5	3530	-	3530	8GW6D DISS	8MW6D	330	-	-	630	-	-	Y
Cadmium	4/23	2 J	8.1	1 - 2	8.1	8GW8S-2	8MW8S	1.8	5	5	5	6	1.9 - 26.3	Y
Calcium	25/25	30100	360000	-	110928	8GW6D-2	8MW6D	-	-	-	-	-	3110 - 46000	N[9]
Calcium, Filtered	20/20	29900	294000	-	120587	8GW6D2DISS	8MW6D	-	-	-	-	-	-	N[9]
Chromium	9/23	1.1	221	1 - 5	221	8GW7S	8MW7S	18	100	100	50	110	2.7 - 6.7	Y
Chromium, Filtered	2/20	1.1	71.9	1 - 10.1	71.9	8GW7S DISS	8MW7S	18	100	100	50	110	-	Y
Cobalt	3/25	4.2 J	35.9	1 - 5	35.9	8GW7S	8MW7S	220	-	-	420	-	1.9 - 6	N
Cobalt, Filtered	2/20	7.4 J	10.7	1 - 4	10.7	8GW7S DISS	8MW7S	220	-	-	420	-	-	N
Copper	20/25	1.9 J	3850	2 - 5	3850	8GW7S	8MW7S	150	1300	-	1300	48	1.6 - 2160	N[8]
Copper, Filtered	12/20	3.1 J	47.8 J	2 - 3	47.8	8GW6D2DISS	8MW6D	150	1300	-	1300	48	-	N[8]
Iron	25/25	235	141000	-	141000	8GW7S	8MW7S	1100	300	-	-	-	4.8 - 21800	N[8]
Iron, Filtered	15/20	94.6	86600	17 - 1100	59292	8GW7S DISS	8MW7S	1100	300	-	-	-	-	N[8]
Lead	14/25	1.1	1600 J	1 - 50	1600	8GW7S	8MW7S	-	15	-	15	13	1 - 264	Y
Magnesium	25/25	7530	765000	-	765000	8GW6D	8MW6D	-	-	-	-	-	654 - 5810	N[9]
Magnesium, Filtered	20/20	184 J	585000	-	585000	8GW5S2DISS	8MW5S	-	-	-	-	-	-	N[9]
Manganese	25/25	53.8	3250	-	3250	8GW6D	8MW6D	84	50	5000	50	-	0.89 - 2130	Y
Manganese, Filtered	19/20	47.6	3380	2.2	3380	8GW6D DISS	8MW6D	84	50	5000	50	-	-	Y
Mercury	4/25	0.24 J	3.9	0.2	3.9	8GW7S	8MW7S	1.1	2	2	2	0.4	0.13 - 1.3	Y
Mercury, Filtered	3/20	0.2 J	0.22 J	0.2	0.22	8GW4S DISS/ 8GW4S DISS-D	8MW4/ 8MW4	1.1	2	2	2	0.4	-	N
Nickel	5/25	4.8 J	138	1 - 10	138	8GW7S	8MW7S	73	100	100	100	880	5 - 17.5	Y
Nickel, Filtered	2/20	10.1 J	43.1	3 - 14.1	43.1	8GW7S DISS	8MW7S	73	100	100	100	880	-	N
Potassium	25/25	8700	436000	-	139182	8GW6D	8MW6D	-	-	-	-	-	290 - 17900	N[9]
Potassium, Filtered	20/20	7580 J	468000	-	184000	8GW6D DISS	8MW6D	-	-	-	-	-	-	N[9]
Selenium	1/25	7 J	7 J	1 - 30	7	121890-8MW1S	8MW1	18	50	50	50	50	1 - 4.1	N
Silver	2/25	10.5 J	28.7	2 - 7	28.7	121890-8MW2S	8MW2S	18	100	50	36	12	2 - 5.8	Y
Silver, Filtered	1/20	3.5 J	3.5 J	2 - 3	3.5	8GW6D DISS	8MW6D	18	100	50	36	12	-	N

COPC SCREENING - GROUNDWATER SAMPLES - OVERBURDEN WELLS
SITE 8 - GOSS COVE LANDFILL[1]
NSB-NLON, GROTON, CONNECTICUT

Analyte	Frequency of Detection	Minimum Concen-tration	Maximum Concen-tration	Range of Nondetects	95% UCL	Maximum Concentration		COPC Screening Level (2)	Federal MCL (3)	State MCL (4)	State Remediation Standards[5]		Offsite Wells Concentration Range (6)	Select as COPC? (7)
						Sample Number	Location				Groundwater Protection	Surface Water Protection		
Sodium	25/25	16700	7800000	-	6655279	8GW6D	8MW6D	-	-	28000	-	-	3160 - 97700	N[9]
Sodium, Filtered	19/20	15600 J	5050000	774000	5050000	8GW5S2DISS	8MW5S	-	-	28000	-	-	-	N[9]
Thallium	1/25	10.2	10.2	1 - 20	10.2	8GW7S	8MW7S	0.26	2	2	5	63	1.2 - 4.3	Y
Vanadium	5/23	1.1	136	1 - 20	136	8GW7S	8MW7S	26	-	-	50	-	33.1	Y
Vanadium, Filtered	3/20	1.1	50.2	1 - 5.6	50.2	8GW7S DISS	8MW7S	26	-	-	50	-	-	Y
Zinc	21/25	5.4	4530	2 - 9.5	218	8GW7S	8MW7S	1100	5000	-	5000	123	4.5 - 445	Y
Zinc, Filtered	5/20	1	1130	2 - 9.2	1130	8GW7S DISS	8MW7S	1100	5000	-	5000	123	-	Y
TOTAL PETROLEUM HYDROCARBONS (ug/L)														
TPH	1/1	1000	1000	-	1000	SW-8MW4 (95)	8MW4	-	-	-	500	-	NA	Y
MISCELLANEOUS PARAMETERS (mg/L)														
Ammonia, As Nitrogen	1/1	2.2	2.2	-	2.2	8GW7S-2	8MW7S	-	-	-	-	-	NA	N[10]
Biochemical Oxygen Demand	1/1	2.1	2.1	-	2.1	8GW7S-2	8MW7S	-	-	-	-	-	NA	N[10]
Chemical Oxygen Demand	1/1	22	22	-	22	8GW7S-2	8MW7S	-	-	-	-	-	NA	N[10]
Chloride	1/1	5.6	5.6	-	5.6	08GW8S 03	8MW8S	-	-	-	-	-	3 - 180	N[10]
Hardness As CaCO3	17/17	148	5200	-	3056	8GW6D	8MW6D	-	-	-	-	-	NA	N[10]
Nitrite, As Nitrogen	1/1	3	3	-	3	08GW8S 03	8MW8S	-	-	-	-	-	NA	N[10]
Sulfate	1/1	29	29	-	29	08GW8S 03	8MW8S	-	-	-	-	-	NA	N[10]
Total Organic Carbon	2/2	4	5	-	5	08GW8S 03	8MW8S	-	-	-	-	-	NA	N[10]
Total Suspended Solids	1/1	22	22	-	22	8GW7S-2	8MW7S	-	-	-	-	-	NA	N[10]

1 Includes samples 08GW8S 03, 08GW8S DL, 121890-8MW1S, 121890-8MW2S, 121890-8MW3S, 121890-8MW4S, 8GW1S, 8GW1S DISS, 8GW1S-2, 8GW1S-2-D, 8GW1S2DISS, 8GW1S2DISS-D, 8GW2D, 8GW2D DISS, 8GW2D-2, 8GW2D2DISS, 8GW2S, 8GW2S DISS, 8GW2S-2, 8GW2S2DISS, 8GW3, 8GW3 DISS, 8GW3-2, 8GW32DISS, 8GW4-2, 8GW42DISS, 8GW4S, 8GW4S DISS, 8GW4S DISS-D, 8GW4S-D, 8GW5S, 8GW5S DISS, 8GW5S DISS-D, 8GW5S-2, 8GW5S-D, 8GW5S2DISS, 8GW6D, 8GW6D DISS, 8GW6D-2, 8GW6D2DISS, 8GW6S, 8GW6S DISS, 8GW6S-2, 8GW6S2DISS, 8GW7S, 8GW7S DISS, 8GW7S-2, 8GW7S-2-D, 8GW7S2DISS, 8GW7S2DISS-D, 8GW8S, 8GW8S DISS, 8GW8S-2, 8GW8S2DISS, SW-8MW4 (95).
2 Based on current USEPA Region III guidance (USEPA Region III, April 1, 1998). Tap Water Ingestion Value for noncarcinogens is based on a target hazard quotient of 0.1. Value for carcinogens is based on a cancer risk of 1E-6.
3 Maximum Contaminant Level. (USEPA, October 1996).
4 Title 19, Health and Safety, the Public Health Code of the State of Connecticut, Chapter II Environmental Health.
5 CTDEP, January 1996. See Table 1-3 for further details regarding surrogate and/or calculated values.
6 Atlantic, July 1994.
7 Contaminant of Potential Concern; Yes (Y) indicates the maximum concentration exceeds one or more criteria; Unless otherwise indicated, No (N) indicates the maximum does not exceed any of the criteria.
8 USEPA Region I does not advocate quantitative evaluation of this chemical.
9 Essential nutrient; not evaluated for COPC screening.
10 Not applicable for COPC screening.
- Not available or Not applicable.
NA Not analyzed.
ND Not detected.

APPENDIX D.15

COPC SCREENING – GROUNDWATER SAMPLES-
BEDROCK WELLS,
SITE 8 – GOSS COVE LANDFILL

COPC SCREENING - GROUNDWATER SAMPLES - BEDROCK WELLS
SITE 8 - GOSS COVE LANDFILL[1]
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

Analyte	Frequency of Detection	Minimum Concen-tration	Maximum Concen-tration	Range of Nondetects	95% UCL	Maximum Concentration		COPC Screening Level (2)	Federal MCL (3)	State MCL (4)	State Remediation Standards[5]		Offsite Wells Concentration Range (6)	Select as COPC? (7)
						Sample Number	Location				Groundwater Protection	Surface Water Protection		
VOLATILE ORGANICS (ug/L)														
1,2-Dichloroethene (total)	1/8	1 J	1 J	10 - 400	1	08GW8D DL	8MW3D	5.5	70/100	70/100	63	14000	ND	N
2-Hexanone	1/8	49 J	49 J	10 - 250	49	8GW8D-2	8MW8D	150	-	-	280	-	ND	N
Acetone	1/8	220 J	220 J	10 - 410	220	8GW8D	8MW8D	370	-	-	700	-	ND	N
Carbon Disulfide	1/8	58 J	58 J	10 - 250	58	8GW8D-2	8MW8D	100	-	-	700	-	ND	N
Tetrachloroethene	8/8	120	5600	-	3367	8GW8D-2	8MW8D	1.1	5	5	5	88	ND	Y
Trichloroethene	2/8	3 J	25	10 - 400	25	08GW8D DL	8MW8D	1.6	5	5	5	2340	ND	Y
Xylenes, Total	1/8	58 J	58 J	10 - 400	58	8GW8D	8MW8D	1200	10000	10000	530	-	2	N
SEMIVOLATILE ORGANICS (ug/L)														
Benzoic Acid	1/2	1 J	1 J	50	1	8GW8D	8MW8D	15000	-	-	28000	-	ND	N
Bis(2-Ethylhexyl)phthalate	1/2	17	17	10	17	8GW8D	8MW8D	4.8	6	6	2	59	3	Y
Phenol	1/2	0.8 J	0.8 J	10	0.8	8GW8D	8MW8D	2200	-	-	4000	92000000	ND	N
INORGANICS (ug/L)														
Aluminum	2/2	5410	13700 J	-	13700	8GW8D-2	8MW8D	-	50 to 200	-	-	-	15.4 - 3360	N[8]
Arsenic	1/2	6.1	6.1	4.1	6.1	8GW8D-2	8MW8D	0.045	50	50	50	4	0.64	Y
Barium	2/2	117	182 J	-	182	8GW8D-2	8MW8D	260	2000	2000	1000	-	2.8 - 183	N
Barium, Filtered	2/2	44.6	51.9	-	51.9	8GW8D DISS	8MW8D	260	2000	2000	1000	-	-	N
Boron	1/2	74.3	74.3	51.4	74.3	8GW8D	8MW8D	330	-	-	630	-	9.3 - 126	N
Boron, Filtered	1/2	58.4	58.4	44.8	58.4	8GW8D DISS	8MW8D	330	-	-	630	-	-	N
Cadmium	1/2	1 J	1 J	2	1	8GW8D-2	8MW8D	1.8	5	5	5	6	1.9 - 26.3	N
Calcium	2/2	36000	40800	-	40800	8GW8D	8MW8D	-	-	-	-	-	3110 - 46000	N[9]
Calcium, Filtered	2/2	29900	35100	-	35100	8GW8D DISS	8MW8D	-	-	-	-	-	-	N[9]
Chromium	2/2	9.9 J	16.3 J	-	16.3	8GW8D-2	8MW8D	18	100	100	50	110	2.7 - 6.7	N
Cobalt	1/2	12.5	12.5	4	12.5	8GW8D-2	8MW8D	220	-	-	420	-	1.9 - 6	N
Copper	2/2	30.9	71.3	-	71.3	8GW8D	8MW8D	150	1300	-	1300	48	1.6 - 2160	N[8]
Copper, Filtered	1/2	4.2	4.2	3	4.2	8GW8D DISS	8MW8D	150	1300	-	1300	48	-	N[8]
Iron	2/2	7870	19300	-	19300	8GW8D-2	8MW8D	1100	300	-	-	-	4.8 - 21800	N[8]
Iron, Filtered	1/2	99.5 J	99.5 J	17	99.5	8GW8D DISS	8MW8D	1100	300	-	-	-	-	N[8]
Lead	2/2	19.5	49.6 J	-	49.6	8GW8D	8MW8D	-	15	-	15	13	1 - 264	Y
Magnesium	2/2	10100	11600	-	11600	8GW8D-2	8MW8D	-	-	-	-	-	654 - 5810	N[9]
Magnesium, Filtered	2/2	5010	7320	-	7320	8GW8D DISS	8MW8D	-	-	-	-	-	-	N[9]
Manganese	2/2	635 J	757	-	757	8GW8D	8MW8D	84	50	5000	50	-	0.89 - 2130	Y
Manganese, Filtered	2/2	24.9 J	523	-	523	8GW8D DISS	8MW8D	84	50	5000	50	-	-	Y
Nickel	1/2	12.1	12.1	10	12.1	8GW8D-2	8MW8D	73	100	100	100	880	5 - 17.5	N
Potassium	2/2	9950	11700	-	11700	8GW8D-2	8MW8D	-	-	-	-	-	290 - 17900	N[9]
Potassium, Filtered	2/2	7110	7550	-	7550	8GW8D DISS	8MW8D	-	-	-	-	-	-	N[9]
Sodium	2/2	46700	53000	-	53000	8GW8D	8MW8D	-	-	28000	-	-	3160 - 97700	N[9]
Sodium, Filtered	2/2	46000	50400	-	50400	8GW8D DISS	8MW8D	-	-	28000	-	-	-	N[9]
Vanadium	2/2	18.6	46.3 J	-	46.3	8GW8D-2	8MW8D	26	-	-	50	-	33.1	Y
Zinc	2/2	101 J	113	-	113	8GW8D	8MW8D	1100	5000	-	5000	123	4.5 - 445	N
Zinc, Filtered	2/2	17.5	56.4	-	56.4	8GW8D DISS	8MW8D	1100	5000	-	5000	123	-	N

