APPENDIX E

GROUNDWATER MODELING SUPPLEMENTAL INFORMATION

RAYMARK – OU2 - GROUNDWATER
STRATFORD, CONNECTICUT
SUPPORT FOR SECTION 4

1.0 PLUME IMAGING

Groundwater contaminant concentration data were interpolated in three dimensions using the Visual Groundwater™ software package. Two-dimensional slices through the three-dimensional model domain provided images of the spatial distribution of each contaminant at specified elevations or along specified cross-section lines.

1.1 Interpolation and Contouring

Three-dimensional interpolation in Visual Groundwater™ is accomplished via the natural neighbor method. The natural neighbor method is based on the Voronoi tessellation of the data points. In this method the model domain is split into a set of three-dimensional polygons. Each polygon is associated with a single data point such that the interior of the polygon corresponds to the region of space that is closest to the data point. To interpolate to a grid node in the model domain, the tessellation is recomputed with the addition of the interpolation point. The Voronoi polygon of the interpolation point is then compared with the original tessellation of just the data points. Those data points whose original Voronoi polygons overlap space occupied by the interpolation point polygon are its natural neighbors, and this natural neighbor subset of data points is used to interpolate the value at the grid node. The number of natural neighbors about an interpolation point depends on the geometric configuration of the grid and data values. The interpolation weight assigned to a data point is simply the volume fraction of the interpolation point polygon that is shared by the original polygon of the datum. For more information on the natural neighbor interpolation method see Watson (1992).

Traditionally, three-dimensional hydrogeologic data were interpolated in two dimensions. For example, plan view contour maps of three-dimensional plumes were generated either by selecting a depth interval and only contouring data from those wells whose screens intercepted that interval, or contouring data from all of the wells at a site irrespective of screen depths. However, when three-dimensional data are interpolated in two dimensions one of two problems arise: 1) potentially valuable information existing above and below the plane of interest is ignored if only those samples intersecting the plane are contoured, or 2) the spatial

relationships between data points and the weights assigned to each data point are distorted if points above and below the plane of interest are transposed onto this plane and subsequently contoured. Three-dimensional interpolation avoids these pitfalls because all of the data points are considered in the interpolation process, but the influence of a given datum on the contours shown on a 2-D slice through the 3-D model domain decreases as its distance from that plane increases.

The aforementioned problems associated with two-dimensional interpolation become increasingly difficult to manage as the number of data points, the vertical separation between data points, and the variability in vertical separation distances increase. Both problems can be minimized by plotting a series of contour maps for a variety of narrow depth intervals and cross-sectional orientations. This approach also enables the professional judgement of the hydrogeologist to be utilized in the contouring process. For each interpolation and contouring project a decision needs to be made as to whether the advantage of incorporating subjective professional judgement in the creation of a set of images outweighs the advantages of objective 3-D interpolation, efficient handling of large data sets, and the ability to visualize and manipulate data in 3-D space.

1.2 Selection of Plan and Cross-Sectional Views

Images of contaminant concentrations at shallow depths were presented along with cross-sections positioned through the centers of hot spots. The shallow plan view illustrates the extent of contamination in the ground water near the water table. It also enables the reader to identify areas where the upward migration of vapors into basements may be of greatest concern. Cross-sections provide useful information pertaining to the geometries of hot spots and the variability in contaminant concentrations with depth.

The elevations of the shallow plan views were not the same for every contaminant. The primary objective for selecting plan view elevations was to present a conservative view of groundwater contamination near the water table. This objective was met by balancing two criteria. First, the elevation should correspond to the depth at which the highest concentration was found in the shallow groundwater. Second, the elevation should be as close as possible to the water table without being too close to this upper boundary of the model domain. Mathematical modeling results tend to be less accurate at the physical boundaries of a model domain. Further from the

boundary the influence of edge effects diminishes and modeled concentrations more accurately represent measured values. On April 15, 2003 the elevation of the water table was between 3 ft and 7 ft (MSL) throughout most of the OU2 study area (see Figure 3-6). In the winter of 2002/2003 relatively high concentrations of target contaminants were found in samples collected at elevations between -2 ft and +4 ft (MSL). Since measured and modeled concentrations were in good agreement at elevations less than or equal to 4 ft (MSL), the shallow plume map elevation for each contaminant was set at some value between -2 ft and +4 ft (MSL), depending on the particular depth at which the highest concentration was found.

1.3 Plume Map Limitations

Although these images successfully illustrate the nature and extent of contamination with respect to a variety of groundwater contaminants, several points must be considered when viewing the maps. First, the colored portion of each map represents the areal extent of the modeling domain. The areal extent of contamination may be greater than that shown. Second, data density varies, so modeled concentrations in areas of low sample density have greater uncertainty associated with them. Third, the interpolation algorithm smooths data values; as a result, actual concentrations at some locations may be different from those shown. Great care was taken to minimize smoothing and verify the accuracy of modeled concentrations at locations having hard data, but some smoothing was inevitable, and its effects were more pronounced where extreme high and low values occurred in close proximity to one another.

Finally, an additional source of uncertainty in these images is due to samples having nondetectable concentrations of individual contaminants. When a substance was not detected in a given sample and the detection limit was very low, a value of one-half the detection limit was assigned to that contaminant at that sample location. However, when the detection limit was higher than a pertinent regulatory criterion, the location was excluded from the data set for that contaminant, because the consequences of assigning a value to that sample location were more severe. For example, assigning a concentration of 0 or 5 µg/L to a location where vinyl chloride was not detected and its detection limit was 10 µg/L might significantly underestimate or overestimate a potential volatilization hazard at that location.

Two criteria were used to select detection limit cutoffs: 1) a sufficient number of sample points were needed to generate a meaningful image, and 2) concentrations assigned to nondetects

had to be below pertinent regulatory criteria for that contaminant. Table E-1 summarizes the use of sample nondetects in the creation of plume images:

TABLE E-1
USE OF SAMPLE NONDETECTS IN PLUME MAPS
DRAFT FINAL REMEDIAL INVESTIGATION
RAYMARK – OU2 – GROUNDWATER
STRATFORD, CONNECTICUT

Contaminant	Residential Volatilization Criterion (μg/L)	Surface Water Protection Criterion (μg/L)	Detection Limit Cutoff (μg/L)	Concentration Assigned to Point where Detection Limit was at or Below Cutoff
1,1,1-Trichloroethane*	20,400	62,000	10	≤ 5
1,1-Dichloroethene*	1	96	1	≤ 0.5
Benzene	215	710	10	≤ 5
Chlorobenzene	1800	420,000	10	≤ 5
Trichloroethene	219	2340	10	≤ 5
Toluene	23,500	4,000,000	10	≤ 5
Vinyl Chloride	2	15,750	1	≤ 0.5
Arsenic	——	4	4	≤ 2
Beryllium	——	4	2	≤ 1
Cadmium	——	6	2	≤ 1
Copper	——	48	4	≤ 2
Lead	——	13	3	≤ 1.5
Nickel	——	880	6	≤ 3
Zinc	——	123	6	≤ 3

* CT residential Volatization Criteria listed above are the existing promulgated criteria. CTDEP has proposed new criteria for 1,1-DCE of 190 μg/L and for TCE of 27 μg/L

References Cited

Watson, D. 1992. *Contouring: A Guide to the Analysis and Display of Spatial Data.* Pergamon Press, New York, NY, 321p.

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1.0 CALIBRATION

Model calibration is the process of varying uncertain model parameters over likely ranges of values until a match between modeled and measured data is obtained. Calibration is needed to account for unmeasured, unknown, or unrepresented variables as well as uncertainty in measured input data. However, a numerical or analytical model that fits the observed data may still have poor predictive capabilities if the conceptual model (assumptions regarding sources and sinks, flow path directions, etc.) is inaccurate.

Analytical contaminant transport models were developed for sources B, D, E, and F shown on Figure 5-1. The models for sources B and D were calibrated to measured values along their respective flow paths, and Table 5-3 shows that the simulated concentrations closely match the measured values. By contrast, the source E and F models were not calibrated to down gradient concentration data. The modeled contaminants emanating from sources E and F were not detected in groundwater samples collected from down gradient monitoring wells, and although this information was considered in the development of the source E and F models, the models were not strictly calibrated to it.

2.0 SENSITIVITY ANALYSIS

The purpose of a sensitivity analysis is to demonstrate a model's responsiveness to variations in input parameters. The response to these variations is of interest because the range in resulting predictions illustrates the level of uncertainty in those predictions. A sensitivity analysis can also help guide the collection of additional field data by identifying the parameters having the greatest influence on predicted results.

A two-step sensitivity analysis was performed on the source B (TCE), D (1,1-DCE) and F (arsenic) models presented in section 5.3.4. In the first step, each input parameter was assigned a range of values that was ± 25 percent of the base case value. Then the models were rerun several times to allow each of the input parameters to be varied to their maximum

and minimum values while holding all other parameters constant. The predicted concentrations were tabulated and the input parameters numerically ranked in order of importance (see Tables E-2 through E-4). This evaluation allowed comparisons of the relative impacts of the different input parameters on predicted concentrations. In the second step, the input parameters for each model were assigned a likely range of values based on field observations or ranges in the literature for similar environmental conditions. As before, the models were rerun with each of the input parameters varied to their maximum and minimum values while holding all other parameters constant, and the predicted concentrations were tabulated (see Table E-5 through E-7). This evaluation provided information on the level of uncertainty in the models' predictions.

The results presented in Table E-2 show that predicted TCE concentrations and arrival times are most strongly influenced by the values chosen to represent the groundwater velocity-related parameters (effective porosity, hydraulic gradient, and hydraulic conductivity), travel distance, and contaminant half-life. Table E-3 shows that 1,1-DCE arrival times are also most sensitive to the travel distance and groundwater velocity-related parameters. Nevertheless, predicted 1,1-DCE concentrations are most sensitive to the model's vertical attributes (centerline depth below the creek, source thickness, and vertical transverse dispersivity). The vertical aspects of the 1,1-DCE model exert such a strong influence, because the model forecasts concentrations along the upper margin of the 1,1-DCE plume (see section 5.3.4.3). Source thickness and source concentration exert the strongest influence on predicted arsenic concentrations (see Table E-4). Arsenic concentration predictions are insensitive to velocity-related parameters. Velocity-related parameters only affect arsenic arrival times; they do not affect predicted concentrations, because the arsenic does not degrade as it moves through the aquifer.

The findings summarized in Tables E-5 through E-7 suggest that ranges in predicted TCE, 1,1-DCE, and arsenic concentrations of up to an order of magnitude may arise from uncertainty in input parameter values. Moreover, Tables E-5 and E-6 show that there is relatively little uncertainty in predicted VOC arrival times. Predicted arrival times range from 1982 to 1999 AD when VOC model parameters are assigned likely ranges of values. By contrast, the range in predicted arrival times is much greater for arsenic (2000-2340 AD), due largely to uncertainty in the values chosen to represent hydraulic conductivity and arsenic partitioning.

TABLE E-2
SENSITIVITY ANALYSIS RESULTS FOR SOURCE B (TCE) MODEL
PART 1: ± 25 PERCENT OF BASE CASE
DRAFT REMEDIAL INVESTIGATION REPORT
RAYMARK – OU2 – GROUNDWATER
STRATFORD, CONNECTICUT

Run	Parameter	Value	Concentration (μg/L)[1]	Rank	Arrival (yr)[2]	Rank
1	low porosity	0.26	5440	14	1993	17
2	high porosity	0.44	5860	15	1993	17
3	low effective porosity	0.19	10700	2	1988	1
4	high effective porosity	0.31	3060	10	1995	8
5	low bulk density (g/cm^3)	1.19	5820	22	1992	10
6	high bulk density (g/cm^3)	1.99	5570	19	1992	10
7	low distribution coefficient (ml/g)	0.00885	5820	22	1992	10
8	high distribution coefficient (ml/g)	0.0148	5570	19	1993	17
9	short travel distance (m)	576	11400	1	1988	1
10	long travel distance (m)	960	2830	9	1996	4
11	low longitudinal dispersivity (m)	8.04	5560	18	1992	10
12	high longitudinal dispersivity (m)	13.40	5830	19	1993	17
13	low horizontal transverse dispersivity (m)	0.402	5820	22	1993	17
14	high horizontal transverse dispersivity (m)	0.670	5550	17	1993	17
15	low vertical transverse dispersivity (m)	——	——	—	——	—
16	high vertical transverse dispersivity (m)	——	——	—	——	—
17	low hydraulic conductivity (m/y)	9098	2420	8	1997	3
18	high hydraulic conductivity (m/y)	15160	9630	4	1990	4
19	low hydraulic gradient	0.00110	2400	6	1996	4
20	high hydraulic gradient	0.00184	9680	3	1990	4
21	low source concentration (μg/l)	66000	4270	11	1992	10
22	high source concentration (μg/l)	110000	7120	12	1993	17
23	narrow source (m)	90	5220	13	1992	10
24	wide source (m)	150	5860	15	1993	17
25	thin source (m)	——	——	—	——	—
26	thick source (m)	——	——	—	——	—
27	short half life (y)	2.07	2410	7	1991	8
28	long half life (y)	3.45	9630	4	1994	10

[1] Maximum point concentration predicted to enter the Housatonic River from the acid pit DNAPL source (concentration predicted in base case = 5700 μg/L)
[2] Arrival time for maximum point concentration (calendar year in base case = 1993)

TABLE E-3
SENSITIVITY ANALYSIS RESULTS FOR SOURCE D (1,1-DCE) MODEL
PART 1: ± 25 PERCENT OF BASE CASE
DRAFT REMEDIAL INVESTIGATION REPORT
RAYMARK – OU2 – GROUNDWATER
STRATFORD, CONNECTICUT

Run	Parameter	Value	Concentration (μg/L)[1]	Rank	Arrival (yr)[2]	Rank
1	low porosity	0.26	530	22	1993	9
2	high porosity	0.44	530	22	1993	9
3	low effective porosity	0.19	620	14	1992	3
4	high effective porosity	0.31	450	15	1994	3
5	low bulk density (g/cm^3)	1.19	530	22	1993	9
6	high bulk density (g/cm^3)	1.99	530	22	1993	9
7	low distribution coefficient (ml/g)	0.00635	530	22	1993	9
8	high distribution coefficient (ml/g)	0.0106	530	22	1993	9
9	short travel distance (m)	555	450	15	1992	3
10	long travel distance (m)	925	530	22	1994	3
11	plume centerline shallow below creek (m)	13.9	1260	1	1993	9
12	plume centerline deep below creek (m)	23.1	180	2	1993	9
13	low longitudinal dispersivity (m)	7.93	530	22	1993	9
14	high longitudinal dispersivity (m)	13.21	530	22	1993	9
15	low horizontal transverse dispersivity (m)	0.397	600	17	1993	9
16	high horizontal transverse dispersivity (m)	0.661	480	21	1993	9
17	low vertical transverse dispersivity (m)	0.0397	340	3	1993	9
18	high vertical transverse dispersivity (m)	0.0661	690	5	1993	9
19	low hydraulic conductivity (m/y)	50060	430	11	1995	1
20	high hydraulic conductivity (m/y)	83440	600	17	1992	3
21	low hydraulic gradient	0.000565	430	11	1995	1
22	high hydraulic gradient	0.000941	600	17	1992	3
23	low source concentration (μg/l)	31500	400	7	1993	9
24	high source concentration (μg/l)	52500	660	7	1993	9
25	narrow source (m)	22.5	410	9	1993	9
26	wide source (m)	37.5	650	9	1993	9
27	thin source (m)	7.5	370	5	1993	9
28	thick source (m)	12.5	720	3	1993	9
29	short half life (y)	2.97	430	11	1993	9
30	long half life (y)	4.95	600	17	1993	9

[1] Maximum point concentration predicted to enter Ferry Creek from the source beneath Lagoon 4 (concentration predicted in base case = 530 μg/L)
[2] Arrival time for maximum point concentration (calendar year in base case = 1993)

TABLE E-4
SENSITIVITY ANALYSIS RESULTS FOR SOURCE F (ARSENIC) MODEL
PART 1: ± 25 PERCENT OF BASE CASE
DRAFT REMEDIAL INVESTIGATION REPORT
RAYMARK – OU2 – GROUNDWATER
STRATFORD, CONNECTICUT

Run	Parameter	Value	Concentration (μg/L)[1]	Rank	Arrival (yr)[2]	Rank
1	low porosity	0.26	84	12	2180	1
2	high porosity	0.44	84	12	2070	2
3	low effective porosity	0.19	84	12	2080	5
4	high effective porosity	0.31	84	12	2140	5
5	low bulk density (g/cm^3)	1.19	84	12	2080	5
6	high bulk density (g/cm^3)	1.99	84	12	2140	5
7	low distribution coefficient (ml/g)	7.5	84	12	2080	5
8	high distribution coefficient (ml/g)	12.5	84	12	2140	5
9	short travel distance (m)	128	96	5	2090	12
10	long travel distance (m)	214	75	7	2140	5
11	low longitudinal dispersivity (m)	4.33	84	12	2100	15
12	high longitudinal dispersivity (m)	7.21	84	12	2120	15
13	low horizontal transverse dispersivity (m)	0.217	84	12	2110	19
14	high horizontal transverse dispersivity (m)	0.361	83	10	2110	19
15	low vertical transverse dispersivity (m)	0.0217	96	5	2120	15
16	high vertical transverse dispersivity (m)	0.0361	76	8	2110	19
17	low hydraulic conductivity (m/y)	3210	84	12	2150	2
18	high hydraulic conductivity (m/y)	5350	84	12	2090	12
19	low hydraulic gradient	0.0031	84	12	2150	2
20	high hydraulic gradient	0.0051	84	12	2090	12
21	low source concentration (μg/l)	184	63	1	2110	19
22	high source concentration (μg/l)	307	105	1	2110	19
23	narrow source (m)	40	81	9	2110	19
24	wide source (m)	66	85	10	2120	15
25	thin source (m)	1.05	64	3	2110	19
26	thick source (m)	1.75	103	4	2110	19

[1] Maximum point concentration predicted to enter Ferry Creek from the Raymark Waste source at MW-102 (concentration predicted in base case = 84 μg/L)
[2] Arrival time for maximum point concentration (calendar year in base case = 2110)

TABLE E-5
SENSITIVITY ANALYSIS RESULTS FOR SOURCE B (TCE) MODEL
PART 2: LIKELY RANGES OF VALUES
DRAFT REMEDIAL INVESTIGATION REPORT
RAYMARK – OU2 – GROUNDWATER
STRATFORD, CONNECTICUT

Run	Parameter	Value[1]	Concentration (µg/L)[2]	Arrival (yr)[3]
1	low porosity	0.26	5440	1993
2	high porosity	0.53	5960	1992
3	low effective porosity	0.10	28100	1982
4	high effective porosity	0.35	2040	1998
5	low bulk density (g/cm^3)	1.37	5770	1993
6	high bulk density (g/cm^3)	1.81	5630	1993
7	low distribution coefficient (ml/g)	0.0087	5830	1993
8	high distribution coefficient (ml/g)	0.0150	5560	1993
9	short travel distance (m)	691	7540	1991
10	long travel distance (m)	845	4300	1993
11	low longitudinal dispersivity (m)	2	5250	1989
12	high longitudinal dispersivity (m)	20	6160	1996
13	low horizontal transverse dispersivity (m)	0.268	5890	1992
14	high horizontal transverse dispersivity (m)	0.536	5700	1993
15	low vertical transverse dispersivity (m)	——	——	——
16	high vertical transverse dispersivity (m)	——	——	——
17	low hydraulic conductivity (m/y)	8455	1870	1998
18	high hydraulic conductivity (m/y)	15690	10300	1987
19	low hydraulic gradient	0.00132	4260	1995
20	high hydraulic gradient	0.00162	7280	1992
21	low source concentration (µg/l)	76000	4920	1993
22	high source concentration (µg/l)	100000	6470	1992
23	narrow source (m)	70	4600	1993
24	wide source (m)	170	5900	1993
25	thin source (m)	——	——	——
26	thick source (m)	——	——	——
27	short half life (y)	2.21	3000	1991
28	long half life (y)	3.31	8800	1994

[1] Values for runs: 1-8 were taken from EPA (1998), 11-14 were based on Gelhar et al. (1992), 9-10 and 19-20 were ±10% of the base case, 17-18 were the 95% confidence limits on the mean, 21-22 were the minimum and maximum concentrations in source area recovery wells, 23-24 were ± 50 m, and 27-28 were ± 20% of the base case.
[2] Maximum point concentration predicted to enter the Housatonic River from the acid pit DNAPL source (concentration predicted in base case = 5700 µg/L)
[3] Arrival time for maximum point concentration (calendar year in base case = 1993)

TABLE E-6
SENSITIVITY ANALYSIS RESULTS FOR SOURCE D (1,1-DCE) MODEL
PART 2: LIKELY RANGES OF VALUES
DRAFT REMEDIAL INVESTIGATION REPORT
RAYMARK – OU2 – GROUNDWATER
STRATFORD, CONNECTICUT

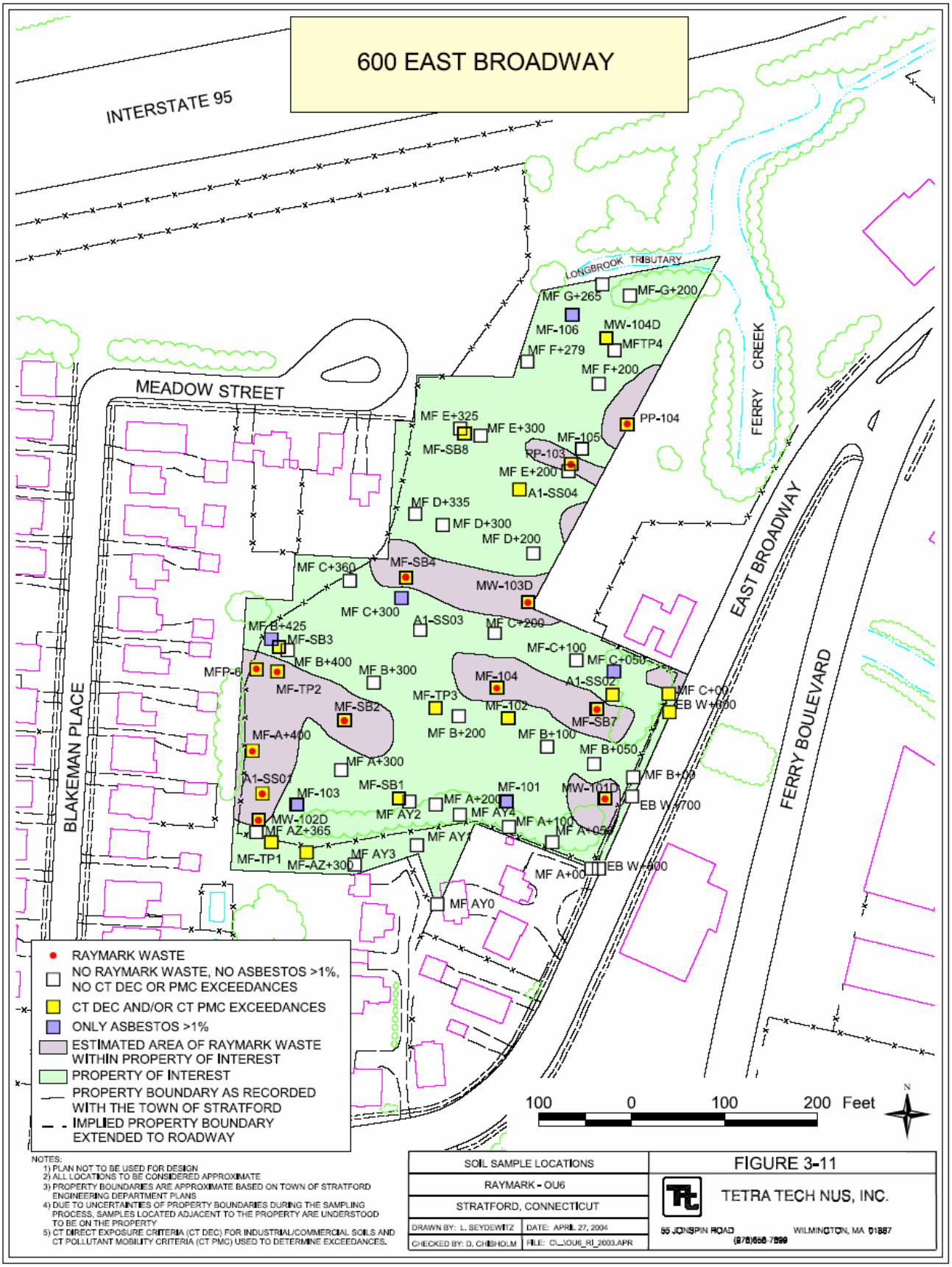
Run	Parameter	Value[1]	Concentration (µg/L)[2]	Arrival (yr)[3]
1	low porosity	0.26	530	1993
2	high porosity	0.53	530	1993
3	low effective porosity	0.10	780	1990
4	high effective porosity	0.35	410	1995
5	low bulk density (g/cm^3)	1.37	530	1993
6	high bulk density (g/cm^3)	1.81	530	1993
7	low distribution coefficient (ml/g)	0.0065	530	1993
8	high distribution coefficient (ml/g)	0.0150	520	1993
9	short travel distance (m)	666	510	1992
10	long travel distance (m)	814	540	1994
11	plume centerline shallow below creek (m)	16.7	770	1993
12	plume centerline deep below creek (m)	20.4	350	1993
13	low longitudinal dispersivity (m)	2	530	1992
14	high longitudinal dispersivity (m)	20	530	1993
15	low horizontal transverse dispersivity (m)	0.264	720	1993
16	high horizontal transverse dispersivity (m)	0.529	530	1993
17	low vertical transverse dispersivity (m)	0.0211	70	1993
18	high vertical transverse dispersivity (m)	0.0529	530	1993
19	low hydraulic conductivity (m/y)	33380	280	1999
20	high hydraulic conductivity (m/y)	100100	660	1991
21	low hydraulic gradient	0.00068	500	1994
22	high hydraulic gradient	0.00083	560	1992
23	low source concentration (µg/l)	37800	480	1993
24	high source concentration (µg/l)	46200	580	1993
25	narrow source (m)	15	280	1993
26	wide source (m)	45	750	1993
27	thin source (m)	5	240	1993
28	thick source (m)	15	940	1993
29	short half life (y)	3.17	450	1993
30	long half life (y)	4.75	590	1993

[1] Values for runs: 1-8 were taken from EPA (1998), 13-18 were based on Gelhar et al. (1992), 9-12 and 21-24 were ±10% of the base case, 19-20 and 25-28 were ±50% of the base case, and 29-30 were ± 20% of the base case.
[2] Maximum point concentration predicted to enter Ferry Creek from the source beneath Lagoon 4 (concentration predicted in base case = 530 µg/L)
[3] Arrival time for maximum point concentration (calendar year in base case = 1993)

TABLE E-7
SENSITIVITY ANALYSIS RESULTS FOR SOURCE F (ARSENIC) MODEL
PART 2: LIKELY RANGES OF VALUES
DRAFT REMEDIAL INVESTIGATION REPORT
RAYMARK – OU2 – GROUNDWATER
STRATFORD, CONNECTICUT

Run	Parameter	Value[1]	Concentration (µg/L)[2]	Arrival (yr)[3]
1	low porosity	0.26	84	2180
2	high porosity	0.53	84	2050
3	low effective porosity	0.10	84	2040
4	high effective porosity	0.35	84	2160
5	low bulk density (g/cm^3)	1.37	84	2100
6	high bulk density (g/cm^3)	1.81	84	2130
7	low distribution coefficient (ml/g)	1	84	2000
8	high distribution coefficient (ml/g)	26	84	2320
9	short travel distance (m)	154	88	2100
10	long travel distance (m)	188	80	2120
11	low longitudinal dispersivity (m)	1	84	2080
12	high longitudinal dispersivity (m)	20	84	2180
13	low horizontal transverse dispersivity (m)	0.144	85	2120
14	high horizontal transverse dispersivity (m)	0.289	84	2110
15	low vertical transverse dispersivity (m)	0.0115	127	2120
16	high vertical transverse dispersivity (m)	0.0289	84	2110
17	low hydraulic conductivity (m/y)	1570	84	2340
18	high hydraulic conductivity (m/y)	6960	84	2060
19	low hydraulic gradient	0.0037	84	2130
20	high hydraulic gradient	0.0045	84	2100
21	low source concentration (µg/l)	110	38	2110
22	high source concentration (µg/l)	245.5	84	2110
23	narrow source (m)	47.7	83	2110
24	wide source (m)	58.3	84	2110
25	thin source (m)	1.26	76	2110
26	thick source (m)	1.54	92	2120

[1] Values for runs: 1-6 were taken from EPA (1998); 7-8 were taken from Spitz and Moreno (1996); 9-10, 19-20, and 23-26 were ±10% of the base case; 11-16 were based on Gelhar et al. (1992); 17-18 were the 95% confidence limits on the mean, 21-22 were the historic minimum and maximum concentrations in MW-102S.
[2] Maximum point concentration predicted to enter Ferry Creek from the Raymark Waste source at MW-102 (concentration predicted in base case = 84 µg/L)
[3] Arrival time for maximum point concentration (calendar year in base case = 2110)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MEADOW STREET
BLAKEMAN PLACE
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FERRY BOULEVARD
FERRY CREEK
LONGBROOK TRIBUTARY
MF G+265
MF-G+200
MF-106
MW-104D
MFTP4
MF F+279
MF F+200
PP-104
MF E+325
MF E+300
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MF E+200
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MF-SB4
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MF C+200
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MF C+050
MF B+400
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MF-SB2
MF-102
MF-SB7
MF B+200
MF B+100
MF-A+400
MF B+050
MF A+300
MF B+00
A1-SS01
MF-SB1
MF-101
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MF-103
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EB W+700
MF AY2
MF AY4
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MF A+100
MF AZ+365
MF A+050
MF AY1
MF-TP1
MF AY3
MF-AZ+300
MF A+00
EB W+400
MF AY0
RAYMARK WASTE
NO RAYMARK WASTE, NO ASBESTOS >1%, NO CT DEC OR PMC EXCEEDANCES
CT DEC AND/OR CT PMC EXCEEDANCES
ONLY ASBESTOS >1%
ESTIMATED AREA OF RAYMARK WASTE WITHIN PROPERTY OF INTEREST
PROPERTY OF INTEREST
PROPERTY BOUNDARY AS RECORDED WITH THE TOWN OF STRATFORD
IMPLIED PROPERTY BOUNDARY EXTENDED TO ROADWAY
100 0 100 200 Feet
N
NOTES:
1) PLAN NOT TO BE USED FOR DESIGN
2) ALL LOCATIONS TO BE CONSIDERED APPROXIMATE
3) PROPERTY BOUNDARIES ARE APPROXIMATE BASED ON TOWN OF STRATFORD ENGINEERING DEPARTMENT PLANS
4) DUE TO UNCERTAINTIES OF PROPERTY BOUNDARIES DURING THE SAMPLING PROCESS, SAMPLES LOCATED ADJACENT TO THE PROPERTY ARE UNDERSTOOD TO BE ON THE PROPERTY
5) CT DIRECT EXPOSURE CRITERIA (CT DEC) FOR INDUSTRIAL/COMMERCIAL SOILS AND CT POLLUTANT MOBILITY CRITERIA (CT PMC) USED TO DETERMINE EXCEEDANCES.
SOIL SAMPLE LOCATIONS
RAYMARK - OU6
STRATFORD, CONNECTICUT
DRAWN BY: L. SEYDEWITZ
DATE: APRIL 27, 2004
CHECKED BY: D. CHISHOLM
FILE: C:_\OU6_RI_2003.APR
FIGURE 3-11
TETRA TECH NUS, INC.
55 JONSPIN ROAD
WILMINGTON, MA 01887
(978)658-7899

APPENDIX F

HUMAN HEALTH RISK SUPPORTING DOCUMENTATION

APPENDIX F-1

HHRA RAGS D TABLES

TABLE 1
SELECTION OF EXPOSURE PATHWAYS
REMEDIAL INVESTIGATION
RAYMARK OU2 - GROUNDWATER
STRATFORD, 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	Air	Air	Homes	Resident	Adult/Child	Inhalation	On-site	Quant	Indoor air sampling has detected contaminants at residential homes within an area of groundwater contamination.
	Groundwater	Air	Basements of Homes	Resident	Adult/Child	Inhalation	On-site	Quant	Residential homes with basements are located within an area of groundwater contamination. Johnson & Ettinger model results will be discussed.
		Groundwater	Tap	Resident	Adult/Child	Dermal	On-site	None	Groundwater is not used as a drinking water source in the area.
						Ingestion	On-site	None	Groundwater is not used as a drinking water source in the area.
			Construction trenches	Excavation Worker	Adult	Dermal	On-site	None	Direct contact with groundwater by excavation workers is a minor pathway.
Current/Future	Groundwater	Surface Water	Housatonic River	Recreational Visitor	Adult	Dermal	On-site	Qual	Contaminated groundwater is moving toward the Housatonic River. Surface water quality is expected to have been impacted. A swimming scenario is possible, but further sampling is needed to quantify risks.
						Ingestion	On-site	Qual	Incidental ingestion is possible for swimming scenarios.
					Child	Dermal	On-site	Qual	Contaminated groundwater is moving toward the Housatonic River. Surface water quality is expected to have been impacted. A swimming scenario is possible, but further sampling is needed to quantify risks.
						Ingestion	On-site	Qual	Incidental ingestion is possible for swimming scenarios.
Future	Groundwater	Surface Water	Ferry Creek	Recreational Visitor	Adult	Dermal	On-site	Quant	Contaminated groundwater is moving toward Ferry Creek. Surface water quality is expected to deteriorate. Wading scenario.
						Ingestion	On-site	None	No ingestion for wading scenarios.
					Child	Dermal	On-site	Quant	Contaminated groundwater is moving toward Ferry Creek. Surface water quality is expected to deteriorate. Wading scenario.
						Ingestion	On-site	None	No ingestion for wading scenarios.
		Oysters	Ferry Creek	Fishermen	Adult	Ingestion	On-site	Qual	Modeled future oyster concentrations will be compared to actual recent concentrations evaluated in OU3.

TABLE 2.1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
REMEDIAL INVESTIGATION
RAYMARK OU2 - GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Indoor Air
Exposure Medium: Indoor Air
Exposure Point: Homes

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background (2) Value	Screening (3) Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for (4) Contaminant Deletion or Selection
71-55-6	1,1,1-Trichloroethane	0.291		110		µg/m^3	Air Sample 59	62/69	0.44 - 2.58	110	3.77	230 nc			NO	BSL
79-34-5	1,1,2,2-Tetrachloroethane	38		38		µg/m^3	Air Sample 59	1/41	0.436 - 1.87	38		0.033 ca			YES	ASL
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	0.541		3.24		µg/m^3	Air Sample 27	33/49	0.618 - 4.17	3.24	0.911	3100 nc			NO	BSL
79-00-5	1,1,2-Trichloroethane	0.627	L	9.89		µg/m^3	Air Sample 53	2/44	0.341 - 1.48	9.89		0.12 ca			YES	ASL
75-34-3	1,1-Dichloroethane	0.408		14.7		µg/m^3	Air Sample 74	20/52	0.294 - 1.75	14.7		52 nc			NO	BSL
75-35-4	1,1-Dichloroethene	0.272		48		µg/m^3	Air Sample 59, Air Sample 60	42/69	0.284 - 1.92	48		21 nc			YES	ASL
95-63-6	1,2,4-Trimethylbenzene	0.0791		33.1		µg/m^3	Air Sample 01	57/66	0.341 - 2.32	33.1	11.1	0.62 nc			YES	ASL
106-93-4	1,2-Dibromoethane	0.882	L	0.882	L	µg/m^3	Air Sample 32	1/33	0.48 - 2.09	0.882		0.0087 ca*			YES	ASL
95-50-1	1,2-Dichlorobenzene	0.545		0.684	L	µg/m^3	Air Sample 32	2/35	0.375 - 1.57	0.684		21 nc			NO	BSL
107-06-2	1,2-Dichloroethane	0.326		0.326		µg/m^3	Air Sample 33	1/41	0.253 - 1.1	0.326		0.074 ca*			YES	ASL
108-67-8	1,3,5-Trimethylbenzene	0.129		14.8		µg/m^3	Air Sample 01	38/51	0.341 - 2.08	14.8	3.21	0.62 nc			YES	ASL
106-99-0	1,3-Butadiene	0.12		7.34		µg/m^3	Air Sample 01	14/43	0.14 - 1.22	7.34	0.298	0.0069 ca			YES	ASL
106-46-7	1,4-Dichlorobenzene	0.0702		811		µg/m^3	Air Sample 19	19/50	0.375 - 2.48	811		0.31 ca			YES	ASL
78-93-3	2-Butanone	0.891		98		µg/m^3	Air Sample 20	57/67	0.172 - 6.83	98	1.57	100 nc			NO	BSL
591-78-6	2-Hexanone	0.371		0.371		µg/m^3	Air Sample 01	1/42	0.223 - 1.07	0.371					NO	NTX
67-63-0	2-Propanol	0.42	J	198	JE	µg/m^3	Air Sample 22	27/56	0.131 - 4.45	198	151				NO	NTX
622-96-8	4-Ethyltoluene	0.129		69.2	J	µg/m^3	Air Sample 01	60/66	0.465 - 1.38	69.2	9.69				NO	NTX
108-10-1	4-Methyl-2-Pentanone	0.12		14		µg/m^3	Air Sample 20	11/43	0.251 - 0.948	14		8.3 nc			YES	ASL
67-64-1	Acetone	0.232	BJ	95.3		µg/m^3	Air Sample 06	66/69	0.211 - 4.72	95.3	10.1	37 nc			YES	ASL
107-13-1	Acrylonitrile	0.241		0.241		µg/m^3	Air Sample 55	1/12	0.175 - 0.547	0.241		0.028 ca*			YES	ASL
71-43-2	Benzene	0.45		12.5		µg/m^3	Air Sample 52	69/69	0 - 0	12.5	5.11	0.23 ca*			YES	ASL
100-44-7	Benzyl Chloride	0.532	L	6.26		µg/m^3	Air Sample 59	2/33	0.303 - 1.41	6.26		0.04 ca			YES	ASL
75-27-4	Bromodichloromethane	0.294	L	2.6	L	µg/m^3	Air Sample 28	7/47	0.2 - 26.6	2.6		0.11 ca			YES	ASL
75-25-2	Bromoform	1.49	L,J	1.49	L,J	µg/m^3	Air Sample 32	1/5	2.71 - 27.1	1.49		1.7 ca*			NO	BSL
74-83-9	Bromomethane	0.0509		0.509	L	µg/m^3	Air Sample 32	4/41	0.251 - 3.33	0.509		0.52 nc			NO	BSL
75-15-0	Carbon Disulfide	0.2	L	1.25		µg/m^3	Air Sample 16	9/49	0.182 - 1.41	1.25		73 nc			NO	BSL
56-23-5	Carbon Tetrachloride	0.375	L	1.07	L	µg/m^3	Air Sample 32	30/50	0.324 - 1.97	1.07	0.741	0.13 ca*			YES	ASL
75-00-3	Chloroethane	1.33		3.99		µg/m^3	Air Sample 33	5/46	0.152 - 7.44	3.99	1.69	2.3 ca			YES	ASL
67-66-3	Chloroform	0.0787	L	5.9		µg/m^3	Air Sample 16	52/64	0.335 - 2.36	5.9	2.08	0.31 ca/nc			YES	ASL
74-87-3	Chloromethane	0.645		3.54		µg/m^3	Air Sample 42	23/44	0.142 - 4.2	3.54		1.1 ca			YES	ASL
156-59-2	cis-1,2-Dichloroethene	0.21		16.4		µg/m^3	Air Sample 59	29/59	0.284 - 1.08	16.4		3.7 nc			YES	ASL
10061-01-5	cis-1,3-Dichloropropene	0.421	L	0.421	L	µg/m^3	Air Sample 32	1/33	0.284 - 1.24	0.421					NO	NTX

TABLE 2.1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
REMEDIAL INVESTIGATION
RAYMARK OU2 - GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Indoor Air
Exposure Medium: Indoor Air
Exposure Point: Homes

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background (2) Value	Screening (3) Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for (4) Contaminant Deletion or Selection
110-82-7	Cyclohexane	0.415		6.92		µg/m^3	Air Sample 58	24/51	0.222 - 1.7	6.92	3.15	2100 nc			NO	BSL
124-48-1	Dibromochloromethane	1.69	L	1.69	L	µg/m^3	Air Sample 32	1/33	1.02 - 4.07	1.69		0.08 ca			YES	ASL
75-71-8	Dichlorodifluoromethane	1.15	L	149		µg/m^3	Air Sample 45	67/69	1.25 - 1.35	149	69.7	21 nc			YES	ASL
1320-37-2	Dichlorotetrafluoroethane	1.13	L	4.86		µg/m^3	Air Sample 24	4/6	1.41 - 1.48	4.86					NO	NTX
141-78-6	Ethyl Acetate	0.41		42.5		µg/m^3	Air Sample 06	18/33	0.323 - 1.92	42.5	15.8	330 nc			NO	BSL
100-41-4	Ethylbenzene	0.201	L	73.8		µg/m^3	Air Sample 06	64/67	0.432 - 2.36	73.8	6.25	1.7 ca			YES	ASL
76-14-2	Freon 114	0.0775		0.965	L	µg/m^3	Air Sample 32	5/33	0.444 - 1.9	0.965					NO	NTX
142-82-5	Heptane	0.412		29.7		µg/m^3	Air Sample 33	27/48	0.272 - 1.11	29.7					NO	NTX
110-54-3	Hexane	0.815		35.4		µg/m^3	Air Sample 04	66/69	0.886 - 0.992	35.4	22.4	21 nc			YES	ASL
108383/1	m&p-Xylene	0.655	L	100		µg/m^3	Air Sample 59, Air Sample 60	64/64	0 - 0	100	20.6				NO	NTX
1634-04-4	Methyl tert-Butyl Ether	0.363		69		µg/m^3	Air Sample 33	46/47	0.312 - 0.312	69	25.4	19 ca			YES	ASL
75-09-2	Methylene Chloride	0.521		910		µg/m^3	Air Sample 01	53/61	0.343 - 1.64	910	3.22	4.1 ca			YES	ASL
75-97-8	Methyl-t-Butyl Ketone	1.11		173	E	µg/m^3	Air Sample 29	20/22	0.784 - 1.07	173					NO	NTX
95-47-6	o-Xylene	0.24	L	86.9		µg/m^3	Air Sample 06	67/69	1.05 - 2.14	86.9	7.64				NO	NTX
100-42-5	Styrene	0.24	L	8.14		µg/m^3	Air Sample 01	19/45	0.261 - 1.89	8.14		110 nc			NO	BSL
127-18-4	Tetrachloroethene	0.301	, L	25.3		µg/m^3	Air Sample 35	34/57	0.506 - 3.35	25.3		0.67 ca			YES	ASL
109-99-9	Tetrahydrofuran	1.13		32.7		µg/m^3	Air Sample 20, Air Sample 33	24/65	0.181 - 7.43	32.7	4.84	0.99 ca			YES	ASL
108-88-3	Toluene	0.273	BL	159		µg/m^3	Air Sample 57	69/69	0 - 0	159	30.8	40 nc			YES	ASL
1330-20-7	Total Xylenes	4.8	L	761		µg/m^3	Air Sample 06	5/5	0 - 0	761		11 nc			YES	ASL
156-60-5	trans-1,2-Dichloroethene	0.447	L	0.447	L	µg/m^3	Air Sample 32	1/39	0.253 - 1.11	0.447		7.3 nc			NO	BSL
10061-02-6	trans-1,3-Dichloropropene	0.43	L	0.43	L	µg/m^3	Air Sample 32	1/33	0.284 - 1.19	0.43					NO	NTX
79-01-6	Trichloroethene	0.384	L	52.5		µg/m^3	Air Sample 59	39/69	0.363 - 2.6	52.5		0.017 ca			YES	ASL
75-69-4	Trichlorofluoromethane	1.25		62.3		µg/m^3	Air Sample 45	61/69	1.13 - 3.06	62.3	27	73 nc			NO	BSL
76-13-1	Trichlorotrifluoroethane	0.718	L	1.68	L	µg/m^3	Air Sample 32	5/5	0 - 0	1.68					NO	NTX
108-05-4	Vinyl Acetate	0.674		39		µg/m^3	Air Sample 16	29/34	0.745 - 3.9	39		21 nc			YES	ASL
75-01-4	Vinyl Chloride	0.438		0.618		µg/m^3	Air Sample 42	2/69	0.152 - 1.39	0.618		0.11 ca			YES	ASL

TABLE 2.1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
REMEDIAL INVESTIGATION
RAYMARK OU2 - GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Indoor Air
Exposure Medium: Indoor Air
Exposure Point: Homes

CAS Number	Chemical	Minimum (1) Concentration	Minimum Qualifier	Maximum (1) Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background (2) Value	Screening (3) Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for (4) Contaminant Deletion or Selection

(1) Minimum/maximum detected concentration.
(2) N/A - Refer to supporting information for background discussion.
Background values are the maximum of off-site background concentrations.
(3) Region IX PRG Ambient air, November 2002. Region IX PRGs for non-carcinogens have been adjusted by a factor of 0.1 to correspond to an HI of 0.1
(4) Rationale Codes Selection Reason:
Infrequent Detection but Associated Historically (HIST)
Frequent Detection (FD)
Toxicity Information Available (TX)
Above Screening Levels (ASL)
Deletion Reason:
Infrequent Detection (IFD)
Background Levels (BKG)
No Toxicity Information (NTX)
Essential Nutrient (NUT)
Below Screening Level (BSL)

Definitions:
N/A = Not Applicable
SQL = Sample Quantitation Limit
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered

MCL = Federal Maximum Contaminant Level
SMCL = Secondary Maximum Contaminant Level
J = Estimated Value
ca = Carcinogenic
nc = Non-Carcinogenic
EB = present in equipment blank
L = Estimated value is below the calibration range
E = Estimated value exceeds the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 5 times the concentration in the blank.

TABLE 2.2
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
REMEDIAL INVESTIGATION
RAYMARK OU2 - GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe:	Future
Medium:	Groundwater
Exposure Medium:	Surface Water
Exposure Point:	Ferry Creek or Housatonic River

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
71-55-6	1,1,1-Trichloroethane	0.48	L	160000	*	µg/l	OU1-MW-PC02D-07	271/477	1 - 200	160000	110	62000			YES	ASL
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	7	J	7	J	µg/l	OU1-MW-PC16B-07	1/477	1 - 200	7					NO	NTX
79-00-5	1,1,2-Trichloroethane	1	J	96		µg/l	OU1-MW-PC02B-07	53/477	1 - 200	96		1260			NO	BSL
75-34-3	1,1-Dichloroethane	0.57	L	6200	*	µg/l	OU1-MW-RW6A-07	316/477	1 - 100	6200	2				NO	NTX
75-35-4	1,1-Dichloroethene	0.54	L	40000	*	µg/l	OU1-MW-PC02B-07	284/477	0.9 - 200	40000	260	96			YES	ASL
95-63-6	1,2,4-Trimethylbenzene	0.51	L	62		µg/l	OU2-GW217-10	19/215	1 - 200	62					NO	NTX
95-50-1	1,2-Dichlorobenzene	3	J	9	J	µg/l	OU2-MW-BR-1-07	3/477	1 - 200	9		170000			NO	BSL
107-06-2	1,2-Dichloroethane	2	J	50		µg/l	OU1-MW-RW1-07	39/477	1 - 200	50		2970			NO	BSL
78-87-5	1,2-Dichloropropane	8		56	J	µg/l	OU2-MW-CRA5S-07	2/477	1 - 200	56					NO	NTX
108-67-8	1,3,5-Trimethylbenzene	0.47	L	11		µg/l	OU2-GW217-10	5/215	1 - 200	11					NO	NTX
123-91-1	1,4-Dioxane	55	J	15000	J	µg/l	OU1-MW-RW1-07	71/230	100 - 100	15000					NO	NTX
78-93-3	2-Butanone	3.4	L	37	J	µg/l	OU2-MW-110S-07	2/477	4 - 800	37					NO	NTX
591-78-6	2-Hexanone	4		12	J	µg/l	OU1-MW-RW3-07	2/477	0.6 - 120	12					NO	NTX
108-10-1	4-Methyl-2-Pentanone	2	J	380	J	µg/l	OU1-MW-RW6A-07	6/477	0.5 - 100	380					NO	NTX
67-64-1	Acetone	0.63	J,B	2400	*J	µg/l	OU2-MW-4B-07	145/477	2 - 400	2400	13				NO	NTX
71-43-2	Benzene	0.51		4600		µg/l	OU2-MW-CRA6S-07-AVG	97/477	1 - 200	4600		710			YES	ASL
75-27-4	Bromodichloromethane	1	J	13		µg/l	OU2-MW-506B-07	8/477	1 - 200	13	6				NO	NTX
75-25-2	Bromoform	1	J	4	J	µg/l	OU2-MW-533B-07	2/477	1 - 200	4		10800			NO	BSL
74-83-9	Bromomethane	0.58	L,B	61		µg/l	RM-GW214-0022	16/477	1 - 200	61					NO	NTX
75-15-0	Carbon Disulfide	1.6	L	53		µg/l	OU2-MW-110S-07	4/477	3 - 600	53					NO	NTX
56-23-5	Carbon Tetrachloride	11		11		µg/l	OU1-MW-RW1-07	1/477	1 - 200	11		132			NO	BSL
108-90-7	Chlorobenzene	1	, J	6100	*	µg/l	OU1-MW-PC03S-07	167/477	1 - 100	6100	1200	420000			NO	BSL
75-00-3	Chloroethane	0.54	L	1000	*	µg/l	OU1-MW-RW6A-07	56/477	1 - 100	1000					NO	NTX
67-66-3	Chloroform	0.54	L	61		µg/l	OU1-MW-PC14S-07	97/477	1 - 200	61	23	14100			NO	BSL
74-87-3	Chloromethane	0.58	L	5	L	µg/l	RM-GW09-0026	7/477	1 - 200	5					NO	NTX
156-59-2	cis-1,2-Dichloroethene	0.43	L	25000	*	µg/l	OU1-MW-RW6A-07	320/477	1 - 100	25000	6				NO	NTX
110-82-7	Cyclohexane	2	J	340	*J	µg/l	OU2-MW-CRA5S-07	13/262	10 - 10	340					NO	NTX
124-48-1	Dibromochloromethane	2	J	2	J	µg/l	OU2-MW-506B-07	1/477	1 - 200	2		1020			NO	BSL
75-71-8	Dichlorodifluoromethane	0.6	L,J	20	J	µg/l	RM-GW211-0028	6/477	1 - 200	20					NO	NTX
100-41-4	Ethylbenzene	2	, J	1600	*	µg/l	OU1-MW-PC04S-07	23/477	1 - 200	1600		580000			NO	BSL
98-82-8	Isopropylbenzene	0.95	L	60		µg/l	OU2-MW-1S-07	19/477	1 - 200	60					NO	NTX
108383/1	m&p-Xylene	1.4	L	100		µg/l	OU2-GW217-10	5/215	2 - 400	100					NO	NTX
79-20-9	Methyl Acetate	6	J	24		µg/l	OU1-MW-RW1-07	2/262	10 - 10	24					NO	NTX
1634-04-4	Methyl tert-Butyl Ether	0.54	L	120000		µg/l	RM-GW40-0036	116/477	1 - 200	120000	4				NO	NTX
108-87-2	Methylcyclohexane	1	J	5400	*J	µg/l	OU2-MW-CRA5S-07	22/262	10 - 10	5400					NO	NTX
75-09-2	Methylene Chloride	1	J	440	*J	µg/l	OU1-MW-RW6A-07	24/477	1 - 200	440		48000			NO	BSL
104-51-8	N-Butylbenzene	0.64	L	0.87	L	µg/l	RM-GW211-0013	2/215	1 - 200	0.87					NO	NTX

TABLE 2.2
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
REMEDIAL INVESTIGATION
RAYMARK OU2 - GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe:	Future
Medium:	Groundwater
Exposure Medium:	Surface Water
Exposure Point:	Ferry Creek or Housatonic River

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
103-65-1	N-Propylbenzene	0.83	L	22		µg/l	RM-GW65-0045	4/215	1 - 200	22					NO	NTX
95-47-6	o-Xylene	0.6	L	62		µg/l	OU2-GW217-10	5/215	1 - 200	62					NO	NTX
99-87-6	p-Isopropyltoluene	1.2		1.2		µg/l	RM-GW211-0013	1/215	1 - 200	1.2					NO	NTX
100-42-5	Styrene	0.59	L	0.59	L	µg/l	RM-GW211-0013	1/477	1 - 200	0.59					NO	NTX
127-18-4	Tetrachloroethene	0.52	L	2000	*	µg/l	OU1-MW-RW6A-07	87/477	1 - 200	2000		88			YES	ASL
109-99-9	Tetrahydrofuran	1.7	L	1.7	L	µg/l	RM-GW204-0044	1/215	7 - 1400	1.7					NO	NTX
108-88-3	Toluene	0.53	L	35000	*	µg/l	OU1-MW-PC04S-07	59/477	1 - 200	35000	3	4000000			NO	BSL
1330-20-7	Total Xylenes	1	J	8400	*	µg/l	OU1-MW-PC04S-07	27/262	10 - 10	8400					NO	NTX
156-60-5	trans-1,2-Dichloroethene	0.71	L	160	, J	µg/l	OU1-MW-RW3-07, OU1-MW-RW6A-07	39/477	1 - 200	160					NO	NTX
79-01-6	Trichloroethene	0.75	L	100000	*	µg/l	OU1-MW-RW1-07	293/477	1 - 200	100000	31	2340			YES	ASL
75-69-4	Trichlorofluoromethane	0.51	L	0.9	L	µg/l	RM-GW225-12	2/477	1 - 200	0.9					NO	NTX
75-01-4	Vinyl Chloride	0.51	L	1300		µg/l	RM-GW91-0014	171/477	1 - 100	1300		15750			NO	BSL
74-84-0	Ethane	11		110		µg/l	OU2-MW-304S-07-AVG	13/159	10 - 11	110					NO	NTX
74-85-1	Ethene	10		230		µg/l	OU2-MW-304D-07	9/159	10 - 10	230	10				NO	NTX
74-82-8	Methane	5.3		20000		µg/l	OU2-MW-CRA6D-07	108/159	5 - 5	20000	100				NO	NTX
105-67-9	2,4-Dimethylphenol	1	J	700	*	µg/l	OU4-MW-6-07	6/256	10 - 10	700	36				NO	NTX
51-28-5	2,4-Dinitrophenol	2	J	2100	*J	µg/l	OU1-MW-RW1-07	11/259	25 - 250	2100					NO	NTX
95-57-8	2-Chlorophenol	2	, J	20		µg/l	OU1-MW-PC03D-07-AVG	6/256	10 - 100	20	4				NO	NTX
91-57-6	2-Methylnaphthalene	1	J	41		µg/l	OU2-MW-1S-07	6/259	10 - 100	41					NO	NTX
95-48-7	2-Methylphenol	2	J	30	J	µg/l	OU2-MW-110S-07	7/259	10 - 10	30	12				NO	NTX
88-75-5	2-Nitrophenol	2	J	300	*J	µg/l	OU1-MW-RW1-07	18/259	10 - 100	300					NO	NTX
534-52-1	4,6-Dinitro-2-methylphenol	1	, J	250	*J	µg/l	OU1-MW-RW6-07	9/258	25 - 250	250					NO	NTX
59-50-7	4-Chloro-3-methylphenol	1	J	5	J	µg/l	OU1-MW-RW2-07	4/256	10 - 100	5	4				NO	NTX
106-44-5	4-Methylphenol	1	J	720		µg/l	OU2-MW-110S-07	12/256	10 - 10	720	170				NO	NTX
100-02-7	4-Nitrophenol	1	J	1400	*J	µg/l	OU1-MW-RW1-07	53/259	25 - 250	1400					NO	NTX
83-32-9	Acenaphthene	2	, J	27		µg/l	OU2-MW-503S-07	6/259	10 - 100	27					NO	NTX
208-96-8	Acenaphthylene	0.45		1.3		µg/l	OU1-MW-PC02S-07	3/259	0.2 - 0.2	1.3		0.3			YES	ASL
98-86-2	Acetophenone	2	J	3	J	µg/l	OU1-MW-RW3-07	2/259	10 - 100	3					NO	NTX
100-52-7	Benzaldehyde	1	J	120	J	µg/l	OU1-MW-PC14D-07	7/259	10 - 100	120					NO	NTX
205-99-2	Benzo(b)fluoranthene	0.2		0.32		µg/l	OU2-MW-CRA6D-07	2/259	0.2 - 0.2	0.32	0.2	0.3			YES	ASL
207-08-9	Benzo(k)fluoranthene	0.82	J	0.82	J	µg/l	OU1-MW-RW1-07	1/260	0.2 - 0.2	0.82		0.3			YES	ASL
117-81-7	bis(2-Ethylhexyl)phthalate	1	J	4	, J	µg/l	OU1-MW-PC11S-07, OU2-MW-305BR-07-AVG	10/259	10 - 100	4		59			NO	BSL
105-60-2	Caprolactam	2	J	810	*	µg/l	OU2-MW-4B-07	40/259	10 - 100	810	650				NO	NTX
86-74-8	Carbazole	3		9	J	µg/l	OU1-MW-PC02S-07	2/259	10 - 100	9					NO	NTX
218-01-9	Chrysene	0.16		0.16		µg/l	OU2-MW-309D-07-AVG	1/260	0.2 - 0.2	0.16	0.16				NO	NTX
132-64-9	Dibenzofuran	2		6	J	µg/l	OU1-MW-PC02S-07	3/259	10 - 100	6					NO	NTX

TABLE 2.2
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
REMEDIAL INVESTIGATION
RAYMARK OU2 - GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe:	Future
Medium:	Groundwater
Exposure Medium:	Surface Water
Exposure Point:	Ferry Creek or Housatonic River

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
84-66-2	Diethylphthalate	1	J	140	*	µg/l	OU1-MW-PC08S-07	4/259	10 - 100	140					NO	NTX
84-74-2	Di-n-Butylphthalate	1	J	2	J	µg/l	OU2-MW-309B-07	2/259	10 - 100	2	2	120000			NO	BSL
117-84-0	Di-n-octylphthalate	10	J	10	J	µg/l	OU1-MW-PC12B-07	1/258	10 - 600	10					NO	NTX
206-44-0	Fluoranthene	2	J	2	J	µg/l	OU1-MW-PC02S-07	1/259	10 - 100	2		3700			NO	BSL
86-73-7	Fluorene	2		10		µg/l	OU1-MW-PC02S-07	4/259	10 - 100	10		140000			NO	BSL
91-20-3	Naphthalene	0.6	L	1700		µg/l	RM-GW211-0013	33/474	1 - 200	1700	4				NO	NTX
98-95-3	Nitrobenzene	1	J	1	J	µg/l	OU1-MW-PC14D-07	1/259	10 - 100	1					NO	NTX
86-30-6	N-Nitroso-diphenylamine	5	, J	5	, J	µg/l	OU2-MW-CRA5S-07, OU2-MW-CRA6S-07-AVG	2/259	10 - 100	5					NO	NTX
85-01-8	Phenanthrene	0.12	J	3.1		µg/l	OU1-MW-PC02S-07	17/260	0.2 - 0.2	3.1		0.077			YES	ASL
108-95-2	Phenol	1	J	8300	*	µg/l	OU2-MW-110S-07	15/256	10 - 100	8300	78	92000000			NO	BSL
129-00-0	Pyrene	1	J	4		µg/l	OU2-MW-207MR-07-AVG	3/259	10 - 100	4		110000			NO	BSL
72-54-8	4,4'-DDD	0.14		0.14		µg/l	OU4-MW-6-07	1/257	0.1 - 0.1	0.14					NO	NTX
72-55-9	4,4'-DDE	0.13	J	0.36	J	µg/l	OU1-MW-RW1-07	3/259	0.1 - 0.1	0.36					NO	NTX
50-29-3	4,4'-DDT	0.063	J	0.21	J	µg/l	OU1-MW-RW3-07	3/257	0.1 - 0.1	0.21			0.001	AWQC_CCC Freshwater	NO	NTX
309-00-2	Aldrin	0.19	J	0.23	J	µg/l	OU1-MW-RW2-07	2/259	0.05 - 0.05	0.23			1.3	AWQC_CMC Saltwater	NO	NTX
319-84-6	alpha-BHC	0.057	J	0.23		µg/l	OU1-MW-PC16D-07-AVG, OU2-MW-304B-07	6/257	0.05 - 0.5	0.23					NO	NTX
5103-71-9	alpha-Chlordane	0.1		0.1		µg/l	OU2-MW-215B-07	1/257	0.05 - 0.05	0.1		0.3	0.004	AWQC_CCC Saltwater	NO	BSL
319-85-7	beta-BHC	0.06		4.1	*J	µg/l	OU1-MW-RW1-07	7/258	0.05 - 0.05	4.1					NO	NTX
319-86-8	delta-BHC	0.059		0.074	J	µg/l	OU1-MW-RW6-07	2/257	0.05 - 0.05	0.074					NO	NTX
60-57-1	Dieldrin	0.067	J	0.42		µg/l	OU2-MW-215B-07	5/258	0.05 - 0.05	0.42		0.1	0.0019	AWQC_CCC Saltwater	YES	ASL
959-98-8	Endosulfan I	0.055		0.29	J	µg/l	OU1-MW-RW2-07	4/259	0.05 - 0.05	0.29			0.0087	AWQC_CCC Saltwater	NO	NTX
33213-65-9	Endosulfan II	0.15	J	0.15	J	µg/l	OU1-MW-RW3-07	1/257	0.1 - 0.1	0.15			0.0087	AWQC_CCC Saltwater	NO	NTX
72-20-8	Endrin	0.056	J	0.056	J	µg/l	OU1-MW-RW3-07	1/257	0.05 - 0.05	0.056		0.1	0.0023	AWQC_CCC Saltwater	NO	BSL
7421-93-4	Endrin Aldehyde	0.15	J	0.15	J	µg/l	OU1-MW-RW1-07	1/258	0.1 - 0.1	0.15					NO	NTX
53494-70-5	Endrin Ketone	0.16	J	1.1	J	µg/l	OU1-MW-RW1-07	2/259	0.1 - 0.1	1.1					NO	NTX
58-89-9	gamma-BHC	0.051		2	*J	µg/l	OU1-MW-RW3-07	6/256	0.05 - 0.05	2			0.16	AWQC_CMC Saltwater	NO	NTX
5103-74-2	gamma-Chlordane	0.073		0.35	J	µg/l	OU1-MW-RW2-07	2/258	0.05 - 0.05	0.35		0.3	0.004	AWQC_CCC Saltwater	YES	ASL
76-44-8	Heptachlor	0.023		0.14	J	µg/l	OU1-MW-RW2-07	6/259	0.02 - 0.02	0.14		0.05	0.0036	AWQC_CCC Saltwater	YES	ASL
1024-57-3	Heptachlor Epoxide	0.02		0.66	J	µg/l	OU1-MW-PC12D-07	13/258	0.02 - 0.02	0.66		0.05	0.0036	AWQC_CCC Saltwater	YES	ASL
35822-46-9	1,2,3,4,6,7,8-HpCDD	1	J	91.2		pg/l	OU2-MW-215DB-07-AVG	36/205	0.7 - 23.9	91.2	17.1				NO	NTX
67562-39-4	1,2,3,4,6,7,8-HpCDF	0.53	J	15.1	J	pg/l	OU2-MW-530S-07	26/205	0.3 - 14.6	15.1	8.3				NO	NTX
55673-89-7	1,2,3,4,7,8,9-HpCDF	0.36	EMPC	8	J	pg/l	OU1-MW-PC02B-07	13/205	0.4 - 17.5	8	5				NO	NTX
39227-28-6	1,2,3,4,7,8-HxCDD	0.38	J	9.2	J	pg/l	OU1-MW-PC02B-07	22/205	0.3 - 14.2	9.2	4.7				NO	NTX
70648-26-9	1,2,3,4,7,8-HxCDF	0.72		9.1	JB	pg/l	OU1-MW-PC02B-07	18/205	0.5 - 8.2	9.1	4.2				NO	NTX
57653-85-7	1,2,3,6,7,8-HxCDD	0.37	J	10.1	J	pg/l	OU1-MW-PC02B-07	23/205	0.3 - 13.7	10.1	4.4				NO	NTX
57117-44-9	1,2,3,6,7,8-HxCDF	0.42	J	8.6	JB	pg/l	OU1-MW-PC02B-07	26/205	0.2 - 6.9	8.6	5.6				NO	NTX

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RAYMARK OU2 - GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe:	Future
Medium:	Groundwater
Exposure Medium:	Surface Water
Exposure Point:	Ferry Creek or Housatonic River

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
19408-74-3	1,2,3,7,8,9-HxCDD	0.42	J	7.3	JB	pg/l	OU1-MW-PC02B-07	31/205	0.3 - 15.2	7.3	4.3				NO	NTX
72918-21-9	1,2,3,7,8,9-HxCDF	0.45	J	8.6	JB	pg/l	OU1-MW-PC02B-07	24/205	0.3 - 10	8.6	7				NO	NTX
40321-76-4	1,2,3,7,8-PeCDD	1.1		8.6	J	pg/l	OU1-MW-PC05M-07	26/205	0.2 - 11	8.6	6.6				NO	NTX
57117-41-6	1,2,3,7,8-PeCDF	0.71		10.6	J	pg/l	OU1-MW-PC05M-07	21/204	0.1 - 9.6	10.6	8.6				NO	NTX
60851-34-5	2,3,4,6,7,8-HxCDF	0.38	J	11.6	JB	pg/l	OU1-MW-PC02B-07	23/205	0.2 - 7.3	11.6	4.7				NO	NTX
57117-31-4	2,3,4,7,8-PeCDF	0.82	EMPC	8.9	J	pg/l	OU2-MW-211D-07	27/205	0.2 - 7.8	8.9	4.7				NO	NTX
1746-01-6	2,3,7,8-TCDD	0.3	EMPC	4.8	J	pg/l	OU1-MW-PC05M-07	8/205	0.3 - 9.2	4.8	3.3				NO	NTX
51207-31-9	2,3,7,8-TCDF	0.48	J	3.8	J	pg/l	OU2-MW-212S-07	18/205	0.2 - 7.2	3.8	2.5				NO	NTX
3268-87-9	OCDD	2.9		742		pg/l	OU2-MW-215DB-07-AVG	68/205	2.1 - 75.9	742	72				NO	NTX
39001-02-0	OCDF	1.2	J	96.4		pg/l	OU2-MW-530S-07	35/205	1.1 - 60.5	96.4	5.6				NO	NTX
37871-00-4	Total HpCDD	1.5	EMPC	148		pg/l	OU2-MW-215DB-07-AVG	38/205	0.7 - 23.9	148	33.8				NO	NTX
38998-75-3	Total HpCDF	0.87		37.9	EMPC	pg/l	OU2-MW-530S-07	25/205	0.4 - 21.8	37.9	10.5				NO	NTX
34465-46-8	Total HxCDD	1.4	, EMPC	40.4	EMPC	pg/l	OU1-MW-PC02B-07	18/205	0.3 - 27.7	40.4	23.5				NO	NTX
55684-94-1	Total HxCDF	0.57		37.8		pg/l	OU1-MW-PC02B-07	21/205	0.5 - 31.6	37.8	16.3				NO	NTX
36088-22-9	Total PeCDD	1.1		7.2	J	pg/l	OU2-MW-211D-07	24/205	0.2 - 11	7.2	5.1				NO	NTX
30402-15-4	Total PeCDF	0.78		16.9	EMPC	pg/l	OU2-MW-504D-07	29/205	0.2 - 17.5	16.9	13.3				NO	NTX
41903-57-5	Total TCDD	0.3	EMPC	4.9		pg/l	OU1-MW-PC01B-07	17/205	0.3 - 9.2	4.9	3.3				NO	NTX
55722-27-5	Total TCDF	0.46	J	35.9	EMPC	pg/l	OU2-MW-535S-07	23/205	0.3 - 17.6	35.9	2.5				NO	NTX
TE	Toxicity Equivalency	0.00029	J	18	J	pg/l	OU2-MW-211D-07	89/89	0 - 0	18	13				NO	NTX
7429-90-5	Aluminum	411		725000	J	µg/l	OU2-MW-533B-07	39/257	10.1 - 576	725000			87	AWQC_CCC Freshwater	NO	EPA-I
7440-36-0	Antimony	1.2	J	4.5	J	µg/l	OU2-MW-503B-07	3/256	1.2 - 9.9	4.5		86000			NO	BSL
7440-38-2	Arsenic	3.2		148		µg/l	OU2-MW-505M-07-AVG	60/252	2.3 - 15.8	148		4	36	AWQC_CCC Saltwater	YES	ASL
7440-39-3	Barium	2.4		4570		µg/l	OU4-MW-6-07	216/253	1.3 - 92.2	4570	308				NO	NTX
7440-41-7	Beryllium	0.14	J	113	J	µg/l	OU2-MW-533B-07	22/254	0.1 - 2	113		4			YES	ASL
7440-43-9	Cadmium	0.3	J	553		µg/l	OU2-MW-9-07-AVG	59/254	0.3 - 3.1	553		6	2.2	AWQC_CCC Freshwater	YES	ASL
7440-70-2	Calcium	4400		628000		µg/l	OU1-MW-PC01D-07	255/257	5030 - 6140	628000	222000				NO	NUT
7440-47-3	Chromium	0.38		603		µg/l	OU2-MW-4-07	115/257	0.5 - 7.1	603	7.6	1200	74	AWQC_CCC Freshwater	NO	BSL
7440-48-4	Cobalt	0.75	J	3140	J	µg/l	OU1-MW-PC01B-07	153/256	0.6 - 6.9	3140	2.2				NO	EPA-I
7440-50-8	Copper	0.48		9960		µg/l	OU1-MW-RW1-07	102/254	0.6 - 26.7	9960	29		3.1	AWQC_CCC Saltwater	NO	EPA-I
57-12-5	Cyanide	0.53	J	48.4	J	µg/l	OU1-MW-PC14D-07	13/75	0.71 - 10	48.4	1.2	52	1	AWQC_CCC Saltwater	NO	BSL
7439-89-6	Iron	15.9		2300000		µg/l	OU2-MW-533B-07	152/257	12.5 - 176	2300000	3820				NO	EPA-I
7439-92-1	Lead	1.4	J	227	J	µg/l	OU2-MW-211B-07	41/256	1.2 - 12.6	227		13	2.5	AWQC_CCC Freshwater	YES	ASL
7439-95-4	Magnesium	509		724000		µg/l	OU2-MW-530S-07	256/257	1550 - 1550	724000	146000				NO	NUT
7439-96-5	Manganese	2	J	235000		µg/l	OU1-MW-PC01B-07	244/257	0.33 - 40.4	235000	2030				NO	NTX
7439-97-6	Mercury	0.08		2.8		µg/l	OU1-MW-RW1-07, OU2-MW-101S-07	12/257	0.1 - 0.27	2.8		0.4	0.77	AWQC_CCC Freshwater	YES	ASL
7440-02-0	Nickel	1.2	J	17900		µg/l	OU1-MW-PC16M-07	185/255	1 - 17.6	17900	7	880	8.2	AWQC_CCC Saltwater	YES	ASL
7440-09-7	Potassium	670		228000	J	µg/l	OU2-MW-530S-07	257/257	0 - 0	228000	12000				NO	NUT

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Scenario Timeframe:	Future
Medium:	Groundwater
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CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
7782-49-2	Selenium	2.6		90.3	J	µg/l	OU1-MW-PC01B-07	28/254	2.1 - 13.8	90.3	4.1	50	5	AWQC_CCC Freshwater	YES	ASL
7440-22-4	Silver	0.67	J	15	J	µg/l	OU2-MW-1B-07	43/241	0.6 - 2.4	15		12	1.9	AWQC_CMC Saltwater	YES	ASL
7440-23-5	Sodium	3080		5740000		µg/l	OU2-MW-530S-07	257/257	0 - 0	5740000	234000				NO	NUT
7440-28-0	Thallium	2.4		210	J	µg/l	OU1-MW-PC01B-07	40/257	2.4 - 27	210		63			YES	ASL
7440-62-2	Vanadium	0.46		70.7	J	µg/l	OU2-MW-533B-07	54/255	0.5 - 5.9	70.7	1.7				NO	NTX
7440-66-6	Zinc	1.6	J	10800		µg/l	OU1-MW-PC16M-07	125/254	0.6 - 223	10800	463	123	81	AWQC_CCC Saltwater	YES	ASL
E14506	Alkalinity	8	J	732		mg/l	OU1-MW-PC01S-07	153/161	2 - 2	732	172				NO	NTX
CARBONDIO	Carbon Dioxide	11	J	912		mg/l	OU2-MW-104S-07-AVG	150/161	2 - 174	912	171				NO	NTX
16887-00-6	Chloride	1.65		8220	J	mg/l	OU2-MW-217B-07	151/166	8 - 289	8220	959				NO	NTX
FE2+	Ferrous Iron	0.03		2270	J	mg/l	OU1-MW-PC02B-07	99/160	0.03 - 0.03	2270	0.1				NO	NTX
NITRATE	Nitrate	0.05	J	278	J	mg/l	OU1-MW-PC14D-07	104/165	0.05 - 1	278	7.56				NO	NTX
14797-65-0	Nitrite-N	0.05	, J	3.24		mg/l	OU1-MW-PC14D-07	22/165	0.05 - 1	3.24	0.06				NO	NTX
14808-79-8	Sulfate	5.3		13500		mg/l	OU2-MW-533D-07	156/166	5 - 5	13500	259				NO	NTX
18496-25-8	Sulfide	0.38		2.64		mg/l	OU1-MW-PC04S-07	28/137	0.5 - 0.5	2.64	1.44				NO	NTX
7440-44-0	Total Organic Carbon	2.05		172		mg/l	OU2-MW-CRA6D-07	125/166	2 - 2	172	5.17				NO	NTX

(1) Minimum/maximum detected concentration.