COPC SCREENING - GROUNDWATER SAMPLES - BEDROCK WELLS
SITE 8 - GOSS COVE LANDFILL[1]
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

Analyte	Frequency of Detection	Minimum Concen-tration	Maximum Concen-tration	Range of Nondetects	95% UCL	Maximum Concentration		COPC Screening Level (2)	Federal MCL (3)	State MCL (4)	State Remediation Standards[5]		Offsite Wells Concentration Range (6)	Select as COPC? (7)
						Sample Number	Location				Groundwater Protection	Surface Water Protection		
MISCELLANEOUS PARAMETERS (mg/L)														
Chloride	3/3	7.8	120	-	120	08GW8D 03	8MW8D	-	-	-	-	-	3 - 180	N[10]
Hardness As CaCO3	2/2	100	140	-	140	8GW8D	8MW8D	-	-	-	-	-	NA	N[10]
Nitrite, As Nitrogen	2/3	0.23	0.3	0.1	0.3	08GW8D 03	8MW8D	-	-	-	-	-	NA	N[10]
Sulfate	3/3	9.6	35	-	35	08GW8D 03	8MW8D	-	-	-	-	-	NA	N[10]
Total Organic Carbon	3/3	1	2.1	-	2.1	08GW8D 03	8MW8D	-	-	-	-	-	NA	N[10]

1 Includes samples 08GW10S 01, 08GW10S DL, 08GW8D 03, 08GW8D DL 08GW9S 01, 08GW9S DL, 8GW8D, 8GW8D DISS, 8GW8D-2, 8GW8D2DISS.
2 Based on current USEPA Region III guidance (USEPA Region III, April 1, 1998). Tap Water Ingestion Value for noncarcinogens is based on a target hazard quotient of 0.1. Value for carcinogens is based on a cancer risk of 1E-6.
3 Maximum Contaminant Level. (USEPA, October 1996). See Table 1-3 for further details.
4 Title 19, Health and Safety, the Public Health Code of the State of Connecticut, Chapter II Environmental Health.
5 CTDEP, January 1996.
6 Atlantic, July 1994.
7 Contaminant of Potential Concern; Yes (Y) indicates the maximum concentration exceeds one or more criteria; Unless otherwise indicated, No (N) indicates the maximum does not exceed any of the criteria.
8 USEPA Region I does not advocate quantitative evaluation of this chemical.
9 Essential nutrient; not evaluated for COPC screening.
10 Not applicable for COPC screening.
- Not available or Not applicable.
NA Not analyzed.
ND Not detected.

APPENDIX D.16

COPC SCREENING – GROUNDWATER SAMPLES-
OVERBURDEN WELLS,
SITE 15 – SASDA

COPC SCREENING - GROUNDWATER SAMPLES - OVERBURDEN WELLS
SITE 15 - SASDA[1]
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

Analyte	Frequency of Detection	Minimum Concen-tration	Maximum Concen-tration	Range of Nondetects	95% UCL	Maximum Concentration		COPC Screening Level (2)	Federal MCL (3)	State MCL (4)	State Remediation Standards[5]		Offsite Wells Concentration Range (6)	Select as COPC? (7)
						Sample Number	Location				Groundwater Protection	Surface Water Protection		
VOLATILE ORGANICS (ug/L)														
Carbon Disulfide	1/10	3 J	3 J	10	3	15GW1D	15MW1D	100	-	-	700	-	ND	N
SEMIVOLATILE ORGANICS (ug/L)														
1,4-Dichlorobenzene	1/10	1 J	1 J	10	1	15GW2S-2	15MW2S	0.47	75	75	75	26000	ND	Y
Bis(2-Ethylhexyl)phthalate	4/10	0.6 J	45	10	45	15GW1D	15MW1D	4.8	6	6	2	59	3	Y
Di-n-butyl phthalate	4/10	0.5 J	0.9 J	10	0.9	15GW1D-2-D	15MW1D	370	-	-	700	120000	ND	N
Naphthalene	1/10	1 J	1 J	10	1	15GW3S	15MW3S	150	-	-	280	-	ND	N
Phenanthrene	2/10	0.5 J	0.6 J	10	0.6	15GW3S	15MW3S	-	-	-	200	0.3	ND	Y
PESTICIDES/PCBs (ug/L)														
Heptachlor	1/10	0.54 J	0.54 J	0.05	0.54	15GW3S	15MW3S	0.0023	0.4	0.4	0.4	0.05	ND	Y
INORGANICS (ug/L)														
Aluminum	9/10	114	4210	42	4210	15GW3S	15MW3S	-	50 to 200	-	-	-	15.4 - 3360	N[8]
Aluminum, Filtered	6/10	13.4	2980	14 - 14.6	2980	15GW2S2DISS	15MW2S	-	50 to 200	-	-	-	-	N[8]
Antimony	1/10	3.6 J	3.6 J	3 - 15	3.6	15GW2S-2	15MW2S	1.5	6	6	6	86000	ND	Y
Antimony, Filtered	1/10	14.3	14.3	12 - 15	14.3	15GW3S2DISS	15MW3S	1.5	6	6	6	86000	-	Y
Arsenic	2/10	1.2 J	1.7 J	1 - 4.3	1.4	15GW1D-2	15MW1D	0.045	50	50	50	4	0.64	Y
Barium	10/10	31.6	125	-	72.2	15GW3S	15MW3S	260	2000	2000	1000	-	2.8 - 183	N
Barium, Filtered	10/10	28.3	86.1	-	62.7	15GW3S DISS	15MW3S	260	2000	2000	1000	-	-	N
Beryllium, Filtered	1/10	1.5	1.5	1	1.5	15GW2S2DISS	15MW2S	73	4	4	4	4	-	N
Boron	3/10	38.45	73.2 J	50	73.2	15GW3S-2	15MW3S	330	-	-	630	-	9.3 - 126	N
Boron, Filtered	6/10	19	62.3	50	43.8	15GW3S2DISS	15MW3S	330	-	-	630	-	-	N
Cadmium	5/10	1.4 J	5.3	1 - 2	3.2	15GW2S-2	15MW2S	1.8	5	5	5	6	1.9 - 26.3	Y
Cadmium, Filtered	2/10	4.4 J	5.5	2	5.5	15GW2S2DISS	15MW2S	1.8	5	5	5	6	-	Y
Calcium	10/10	11700	31900	-	31900	15GW3S	15MW3S	-	-	-	-	-	3110 - 46000	N[9]
Calcium, Filtered	10/10	11800	31100	-	31100	15GW3S DISS	15MW3S	-	-	-	-	-	-	N[9]
Chromium	4/10	0.95 J	5.9 J	1 - 3	3.06	15GW3S	15MW3S	18	100	100	50	110	2.7 - 6.7	N
Chromium, Filtered	2/10	3.1	3.4	3	3.4	15GW4S2DISS	15MW4S	18	100	100	50	110	-	N
Cobalt	5/10	1.1 J	10.8	1 - 8.3	6.7	15GW2S-2	15MW2S	220	-	-	420	-	1.9 - 6	N
Cobalt, Filtered	4/10	3.5	9	3 - 10.6	9	15GW2S2DISS	15MW2S	220	-	-	420	-	-	N
Copper	5/10	2.4 J	12.8	1 - 2	12.8	15GW2S-2	15MW2S	150	1300	-	1300	48	1.6 - 2160	N[8]
Copper, Filtered	7/10	2.3 J	11	2	6	15GW2S2DISS	15MW2S	150	1300	-	1300	48	-	N[8]
Iron	9/10	83.1	7110	16	7110	15GW3S	15MW3S	1100	300	-	-	-	4.8 - 21800	N[8]
Iron, Filtered	6/10	15	2720	50	2720	15GW3S DISS	15MW3S	1100	300	-	-	-	-	N[8]
Lead	4/10	2.1 J	21.2 J	1 - 4.4	21.2	15GW3S	15MW3S	-	15	-	15	13	1 - 264	Y
Magnesium	10/10	2390	9490	-	9490	15GW1D	15MW1D	-	-	-	-	-	654 - 5810	N[9]
Magnesium, Filtered	10/10	2160	9340	-	9340	15GW1D DISS	15MW1D	-	-	-	-	-	-	N[9]
Manganese	10/10	27.4	3080	-	3080	15GW3S	15MW3S	84	50	5000	50	-	0.89 - 2130	Y
Manganese, Filtered	10/10	26.9	3080	-	3080	15GW3S DISS	15MW3S	84	50	5000	50	-	-	Y
Nickel	1/10	10.6 J	10.6 J	10 - 12	10.6	15GW2S	15MW2S	73	100	100	100	880	5 - 17.5	N
Nickel, Filtered	1/10	10.6	10.6	7 - 10	10.6	15GW2S2DISS	15MW2S	73	100	100	100	880	-	N
Potassium	10/10	1550 J	7020	-	5571	15GW1D	15MW1D	-	-	-	-	-	290 - 17900	N[9]
Potassium, Filtered	10/10	1500 J	6640	-	5321	15GW1D DISS	15MW1D	-	-	-	-	-	-	N[9]

COPC SCREENING - GROUNDWATER SAMPLES - OVERBURDEN WELLS
SITE 15 - SASDA[1]
BASEWIDE GROUNDWATER OPERABLE UNIT REMEDIAL INVESTIGATION
NSB-NLON, GROTON, CONNECTICUT

Analyte	Frequency of Detection	Minimum Concen-tration	Maximum Concen-tration	Range of Nondetects	95% UCL	Maximum Concentration		COPC Screening Level (2)	Federal MCL (3)	State MCL (4)	State Remediation Standards[5]		Offsite Wells Concentration Range (6)	Select as COPC? (7)
						Sample Number	Location				Groundwater Protection	Surface Water Protection		
Selenium	1/10	3 J	3 J	1 - 2	3	15GW2S	15MW2S	18	50	50	50	50	1 - 4.1	N
Silver	1/10	1.2 J	1.9 J	1 - 2	1.9	15GW1D-2	15MW1D	18	100	50	36	12	2 - 5.8	N
Sodium	10/10	24600	71000	-	71000	15GW1D-2-D	15MW1D	-	-	28000	-	-	3160 - 97700	N[9]
Sodium, Filtered	10/10	25600	68900	-	68900	15GW1D DISS	15MW1D	-	-	28000	-	-	-	N[9]
Vanadium	4/10	1 J	9.3 J	1 - 5	5.1	15GW3S	15MW3S	26	-	-	50	-	33.1	N
Zinc	10/10	2.9 J	453	-	453	15GW2S-2	15MW2S	1100	5000	-	5000	123	4.5 - 445	Y
Zinc, Filtered	6/10	3.4	450	2 - 6.4	450	15GW2S2DISS	15MW2S	1100	5000	-	5000	123	-	Y
TOTAL PETROLEUM HYDROCARBONS (ug/L)														
Oil & Grease	1/2	500	500	500	500	15GW1D	15MW1D	-	-	-	-	-	NA	N[10]
MISCELLANEOUS PARAMETERS (mg/L)														
Chemical Oxygen Demand	1/1	11	11	-	11	15GW1S-2	15MW1S	-	-	-	-	-	NA	N[10]
Hardness as CaCO3	10/10	36	116	-	98	15GW1D	15MW1D	-	-	-	-	-	NA	N[10]
Total Suspended Solids	2/2	5	17	-	17	15GW1S-2	15MW1S	-	-	-	-	-	NA	N[10]

1 Includes samples 15GW1D, 15GW1D DISS, 15GW1D-2, 15GW1D-2-D, 15GW1D2DISS, 15GW1D2DISS-D, 15GW1S, 15GW1S DISS, 15GW1S-2, 15GW1S2DISS, 15GW2S, 15GW2S DISS, 15GW2S-2. 15GW2S2DISS. 15GW3S. 15GW3S DISS. 15GW3S-2. 15GW3S2DISS. 15GW4S. 15GW4SDISS. 15GW4S-2. 15GW4S2DISS.
2 Based on current USEPA Region III guidance (USEPA Region III, April 1, 1998). Tap Water Ingestion Value for noncarcinogens is based on a target hazard quotient of 0.1. Value for carcinogens is based on a cancer risk of 1E-6.
3 Maximum Contaminant Level. (USEPA, October 1996).
4 Title 19, Health and Safety, the Public Health Code of the State of Connecticut, Chapter II Environmental Health.
5 CTDEP, January 1996.
6 Atlantic, July 1994.
7 Contaminant of Potential Concern; Yes (Y) indicates the maximum concentration exceeds one or more criteria; Unless otherwise indicated, No (N) indicates the maximum does not exceed any of the criteria.
8 USEPA Region I does not advocate quantitative evaluation of this chemical.
9 Essential nutrient; not evaluated for COPC screening.
10 Not applicable for COPC screening.
- Not available or Not applicable.
NA Not analyzed.
ND Not detected.