(2) Maximum detected background concentration.

(3) Screening toxicity values are Connecticut Surface Water Protecttion Criteria.

(4) Rationale Codes Selection Reason: Above Screening Levels (ASL)

Deletion Reason:
- Background Levels (BKG)
- No Screening Toxicity Value (NSTV)
- Essential Nutrient (NUT)
- Below Screening Level (BSL)
- EPA Region I does not advocate quantitative risk evaluation of this contaminant (EPA-I) given lack of approved toxicity criteria

Definitions:
- N/A = Not Applicable
- COPC = Chemical of Potential Concern
- ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
- J = Estimated Value
- B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 5 times the concentration in the blank.
- L = Estimated value is below the calibration range
- EMPC = Estimated Maximum Possible Concentration
- * = From dilution analysis

TABLE 3.1
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
REMEDIAL INVESTIGATION
RAYMARK OU2 - GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Indoor air
Exposure Medium: Indoor air
Exposure Point: Homes

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Indoor Air EPC Value	Indoor Air EPC Statistic	Indoor Air EPC Rationale	Indoor Air EPC Value	Indoor Air EPC Statistic	Indoor Air EPC Rationale
1,1,2,2-Tetrachloroethane	µg/m^3	1	0.9	38		µg/m^3	38	Max	(1)	1	Avg	(1)
1,1,2-Trichloroethane	µg/m^3	0.6	0.5	9.89		µg/m^3	9.89	Max	(1)	0.6	Avg	(1)
1,1-Dichloroethene	µg/m^3	5	8	48		µg/m^3	48	Max	(1)	5	Avg	(1)
1,2,4-Trimethylbenzene	µg/m^3	3	5	33.1		µg/m^3	33.1	Max	(1)	3	Avg	(1)
1,2-Dibromoethane	µg/m^3	0.5	0.6	0.882	L	µg/m^3	0.882	Max	(1)	0.5	Avg	(1)
1,2-Dichloroethane	µg/m^3	0.3	0.3	0.326		µg/m^3	0.326	Max	(1)	0.3	Avg	(1)
1,3,5-Trimethylbenzene	µg/m^3	1	2	14.8		µg/m^3	14.8	Max	(1)	1	Avg	(1)
1,3-Butadiene	µg/m^3	0.5	0.7	7.34		µg/m^3	7.34	Max	(1)	0.5	Avg	(1)
1,4-Dichlorobenzene	µg/m^3	23	9	811		µg/m^3	811	Max	(1)	23	Avg	(1)
4-Methyl-2-Pentanone	µg/m^3	0.7	0.6	14		µg/m^3	14	Max	(1)	0.7	Avg	(1)
Acetone	µg/m^3	11	18	95.3		µg/m^3	95.3	Max	(1)	11	Avg	(1)
Acrylonitrile	µg/m^3	0.2	0.2	0.241		µg/m^3	0.241	Max	(1)	0.2	Avg	(1)
Benzene	µg/m^3	2	3	12.5		µg/m^3	12.5	Max	(1)	2	Avg	(1)
Benzyl Chloride	µg/m^3	0.5	0.6	6.26		µg/m^3	6.26	Max	(1)	0.5	Avg	(1)
Bromodichloromethane	µg/m^3	1	2	2.6	L	µg/m^3	2.6	Max	(1)	1	Avg	(1)
Carbon Tetrachloride	µg/m^3	0.5	0.5	1.07	L	µg/m^3	1.07	Max	(1)	0.5	Avg	(1)
Chloroethane	µg/m^3	1	2	3.99		µg/m^3	3.99	Max	(1)	1	Avg	(1)
Chloroform	µg/m^3	1	1	5.9		µg/m^3	5.9	Max	(1)	1	Avg	(1)
Chloromethane	µg/m^3	1	2	3.54		µg/m^3	3.54	Max	(1)	1	Avg	(1)
cis-1,2-Dichloroethene	µg/m^3	2	3	16.4		µg/m^3	16.4	Max	(1)	2	Avg	(1)
Dibromochloromethane	µg/m^3	1	1	1.69	L	µg/m^3	1.69	Max	(1)	1	Avg	(1)
Dichlorodifluoromethane	µg/m^3	8	7	149		µg/m^3	149	Max	(1)	8	Avg	(1)
Ethylbenzene	µg/m^3	4	5	73.8		µg/m^3	73.8	Max	(1)	4	Avg	(1)
Hexane	µg/m^3	6	8	35.4		µg/m^3	35.4	Max	(1)	6	Avg	(1)
Methyl tert-Butyl Ether	µg/m^3	9	16	69		µg/m^3	69	Max	(1)	9	Avg	(1)
Methylene Chloride	µg/m^3	24	26	910		µg/m^3	910	Max	(1)	24	Avg	(1)
Tetrachloroethene	µg/m^3	1	1	25.3		µg/m^3	25.3	Max	(1)	1	Avg	(1)
Tetrahydrofuran	µg/m^3	3	6	32.7		µg/m^3	32.7	Max	(1)	3	Avg	(1)
Toluene	µg/m^3	20	29	159		µg/m^3	159	Max	(1)	20	Avg	(1)
Total Xylenes	µg/m^3	170	NA	761		µg/m^3	761	Max	(1)	170	Avg	(1)
Trichloroethene	µg/m^3	5	7	52.5		µg/m^3	52.5	Max	(1)	5	Avg	(1)
Vinyl Acetate	µg/m^3	6	11	39		µg/m^3	39	Max	(1)	6	Avg	(1)
Vinyl Chloride	µg/m^3	0.2	0.3	0.618		µg/m^3	0.618	Max	(1)	0.2	Avg	(1)

(1) Maximum selected as RME EPC and average selected as CTE EPC at the direction of EPA Region I.

TABLE 3.2
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
REMEDIAL INVESTIGATION
RAYMARK OU2 - GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Surface Water
Exposure Point: Ferry Creek

Chemical of Potential Concern	Units	Arithmetic Mean Groundwater	95% UCL of Normal Data	Source Detected Concentration Groundwater	Maximum Qualifier	EPC Units Surface Water	Reasonable Maximum Exposure		
							Surface Water EPC Value	Surface Water EPC Statistic	Surface Water EPC Rationale
Arsenic	µg/L	NA	NA	246		µg/L	8.4	(1)	Modeled from MAX GW
Zinc	µg/L	NA	NA	970		µg/L	33	(1)	Modeled from MAX GW
1,1-Dichlorethene	µg/L	NA	NA	42000		µg/L	53	(1)	Modeled from MAX GW

(1) Modeled concentrations reflect modeled maximum sustained groundwater concentrations arriving at Ferry Creek within the foreseeable future and an assumed 1:10 dilution factor to account for mixing into Ferry Creek surface water.

TABLE 4.1A
VALUES USED FOR DAILY INTAKE CALCULATIONS
REMEDIAL INVESTIGATION
RAYMARK OU2 - GROUNDWATER
STRATFORD, CONNECTICUT

Current/ Future Residental Exposures to Indoor Air

Scenario Timeframe: Current/Future
Medium: Indoor Air
Exposure Medium: Indoor Air
Exposure Point: Homes
Receptor Population: Resident
Receptor Age: Adult/Child - Ages 0-30 years

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Indoor Air	$\mu g/m^3$	See Table 3	See Table 3	See Table 3	See Table 3	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-S	Inhalation Rate	m^3/day	20	EPA, 1997	20	EPA, 1997	(CA x IR x EF x ED x CF1)/(BW x AT)
	EF	Exposure Frequency	days/year	350	EPA, 1994	350	EPA, 1994	
	ED	Exposure Duration	years	30	EPA, 1997	9	EPA, 1997	
	CF1	Conversion Factor	mg/µg	1E-03	--	1E-03	--	
	BW	Body Weight	kg	70	EPA, 1997	70	EPA, 1997	
	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	

EPA, 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.
EPA, 1994: USEPA Region I Waste Management Division, USEPA Risk Update No. 2, Aug. 1994.
EPA, 1997: Exposure Factors Handbook. Volume I, Aug. 1997, EPA/600/P-25/002FA.

TABLE 4.1B
VALUES USED FOR DAILY INTAKE CALCULATIONS
REMEDIAL INVESTIGATION
RAYMARK OU2 - GROUNDWATER
STRATFORD, CONNECTICUT

Current/ Future Industrial/Commercial Exposures to Indoor Air

Scenario Timeframe: Current/Future
Medium: Indoor Air
Exposure Medium: Indoor Air
Exposure Point: Industrial/Commercial Properties
Receptor Population: Industrial/Commercial 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
Inhalation	CA	Chemical Concentration in Indoor Air	$\mu g/m^3$	See Table 3	See Table 3	See Table 3	See Table 3	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR-S	Inhalation Rate	m^3/day	20	EPA, 1997	20	EPA, 1997	(CA x IR x ET x EF x ED x CF1 x CF2)/(BW x AT)
	ET	Exposure Time	hr/day	8	EPA, 1997	8	EPA, 1997	
	EF	Exposure Frequency	days/year	250	EPA, 1994	250	EPA, 1994	
	ED	Exposure Duration	years	25	EPA, 1997	9	EPA, 1997	
	CF1	Conversion Factor	mg/µg	1E-03	--	1E-03	--	
	CF2	Conversion Factor	day/hr	1/24	--	1/24	--	
	BW	Body Weight	kg	70	EPA, 1997	70	EPA, 1997	
	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	

EPA, 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.
EPA, 1994: USEPA Region I Waste Management Division, USEPA Risk Update No. 2, Aug. 1994.
EPA, 1997: Exposure Factors Handbook. Volume I, Aug. 1997, EPA/600/P-25/002FA.

TABLE 4.2A
VALUES USED FOR DAILY INTAKE CALCULATIONS - RECREATIONAL VISITOR CONTACT WITH SURFACE WATER
REMEDIAL INVESTIGATION
RAYMARK OU2 - GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Surface Water
Exposure Point: Ferry Creek
Receptor Population: Recreational Visitor
Receptor Age: Child

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	Intake Equation/ Model Name
Dermal Absorption	Cw	Chemical Concentration in Drinking Water	µg/l	See Table 3	See Table 3	DAD (mg/kg-day) =
	CF1	Conversion Factor	mg/µg	1E-03	--	$(DA_{event}$ x SA x EV x EF x ED)/
	CF2	Conversion Factor	L/cm^3	1E-03	--	(BW x AT)
	DAevent	Absorbed Dose per Event	mg/cm^2*d		(2)	for inorganics: DA_{event} = Kp x Cw x t_{event} x CF1 x CF2
	SA	Skin Surface Area Available for Contact	cm^2	1,900	EPA, 1997	for organics; the equation selected for DA event is
	DABS	Dermal Permeability Coefficient-Kp (chemical-specific)	cm/hr	See Table 5.1	See Table 5.1	dependent on t event. See text for the equations.
	t_{event}	Event Duration	hr/event	1	(1)	
	EV	Event Frequency	events/day	1	EPA, 2001	
	EF	Exposure Frequency	days/year	90	(1)	assumes 7 days/week during 3 warmer months/yr
	ED	Exposure Duration	years	6	EPA, 1997	
	BW	Body Weight	kg	15	EPA, 1997	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	EPA, 1989	

(1) Professional Judgement.
(2) DAevent depends on exposure- and chemical-specific factors.
EPA, 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.
EPA, 1994: USEPA Region I Waste Management Division, USEPA Risk Update No. 2, Aug. 1994.
EPA, 1997: Exposure Factors Handbook. Volume I, Aug. 1997, EPA/600/P-25/002FA.
EPA, 2001: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim . December 2001.
Surface Area is based on hands, lower arms, lower legs, and feet.

TABLE 4.2B
VALUES USED FOR DAILY INTAKE CALCULATIONS - RECREATIONAL VISITOR CONTACT WITH SURFACE WATER
DRAFT FINAL REMEDIAL INVESTIGATION
RAYMARK OU2 - GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Surface Water
Exposure Point: Ferry Creek
Receptor Population: Recreational Visitor
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	Intake Equation/ Model Name
Dermal Absorption	Cw	Chemical Concentration in Drinking Water	µg/l	See Table 3	See Table 3	DAD (mg/kg-day) =
	CF1	Conversion Factor	mg/µg	1E-03	--	(DA_{event} x SA x EV x EF x ED)/
	CF2	Conversion Factor	L/cm^3	1E-03	--	(BW x AT)
	DAevent	Absorbed Dose per Event	mg/cm^2*d		(2)	for inorganics: DA_{event} = Kp x Cw x t_{event} x CF1 x CF2
	SA	Skin Surface Area Available for Contact	cm^2	4,500	EPA, 1997	for organics; the equation selected for DA event is dependent
	DABS	Dermal Permeability Coefficient-Kp (chemical-specific)	cm/hr	See Table 5.1	See Table 5.1	on t event. See text for the equations.
	t_{event}	Event Duration	hr/event	1	(1)	
	EV	Event Frequency	events/day	1	EPA, 2001	
	EF	Exposure Frequency	days/year	90	(1)	assumes 7 days/week during 3 warmer months/yr
	ED	Exposure Duration	years	24	EPA, 1997	
	BW	Body Weight	kg	70	EPA, 1997	
	AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	EPA, 1989	

(1) Professional Judgement.
(2) DAevent depends on exposure- and chemical-specific factors.
EPA, 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.
EPA, 1994: USEPA Region I Waste Management Division, USEPA Risk Update No. 2, Aug. 1994.
EPA, 1997: Exposure Factors Handbook. Volume I, Aug. 1997, EPA/600/P-25/002FA.
EPA, 2001: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim . December 2001.
Surface Area is based on hands, lower arms, lower legs, and feet.

TABLE 5.1
NON-CANCER CHRONIC TOXICITY DATA -- ORAL/DERMAL
REMEDIAL INVESTIGATION
RAYMARK OU2 - GROUNDWATER
STRATFORD, CONNECTICUT

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value (1)	Oral RfD Units	GI Absorption in Toxicity Study	Adjusted Dermal RfD (2)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ (MM/DD/YY)	Dermal Permeability Coeffient in Water (3) (K_p) cm/hr
Arsenic	Chronic	3.0E-04	mg/kg/day	1.0E+00	3.0E-04	mg/kg/day	Skin, CVS	3/1	IRIS	12/9/2003	0.001
Zinc	Chronic	3.0E-01	mg/kg/day	1.0E+00	3.0E-01	mg/kg/day	Blood	3/1	IRIS	12/9/2003	0.0006
1,1-Dichloroethene	Chronic	5.0E-02	mg/kg/day	1.0E+00	5.0E-02	mg/kg/day	Liver	100/1	IRIS	12/9/2003	0.012
Trichloroethene	Chronic	3.0E-04	mg/kg/day	1.0E+00	3.0E-04	mg/kg/day	NA	NA	EPA IX	11/1/02	0.012

N/A = Not Applicable
(1) To be used for oral pathway only. Based on administered dose.
(2) Adjusted RfD = oral RfD x GI absorption value in toxicity study upon which the RfD is based. To be used for dermal pathway only.
(3) EPA, 2001 - Risk Assessment Guidance for Superfund, (RAGS) Part E
CVS = Cardiovascular System
N/A = Not Applicable
IRIS = Integrated Risk Information System
EPA IX = USEPA Region IX PRG Tables, November 2002.

TABLE 5.2
NON-CANCER TOXICITY DATA -- INHALATION
REMEDIAL INVESTIGATION
RAYMARK OU2 - GROUNDWATER
STRATFORD, CONNECTICUT

Chemical of Potential Concern	Chronic/ Subchronic	Value Inhalation RfC	Units	Adjusted Inhalation RfD (1)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfC:RfD: Target Organ	Dates (2) (MM/DD/YYYY)
1,1,2,2-Tetrachloroethane	Chronic			6.0E-02	mg/kg-day			EPA Region IX	2/9/2004
1,1,2-Trichloroethane	Chronic			4.0E-03	mg/kg-day	blood		EPA Region IX	2/9/2004
1,1-Dichlorethene	Chronic	2.0E-01	mg/m^3	5.7E-02	mg/kg-day	liver	30/1	IRIS	2/9/2004
1,2,4-Trimethylbenzene	Chronic			1.7E-03	mg/kg-day			NCEA	2002
1,2-Dibromoethane	Chronic			5.7E-05	mg/kg-day			HEAST	1997
1,2-Dichloroethane	Chronic			1.4E-03	mg/kg-day			NCEA	2002
1,3,5-Trimethylbenzene	Chronic			1.7E-03	mg/kg-day			NCEA	2002
1,3-Butadiene	Chronic	2.0E-03	mg/m^3	5.7E-04	mg/kg-day	reproductive	1000/1	IRIS	2/9/2004
1,4-Dichlorobenzene	Chronic	8.0E-01	mg/m^3	3.0E-02	mg/kg-day	liver	100/1	IRIS	2/9/2004
4-Methyl-2-Pentanone									
Acetone	Chronic			1.0E-01	mg/kg-day	liver/kidney		EPA Region IX	2/9/2004
Acrylonitrile	Chronic	2.0E-03	mg/m^3	5.7E-04	mg/kg-day	epithelium	1000/1	IRIS	2/9/2004
Benzene	Chronic	3.0E-02	mg/m^3	1.7E-03	mg/kg-day	lymphocytes	300/1	IRIS	2/9/2004
Benzyl Chloride	Chronic			2.9E-03	mg/kg-day			NCEA	2002
Bromodichloromethane	Chronic			2.0E-02	mg/kg-day	kidney		EPA Region IX	2/9/2004
Carbon Tetrachloride	Chronic			7.0E-04	mg/kg-day			EPA Region IX	2/9/2004
Chloroethane	Chronic			2.9E+00	mg/kg-day			IRIS	2/9/2004
Chloroform	Chronic			8.6E-04	mg/kg-day	liver		NCEA	2002
Chloromethane	Chronic			8.6E-02	mg/kg-day			NCEA	2002
cis-1,2-Dichloroethene	Chronic			1.0E-02	mg/kg-day	blood		EPA Region IX	2/9/2004
Dibromochloromethane	Chronic			2.0E-02	mg/kg-day			EPA Region IX	2/9/2004
Dichlorodifluoromethane	Chronic			5.7E-02	mg/kg-day	liver		HEAST	1997
Ethylbenzene	Chronic	1.0E+00	mg/m^3	2.9E-01	mg/kg-day	developmental	300/1	IRIS	2/9/2004
Hexane	Chronic	2.0E-01	mg/m^3	5.7E-02	mg/kg-day	neurotoxicity	300/1	IRIS	2/9/2004
Methyl tert-Butyl Ether	Chronic	3.0E+00	mg/m^3	8.6E-01	mg/kg-day	liver/kidney	100/1	IRIS	2/9/2004
Methylene Chloride	Chronic			8.6E-01	mg/kg-day	liver		HEAST	1997
Tetrachloroethene	Chronic			1.7E-01	mg/kg-day	liver		NCEA	2002
Tetrahydrofuran	Chronic			8.6E-02	mg/kg-day			NCEA	2002
Toluene	Chronic	4.0E-01	mg/m^3	1.1E-01	mg/kg-day	neurotoxicity	300/1	IRIS	2/9/2004
Total Xylenes	Chronic	1.0E-01	mg/m^3	2.9E-02	mg/kg-day	motor	300/1	IRIS	2/9/2004
Trichloroethene	Chronic	NA	mg/m^3	NA	mg/kg-day				
Trichloroethene*	Chronic	NA	mg/m^3	1.0E-02	mg/kg-day			NCEA	2002
Vinyl Acetate	Chronic	2.0E-01	mg/m^3	5.7E-02	mg/kg-day	epithelial	30/1	IRIS	2/9/2004
Vinyl chloride	Chronic	1.0E-01	mg/m^3	2.9E-02	mg/kg-day	liver	30/1	IRIS	2/9/2004

* NCEA Proposed revised inhalation RfC for trichloroethene.
(1) Provide equation used for derivation in text.
(2) For IRIS values, provide the date IRIS was searched.
For HEAST values, provide the date of HEAST.
For NCEA values, provide the date of the article provided by NCEA.

TABLE 6.1
CANCER TOXICITY DATA -- ORAL/DERMAL
REMEDIAL INVESTIGATION
RAYMARK OU2 - GROUNDWATER
STRATFORD, CONNECTICUT

Chemical of Potential Concern	Oral Cancer Slope Factor (1)	GI Absorption in Toxicity Study	Adjusted Dermal Cancer Slope Factor (2)	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (MM/DD/YY)
Arsenic	1.5E+00	100%	1.5E+00	$(mg/kg\text{-}day)^{-1}$	A	IRIS	12/09/03
Zinc	NA	100%	NA	NA	D	IRIS	12/09/03
1,1-Dichloroethene	NA	100%	NA	NA	C	IRIS	12/09/03
Trichloroethene	4.0E-01	100%	4.0E-01	$(mg/kg\text{-}day)^{-1}$	NA	EPA Reg I	July 2003

IRIS = Integrated Risk Information System
HEAST= Health Effects Assessment Summary Tables
NCEA=National Center for Environnmental Assessment
EPA Reg I= EPA Region I communication from Sarah Levinson, July 2003
(1) To be used for oral pathway only. Based on administered dose.
(2) Adjusted slope factor (SF) = oral SF x GI absorption value in toxicity study upon which the SF is based. To be used for dermal pathway only.

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 6.2
CANCER TOXICITY DATA -- INHALATION
REMEDIAL INVESTIGATION
RAYMARK OU2 - GROUNDWATER
STRATFORD, CONNECTICUT

Chemical of Potential Concern	Unit Risk	Units	Adjustment	Inhalation Cancer Slope Factor	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (1) (MM/DD/YYYY)
1,1,2,2-Tetrachloroethane	5.8E-05	$(\mu g/m^3)^{-1}$		2.0E-01	$(mg/kg\text{-}d)^{-1}$	C	IRIS	2/9/2004
1,1,2-Trichloroethane	1.6E-05	$(\mu g/m^3)^{-1}$		5.6E-02	$(mg/kg\text{-}d)^{-1}$	C	IRIS	2/9/2004
1,1-Dichlorethene						C	IRIS	2/9/2004
1,2,4-Trimethylbenzene								
1,2-Dibromoethane	2.2E-04	$(\mu g/m^3)^{-1}$		7.7E-01	$(mg/kg\text{-}d)^{-1}$	B2	IRIS	2/9/2004
1,2-Dichloroethane	2.6E-05	$(\mu g/m^3)^{-1}$		9.1E-02	$(mg/kg\text{-}d)^{-1}$	B2	IRIS	2/9/2004
1,3,5-Trimethylbenzene								
1,3-Butadiene	3.0E-05	$(\mu g/m^3)^{-1}$		9.8E-01	$(mg/kg\text{-}d)^{-1}$		IRIS	2/9/2004
1,4-Dichlorobenzene								
4-Methyl-2-Pentanone								
Acetone								
Acrylonitrile	6.8E-05	$(\mu g/m^3)^{-1}$		2.4E-01	$(mg/kg\text{-}d)^{-1}$	B1	IRIS	2/9/2004
Benzene	7.8E-06	$(\mu g/m^3)^{-1}$		2.7E-02	$(mg/kg\text{-}d)^{-1}$	A	IRIS	2/9/2004
Benzyl Chloride				1.7E-01	$(mg/kg\text{-}d)^{-1}$	B2	EPA	2/9/2004
Bromodichloromethane				6.2E-02	$(mg/kg\text{-}d)^{-1}$	B2	EPA	2/9/2004
Carbon Tetrachloride	1.5E-05	$(\mu g/m^3)^{-1}$		5.3E-02	$(mg/kg\text{-}d)^{-1}$	B2	IRIS	2/9/2004
Chloroethane				2.9E-03	$(mg/kg\text{-}d)^{-1}$		EPA	2/9/2004
Chloroform	2.3E-05	$(\mu g/m^3)^{-1}$		1.9E-02	$(mg/kg\text{-}d)^{-1}$	B2	IRIS	2/9/2004
Chloromethane				6.3E-03	$(mg/kg\text{-}d)^{-1}$		HEAST	1997
cis-1,2-Dichloroethene								
Dibromochloromethane				8.4E-02	$(mg/kg\text{-}d)^{-1}$	C	EPA	2/9/2004
Dichlorodifluoromethane								
Ethylbenzene				3.9E-03	$(mg/kg\text{-}d)^{-1}$	D	NCEA	2002
Hexane								
Methyl tert-Butyl Ether				3.5E-04	$(mg/kg\text{-}d)^{-1}$		NCEA	2002
Methylene Chloride				1.6E-03	$(mg/kg\text{-}d)^{-1}$		IRIS	2/9/2004
Tetrachloroethene				1.0E-02	$(mg/kg\text{-}d)^{-1}$		NCEA	2002
Tetrahydrofuran				6.8E-03	$(mg/kg\text{-}d)^{-1}$		NCEA	2002
Toluene								
Total Xylenes								
Trichloroethene*				4.0E-01	$(mg/kg\text{-}d)^{-1}$	B2	NCEA	2002
Trichloroethene	1.7E-06	$(\mu g/m^3)^{-1}$		6.0E-03	$(mg/kg\text{-}d)^{-1}$	B2		
Vinyl Acetate								
Vinyl chloride	8.8E-06	$(\mu g/m^3)^{-1}$		3.1E-02	$(mg/kg\text{-}d)^{-1}$	A	IRIS	2/9/2004

IRIS = Integrated Risk Information System
HEAST= Health Effects Assessment Summary Tables
EPA = EPA Region IX
NCEA = National Center for Exposure Assessment
* NCEA Proposed revised inhalation CSF for trichloroethene.
(1) For IRIS values, the date IRIS was searched.
For HEAST values, the date of HEAST.
For NCEA values, provide the date of the article provided by NCEA.

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 7.1A CTE
CALCULATION OF NON-CANCER HAZARDS - RESIDENTIAL EXPOSURE TO INDOOR AIR
CENTRAL TENDENCY EXPOSURE
REMEDIAL INVESTIGATION
RAYMARK OU2 - GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Indoor air
Exposure Medium: Indoor air
Exposure Point: Homes
Receptor Population: Residents
Receptor Age: 0 through 30 years

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 (Inhalation)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Inhalation	1,1,2,2-Tetrachloroethane	1	µg/m^3	1	µg/m^3	M	2.7E-04	mg/kg*day	6.0E-02	mg/kg-day	N/A	N/A	4.57E-03
	1,1,2-Trichloroethane	0.6	µg/m^3	0.6	µg/m^3	M	1.6E-04	mg/kg*day	4.0E-03	mg/kg-day	N/A	N/A	4.11E-02
	1,1-Dichloroethene	5	µg/m^3	5	µg/m^3	M	1.4E-03	mg/kg*day	5.7E-02	mg/kg-day	N/A	N/A	2.40E-02
	1,2,4-Trimethylbenzene	3	µg/m^3	3	µg/m^3	M	8.2E-04	mg/kg*day	1.7E-03	mg/kg-day	N/A	N/A	4.83E-01
	1,2-Dibromoethane	0.5	µg/m^3	0.5	µg/m^3	M	1.4E-04	mg/kg*day	5.7E-05	mg/kg-day	N/A	N/A	2.40E+00
	1,2-Dichloroethane	0.3	µg/m^3	0.3	µg/m^3	M	8.2E-05	mg/kg*day	1.4E-03	mg/kg-day	N/A	N/A	5.87E-02
	1,3,5-Trimethylbenzene	1	µg/m^3	1	µg/m^3	M	2.7E-04	mg/kg*day	1.7E-03	mg/kg-day	N/A	N/A	1.61E-01
	1,3-Butadiene	0.5	µg/m^3	0.5	µg/m^3	M	1.4E-04	mg/kg*day	2.9E-02	mg/kg-day	N/A	N/A	4.79E-03
	1,4-Dichlorobenzene	23	µg/m^3	23	µg/m^3	M	6.3E-03	mg/kg*day	3.0E-02	mg/kg-day	N/A	N/A	2.10E-01
	4-Methyl-2-Pentanone	0.7	µg/m^3	0.7	µg/m^3	M	1.9E-04	mg/kg*day		mg/kg-day	N/A	N/A	
	Acetone	11	µg/m^3	11	µg/m^3	M	3.0E-03	mg/kg*day	1.0E-01	mg/kg-day	N/A	N/A	3.01E-02
	Acrylonitrile	0.2	µg/m^3	0.2	µg/m^3	M	5.5E-05	mg/kg*day	5.7E-04	mg/kg-day	N/A	N/A	9.61E-02
	Benzene	2	µg/m^3	2	µg/m^3	M	5.5E-04	mg/kg*day	1.7E-03	mg/kg-day	N/A	N/A	3.22E-01
	Benzyl Chloride	0.5	µg/m^3	0.5	µg/m^3	M	1.4E-04	mg/kg*day	2.9E-03	mg/kg-day	N/A	N/A	4.72E-02
	Bromodichloromethane	1	µg/m^3	1	µg/m^3	M	2.7E-04	mg/kg*day	2.0E-02	mg/kg-day	N/A	N/A	1.37E-02
	Carbon Tetrachloride	0.5	µg/m^3	0.5	µg/m^3	M	1.4E-04	mg/kg*day	7.0E-04	mg/kg-day	N/A	N/A	1.96E-01
	Chloroethane	1	µg/m^3	1	µg/m^3	M	2.7E-04	mg/kg*day	2.9E+00	mg/kg-day	N/A	N/A	9.45E-05
	Chloroform	1	µg/m^3	1	µg/m^3	M	2.7E-04	mg/kg*day	8.6E-04	mg/kg-day	N/A	N/A	3.19E-01
	Chloromethane	1	µg/m^3	1	µg/m^3	M	2.7E-04	mg/kg*day	8.6E-02	mg/kg-day	N/A	N/A	3.19E-03
	cis-1,2-Dichloroethene	2	µg/m^3	2	µg/m^3	M	5.5E-04	mg/kg*day	1.0E-02	mg/kg-day	N/A	N/A	5.48E-02
	Dibromochloromethane	1	µg/m^3	1	µg/m^3	M	2.7E-04	mg/kg*day	2.0E-02	mg/kg-day	N/A	N/A	1.37E-02
	Dichlorodifluoromethane	8	µg/m^3	8	µg/m^3	M	2.2E-03	mg/kg*day	5.7E-02	mg/kg-day	N/A	N/A	3.85E-02
	Ethylbenzene	4	µg/m^3	4	µg/m^3	M	1.1E-03	mg/kg*day	2.9E-01	mg/kg-day	N/A	N/A	3.78E-03
	Hexane	6	µg/m^3	6	µg/m^3	M	1.6E-03	mg/kg*day	5.7E-02	mg/kg-day	N/A	N/A	2.88E-02
	Methyl tert-Butyl Ether	9	µg/m^3	9	µg/m^3	M	2.5E-03	mg/kg*day	8.6E-01	mg/kg-day	N/A	N/A	2.87E-03
	Methylene Chloride	24	µg/m^3	24	µg/m^3	M	6.6E-03	mg/kg*day	8.6E-01	mg/kg-day	N/A	N/A	7.65E-03
	Tetrachloroethene	1	µg/m^3	1	µg/m^3	M	2.7E-04	mg/kg*day	1.7E-01	mg/kg-day	N/A	N/A	1.61E-03
	Tetrahydrofuran	3	µg/m^3	3	µg/m^3	M	8.2E-04	mg/kg*day	8.6E-02	mg/kg-day	N/A	N/A	9.56E-03
	Toluene	20	µg/m^3	20	µg/m^3	M	5.5E-03	mg/kg*day	1.1E-01	mg/kg-day	N/A	N/A	4.98E-02
	Total Xylenes	170	µg/m^3	170	µg/m^3	M	4.7E-02	mg/kg*day	2.9E-02	mg/kg-day	N/A	N/A	1.61E+00
	Trichloroethene	5	µg/m^3	5	µg/m^3	M	1.4E-03	mg/kg*day	1.0E-02	mg/kg-day	N/A	N/A	1.37E-01
	Vinyl Acetate	6	µg/m^3	6	µg/m^3	M	1.6E-03	mg/kg*day	5.7E-02	mg/kg-day	N/A	N/A	2.88E-02
	Vinyl chloride	0.2	µg/m^3	0.2	µg/m^3	M	5.5E-05	mg/kg*day	2.9E-02	mg/kg-day	N/A	N/A	1.92E-03
	(Total)												6.40E+00
												Total of Routes	6.40E+00

(1) Medium-Specific (M) EPC selected for hazard calculation.

TABLE 7.1B CTE
CALCULATION OF NON-CANCER HAZARDS - INDUSTRIAL/COMMERCIAL EXPOSURE TO INDOOR AIR
CENTRAL TENDENCY EXPOSURE
REMEDIAL INVESTIGATION
RAYMARK OU2 - GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Indoor air
Exposure Medium: Indoor air
Exposure Point: Commercial Properties
Receptor Population: Industrial/Commercial Workers
Receptor Age: Adults

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 (Inhalation)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Inhalation	1,1,2,2-Tetrachloroethane	1	µg/m^3	1	µg/m^3	M	6.6E-05	mg/kg*day	6.0E-02	mg/kg-day	N/A	N/A	1.09E-03
	1,1,2-Trichloroethane	0.6	µg/m^3	0.6	µg/m^3	M	3.9E-05	mg/kg*day	4.0E-03	mg/kg-day	N/A	N/A	9.83E-03
	1,1-Dichloroethene	5	µg/m^3	5	µg/m^3	M	3.3E-04	mg/kg*day	5.7E-02	mg/kg-day	N/A	N/A	5.75E-03
	1,2,4-Trimethylbenzene	3	µg/m^3	3	µg/m^3	M	2.0E-04	mg/kg*day	1.7E-03	mg/kg-day	N/A	N/A	1.16E-01
	1,2-Dibromoethane	0.5	µg/m^3	0.5	µg/m^3	M	3.3E-05	mg/kg*day	5.7E-05	mg/kg-day	N/A	N/A	5.75E-01
	1,2-Dichloroethane	0.3	µg/m^3	0.3	µg/m^3	M	2.0E-05	mg/kg*day	1.4E-03	mg/kg-day	N/A	N/A	1.40E-02
	1,3,5-Trimethylbenzene	1	µg/m^3	1	µg/m^3	M	6.6E-05	mg/kg*day	1.7E-03	mg/kg-day	N/A	N/A	3.86E-02
	1,3-Butadiene	0.5	µg/m^3	0.5	µg/m^3	M	3.3E-05	mg/kg*day	2.9E-02	mg/kg-day	N/A	N/A	1.15E-03
	1,4-Dichlorobenzene	23	µg/m^3	23	µg/m^3	M	1.5E-03	mg/kg*day	3.0E-02	mg/kg-day	N/A	N/A	5.03E-02
	4-Methyl-2-Pentanone	0.7	µg/m^3	0.7	µg/m^3	M	4.6E-05	mg/kg*day		mg/kg-day	N/A	N/A	
	Acetone	11	µg/m^3	11	µg/m^3	M	7.2E-04	mg/kg*day	1.0E-01	mg/kg-day	N/A	N/A	7.21E-03
	Acrylonitrile	0.2	µg/m^3	0.2	µg/m^3	M	1.3E-05	mg/kg*day	5.7E-04	mg/kg-day	N/A	N/A	2.30E-02
	Benzene	2	µg/m^3	2	µg/m^3	M	1.3E-04	mg/kg*day	1.7E-03	mg/kg-day	N/A	N/A	7.71E-02
	Benzyl Chloride	0.5	µg/m^3	0.5	µg/m^3	M	3.3E-05	mg/kg*day	2.9E-03	mg/kg-day	N/A	N/A	1.13E-02
	Bromodichloromethane	1	µg/m^3	1	µg/m^3	M	6.6E-05	mg/kg*day	2.0E-02	mg/kg-day	N/A	N/A	3.28E-03
	Carbon Tetrachloride	0.5	µg/m^3	0.5	µg/m^3	M	3.3E-05	mg/kg*day	7.0E-04	mg/kg-day	N/A	N/A	4.68E-02
	Chloroethane	1	µg/m^3	1	µg/m^3	M	6.6E-05	mg/kg*day	2.9E+00	mg/kg-day	N/A	N/A	2.26E-05
	Chloroform	1	µg/m^3	1	µg/m^3	M	6.6E-05	mg/kg*day	8.6E-04	mg/kg-day	N/A	N/A	7.62E-02
	Chloromethane	1	µg/m^3	1	µg/m^3	M	6.6E-05	mg/kg*day	8.6E-02	mg/kg-day	N/A	N/A	7.62E-04
	cis-1,2-Dichloroethene	2	µg/m^3	2	µg/m^3	M	1.3E-04	mg/kg*day	1.0E-02	mg/kg-day	N/A	N/A	1.31E-02
	Dibromochloromethane	1	µg/m^3	1	µg/m^3	M	6.6E-05	mg/kg*day	2.0E-02	mg/kg-day	N/A	N/A	3.28E-03
	Dichlorodifluoromethane	8	µg/m^3	8	µg/m^3	M	5.2E-04	mg/kg*day	5.7E-02	mg/kg-day	N/A	N/A	9.20E-03
	Ethylbenzene	4	µg/m^3	4	µg/m^3	M	2.6E-04	mg/kg*day	2.9E-01	mg/kg-day	N/A	N/A	9.04E-04
	Hexane	6	µg/m^3	6	µg/m^3	M	3.9E-04	mg/kg*day	5.7E-02	mg/kg-day	N/A	N/A	6.90E-03
	Methyl tert-Butyl Ether	9	µg/m^3	9	µg/m^3	M	5.9E-04	mg/kg*day	8.6E-01	mg/kg-day	N/A	N/A	6.86E-04
	Methylene Chloride	24	µg/m^3	24	µg/m^3	M	1.6E-03	mg/kg*day	8.6E-01	mg/kg-day	N/A	N/A	1.83E-03
	Tetrachloroethene	1	µg/m^3	1	µg/m^3	M	6.6E-05	mg/kg*day	1.7E-01	mg/kg-day	N/A	N/A	3.86E-04
	Tetrahydrofuran	3	µg/m^3	3	µg/m^3	M	2.0E-04	mg/kg*day	8.6E-02	mg/kg-day	N/A	N/A	2.29E-03
	Toluene	20	µg/m^3	20	µg/m^3	M	1.3E-03	mg/kg*day	1.1E-01	mg/kg-day	N/A	N/A	1.19E-02
	Total Xylenes	170	µg/m^3	170	µg/m^3	M	1.1E-02	mg/kg*day	2.9E-02	mg/kg-day	N/A	N/A	3.84E-01
	Trichloroethene	5	µg/m^3	5	µg/m^3	M	3.3E-04	mg/kg*day	1.0E-02	mg/kg-day	N/A	N/A	3.28E-02
	Vinyl Acetate	6	µg/m^3	6	µg/m^3	M	3.9E-04	mg/kg*day	5.7E-02	mg/kg-day	N/A	N/A	6.90E-03
	Vinyl chloride	0.2	µg/m^3	0.2	µg/m^3	M	1.3E-05	mg/kg*day	2.9E-02	mg/kg-day	N/A	N/A	4.59E-04
	(Total)												1.53E+00
												Total of Routes	1.53E+00

(1) Medium-Specific (M) EPC selected for hazard calculation.

TABLE 7.1A RME
CALCULATION OF NON-CANCER HAZARDS - RESIDENTIAL EXPOSURE TO INDOOR AIR
REASONABLE MAXIMUM EXPOSURE
REMEDIAL INVESTIGATION
RAYMARK OU2 - GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Indoor air
Exposure Medium: Indoor air
Exposure Point: Homes
Receptor Population: Residents
Receptor Age: 0 through 30 years

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 (Inhalation)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Inhalation	1,1,2,2-Tetrachloroethane	38	µg/m^3	38	µg/m^3	M	1.0E-02	mg/kg*day	6.0E-02	mg/kg-day	N/A	N/A	1.74E-01
	1,1,2-Trichloroethane	9.89	µg/m^3	9.89	µg/m^3	M	2.7E-03	mg/kg*day	4.0E-03	mg/kg-day	N/A	N/A	6.77E-01
	1,1-Dichloroethene	48	µg/m^3	48	µg/m^3	M	1.3E-02	mg/kg*day	5.7E-02	mg/kg-day	N/A	N/A	2.31E-01
	1,2,4-Trimethylbenzene	33.1	µg/m^3	33.1	µg/m^3	M	9.1E-03	mg/kg*day	1.7E-03	mg/kg-day	N/A	N/A	5.33E+00
	1,2-Dibromoethane	0.882	µg/m^3	0.882	µg/m^3	M	2.4E-04	mg/kg*day	5.7E-05	mg/kg-day	N/A	N/A	4.24E+00
	1,2-Dichloroethane	0.326	µg/m^3	0.326	µg/m^3	M	8.9E-05	mg/kg*day	1.4E-03	mg/kg-day	N/A	N/A	6.38E-02
	1,3,5-Trimethylbenzene	14.8	µg/m^3	14.8	µg/m^3	M	4.1E-03	mg/kg*day	1.7E-03	mg/kg-day	N/A	N/A	2.39E+00
	1,3-Butadiene	7.34	µg/m^3	7.34	µg/m^3	M	2.0E-03	mg/kg*day	2.9E-02	mg/kg-day	N/A	N/A	7.04E-02
	1,4-Dichlorobenzene	811	µg/m^3	811	µg/m^3	M	2.2E-01	mg/kg*day	3.0E-02	mg/kg-day	N/A	N/A	7.41E+00
	4-Methyl-2-Pentanone	14	µg/m^3	14	µg/m^3	M	3.8E-03	mg/kg*day		mg/kg-day	N/A	N/A	
	Acetone	95.3	µg/m^3	95.3	µg/m^3	M	2.6E-02	mg/kg*day	1.0E-01	mg/kg-day	N/A	N/A	2.61E-01
	Acrylonitrile	0.241	µg/m^3	0.241	µg/m^3	M	6.6E-05	mg/kg*day	5.7E-04	mg/kg-day	N/A	N/A	1.16E-01
	Benzene	12.5	µg/m^3	12.5	µg/m^3	M	3.4E-03	mg/kg*day	1.7E-03	mg/kg-day	N/A	N/A	2.01E+00
	Benzyl Chloride	6.26	µg/m^3	6.26	µg/m^3	M	1.7E-03	mg/kg*day	2.9E-03	mg/kg-day	N/A	N/A	5.91E-01
	Bromodichloromethane	2.6	µg/m^3	2.6	µg/m^3	M	7.1E-04	mg/kg*day	2.0E-02	mg/kg-day	N/A	N/A	3.56E-02
	Carbon Tetrachloride	1.07	µg/m^3	1.07	µg/m^3	M	2.9E-04	mg/kg*day	7.0E-04	mg/kg-day	N/A	N/A	4.19E-01
	Chloroethane	3.99	µg/m^3	3.99	µg/m^3	M	1.1E-03	mg/kg*day	2.9E+00	mg/kg-day	N/A	N/A	3.77E-04
	Chloroform	5.9	µg/m^3	5.9	µg/m^3	M	1.6E-03	mg/kg*day	8.6E-04	mg/kg-day	N/A	N/A	1.88E+00
	Chloromethane	3.54	µg/m^3	3.54	µg/m^3	M	9.7E-04	mg/kg*day	8.6E-02	mg/kg-day	N/A	N/A	1.13E-02
	cis-1,2-Dichloroethene	16.4	µg/m^3	16.4	µg/m^3	M	4.5E-03	mg/kg*day	1.0E-02	mg/kg-day	N/A	N/A	4.49E-01
	Dibromochloromethane	1.69	µg/m^3	1.69	µg/m^3	M	4.6E-04	mg/kg*day	2.0E-02	mg/kg-day	N/A	N/A	2.32E-02
	Dichlorodifluoromethane	149	µg/m^3	149	µg/m^3	M	4.1E-02	mg/kg*day	5.7E-02	mg/kg-day	N/A	N/A	7.16E-01
	Ethylbenzene	73.8	µg/m^3	73.8	µg/m^3	M	2.0E-02	mg/kg*day	2.9E-01	mg/kg-day	N/A	N/A	6.97E-02
	Hexane	35.4	µg/m^3	35.4	µg/m^3	M	9.7E-03	mg/kg*day	5.7E-02	mg/kg-day	N/A	N/A	1.70E-01
	Methyl tert-Butyl Ether	69	µg/m^3	69	µg/m^3	M	1.9E-02	mg/kg*day	8.6E-01	mg/kg-day	N/A	N/A	2.20E-02
	Methylene Chloride	910	µg/m^3	910	µg/m^3	M	2.5E-01	mg/kg*day	8.6E-01	mg/kg-day	N/A	N/A	2.90E-01
	Tetrachloroethene	25.3	µg/m^3	25.3	µg/m^3	M	6.9E-03	mg/kg*day	1.7E-01	mg/kg-day	N/A	N/A	4.08E-02
	Tetrahydrofuran	32.7	µg/m^3	32.7	µg/m^3	M	9.0E-03	mg/kg*day	8.6E-02	mg/kg-day	N/A	N/A	1.04E-01
	Toluene	159	µg/m^3	159	µg/m^3	M	4.4E-02	mg/kg*day	1.1E-01	mg/kg-day	N/A	N/A	3.96E-01
	Total Xylenes	761	µg/m^3	761	µg/m^3	M	2.1E-01	mg/kg*day	2.9E-02	mg/kg-day	N/A	N/A	7.19E+00
	Trichloroethene	52.5	µg/m^3	52.5	µg/m^3	M	1.4E-02	mg/kg*day	1.0E-02	mg/kg-day	N/A	N/A	1.44E+00
	Vinyl Acetate	39	µg/m^3	39	µg/m^3	M	1.1E-02	mg/kg*day	5.7E-02	mg/kg-day	N/A	N/A	1.87E-01
	Vinyl chloride	0.618	µg/m^3	0.618	µg/m^3	M	1.7E-04	mg/kg*day	2.9E-02	mg/kg-day	N/A	N/A	5.93E-03
	(Total)												3.70E+01
												Total of Routes	3.70E+01

(1) Medium-Specific (M) EPC selected for hazard calculation.

TABLE 7.1B RME
CALCULATION OF NON-CANCER HAZARDS - INDUSTRIAL/COMMERCIAL EXPOSURE TO INDOOR AIR
REASONABLE MAXIMUM EXPOSURE
REMEDIAL INVESTIGATION
RAYMARK OU2 - GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Indoor air
Exposure Medium: Indoor air
Exposure Point: Commercial Properties
Receptor Population: Industrial/Commercial Workers
Receptor Age: Adults

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 (Inhalation)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Inhalation	1,1,2,2-Tetrachloroethane	38	µg/m^3	38	µg/m^3	M	2.5E-03	mg/kg*day	6.0E-02	mg/kg-day	N/A	N/A	4.15E-02
	1,1,2-Trichloroethane	9.89	µg/m^3	9.89	µg/m^3	M	6.5E-04	mg/kg*day	4.0E-03	mg/kg-day	N/A	N/A	1.62E-01
	1,1-Dichloroethene	48	µg/m^3	48	µg/m^3	M	3.1E-03	mg/kg*day	5.7E-02	mg/kg-day	N/A	N/A	5.52E-02
	1,2,4-Trimethylbenzene	33.1	µg/m^3	33.1	µg/m^3	M	2.2E-03	mg/kg*day	1.7E-03	mg/kg-day	N/A	N/A	1.28E+00
	1,2-Dibromoethane	0.882	µg/m^3	0.882	µg/m^3	M	5.8E-05	mg/kg*day	5.7E-05	mg/kg-day	N/A	N/A	1.01E+00
	1,2-Dichloroethane	0.326	µg/m^3	0.326	µg/m^3	M	2.1E-05	mg/kg*day	1.4E-03	mg/kg-day	N/A	N/A	1.53E-02
	1,3,5-Trimethylbenzene	14.8	µg/m^3	14.8	µg/m^3	M	9.7E-04	mg/kg*day	1.7E-03	mg/kg-day	N/A	N/A	5.71E-01
	1,3-Butadiene	7.34	µg/m^3	7.34	µg/m^3	M	4.8E-04	mg/kg*day	2.9E-02	mg/kg-day	N/A	N/A	1.68E-02
	1,4-Dichlorobenzene	811	µg/m^3	811	µg/m^3	M	5.3E-02	mg/kg*day	3.0E-02	mg/kg-day	N/A	N/A	1.77E+00
	4-Methyl-2-Pentanone	14	µg/m^3	14	µg/m^3	M	9.2E-04	mg/kg*day		mg/kg-day	N/A	N/A	
	Acetone	95.3	µg/m^3	95.3	µg/m^3	M	6.2E-03	mg/kg*day	1.0E-01	mg/kg-day	N/A	N/A	6.25E-02
	Acrylonitrile	0.241	µg/m^3	0.241	µg/m^3	M	1.6E-05	mg/kg*day	5.7E-04	mg/kg-day	N/A	N/A	2.77E-02
	Benzene	12.5	µg/m^3	12.5	µg/m^3	M	8.2E-04	mg/kg*day	1.7E-03	mg/kg-day	N/A	N/A	4.82E-01
	Benzyl Chloride	6.26	µg/m^3	6.26	µg/m^3	M	4.1E-04	mg/kg*day	2.9E-03	mg/kg-day	N/A	N/A	1.42E-01
	Bromodichloromethane	2.6	µg/m^3	2.6	µg/m^3	M	1.7E-04	mg/kg*day	2.0E-02	mg/kg-day	N/A	N/A	8.52E-03
	Carbon Tetrachloride	1.07	µg/m^3	1.07	µg/m^3	M	7.0E-05	mg/kg*day	7.0E-04	mg/kg-day	N/A	N/A	1.00E-01
	Chloroethane	3.99	µg/m^3	3.99	µg/m^3	M	2.6E-04	mg/kg*day	2.9E+00	mg/kg-day	N/A	N/A	9.02E-05
	Chloroform	5.9	µg/m^3	5.9	µg/m^3	M	3.9E-04	mg/kg*day	8.6E-04	mg/kg-day	N/A	N/A	4.50E-01
	Chloromethane	3.54	µg/m^3	3.54	µg/m^3	M	2.3E-04	mg/kg*day	8.6E-02	mg/kg-day	N/A	N/A	2.70E-03
	cis-1,2-Dichloroethene	16.4	µg/m^3	16.4	µg/m^3	M	1.1E-03	mg/kg*day	1.0E-02	mg/kg-day	N/A	N/A	1.08E-01
	Dibromochloromethane	1.69	µg/m^3	1.69	µg/m^3	M	1.1E-04	mg/kg*day	2.0E-02	mg/kg-day	N/A	N/A	5.54E-03
	Dichlorodifluoromethane	149	µg/m^3	149	µg/m^3	M	9.8E-03	mg/kg*day	5.7E-02	mg/kg-day	N/A	N/A	1.71E-01
	Ethylbenzene	73.8	µg/m^3	73.8	µg/m^3	M	4.8E-03	mg/kg*day	2.9E-01	mg/kg-day	N/A	N/A	1.67E-02
	Hexane	35.4	µg/m^3	35.4	µg/m^3	M	2.3E-03	mg/kg*day	5.7E-02	mg/kg-day	N/A	N/A	4.07E-02
	Methyl tert-Butyl Ether	69	µg/m^3	69	µg/m^3	M	4.5E-03	mg/kg*day	8.6E-01	mg/kg-day	N/A	N/A	5.26E-03
	Methylene Chloride	910	µg/m^3	910	µg/m^3	M	6.0E-02	mg/kg*day	8.6E-01	mg/kg-day	N/A	N/A	6.94E-02
	Tetrachloroethene	25.3	µg/m^3	25.3	µg/m^3	M	1.7E-03	mg/kg*day	1.7E-01	mg/kg-day	N/A	N/A	9.76E-03
	Tetrahydrofuran	32.7	µg/m^3	32.7	µg/m^3	M	2.1E-03	mg/kg*day	8.6E-02	mg/kg-day	N/A	N/A	2.49E-02
	Toluene	159	µg/m^3	159	µg/m^3	M	1.0E-02	mg/kg*day	1.1E-01	mg/kg-day	N/A	N/A	9.48E-02
	Total Xylenes	761	µg/m^3	761	µg/m^3	M	5.0E-02	mg/kg*day	2.9E-02	mg/kg-day	N/A	N/A	1.72E+00
	Trichloroethene	52.5	µg/m^3	52.5	µg/m^3	M	3.4E-03	mg/kg*day	1.0E-02	mg/kg-day	N/A	N/A	3.44E-01
	Vinyl Acetate	39	µg/m^3	39	µg/m^3	M	2.6E-03	mg/kg*day	5.7E-02	mg/kg-day	N/A	N/A	4.49E-02
	Vinyl chloride	0.618	µg/m^3	0.618	µg/m^3	M	4.1E-05	mg/kg*day	2.9E-02	mg/kg-day	N/A	N/A	1.42E-03
	(Total)												8.86E+00
												Total of Routes	8.86E+00

(1) Medium-Specific (M) EPC selected for hazard calculation.

TABLE 7.2A RME
CALCULATION OF NON-CANCER HAZARDS - RECREATIONAL VISITOR CONTACT WITH SURFACE WATER
REASONABLE MAXIMUM EXPOSURE
DRAFT FINAL REMEDIAL INVESTIGATION
RAYMARK OU2 - GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Surface Water
Exposure Point: Ferry Creek
Receptor Population: Recreational Visitor
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	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Dermal	Arsenic	84	µg/l	8.4	µg/L	R	2.62E-07	mg/kg-day	3.0E-04	mg/kg-day	N/A	N/A	8.7E-04
	Zinc	330	µg/l	33	µg/L	R	6.18E-07	mg/kg-day	3.0E-01	mg/kg-day	N/A	N/A	2.1E-06
	1,1-Dichloroethene	530	µg/l	53	µg/L	R	3.46E-05	mg/kg-day	5.0E-02	mg/kg-day	N/A	N/A	6.9E-04
	(Total)												1.6E-03
												Total of Routes	1.6E-03

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

TABLE 8.1A CTE
CALCULATION OF CANCER RISKS - RESIDENTIAL EXPOSURE TO INDOOR AIR
CENTRAL TENDENCY EXPOSURE
REMEDIAL INVESTIGATION
RAYMARK OU2 - GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Indoor air
Exposure Medium: Indoor air
Exposure Point: Homes
Receptor Population: Residents
Receptor Age: 0 through 30 years

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
Inhalation	1,1,2,2-Tetrachloroethane	1	µg/m^3	1	µg/m^3	M	3.5E-05	mg/kg*day	2.0E-01	(mg/kg-d)$^{-1}$	7.0E-06
	1,1,2-Trichloroethane	0.6	µg/m^3	0.6	µg/m^3	M	2.1E-05	mg/kg*day	5.6E-02	(mg/kg-d)$^{-1}$	1.2E-06
	1,1-Dichloroethene	5	µg/m^3	5	µg/m^3	M	1.8E-04	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	1,2,4-Trimethylbenzene	3	µg/m^3	3	µg/m^3	M	1.1E-04	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	1,2-Dibromoethane	0.5	µg/m^3	0.5	µg/m^3	M	1.8E-05	mg/kg*day	7.7E-01	(mg/kg-d)$^{-1}$	1.4E-05
	1,2-Dichloroethane	0.3	µg/m^3	0.3	µg/m^3	M	1.1E-05	mg/kg*day	9.1E-02	(mg/kg-d)$^{-1}$	9.6E-07
	1,3,5-Trimethylbenzene	1	µg/m^3	1	µg/m^3	M	3.5E-05	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	1,3-Butadiene	0.5	µg/m^3	0.5	µg/m^3	M	1.8E-05	mg/kg*day	9.8E-01	(mg/kg-d)$^{-1}$	1.7E-05
	1,4-Dichlorobenzene	23	µg/m^3	23	µg/m^3	M	8.1E-04	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	4-Methyl-2-Pentanone	0.7	µg/m^3	0.7	µg/m^3	M	2.5E-05	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Acetone	11	µg/m^3	11	µg/m^3	M	3.9E-04	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Acrylonitrile	0.2	µg/m^3	0.2	µg/m^3	M	7.0E-06	mg/kg*day	2.4E-01	(mg/kg-d)$^{-1}$	1.7E-06
	Benzene	2	µg/m^3	2	µg/m^3	M	7.0E-05	mg/kg*day	2.7E-02	(mg/kg-d)$^{-1}$	1.9E-06
	Benzyl Chloride	0.5	µg/m^3	0.5	µg/m^3	M	1.8E-05	mg/kg*day	1.7E-01	(mg/kg-d)$^{-1}$	3.0E-06
	Bromodichloromethane	1	µg/m^3	1	µg/m^3	M	3.5E-05	mg/kg*day	6.2E-02	(mg/kg-d)$^{-1}$	2.2E-06
	Carbon Tetrachloride	0.5	µg/m^3	0.5	µg/m^3	M	1.8E-05	mg/kg*day	5.3E-02	(mg/kg-d)$^{-1}$	9.3E-07
	Chloroethane	1	µg/m^3	1	µg/m^3	M	3.5E-05	mg/kg*day	2.9E-03	(mg/kg-d)$^{-1}$	1.0E-07
	Chloroform	1	µg/m^3	1	µg/m^3	M	3.5E-05	mg/kg*day	1.9E-02	(mg/kg-d)$^{-1}$	6.7E-07
	Chloromethane	1	µg/m^3	1	µg/m^3	M	3.5E-05	mg/kg*day	6.3E-03	(mg/kg-d)$^{-1}$	2.2E-07
	cis-1,2-Dichloroethene	2	µg/m^3	2	µg/m^3	M	7.0E-05	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Dibromochloromethane	1	µg/m^3	1	µg/m^3	M	3.5E-05	mg/kg*day	8.4E-02	(mg/kg-d)$^{-1}$	3.0E-06
	Dichlorodifluoromethane	8	µg/m^3	8	µg/m^3	M	2.8E-04	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Ethylbenzene	4	µg/m^3	4	µg/m^3	M	1.4E-04	mg/kg*day	3.9E-03	(mg/kg-d)$^{-1}$	5.4E-07
	Hexane	6	µg/m^3	6	µg/m^3	M	2.1E-04	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Methyl tert-Butyl Ether	9	µg/m^3	9	µg/m^3	M	3.2E-04	mg/kg*day	3.5E-04	(mg/kg-d)$^{-1}$	1.1E-07
	Methylene Chloride	24	µg/m^3	24	µg/m^3	M	8.5E-04	mg/kg*day	1.6E-03	(mg/kg-d)$^{-1}$	1.4E-06
	Tetrachloroethene	1	µg/m^3	1	µg/m^3	M	3.5E-05	mg/kg*day	1.0E-02	(mg/kg-d)$^{-1}$	3.5E-07
	Tetrahydrofuran	3	µg/m^3	3	µg/m^3	M	1.1E-04	mg/kg*day	6.8E-03	(mg/kg-d)$^{-1}$	7.2E-07
	Toluene	20	µg/m^3	20	µg/m^3	M	7.0E-04	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Total Xylenes	170	µg/m^3	170	µg/m^3	M	6.0E-03	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Trichloroethene	5	µg/m^3	5	µg/m^3	M	1.8E-04	mg/kg*day	4.0E-01	(mg/kg-d)$^{-1}$	7.0E-05
	Vinyl Acetate	6	µg/m^3	6	µg/m^3	M	2.1E-04	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Vinyl chloride	0.2	µg/m^3	0.2	µg/m^3	M	7.0E-06	mg/kg*day	3.1E-02	(mg/kg-d)$^{-1}$	2.2E-07
										Total Risk Across All Exposure Routes/Pathways	1.3E-04

(1) Medium Specific (M) EPC selected for risk calculation.

TABLE 8.1B CTE
CALCULATION OF CANCER RISKS - INDUSTRIAL/COMMERCIAL EXPOSURE TO INDOOR AIR
CENTRAL TENDENCY EXPOSURE
REMEDIAL INVESTIGATION
RAYMARK OU2 - GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Indoor air
Exposure Medium: Indoor air
Exposure Point: Commercial Properties
Receptor Population: Industrial/Commercial Workers
Receptor Age: Adults

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
Inhalation	1,1,2,2-Tetrachloroethane	1	µg/m^3	1	µg/m^3	M	8.4E-06	mg/kg*day	2.0E-01	(mg/kg-d)$^{-1}$	1.7E-06
	1,1,2-Trichloroethane	0.6	µg/m^3	0.6	µg/m^3	M	5.1E-06	mg/kg*day	5.6E-02	(mg/kg-d)$^{-1}$	2.8E-07
	1,1-Dichloroethene	5	µg/m^3	5	µg/m^3	M	4.2E-05	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	1,2,4-Trimethylbenzene	3	µg/m^3	3	µg/m^3	M	2.5E-05	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	1,2-Dibromoethane	0.5	µg/m^3	0.5	µg/m^3	M	4.2E-06	mg/kg*day	7.7E-01	(mg/kg-d)$^{-1}$	3.2E-06
	1,2-Dichloroethane	0.3	µg/m^3	0.3	µg/m^3	M	2.5E-06	mg/kg*day	9.1E-02	(mg/kg-d)$^{-1}$	2.3E-07
	1,3,5-Trimethylbenzene	1	µg/m^3	1	µg/m^3	M	8.4E-06	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	1,3-Butadiene	0.5	µg/m^3	0.5	µg/m^3	M	4.2E-06	mg/kg*day	9.8E-01	(mg/kg-d)$^{-1}$	4.1E-06
	1,4-Dichlorobenzene	23	µg/m^3	23	µg/m^3	M	1.9E-04	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	4-Methyl-2-Pentanone	0.7	µg/m^3	0.7	µg/m^3	M	5.9E-06	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Acetone	11	µg/m^3	11	µg/m^3	M	9.3E-05	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Acrylonitrile	0.2	µg/m^3	0.2	µg/m^3	M	1.7E-06	mg/kg*day	2.4E-01	(mg/kg-d)$^{-1}$	4.0E-07
	Benzene	2	µg/m^3	2	µg/m^3	M	1.7E-05	mg/kg*day	2.7E-02	(mg/kg-d)$^{-1}$	4.6E-07
	Benzyl Chloride	0.5	µg/m^3	0.5	µg/m^3	M	4.2E-06	mg/kg*day	1.7E-01	(mg/kg-d)$^{-1}$	7.2E-07
	Bromodichloromethane	1	µg/m^3	1	µg/m^3	M	8.4E-06	mg/kg*day	6.2E-02	(mg/kg-d)$^{-1}$	5.2E-07
	Carbon Tetrachloride	0.5	µg/m^3	0.5	µg/m^3	M	4.2E-06	mg/kg*day	5.3E-02	(mg/kg-d)$^{-1}$	2.2E-07
	Chloroethane	1	µg/m^3	1	µg/m^3	M	8.4E-06	mg/kg*day	2.9E-03	(mg/kg-d)$^{-1}$	2.4E-08
	Chloroform	1	µg/m^3	1	µg/m^3	M	8.4E-06	mg/kg*day	1.9E-02	(mg/kg-d)$^{-1}$	1.6E-07
	Chloromethane	1	µg/m^3	1	µg/m^3	M	8.4E-06	mg/kg*day	6.3E-03	(mg/kg-d)$^{-1}$	5.3E-08
	cis-1,2-Dichloroethene	2	µg/m^3	2	µg/m^3	M	1.7E-05	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Dibromochloromethane	1	µg/m^3	1	µg/m^3	M	8.4E-06	mg/kg*day	8.4E-02	(mg/kg-d)$^{-1}$	7.1E-07
	Dichlorodifluoromethane	8	µg/m^3	8	µg/m^3	M	6.7E-05	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Ethylbenzene	4	µg/m^3	4	µg/m^3	M	3.4E-05	mg/kg*day	3.9E-03	(mg/kg-d)$^{-1}$	1.3E-07
	Hexane	6	µg/m^3	6	µg/m^3	M	5.1E-05	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Methyl tert-Butyl Ether	9	µg/m^3	9	µg/m^3	M	7.6E-05	mg/kg*day	3.5E-04	(mg/kg-d)$^{-1}$	2.7E-08
	Methylene Chloride	24	µg/m^3	24	µg/m^3	M	2.0E-04	mg/kg*day	1.6E-03	(mg/kg-d)$^{-1}$	3.2E-07
	Tetrachloroethene	1	µg/m^3	1	µg/m^3	M	8.4E-06	mg/kg*day	1.0E-02	(mg/kg-d)$^{-1}$	8.4E-08
	Tetrahydrofuran	3	µg/m^3	3	µg/m^3	M	2.5E-05	mg/kg*day	6.8E-03	(mg/kg-d)$^{-1}$	1.7E-07
	Toluene	20	µg/m^3	20	µg/m^3	M	1.7E-04	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Total Xylenes	170	µg/m^3	170	µg/m^3	M	1.4E-03	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Trichloroethene	5	µg/m^3	5	µg/m^3	M	4.2E-05	mg/kg*day	4.0E-01	(mg/kg-d)$^{-1}$	1.7E-05
	Vinyl Acetate	6	µg/m^3	6	µg/m^3	M	5.1E-05	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Vinyl chloride	0.2	µg/m^3	0.2	µg/m^3	M	1.7E-06	mg/kg*day	3.1E-02	(mg/kg-d)$^{-1}$	5.2E-08
										Total Risk Across All Exposure Routes/Pathways	3.0E-05

(1) Medium Specific (M) EPC selected for risk calculation.