APPENDIX D.17

COPC SCREENING – GROUNDWATER SAMPLES-
OVERBURDEN WELLS, SITE 23 – FUEL FARM
(INCLUDING SITE 9 – OT-5 OILY WASTEWATER TANK)

COPC SCREENING - GROUNDWATER SAMPLES - OVERBURDEN WELLS
SITE 23 - TANK FARM (INCLUDING SITE 9 - OT-5 OILY WASTEWATER TANK)[1]
NSB-NLON, GROTON, CONNECTICUT

Analyte	Frequency of Detection	Minimum Concen-tration	Maximum Concen-tration	Range of Nondetects	95% UCL	Maximum Concentration		COPC Screening Level (2)	Federal MCL (3)	State MCL (4)	State Remediation Standards[5]		Offsite Wells Concentration Range (6)	Select as COPC? (7)
						Sample Number	Location				Groundwater Protection	Surface Water Protection		
VOLATILE ORGANICS (ug/L)														
1,1,1-Trichloroethane	4/37	2 J	4 J	10	4	HNUS23 DL	HNUS-23	54	200	200	200	62000	ND	N
1,1-Dichloroethane	4/37	4 J	5 J	10	5	HNUS23 02/ HNUS23 02-D/ HNUS23 DL	HNUS-23/ HNUS-23/ HNUS-23	80	-	-	70	-	ND	N
Acetone	1/37	18	18	10 - 17	18	OT-GW01	OT-GW01	370	-	-	700	-	ND	N
Benzene	11/94	0.5	828	0.5 - 100	828	ERM-15 (95)	ERM-15	0.36	5	5	1	710	ND	Y
Bromodichloromethane	2/37	4 J	9 J	10	9	OT-GW01	OT-GW01	0.17	100/80	100	0.56	660	ND	Y
Bromomethane	1/37	1 J	1 J	10	1	SWTW28 (95)	SB/TW-28	0.85	-	-	9.8	80000	ND	Y
Chloroform	3/37	2 J	18	10	18	OT-GW01	OT-GW01	0.15	100/80	100	6	14100	ND	Y
Ethylbenzene	10/94	1	515	1 - 100	515	ERM-15 (95)	ERM-15	130	700	700	700	580000	ND	Y
Methyl Tert-Butyl Ether	1/39	6 J	6 J	10 - 1000	6	T9TW10 (95)	TW-10	630	-	-	100	-	ND	N
Tetrachloroethene	5/37	2 J	10	10	10	SWTW19 (95)	SB/TW-19	1.1	5	5	5	88	ND	Y
Toluene	14/94	0.6 J	3550	1 - 100	3550	ERM-14 (95)	ERM-14	75	1000	1000	1000	4000000	ND	Y
Xylenes, Total	15/90	0.5 J	4810	1 - 100	4810	ERM-14 (95)	ERM-14	1200	10000	10000	530	-	2	Y
SEMIVOLATILE ORGANICS (ug/L)														
2,6-Dinitrotoluene	1/27	0.6 J	0.6 J	10 - 100	0.6	OT-GW03	OT-GW03	3.7	-	-	7	-	ND	N
2-Methylnaphthalene	2/27	73	740	10 - 11	740	T4TW11 (95)	SB/TW-11	150	-	-	280	-	ND	Y
Anthracene	2/27	2 J	5 J	10 - 11	5	T4TW11 (95)	SB/TW-11	1100	-	-	2000	1100000	ND	N
Benzo(a)anthracene	1/27	0.8 J	0.8 J	10 - 100	0.8	SWTW07 (95)	SB/TW-7	0.092	-	-	0.06	0.3	ND	Y
Bis(2-Ethylhexyl)phthalate	3/27	0.8 J	6 J	10 - 100	6	OT-GW04-D	OT-GW04	4.8	6	6	2	59	3	Y
Carbazole	1/23	2 J	2 J	10 - 100	2	SWTW07 (95)	SB/TW-7	3.3	-	-	1.8	29	ND	Y
Chrysene	1/27	0.7 J	0.7 J	10 - 100	0.7	SWTW07 (95)	SB/TW-7	9.2	-	-	4.8	0.3	ND	Y
Di-n-butyl phthalate	10/27	0.5 J	16 J	10 - 100	16	SWTW25 (95)	SB/TW-25	370	-	-	700	120000	ND	N
Dibenzofuran	1/27	9 J	9 J	10 - 100	9	SWTW07 (95)	SB/TW-7	2.4	-	-	28	-	ND	Y
Diethyl Phthalate	2/27	0.5 J	12	10 - 100	12	T4GW08 (95)	HNUS-8	2900	-	-	5600	2400000	ND	N
Dimethyl Phthalate	1/27	4 J	4 J	10 - 100	4	T4GW08 (95)	HNUS-8	37000	-	-	70000	58000000	ND	N
Fluoranthene	1/27	4 J	4 J	10 - 100	4	SWTW07 (95)	SB/TW-7	150	-	-	280	3700	ND	N
Fluorene	3/27	0.7 J	51 J	10 - 11	51	T4TW11 (95)	SB/TW-11	150	-	-	280	140000	ND	N
Naphthalene	4/27	0.7 J	200	10 - 11	200	T4TW11 (95)	SB/TW-11	150	-	-	280	-	ND	Y
Phenanthrene	2/27	23	180	10 - 11	180	T4TW11 (95)	SB/TW-11	-	-	-	200	0.3	ND	Y
Pyrene	1/27	2 J	2 J	10 - 100	2	SWTW07 (95)	SB/TW-7	110	-	-	200	110000	ND	N
PESTICIDES/PCBs (ug/L)														
Heptachlor	1/27	0.05	0.05	0.05	0.05	SWTW07 (95)	SB/TW-7	0.0023	0.4	0.4	0.4	0.05	ND	Y
INORGANICS (ug/L)														
Aluminum	26/27	32.9	115000	15.3 - 16.2	115000	T4TW06 (95)	TW-6	-	50 to 200	-	-	-	15.4 - 3360	N[8]
Aluminum, Filtered	3/4	28.9	35.8	14	35.8	OT-GW04 DISS	OT-GW04	-	50 to 200	-	-	-	-	N[8]
Arsenic	11/27	2.7	82.4	2 - 4	82.4	T4TW06 (95)	TW-6	0.045	50	50	50	4	0.64	Y
Barium	27/27	27.5	689	-	689	SWTW07 (95)	SB/TW-7	260	2000	2000	1000	-	2.8 - 183	Y
Barium, Filtered	4/4	36.8	101	-	101	OT-GW04-D DISS	OT-GW04	260	2000	2000	1000	-	-	N
Beryllium	4/27	1.4	5.6	1	5.6	SWTW07 (95)	SB/TW-7	73	4	4	4	4	0.33 - 0.41	Y
Calcium	27/27	8370	74400	-	42732	SWTW05 (95)	SB/TW-5	-	-	-	-	-	3110 - 46000	N[9]

COPC SCREENING - GROUNDWATER SAMPLES - OVERBURDEN WELLS
SITE 23 - TANK FARM (INCLUDING SITE 9 - OT-5 OILY WASTEWATER TANK)[1]
NSB-NLON, GROTON, CONNECTICUT

Analyte	Frequency of Detection	Minimum Concen-tration	Maximum Concen-tration	Range of Nondetects	95% UCL	Maximum Concentration		COPC Screening Level (2)	Federal MCL (3)	State MCL (4)	State Remediation Standards[5]		Offsite Wells Concentration Range (6)	Select as COPC? (7)
						Sample Number	Location				Groundwater Protection	Surface Water Protection		
Calcium, Filtered	4/4	34900	50100	-	45368	OT-GW01 DISS	OT-GW01	-	-	-	-	-	-	N[9]
Chromium	18/27	1.4	127	1 - 9.6	127	T4TW06 (95)	TW-6	18	100	100	50	110	2.7 - 6.7	Y
Chromium, Filtered	1/4	4.9	4.9	3	4.9	OT-GW03 DISS	OT-GW03	18	100	100	50	110	-	N
Cobalt	20/27	1.5	61.2	1 - 4	12.7	T4TW06 (95)	TW-6	220	-	-	420	-	1.9 - 6	N
Copper	12/27	5.8	176	1 - 4.5	176	T4TW06 (95)	TW-6	150	1300	-	1300	48	1.6 - 2160	N[8]
Copper, Filtered	1/4	2.8	2.8	2	2.8	OT-GW03 DISS	OT-GW03	150	1300	-	1300	48	-	N[8]
Cyanide	6/23	2.2	29.1	2 - 3	29.1	T5GW11-D (95)	HNUS-11	73	200	200	200	52	1.2 - 15.5	N
Iron	26/27	145	262000	33.5	120027	T4TW06 (95)	TW-6	1100	300	-	-	-	4.8 - 21800	N[8]
Iron, Filtered	4/4	24.5	1640	-	1640	OT-GW02 DISS	OT-GW02	1100	300	-	-	-	-	N[8]
Lead	12/27	1	165	2 - 2.5	165	SWTW07 (95)	SB/TW-7	-	15	-	15	13	1 - 264	Y
Magnesium	27/27	1990	29100	-	12917	T4TW06 (95)	TW-6	-	-	-	-	-	654 - 5810	N[9]
Magnesium, Filtered	4/4	4820	7060	-	6952	OT-GW01 DISS	OT-GW01	-	-	-	-	-	-	N[9]
Manganese	27/27	36.1	5540	-	5540	T4GW08 (95)	HNUS-8	84	50	5000	50	-	0.89 - 2130	Y
Manganese, Filtered	4/4	35.7	796	-	796	OT-GW01 DISS	OT-GW01	84	50	5000	50	-	-	Y
Mercury	3/27	0.21	5.8	0.2	5.8	SWTW14 (95)	SB/TW-14	1.1	2	2	2	0.4	0.13 - 1.3	Y
Mercury, Filtered	1/4	0.495	0.89	0.2	0.89	OT-GW04-D DISS	OT-GW04	1.1	2	2	2	0.4	-	Y
Nickel	24/27	1.6	5990	1 - 10	3165	SWTW07 (95)	SB/TW-7	73	100	100	100	880	5 - 17.5	Y
Potassium	27/27	2310	24300	-	10280	SWTW28 (95)	SB/TW-28	-	-	-	-	-	290 - 17900	N[9]
Potassium, Filtered	4/4	4660	5440	-	5440	OT-GW04 DISS/ OT-GW04-D DISS	OT-GW04/ OT-GW04	-	-	-	-	-	-	N[9]
Selenium	8/27	1.65	13.6	2 - 3	13.6	T4TW06 (95)	TW-6	18	50	50	50	50	1 - 4.1	N
Silver, Filtered	2/4	1.8	2.6	2	2.1	OT-GW04 DISS	OT-GW04	180	100	50	36	12	-	N
Sodium	27/27	5500	134000	-	62330	SWTW28 (95)	SB/TW-28	-	-	28000	-	-	3160 - 97700	N[9]
Sodium, Filtered	4/4	27400	67100	-	67100	OT-GW04-D DISS	OT-GW04	-	-	28000	-	-	-	N[9]
Thallium	9/27	3.2	7.8	1 - 10	3.4	T5GW11-D (95)	HNUS-11	0.26	2	2	5	63	1.2 - 4.3	Y
Vanadium	20/27	1.1	193	1 - 5	193	T4TW06 (95)	TW-6	26	-	-	50	-	33.1	Y
Zinc	21/27	2.4	207	2 - 9	59.3	T4TW06 (95)	TW-6	1100	5000	-	5000	123	4.5 - 445	Y
Zinc, Filtered	4/4	2.2	4.2	-	3.8	OT-GW04 DISS	OT-GW04	1100	5000	-	5000	123	-	N
TOTAL PETROLEUM HYDROCARBONS (ug/L)														
Diesel Range Organics	8/8	210	2800	-	2800	OT3GW00702 (96)	HNUS-7	-	-	-	-	-	NA	N[10]
Gasoline Range Organics	6/8	10	140	10	140	OT3GW00702 (96)	HNUS-7	-	-	-	-	-	NA	N[10]
TPH	17/89	500	4920000	500 - 1000	4920000	T8TW23 (95)	SB/TW-23	-	-	-	500	-	NA	N[10]
MISCELLANEOUS PARAMETERS (mg/L)														
Chloride	4/4	10	30	-	30	HNUS23 02	HNUS-23	-	-	-	-	-	3 - 180	N[10]
Methane	2/4	0.022	0.024	0.003	0.024	HNUS23 02	HNUS-23	-	-	-	-	-	NA	N[10]
Nitrite, As Nitrogen	4/4	0.81	4.7	-	4.6	HNUS22 02	HNUS-22	-	-	-	-	-	NA	N[10]
Sulfate	4/4	9.9	22	-	22	HNUS23 02-D	HNUS-23	-	-	-	-	-	NA	N[10]
Total Organic Carbon	4/4	1.4	2.3	-	2.3	HNUS23 02/ HNUS23 02-D	HNUS-23/ HNUS-23	-	-	-	-	-	NA	N[10]

COPC SCREENING - GROUNDWATER SAMPLES - OVERBURDEN WELLS
SITE 23 - TANK FARM (INCLUDING SITE 9 - OT-5 OILY WASTEWATER TANK)[1]
NSB-NLON, GROTON, CONNECTICUT

Analyte	Frequency of Detection	Minimum Concen-tration	Maximum Concen-tration	Range of Nondetects	95% UCL	Maximum Concentration		COPC Screening Level (2)	Federal MCL (3)	State MCL (4)	State Remediation Standards[5]		Offsite Wells Concentration Range (6)	Select as COPC? (7)
						Sample Number	Location				Groundwater Protection	Surface Water Protection		

1 Includes samples ERM-1 (95), ERM-11 (95), ERM-13 (95), ERM-14 (95), ERM-15 (95), ERM-17 (95), ERM-19 (95), ERM-2 (95), ERM-5 (95), HNUS22 02, HNUS22 DL, HNUS23 02, HNUS23 02-D, HNUS23 DL, HNUS24 02, HNUS24 DL, HNUS24 DL-D, LATW03 (95), MW-11 (95), OT-GW01, OT-GW01 DISS, OT-GW02, OT-GW02 DISS, OT-GW03, OT-GW03 DISS, OT-GW04, OT-GW04 DISS, OT-GW04-D, OT-GW04-D DISS, OT1TW02901 (96), OT1TW03001 (96), OT1TW03101 (96), OT1TW03102 (96), OT3GW00701 (96), OT3GW00702 (96), OT3TW03201 (96), OT3TW03301 (96), OT3TW03401 (96), OT4TW04001 (96), OT4TW04201 (96), OT4TW04301 (96), OT4TW04301-D (96), OT4TW04302 (96), OT4TW04401 (96), OT8TW03501 (96), OT8TW03601 (96), OT8TW03701 (96), OT8TW03801 (96), OT8TW03901 (96), OT8TW04801 (96), SWGW23 (95), SWGW24 (95), SWTEMP12 (95), SWTW05 (95), SWTW06 (95), SWTW07 (95), SWTW09 (95), SWTW10 (95), SWTW10-D (95), SWTW13 (95), SWTW14 (95), SWTW15 (95), SWTW16 (95), SWTW18 (95), SWTW19 (95), SWTW25 (95), SWTW26 (95), SWTW27 (95), SWTW28 (95), T1GW01 (95), T1GW01-D (95), T1GW02 (95), T1TW01 (95), T1TW02 (95), T1TW03 (95), T2GW04 (95), T2GW05 (95), T2TW01 (95), T2TW02 (95), T2TW02-D (95), T2TW03 (95), T2TW04 (95), T2TW04A (95), T3GW06 (95), T3GW07 (95), T3TW05 (95), T3TW08 (95), T3TW08-D (95), T4GW08 (95), T4GW09 (95), T4TW06 (95), T4TW11 (95), T5GW10 (95), T5GW11 (95), T5GW11-D (95), T6GW12 (95), T6W13 (95), T7GW14 (95), T7GW15 (95), T7TW07 (95), T7TW08 (95), T8GW16 (95), T8GW16-D (95), T8GW17 (95), T8GW18 (95), T8TW09 (95), T8TW20 (95), T8TW22 (95), T8TW23 (95), T8TW24 (95), T9GW20 (95), T9GW21 (95), T9GW22 (95), T9TW10 (95), T9TW11 (95).
2 Based on current USEPA Region III guidance (USEPA Region III, April 1, 1998). Tap Water Ingestion Value for noncarcinogens is based on a target hazard quotient of 0.1. Value for carcinogens is based on a cancer risk of 1E-6.
3 Maximum Contaminant Level (USEPA, October 1996)
4 Title 19, Health and Safety, the Public Health Code of the State of Connecticut, Chapter II Environmental Health. See Table 1-3 for further details.
5 CTDEP, January 1996.
6 Atlantic, July 1994.
7 Contaminant of Potential Concern; Yes (Y) indicates the maximum concentration exceeds one or more criteria; Unless otherwise indicated, No (N) indicates the maximum does not exceed any of the criteria.
8 USEPA Region I does not advocate quantitative evaluation of this chemical.
9 Essential nutrient; not evaluated for COPC screening.
10 Not applicable for COPC screening.
\- Not available or Not applicable.
NA Not analyzed.
ND Not detected.

APPENDIX E

EXAMPLE BACKGROUND GROUNDWATER CALCULATION

CALCULATION WORKSHEET Order No. 19116 (01-91)

CLIENT: NSB New London	JOB NUMBER: 7856
SUBJECT: Sample Calculations of Statistical Analyses	
BASED ON: GW Background Total Barium Results	DRAWING NUMBER:
BY: TSK / CHECKED BY: BEL	APPROVED BY: / DATE: 12/28/00

THE DATA USED FOR THE FOLLOWING SAMPLE CALCULATIONS ARE THE TOTAL BARIUM RESULTS FROM BACKGROUND GROUNDWATER SAMPLES:

SAMPLE	RESULT	QUALIFIER	UNITS	VALUE	LOG-VALUE
2LGW20S-04	49.1		UG/L	49.1	3.894
JWGW21S-04	94.7		UG/L	94.7	4.551
HGW01S-04	47.8		UG/L	47.8	3.867
S22WMW21D01	80.3		UG/L	80.3	4.386
S23HNUS2301	49.8		UG/L	49.8	3.908
S23HNUS2302	51.4		UG/L	51.4	3.940
S23MW01D01	56.7		UG/L	56.7	4.038
S23MW01D02-AVG	60.4		UG/L	60.4	4.101
S23MW01S01	27.5	U	UG/L	13.75	2.621
S23MW01S02	21.4	U	UG/L	10.7	2.370
S2LMW20S02	50		UG/L	50	3.912
S2LMW35B01-AVG	78.55		UG/L	78.55	4.364
S2LMW35B02	73.4		UG/L	73.4	4.296
S2WMW21D02	78.3		UG/L	78.3	4.361
S2WMW21S02	46.5		UG/L	46.5	3.839
S2WMW22D01	96.4		UG/L	96.4	4.569
S2WMW22D02	160		UG/L	160	5.075
S2WMW22S01	227		UG/L	227	5.425
S2WMW22S02	154		UG/L	154	5.037
S4MW01S02	50.3		UG/L	50.3	3.918
S8MW08D01	34.1		UG/L	34.1	3.529
S8MW08D02	41		UG/L	41	3.714
S8MW10S01	15.2	U	UG/L	7.6	2.028
S8MW10S02	19.7	U	UG/L	9.85	2.287

* 1/2 DETECTION LIMIT USED FOR RESULT WITH "U" QUALIFIERS

CLIENT	JOB NUMBER
NSB NEW LONDON	7856

SUBJECT: SAMPLE CALCULATIONS OF STATISTICAL ANALYSIS

BASED ON	DRAWING NUMBER
GW BACKGROUND TOTAL BARIUM RESULTS	

BY	CHECKED BY	APPROVED BY	DATE
TSK	BEL		12/28/00

1. CALCULATE THE ARITHMETIC MEAN ($\bar{X}$):

$$\bar{X} = \frac{\sum_{i=1}^{n} X_i}{n}$$

$$\sum_{i=1}^{24} X_i = 49.1 + 94.7 + 47.8 + 50.3 + 49.8 + 51.4 + 56.7 + 60.4 + 13.75 + 10.7 + 50 + 78.55 + 73.4 + 78.3 + 46.5 + 96.4 + 160 + 227 + 154 + 50.3 + 34.1 + 41 + 7.6 + 9.85 =$$

$$\bar{X} = \frac{1621.65}{24} = 67.56875$$

2. CALCULATE THE STANDARD DEVIATION (S_x):

$$S_x = \sqrt{\frac{\sum_{i=1}^{n} (X_i - \bar{X})^2}{n-1}}$$

$$\sum_{i=1}^{24} (X_i - \bar{X})^2 = (49.1 - 67.56875)^2 + (94.7 - 67.56875)^2 + (47.8 - 67.56875)^2 + (80.3 - 67.56875)^2 + (49.8 - 67.56875)^2 + (51.4 - 67.56875)^2 + (56.7 - 67.56875)^2 + (60.4 - 67.56875)^2 + (13.75 - 67.56875)^2 + (10.7 - 67.56875)^2 + (50 - 67.56875)^2 + (78.55 - 67.56875)^2 + (73.4 - 67.56875)^2 + (78.3 - 67.56875)^2 + (46.5 - 67.56875)^2 + (96.4 - 67.56875)^2 + (160 - 67.56875)^2 + (227 - 67.56875)^2 + (154 - 67.56875)^2 + (50.3 - 67.56875)^2 + (34.1 - 67.56875)^2 + (41 - 67.56875)^2 + (7.6 - 67.56875)^2 + (9.85 - 67.56875)^2 =$$

$$= (-18.46875)^2 + (27.13125)^2 + (-19.76875)^2 + (12.73125)^2 + (-17.76875)^2 + (-16.16875)^2 + (-10.86875)^2 + (-7.16875)^2 + (-53.81875)^2 + (-56.86875)^2 + (-17.56875)^2 + (10.98125)^2$$

CLIENT	JOB NUMBER
NSB New London	7856

SUBJECT: Sample Calculations of Statistical Analysis

BASED ON	DRAWING NUMBER
GW Background Total Barium Results	

BY	CHECKED BY	APPROVED BY	DATE
TSK	BCL		12/28/06

$$(5.83125)^2 + (10.73125)^2 + (-21.06875)^2 + (28.83125)^2 + (92.43125)^2 + (159.43125)^2 + (86.43125)^2 + (-17.26875)^2 + (-33.46875)^2 + (-26.56875)^2 + (59.96875)^2 + (-57.71875)^2 =$$

$$= (341.0947266) + (736.1047266) + (390.8034766) + (162.0847266) + (315.7284766) + (261.4284766) + (118.1297266) + (51.39097656) + (2896.457852) + (3234.054727) + (3086.660976 6) + (1206.587851 6) + (34.0634 7656) + (115.15 97266) + (443.89 22266) + (831.2409 7266) + (8543.535977) + (25418.32348) + (7470.360977) + (298.2097266) + (1120.157227) + (705.8984766) + (3596.250977) + (3331.454102) =$$

$$\sum_{i=1}^{24} (X_i - \bar{X})^2 = 60845.01407$$

$$S_X = \sqrt{\frac{60845.01407}{23}} = \sqrt{2645.435394} = 51.433796$$

3. Calculate the <u>Shapiro-Wilk W Statistic</u> (W_{CALC}):

$$W_{CALC} = \left(\frac{b}{S_x\sqrt{n-1}}\right)^2$$

Calculate b by creating the following table:

Column 1 = Results ordered from smallest to largest (R_i)
Column 2 = Results ordered from largest to smallest (R_{n-i+1})
Column 3 = Column 2 − Column 1 ($R_{n-i+1} - R_i$)
Column 4 = Coefficient a_i found in <u>Table 1</u>
Column 5 = Column 3 × Column 4 = $b_i = a_i(R_{n-i+1} - R_i)$

$$b = \sum_{i=1}^{K} b_i$$

Where K is the greatest integer less than or equal to $n/2$

CALCULATION WORKSHEET Order No. 19116 (01-91)

CLIENT: NSB New London	JOB NUMBER: 7856
SUBJECT: Sample Calculations of Statistical Analysis	
BASED ON: GW Background Total Barium Results	DRAWING NUMBER:
BY: TSK / CHECKED BY: BEL	APPROVED BY: / DATE: 12/28/00

R_i	R_{n-i+1}	$R_{n-i+1} - R_i$	a_i	b_i	i
7.6	227	219.4	0.4493	98.57642	1
9.85	160	150.15	0.3098	46.51647	2
10.7	154	143.3	0.2554	36.59882	3
13.75	96.4	82.65	0.2145	17.728475	4
34.1	94.7	60.6	0.1807	10.95042	5
41	80.3	39.3	0.1512	5.94216	6
46.5	78.55	32.05	0.1245	3.990225	7
47.8	78.3	30.5	0.0997	3.04085	8
49.1	73.4	24.3	0.0764	1.85652	9
49.8	60.4	10.6	0.0539	0.57134	10
50	56.7	6.7	0.0321	0.21507	11
50.3	51.4	1.1	0.0107	0.01177	12
51.4	50.3				13
56.7	50				14
60.4	49.8				15
73.4	49.1				16
78.3	47.8				17
78.55	46.5				18
80.3	41				19
94.7	34.1				20
96.4	13.75				21
154	10.7				22
160	9.85				23
227	7.6			+	24

$b = 225.99849$

$$W_{CALC} = \left(\frac{b}{S_x\sqrt{n-1}}\right)^2 = \left(\frac{225.99849}{(51.433796)\sqrt{23}}\right)^2 = \left(\frac{225.99849}{(51.433796)(4.79583)}\right)^2$$

$$= \left(\frac{225.99849}{246.6678202}\right)^2 = (.9162058)^2 = (.83943)$$

$W_{CALC} = .83943$

CLIENT	JOB NUMBER
NSB New London	7856

SUBJECT: Sample Calculations of Statistical Analysis

BASED ON	DRAWING NUMBER
GW Background, Total Barium Results	

BY	CHECKED BY	APPROVED BY	DATE
TSK	BEL		12/28/00

Determine W_{TEST} at 5% level of significance ($n=24$) from Table 2:

$$W_{TEST} = 0.916$$

Compare W_{CALC} with W_{TEST}

$$W_{CALC} = .83943 < 0.916 = W_{TEST}$$

Since $W_{CALC} < W_{TEST}$, we Reject the Null Hypothesis that the data has a Normal Distribution.

4) Calculate the Normal 95% Upper Tolerance Limit ($UTL_{0.95}$)

Step 1: Take mean ($\bar{x}$) and standard deviation (S_x) from previous calculation.

Step 2: Construct the one-sided upper tolerance limit as:

$$UTL_{0.95} = \bar{x} + KS_x$$

where K is the one-sided normal tolerance factor found in Table 3

Determine K, $\bar{x}$, S_x

$K = 2.309$ (with $\gamma = .95$, coverage = 95%, $n = 24$)

$\bar{x} = 67.56875$ $S_x = 51.433796$

$$UTL_{0.95} = 67.56875 + (2.309)(51.433796)$$
$$= 67.56875 + 118.760635$$

$$UTL_{0.95} = 186.3294$$

CALCULATION WORKSHEET Order No. 19116 (01-91)

CLIENT: NSB New London	JOB NUMBER: 7856
SUBJECT: Sample Calculations of Statistical Analysis	
BASED ON: GW Background Data Total Barium Results	DRAWING NUMBER:
BY: TSK / CHECKED BY: BGL	APPROVED BY: / DATE: 12/28/00

5. CALCULATE THE LOGNORMAL 95% UPPER TOLERANCE LIMIT:

STEP 1: USE ($\text{LOG}\,\bar{X}$) AND LOGNORMAL S_x ($\bar{Y}$ & S_y) FROM LOG-VALUE DATA

STEP 2: FIND K FROM TABLE 4

STEP 3: CONSTRUCT ONE-SIDED LOGNORMAL TOLERANCE LIMIT AS:

$$UTL_{0.95} = e^{(\bar{y} + KS_y)}$$

FIND $\bar{y}$, S_y, K

$K = 2.309$ $\bar{y} = 3.9178677$

$S_y = 0.85973048$

* $\bar{y}$ & S_y FOUND SAME WAY AS $\bar{X}$ & S_x EXCEPT USING LOG-VALUE DATA IN COLUMN 6 ON PAGE 1.

$$UTL_{0.95} = e^{(\bar{y} + KS_y)}$$

$$(\bar{y} + KS_y) = 3.9178677 + [(2.309)(0.85973048)] = 3.9178677 + 1.9851176$$

$$= 5.9029853 78$$

$$UTL_{0.95} = e^{(5.9029853 78)}$$

$$= 366.12887$$

Sample Calculations Table 1
COEFFICIENTS A_i FOR W TEST OF NORMALITY FOR N=2 to 50

i/n	2	3	4	5	6	7	8	9	10
1	0.7071	0.7071	0.6872	0.6646	0.6431	0.6233	0.6052	0.5888	0.5739
2			0.1677	0.2413	0.2806	0.3031	0.3164	0.3244	0.3291
3					0.0875	0.1401	0.1743	0.1976	0.2141
4							0.0561	0.0947	0.1224
5									0.0399

i/n	11	12	13	14	15	16	17	18	19	20
1	0.5601	0.5475	0.5359	0.5251	0.5150	0.5056	0.4968	0.4886	0.4808	0.4734
2	0.3315	0.3325	0.3325	0.3318	0.3306	0.3290	0.3273	0.3253	0.3232	0.3211
3	0.2260	0.2347	0.2412	0.2460	0.2495	0.2521	0.2540	0.2553	0.2561	0.2565
4	0.1429	0.1586	0.1707	0.1802	0.1878	0.1939	0.1988	0.2027	0.2059	0.2085
5	0.0695	0.0922	0.1099	0.1240	0.1353	0.1447	0.1524	0.1587	0.1641	0.1686
6		0.0303	0.0539	0.0727	0.0880	0.1005	0.1109	0.1197	0.1271	0.1334
7				0.0240	0.0433	0.0593	0.0725	0.0837	0.0932	0.1013
8						0.0196	0.0359	0.0496	0.0612	0.0711
9								0.0163	0.0303	0.0422
10										0.0140

i/n	21	22	23	24	25	26	27	28	29	30
1	0.4643	0.4590	0.4542	0.4493	0.4450	0.4407	0.4366	0.4328	0.4291	0.4254
2	0.3185	0.3156	0.3126	0.3098	0.3069	0.3043	0.3018	0.2992	0.2968	0.2944
3	0.2578	0.2571	0.2563	0.2554	0.2543	0.2533	0.2522	0.2510	0.2499	0.2487
4	0.2119	0.2131	0.2139	0.2145	0.2148	0.2151	0.2152	0.2151	0.2150	0.2148
5	0.1736	0.1764	0.1787	0.1807	0.1822	0.1836	0.1848	0.1857	0.1864	0.1870
6	0.1399	0.1443	0.1480	0.1512	0.1539	0.1563	0.1584	0.1601	0.1616	0.1630
7	0.1092	0.1150	0.1201	0.1245	0.1283	0.1316	0.1346	0.1372	0.1395	0.1415
8	0.0804	0.0878	0.0941	0.0997	0.1046	0.1089	0.1128	0.1162	0.1192	0.1219
9	0.0530	0.0618	0.0696	0.0764	0.0823	0.0876	0.0923	0.0965	0.1002	0.1036
10	0.0263	0.0368	0.0459	0.0539	0.0610	0.0672	0.0728	0.0778	0.0822	0.0862
11		0.0122	0.0228	0.0321	0.0403	0.0476	0.0540	0.0596	0.0650	0.0697
12				0.0107	0.0200	0.0284	0.0358	0.0424	0.0483	0.0537
13						0.0094	0.0178	0.0253	0.0320	0.0381
14								0.0084	0.0159	0.0227
15										0.0076