TABLE 8.1A RME
CALCULATION OF CANCER RISKS - RESIDENTIAL EXPOSURE TO INDOOR AIR
REASONABLE MAXIMUM EXPOSURE
REMEDIAL INVESTIGATION
RAYMARK OU2-GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Indoor air
Exposure Medium: Indoor air
Exposure Point: Homes
Receptor Population: Residents
Receptor Age: 0 through 30 years

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
Inhalation	1,1,2,2-Tetrachloroethane	38	µg/m^3	38	µg/m^3	M	4.5E-03	mg/kg*day	2.0E-01	(mg/kg-d)$^{-1}$	8.9E-04
	1,1,2-Trichloroethane	9.89	µg/m^3	9.89	µg/m^3	M	1.2E-03	mg/kg*day	5.6E-02	(mg/kg-d)$^{-1}$	6.5E-05
	1,1-Dichloroethene	48	µg/m^3	48	µg/m^3	M	5.6E-03	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	1,2,4-Trimethylbenzene	33.1	µg/m^3	33.1	µg/m^3	M	3.9E-03	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	1,2-Dibromoethane	0.882	µg/m^3	0.882	µg/m^3	M	1.0E-04	mg/kg*day	7.7E-01	(mg/kg-d)$^{-1}$	8.0E-05
	1,2-Dichloroethane	0.326	µg/m^3	0.326	µg/m^3	M	3.8E-05	mg/kg*day	9.1E-02	(mg/kg-d)$^{-1}$	3.5E-06
	1,3,5-Trimethylbenzene	14.8	µg/m^3	14.8	µg/m^3	M	1.7E-03	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	1,3-Butadiene	7.34	µg/m^3	7.34	µg/m^3	M	8.6E-04	mg/kg*day	9.8E-01	(mg/kg-d)$^{-1}$	8.4E-04
	1,4-Dichlorobenzene	811	µg/m^3	811	µg/m^3	M	9.5E-02	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	4-Methyl-2-Pentanone	14	µg/m^3	14	µg/m^3	M	1.6E-03	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Acetone	95.3	µg/m^3	95.3	µg/m^3	M	1.1E-02	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Acrylonitrile	0.241	µg/m^3	0.241	µg/m^3	M	2.8E-05	mg/kg*day	2.4E-01	(mg/kg-d)$^{-1}$	6.8E-06
	Benzene	12.5	µg/m^3	12.5	µg/m^3	M	1.5E-03	mg/kg*day	2.7E-02	(mg/kg-d)$^{-1}$	4.0E-05
	Benzyl Chloride	6.26	µg/m^3	6.26	µg/m^3	M	7.4E-04	mg/kg*day	1.7E-01	(mg/kg-d)$^{-1}$	1.2E-04
	Bromodichloromethane	2.6	µg/m^3	2.6	µg/m^3	M	3.1E-04	mg/kg*day	6.2E-02	(mg/kg-d)$^{-1}$	1.9E-05
	Carbon Tetrachloride	1.07	µg/m^3	1.07	µg/m^3	M	1.3E-04	mg/kg*day	5.3E-02	(mg/kg-d)$^{-1}$	6.7E-06
	Chloroethane	3.99	µg/m^3	3.99	µg/m^3	M	4.7E-04	mg/kg*day	2.9E-03	(mg/kg-d)$^{-1}$	1.4E-06
	Chloroform	5.9	µg/m^3	5.9	µg/m^3	M	6.9E-04	mg/kg*day	1.9E-02	(mg/kg-d)$^{-1}$	1.3E-05
	Chloromethane	3.54	µg/m^3	3.54	µg/m^3	M	4.2E-04	mg/kg*day	6.3E-03	(mg/kg-d)$^{-1}$	2.6E-06
	cis-1,2-Dichloroethene	16.4	µg/m^3	16.4	µg/m^3	M	1.9E-03	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Dibromochloromethane	1.69	µg/m^3	1.69	µg/m^3	M	2.0E-04	mg/kg*day	8.4E-02	(mg/kg-d)$^{-1}$	1.7E-05
	Dichlorodifluoromethane	149	µg/m^3	149	µg/m^3	M	1.7E-02	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Ethylbenzene	73.8	µg/m^3	73.8	µg/m^3	M	8.7E-03	mg/kg*day	3.9E-03	(mg/kg-d)$^{-1}$	3.3E-05
	Hexane	35.4	µg/m^3	35.4	µg/m^3	M	4.2E-03	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Methyl tert-Butyl Ether	69	µg/m^3	69	µg/m^3	M	8.1E-03	mg/kg*day	3.5E-04	(mg/kg-d)$^{-1}$	2.8E-06
	Methylene Chloride	910	µg/m^3	910	µg/m^3	M	1.1E-01	mg/kg*day	1.6E-03	(mg/kg-d)$^{-1}$	1.7E-04
	Tetrachloroethene	25.3	µg/m^3	25.3	µg/m^3	M	3.0E-03	mg/kg*day	1.0E-02	(mg/kg-d)$^{-1}$	3.0E-05
	Tetrahydrofuran	32.7	µg/m^3	32.7	µg/m^3	M	3.8E-03	mg/kg*day	6.8E-03	(mg/kg-d)$^{-1}$	2.6E-05
	Toluene	159	µg/m^3	159	µg/m^3	M	1.9E-02	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Total Xylenes	761	µg/m^3	761	µg/m^3	M	8.9E-02	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Trichloroethene	52.5	µg/m^3	52.5	µg/m^3	M	6.2E-03	mg/kg*day	4.0E-01	(mg/kg-d)$^{-1}$	2.5E-03
	Vinyl Acetate	39	µg/m^3	39	µg/m^3	M	4.6E-03	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Vinyl chloride	0.618	µg/m^3	0.618	µg/m^3	M	7.3E-05	mg/kg*day	3.1E-02	(mg/kg-d)$^{-1}$	2.2E-06
										Total Risk Across All Exposure Routes/Pathways	4.8E-03

(1) Medium Specific (M) EPC selected for risk calculation.

TABLE 8.1B RME
CALCULATION OF CANCER RISKS - INDUSTRIAL/COMMERCIAL EXPOSURE TO INDOOR AIR
REASONABLE MAXIMUM EXPOSURE
REMEDIAL INVESTIGATION
RAYMARK OU2-GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Indoor air
Exposure Medium: Indoor air
Exposure Point: Commercial Properties
Receptor Population: Industrial/Commercial Workers
Receptor Age: Adults

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
Inhalation	1,1,2,2-Tetrachloroethane	38	$\mu g/m^3$	38	$\mu g/m^3$	M	8.9E-04	mg/kg*day	2.0E-01	$(mg/kg\text{-}d)^{-1}$	1.8E-04
	1,1,2-Trichloroethane	9.89	$\mu g/m^3$	9.89	$\mu g/m^3$	M	2.3E-04	mg/kg*day	5.6E-02	$(mg/kg\text{-}d)^{-1}$	1.3E-05
	1,1-Dichloroethene	48	$\mu g/m^3$	48	$\mu g/m^3$	M	1.1E-03	mg/kg*day	NA	$(mg/kg\text{-}d)^{-1}$	
	1,2,4-Trimethylbenzene	33.1	$\mu g/m^3$	33.1	$\mu g/m^3$	M	7.7E-04	mg/kg*day	NA	$(mg/kg\text{-}d)^{-1}$	
	1,2-Dibromoethane	0.882	$\mu g/m^3$	0.882	$\mu g/m^3$	M	2.1E-05	mg/kg*day	7.7E-01	$(mg/kg\text{-}d)^{-1}$	1.6E-05
	1,2-Dichloroethane	0.326	$\mu g/m^3$	0.326	$\mu g/m^3$	M	7.6E-06	mg/kg*day	9.1E-02	$(mg/kg\text{-}d)^{-1}$	6.9E-07
	1,3,5-Trimethylbenzene	14.8	$\mu g/m^3$	14.8	$\mu g/m^3$	M	3.5E-04	mg/kg*day	NA	$(mg/kg\text{-}d)^{-1}$	
	1,3-Butadiene	7.34	$\mu g/m^3$	7.34	$\mu g/m^3$	M	1.7E-04	mg/kg*day	9.8E-01	$(mg/kg\text{-}d)^{-1}$	1.7E-04
	1,4-Dichlorobenzene	811	$\mu g/m^3$	811	$\mu g/m^3$	M	1.9E-02	mg/kg*day	NA	$(mg/kg\text{-}d)^{-1}$	
	4-Methyl-2-Pentanone	14	$\mu g/m^3$	14	$\mu g/m^3$	M	3.3E-04	mg/kg*day	NA	$(mg/kg\text{-}d)^{-1}$	
	Acetone	95.3	$\mu g/m^3$	95.3	$\mu g/m^3$	M	2.2E-03	mg/kg*day	NA	$(mg/kg\text{-}d)^{-1}$	
	Acrylonitrile	0.241	$\mu g/m^3$	0.241	$\mu g/m^3$	M	5.6E-06	mg/kg*day	2.4E-01	$(mg/kg\text{-}d)^{-1}$	1.4E-06
	Benzene	12.5	$\mu g/m^3$	12.5	$\mu g/m^3$	M	2.9E-04	mg/kg*day	2.7E-02	$(mg/kg\text{-}d)^{-1}$	8.0E-06
	Benzyl Chloride	6.26	$\mu g/m^3$	6.26	$\mu g/m^3$	M	1.5E-04	mg/kg*day	1.7E-01	$(mg/kg\text{-}d)^{-1}$	2.5E-05
	Bromodichloromethane	2.6	$\mu g/m^3$	2.6	$\mu g/m^3$	M	6.1E-05	mg/kg*day	6.2E-02	$(mg/kg\text{-}d)^{-1}$	3.8E-06
	Carbon Tetrachloride	1.07	$\mu g/m^3$	1.07	$\mu g/m^3$	M	2.5E-05	mg/kg*day	5.3E-02	$(mg/kg\text{-}d)^{-1}$	1.3E-06
	Chloroethane	3.99	$\mu g/m^3$	3.99	$\mu g/m^3$	M	9.3E-05	mg/kg*day	2.9E-03	$(mg/kg\text{-}d)^{-1}$	2.7E-07
	Chloroform	5.9	$\mu g/m^3$	5.9	$\mu g/m^3$	M	1.4E-04	mg/kg*day	1.9E-02	$(mg/kg\text{-}d)^{-1}$	2.6E-06
	Chloromethane	3.54	$\mu g/m^3$	3.54	$\mu g/m^3$	M	8.3E-05	mg/kg*day	6.3E-03	$(mg/kg\text{-}d)^{-1}$	5.2E-07
	cis-1,2-Dichloroethene	16.4	$\mu g/m^3$	16.4	$\mu g/m^3$	M	3.8E-04	mg/kg*day	NA	$(mg/kg\text{-}d)^{-1}$	
	Dibromochloromethane	1.69	$\mu g/m^3$	1.69	$\mu g/m^3$	M	4.0E-05	mg/kg*day	8.4E-02	$(mg/kg\text{-}d)^{-1}$	3.3E-06
	Dichlorodifluoromethane	149	$\mu g/m^3$	149	$\mu g/m^3$	M	3.5E-03	mg/kg*day	NA	$(mg/kg\text{-}d)^{-1}$	
	Ethylbenzene	73.8	$\mu g/m^3$	73.8	$\mu g/m^3$	M	1.7E-03	mg/kg*day	3.9E-03	$(mg/kg\text{-}d)^{-1}$	6.7E-06
	Hexane	35.4	$\mu g/m^3$	35.4	$\mu g/m^3$	M	8.3E-04	mg/kg*day	NA	$(mg/kg\text{-}d)^{-1}$	
	Methyl tert-Butyl Ether	69	$\mu g/m^3$	69	$\mu g/m^3$	M	1.6E-03	mg/kg*day	3.5E-04	$(mg/kg\text{-}d)^{-1}$	5.7E-07
	Methylene Chloride	910	$\mu g/m^3$	910	$\mu g/m^3$	M	2.1E-02	mg/kg*day	1.6E-03	$(mg/kg\text{-}d)^{-1}$	3.4E-05
	Tetrachloroethene	25.3	$\mu g/m^3$	25.3	$\mu g/m^3$	M	5.9E-04	mg/kg*day	1.0E-02	$(mg/kg\text{-}d)^{-1}$	5.9E-06
	Tetrahydrofuran	32.7	$\mu g/m^3$	32.7	$\mu g/m^3$	M	7.7E-04	mg/kg*day	6.8E-03	$(mg/kg\text{-}d)^{-1}$	5.2E-06
	Toluene	159	$\mu g/m^3$	159	$\mu g/m^3$	M	3.7E-03	mg/kg*day	NA	$(mg/kg\text{-}d)^{-1}$	
	Total Xylenes	761	$\mu g/m^3$	761	$\mu g/m^3$	M	1.8E-02	mg/kg*day	NA	$(mg/kg\text{-}d)^{-1}$	
	Trichloroethene	52.5	$\mu g/m^3$	52.5	$\mu g/m^3$	M	1.2E-03	mg/kg*day	4.0E-01	$(mg/kg\text{-}d)^{-1}$	4.9E-04
	Vinyl Acetate	39	$\mu g/m^3$	39	$\mu g/m^3$	M	9.1E-04	mg/kg*day	NA	$(mg/kg\text{-}d)^{-1}$	
	Vinyl chloride	0.618	$\mu g/m^3$	0.618	$\mu g/m^3$	M	1.4E-05	mg/kg*day	3.1E-02	$(mg/kg\text{-}d)^{-1}$	4.5E-07
										Total Risk Across All Exposure Routes/Pathways	9.7E-04

(1) Medium Specific (M) EPC selected for risk calculation.

TABLE 8.2B RME
CALCULATION OF CANCER RISKS
REASONABLE MAXIMUM EXPOSURE
DRAFT FINAL REMEDIAL INVESTIGATION
RAYMARK OU2 - GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Surface Water
Exposure Point: Ferry Creek
Receptor Population: Recreational Visitor
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	Arsenic	84	µg/L	8.4	µg/L	R	4.57E-08	mg/kg-day	1.50E+00	$(mg/kg\text{-}day)^{-1}$	6.8E-08
	Zinc	330	µg/L	33	µg/L	R	1.08E-07	mg/kg-day		$(mg/kg\text{-}day)^{-1}$	
	1,1-Dichlorethene	530	µg/L	53	µg/L	R	6.01E-06	mg/kg-day		$(mg/kg\text{-}day)^{-1}$	
	(total)										6.8E-08
											6.8E-08

(1) Specify Medium-Specific (M) or Route-Specific (R) EPC selected for hazard calculation.

TABLE 9.1A CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
REMEDIAL INVESTIGATION
RAYMARK OU2-GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Current/Future
Receptor Population: Residents
Receptor Age: 0 through 30 years

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
Indoor air	Indoor air	Homes	1,1,2,2-Tetrachloroethane		7.0E-06		7.0E-06	1,1,2,2-Tetrachloroethane			4.57E-03		4.57E-03
			1,1,2-Trichloroethane		1.2E-06		1.2E-06	1,1,2-Trichloroethane	blood		4.11E-02		4.11E-02
			1,1-Dichloroethene					1,1-Dichloroethene	liver		2.40E-02		2.40E-02
			1,2,4-Trimethylbenzene					1,2,4-Trimethylbenzene			4.83E-01		4.83E-01
			1,2-Dibromoethane		1.4E-05		1.4E-05	1,2-Dibromoethane			2.40E+00		2.40E+00
			1,2-Dichloroethane		9.6E-07		9.6E-07	1,2-Dichloroethane			5.87E-02		5.87E-02
			1,3,5-Trimethylbenzene					1,3,5-Trimethylbenzene			1.61E-01		1.61E-01
			1,3-Butadiene		1.7E-05		1.7E-05	1,3-Butadiene	reproductive		4.79E-03		4.79E-03
			1,4-Dichlorobenzene					1,4-Dichlorobenzene	liver		2.10E-01		2.10E-01
			4-Methyl-2-Pentanone					4-Methyl-2-Pentanone					
			Acetone					Acetone	liver/kidney		3.01E-02		3.01E-02
			Acrylonitrile		1.7E-06		1.7E-06	Acrylonitrile	epithelium		9.61E-02		9.61E-02
			Benzene		1.9E-06		1.9E-06	Benzene	lymphocytes		3.22E-01		3.22E-01
			Benzyl Chloride		3.0E-06		3.0E-06	Benzyl Chloride			4.72E-02		4.72E-02
			Bromodichloromethane		2.2E-06		2.2E-06	Bromodichloromethane	kidney		1.37E-02		1.37E-02
			Carbon Tetrachloride		9.3E-07		9.3E-07	Carbon Tetrachloride			1.96E-01		1.96E-01
			Chloroethane		1.0E-07		1.0E-07	Chloroethane			9.45E-05		9.45E-05
			Chloroform		6.7E-07		6.7E-07	Chloroform	liver		3.19E-01		3.19E-01
			Chloromethane		2.2E-07		2.2E-07	Chloromethane			3.19E-03		3.19E-03
			cis-1,2-Dichloroethene					cis-1,2-Dichloroethene	blood		5.48E-02		5.48E-02
			Dibromochloromethane		3.0E-06		3.0E-06	Dibromochloromethane			1.37E-02		1.37E-02
			Dichlorodifluoromethane					Dichlorodifluoromethane	liver		3.85E-02		3.85E-02
			Ethylbenzene		5.4E-07		5.4E-07	Ethylbenzene	developmental		3.78E-03		3.78E-03
			Hexane					Hexane	neurotoxicity		2.88E-02		2.88E-02
			Methyl tert-Butyl Ether		1.1E-07		1.1E-07	Methyl tert-Butyl Ether	liver/kidney		2.87E-03		2.87E-03
			Methylene Chloride		1.4E-06		1.4E-06	Methylene Chloride	liver		7.65E-03		7.65E-03
			Tetrachloroethene		3.5E-07		3.5E-07	Tetrachloroethene	liver		1.61E-03		1.61E-03
			Tetrahydrofuran		7.2E-07		7.2E-07	Tetrahydrofuran			9.56E-03		9.56E-03
			Toluene					Toluene	neurotoxicity		4.98E-02		4.98E-02
			Total Xylenes					Total Xylenes	motor		1.61E+00		1.61E+00
			Trichloroethene		7.0E-05		7.0E-05	Trichloroethene			1.37E-01		1.37E-01
			Vinyl Acetate					Vinyl Acetate	epithelial		2.88E-02		2.88E-02
			Vinyl chloride		2.2E-07		2.2E-07	Vinyl chloride	liver		1.92E-03		1.92E-03
						Total Risk Across[Medium]	1.3E-04					Total Hazard Index Across All Media and All Exposure Routes	6.4E+00
						Total Risk Across All Media and All Exposure Routes	1.3E-04						

TABLE 9.1B CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
REMEDIAL INVESTIGATION
RAYMARK OU2-GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Current/Future
Receptor Population: Industrial/Commercial Workers
Receptor Age: Adults

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
Indoor air	Indoor air	Commercial Properties	1,1,2,2-Tetrachloroethane		1.7E-06		1.7E-06	1,1,2,2-Tetrachloroethane			1.09E-03		1.09E-03
			1,1,2-Trichloroethane		2.8E-07		2.8E-07	1,1,2-Trichloroethane	blood		9.83E-03		9.83E-03
			1,1-Dichloroethene					1,1-Dichloroethene	liver		5.75E-03		5.75E-03
			1,2,4-Trimethylbenzene					1,2,4-Trimethylbenzene			1.16E-01		1.16E-01
			1,2-Dibromoethane		3.2E-06		3.2E-06	1,2-Dibromoethane			5.75E-01		5.75E-01
			1,2-Dichloroethane		2.3E-07		2.3E-07	1,2-Dichloroethane			1.40E-02		1.40E-02
			1,3,5-Trimethylbenzene					1,3,5-Trimethylbenzene			3.86E-02		3.86E-02
			1,3-Butadiene		4.1E-06		4.1E-06	1,3-Butadiene	reproductive		1.15E-03		1.15E-03
			1,4-Dichlorobenzene					1,4-Dichlorobenzene	liver		5.03E-02		5.03E-02
			4-Methyl-2-Pentanone					4-Methyl-2-Pentanone					
			Acetone					Acetone	liver/kidney		7.21E-03		7.21E-03
			Acrylonitrile		4.0E-07		4.0E-07	Acrylonitrile	epithelium		2.30E-02		2.30E-02
			Benzene		4.6E-07		4.6E-07	Benzene	lymphocytes		7.71E-02		7.71E-02
			Benzyl Chloride		7.2E-07		7.2E-07	Benzyl Chloride			1.13E-02		1.13E-02
			Bromodichloromethane		5.2E-07		5.2E-07	Bromodichloromethane	kidney		3.28E-03		3.28E-03
			Carbon Tetrachloride		2.2E-07		2.2E-07	Carbon Tetrachloride			4.68E-02		4.68E-02
			Chloroethane		2.4E-08		2.4E-08	Chloroethane			2.26E-05		2.26E-05
			Chloroform		1.6E-07		1.6E-07	Chloroform	liver		7.62E-02		7.62E-02
			Chloromethane		5.3E-08		5.3E-08	Chloromethane			7.62E-04		7.62E-04
			cis-1,2-Dichloroethene					cis-1,2-Dichloroethene	blood		1.31E-02		1.31E-02
			Dibromochloromethane		7.1E-07		7.1E-07	Dibromochloromethane			3.28E-03		3.28E-03
			Dichlorodifluoromethane					Dichlorodifluoromethane	liver		9.20E-03		9.20E-03
			Ethylbenzene		1.3E-07		1.3E-07	Ethylbenzene	developmental		9.04E-04		9.04E-04
			Hexane					Hexane	neurotoxicity		6.90E-03		6.90E-03
			Methyl tert-Butyl Ether		2.7E-08		2.7E-08	Methyl tert-Butyl Ether	liver/kidney		6.86E-04		6.86E-04
			Methylene Chloride		3.2E-07		3.2E-07	Methylene Chloride	liver		1.83E-03		1.83E-03
			Tetrachloroethene		8.4E-08		8.4E-08	Tetrachloroethene	liver		3.86E-04		3.86E-04
			Tetrahydrofuran		1.7E-07		1.7E-07	Tetrahydrofuran			2.29E-03		2.29E-03
			Toluene					Toluene	neurotoxicity		1.19E-02		1.19E-02
			Total Xylenes					Total Xylenes	motor		3.84E-01		3.84E-01
			Trichloroethene		1.7E-05		1.7E-05	Trichloroethene			3.28E-02		3.28E-02
			Vinyl Acetate					Vinyl Acetate	epithelial		6.90E-03		6.90E-03
			Vinyl chloride		5.2E-08		5.2E-08	Vinyl chloride	liver		4.59E-04		4.59E-04
						Total Risk Across[Medium]	3.0E-05					Total Hazard Index Across All Media and All Exposure Routes	1.5E+00
						Total Risk Across All Media and All Exposure Routes	3.0E-05						

TABLE 9.1A.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
REMEDIAL INVESTIGATION
RAYMARK OU2-GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Current/Future
Receptor Population: Residents
Receptor Age: 0 through 30 years

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
Indoor air	Indoor air	Homes	1,1,2,2-Tetrachloroethane		8.9E-04		8.9E-04	1,1,2,2-Tetrachloroethane			1.74E-01		1.74E-01
			1,1,2-Trichloroethane		6.5E-05		6.5E-05	1,1,2-Trichloroethane	blood		6.77E-01		6.77E-01
			1,1-Dichloroethene					1,1-Dichloroethene	liver		2.31E-01		2.31E-01
			1,2,4-Trimethylbenzene					1,2,4-Trimethylbenzene			5.33E+00		5.33E+00
			1,2-Dibromoethane		8.0E-05		8.0E-05	1,2-Dibromoethane			4.24E+00		4.24E+00
			1,2-Dichloroethane		3.5E-06		3.5E-06	1,2-Dichloroethane			6.38E-02		6.38E-02
			1,3,5-Trimethylbenzene					1,3,5-Trimethylbenzene			2.39E+00		2.39E+00
			1,3-Butadiene		8.4E-04		8.4E-04	1,3-Butadiene	reproductive		7.04E-02		7.04E-02
			1,4-Dichlorobenzene					1,4-Dichlorobenzene	liver		7.41E+00		7.41E+00
			4-Methyl-2-Pentanone					4-Methyl-2-Pentanone					
			Acetone					Acetone	liver/kidney		2.61E-01		2.61E-01
			Acrylonitrile		6.8E-06		6.8E-06	Acrylonitrile	epithelium		1.16E-01		1.16E-01
			Benzene		4.0E-05		4.0E-05	Benzene	lymphocytes		2.01E+00		2.01E+00
			Benzyl Chloride		1.2E-04		1.2E-04	Benzyl Chloride			5.91E-01		5.91E-01
			Bromodichloromethane		1.9E-05		1.9E-05	Bromodichloromethane	kidney		3.56E-02		3.56E-02
			Carbon Tetrachloride		6.7E-06		6.7E-06	Carbon Tetrachloride			4.19E-01		4.19E-01
			Chloroethane		1.4E-06		1.4E-06	Chloroethane			3.77E-04		3.77E-04
			Chloroform		1.3E-05		1.3E-05	Chloroform	liver		1.88E+00		1.88E+00
			Chloromethane		2.6E-06		2.6E-06	Chloromethane			1.13E-02		1.13E-02
			cis-1,2-Dichloroethene					cis-1,2-Dichloroethene	blood		4.49E-01		4.49E-01
			Dibromochloromethane		1.7E-05		1.7E-05	Dibromochloromethane			2.32E-02		2.32E-02
			Dichlorodifluoromethane					Dichlorodifluoromethane	liver		7.16E-01		7.16E-01
			Ethylbenzene		3.3E-05		3.3E-05	Ethylbenzene	developmental		6.97E-02		6.97E-02
			Hexane					Hexane	neurotoxicity		1.70E-01		1.70E-01
			Methyl tert-Butyl Ether		2.8E-06		2.8E-06	Methyl tert-Butyl Ether	liver/kidney		2.20E-02		2.20E-02
			Methylene Chloride		1.7E-04		1.7E-04	Methylene Chloride	liver		2.90E-01		2.90E-01
			Tetrachloroethene		3.0E-05		3.0E-05	Tetrachloroethene	liver		4.08E-02		4.08E-02
			Tetrahydrofuran		2.6E-05		2.6E-05	Tetrahydrofuran			1.04E-01		1.04E-01
			Toluene					Toluene	neurotoxicity		3.96E-01		3.96E-01
			Total Xylenes					Total Xylenes	motor		7.19E+00		7.19E+00
			Trichloroethene		2.5E-03		2.5E-03	Trichloroethene			1.44E+00		1.44E+00
			Vinyl Acetate					Vinyl Acetate	epithelial		1.87E-01		1.87E-01
			Vinyl chloride		2.2E-06		2.2E-06	Vinyl chloride	liver		5.93E-03		5.93E-03
						Total Risk Across[Medium]	4.8E-03					Total Hazard Index Across All Media and All Exposure Routes	3.7E+01
						Total Risk Across All Media and All Exposure Routes	4.8E-03						

TABLE 9.1B RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
REMEDIAL INVESTIGATION
RAYMARK OU2-GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Current/Future
Receptor Population: Industrial/Commercial Workers
Receptor Age: Adults

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
Indoor air	Indoor air	Commercial Properties	1,1,2,2-Tetrachloroethane		1.8E-04		1.8E-04	1,1,2,2-Tetrachloroethane			4.15E-02		4.15E-02
			1,1,2-Trichloroethane		1.3E-05		1.3E-05	1,1,2-Trichloroethane	blood		1.62E-01		1.62E-01
			1,1-Dichloroethene					1,1-Dichloroethene	liver		5.52E-02		5.52E-02
			1,2,4-Trimethylbenzene					1,2,4-Trimethylbenzene			1.28E+00		1.28E+00
			1,2-Dibromoethane		1.6E-05		1.6E-05	1,2-Dibromoethane			1.01E+00		1.01E+00
			1,2-Dichloroethane		6.9E-07		6.9E-07	1,2-Dichloroethane			1.53E-02		1.53E-02
			1,3,5-Trimethylbenzene					1,3,5-Trimethylbenzene			5.71E-01		5.71E-01
			1,3-Butadiene		1.7E-04		1.7E-04	1,3-Butadiene	reproductive		1.68E-02		1.68E-02
			1,4-Dichlorobenzene					1,4-Dichlorobenzene	liver		1.77E+00		1.77E+00
			4-Methyl-2-Pentanone					4-Methyl-2-Pentanone					
			Acetone					Acetone	liver/kidney		6.25E-02		6.25E-02
			Acrylonitrile		1.4E-06		1.4E-06	Acrylonitrile	epithelium		2.77E-02		2.77E-02
			Benzene		8.0E-06		8.0E-06	Benzene	lymphocytes		4.82E-01		4.82E-01
			Benzyl Chloride		2.5E-05		2.5E-05	Benzyl Chloride			1.42E-01		1.42E-01
			Bromodichloromethane		3.8E-06		3.8E-06	Bromodichloromethane	kidney		8.52E-03		8.52E-03
			Carbon Tetrachloride		1.3E-06		1.3E-06	Carbon Tetrachloride			1.00E-01		1.00E-01
			Chloroethane		2.7E-07		2.7E-07	Chloroethane			9.02E-05		9.02E-05
			Chloroform		2.6E-06		2.6E-06	Chloroform	liver		4.50E-01		4.50E-01
			Chloromethane		5.2E-07		5.2E-07	Chloromethane			2.70E-03		2.70E-03
			cis-1,2-Dichloroethene					cis-1,2-Dichloroethene	blood		1.08E-01		1.08E-01
			Dibromochloromethane		3.3E-06		3.3E-06	Dibromochloromethane			5.54E-03		5.54E-03
			Dichlorodifluoromethane					Dichlorodifluoromethane	liver		1.71E-01		1.71E-01
			Ethylbenzene		6.7E-06		6.7E-06	Ethylbenzene	developmental		1.67E-02		1.67E-02
			Hexane					Hexane	neurotoxicity		4.07E-02		4.07E-02
			Methyl tert-Butyl Ether		5.7E-07		5.7E-07	Methyl tert-Butyl Ether	liver/kidney		5.26E-03		5.26E-03
			Methylene Chloride		3.4E-05		3.4E-05	Methylene Chloride	liver		6.94E-02		6.94E-02
			Tetrachloroethene		5.9E-06		5.9E-06	Tetrachloroethene	liver		9.76E-03		9.76E-03
			Tetrahydrofuran		5.2E-06		5.2E-06	Tetrahydrofuran			2.49E-02		2.49E-02
			Toluene					Toluene	neurotoxicity		9.48E-02		9.48E-02
			Total Xylenes					Total Xylenes	motor		1.72E+00		1.72E+00
			Trichloroethene		4.9E-04		4.9E-04	Trichloroethene			3.44E-01		3.44E-01
			Vinyl Acetate					Vinyl Acetate	epithelial		4.49E-02		4.49E-02
			Vinyl chloride		4.5E-07		4.5E-07	Vinyl chloride	liver		1.42E-03		1.42E-03
						Total Risk Across[Medium]	9.7E-04					Total Hazard Index Across All Media and All Exposure Routes	8.9E+00
						Total Risk Across All Media and All Exposure Routes	9.7E-04						

TABLE 9.2B RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
DRAFT FINAL REMEDIAL INVESTIGATION
RAYMARK OU2 - GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Future
Receptor Population: Recreational Visitor
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	Surface Water	Ferry Creek	Arsenic			6.8E-08	6.8E-08	Arsenic	Skin, CVS			4.4E-04	4.4E-04
			Zinc				0.0E+00	Zinc	Blood			1.0E-06	1.0E-06
			1,1-Dichlorethene				0.0E+00	1,1-Dichlorethene	Liver			3.5E-04	3.5E-04
			(Total)			6.8E-08	6.8E-08	(Total)				8.0E-04	8.0E-04
						Total Risk Across Surface Water	6.8E-08				Total Hazard Index Across All Media and All Exposure Routes		8.0E-04
						Total Risk Across All Media and All Exposure Routes	6.8E-08						

TABLE 10.1A CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
REMEDIAL INVESTIGATION
RAYMARK OU2-GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Current/Future
Receptor Population: Residents
Receptor Age: 0 through 30 years

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
Indoor air	Indoor air	Homes	1,1,2,2-Tetrachloroethane		7.0E-06		7.0E-06						
			1,1,2-Trichloroethane		1.2E-06		1.2E-06						
			1,2-Dibromoethane		1.4E-05		1.4E-05	1,2-Dibromoethane			2.40E+00		2.40E+00
			1,3-Butadiene		1.7E-05		1.7E-05						
			Acrylonitrile		1.7E-06		1.7E-06						
			Benzene		1.9E-06		1.9E-06						
			Benzyl Chloride		3.0E-06		3.0E-06						
			Bromodichloromethane		2.2E-06		2.2E-06						
			Dibromochloromethane		3.0E-06		3.0E-06						
			Methylene Chloride		1.4E-06		1.4E-06						
								Total Xylenes	motor		1.61E+00		1.61E+00
			Trichloroethene		7.0E-05		7.0E-05						
						Total Risk Across[Medium]	1.2E-04					Total Hazard Index Across All Media and All Exposure Routes	4.0E+00
						Total Risk Across All Media and All Exposure Routes	1.2E-04						

TABLE 10.1B CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
REMEDIAL INVESTIGATION
RAYMARK OU2-GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Current/Future
Receptor Population: Industrial/Commercial Workers
Receptor Age: Adults

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
Indoor air	Indoor air	Commercial Properties	1,1,2,2-Tetrachloroethane		1.7E-06		1.7E-06						
			1,2-Dibromoethane		3.2E-06		3.2E-06						
			1,3-Butadiene		4.1E-06		4.1E-06						
			Trichloroethene		1.7E-05		1.7E-05						
						Total Risk Across[Medium]	2.6E-05					Total Hazard Index Across All Media and All Exposure Routes	0.0E+00
						Total Risk Across All Media and All Exposure Routes	2.6E-05						