i/n	31	32	33	34	35	36	37	38	39	40
1	0.4220	0.4188	0.4156	0.4127	0.4096	0.4068	0.4040	0.4015	0.9689	0.3964
2	0.2921	0.2898	0.2876	0.2854	0.2834	0.2813	0.2794	0.2774	0.2755	0.2737
3	0.2475	0.2463	0.2451	0.2439	0.2427	0.2415	0.2403	0.2391	0.2380	0.2368
4	0.2145	0.2141	0.2137	0.2132	0.2127	0.2121	0.2116	0.2110	0.2104	0.2098
5	0.1874	0.1878	0.1880	0.1882	0.1883	0.1883	0.1883	0.1881	0.1880	0.1878
6	0.1641	0.1651	0.1660	0.1667	0.1673	0.1678	0.1683	0.1686	0.1689	0.1691
7	0.1433	0.1449	0.1463	0.1475	0.1487	0.1496	0.1503	0.1513	0.1520	0.1526
8	0.1243	0.1265	0.1284	0.1301	0.1317	0.1331	0.1344	0.1356	0.1366	0.1376
9	0.1066	0.1093	0.1118	0.1140	0.1160	0.1179	0.1196	0.1211	0.1225	0.1237
10	0.0899	0.0931	0.0961	0.0988	0.1013	0.1036	0.1056	0.1075	0.1092	0.1108
11	0.0739	0.0777	0.0821	0.0844	0.0873	0.0900	0.0924	0.0947	0.0967	0.0986
12	0.0585	0.0629	0.0669	0.0706	0.0739	0.0770	0.0798	0.0824	0.0848	0.0870
13	0.0435	0.0485	0.0530	0.0572	0.0610	0.0645	0.0677	0.0706	0.0733	0.0759
14	0.0289	0.0344	0.0395	0.0441	0.0484	0.0523	0.0559	0.0592	0.0622	0.0651
15	0.0144	0.0206	0.0262	0.0314	0.0361	0.0404	0.0444	0.0481	0.0515	0.0546
16		0.0068	0.0131	0.0187	0.0239	0.0287	0.0331	0.0372	0.0409	0.0444
17				0.0062	0.0119	0.0172	0.0220	0.0264	0.0305	0.0343
18						0.0057	0.0110	0.0158	0.0203	0.0244
19								0.0053	0.0101	0.0146
20										0.0049

i/n	41	42	43	44	45	46	47	48	49	50
1	0.3940	0.3917	0.3894	0.3872	0.3850	0.3830	0.3808	0.3789	0.3770	0.3751
2	0.2719	0.2701	0.2684	0.2667	0.2651	0.2635	0.2620	0.2604	0.2589	0.2574
3	0.2357	0.2345	0.2334	0.2323	0.2313	0.2302	0.2291	0.2281	0.2271	0.2260
4	0.2091	0.2085	0.2078	0.2072	0.2065	0.2058	0.2052	0.2045	0.2038	0.2032
5	0.1876	0.1874	0.1871	0.1868	0.1865	0.1862	0.1859	0.1855	0.1851	0.1847
6	0.1693	0.1694	0.1695	0.1695	0.1696	0.1695	0.1695	0.1693	0.1692	0.1691
7	0.1531	0.1535	0.1539	0.1542	0.1545	0.1548	0.1550	0.1551	0.1553	0.1554
8	0.1384	0.1392	0.1398	0.1405	0.1410	0.1415	0.1420	0.1423	0.1427	0.1430
9	0.1249	0.1259	0.1269	0.1278	0.1286	0.1293	0.1300	0.1306	0.1312	0.1317
10	0.1123	0.1136	0.1149	0.1160	0.1170	0.1180	0.1189	0.1197	0.1205	0.1212
11	0.1004	0.1020	0.1035	0.1049	0.1062	0.1073	0.1085	0.1095	0.1105	0.1113
12	0.0891	0.0909	0.0927	0.0943	0.0959	0.0972	0.0986	0.0998	0.1010	0.1020
13	0.0782	0.0804	0.0824	0.0842	0.0860	0.0876	0.0892	0.0906	0.0919	0.0932
14	0.0677	0.0701	0.0724	0.0745	0.0775	0.0785	0.0801	0.0817	0.0832	0.0846
15	0.0575	0.0602	0.0628	0.0651	0.0673	0.0694	0.0713	0.0731	0.0748	0.0764
16	0.0476	0.0506	0.0534	0.0560	0.0584	0.0607	0.0628	0.0648	0.0667	0.0685
17	0.0379	0.0411	0.0442	0.0471	0.0497	0.0522	0.0546	0.0568	0.0588	0.0608
18	0.0283	0.0318	0.0352	0.0383	0.0412	0.0439	0.0465	0.0489	0.0511	0.0532
19	0.0188	0.0227	0.0263	0.0296	0.0328	0.0357	0.0385	0.0411	0.0436	0.0459
20	0.0094	0.0136	0.0175	0.0211	0.0245	0.0277	0.0307	0.0335	0.0361	0.0386
21		0.0045	0.0087	0.0126	0.0163	0.0197	0.0229	0.0259	0.0288	0.0314
22				0.0042	0.0081	0.0188	0.0153	0.0185	0.0215	0.0244
23						0.0039	0.0076	0.0111	0.0143	0.0174
24								0.0037	0.0071	0.0104
25										0.0350

Sample Calculations Table 2
PERCENTAGE POINTS OF THE W TEST FOR N=3 to 50

n	0.01	0.05
3	0.753	0.767
4	0.687	0.748
5	0.686	0.762
6	0.713	0.788
7	0.730	0.803
8	0.749	0.818
9	0.764	0.829
10	0.781	0.842
11	0.792	0.850
12	0.805	0.859
13	0.814	0.866
14	0.825	0.874
15	0.835	0.881
16	0.844	0.887
17	0.851	0.892
18	0.858	0.897
19	0.863	0.901
20	0.868	0.905
21	0.873	0.908
22	0.878	0.911
23	0.881	0.914
24	0.884	0.916
25	0.888	0.918
26	0.891	0.920
27	0.894	0.923
28	0.896	0.924
29	0.898	0.926
30	0.900	0.927

n	0.01	0.05
31	0.902	0.929
32	0.904	0.930
33	0.906	0.931
34	0.908	0.933
35	0.910	0.934
36	0.912	0.935
37	0.914	0.936
38	0.916	0.938
39	0.917	0.939
40	0.919	0.940
41	0.920	0.941
42	0.922	0.942
43	0.923	0.943
44	0.924	0.944
45	0.926	0.945
46	0.927	0.945
47	0.928	0.946
48	0.929	0.947
49	0.929	0.947
50	0.930	0.947

Sample Calculations Table 3

TOLERANCE FACTORS (K) FOR ONE-SIDED NORMAL TOLERANCE INTERVALS WITH CONFIDENCE FACTOR Y=0.95 AND COVERAGE P=95%

n	K	n	K
3	7.655	150	1.868
4	5.145	175	1.850
5	4.202	200	1.836
6	3.707	225	1.824
7	3.399	250	1.814
8	3.188	275	1.806
9	3.031	300	1.799
10	2.911	325	1.792
11	2.815	350	1.787
12	2.736	375	1.782
13	2.670	400	1.777
14	2.614	425	1.773
15	2.566	450	1.769
16	2.523	475	1.766
17	2.486	500	1.763
18	2.543	525	1.760
19	2.423	550	1.757
20	2.396	575	1.754
21	2.371	600	1.752
22	2.350	625	1.750
23	2.329	650	1.748
24	2.309	675	1.746
25	2.292	700	1.744
30	2.220	725	1.742
35	2.166	750	1.740
40	2.126	775	1.739
45	2.092	800	1.737
50	2.065	825	1.736
55	2.036	850	1.734
60	2.017	875	1.733
65	2.000	900	1.732
70	1.986	925	1.731
75	1.972	950	1.729
100	1.924	975	1.728
125	1.891	1000	1.727

APPENDIX F

DESCRIPTION OF POTENTIAL SOURCE AREAS IN THE NORTHERN REGION BY NSB-NLON

5090
Ser 1600.1111/RDC

MEMORANDUM

From: Environmental Department, Code 1602C
To: File

Subj: USE, STORAGE AND DISPOSAL OF HAZARDOUS MATERIALS AND WASTE AT NAVAL SUBMARINE BASE NEW LONDON WEAPONS COMPLEX

Encl: (1) Synopsis of interview with Naval Submarine Base New London Weapons Complex personnel concerning past use, storage and disposal of hazardous materials and waste.
(2) MSDSs for Chemical Compounds

1. Enclosure (1) provides anecdotal information on the subject topic for the purpose of assessing present day groundwater contamination at Naval Submarine Base New London (SUBASENLON). Enclosure (2) provides MSDSs for referenced chemical compounds used at the Weapons Complex.

2. This memorandum will be maintained on file with Installation Restoration records located at the SUBASENLON Environmental Department.

RICHARD CONANT
Biologist

SYNOPSIS OF INTERVIEW
WITH
NAVAL SUBMARINE BASE NEW LONDON WEAPONS COMPLEX PERSONNEL
CONCERNING
PAST USE, STORAGE AND DISPOSAL OF HAZARDOUS MATERIAL AND WASTE

1. Richard Conant of the SUBASENLON Environmental Department met informally with SUBASENLON Weapons Complex personnel on 6 Dec 00 to discuss past storage, handling and disposal of hazardous material and waste at the NSSF Weapons Complex. The personnel interviewed had a collective memory of events at the complex from the early 1980's until present day. The following is a review of each building site at the Weapons Complex:

a. Building 325, Torpedo maintenance and overhaul facility: Recollection of occasional spills/leaks of Otto fuel II(Propylene glycol dinitrate (76%), 2-nitrodiphenylamine (1.5%) and di-n-butyl sebacate (22.5%)) inside the facility, but no recall of any spills outside or adjacent to the building or of any exterior storage of Haz Mat/Haz Waste. Deep sinks in the building and all sanitary facilities were connected to leach fields located SW of the building from the time the building was constructed in 1951 until the time that the building was connected to town of Groton sewer system in 1983. The interviewed personnel were not stationed at the Weapons Complex prior to the early 1980s and could not provide information on disposal of any Haz Waste to the leach fields before the building was connected to town sanitary in 1983.
Heating oil stored in a 1000 gallon UST located south of Building 325 was determined to be leaking and taking on ground water in 1995. The tank was replaced at that time, but oil contamination in the tank grave indicated that some release to adjacent soils and ground water may have occurred over an undetermined period of time. A 15,000 gallon heating oil UST remains in place at the site and supplies heating oil for Building 325.

b. B-528 located immediately adjacent to B-325 contained Otto fuel reclamation tanks. These tanks underwent full RCRA closure in 1999. There was no recollection of any major spills in this facility or releases to the environment.

c. Otto fuel pipeline from B-450 to B-325: This 12" diameter ductile iron pipe transferred both virgin and reclaimed Otto fuel from storage tanks at B-450 to the torpedo shops in Building 325. There was no recollection of pipeline leaks or releases. The existing pipeline is partially buried and partially exposed above ground surface.

d. B-477 Storage Facility. This storage building is located due east of Building 450 and upgradient of Building 325 via a wide paved access road. This was a general enclosed storage area for hazardous materials. Weapons personnel can recall storage of steam turbine oil, a compound known as PD 680 (dry-cleaning compound), see enclosure (2), and 2190 engine lubricant in the building. There was recollection of a drum falling over and causing a spill, but apparently there was no release from the building and the spill was cleaned up.

e. Building 450. This building is located immediately north and upgradient of Building 325. The building has been used in the past for a variety of torpedo maintenance functions. The south side of the building contained a "PAX" machine in a covered open-sided shed that packed Otto fuel contaminated PPE and waste into 55-gallon drums. The full drums were then stored temporarily a designated waste accumulation site adjacent to Building 477 while awaiting off-site disposal. There was no recollection of spills in this area, but there could have been some contamination of the surrounding paved ground surfaces.

Immediately south of B-450, there was a three or six thousand-gallon tank of Otto fuel in a concrete secondary containment. Weapons personnel recollect some spills within the secondary containment, but those were promptly cleaned up.

A UST located immediately south of B-450 served as a "sump tank" for waste Otto fuel from torpedo maintenance operations inside of B-450. There was a "major" spill from this tank to the surrounding asphalt surface in 1986 when the UST was overfilled with waste Otto fuel and water. Spillage ran downslope on the pavement toward B-477, but was reportedly intercepted and cleaned up before it ran off the tarmac to the surrounding soils and grassy areas.

Outside the north side of Building 450, "Haz Flam" lockers stored a variety of hazardous materials including paints, freon, and 1,1,1 TCE solvent. There was also reportedly a PCB transformer situated on a concrete pad with no secondary containment. This transformer was

changed out in the last ten years with a non-PCB transformer. Weapons personnel could recall no spill incidents involving the transformer or the Haz Flam lockers.

Torpedo maintenance operations inside B-450 generated waste Otto fuel that was drained to the aforementioned UST. Solvents use to clean equipment in B-450 consisted of Precision Cleaning Solvent and CLP (Cleaner, Lubricant and Preservative or "Brake Free"), see enclosure (2). Liquid waste solvents may have been disposed of to deep sinks leading to the sanitary system or to the Otto fuel sump tank. No information was discerned as to whether the B-450 sanitary lines were a one time tied into the leach fields before all of the Weapons Complex was connected to town sewer in 1983.

f. B-524: This building was constructed in 1988 and has served primarily as administrative offices for the Weapons Complex, although some minor torpedo maintenance has been done in the building. Personnel remember that Hazardous Materials including paints, thinners, Precision Clean Solvent, PD-680 solvent, and Cleaner, Lubricant and Preservation (CLP), see enclosure (2), were stored in outside Haz Flam lockers and that some minor quantities of hazardous waste were generated at the site. B-524 has been connected to the town of Groton sanitary sewer system from its construction date.

DOD Hazardous Materials Information System
DoD 6050.5-LR
AS OF May 1993
Proprietary Version - For U.S. Government Use Only

CLP

9150
...: 010536688
nufacturer's CAGE: 6P177
rt No. Indicator: C
rt Number/Trade Name: BREAK-FREE CLP,LIQUID

SHML Data

em Status: AUTHORIZED FOR SHIPBOARD USE
ML FSC: 9150
ML NIIN: 010536688
solete NSN: N
placed by NSN: <blank>
menclature: CLEANER,LUBRICANT A
G: 9G - Tech Command, FMSO; Inventory Control Point, Defense General
pply Center
quisition Advice Code: D
ecial Matl. Content Code: T - Toxic
ecial Matl. Ident. Code: <blank>
HML Unit Of Issue: GL - Gallon
it Of Measure: <blank>
antity Per Unit Package: 4
helf Life: 7 (36 Months (Type II Extendable))
helf Life Action Code: <blank>
Of Storage: <blank>
fication: BREAK-FREE CLP
PmIG: 2057
emarks: <blank>

Nuclear Water Data

This is not a Nuclear Water Chemical NIIN.

Standard PMS Identification Number Data

PIN FSC: 9150
PIN NIIN: 010536688
PIN: 2057A

General Information

tem Name: CLEANER,LUBRICANT AND PRESERVATIVE
anufacturer's Name: SAN/BAR CORP.,BREAK-FREE DIV.
anufacturer's Street: 9999 MUIRLAND BLVD
anufacturer's P. O. Box:
anufacturer's City: IRVINE
anufacturer's State: CA
anufacturer's Country:
anufacturer's Zip Code: 92714
facturer's Emerg Ph #: 714-953-1900
facturer's Info Ph #: 714-953-1900
istributor/Vendor # 1:
istributor/Vendor # 1 Cage:

stributor/Vendor # 2:
stributor/Vendor # 2 Cage:
stributor/Vendor # 3:
ibutor/Vendor # 3 Cage:
ibutor/Vendor # 4:
stributor/Vendor # 4 Cage:
fety Data Action Code:
fety Focal Point: D
cord No. For Safety Entry: 004
t Safety Entries This Stk#: 006
atus: SE
te MSDS Prepared: 01OCT87
fety Data Review Date: 06FEB89
pply Item Manager: CX
SDS Preparer's Name:
eparer's Company:
eparer's St Or P. O. Box:
eparer's City:
eparer's State:
eparer's Zip Code:
ther MSDS Number:
SDS Serial Number: BGJGM
pecification Number: MIL-L-63460
pec Type, Grade, Class: N/K
azard Characteristic Code: N1
nit Of Issue: GL
nit Of Issue Container Qty: 1 GAL
ype Of Container: POLY BOTTLE
Unit Weight: 7.50 LB
State License Number: N/R
et Explosive Weight:
et Propellant Weight-Ammo: N/R
oast Guard Ammunition Code:

==========

Ingredients/Identity Information

==========

roprietary: NO
ngredient: SYNTHETIC & PARAFFINIC OILS
ngredient Sequence Number: 01
ercent: <70
ngredient Action Code:
ngredient Focal Point: D
IOSH (RTECS) Number: 10020540I
AS Number:
SHA PEL: 5 MG/M3 OIL MIST
CGIH TLV: 5 MG/M3 OIL MIST
ther Recommended Limit:

---

roprietary: NO
ngredient: N-BUTYL ACETATE (SARA III)
ngredient Sequence Number: 02
ercent: <5
ngredient Action Code:
edient Focal Point: D
H (RTECS) Number: AF7350000
AS Number: 123-86-4
SHA PEL: 150 PPM/200 STEL

IH TLV: 150 PPM/200STEL;9192
er Recommended Limit:
---
rietary: NO
dient: 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE (FREON 113) (SARA III)
edient Sequence Number: 03
cent: <10
gredient Action Code:
gredient Focal Point: D
OSH (RTECS) Number: KJ4000000
S Number: 76-13-1
HA PEL: 1000PPM/1250STEL
GIH TLV: 1000PPM/1250STEL9192
her Recommended Limit: ACGIH STEL 1250 PPM
---
oprietary: NO
gredient: METHYL CHLOROFORM (1,1,1-TRICHLOROEHANE) (SARA III)
gredient Sequence Number: 04
rcent: <20
gredient Action Code:
gredient Focal Point: D
OSH (RTECS) Number: KJ2975000
S Number: 71-55-6
HA PEL: 350 PPM/450 STEL
GIH TLV: 350 PPM/450STEL;9192
her Recommended Limit:
---
roprietary: NO
edient: ISOPROPYL ALCOHOL (SARA III)
dient Sequence Number: 05
ercent: <5
ngredient Action Code:
ngredient Focal Point: D
IOSH (RTECS) Number: NT8050000
AS Number: 67-63-0
SHA PEL: 400 PPM/500 STEL
CGIH TLV: 400 PPM/500STEL;9192
ther Recommended Limit:
---
roprietary: NO
ngredient: TRICRESYL PHOSPHATE (NIOSH NO BY HMIS - CAS NO BY MFR) (<1% RTHO ISOMER)
ngredient Sequence Number: 06
ercent: <5
ngredient Action Code:
ngredient Focal Point: D
IOSH (RTECS) Number: TD0175000
AS Number: 68952-35-2
SHA PEL: NOT ESTABLISHED
CGIH TLV: NOT ESTABLISHED
ther Recommended Limit:
==========
Physical/Chemical Characteristics
==========
rance And Odor: LIGHT AMBER LIQUID,SLIGHT ODOR
oiling Point: 140F/60CIBP
elting Point: <-75F/-59C

or Pressure (MM Hg/70 F): N/K
or Density (Air=1): 2.4
cific Gravity: 0.9
position Temperature: N/K
ration Rate And Ref: N/K
ubility In Water: <1%
rcent Volatiles By Volume: N/K
scosity:
: N/K
dioactivity:
rm (Radioactive Matl):
gnetism (Milligauss):
rrosion Rate (IPY):
toignition Temperature:

Fire and Explosion Hazard Data

ash Point: >200F/93C
ash Point Method: TCC
wer Explosive Limit: N/K
per Explosive Limit: N/K
tinguishing Media: CARBON DIOXIDE,DRY CHEMICAL,FOAM,WATER SPRAY
ecial Fire Fighting Proc: WEAR SELF CONTAINED BREATHING APPARATUS. USE
TER SPRAY TO DISPERSE UNIGNITED VAPORS.
usual Fire And Expl Hazrds: VAPOR IS HEAVIER THAN AIR AND MAY
"LASHBACK" FROM IGNITION SOURCE.

Reactivity Data

lity: YES
ond To Avoid (Stability): HIGH,TEMPERATURES,IGNITION SOURCES
aterials To Avoid: STRONG OXIDIZERS
azardous Decomp Products: NORMAL PRODUCTS OF COMBUSTION PLUS HYDROGEN
HLORIDE,PHOSGENE
azardous Poly Occur: NO
onditions To Avoid (Poly): N/R

Health Hazard Data

D50-LC50 Mixture: N/K
oute Of Entry - Inhalation: YES
oute Of Entry - Skin: YES
oute Of Entry - Ingestion: YES
ealth Haz Acute And Chronic: PRODUCT IS MILDLY IRRITATING AND ONLY
LIGHTLY TOXIC. REPEATED HIGH OR OVER EXPOSURES MAY CAUSE LIVER OR KIDNEY
AMAGE.
arcinogenicity - NTP: NO
arcinogenicity - IARC: NO
arcinogenicity - OSHA: NO
xplanation Carcinogenicity: INGREDIENTS HAVE BEEN TESTED BUT RESULTS HAVE
EEN INCONCLUSIVE.
igns/Symptoms Of Overexp: EYE:IRRITATION. SKIN:DRYING,POSSIBLE SYSTEMIC
FFECTS DUE TO ABSORPTION THROUGH SKIN. INHALED:RESPIRATORY
TATION,LIGHT HEADED,DIZZINESS,NAUSEA,POSSIBLE HEART ARRYTHMAS.
STED:G/I IRRITATION.VOMITING MAY RESULT IN ASPIRATION.
ed Cond Aggravated By Exp: PRE-EXISTING SKIN,EYE,RESPIRATORY DISORDERS.
mergency/First Aid Proc: EYE:FLUSH WITH WATER 15 MIN. SKIN:WASH WITH SOAP

WATER. REMOVE CONTAMINATED CLOTHING & LAUNDER BEFORE REUSE. INHALED: MOVE FROM EXPOSURE. INGESTED:DO NOT INDUCE VOMITING. GIVE WATER AND GET DICAL ATTENTION. IF ANY SYMPTOMS PERSIST OR ARE SEVERE,GET MEDICAL NTION.

==========

Precautions for Safe Handling and Use

==========

.eps If Matl Released/Spill: WIPE UP OR ABSORB WITH INERT MATERIAL. STORE I CLOSED CONTAINERS AWAY FROM IGNITION SOURCES.

utralizing Agent: NONE

aste Disposal Method: DISPOSE I/A/W FEDERAL,STATE,LOCAL REGULATIONS. DO OT DUMP INTO SEWER,ON GROUND,OR IN WATERSUPPLY,RIVER,STREAM,ETC. HMIS GGESTS INCINERATION.

recautions-Handling/Storing: DO NOT STORE ABOVE 120F/49C. DO NOT STORE OR SE NEAR OPEN FLAME. STORE IN WELL VENTILATED AREA.

ther Precautions: VAPORS ARE HEAVIER THAN AIR. USE CAUTION IN LOW OR NCLOSED AREAS WHERE VAPORS MAY ACCUMULATE,EXCLUDING OXYGEN THUS CAUSE JFFOCATION. USE GOOD SAFETY PRACTICE.

==========

Control Measures

==========

espiratory Protection: USE NIOSH RESPIRATOR WITH CANISTER FOR ORGANIC APORS WHEN EXPOSED ABOVE TLV.

entilation: NORMAL ROOM VENTILATION EXPECTED TO BE SUFFICIENT.

rotective Gloves: RUBBER/PLASTIC

ye Protection: SAFETY GLASSES

ther Protective Equipment: GOGGLES AND/OR RUBBER/PLASTIC CLOTHING FOR OBS WITH HIGH SPLASH HAZARD.

Hygienic Practices: USE GOOD CHEMICAL HYGIENE PRACTICE.

.. Safety & Health Data: PEL & TLV FOR O-TRICRESYL PHOSPHATE IS 0.5 G/M3(SKIN). MFR CLAIMS <1% ORTHO ISOMER.

==========

Transportation Data

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ransportation Action Code:

ransportation Focal Point: D

rans Data Review Date: 91184

OT PSN Code: ZZZ

OT Proper Shipping Name: NOT REGULATED FOR THIS MODE OF TRANSPORTATION

OT Class: N/R

OT Label: N/R

imited Quantity: NO

OT Mode Indicator:

dentification Number: N/R

eportable Qty - Trans File: NO

OT/DoD Exemption Number:

MO PSN Code: ZZZ

MO Proper Shipping Name: NOT REGULATED FOR THIS MODE OF TRANSPORTATION

MO Regulations Page Number: N/R

MO UN Number: N/R

MO UN Class: N/R

MO Subsidiary Risk Label: N/R

ATA PSN Code: ZZZ

UN ID Number: N/R

Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION

ATA UN Class: N/R

ATA Subsidiary Risk Class: N/R

\ Label: N/R
71-4 PSN Code: ZZZ
71-4 Prop. Shipping Name: NOT REGULATED FOR THIS MODE OF
PORTATION
1-4 Class: N/R
71-4 Label: N/R
71-4 ID Number: N/R
MMAC Code:
h Entry NOS Shipping Name:
itional Trans Data:

Disposal Data

sposal Data Action Code:
sposal Data Focal Point:
sposal Data Review Date:
For This Disp Entry:
Disp Entries This Stock#:
dfill Ban Item:
sposal Supplemental Data:
t EPA Haz Wst Code UnUsed:
t EPA Haz Wst Name UnUsed:
t EPA Haz Wst Char UnUsed:
t EPA Acute Hazard UnUsed:
d EPA Haz Wst Code UnUsed:
d EPA Haz Wst Name UnUsed:
d EPA Haz Wst Char UnUsed:
d EPA Acute Hazard UnUsed:
EPA Haz Wst Code UnUsed:
PA Haz Wst Name UnUsed:
d EPA Haz Wst Char UnUsed:
d EPA Acute Hazard UnUsed:

Label Data

abel Required: YES
ate of Technical Review: 24AUG90
abel Date: UNDATED
anufacturer's Label No.: N/R
abel Status: D
mmon Name of Product: BREAK-FREE CLP, LIQUID (POST OCT 87)
hronic Hazard: UNK
ignal Word: CAUTION!
cute Health Hazard-None:
cute Health Hazard-Slight: X
cute Health Hazard-Moderate:
cute Health Hazard-Severe:
ontact Hazard-None:
ontact Hazard-Slight: X
ontact Hazard-Moderate:
ontact Hazard-Severe:
ire Hazard-None:
ire Hazard-Slight: X
Hazard-Moderate:
Hazard-Severe:
eactivity Hazard-None: X
eactivity Hazard-Slight:

activity Hazard-Moderate:
activity Hazard-Severe:
ecial Hazard Precautions: COMBUSTIBLE LIQUID. CONTAINS SYNTHETIC OILS IN CARBON AND ORGANIC SOLVENTS. LIQUID CONTACT MAY CAUSE EYES AND SKIN ATION. VAPOR INHALATION MAY CAUSE RESPIRATORY TRACT IRRITATION. MAY .SE DIZZINESS, LIGHT HEADEDNESS, POSSIBLE CNS DEPRESSION. HARMFUL IF ALLOWED. GET MEDICAL ASSISTANCE IF SYMPTOMS PERSIST. AVOID CONTACT WITH IN AND CLOTHING. KEEP CONTAINERS TIGHTLY CLOSED WHEN NOT IN USE. KEEP AY FROM OXIDIZERS, HEAT AND ALL SOURCES OF IGNITION. IN CASE OF FIRE, USE TER SPRAY, FOAM, DRY CHEMICAL, OR CARBON DIOXIDE. USE IN WELL VENTILATED EA. DO NOT FLUSH SPILLED MATERIAL TO SEWER. DISPOSE OF EMPTY BOTTLES AS ZARDOUS MATL.
otect Eye: X
otect Skin: X
otect Respiratory: X
fg's Name From Label: SAN/BAR CORP BREAK-FREE DIVISION
fg's Street From Label: 9999 MUIRLAND BLVD
fg's P.O. Box From Label:
fg's City From Label: IRVINE
fg's State From Label: CA
fg's Zip Code From Label: 92714
fg's Country From Label: US
nergency Ph. No. From Label: 714-953-1900
ear Procured:

MSDS Safety Information

T

FSC: 6850 **NIIN:** 00-274-5421 **MSDS Date:** 07/20/1994 **MSDS Num:** BQKPD
Submitter: D DG **Tech Review:** 11/24/1997 **Status CD:** C
Product ID: 84044 SHELL SOL 142HT (SUR DRI)(PD680 TYPE II) **MFN:** 02
Article: N **Kit Part:** N PD-680

Responsible Party **Cage:** 54527
Name: SHELL OIL COMPANY
Address: 1 SHELL PLAZA **Box:** 2463
City: HOUSTON **State:** TX **Zip:** 77001
Country: US
Info Phone Number: 713-241-4819/4141/2252 FAX -6511
Emergency Phone Number: 800-424-9300(CHEMTREC)/713-473-9461
Preparer's Name: J.C.WILLETT
Proprietary Ind: N **Review Ind:** Y
Published: Y **Special Project CD:** N

Preparer Co. when other than Responsible Party Co.