TABLE 10.1A RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
REMEDIAL INVESTIGATION
RAYMARK OU2-GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Current/Future
Receptor Population: Residents
Receptor Age: 0 through 30 years

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
Indoor air	Indoor air	Commercial Properties	1,1,2,2-Tetrachloroethane		8.9E-04		8.9E-04						
			1,1,2-Trichloroethane		6.5E-05		6.5E-05						
								1,2,4-Trimethylbenzene			5.33E+00		5.33E+00
			1,2-Dibromoethane		8.0E-05		8.0E-05	1,2-Dibromoethane			4.24E+00		4.24E+00
			1,2-Dichloroethane		3.5E-06		3.5E-06						
								1,3,5-Trimethylbenzene			2.39E+00		2.39E+00
			1,3-Butadiene		8.4E-04		8.4E-04						
								1,4-Dichlorobenzene	liver		7.41E+00		7.41E+00
			Acrylonitrile		6.8E-06		6.8E-06						
			Benzene		4.0E-05		4.0E-05	Benzene	lymphocytes		2.01E+00		2.01E+00
			Benzyl Chloride		1.2E-04		1.2E-04						
			Bromodichloromethane		1.9E-05		1.9E-05						
			Carbon Tetrachloride		6.7E-06		6.7E-06						
			Chloroethane		1.4E-06		1.4E-06						
			Chloroform		1.3E-05		1.3E-05	Chloroform	liver		1.88E+00		1.88E+00
			Chloromethane		2.6E-06		2.6E-06						
			Dibromochloromethane		1.7E-05		1.7E-05						
			Ethylbenzene		3.3E-05		3.3E-05						
			Methyl tert-Butyl Ether		2.8E-06		2.8E-06						
			Methylene Chloride		1.7E-04		1.7E-04						
			Tetrachloroethene		3.0E-05		3.0E-05						
			Tetrahydrofuran		2.6E-05		2.6E-05						
								Total Xylenes	motor		7.19E+00		7.19E+00
			Trichloroethene		2.5E-03		2.5E-03	Trichloroethene			1.44E+00		1.44E+00
			Vinyl chloride		2.2E-06		2.2E-06	Vinyl chloride	liver		5.93E-03		5.93E-03
						Total Risk Across[Medium]	4.8E-03					Total Hazard Index Across All Media and All Exposure Routes	3.2E+01
						Total Risk Across All Media and All Exposure Routes	4.8E-03						

TABLE 10.1B RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
REMEDIAL INVESTIGATION
RAYMARK OU2-GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Current/Future
Receptor Population: Industrial/Commercial Workers
Receptor Age: Adults

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
Indoor air	Indoor air	Commercial Properties	1,1,2,2-Tetrachloroethane		1.8E-04		1.8E-04						
			1,1,2-Trichloroethane		1.3E-05		1.3E-05						
								1,2,4-Trimethylbenzene			1.28E+00		1.28E+00
			1,2-Dibromoethane		1.6E-05		1.6E-05	1,2-Dibromoethane			1.01E+00		1.01E+00
			1,3-Butadiene		1.7E-04		1.7E-04						
								1,4-Dichlorobenzene	liver		1.77E+00		1.77E+00
			Acrylonitrile		1.4E-06		1.4E-06						
			Benzene		8.0E-06		8.0E-06						
			Benzyl Chloride		2.5E-05		2.5E-05						
			Bromodichloromethane		3.8E-06		3.8E-06						
			Carbon Tetrachloride		1.3E-06		1.3E-06						
			Chloroform		2.6E-06		2.6E-06						
			Dibromochloromethane		3.3E-06		3.3E-06						
			Ethylbenzene		6.7E-06		6.7E-06						
			Methylene Chloride		3.4E-05		3.4E-05						
			Tetrachloroethene		5.9E-06		5.9E-06						
			Tetrahydrofuran		5.2E-06		5.2E-06						
								Total Xylenes	motor		1.72E+00		1.72E+00
			Trichloroethene		4.9E-04		4.9E-04						
						Total Risk Across[Medium]	9.6E-04					Total Hazard Index Across All Media and All Exposure Routes	5.8E+00
						Total Risk Across All Media and All Exposure Routes	9.6E-04						

APPENDIX F-2

EVALUATION OF MODELED INDOOR AIR

TABLE 1
SHALLOW GROUNDWATER WITHIN THE INDOOR AIR AREA OF INVESTIGATION SAMPLE LIST
REMEDIAL INVESTIGATION
RAYMARK OU2 - GROUNDWATER
STRATFORD, CONNECTICUT

MATRIX	BORING	SAMPLE DATE	NSAMPLE
Groundwater	MW-110S	5/16/1994	SP-MW-110S-01
Groundwater	MW-110S	8/26/1994	RM-SP-MW-110S-02
Groundwater	MW-110S	11/28/1994	RM-SP-MW-110S-03
Groundwater	MW-110S	3/27/1995	RM-SP-MW-110S-04
Groundwater	MW-110S	11/10/1997	OU2-MW-110S-05
Groundwater	MW-110S	1/13/2003	OU2-MW-110S-07
Groundwater	MW-202S	1/8/2003	OU2-MW-202S-07
Groundwater	MW-202S	1/8/2003	OU2-GW-202S-07
Groundwater	MW-203S	1/7/2003	OU2-GW-203S-07
Groundwater	MW-203S	1/7/2003	OU2-MW-203S-07
Groundwater	MW-212S	11/13/1997	OU2-MW-212S-01
Groundwater	MW-212S	11/20/1998	OU2-MW-212S-02
Groundwater	MW-212S	12/17/2002	OU2-MW-212S-07
Groundwater	MW-213S	11/17/1997	OU2-MW-213S-01
Groundwater	MW-213S	11/21/1998	OU2-MW-213S-02-AVG
Groundwater	MW-213S	1/7/2003	OU2-MW-213S-07
Groundwater	MW-213S	1/7/2003	OU2-GW-213S-07
Groundwater	MW-214S	11/13/1997	OU2-MW-214S-01
Groundwater	MW-214S	11/19/1998	OU2-MW-214S-02
Groundwater	MW-214S	1/7/2003	OU2-MW-214S-07
Groundwater	MW-214S	1/7/2003	OU2-GW-214S-07
Groundwater	MW-215S	1/9/2003	OU2-GW-215S-07
Groundwater	MW-215S	1/9/2003	OU2-MW-215S-07
Groundwater	MW-217S	1/10/2003	OU2-MW-217S-07
Groundwater	MW-301S	1/22/1999	OU2-MW-301S-01
Groundwater	MW-301S	1/15/2003	OU2-MW-301S-07
Groundwater	MW-302S	1/22/1999	OU2-MW-302S-01
Groundwater	MW-302S	1/9/2003	OU2-GW-302S-07
Groundwater	MW-302S	1/9/2003	OU2-MW-302S-07
Groundwater	MW-503S	12/18/2002	OU2-MW-503S-07
Groundwater	MW-507S	1/7/2003	OU2-MW-507S-07
Groundwater	MW-507S	1/7/2003	OU2-GW-507S-07
Groundwater	MW-508S	1/8/2003	OU2-GW-508S-07-AVG
Groundwater	MW-508S	1/8/2003	OU2-MW-508S-07
Groundwater	MW-513S	1/9/2003	OU2-GW-513S-07
Groundwater	MW-513S	1/9/2003	OU2-MW-513S-07
Groundwater	MW-514S	1/9/2003	OU2-GW-514S-07-AVG
Groundwater	MW-514S	1/9/2003	OU2-MW-514S-07
Groundwater	MW-515S	1/7/2003	OU2-MW-515S-07-AVG
Groundwater	MW-515S	1/7/2003	OU2-GW-515S-07-AVG
Groundwater	MW-517S	1/9/2003	OU2-GW-517S-07
Groundwater	MW-517S	1/9/2003	OU2-MW-517S-07
Groundwater	MW-518S	1/9/2003	OU2-GW-518S-07

TABLE 1
SHALLOW GROUNDWATER WITHIN THE INDOOR AIR AREA OF INVESTIGATION SAMPLE LIST
REMEDIAL INVESTIGATION
RAYMARK OU2 - GROUNDWATER
STRATFORD, CONNECTICUT

MATRIX	BORING	SAMPLE DATE	NSAMPLE
Groundwater	MW-518S	1/9/2003	OU2-MW-518S-07
Groundwater	MW-519S	1/9/2003	OU2-GW-519S-07
Groundwater	MW-519S	1/9/2003	OU2-MW-519S-07
Groundwater	MW-520S	1/7/2003	OU2-GW-520S-07
Groundwater	MW-520S	1/7/2003	OU2-MW-520S-07
Groundwater	MW-523S	1/8/2003	OU2-GW-523S-07
Groundwater	MW-523S	1/8/2003	OU2-MW-523S-07
Groundwater	MW-525S	1/8/2003	OU2-GW-525S-07
Groundwater	MW-525S	1/8/2003	OU2-MW-525S-07
Groundwater	MW-526S	1/8/2003	OU2-GW-526S-07
Groundwater	MW-526S	1/9/2003	OU2-MW-526S-07
Groundwater	MW-527S	1/9/2003	OU2-GW-527S-07
Groundwater	MW-527S	1/9/2003	OU2-MW-527S-07
Groundwater	MW-528S	1/6/2003	OU2-GW-528S-07
Groundwater	MW-528S	1/6/2003	OU2-MW-528S-07
Groundwater	MW-534S	1/10/2003	OU2-MW-534S-07-AVG
Groundwater	MW-535S	1/10/2003	OU2-MW-535S-07
Groundwater	MW-536S	1/8/2003	OU2-GW-536S-07
Groundwater	MW-536S	1/8/2003	OU2-MW-536S-07
Groundwater	SPDA-E222,S132	2/3/2003	OU2-MW-SPDA-E222,S132-07
Groundwater	WA120AG	2/6/2003	OU2-MW-WA120AG-E512-541-07

TABLE 2
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
REMEDIAL INVESTIGATION
RAYMARK OU2-GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Shallow Groundwater
Exposure Medium: Indoor Air
Exposure Point: Homes

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
71-55-6	1,1,1-Trichloroethane	1	J	6400	*	µg/l	OU2-MW-212S-01	26/43	10 - 10	6400		20400			NO	BSL
79-00-5	1,1,2-Trichloroethane	2	J	4	J	µg/l	OU2-MW-212S-07	4/43	10 - 500	4		8000			NO	BSL
75-34-3	1,1-Dichloroethane	1	J	480		µg/l	OU2-MW-212S-01	26/43	10 - 500	480		34600			NO	BSL
75-35-4	1,1-Dichloroethene	3		2100	*	µg/l	OU2-MW-212S-01	24/43	0.9 - 15	2100		190			YES	ASL
107-06-2	1,2-Dichloroethane	3	J	7	J	µg/l	OU2-MW-212S-01	2/43	10 - 500	7		21			NO	BSL
540-59-0	1,2-Dichloroethene (total)	1	J	1100	*	µg/l	OU2-MW-212S-01	11/13	10 - 10	1100					NO	NTX
123-91-1	1,4-Dioxane	72	J	300	J	µg/l	OU2-MW-520S-07	4/28	100 - 100	300					NO	NTX
78-93-3	2-Butanone	37	J	97	J	µg/l	SP-MW-110S-01	7/43	10 - 500	97		50000			NO	BSL
591-78-6	2-Hexanone	4	, J	4	, J	µg/l	OU2-MW-110S-05, OU2-MW-515S-07-AVG	2/43	10 - 500	4					NO	NTX
108-10-1	4-Methyl-2-Pentanone	2	J	3	J	µg/l	OU2-MW-110S-05	2/43	10 - 500	3		50000			NO	BSL
67-64-1	Acetone	7	J	360	*	µg/l	OU2-MW-110S-05	7/43	10 - 500	360		50000			NO	BSL
71-43-2	Benzene	1	J	16		µg/l	OU2-MW-520S-07	9/42	10 - 50	16		215			NO	BSL
75-27-4	Bromodichloromethane	5	J	5	J	µg/l	OU2-MW-203S-07	1/43	10 - 500	5					NO	NTX
75-15-0	Carbon Disulfide	45		74		µg/l	OU2-MW-110S-05	5/43	10 - 500	74					NO	NTX
108-90-7	Chlorobenzene	1	J	23		µg/l	OU2-MW-212S-07	6/42	10 - 50	23		1800			NO	BSL
75-00-3	Chloroethane	4	J	5	J	µg/l	OU2-MW-513S-07, OU2-MW-517S-07	3/43	10 - 500	5					NO	NTX
67-66-3	Chloroform	1	J	26		µg/l	OU2-MW-203S-07	8/43	10 - 500	26		287			NO	BSL
156-59-2	cis-1,2-Dichloroethene	1	J	680	*	µg/l	OU2-MW-212S-07	20/30	10 - 10	680					NO	NTX
100-41-4	Ethylbenzene	2	J	15		µg/l	SP-MW-110S-01	7/42	10 - 50	15		50000			NO	BSL
98-82-8	Isopropylbenzene	3	J	3	J	µg/l	OU2-MW-503S-07	1/30	10 - 10	3					NO	NTX
1634-04-4	Methyl tert-Butyl Ether	1	J	78		µg/l	OU2-MW-519S-07	9/30	10 - 10	78					NO	NTX
108-87-2	Methylcyclohexane	1	J	2	J	µg/l	OU2-MW-513S-07	3/30	10 - 10	2					NO	NTX
75-09-2	Methylene Chloride	6	J	9		µg/l	OU2-MW-213S-02-AVG	2/43	10 - 500	9		50000			NO	BSL
127-18-4	Tetrachloroethene	3	J	5	J	µg/l	OU2-MW-212S-01, OU2-MW-212S-07, OU2-MW-513S-07	5/43	10 - 500	5		1500			NO	BSL
108-88-3	Toluene	32	J	48		µg/l	OU2-MW-110S-07	7/42	10 - 50	48		23500			NO	BSL
1330-20-7	Total Xylenes	3	J	61		µg/l	SP-MW-110S-01	8/42	10 - 50	61		21300			NO	BSL
79-01-6	Trichloroethene	2	J	1700	*	µg/l	OU2-MW-513S-07	29/47	10 - 10	1700		27			YES	ASL
75-01-4	Vinyl Chloride	2		62		µg/l	OU2-MW-212S-07, OU2-MW-514S-07	26/43	1 - 500	62		2			YES	ASL

TABLE 2
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
REMEDIAL INVESTIGATION
RAYMARK OU2-GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Shallow Groundwater
Exposure Medium: Indoor Air
Exposure Point: Homes

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
74-84-0	Ethane	13		13		µg/l	OU2-MW-527S-07	1/15	2 - 10	13					NO	NTX
74-82-8	Methane	5.3		11000		µg/l	OU2-MW-503S-07	3/15	1 - 5	11000					NO	NTX
108-60-1	2,2'-oxybis(1-Chloropropane)	31	J	31	J	µg/l	RM-SP-MW-110S-02	1/43	10 - 1000	31					NO	NTX
105-67-9	2,4-Dimethylphenol	29	J	49	J	µg/l	OU2-MW-110S-07	3/43	10 - 1000	49					NO	NTX
91-57-6	2-Methylnaphthalene	8	J	8	J	µg/l	OU2-MW-503S-07	1/43	10 - 1000	8					NO	NTX
95-48-7	2-Methylphenol	22	J	30	J	µg/l	OU2-MW-110S-07	3/43	10 - 1000	30					NO	NTX
106-44-5	4-Methylphenol	420		1300	J	µg/l	RM-SP-MW-110S-02	6/43	10 - 10	1300					NO	NTX
100-02-7	4-Nitrophenol	1	J	55		µg/l	OU2-MW-212S-02	6/42	25 - 620	55					NO	NTX
83-32-9	Acenaphthene	27		27		µg/l	OU2-MW-503S-07	1/43	10 - 1000	27					NO	NTX
208-96-8	Acenaphthylene	0.45		1.2		µg/l	OU2-MW-110S-07	2/43	0.2 - 1000	1.2					NO	NTX
105-60-2	Caprolactam	12		12		µg/l	OU2-MW-301S-07	1/30	10 - 100	12					NO	NTX
86-74-8	Carbazole	2	J	2	J	µg/l	RM-SP-MW-110S-02	1/43	10 - 1000	2					NO	NTX
86-73-7	Fluorene	6	J	6	J	µg/l	OU2-MW-503S-07	1/43	10 - 1000	6					NO	NTX
91-20-3	Naphthalene	1	J	3	J	µg/l	RM-SP-MW-110S-02	4/43	10 - 1000	3					NO	NTX
85-01-8	Phenanthrene	0.85		1.5		µg/l	OU2-MW-503S-07	2/43	0.2 - 1000	1.5					NO	NTX
108-95-2	Phenol	5200	*	12000		µg/l	RM-SP-MW-110S-03	6/43	10 - 10	12000					NO	NTX
TOTPAH	Total PAH	1		3		µg/l	RM-SP-MW-110S-02	3/13	10 - 1000	3					NO	NTX
72-55-9	4,4'-DDE	0.002	J	0.0078	J	µg/l	RM-SP-MW-110S-02	2/43	0.1 - 2	0.0078					NO	NTX
50-29-3	4,4'-DDT	0.0039		0.0039		µg/l	OU2-MW-213S-02-AVG	1/41	0.1 - 2	0.0039					NO	NTX
319-84-6	alpha-BHC	0.017	J	0.017	J	µg/l	OU2-MW-212S-02	1/43	0.05 - 1	0.017					NO	NTX
5103-71-9	alpha-Chlordane	0.005	J	0.005	J	µg/l	RM-SP-MW-110S-03	1/43	0.05 - 1	0.005					NO	NTX
319-85-7	beta-BHC	0.005		0.056		µg/l	OU2-MW-212S-02	3/43	0.05 - 1	0.056					NO	NTX
319-86-8	delta-BHC	0.008	J	0.008	J	µg/l	RM-SP-MW-110S-03	1/41	0.05 - 1	0.008					NO	NTX
60-57-1	Dieldrin	0.072		0.25		µg/l	OU2-MW-302S-07	3/43	0.05 - 0.1	0.25					NO	NTX
959-98-8	Endosulfan I	0.0036		0.037	J	µg/l	OU2-MW-212S-02	2/43	0.05 - 1	0.037					NO	NTX
1031-07-8	Endosulfan Sulfate	0.0037	J	0.005	J	µg/l	RM-SP-MW-110S-03	3/41	0.1 - 2	0.005					NO	NTX
72-20-8	Endrin	0.0054	J	0.0054	J	µg/l	OU2-MW-212S-02	1/43	0.05 - 2	0.0054					NO	NTX
58-89-9	gamma-BHC	0.0034	J	0.037	J	µg/l	OU2-MW-212S-02	3/42	0.05 - 1	0.037					NO	NTX
5103-74-2	gamma-Chlordane	0.005	J	0.05		µg/l	SP-MW-110S-01	2/43	0.05 - 1	0.05					NO	NTX
1024-57-3	Heptachlor Epoxide	0.037		0.055	P	µg/l	OU2-MW-302S-07	2/41	0.02 - 0.05	0.055					NO	NTX
72-43-5	Methoxychlor	0.028	J	0.028	J	µg/l	RM-SP-MW-110S-02	1/43	0.5 - 10	0.028					NO	NTX

TABLE 2
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
REMEDIAL INVESTIGATION
RAYMARK OU2-GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Shallow Groundwater
Exposure Medium: Indoor Air
Exposure Point: Homes

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
35822-46-9	1,2,3,4,6,7,8-HpCDD	2	J	13.5		pg/l	OU2-MW-515S-07-AVG	8/27	1.1 - 8.8	13.5					NO	NTX
67562-39-4	1,2,3,4,6,7,8-HpCDF	1.2	J	5.9	J	pg/l	OU2-MW-535S-07	3/27	0.5 - 5.7	5.9					NO	NTX
55673-89-7	1,2,3,4,7,8,9-HpCDF	1.7	EMPC	6.3	J	pg/l	OU2-MW-217S-07	2/27	0.8 - 6	6.3					NO	NTX
39227-28-6	1,2,3,4,7,8-HxCDD	1.7	J	6.1	J	pg/l	OU2-MW-217S-07	3/27	0.6 - 5.2	6.1					NO	NTX
70648-26-9	1,2,3,4,7,8-HxCDF	5.9	J	5.9	J	pg/l	OU2-MW-535S-07	1/27	0.7 - 7.5	5.9					NO	NTX
57653-85-7	1,2,3,6,7,8-HxCDD	1.5	EMPC, J	7.3	J	pg/l	OU2-MW-217S-07	4/27	0.7 - 5	7.3					NO	NTX
57117-44-9	1,2,3,6,7,8-HxCDF	1.3	EMPC	1.9	J	pg/l	OU2-MW-301S-07	2/27	0.6 - 6.5	1.9					NO	NTX
19408-74-3	1,2,3,7,8,9-HxCDD	1.5	J	3.9	J	pg/l	OU2-MW-213S-07	6/27	0.8 - 7.7	3.9					NO	NTX
72918-21-9	1,2,3,7,8,9-HxCDF	1.7	EMPC	2	EMPC	pg/l	OU2-MW-301S-07	2/27	0.7 - 10	2					NO	NTX
40321-76-4	1,2,3,7,8-PeCDD	2.1	EMPC	6.8	EMPC, J	pg/l	OU2-MW-217S-07, OU2-MW-525S-07	6/27	0.6 - 7.9	6.8					NO	NTX
57117-41-6	1,2,3,7,8-PeCDF	2.4	EMPC	3.2	J	pg/l	OU2-MW-301S-07	2/27	0.6 - 9.6	3.2					NO	NTX
60851-34-5	2,3,4,6,7,8-HxCDF	1.3	J	2.1	J	pg/l	OU2-MW-301S-07	2/27	0.5 - 5.6	2.1					NO	NTX
57117-31-4	2,3,4,7,8-PeCDF	1.7	EMPC	2.1	J	pg/l	OU2-MW-301S-07	2/27	0.6 - 7.8	2.1					NO	NTX
1746-01-6	2,3,7,8-TCDD	1.7	J	1.7	J	pg/l	OU2-MW-301S-07	1/27	0.7 - 4.5	1.7					NO	NTX
51207-31-9	2,3,7,8-TCDF	2.1	J	3.8	J	pg/l	OU2-MW-212S-07	2/27	0.5 - 3.1	3.8					NO	NTX
3268-87-9	OCDD	6.3	J	375		pg/l	OU2-MW-515S-07-AVG	7/27	4.3 - 46.4	375					NO	NTX
39001-02-0	OCDF	3.3	J	4	EMPC	pg/l	OU2-MW-110S-07	2/27	1.6 - 16.1	4					NO	NTX
37871-00-4	Total HpCDD	2	J	27.7		pg/l	OU2-MW-515S-07-AVG	8/27	1.1 - 8.8	27.7					NO	NTX
38998-75-3	Total HpCDF	1.2	J	5.9	J	pg/l	OU2-MW-535S-07	3/27	0.6 - 12	5.9					NO	NTX
34465-46-8	Total HxCDD	1.4		1.4		pg/l	OU2-MW-534S-07-AVG	1/27	1 - 21.1	1.4					NO	NTX
36088-22-9	Total PeCDD	2.3	EMPC	6.8	EMPC, J	pg/l	OU2-MW-217S-07, OU2-MW-525S-07	4/27	0.6 - 9.7	6.8					NO	NTX
30402-15-4	Total PeCDF	1.7	EMPC	5.2	J	pg/l	OU2-MW-301S-07	3/27	0.6 - 17.4	5.2					NO	NTX
41903-57-5	Total TCDD	1.6	EMPC	1.9	EMPC	pg/l	OU2-MW-202S-07	4/27	1 - 4.5	1.9					NO	NTX
55722-27-5	Total TCDF	2.1	J	35.9	EMPC	pg/l	OU2-MW-535S-07	4/27	0.5 - 4.1	35.9					NO	NTX
TE	Toxicity Equivalency	0.0049	J	8.3	J	pg/l	OU2-MW-217S-07	14/14	0 - 0	8.3					NO	NTX
7429-90-5	Aluminum	42.1		2330		µg/l	RM-SP-MW-110S-02	9/43	10.1 - 310	2330					NO	NTX
7440-36-0	Antimony	3.6		3.6		µg/l	OU2-MW-213S-02-AVG	1/42	2.3 - 28.5	3.6					NO	NTX
7440-38-2	Arsenic	3.6		18	J	µg/l	RM-SP-MW-110S-03	6/42	2.3 - 9	18					NO	NTX
7440-39-3	Barium	10.5		529		µg/l	OU2-MW-110S-05	41/43	1.8 - 8.1	529					NO	NTX

TABLE 2
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
REMEDIAL INVESTIGATION
RAYMARK OU2-GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Shallow Groundwater
Exposure Medium: Indoor Air
Exposure Point: Homes

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
7440-41-7	Beryllium	0.6		0.62		µg/l	OU2-MW-213S-02-AVG	2/43	0.1 - 1.1	0.62					NO	NTX
7440-43-9	Cadmium	0.33	J	1.6	J	µg/l	OU2-MW-214S-01	5/43	0.3 - 3.9	1.6					NO	NTX
7440-70-2	Calcium	4400		645000		µg/l	OU2-MW-110S-05	43/43	0 - 0	645000					NO	NTX
7440-47-3	Chromium	0.61	J	8.9		µg/l	OU2-MW-213S-01	15/43	0.5 - 5.7	8.9					NO	NTX
7440-48-4	Cobalt	1.1		13.6		µg/l	OU2-MW-214S-01	17/42	0.6 - 4.9	13.6					NO	NTX
7440-50-8	Copper	0.48		24.6	J	µg/l	OU2-MW-302S-01	13/42	0.6 - 24.6	24.6					NO	NTX
57-12-5	Cyanide	2.7	J	2.7	J	µg/l	OU2-MW-212S-07	1/5	2.7 - 10	2.7					NO	NTX
7439-89-6	Iron	60.5		27500		µg/l	OU2-MW-214S-01	15/43	13.7 - 122	27500					NO	NTX
7439-92-1	Lead	3.1		3.1		µg/l	OU2-MW-213S-02-AVG	1/40	1 - 11.9	3.1					NO	NTX
7439-95-4	Magnesium	86.9		102000		µg/l	OU2-MW-535S-07	40/43	33.2 - 149	102000					NO	NTX
7439-96-5	Manganese	2	J	23400		µg/l	OU2-MW-212S-02	32/43	0.33 - 34.6	23400					NO	NTX
7439-97-6	Mercury	0.11	J	1.6	J	µg/l	RM-SP-MW-110S-03	6/43	0.1 - 0.2	1.6					NO	NTX
7440-02-0	Nickel	1.2	J	124	J	µg/l	RM-SP-MW-110S-03	31/43	1 - 8.8	124					NO	NTX
7440-09-7	Potassium	1970	J	45000	J	µg/l	OU2-MW-535S-07	43/43	0 - 0	45000					NO	NTX
7782-49-2	Selenium	2.9	J	13.2	J	µg/l	OU2-MW-212S-01	6/43	2.1 - 7	13.2					NO	NTX
7440-22-4	Silver	0.87	J	2.2		µg/l	OU2-MW-212S-02	8/42	0.6 - 3.6	2.2					NO	NTX
7440-23-5	Sodium	3490		898000		µg/l	OU2-MW-535S-07	43/43	0 - 0	898000					NO	NTX
7440-62-2	Vanadium	3.4		24.5	J	µg/l	RM-SP-MW-110S-02	7/43	0.5 - 2.6	24.5					NO	NTX
7440-66-6	Zinc	1.6	J	99.1	J	µg/l	OU2-MW-302S-01	21/43	1.4 - 35.2	99.1					NO	NTX

(1) Minimum/maximum detected concentration.
(2) N/A - Refer to supporting information for background discussion.
Background values are the maximum of off-site background concentrations.
(3) Screening toxicity values are Connecticut Groundwater Volatilization Criteria.
(4) Rationale Codes Selection Reason: Above Screening Levels (ASL)

Deletion Reason: No Toxicity Information (NTX)
Below Screening Level (BSL)

Definitions:
N/A = Not Applicable
SQL = Sample Quantitation Limit
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
MCL = Federal Maximum Contaminant Level
SMCL = Secondary Maximum Contaminant Level
J = Estimated Value
ca = Carcinogenic
nc = Non-Carcinogenic
EB = present in equipment blank
* = From dilution analysis
EMPC = Estimated Maximum Possible Concentration

TABLE 3
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
REMEDIAL INVESTIGATION
RAYMARK OU2-GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Current/Futur
Medium: Groundwater
Exposure Medium: Indoor air
Exposure Point: Homes

Chemical of Potential Concern	Units	Arithmetic Mean Groundwater	95% UCL of Normal Data	Maximum Detected Concentration Groundwater	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure		
							Indoor Air EPC Value	Indoor Air EPC Statistic	Indoor Air EPC Rationale
1,1-Dichloroethene	µg/L	210	NA	2100		µg/m^3	1080		Modeled from gw MAX
Trichloroethene	µg/L	170	NA	1700		µg/m^3	209		Modeled from gw MAX
Vinyl chloride	µg/L	14	NA	62		µg/m^3	38.1		Modeled from gw MAX

DATA ENTRY SHEET

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION
(enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
75014	6.20E+01	Vinyl chloride (chloroethene)

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (15 or 200 cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER SCS soil type directly above water table	ENTER Average soil/ groundwater temperature, T_S (°C)
200	252.34	S	14.5

MORE ↓

ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)	ENTER Vadose zone soil dry bulk density, ρ_b^V (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)
S			1.5	0.43	0.1

MORE ↓

ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)	ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
1.0E-06	1	70	25	25	83.3

Used to calculate risk-based groundwater concentration.

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (^oC)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (^oK)	Critical temperature, T_C (^oK)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
1.06E-01	1.23E-05	2.71E-02	25	5,250	259.25	432.00	1.86E+01	2.76E+03	8.8E-06	1.0E-01

END

INTERMEDIATE CALCULATIONS SHEET

Source-building separation, L_T (cm)	Vadose zone soil air-filled porosity, θ_a^V (cm^3/cm^3)	Vadose zone effective total fluid saturation, S_{te} (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{rg} (cm^2)	Vadose zone soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
52.34	0.330	0.125	1.00E-07	0.875	8.75E-08	17.05	0.43	0.177	0.253	3,844

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Vadose zone effective diffusion coefficient, D^{eff}_V (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)
5.63E+04	1.69E+06	2.27E-04	200	4,950	2.00E-02	8.46E-01	1.77E-04	1.43E-02	1.79E-03	4.36E-03

Diffusion path length, L_d (cm)	Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
52.34	200	5.25E+04	0.10	5.76E+01	1.43E-02	3.84E+02	2.68E+68	7.26E-04	3.81E+01	8.8E-06	1.0E-01

RESULTS SHEET

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

Indoor exposure groundwater conc., carcinogen (μg/L)	Indoor exposure groundwater conc., noncarcinogen (μg/L)	Risk-based indoor exposure groundwater conc., (μg/L)	Pure component water solubility, S (μg/L)	Final indoor exposure groundwater conc., (μg/L)
NA	NA	NA	2.76E+06	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
2.7E-05	8.7E-02

MESSAGE SUMMARY BELOW:

END

]

DATA ENTRY SHEET

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION
(enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
79016	1.70E+03	Trichloroethylene

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (15 or 200 cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER SCS soil type directly above water table	ENTER Average soil/ groundwater temperature, T_S (°C)
200	280.24	S	14.5

MORE ↓

ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)	ENTER Vadose zone soil dry bulk density, ρ_b^V (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)
S			1.5	0.43	0.1

MORE ↓

ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)	ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
1.0E-06	1	70	25	25	83.8

Used to calculate risk-based groundwater concentration.

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (^oC)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (^oK)	Critical temperature, T_C (^oK)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
7.90E-02	9.10E-06	1.03E-02	25	7,505	360.36	544.20	1.66E+02	1.10E+03	1.1E-04	4.0E-02

END

INTERMEDIATE CALCULATIONS SHEET

Source-building separation, L_T (cm)	Vadose zone soil air-filled porosity, θ_a^V (cm^3/cm^3)	Vadose zone effective total fluid saturation, S_{te} (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{rg} (cm^2)	Vadose zone soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
80.24	0.330	0.125	1.00E-07	0.875	8.75E-08	17.05	0.43	0.177	0.253	3,844

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Vadose zone effective diffusion coefficient, D^{eff}_V (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)
5.63E+04	1.69E+06	2.27E-04	200	8,501	6.10E-03	2.58E-01	1.77E-04	1.06E-02	1.33E-03	4.29E-03

Diffusion path length, L_d (cm)	Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
80.24	200	4.39E+05	0.10	5.76E+01	1.06E-02	3.84E+02	6.52E+91	6.25E-04	2.75E+02	1.1E-04	4.0E-02

RESULTS SHEET

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

Indoor exposure groundwater conc., carcinogen (μg/L)	Indoor exposure groundwater conc., noncarcinogen (μg/L)	Risk-based indoor exposure groundwater conc., (μg/L)	Pure component water solubility, S (μg/L)	Final indoor exposure groundwater conc., (μg/L)
NA	NA	NA	1.10E+06	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
2.5E-03	1.6E+00

MESSAGE SUMMARY BELOW:

END

]

DATA ENTRY SHEET

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION
(enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
75354	2.10E+03	1,1-Dichloroethylene

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (15 or 200 cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER SCS soil type directly above water table	ENTER Average soil/ groundwater temperature, T_S (°C)
200	252.34	S	14.5

MORE ↓

ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)	ENTER Vadose zone soil dry bulk density, ρ_b^V (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)
S			1.5	0.43	0.1

MORE ↓

ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)	ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
1.0E-06	1	70	25	25	83.3

Used to calculate risk-based groundwater concentration.

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (^oC)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (^oK)	Critical temperature, T_C (^oK)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
9.00E-02	1.04E-05	2.61E-02	25	6,247	304.75	576.05	5.89E+01	2.25E+03	0.0E+00	2.0E-01

END

INTERMEDIATE CALCULATIONS SHEET

Source-building separation, L_T (cm)	Vadose zone soil air-filled porosity, θ_a^V (cm^3/cm^3)	Vadose zone effective total fluid saturation, S_{te} (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{rg} (cm^2)	Vadose zone soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
52.34	0.330	0.125	1.00E-07	0.875	8.75E-08	17.05	0.43	0.177	0.253	3,844

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Vadose zone effective diffusion coefficient, D^{eff}_V (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)
5.63E+04	1.69E+06	2.27E-04	200	6,363	1.76E-02	7.47E-01	1.77E-04	1.21E-02	1.52E-03	3.70E-03

Diffusion path length, L_d (cm)	Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, $exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
52.34	200	1.57E+06	0.10	5.76E+01	1.21E-02	3.84E+02	3.92E+80	6.91E-04	1.08E+03	NA	2.0E-01

RESULTS SHEET

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

Indoor exposure groundwater conc., carcinogen (μg/L)	Indoor exposure groundwater conc., noncarcinogen (μg/L)	Risk-based indoor exposure groundwater conc., (μg/L)	Pure component water solubility, S (μg/L)	Final indoor exposure groundwater conc., (μg/L)
NA	NA	NA	2.25E+06	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	1.2E+00

MESSAGE SUMMARY BELOW:

END

]

APPENDIX F-3

PREDICTED OYSTER TISSUE CONCENTRATIONS

TABLE 1
BIOLOGICAL ACCUMULATION FACTORS AND ESTIMATED BIVALVE TISSUE CONCENTRATIONS
REMEDIAL INVESTIGATION
RAYMARK - OU2 - GROUNDWATER
STRATFORD, CONNECTICUT

Chemical	Sediment Pore Water Predicted at Seep ug/L	Surface Water Estimated in Ferry Creek ug/L	BCF for Higher Water Concentrations (g/kg)/(g/L)	Bivalve Tissue Estimated for Ferry Creek mg/kg - wet	Surface Water Estimated in Housatonic River ug/L	BCF for Lower Water Concentrations (g/kg)/(g/L)	Bivalve Tissue Estimated for Housatonic River mg/kg - wet
Arsenic	84	8.4	9	0.076	0.84	9	0.0076
Zinc	330	33	153	5.0	3.3	491	1.6
1,1-DCE	530	53	--	--	--	--	--
TCE	5,700	--	--	--	--	--	--

Note: No marine invertebrate data are available to derive BCFs for 1,1-DCE or TCE.

APPENDIX F-4

SAMPLE CALCULATIONS

CLIENT	JOB NUMBER
EPA Raymark OU2	4236

SUBJECT: Residential Exposure to Indoor Air - RME - Inhalation

BASED ON	DRAWING NUMBER

BY	CHECKED BY	APPROVED BY	DATE
CLW			Nov 19, 2004

Trichloroethene:

$$\text{Intake}_{mg/kg\cdot d} = \frac{EPC_{air}\,(\mu g/m^3) \times InhR\,(m^3/d) \times EF\,(d/y) \times ED\,(y) \times 10^{-3}\,(mg/\mu g)}{BW_{kg} \times AT_{days}}$$

where:

EPC =	Exposure Point Concentration	52.5 µg/m³
InhR =	Inhalation Rate	20 m³/d
EF =	Exposure Frequency	350 d/y
ED =	Exposure Duration	30 y
BW =	Body Weight	70 kg
AT =	Averaging Time	non-cancer 30 y × 365 d = 10950 d
		cancer 70 y × 365 d = 25550 d

$$\text{Non-cancer Intake}_{mg/kg\cdot d} = \frac{52.5\,\cancel{\mu g/m^3} \times 20\,\cancel{m^3/d} \times 350\,\cancel{d/y} \times 30\,\cancel{y} \times 10^{-3}\,mg/\cancel{\mu g}}{70\,kg \times 10\,950\,d}$$

$$= 1.4 \times 10^{-2}\ mg/kg\cdot d$$

$$\text{Hazard Index (HI)} = \frac{\text{Intake}}{\text{RfD (Reference Dose)}} = \frac{1.4 \times 10^{-2}}{1.0 \times 10^{-2}} = 1.4$$

$$\text{Cancer Intake}_{mg/kg\cdot d} = \frac{52.5\,\cancel{\mu g/m^3} \times 20\,\cancel{m^3/d} \times 350\,\cancel{d/y} \times 30\,\cancel{y} \times 10^{-3}\,mg/\cancel{\mu g}}{70\,kg \times 25550\,d}$$

$$= 6.2 \times 10^{-3}\ mg/kg\cdot d$$

$$\text{Cancer Risk} = \text{Intake} \times \text{Cancer Slope Factor (CSF)} = 6.2 \times 10^{-3} \times 4 \times 10^{-1} = 2.5 \times 10^{-3}$$

CLIENT	JOB NUMBER
EPA Raymark OU2	4236

SUBJECT: Industrial Exposure to Indoor Air - CTE - Inhalation

BASED ON	DRAWING NUMBER

BY	CHECKED BY	APPROVED BY	DATE
clw			Nov. 19, 2008

Trichloroethene:

$$\text{Intake} = \frac{EPC \times InhR \times EF \times ED \times 10^{-3}}{BW \times AT} \text{ mg/kg}$$

Where:

EPC = Exposure Point Concentration		5 ug/m³
InhR = Inhalation Rate		6.7 m³/d
EF = Exposure Frequency		250 d/y
ED = Exposure Duration		9 y
BW = Body Weight		70 kg
AT = Averaging Time	non-cancer	9 × 365 = 3265 d
	cancer	70 × 365 = 25550 d

$$\text{Non-Cancer Intake} = \frac{5 \times 6.7 \times 250 \times 9 \times 10^{-3}}{70 \times 3265}$$

$$= 3.3 \times 10^{-4} \text{ mg/kg·d}$$

$$HI = \frac{\text{Intake}}{RfD} = \frac{3.3 \times 10^{-4}}{1.0 \times 10^{-2}} = 3.3 \times 10^{-2}$$

$$\text{Cancer Intake} = \frac{5 \times 6.7 \times 250 \times 9 \times 10^{-3}}{70 \times 25550}$$

$$= 4.2 \times 10^{-5}$$

$$\text{Cancer Risk} = \text{Intake} \times CSF = 4.2 \times 10^{-5} \times 4 \times 10^{-1}$$

$$= 1.68 \times 10^{-7}$$

CLIENT	JOB NUMBER
EPA Raymark OU2	4236
SUBJECT: Recreational Exposure to Surface Water - RME - Dermal - child	
BASED ON: RAGS E Dermal Guidance 2004	DRAWING NUMBER
BY: CLW / CHECKED BY	APPROVED BY / DATE: Nov. 19, 2004

Arsenic: $EPC_{sw} = 8.4\ \mu g/L$

inorganic $DA_{event} = K_p \times EPC_{sw} \times t_{event} \times 10^{-3}\frac{mg}{\mu g} \times 10^{-3}\ L/cm^3$

$mg/cm^2 \cdot event \quad cm/hr \quad \mu g/L \quad hr/ev$

$$DAD_{mg/kg \cdot d} = \frac{DA_{event\ mg/cm^2 \cdot event} \times SA_{cm^2} \times EV_{ev/day} \times EF_{d/y} \times ED_y}{BW_{kg} \times AT_{days}}$$

where:
- DA_{event} = Absorbed Dose/event
- K_p = Dermal Permeability Coefficient in water = $0.001\ \frac{cm}{hr}$
- EPC_{sw} = Exposure Point Concentration in Surface Water = $8.4\ \frac{\mu g}{L}$
- t_{event} = Event Duration = 1 hr/event
- SA = Surface Area available = 1900 cm^2
- EV = Event Frequency = 1 ev/day
- EF = Exposure Frequency = 90 days/yr
- ED = Exposure Duration = 6 years
- BW = Body Weight = 70 kg
- AT = Averaging Time non-cancer 6 yr × 365 d = 2190 d; cancer 70 y × 365 d = 25550 d

$DA_{event} = 0.001 \times 8.4 \times 1 \times 10^{-3} \times 10^{-3} = 8.4 \times 10^{-9}\ mg/cm^2 \cdot ev$

non cancer $DAD = \frac{8.4 \times 10^{-9} \times 1900 \times 1 \times 90 \times 6}{15 \times 2190} = 2.6 \times 10^{-7}\ mg/kg \cdot d$

Hazard Index $= \frac{DAD}{\text{Reference Dose}} = \frac{2.6 \times 10^{-7}}{3.0 \times 10^{-4}} = 8.7 \times 10^{-4}$

cancer $DAD = \frac{8.4 \times 10^{-9} \times 1900 \times 1 \times 90 \times 6}{15 \times 25550} = 2.25 \times 10^{-8}\ mg/kg \cdot d$

Cancer Risk = DAD × CSF = $2.25 \times 10^{-8} \times 1.5 = 3.4 \times 10^{-8}$

CSF: Cancer Slope Factor

CLIENT	JOB NUMBER
EPA Raymark OU2	4236

SUBJECT: Recreational Exposure to Surface Water - RME - adult - DERMAL

BASED ON	DRAWING NUMBER
RAGS E Dermal Guidance 2004	

BY	CHECKED BY	APPROVED BY	DATE
Clw			Nov. 19, 2004

1,1-DCE: $t^* = 0.89\ hr < t_{event} = 1\ hr/ev$

$K_p = 0.012\ cm/hr$

$\tau_{event} = 0.37\ hr/ev$

$B = 0$

$FA = 1.0$

$EPC_{sw} = 53\ \mu g/L$

$SA = 4500\ cm^2$

$EV = 1\ event/d$

$EF = 90\ d/yr$

$ED = 24\ y$

$BW = 70\ kg$

$AT_{nc} = 8760\ d$

$AT_c = 25550\ d$

$$DA_{event}\ (mg/cm^2.ev) = (FA)(K_p)(EPC_{sw})(10^{-3}\ L/cm^3)\left(\frac{t_{event}}{1+B} + 2\tau_{event}\left(\frac{1+3B+3B^2}{(1+B)^2}\right)\right)\times 10^{-3}\ \frac{mg}{\mu g}$$

$$= 1 \times 0.012 \times 53 \times 10^{-3}\left(\frac{1}{1+0} + 2(0.37)\left(\frac{1+3(0)+3(0)^2}{(1+0)^2}\right)\right)\times 10^{-3}$$

$$= 1 \times 0.012 \times 53 \times 10^{-3}(1 + 2(0.37)(1)) \times 10^{-3}$$

$$= 1 \times 0.012 \times 53 \times 10^{-3}(1.74) \times 10^{-3}$$

$$= 1.11 \times 10^{-6}\ mg/cm^2.ev$$

$$DAD\ (mg/kg.d) = \frac{DA_{event}\ (mg/cm^2.ev) \times SA_{cm^2} \times EV_{ev/d} \times EF_{d/y} \times ED_y}{BW_{kg} \times AT_d}$$

$$\text{noncancer } DAD = \frac{1.11\times10^{-6} \times 4500 \times 1 \times 90 \times 24}{70 \times 8760} = 1.76 \times 10^{-5}$$

$$HI = \frac{DAD_{nc}}{RfD} = \frac{1.76\times10^{-5}}{5\times10^{-2}} = 3.5\times10^{-4}$$

$$\text{cancer } DAD = \frac{1.11\times10^{-6} \times 4500 \times 1 \times 90 \times 24}{70 \times 25550} = 6.01\times10^{-6}$$

$$\text{Cancer Risk} = DAD_{ca} \times CSF = 6.01\times10^{-6} \times NA^* = NA$$

NA^* = Not Available / Not Applicable

* The CSF for 11DCE has been withdrawn by EPA

APPENDIX F-5

TOXICITY PROFILES

F.5.1 1,1-Dichloroethene

F.5.1.1 Noncancer Toxicity

Chronic oral exposure of laboratory animals to 1,1-dichloroethene induced liver effects (EPA, 2004). In animals, inhalation exposure induced degenerative changes in the liver and kidneys (ATSDR, 1989b). No health effects were observed in a limited study of 138 exposed workers (ACGIH, 1986). The EPA (EPA, 2004) presented a verified RfD for chronic oral exposure of 0.05 mg/kg/day, based on a Benchmark Dose ($BMDL_{10}$) for liver effects in a chronic drinking water study in rats and an uncertainty factor of 100. The same value is used as a provisional subchronic oral RfD. The EPA (EPA, 2004) also presents an RfC for chronic inhalation exposure of 0.2 mg/m^3, based on liver effects in an inhalation study in rats. The liver is the principal target organ for exposure to 1,1-dichloroethene.

F.5.1.2 Carcinogenicity

EPA classifieds 1,1-dichloroethene as a cancer weight-of-evidence Group C compound (possible human carcinogen), based on an inadequate occupational exposure cancer study, limited data in several animal studies, its mutagenicity and ability to alkylate deoxyribonucleic acid (DNA), and its structural similarity to vinyl chloride, a known human carcinogen (EPA, 2004). The 1,1-DCE shows suggestive evidence of human carcinogenicity by the inhalation route of exposure and equivocal evidence of carcinogenicity by the oral route of exposure. EPA concludes that the available data is insufficient to develop a cancer slope factor for 1,1-DCE (EPA, 2004).

F.5.2 Trichloroethene

F.5.2.1 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 (ACGIH, 1986). 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 0.0003 mg/kg/day was presented by EPA (EPA, 2001). An inhalation RfC value of 0.01 was presented by EPA (EPA, 2001). The principal target organs for trichloroethene are the CNS and heart, and, to a lesser extent, the liver and kidney.

F.5.2.2 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) (ATSDR, 1995d). Cancer studies in humans were inadequate. Interpretation of the data regarding the carcinogenicity of trichloroethene is controversial, and the EPA (EPA, 2001) 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 presents the slope factor of 0.4 per mg/kg/day for oral exposure and inhalation exposures (EPA, 2001).

F.5.3 Benzene

F.5.3.1 Pharmacokinetics

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) (Sabourin et al., 1987; Srobova et al., 1950). 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 (Susten, 1985).

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 (Winek and Collum, 1971). 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 (Ghantous and Danielsson, 1986; Rickert et al., 1979; Low et al., 1989).

Numerous studies indicate that the metabolism of benzene is required for its toxicity (Kalf et al., 1987). The liver is the main site for the metabolism of benzene; the bone marrow, a minor site (ATSDR, 1992). Phenol, hydroquinone, catechol, and benzene oxide are the major metabolites (Kalf et al, 1987; Snyder, 1987). The metabolite(s) of benzene that are responsible for its toxicity have not been positively identified, but likely candidates include muconaldehyde, quinones, and free radicals generated by oxidizing enzymes (Henderson et al., 1989; Snyder, 1987).

Benzene is eliminated either unchanged in expired air or as metabolites in the urine (ATSDR, 1992). The proportions of the administered dose excreted by each route and the half-times for excretion are dependent on route, dose, and duration of exposure.

F.5.3.2 Noncancer Toxicity

Lethal oral doses of benzene are estimated to be 10 mL in humans; oral LD_{50} values for benzene in rats range from 0.93 to 5.96 g/kg (Cornish and Ryan, 1965; Withey and Hall, 1975). These data indicate that benzene is of low acute toxicity (O'Bryan and Ross, 1986).

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 (Thienes and Haley, 1972; Clayton and Clayton, 1981; Cornish and Ryan, 1965). 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 (Hsieh et al., 1988b). 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) (Huff et al., 1989).

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 (Clayton and Clayton, 1981). The estimated LC_{50} value for the rat is 13,700 ppm (Drew and Fouts, 1974).

As with orally administered benzene, the targets for nonlethal concentrations of inhaled benzene include the nervous, hematological, and immunological systems. Neurological symptoms in humans may appear at exposure concentrations of 700 ppm (Clayton and Clayton, 1981). In animals, 1 week of exposure to 300 ppm induced behavioral effects (Drew and Fouts, 1974), and one to four weeks of exposure to benzene concentrations ranging from 21-50 ppm suppressed the bone marrow (NOAEL, 10 ppm) (Cronkite et al., 1985; Toft et al., 1982), the cellular immune response (NOAEL, 10 ppm) (Rosenthal and Snyder, 1985), and the humoral immune response (LOAEL, 50 ppm) (Aoyama, 1986).

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 (Snyder, 1984). A group of workers exposed to benzene concentrations of 30 and 150 ppm for 4 months to 1 year had increased incidences of pancytopenia (Aksoy et al., 1971; Aksoy et al., 1972; Aksoy and Erdem, 1978). 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 (Aksoy et al., 1972). 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 (Baarson et al., 1984; Ward et al., 1985).

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 (Kellerova, 1985). Others exposed to benzene concentrations of 210 ppm for 6-8 years had peripheral nerve damage (Baslo and Aksoy, 1982).

In humans, benzene crosses the placenta and is present in the cord blood in amounts equal to those in maternal blood (Dowty et al., 1976); however, studies of the effects of benzene on human reproduction and development have been confounded by the presence of other chemicals in the environment (USAF, 1989). Benzene does produce developmental effects (fetal toxicity, but not malformations) in the offspring of treated animals, mostly at maternally toxic doses (Nawrot and Staples, 1979; Seidenberg et al., 1986; Keller and Snyder, 1988).

Reference doses/concentrations for benzene have recently been established. EPA presents an oral RfD of 0.004 mg/kg/day and an inhalation RfC of 0.03 mg/m_3 based on a human occupational inhalation study benchmark dose of 1.2 mg/kg/day and an uncertainty factor of 300 (EPA, 2004) for benzene.

F.5.3.3 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 (Aksoy, 1989). Workers at risk were exposed in one study to 8-hour TWA concentrations ranging from 10 to 100 ppm (Rinsky et al., 1981) and in another to 8-hour TWA concentrations ranging from <2 to >25 ppm (Ott et al., 1978). In a historical prospective mortality study of chemical workers, Yin et al. (1987) described a dose-response relationship between exposure to benzene and lymphatic and hematopoietic cancers, which 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 (Huff et al., 1989; Maltoni et al., 1989). In one study C57Bl/BNL mice had increased incidences of leukemia, lymphoma, and solid tumors after exposure to 300 ppm for only 16 weeks (Cronkite et al., 1985; Cronkite, 1986).

Based on "convincing human evidence as well as supporting evidence from animal studies", benzene has been placed in the EPA weight-of-evidence classification A, human carcinogen (EPA, 2004). The oral slope factor for benzene is presented as a range 1.5E-02 to 5.5E-02 $(mg/kg/day)^{-1.}$. The drinking water unit risk value is presented as a range, 4.4 E-04 to 1.6E-03 per mg/L (EPA, 2004). The inhalation unit risk value is also presented as a range, 2.2 E-06 to 7.8E-06 per ug/m^3 (EPA, 2004).

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F.5.4 Vinyl Chloride

F.5.4.1 Noncancer Toxicity

Data were not located regarding oral exposure of humans to vinyl chloride (ATSDR 1989a). In rats, lifetime dietary ingestion of vinyl chloride slightly but significantly increased mortality and induced mild histopathologic effects in the liver. Several early occupational studies associated vinyl chloride exposure with a syndrome known as vinyl chloride disease, which includes acroosteolysis (dissolution of the ends of the distal phalanges of the hands), circulatory disturbances in the extremities, Raynaud syndrome (sudden, recurrent bilateral cyanosis of the digits), scleroderma, hematologic effects, effects on the lungs, and impaired liver function and liver damage. Mild neurologic effects were also associated with occupational exposure. Long-term inhalation studies in rats and mice identified elevated relative liver weight as a sensitive indicator of liver effects. The principal target organs for vinyl chloride appear to be the CNS and the liver. EPA (EPA, 2004) presents an oral RfD of 0.003 mg/kg/day and an inhalation RfC of 0.1 mg/m_3 based on liver effects in a rat chronic feeding study and an uncertainty factor of 30.

F.5.4.2 Carcinogenicity

The EPA (EPA, 2004) lists vinyl chloride as an EPA cancer weight-of-evidence Group A compound (human carcinogen) and presents a verified oral slope factor of 0.7 per mg/kg/day, based on the increased incidence of liver and lung tumors in a lifetime dietary study in rats. An inhalation unit risk of 8.8E-06 per $\mu g/m^3$, equivalent to 0.03 per mg/kg/day, assuming humans inhale 20 m^3 of air/day and weigh 70 kg, is based on liver tumors in rats intermittently exposed by inhalation for 12 months.

F.5.5 Arsenic

F.5.5.1 Pharmacokinetics

Several studies confirm that soluble inorganic arsenic compounds and organic arsenic compounds are almost completely (>90 percent) absorbed from the GI tract in both animals and humans (Ishinishi et al., 1986). The absorption efficiency of insoluble inorganic arsenic compounds depends on particle size an stomach pH. Initial distribution of absorbed arsenic is to the liver, kidneys, and lungs, flowed by redistribution to hair, nails, teeth, bone, and skin, which are considered tissues of accumulation. Arsenic has a long half-life in the blood of rats, compared with other animals and humans, because of firm binding to the hemoglobin in erythrocytes.

Metabolism of inorganic arsenic includes reversible oxidation-reduction so that both arsenite (valence of 3) and arsenate (valence of 5) are present in the urine of animals treated with arsenic of either valence (Ishinishi et al., 1986). Arsenite is subsequently oxidized and methylated by a saturable mechanism to form mono- or dimethylarsenate; the latter is the predominant metabolite in the urine of animals or humans. Organic arsenic compounds (arsenilic acid, cacodylic acid) are not readily converted to inorganic arsenic. Excretion of organic or inorganic arsenic is largely via the urine, but considerable species variation exists. Continuously exposed humans appear to excrete 60 to 70 percent of their daily intake of arsenate or arsenite via the urine.

F.5.5.2 Noncancer Toxicity

A lethal dose of arsenic trioxide in humans is 70 to 180 mg. (approximately 50 to 140 mg arsenic; Ishinishi et al., 1986). Acute oral exposure of humans to high doses of arsenic produce liver swelling, skin lesions, disturbed heart function, and neurological effects. The only noncarcer effects in humans clearly attributable to chronic oral exposure to arsenic are dermal hyperpigmentation and keratosis, as revealed by studies of several hundred Chinese exposed to naturally occurring arsenic in well water (Tseng, 1977; Tseng et al., 1968; EPA, 2004). Similar effects were observed in persons exposed to high levels of arsenic in water in Utah and the northern part of Mexico (Cebrian et al., 1983; Southwick et al., 1983).

Occupational (predominantly inhalation) exposure is also associated with neurological deficits, anemia, and cardiovascular effects (Ishinishi et al. 1986), but concomitant exposure to other chemicals cannot be ruled out. The EPA (EPA, 2004) derived an RfD of 0.3 ug/kg/day for chronic oral exposure, based on an NOAEL of 0.8 ug/kg/day for skin lesions from Chinese data. The principal target organ for arsenic appears to be the skin. The nervous system and cardiovascular systems appear to be less significant target organs. Inorganic arsenic may be an essential nutrient, exerting beneficial effects on growth, health, and feed conversion efficiency (Underwood, 1977).

F.5.5.3 Carcinogenicity

Inorganic arsenic is clearly a carcinogen in humans. Inhalation exposure is associated with increased risk of lung cancer in persons employed as smelter workers, in arsenical pesticide applicators, and in a population residing near a pesticide manufacturing plant (EPA, 2004). Oral exposure to high levels in well water is associated with increased risk of skin cancer (Tseng, 1977; EPA, 2004). Extensive animal testing with various forms of arsenic given by many routes of exposure to several species, however, has not demonstrated the carcinogenicity of arsenic (International Agency for Research on Cancer (IARC, 1980). The EPA (EPA, 2004) classifies inorganic arsenic in cancer weight-of-evidence Group A (human carcinogen), and recommends an oral unit risk of 0.00005 ug/L in drinking water, based on the incidence of skin cancer in the Tseng (Tseng, 1977) study. The EPA presents a chronic oral slope factor of 1.5 per mg/kg/day based on the same information. The EPA (EPA, 2004) notes that the uncertainties associated with the oral unit risk are considerably less than those for most carcinogens, so that the unit risk might be reduced in order of magnitude. An inhalation unit risk of 0.0043 per mg/m^3 was derived for inorganic arsenic from the incidence of lung cancer in occupationally exposed men (EPA, 2004) equivalent to 15.1 per mg/kg/day, was derived from the same data assuming an inhalation rate of 20 m^3/day and a body weight of 70 kg for humans.

F.5.6 Zinc

F.5.6.1 Pharmacokinetics

Zinc is a nutritionally required trace element. Estimates of the efficiency of GI absorption of zinc in animals range from <10 to 90 percent (Elinder, 1986). Estimates in normal humans range from approximately 20 to 77 percent (Elinder, 1986; Goyer, 1991). The net absorption of zinc appears to be homeostatically controlled, but it is unclear whether GI absorption, intestinal secretion, or both are regulated. Distribution of absorbed zinc is primarily to the liver (Goyer, 1991), with subsequent redistribution to bone, muscle, and kidney (Elinder, 1986). Highest tissue concentrations are found in the prostate. Excretion appears to be principally through the feces, in part from biliary secretion, but the relative importance of fecal and urinary excretion is species-dependent. The half-life of zinc absorbed from the GI tracts of humans in normal zinc homeostasis is approximately 162 to 500 days.

F.5.6.2 Noncancer Toxicity

Humans exposed to high concentrations of aerosols of zinc compounds may experience severe pulmonary damage and death (Elinder, 1986). The usual occupational exposure is to freshly formed fumes of zinc, which can induce a reversible syndrome known as metal fume fever. Orally, zinc exhibits a low order of acute toxicity. Animals dosed with 100 times dietary requirement showed no evidence of toxicity (Goyer, 1991). In humans, acute poisoning from foods or beverages prepared in galvanized containers is characterized by GI upset (Elinder 1986c). Chronic oral toxicity in animals is associated with poor growth, GI inflammation, arthritis, lameness, and a microcytic, hypochromic anemia (Elinder, 1986), possibly secondary to copper deficiency (Underwood, 1977). The EPA (EPA, 2004) presented a verified RfD of 0.3 mg/kg/day for chronic oral exposure to zinc, based on anemia in humans.

F.5.6.3 Carcinogenicity

The EPA (EPA, 2004) classifies zinc in cancer weight-of-evidence Group D (not classifiable as to carcinogenicity to humans) based on inadequate evidence for carcinogenicity in humans and animals. The human data consist largely of occupational exposure studies not designed

to detect a carcinogenic response, and of reports that prostatic zinc concentrations were lower in cancerous than in noncancerous tissue. The animal data consist of several dietary, drinking water, and zinc injection studies, none of which provided convincing data for a carcinogenic response.

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APPENDIX F-6

ALTERNATIVE TCE RISK CALCULATIONS

TABLE 7.1A CTE
CALCULATION OF NON-CANCER HAZARDS - RESIDENTIAL EXPOSURE TO INDOOR AIR
CENTRAL TENDENCY EXPOSURE
REMEDIAL INVESTIGATION
RAYMARK OU2 - GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Indoor air
Exposure Medium: Indoor air
Exposure Point: Homes
Receptor Population: Residents
Receptor Age: 0 through 30 years

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 (Inhalation)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Inhalation	1,1,2,2-Tetrachloroethane	1	µg/m^3	1	µg/m^3	M	2.7E-04	mg/kg*day	6.0E-02	mg/kg-day	N/A	N/A	4.57E-03
	1,1,2-Trichloroethane	0.6	µg/m^3	0.6	µg/m^3	M	1.6E-04	mg/kg*day	4.0E-03	mg/kg-day	N/A	N/A	4.11E-02
	1,1-Dichloroethene	5	µg/m^3	5	µg/m^3	M	1.4E-03	mg/kg*day	5.7E-02	mg/kg-day	N/A	N/A	2.40E-02
	1,2,4-Trimethylbenzene	3	µg/m^3	3	µg/m^3	M	8.2E-04	mg/kg*day	1.7E-03	mg/kg-day	N/A	N/A	4.83E-01
	1,2-Dibromoethane	0.5	µg/m^3	0.5	µg/m^3	M	1.4E-04	mg/kg*day	5.7E-05	mg/kg-day	N/A	N/A	2.40E+00
	1,2-Dichloroethane	0.3	µg/m^3	0.3	µg/m^3	M	8.2E-05	mg/kg*day	1.4E-03	mg/kg-day	N/A	N/A	5.87E-02
	1,3,5-Trimethylbenzene	1	µg/m^3	1	µg/m^3	M	2.7E-04	mg/kg*day	1.7E-03	mg/kg-day	N/A	N/A	1.61E-01
	1,3-Butadiene	0.5	µg/m^3	0.5	µg/m^3	M	1.4E-04	mg/kg*day	2.9E-02	mg/kg-day	N/A	N/A	4.79E-03
	1,4-Dichlorobenzene	23	µg/m^3	23	µg/m^3	M	6.3E-03	mg/kg*day	3.0E-02	mg/kg-day	N/A	N/A	2.10E-01
	4-Methyl-2-Pentanone	0.7	µg/m^3	0.7	µg/m^3	M	1.9E-04	mg/kg*day		mg/kg-day	N/A	N/A	
	Acetone	11	µg/m^3	11	µg/m^3	M	3.0E-03	mg/kg*day	1.0E-01	mg/kg-day	N/A	N/A	3.01E-02
	Acrylonitrile	0.2	µg/m^3	0.2	µg/m^3	M	5.5E-05	mg/kg*day	5.7E-04	mg/kg-day	N/A	N/A	9.61E-02
	Benzene	2	µg/m^3	2	µg/m^3	M	5.5E-04	mg/kg*day	1.7E-03	mg/kg-day	N/A	N/A	3.22E-01
	Benzyl Chloride	0.5	µg/m^3	0.5	µg/m^3	M	1.4E-04	mg/kg*day	2.9E-03	mg/kg-day	N/A	N/A	4.72E-02
	Bromodichloromethane	1	µg/m^3	1	µg/m^3	M	2.7E-04	mg/kg*day	2.0E-02	mg/kg-day	N/A	N/A	1.37E-02
	Carbon Tetrachloride	0.5	µg/m^3	0.5	µg/m^3	M	1.4E-04	mg/kg*day	7.0E-04	mg/kg-day	N/A	N/A	1.96E-01
	Chloroethane	1	µg/m^3	1	µg/m^3	M	2.7E-04	mg/kg*day	2.9E+00	mg/kg-day	N/A	N/A	9.45E-05
	Chloroform	1	µg/m^3	1	µg/m^3	M	2.7E-04	mg/kg*day	8.6E-04	mg/kg-day	N/A	N/A	3.19E-01
	Chloromethane	1	µg/m^3	1	µg/m^3	M	2.7E-04	mg/kg*day	8.6E-02	mg/kg-day	N/A	N/A	3.19E-03
	cis-1,2-Dichloroethene	2	µg/m^3	2	µg/m^3	M	5.5E-04	mg/kg*day	1.0E-02	mg/kg-day	N/A	N/A	5.48E-02
	Dibromochloromethane	1	µg/m^3	1	µg/m^3	M	2.7E-04	mg/kg*day	2.0E-02	mg/kg-day	N/A	N/A	1.37E-02
	Dichlorodifluoromethane	8	µg/m^3	8	µg/m^3	M	2.2E-03	mg/kg*day	5.7E-02	mg/kg-day	N/A	N/A	3.85E-02
	Ethylbenzene	4	µg/m^3	4	µg/m^3	M	1.1E-03	mg/kg*day	2.9E-01	mg/kg-day	N/A	N/A	3.78E-03
	Hexane	6	µg/m^3	6	µg/m^3	M	1.6E-03	mg/kg*day	5.7E-02	mg/kg-day	N/A	N/A	2.88E-02
	Methyl tert-Butyl Ether	9	µg/m^3	9	µg/m^3	M	2.5E-03	mg/kg*day	8.6E-01	mg/kg-day	N/A	N/A	2.87E-03
	Methylene Chloride	24	µg/m^3	24	µg/m^3	M	6.6E-03	mg/kg*day	8.6E-01	mg/kg-day	N/A	N/A	7.65E-03
	Tetrachloroethene	1	µg/m^3	1	µg/m^3	M	2.7E-04	mg/kg*day	1.7E-01	mg/kg-day	N/A	N/A	1.61E-03
	Tetrahydrofuran	3	µg/m^3	3	µg/m^3	M	8.2E-04	mg/kg*day	8.6E-02	mg/kg-day	N/A	N/A	9.56E-03
	Toluene	20	µg/m^3	20	µg/m^3	M	5.5E-03	mg/kg*day	1.1E-01	mg/kg-day	N/A	N/A	4.98E-02
	Total Xylenes	170	µg/m^3	170	µg/m^3	M	4.7E-02	mg/kg*day	2.9E-02	mg/kg-day	N/A	N/A	1.61E+00
	Trichloroethene	5	µg/m^3	5	µg/m^3	M	1.4E-03	mg/kg*day		mg/kg-day	N/A	N/A	
	Vinyl Acetate	6	µg/m^3	6	µg/m^3	M	1.6E-03	mg/kg*day	5.7E-02	mg/kg-day	N/A	N/A	2.88E-02
	Vinyl chloride	0.2	µg/m^3	0.2	µg/m^3	M	5.5E-05	mg/kg*day	2.9E-02	mg/kg-day	N/A	N/A	1.92E-03
	(Total)												6.27E+00
												Total of Routes	6.27E+00

(1) Medium-Specific (M) EPC selected for hazard calculation.