Cage: 54527 **Assigned Ind:** N
Name: SHELL OIL COMPANY
Address: **Box:** 2463
City: HOUSTON **State:** TX **Zip:** 77210

Contractor Summary

T

Cage: 0A9L8 **Name:** HOME OIL COMPANY, INC.
Address: 3511 N. OHIO **Box:** 2609
City: WICHITA **State:** KS **Zip:** 67201-2609
Country: US **Phone:** 316-838-4663/316-832-1211FAX

Cage: 54527 **Name:** SHELL OIL COMPANY
Box: 2463
City: HOUSTON **State:** TX **Zip:** 77210
Country: US **Phone:** 800-231-6950

Item Description Information

Item Manager: S9G
Item Name: DRY CLEANING SOLVENT
Specification Number: NK **Type/Grade/Class:** NK
Unit of Issue: CN **Quantitative Expression:** 00000000005GL
UI Container Qty: NK **Type of Container:**

Ingredients

Cas: 64742-88-7 Code: M RTECS #: 1003692SN Code: M

Name: SHELL SOL 142 HT (COMPLEX COMBINATION OF PREDOMINANTLY C9-C12 HYDROCARBONS;EXACT COMPOSITION WILL VARY)

% Text: 100 Environmental Wt:

Other REC Limits: NONE RECOMMENDED

OSHA PEL: NOT ESTABLISHED Code: M OSHA STEL: Code:

ACGIH TLV: NOT ESTABLISHED Code: M ACGIH STEL: N/P Code:

EPA Rpt Qty: DOT Rpt Qty:

Ozone Depleting Chemical: N

Health Hazards Data

LD50 LC50 Mixture ORAL RAT LD50 >25MG/KG (SIMILAR PRODUCT)

Route Of Entry Inds - Inhalation: YES Skin: YES Ingestion: YES

Carcinogenicity Inds - NTP: NO IARC: NO OSHA: NO

Health Hazards Acute And Chronic

EYE:LIQ PRACTICALLY NON-IRRIT.SKIN:LIQ SLIGHTLY IRRIT,PROL/REP CONTACT CAN RESULT IN DEFATTING,DRYING OF SKIN RESULTING IN IRRIT,DERM.INHAL:VAP MAY CAUSE IRRIT TO NOSE/THROAT/RESP TRACT.HIGH VAPOR CONCEN MAY RESULT IN CNS DEPRESS.INGEST:MAY RESULT IN VOMT,ASPIRAITON OF VOMITUS INTO LUNGS AVOIDED EVEN SM QUANT(SUPPLE)

Explanation Of Carcinogenicity

NOT A CARCINOGEN.

Signs And Symptions Of Overexposure

IRRIT AS NOTED ABOVE.EARLY TO MODERATE CNS DEPRESS EVIDENCED BY GIDDINESS,HEAD,DIZZ,NAU.IN EXTREME CASES UNCOSNC,DEATH MAY OCCUR.ASPIRAITON PNEUMONITIS MAY BE EVIDENCED BY COUG,LABOR BREATING,CYANOSIS(BLUISH SKIN);SEVERE CASES DEATH MAY OCC UR.

Medical Cond Aggravated By Exposure

PRE-EXISTING EYE,SKIN,RESPIRATORY DISORDERS MAY BE AGGRAVATED BY EXPO TO THIS PRODUCT.

First Aid

EYE:FLUSH W/PLENTY OF WATER FOR 15MINS,HOLDING EYELIDS OPN.GET MED ATTN.SKIN:REMOVE CONTAM CLOTH/SOES.FOUSH W/WATER,FOLLOW BY WASH W/SOAP/WATER.IRRIT OCCURS GET MED ATTN.INHA:REMOVE TO FRESH AIR.BREATH DIFFI PROVIDE OXY;NOT BREATH GIVE ART RESP.INGEST:DOT INDUCE VOMIT.IF OCCURS SPONT KEEP HEAD BELOW HIPS TO PREVENT ASPIRATION OF LIQ INTO LUNGS.GET MED ATTN.NOTE TO DR:>2.0ML/KG INGEST,VOMIT(SUPPL)

Spill Release Procedures

CAUT-COMBUST.LG:REMOVE POT IGN SOURCES.WEAR APPROP RES/PORT CLOTH.SHUTOFF SOURCE W/RISK.DIKE/CONTAIN.REMOVE W/VACUUM TRUCKS/PUMP TO STORAGE/SALVAGE VESSEL.SOAKUP RESIDUE W/ABSORBENT(CLAY,SAND,SUITABLE MATL).PLACE IN NON LEAK CNTNR,SEAL TIGH T(NEUTRA)

Neutralizing Agent

SPILL:PROPER DISPO.SM:TAKEUP W/ABSORBENT,PLACE IN NONLEAK CNTNR FOR PROPER DISPO

Waste Disposal Methods

UNDER EPA-CWA PROD CLASSIFIED AS OIL UNDER SEC 311.SPILLS INTO/LEAD TO SURF H2O THAT CAUSE SHEEN MUST BE REPORTED TO NAT RESP CNTR 800-424-8802.PROD WASTE NOT HAZ BY RCRA.PLACE IN APPROP DISPO FACILI ICW LOC REGS.

Handling And Storage Precautions

KEEP LIQ/VAP AWAY FRM HEAT/SPARK/FLAME.SURF SUFFFI HOT MAY IGN LIQ IN ABSENCE OF IGN SOURCE.EXT PILOTLITE,CIGARETTES,TURN OFF IGN SOURCE (OTHER PREC)

Other Precautions

PRIOR TO USE/TIL VAP GONE.VAP MAY ACCUMUL/TRAVEL TO IGNSOURCE DISTANT FRM HDNLG SITE:FLASHFIRE RESULT.KEEP CNTNR CLSD WHEN NOT INUSE.USE W/ADEQU VENTI.CNTNR CONTAIN EPXLO VAP EVEN EMPTIED.DONTCUT/DRILL/GRIND/ETC ON/NEAR CNTNR.GROUND/BOND

Fire and Explosion Hazard Information

T

Flash Point Method: TCC

Flash Point: **Flash Point Text:** 145F,63C

Autoignition Temp: **Autoignition Temp Text:** NP

Lower Limits: 1 **Upper Limits:** 7

Extinguishing Media

USE WATER FOG,FOAM,DRY CHEMICAL,CO2.DONT USE DIRECT STREAM OF WATER.PRODUCT WILL FLOAT & CAN BE REIGN ON SURF OF WATER.

Fire Fighting Procedures

CAUT-COMBUST.DONT ENTER CONF FIRE SPACE W/O FULL BUNKER GEAR(HELMET,FCSHIELD,BUNKER COAT,GLOV,RUBB BOOTS)INCLUDE +PRESS NIOSH APPROV SCBA.COOL FIRE EXPO (SUPPL)

Unusual Fire/Explosion Hazard

CNTNR EXPO TO INTENSE HEAT FRM FIRES SHOULD BE COOL W/H2O-PREVENT VAP PRESSUE BUILDUP RESULT IN RUPTURE.CNTNR AREA EXPO TO DIRECT FLAME CONTACT SHOULD (SUPPLE)

Control Measures

T

Respiratory Protection

AVOID PROL/REP VAP BREATH.IF IEXPO MAY/DOES EXCEED OCCUPAT EXPO LIMITS USE NIOSH-APPROV RESP TO PREVENT OVEREXPO.IAW 29CFR1910.134 USE EITHER ATMOSPHER0SUPP RESP OR AIR-PURIFY RESP FOR ORGANIC VAPORS.

Ventilation

USE EXPLO-PROOF VENTIALTION AS REQUIRED TO CONTROL VAPOR CONCEN.

Protective Gloves

CHEM-RESIST GLVOES-NITRILE MATL.

Eye Protection

SAF GLASSES OR GOGG AS APPROPRIATE.

Other Protective Equipment

OTHER CLOTHING AS REQUIRED TO MIN CONTACT-NITRILE MATL.STATIC ELECTR MAY ACCUMULATE,CREATE FIRE HAZ.

Work Hygienic Practices

AIR DRY CONTAM CLOTH IN WELL VENTI AREA THEN LAUNDER BEF REUSE.WASH W/SOAP/H2O BEF EAT/DRINK/SMOKE/COSMETIC/USE TOILET.

Supplemental Safety and Health

FIRE/EXPLO:COOL W/LG H2O QUANT-PREVENT STRUCTURE WEAK.
FIREFIGHT:CNTNR W/H2O. HEALTH:MAY RESULT IN ASPIRA PNEUITIS.
1STAID:HASNT OCCUR,EMESIS SHOULD BE INDUCE W/SUPERVISION.KEEP VICTIMS HEAD BEL HIPS-PREVENT ASPIRA.SYMTP(LOSS OF GAG REFLEX, CONVULS,UNCONS)OCCUR BEF EMESIS GASTRIC LAVAGE W/CUFF ENDOTRACEAL TUBE CONSIDER

Physical/Chemical Properties

HCC: V4 **NRC/State LIC No:** N/R
Net Prop WT For Ammo: N/R

Boiling Point: **B.P. Text:** 350F,177C
Melt/Freeze Pt: **M.P/F.P Text:** N/AVAI
Decomp Temp: **Decomp Text:** NP
Vapor Pres: <5 @110F **Vapor Density:** 5.3
Volatile Org Content %: **Spec Gravity:** 0.79
VOC Pounds/Gallon: **PH:** NP
VOC Grams/Liter: **Viscosity:** NP
Evaporation Rate & Reference: 0.03, BUTYL ACETATE=1
Solubility in Water: NEGLIGIBLE
Appearance and Odor: LIGHT COLORED LIQUID, HYDROCARBON ODOR
Percent Volatiles by Volume: NP **Corrosion Rate:** NP

Reactivity Data

T

Stability Indicator: YES
Stability Condition To Avoid: AVOID HEAT,FLAME AND CONTACT W/STRONG OXIDIZING AGENTS.
Materials To Avoid: STRONG OXIDIZING AGENTS.
Hazardous Decomposition Products: CARBON MONOXIDE AND UNIDENTIFIED ORGANIC CMPDS MAY BE FORMED DURING COMBUSTION.
Hazardous Polymerization Indicator: NO
Conditions To Avoid Polymerization: NOT APPLICABLE

Toxicological Information

T

Toxicological Information: N/P

Ecological Information

T

Ecological: N/P

MSDS Transport Information

Transport Information: N/P

Regulatory Information

Sara Title III Information: N/P
Federal Regulatory Information: N/P
State Regulatory Information: N/P

Other Information

Other Information: N/P

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HMIS Sponsored by
DEFENSE SUPPLY CENTER RICHMOND

Miller-stephenson

Material Safety Data Sheet

Precision Cleaning Solvent?

IDENTIFICATION

Name: MS-941/CO_2
Safezone® Precision Cleaning Solvent

Chemical Family: Halogenated Hydrocarbon

SARA/TITLE III STATUS:
Reported/Included.

Formula: CH_3CCL_2F CO_2

TSCA Inventory Status:
Reported.

MANUFACTURER/DISTRIBUTOR:
Miller-Stephenson Chemical
George Washington Highway
Danbury, Conn. 06810

Medical Emergency Phone:
(203) 797-2212

Transportation Emergency Phone:
(800) 424-9300

PHYSICAL DATA:

Boiling Point (°F): 90°F/32°C

Percent Volatile by Volume: 100

Density: 1.23 g/cc at 77°F

Vapor Pressure: 10 psia at 70°F

Vapor Density (Air=1): 4.0

Solubility in H_2O: N.A.

pH Information: N.A.

Evaporation Rate (CC14=1): >1

Form: Liquid

Appearance: Clear

Color: Colorless

Odor: Faint Ethereal

HAZARDOUS COMPONENTS:

Material (s):	CAS No.:	Approximate %:
1,1-dichloro-1-fluoroethane	1717-00-6	97
Carbon Dioxide	124-38-9	3

HAZARDOUS REACTIVITY

Stability: Stable at normal temperatures and conditions of storage. However, the product is unstable to high temperatures (>175°F) and flames.

Incompatibility: Reacts with caustics, certain molecular sieves, slowly releasing small amounts of toxic unsaturates, including vinylidene chloride which can form an explosive peroxides if exposed to air.

Decomposition: This product can be decomposed by high temperatures (flames, glowing metal surfaces, etc.) forming hydrogen fluoride, hydrogen chloride, and possibly chlorine.

Polymerization: Will not occur.

FIRE AND EXPLOSION DATA

Flash Point: None. **Method:** CC

Autoignition Temperature: 617°F/325°C **Flammable Limits in Air, % by Vol.:** LEL: 6.4; UEL 15.1

Autodecompostion Temperature: Not Determined.

Fire and Explosion: Vapors are heavier than air and may travel to a source of ignition and flash back. Avoid high temperatures and static charges. Containers have pressure and temperature relief devices, but still may rupture under fire conditions. Explosion is possible. Use water spray to cool containers.

Extinguishing Media: Water spray or fog, "alcohol" foam, dry chemical or carbon dioxide.

Special Fire Fighting Instruction: Stop flow of gas; do not put out fire unless leak can be stopped immediately. Use water spray or fog to protect the firefighters and to cool containers. Wear self-contained breathing apparatus (SCBA).

HEALTH HAZARD INFORMATION

PRINCIPAL HEALTH HAZARDS: (INCLUDING SIGNIFICANT ROUTES, EFFECTS SYMPTOMS OF OVER-EXPOSURE, AND MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE.)

Inhalation of high concentrations of vapor may be harmful and may cause heart irregularities, unconsciousness, or death. Intentional misuse can be fatal. Vapor reduces oxygen available for breathing and is heavier than air.

Animal Data:	Inhalation 4-hour LC 50:	61,647 ppm in rats.
	Skin absorption LD 50:	>2,000 mg/kg in rabbits.
	Oral LD 50:	>5,000 mg/kg in rats.

This compound is not a skin irritant, is a mild eye irritant, and is not a skin sensitizer in animals.

Effects in animals from single inhalation exposures to high doses include anesthesia and transient effects on kidney function. Cardiac sensitization occurred in dogs and monkeys exposed to concentrations of 5,000 ppm and above. Repeated inhalation exposure of rats to 10,000 ppm of HCFC-141b produced reversible hematological effects and slight reversible alterations in clinical chemical parameters. A single skin application produced body weight loss, mild erythema, and slightly swollen livers. A single high oral dose resulted in slight body weight loss and swollen livers.

Animal studies to evaluate HCFC-141b for potential carcinogenic and reproductive effects are currently underway. Animal testing indicates this compound can produce developmental toxicity but only at maternally toxic dose levels.

HCFC-141b does not produce genetic damage in bacterial cell cultures or in animals. However, one test in a mammalian cell culture (CHO) did report evidence of genetic damage while another (Human Lymphocyte Assay) did not. The compound has not been tested for heritable genetic damage.

Human Health Effects: Repeated skin contact may cause irritation with discomfort or rash. Significant skin permeation, and systemic toxicity after contact appears unlikely. Contact with the eye may cause irritation with discomfort, tearing, or blurring of vision.

Higher inhalation exposures to HCFC-141b may lead to anesthetic effects such as dizziness, headache, confusion, incoordination of the heart's electrical activity with irregular pulse, palpitations or inadequate circulation.

P 4

Carcinogenicity: None of the components in this material is listed by IARC, NTP, OSHA or ACGIH as a carcinogen.

Exposure Limits:	TLV (ACGIH)	PEL (OSHA)	AEL (DuPont)
1,1-dichloro-1-fluoroethane	None Established	None Established	500 ppm
Carbon Dioxide	5000 ppm	5000 ppm	5000 ppm

Safety Precautions: Use with sufficient ventilation to keep employee exposures below the recommended limit.

FIRST AID:

Inhalation: If high concentrations of vapor inhaled, immediately remove to fresh air. Keep persons calm. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

Eye: Immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

Skin: Flush skin with water after excessive contact. Wash contaminated clothing before reuse.

Oral: No specific intervention is indicated as the compound is not likely to be hazardous by ingestion. However, consult a physician if necessary.

Note to Physician: Because of possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, should be considered only as a last resort in life threatening emergencies.

PROTECTION INFORMATION:

Generally Applicable Control Measures: Use with sufficient ventilation to keep employee exposure below the recommended exposure limit, especially for enclosed and low places.

Personal Protective Equipment: Butyl rubber gloves and chemical splash goggles should be used when handling. Adequate ventilation is required to control exposures below permissible limits.

DISPOSAL INFORMATION:

Aquatic Toxicity: N.A.

Spill, Leak or Release: Ventilate area. Do not flush into sewers. Dike spill. Collect on absorbent material and transfer to steel drums for recovery or disposal.

Waste Disposal: Comply with federal, state and local regulations. Do not puncture or incinerate cans.

SHIPPING INFORMATION:	DOMESTIC (DOT)	INTERNATIONAL AIR (IATA)
Proper Shipping Name:	Compressed Gas, N.O.S. (Carbon Dioxide)	Aerosols, Non-Flammable N.O.S.
Hazard Class:	Non-Flammable Gas, 2	Non-Flammable Gas, 2
UN #:	1956	1950
DOT/IATA Label:	Non-Flammable Gas	Non-Flammable Gas

ADDITIONAL INFORMATION:

Storage Conditions: Do not store near sources of heat, in direct sunlight or where temperatures exceed 120°F/49°C. Rotate stock to shelf life of one year.

NPCA-HMIS Ratings:

Health	- 1
Flammability	- 0
Reactivity	- 1

Personal Protection rating to be supplied by user depending on use conditions.

SARA/TITLE III HAZARD CATAGORIES AND LIST:

Product Hazard Catagories:

Acute Health	- Yes
Chronic Health-	- No
Fire Hazard	- No
Reactivity Hazard	- No
Pressure Hazard	- Yes

Lists:

Extremely Hazardous Substance	- No
CERCLA Hazardous Substance	- No
Toxic Chemicals	- No

Date Revised: May 1992

Person Responsible: Joanna Saffo
Miller-Stephenson Chemical Company, Inc.
George Washington Highway
Danbury, Connecticut 06810 U.S.A.
(203) 743-4447

MATERIAL SAFETY DATA SHEET FOR U.S.A. AND CANADA

SECTION I – PRODUCT INFORMATION

Safety-Kleen Corp. - 777 Big Timber Road - Elgin, IL, U.S.A. 60123
Safety-Kleen Canada Inc. - 3090 Blvd. Le Carrefour - Suite 300 - Chomedy Laval Quebec, Canada H7T
For Product Technical Information Call 312-694-2700 (U.S.A.);
800-363-2260 (Eastern Canada); 514-686-2040 (Western Provinces/Call Collect)

PCE/TCE

24-HOUR EMERGENCY TELEPHONE	*MEDICAL:*	*TRANSPORTATION:*
These numbers are for emergency use only. If you desire non-emergency information about this product, please call a telephone number listed above.	800-752-7869 (U.S.A.) 312-942-5969 (CANADA) RUSH POISON CONTROL CENTER CHICAGO, ILLINOIS, U.S.A.	708-888-4660 (U.S.A.) SAFETY-KLEEN ENVIRONMENT, HEALTH AND SAFETY DEPARTMENT 613-996-6666 (CANADA) CANUTEC

IDENTITY (TRADE NAME): SAFETY-KLEEN 105 SOLVENT

SYNONYMS: PETROLEUM DISTILLATES, PETROLEUM NAPHTHA, MINERAL SPIRITS, STODDARD SOLVENT

SK PART NUMBER: 6617

FAMILY/CHEMICAL NAME: HYDROCARBON SOLVENT

PRODUCT USAGE: SOLVENT FOR CLEANING AND DEGREASING PARTS

SECTION II – HAZARDOUS COMPONENTS

NAME	SYNONYM	Wt. %	CAS NO.	OSHA PEL TWA (ppm)	OSHA PEL STEL (ppm)	ACGIH TLV TWA (ppm)	ACGIH TLV STEL (ppm)	LD50[a]	LC[illegible]
Parts Washer Solvent (Consists predominantly of C9-C13 Saturated Hydrocarbons)	Mineral Spirits	85.0	64741-41-9	100 **	N.Av.	100 **	N.Av.	> 5000**	3400**
C8+ Aromatics		12.0	Mixture	N.Av.	N.Av.	N.Av.	N.Av.	N.Av.	N.Av.
*Toluene		0.5	108-88-3	100	150	100	150	5000	4000
*Xylene		1.0	1330-20-7	100	150	100	150	4300	5000
*Ethyl Benzene		0.5	100-41-4	100	125	100	125	3500	4000[c]
*1,1,1 Trichloroethane	Methyl Chloroform	0-0.5***	71-55-6	350	450	350	450	10300	18000
*Perchloroethylene	Tetrachloroethylene	0-0.5***	127-18-4	25	N.Av.	50	200	2629	4000[c]
Total Chlorinated Solvents		0-1.0***							

D039

N.Av. = Not available.
* See Section X - Other Regulatory Information
**For Stoddard Solvent
***Even though the concentration range does not fall under the ranges prescribed by WHMIS, this is the actual range which varies with each batch of the product.

[a] Oral-Rat LD50 (mg/kg)
[b] Inhalation-Rat LC50 (ppm/4 hours)
[c] Inhalation-Rat LCLo (ppm/4 hours)

SECTION III – PHYSICAL DATA

SICAL STATE, PEARANCE AND ODOR:	Combustible liquid, clear, green, with characteristic hydrocarbon odor.
ODOR THRESHOLD:	Not available.
BOILING POINT:	304-435°F (151-224°C).
VAPOR PRESSURE:	2 mm Hg at 68°F (20°C).
FREEZING POINT:	Not available.
EVAPORATION RATE:	0.1 (Butyl Acetate = 1).
VOLATILE:	99.9%
VOLATILE ORGANIC COMPOUNDS:	6.4 to 6.7 lbs/gal; 770 to 800 g/l
DENSITY:	Not available.
VAPOR DENSITY:	4.9 (Air = 1).
SOLUBILITY IN WATER:	Negligible.
pH:	Not applicable.
SPECIFIC GRAVITY:	0.77 to 0.80 at 60/60°F (16/16°C) (Water = 1).
COEFFICIENT OF WATER/OIL DISTRIBUTION:	Not available.
MOLECULAR WEIGHT:	142 (Approximately).

SECTION IV – FIRE AND EXPLOSION HAZARD DATA

FLASH POINT:	105°F (41°C) SETA
AUTOIGNITION TEMPERATURE:	473°F (245°C).
CONDITIONS OF FLAMMABILITY:	Materials must be moderately heated before ignition can occur.
FLAMMABLE LIMITS IN AIR:	***LOWER:*** 0.7 Vol. % ***UPPER:*** 6.0 Vol. %
UNUSUAL FIRE AND EXPLOSION HAZARDS:	Decomposition and combustion products may be toxic. Heated containers may rupture, explode or be thrown into the air. Vapors are heavier than air and may travel great distances to ignition source and flash back. Not sensitive to mechanical impact. Material may be sensitive to static discharge, which could result in fire or explosion.
EXTINGUISHING MEDIA:	Carbon dioxide, foam, dry chemical, water (mist only).
FIRE FIGHTING PROCEDURES – SPECIAL:	NFPA 704 Rating 0-2-0 Keep storage containers cool with water spray. Use self-contained breathing apparatus (SCBA).
HAZARDOUS COMBUSTION PRODUCTS:	Thermal decomposition and burning may produce carbon monoxide.

SECTION V – REACTIVITY DATA

STABILITY: Stable under normal temperatures and pressures, and not r water.

INCOMPATIBILITY (MATERIALS AND CONDITIONS TO AVOID): Avoid oxidizing agents, flames, sparks and high temperatures.

HAZARDOUS POLYMERIZATION: Not known to occur under normal temperatures and pressures.

HAZARDOUS DECOMPOSITION PRODUCTS: Normally none.

SECTION VI – HEALTH HAZARD DATA AND TOXICOLOGICAL PROPERTIES

PRIMARY ROUTES OF EXPOSURE: Eye and skin contact; inhalation.

EXPOSURE LIMITS: See Section II.

SIGNS AND SYMPTOMS OF EXPOSURE:

ACUTE:

Eyes: Contact may cause slight to moderate irritation. High vapor concentrations (> 500 ppm) are irritating to the eyes.

Skin: Prolonged or repeated contact tends to remove skin oils, possibly leading to irritation and dermatitis. No significant skin absorption hazard.

Inhalation (Breathing): High concentrations of vapor or mist may be irritating to the respiratory tract cause headaches, dizziness, nausea, impaired coordination, anesthesia and may have other central nervous system effects.

Ingestion (Swallowing): Low order of acute oral toxicity. May cause irritation of the throat, nausea vomiting and symptoms of central nervous system depression. Aspiration into the lungs during inge or vomiting may cause mild to severe pulmonary injury and possibly death.

CHRONIC: Prolonged and/or repeated skin contact may cause drying and cracking or dermatitis.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Individuals with pre-existing central nervous system dysfunction may have increased susceptibility to the effects of exposure. Contact with skin may aggravate pre-existing dermatitis.

CARCINOGENICITY: IARC classifies chemicals by their carcinogenic risk, including agents that are known probable, or possible carcinogens. NTP classifies chemicals as either know carcinogens or for which there is a limited evidence of carcinogenicity in humans sufficient evidence of carcinogenicity in experimental animals.

Perchloroethylene is listed by IARC as a possible carcinogen and is classified by NT as having limited evidence of carcinogenicity in humans or sufficient evidence carcinogenicity in experimental animals.

OTHER POTENTIAL HEALTH HAZARDS: The following information is required by Canadian WHMIS regulations. Irritancy is covered in Signs and Symptoms of Exposure in Section VI. There is no known human sensitization or toxicologically synergistic product. Xylene has demonstrated experimental effects for reproductive toxicity, mutagenicity and teratogenicity. Studies indicate Ethylbenzene and 1,1,1-Trichloroethane are experimental teratogens.

SECTION VII – EMERGENCY AND FIRST AID PROCEDURES

EYES: For direct contact, flush eyes with water for 15 minutes lifting upper and lower li occasionally. If irritation or redness from exposure to vapors or mists develops, move vic away from exposure into fresh air. Consult physician if irritation or pain persists.

SKIN: Remove contaminated clothing. Wash skin twice with soap and water. If irritation or p develops and persists, consult a physician.

TION: ng)	Remove to fresh air immediately. Use oxygen if there is difficulty breathing or artificial respiration if breathing has stopped. Do not leave victim unattended. Seek immediate medical attention if necessary.
GESTION: (swallowing)	If conscious, drink 4 to 8 ounces of water and seek immediate medical attention. DO NOT induce vomiting.

SECTION VIII – PRECAUTIONS FOR SAFE USE AND HANDLING AND PREVENTIVE MEASURES

SPILL PROCEDURES:	Remove all ignition sources. Ventilate area and avoid breathing vapors. For large spills, isolate area and deny entry. If possible, contain as a liquid for possible re-refining. Absorb with compatible absorbent material. Shovel into closable container for disposal. Wear protective equipment specified in Section IX. Contain away from surface waters and sewers.
WASTE DISPOSAL METHODS:	Dispose in accordance with Federal, State, Provincial and local regulations. Contact Safety-Kleen regarding recycling or proper disposal.
HANDLING PRECAUTIONS:	Avoid contact with eyes, skin or clothing. Use in well ventilated area and avoid breathing vapors or mists. Keep away from heat, sparks and flames.
SHIPPING AND STORING PRECAUTIONS:	Keep container tightly closed when not in use and during transport. Empty product containers may contain product residue. Do not pressurize, cut, heat, weld, grind or expose containers to flame or other sources of ignition.
PERSONAL HYGIENE:	Use good personal hygiene. Wash thoroughly with soap and water after handling and before eating, drinking or using tobacco products. Launder contaminated clothing and clean protective equipment before reuse.

SECTION IX – CONTROL MEASURES AND OTHER PREVENTIVE MEASURES

EYE PROTECTION:	Where there is likelihood of spill or splash, wear chemical goggles and faceshield. Contact lenses should not be worn.
PROTECTIVE GLOVES:	Use nitrile or neoprene gloves to prevent contact with skin.
RESPIRATORY PROTECTION:	Use NIOSH/MSHA-approved respiratory protective equipment when concentration of vapors or mists exceeds applicable exposure limit. Depending on the airborne concentration, use a respirator or gas mask with appropriate cartridges and canisters. A self-contained breathing apparatus (SCBA) is required for large spills and emergencies. Selection and use of respiratory protective equipment should be in accordance in the U.S.A. with OSHA General Industry Standard 29 CFR 1910.134 and in Canada with CSA Standard Z94.4-M1982.
ENGINEERING CONTROLS:	Provide local exhaust or general dilution ventilation needed to maintain concentrations of vapors or mists below applicable exposure limits. Where explosive mixtures may be present, systems safe for such locations should be used.
OTHER PROTECTIVE EQUIPMENT:	Wear appropriate solvent-resistant boots, apron or other protective clothing where spills and splashes are possible. A source of clean water should be available in work areas for flushing the eyes and skin.

SECTION X – OTHER REGULATORY INFORMATION

DOT PROPER SHIPPING NAME:	PETROLEUM NAPHTHA
DOT CLASS:	COMBUSTIBLE LIQUID
DOT ID NUMBER:	UN1255

SARA TITLE III:

Product contains toxic chemicals subject to the reporting requirements Section 313 of Title III of the Superfund Amendments and Reauthorization A of 1986 and 40 CFR Part 372. Toxic constituents are listed with an asterisk Section II of this Material Safety Data Sheet.

Product poses the following physical and/or health hazards as de 40 CFR 370.3 (Sections 311, 312 of SARA Title III):

Immediate (Acute) Health Hazard
Delayed (Chronic) Health Hazard
Fire Hazard

TDGA:

NAPHTHA, PETROLEUM
CLASS 3.3, UN1255, P.G. III

WHMIS CLASSIFICATION:

Class B3, Combustible Liquid;
Class D2A, Other Toxic Effects, Very Toxic Material;
Class D2B, Other Toxic Effects, Toxic Material

SECTION XI – PREPARATION INFORMATION

PREPARED BY: Product MSDS Coordinator ***FORM PART NO.*** 82310

ORIGINAL ISSUE DATE: July 20, 1989 ***REVISED:*** December 14, 1990 ***SUPERSEDES:*** March 12, 1990

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