TABLE 7.1B CTE
CALCULATION OF NON-CANCER HAZARDS - INDUSTRIAL/COMMERCIAL EXPOSURE TO INDOOR AIR
CENTRAL TENDENCY EXPOSURE
REMEDIAL INVESTIGATION
RAYMARK OU2 - GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Indoor air
Exposure Medium: Indoor air
Exposure Point: Commercial Properties
Receptor Population: Industrial/Commercial Workers
Receptor Age: Adults

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 (Inhalation)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Inhalation	1,1,2,2-Tetrachloroethane	1	µg/m^3	1	µg/m^3	M	6.6E-05	mg/kg*day	6.0E-02	mg/kg-day	N/A	N/A	1.09E-03
	1,1,2-Trichloroethane	0.6	µg/m^3	0.6	µg/m^3	M	3.9E-05	mg/kg*day	4.0E-03	mg/kg-day	N/A	N/A	9.83E-03
	1,1-Dichloroethene	5	µg/m^3	5	µg/m^3	M	3.3E-04	mg/kg*day	5.7E-02	mg/kg-day	N/A	N/A	5.75E-03
	1,2,4-Trimethylbenzene	3	µg/m^3	3	µg/m^3	M	2.0E-04	mg/kg*day	1.7E-03	mg/kg-day	N/A	N/A	1.16E-01
	1,2-Dibromoethane	0.5	µg/m^3	0.5	µg/m^3	M	3.3E-05	mg/kg*day	5.7E-05	mg/kg-day	N/A	N/A	5.75E-01
	1,2-Dichloroethane	0.3	µg/m^3	0.3	µg/m^3	M	2.0E-05	mg/kg*day	1.4E-03	mg/kg-day	N/A	N/A	1.40E-02
	1,3,5-Trimethylbenzene	1	µg/m^3	1	µg/m^3	M	6.6E-05	mg/kg*day	1.7E-03	mg/kg-day	N/A	N/A	3.86E-02
	1,3-Butadiene	0.5	µg/m^3	0.5	µg/m^3	M	3.3E-05	mg/kg*day	2.9E-02	mg/kg-day	N/A	N/A	1.15E-03
	1,4-Dichlorobenzene	23	µg/m^3	23	µg/m^3	M	1.5E-03	mg/kg*day	3.0E-02	mg/kg-day	N/A	N/A	5.03E-02
	4-Methyl-2-Pentanone	0.7	µg/m^3	0.7	µg/m^3	M	4.6E-05	mg/kg*day		mg/kg-day	N/A	N/A	
	Acetone	11	µg/m^3	11	µg/m^3	M	7.2E-04	mg/kg*day	1.0E-01	mg/kg-day	N/A	N/A	7.21E-03
	Acrylonitrile	0.2	µg/m^3	0.2	µg/m^3	M	1.3E-05	mg/kg*day	5.7E-04	mg/kg-day	N/A	N/A	2.30E-02
	Benzene	2	µg/m^3	2	µg/m^3	M	1.3E-04	mg/kg*day	1.7E-03	mg/kg-day	N/A	N/A	7.71E-02
	Benzyl Chloride	0.5	µg/m^3	0.5	µg/m^3	M	3.3E-05	mg/kg*day	2.9E-03	mg/kg-day	N/A	N/A	1.13E-02
	Bromodichloromethane	1	µg/m^3	1	µg/m^3	M	6.6E-05	mg/kg*day	2.0E-02	mg/kg-day	N/A	N/A	3.28E-03
	Carbon Tetrachloride	0.5	µg/m^3	0.5	µg/m^3	M	3.3E-05	mg/kg*day	7.0E-04	mg/kg-day	N/A	N/A	4.68E-02
	Chloroethane	1	µg/m^3	1	µg/m^3	M	6.6E-05	mg/kg*day	2.9E+00	mg/kg-day	N/A	N/A	2.26E-05
	Chloroform	1	µg/m^3	1	µg/m^3	M	6.6E-05	mg/kg*day	8.6E-04	mg/kg-day	N/A	N/A	7.62E-02
	Chloromethane	1	µg/m^3	1	µg/m^3	M	6.6E-05	mg/kg*day	8.6E-02	mg/kg-day	N/A	N/A	7.62E-04
	cis-1,2-Dichloroethene	2	µg/m^3	2	µg/m^3	M	1.3E-04	mg/kg*day	1.0E-02	mg/kg-day	N/A	N/A	1.31E-02
	Dibromochloromethane	1	µg/m^3	1	µg/m^3	M	6.6E-05	mg/kg*day	2.0E-02	mg/kg-day	N/A	N/A	3.28E-03
	Dichlorodifluoromethane	8	µg/m^3	8	µg/m^3	M	5.2E-04	mg/kg*day	5.7E-02	mg/kg-day	N/A	N/A	9.20E-03
	Ethylbenzene	4	µg/m^3	4	µg/m^3	M	2.6E-04	mg/kg*day	2.9E-01	mg/kg-day	N/A	N/A	9.04E-04
	Hexane	6	µg/m^3	6	µg/m^3	M	3.9E-04	mg/kg*day	5.7E-02	mg/kg-day	N/A	N/A	6.90E-03
	Methyl tert-Butyl Ether	9	µg/m^3	9	µg/m^3	M	5.9E-04	mg/kg*day	8.6E-01	mg/kg-day	N/A	N/A	6.86E-04
	Methylene Chloride	24	µg/m^3	24	µg/m^3	M	1.6E-03	mg/kg*day	8.6E-01	mg/kg-day	N/A	N/A	1.83E-03
	Tetrachloroethene	1	µg/m^3	1	µg/m^3	M	6.6E-05	mg/kg*day	1.7E-01	mg/kg-day	N/A	N/A	3.86E-04
	Tetrahydrofuran	3	µg/m^3	3	µg/m^3	M	2.0E-04	mg/kg*day	8.6E-02	mg/kg-day	N/A	N/A	2.29E-03
	Toluene	20	µg/m^3	20	µg/m^3	M	1.3E-03	mg/kg*day	1.1E-01	mg/kg-day	N/A	N/A	1.19E-02
	Total Xylenes	170	µg/m^3	170	µg/m^3	M	1.1E-02	mg/kg*day	2.9E-02	mg/kg-day	N/A	N/A	3.84E-01
	Trichloroethene	5	µg/m^3	5	µg/m^3	M	3.3E-04	mg/kg*day		mg/kg-day	N/A	N/A	
	Vinyl Acetate	6	µg/m^3	6	µg/m^3	M	3.9E-04	mg/kg*day	5.7E-02	mg/kg-day	N/A	N/A	6.90E-03
	Vinyl chloride	0.2	µg/m^3	0.2	µg/m^3	M	1.3E-05	mg/kg*day	2.9E-02	mg/kg-day	N/A	N/A	4.59E-04
	(Total)												1.50E+00
												Total of Routes	1.50E+00

(1) Medium-Specific (M) EPC selected for hazard calculation.

TABLE 7.1A RME
CALCULATION OF NON-CANCER HAZARDS - RESIDENTIAL EXPOSURE TO INDOOR AIR
REASONABLE MAXIMUM EXPOSURE
REMEDIAL INVESTIGATION
RAYMARK OU2 - GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Indoor air
Exposure Medium: Indoor air
Exposure Point: Homes
Receptor Population: Residents
Receptor Age: 0 through 30 years

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 (Inhalation)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Inhalation	1,1,2,2-Tetrachloroethane	38	µg/m^3	38	µg/m^3	M	1.0E-02	mg/kg*day	6.0E-02	mg/kg-day	N/A	N/A	1.74E-01
	1,1,2-Trichloroethane	9.89	µg/m^3	9.89	µg/m^3	M	2.7E-03	mg/kg*day	4.0E-03	mg/kg-day	N/A	N/A	6.77E-01
	1,1-Dichloroethene	48	µg/m^3	48	µg/m^3	M	1.3E-02	mg/kg*day	5.7E-02	mg/kg-day	N/A	N/A	2.31E-01
	1,2,4-Trimethylbenzene	33.1	µg/m^3	33.1	µg/m^3	M	9.1E-03	mg/kg*day	1.7E-03	mg/kg-day	N/A	N/A	5.33E+00
	1,2-Dibromoethane	0.882	µg/m^3	0.882	µg/m^3	M	2.4E-04	mg/kg*day	5.7E-05	mg/kg-day	N/A	N/A	4.24E+00
	1,2-Dichloroethane	0.326	µg/m^3	0.326	µg/m^3	M	8.9E-05	mg/kg*day	1.4E-03	mg/kg-day	N/A	N/A	6.38E-02
	1,3,5-Trimethylbenzene	14.8	µg/m^3	14.8	µg/m^3	M	4.1E-03	mg/kg*day	1.7E-03	mg/kg-day	N/A	N/A	2.39E+00
	1,3-Butadiene	7.34	µg/m^3	7.34	µg/m^3	M	2.0E-03	mg/kg*day	2.9E-02	mg/kg-day	N/A	N/A	7.04E-02
	1,4-Dichlorobenzene	811	µg/m^3	811	µg/m^3	M	2.2E-01	mg/kg*day	3.0E-02	mg/kg-day	N/A	N/A	7.41E+00
	4-Methyl-2-Pentanone	14	µg/m^3	14	µg/m^3	M	3.8E-03	mg/kg*day		mg/kg-day	N/A	N/A	
	Acetone	95.3	µg/m^3	95.3	µg/m^3	M	2.6E-02	mg/kg*day	1.0E-01	mg/kg-day	N/A	N/A	2.61E-01
	Acrylonitrile	0.241	µg/m^3	0.241	µg/m^3	M	6.6E-05	mg/kg*day	5.7E-04	mg/kg-day	N/A	N/A	1.16E-01
	Benzene	12.5	µg/m^3	12.5	µg/m^3	M	3.4E-03	mg/kg*day	1.7E-03	mg/kg-day	N/A	N/A	2.01E+00
	Benzyl Chloride	6.26	µg/m^3	6.26	µg/m^3	M	1.7E-03	mg/kg*day	2.9E-03	mg/kg-day	N/A	N/A	5.91E-01
	Bromodichloromethane	2.6	µg/m^3	2.6	µg/m^3	M	7.1E-04	mg/kg*day	2.0E-02	mg/kg-day	N/A	N/A	3.56E-02
	Carbon Tetrachloride	1.07	µg/m^3	1.07	µg/m^3	M	2.9E-04	mg/kg*day	7.0E-04	mg/kg-day	N/A	N/A	4.19E-01
	Chloroethane	3.99	µg/m^3	3.99	µg/m^3	M	1.1E-03	mg/kg*day	2.9E+00	mg/kg-day	N/A	N/A	3.77E-04
	Chloroform	5.9	µg/m^3	5.9	µg/m^3	M	1.6E-03	mg/kg*day	8.6E-04	mg/kg-day	N/A	N/A	1.88E+00
	Chloromethane	3.54	µg/m^3	3.54	µg/m^3	M	9.7E-04	mg/kg*day	8.6E-02	mg/kg-day	N/A	N/A	1.13E-02
	cis-1,2-Dichloroethene	16.4	µg/m^3	16.4	µg/m^3	M	4.5E-03	mg/kg*day	1.0E-02	mg/kg-day	N/A	N/A	4.49E-01
	Dibromochloromethane	1.69	µg/m^3	1.69	µg/m^3	M	4.6E-04	mg/kg*day	2.0E-02	mg/kg-day	N/A	N/A	2.32E-02
	Dichlorodifluoromethane	149	µg/m^3	149	µg/m^3	M	4.1E-02	mg/kg*day	5.7E-02	mg/kg-day	N/A	N/A	7.16E-01
	Ethylbenzene	73.8	µg/m^3	73.8	µg/m^3	M	2.0E-02	mg/kg*day	2.9E-01	mg/kg-day	N/A	N/A	6.97E-02
	Hexane	35.4	µg/m^3	35.4	µg/m^3	M	9.7E-03	mg/kg*day	5.7E-02	mg/kg-day	N/A	N/A	1.70E-01
	Methyl tert-Butyl Ether	69	µg/m^3	69	µg/m^3	M	1.9E-02	mg/kg*day	8.6E-01	mg/kg-day	N/A	N/A	2.20E-02
	Methylene Chloride	910	µg/m^3	910	µg/m^3	M	2.5E-01	mg/kg*day	8.6E-01	mg/kg-day	N/A	N/A	2.90E-01
	Tetrachloroethene	25.3	µg/m^3	25.3	µg/m^3	M	6.9E-03	mg/kg*day	1.7E-01	mg/kg-day	N/A	N/A	4.08E-02
	Tetrahydrofuran	32.7	µg/m^3	32.7	µg/m^3	M	9.0E-03	mg/kg*day	8.6E-02	mg/kg-day	N/A	N/A	1.04E-01
	Toluene	159	µg/m^3	159	µg/m^3	M	4.4E-02	mg/kg*day	1.1E-01	mg/kg-day	N/A	N/A	3.96E-01
	Total Xylenes	761	µg/m^3	761	µg/m^3	M	2.1E-01	mg/kg*day	2.9E-02	mg/kg-day	N/A	N/A	7.19E+00
	Trichloroethene	52.5	µg/m^3	52.5	µg/m^3	M	1.4E-02	mg/kg*day		mg/kg-day	N/A	N/A	
	Vinyl Acetate	39	µg/m^3	39	µg/m^3	M	1.1E-02	mg/kg*day	5.7E-02	mg/kg-day	N/A	N/A	1.87E-01
	Vinyl chloride	0.618	µg/m^3	0.618	µg/m^3	M	1.7E-04	mg/kg*day	2.9E-02	mg/kg-day	N/A	N/A	5.93E-03
	(Total)												3.56E+01
												Total of Routes	3.56E+01

(1) Medium-Specific (M) EPC selected for hazard calculation.

TABLE 7.1B RME
CALCULATION OF NON-CANCER HAZARDS - INDUSTRIAL/COMMERCIAL EXPOSURE TO INDOOR AIR
REASONABLE MAXIMUM EXPOSURE
REMEDIAL INVESTIGATION
RAYMARK OU2 - GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Indoor air
Exposure Medium: Indoor air
Exposure Point: Commercial Properties
Receptor Population: Industrial/Commercial Workers
Receptor Age: Adults

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 (Inhalation)	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Inhalation	1,1,2,2-Tetrachloroethane	38	µg/m^3	38	µg/m^3	M	2.5E-03	mg/kg*day	6.0E-02	mg/kg-day	N/A	N/A	4.15E-02
	1,1,2-Trichloroethane	9.89	µg/m^3	9.89	µg/m^3	M	6.5E-04	mg/kg*day	4.0E-03	mg/kg-day	N/A	N/A	1.62E-01
	1,1-Dichloroethene	48	µg/m^3	48	µg/m^3	M	3.1E-03	mg/kg*day	5.7E-02	mg/kg-day	N/A	N/A	5.52E-02
	1,2,4-Trimethylbenzene	33.1	µg/m^3	33.1	µg/m^3	M	2.2E-03	mg/kg*day	1.7E-03	mg/kg-day	N/A	N/A	1.28E+00
	1,2-Dibromoethane	0.882	µg/m^3	0.882	µg/m^3	M	5.8E-05	mg/kg*day	5.7E-05	mg/kg-day	N/A	N/A	1.01E+00
	1,2-Dichloroethane	0.326	µg/m^3	0.326	µg/m^3	M	2.1E-05	mg/kg*day	1.4E-03	mg/kg-day	N/A	N/A	1.53E-02
	1,3,5-Trimethylbenzene	14.8	µg/m^3	14.8	µg/m^3	M	9.7E-04	mg/kg*day	1.7E-03	mg/kg-day	N/A	N/A	5.71E-01
	1,3-Butadiene	7.34	µg/m^3	7.34	µg/m^3	M	4.8E-04	mg/kg*day	2.9E-02	mg/kg-day	N/A	N/A	1.68E-02
	1,4-Dichlorobenzene	811	µg/m^3	811	µg/m^3	M	5.3E-02	mg/kg*day	3.0E-02	mg/kg-day	N/A	N/A	1.77E+00
	4-Methyl-2-Pentanone	14	µg/m^3	14	µg/m^3	M	9.2E-04	mg/kg*day		mg/kg-day	N/A	N/A	
	Acetone	95.3	µg/m^3	95.3	µg/m^3	M	6.2E-03	mg/kg*day	1.0E-01	mg/kg-day	N/A	N/A	6.25E-02
	Acrylonitrile	0.241	µg/m^3	0.241	µg/m^3	M	1.6E-05	mg/kg*day	5.7E-04	mg/kg-day	N/A	N/A	2.77E-02
	Benzene	12.5	µg/m^3	12.5	µg/m^3	M	8.2E-04	mg/kg*day	1.7E-03	mg/kg-day	N/A	N/A	4.82E-01
	Benzyl Chloride	6.26	µg/m^3	6.26	µg/m^3	M	4.1E-04	mg/kg*day	2.9E-03	mg/kg-day	N/A	N/A	1.42E-01
	Bromodichloromethane	2.6	µg/m^3	2.6	µg/m^3	M	1.7E-04	mg/kg*day	2.0E-02	mg/kg-day	N/A	N/A	8.52E-03
	Carbon Tetrachloride	1.07	µg/m^3	1.07	µg/m^3	M	7.0E-05	mg/kg*day	7.0E-04	mg/kg-day	N/A	N/A	1.00E-01
	Chloroethane	3.99	µg/m^3	3.99	µg/m^3	M	2.6E-04	mg/kg*day	2.9E+00	mg/kg-day	N/A	N/A	9.02E-05
	Chloroform	5.9	µg/m^3	5.9	µg/m^3	M	3.9E-04	mg/kg*day	8.6E-04	mg/kg-day	N/A	N/A	4.50E-01
	Chloromethane	3.54	µg/m^3	3.54	µg/m^3	M	2.3E-04	mg/kg*day	8.6E-02	mg/kg-day	N/A	N/A	2.70E-03
	cis-1,2-Dichloroethene	16.4	µg/m^3	16.4	µg/m^3	M	1.1E-03	mg/kg*day	1.0E-02	mg/kg-day	N/A	N/A	1.08E-01
	Dibromochloromethane	1.69	µg/m^3	1.69	µg/m^3	M	1.1E-04	mg/kg*day	2.0E-02	mg/kg-day	N/A	N/A	5.54E-03
	Dichlorodifluoromethane	149	µg/m^3	149	µg/m^3	M	9.8E-03	mg/kg*day	5.7E-02	mg/kg-day	N/A	N/A	1.71E-01
	Ethylbenzene	73.8	µg/m^3	73.8	µg/m^3	M	4.8E-03	mg/kg*day	2.9E-01	mg/kg-day	N/A	N/A	1.67E-02
	Hexane	35.4	µg/m^3	35.4	µg/m^3	M	2.3E-03	mg/kg*day	5.7E-02	mg/kg-day	N/A	N/A	4.07E-02
	Methyl tert-Butyl Ether	69	µg/m^3	69	µg/m^3	M	4.5E-03	mg/kg*day	8.6E-01	mg/kg-day	N/A	N/A	5.26E-03
	Methylene Chloride	910	µg/m^3	910	µg/m^3	M	6.0E-02	mg/kg*day	8.6E-01	mg/kg-day	N/A	N/A	6.94E-02
	Tetrachloroethene	25.3	µg/m^3	25.3	µg/m^3	M	1.7E-03	mg/kg*day	1.7E-01	mg/kg-day	N/A	N/A	9.76E-03
	Tetrahydrofuran	32.7	µg/m^3	32.7	µg/m^3	M	2.1E-03	mg/kg*day	8.6E-02	mg/kg-day	N/A	N/A	2.49E-02
	Toluene	159	µg/m^3	159	µg/m^3	M	1.0E-02	mg/kg*day	1.1E-01	mg/kg-day	N/A	N/A	9.48E-02
	Total Xylenes	761	µg/m^3	761	µg/m^3	M	5.0E-02	mg/kg*day	2.9E-02	mg/kg-day	N/A	N/A	1.72E+00
	Trichloroethene	52.5	µg/m^3	52.5	µg/m^3	M	3.4E-03	mg/kg*day		mg/kg-day	N/A	N/A	
	Vinyl Acetate	39	µg/m^3	39	µg/m^3	M	2.6E-03	mg/kg*day	5.7E-02	mg/kg-day	N/A	N/A	4.49E-02
	Vinyl chloride	0.618	µg/m^3	0.618	µg/m^3	M	4.1E-05	mg/kg*day	2.9E-02	mg/kg-day	N/A	N/A	1.42E-03
	(Total)												8.51E+00
												Total of Routes	8.51E+00

(1) Medium-Specific (M) EPC selected for hazard calculation.

TABLE 8.1A CTE
CALCULATION OF CANCER RISKS - RESIDENTIAL EXPOSURE TO INDOOR AIR
CENTRAL TENDENCY EXPOSURE
REMEDIAL INVESTIGATION
RAYMARK OU2 - GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Indoor air
Exposure Medium: Indoor air
Exposure Point: Homes
Receptor Population: Residents
Receptor Age: 0 through 30 years

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
Inhalation	1,1,2,2-Tetrachloroethane	1	µg/m^3	1	µg/m^3	M	3.5E-05	mg/kg*day	2.0E-01	(mg/kg-d)$^{-1}$	7.0E-06
	1,1,2-Trichloroethane	0.6	µg/m^3	0.6	µg/m^3	M	2.1E-05	mg/kg*day	5.6E-02	(mg/kg-d)$^{-1}$	1.2E-06
	1,1-Dichloroethene	5	µg/m^3	5	µg/m^3	M	1.8E-04	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	1,2,4-Trimethylbenzene	3	µg/m^3	3	µg/m^3	M	1.1E-04	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	1,2-Dibromoethane	0.5	µg/m^3	0.5	µg/m^3	M	1.8E-05	mg/kg*day	7.7E-01	(mg/kg-d)$^{-1}$	1.4E-05
	1,2-Dichloroethane	0.3	µg/m^3	0.3	µg/m^3	M	1.1E-05	mg/kg*day	9.1E-02	(mg/kg-d)$^{-1}$	9.6E-07
	1,3,5-Trimethylbenzene	1	µg/m^3	1	µg/m^3	M	3.5E-05	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	1,3-Butadiene	0.5	µg/m^3	0.5	µg/m^3	M	1.8E-05	mg/kg*day	9.8E-01	(mg/kg-d)$^{-1}$	1.7E-05
	1,4-Dichlorobenzene	23	µg/m^3	23	µg/m^3	M	8.1E-04	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	4-Methyl-2-Pentanone	0.7	µg/m^3	0.7	µg/m^3	M	2.5E-05	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Acetone	11	µg/m^3	11	µg/m^3	M	3.9E-04	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Acrylonitrile	0.2	µg/m^3	0.2	µg/m^3	M	7.0E-06	mg/kg*day	2.4E-01	(mg/kg-d)$^{-1}$	1.7E-06
	Benzene	2	µg/m^3	2	µg/m^3	M	7.0E-05	mg/kg*day	2.7E-02	(mg/kg-d)$^{-1}$	1.9E-06
	Benzyl Chloride	0.5	µg/m^3	0.5	µg/m^3	M	1.8E-05	mg/kg*day	1.7E-01	(mg/kg-d)$^{-1}$	3.0E-06
	Bromodichloromethane	1	µg/m^3	1	µg/m^3	M	3.5E-05	mg/kg*day	6.2E-02	(mg/kg-d)$^{-1}$	2.2E-06
	Carbon Tetrachloride	0.5	µg/m^3	0.5	µg/m^3	M	1.8E-05	mg/kg*day	5.3E-02	(mg/kg-d)$^{-1}$	9.3E-07
	Chloroethane	1	µg/m^3	1	µg/m^3	M	3.5E-05	mg/kg*day	2.9E-03	(mg/kg-d)$^{-1}$	1.0E-07
	Chloroform	1	µg/m^3	1	µg/m^3	M	3.5E-05	mg/kg*day	1.9E-02	(mg/kg-d)$^{-1}$	6.7E-07
	Chloromethane	1	µg/m^3	1	µg/m^3	M	3.5E-05	mg/kg*day	6.3E-03	(mg/kg-d)$^{-1}$	2.2E-07
	cis-1,2-Dichloroethene	2	µg/m^3	2	µg/m^3	M	7.0E-05	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Dibromochloromethane	1	µg/m^3	1	µg/m^3	M	3.5E-05	mg/kg*day	8.4E-02	(mg/kg-d)$^{-1}$	3.0E-06
	Dichlorodifluoromethane	8	µg/m^3	8	µg/m^3	M	2.8E-04	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Ethylbenzene	4	µg/m^3	4	µg/m^3	M	1.4E-04	mg/kg*day	3.9E-03	(mg/kg-d)$^{-1}$	5.4E-07
	Hexane	6	µg/m^3	6	µg/m^3	M	2.1E-04	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Methyl tert-Butyl Ether	9	µg/m^3	9	µg/m^3	M	3.2E-04	mg/kg*day	3.5E-04	(mg/kg-d)$^{-1}$	1.1E-07
	Methylene Chloride	24	µg/m^3	24	µg/m^3	M	8.5E-04	mg/kg*day	1.6E-03	(mg/kg-d)$^{-1}$	1.4E-06
	Tetrachloroethene	1	µg/m^3	1	µg/m^3	M	3.5E-05	mg/kg*day	1.0E-02	(mg/kg-d)$^{-1}$	3.5E-07
	Tetrahydrofuran	3	µg/m^3	3	µg/m^3	M	1.1E-04	mg/kg*day	6.8E-03	(mg/kg-d)$^{-1}$	7.2E-07
	Toluene	20	µg/m^3	20	µg/m^3	M	7.0E-04	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Total Xylenes	170	µg/m^3	170	µg/m^3	M	6.0E-03	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Trichloroethene	5	µg/m^3	5	µg/m^3	M	1.8E-04	mg/kg*day	6.0E-03	(mg/kg-d)$^{-1}$	1.1E-06
	Vinyl Acetate	6	µg/m^3	6	µg/m^3	M	2.1E-04	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Vinyl chloride	0.2	µg/m^3	0.2	µg/m^3	M	7.0E-06	mg/kg*day	3.1E-02	(mg/kg-d)$^{-1}$	2.2E-07
										Total Risk Across All Exposure Routes/Pathways	5.8E-05

(1) Medium Specific (M) EPC selected for risk calculation.

TABLE 8.1B CTE
CALCULATION OF CANCER RISKS - INDUSTRIAL/COMMERCIAL EXPOSURE TO INDOOR AIR
CENTRAL TENDENCY EXPOSURE
REMEDIAL INVESTIGATION
RAYMARK OU2 - GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Indoor air
Exposure Medium: Indoor air
Exposure Point: Commercial Properties
Receptor Population: Industrial/Commercial Workers
Receptor Age: Adults

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
Inhalation	1,1,2,2-Tetrachloroethane	1	µg/m^3	1	µg/m^3	M	8.4E-06	mg/kg*day	2.0E-01	(mg/kg-d)$^{-1}$	1.7E-06
	1,1,2-Trichloroethane	0.6	µg/m^3	0.6	µg/m^3	M	5.1E-06	mg/kg*day	5.6E-02	(mg/kg-d)$^{-1}$	2.8E-07
	1,1-Dichloroethene	5	µg/m^3	5	µg/m^3	M	4.2E-05	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	1,2,4-Trimethylbenzene	3	µg/m^3	3	µg/m^3	M	2.5E-05	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	1,2-Dibromoethane	0.5	µg/m^3	0.5	µg/m^3	M	4.2E-06	mg/kg*day	7.7E-01	(mg/kg-d)$^{-1}$	3.2E-06
	1,2-Dichloroethane	0.3	µg/m^3	0.3	µg/m^3	M	2.5E-06	mg/kg*day	9.1E-02	(mg/kg-d)$^{-1}$	2.3E-07
	1,3,5-Trimethylbenzene	1	µg/m^3	1	µg/m^3	M	8.4E-06	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	1,3-Butadiene	0.5	µg/m^3	0.5	µg/m^3	M	4.2E-06	mg/kg*day	9.8E-01	(mg/kg-d)$^{-1}$	4.1E-06
	1,4-Dichlorobenzene	23	µg/m^3	23	µg/m^3	M	1.9E-04	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	4-Methyl-2-Pentanone	0.7	µg/m^3	0.7	µg/m^3	M	5.9E-06	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Acetone	11	µg/m^3	11	µg/m^3	M	9.3E-05	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Acrylonitrile	0.2	µg/m^3	0.2	µg/m^3	M	1.7E-06	mg/kg*day	2.4E-01	(mg/kg-d)$^{-1}$	4.0E-07
	Benzene	2	µg/m^3	2	µg/m^3	M	1.7E-05	mg/kg*day	2.7E-02	(mg/kg-d)$^{-1}$	4.6E-07
	Benzyl Chloride	0.5	µg/m^3	0.5	µg/m^3	M	4.2E-06	mg/kg*day	1.7E-01	(mg/kg-d)$^{-1}$	7.2E-07
	Bromodichloromethane	1	µg/m^3	1	µg/m^3	M	8.4E-06	mg/kg*day	6.2E-02	(mg/kg-d)$^{-1}$	5.2E-07
	Carbon Tetrachloride	0.5	µg/m^3	0.5	µg/m^3	M	4.2E-06	mg/kg*day	5.3E-02	(mg/kg-d)$^{-1}$	2.2E-07
	Chloroethane	1	µg/m^3	1	µg/m^3	M	8.4E-06	mg/kg*day	2.9E-03	(mg/kg-d)$^{-1}$	2.4E-08
	Chloroform	1	µg/m^3	1	µg/m^3	M	8.4E-06	mg/kg*day	1.9E-02	(mg/kg-d)$^{-1}$	1.6E-07
	Chloromethane	1	µg/m^3	1	µg/m^3	M	8.4E-06	mg/kg*day	6.3E-03	(mg/kg-d)$^{-1}$	5.3E-08
	cis-1,2-Dichloroethene	2	µg/m^3	2	µg/m^3	M	1.7E-05	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Dibromochloromethane	1	µg/m^3	1	µg/m^3	M	8.4E-06	mg/kg*day	8.4E-02	(mg/kg-d)$^{-1}$	7.1E-07
	Dichlorodifluoromethane	8	µg/m^3	8	µg/m^3	M	6.7E-05	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Ethylbenzene	4	µg/m^3	4	µg/m^3	M	3.4E-05	mg/kg*day	3.9E-03	(mg/kg-d)$^{-1}$	1.3E-07
	Hexane	6	µg/m^3	6	µg/m^3	M	5.1E-05	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Methyl tert-Butyl Ether	9	µg/m^3	9	µg/m^3	M	7.6E-05	mg/kg*day	3.5E-04	(mg/kg-d)$^{-1}$	2.7E-08
	Methylene Chloride	24	µg/m^3	24	µg/m^3	M	2.0E-04	mg/kg*day	1.6E-03	(mg/kg-d)$^{-1}$	3.2E-07
	Tetrachloroethene	1	µg/m^3	1	µg/m^3	M	8.4E-06	mg/kg*day	1.0E-02	(mg/kg-d)$^{-1}$	8.4E-08
	Tetrahydrofuran	3	µg/m^3	3	µg/m^3	M	2.5E-05	mg/kg*day	6.8E-03	(mg/kg-d)$^{-1}$	1.7E-07
	Toluene	20	µg/m^3	20	µg/m^3	M	1.7E-04	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Total Xylenes	170	µg/m^3	170	µg/m^3	M	1.4E-03	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Trichloroethene	5	µg/m^3	5	µg/m^3	M	4.2E-05	mg/kg*day	6.0E-03	(mg/kg-d)$^{-1}$	2.5E-07
	Vinyl Acetate	6	µg/m^3	6	µg/m^3	M	5.1E-05	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Vinyl chloride	0.2	µg/m^3	0.2	µg/m^3	M	1.7E-06	mg/kg*day	3.1E-02	(mg/kg-d)$^{-1}$	5.2E-08
										Total Risk Across All Exposure Routes/Pathways	1.4E-05

(1) Medium Specific (M) EPC selected for risk calculation.

TABLE 8.1A RME
CALCULATION OF CANCER RISKS - RESIDENTIAL EXPOSURE TO INDOOR AIR
REASONABLE MAXIMUM EXPOSURE
REMEDIAL INVESTIGATION
RAYMARK OU2-GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Indoor air
Exposure Medium: Indoor air
Exposure Point: Homes
Receptor Population: Residents
Receptor Age: 0 through 30 years

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
Inhalation	1,1,2,2-Tetrachloroethane	38	µg/m^3	38	µg/m^3	M	4.5E-03	mg/kg*day	2.0E-01	(mg/kg-d)$^{-1}$	8.9E-04
	1,1,2-Trichloroethane	9.89	µg/m^3	9.89	µg/m^3	M	1.2E-03	mg/kg*day	5.6E-02	(mg/kg-d)$^{-1}$	6.5E-05
	1,1-Dichloroethene	48	µg/m^3	48	µg/m^3	M	5.6E-03	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	1,2,4-Trimethylbenzene	33.1	µg/m^3	33.1	µg/m^3	M	3.9E-03	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	1,2-Dibromoethane	0.882	µg/m^3	0.882	µg/m^3	M	1.0E-04	mg/kg*day	7.7E-01	(mg/kg-d)$^{-1}$	8.0E-05
	1,2-Dichloroethane	0.326	µg/m^3	0.326	µg/m^3	M	3.8E-05	mg/kg*day	9.1E-02	(mg/kg-d)$^{-1}$	3.5E-06
	1,3,5-Trimethylbenzene	14.8	µg/m^3	14.8	µg/m^3	M	1.7E-03	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	1,3-Butadiene	7.34	µg/m^3	7.34	µg/m^3	M	8.6E-04	mg/kg*day	9.8E-01	(mg/kg-d)$^{-1}$	8.4E-04
	1,4-Dichlorobenzene	811	µg/m^3	811	µg/m^3	M	9.5E-02	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	4-Methyl-2-Pentanone	14	µg/m^3	14	µg/m^3	M	1.6E-03	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Acetone	95.3	µg/m^3	95.3	µg/m^3	M	1.1E-02	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Acrylonitrile	0.241	µg/m^3	0.241	µg/m^3	M	2.8E-05	mg/kg*day	2.4E-01	(mg/kg-d)$^{-1}$	6.8E-06
	Benzene	12.5	µg/m^3	12.5	µg/m^3	M	1.5E-03	mg/kg*day	2.7E-02	(mg/kg-d)$^{-1}$	4.0E-05
	Benzyl Chloride	6.26	µg/m^3	6.26	µg/m^3	M	7.4E-04	mg/kg*day	1.7E-01	(mg/kg-d)$^{-1}$	1.2E-04
	Bromodichloromethane	2.6	µg/m^3	2.6	µg/m^3	M	3.1E-04	mg/kg*day	6.2E-02	(mg/kg-d)$^{-1}$	1.9E-05
	Carbon Tetrachloride	1.07	µg/m^3	1.07	µg/m^3	M	1.3E-04	mg/kg*day	5.3E-02	(mg/kg-d)$^{-1}$	6.7E-06
	Chloroethane	3.99	µg/m^3	3.99	µg/m^3	M	4.7E-04	mg/kg*day	2.9E-03	(mg/kg-d)$^{-1}$	1.4E-06
	Chloroform	5.9	µg/m^3	5.9	µg/m^3	M	6.9E-04	mg/kg*day	1.9E-02	(mg/kg-d)$^{-1}$	1.3E-05
	Chloromethane	3.54	µg/m^3	3.54	µg/m^3	M	4.2E-04	mg/kg*day	6.3E-03	(mg/kg-d)$^{-1}$	2.6E-06
	cis-1,2-Dichloroethene	16.4	µg/m^3	16.4	µg/m^3	M	1.9E-03	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Dibromochloromethane	1.69	µg/m^3	1.69	µg/m^3	M	2.0E-04	mg/kg*day	8.4E-02	(mg/kg-d)$^{-1}$	1.7E-05
	Dichlorodifluoromethane	149	µg/m^3	149	µg/m^3	M	1.7E-02	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Ethylbenzene	73.8	µg/m^3	73.8	µg/m^3	M	8.7E-03	mg/kg*day	3.9E-03	(mg/kg-d)$^{-1}$	3.3E-05
	Hexane	35.4	µg/m^3	35.4	µg/m^3	M	4.2E-03	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Methyl tert-Butyl Ether	69	µg/m^3	69	µg/m^3	M	8.1E-03	mg/kg*day	3.5E-04	(mg/kg-d)$^{-1}$	2.8E-06
	Methylene Chloride	910	µg/m^3	910	µg/m^3	M	1.1E-01	mg/kg*day	1.6E-03	(mg/kg-d)$^{-1}$	1.7E-04
	Tetrachloroethene	25.3	µg/m^3	25.3	µg/m^3	M	3.0E-03	mg/kg*day	1.0E-02	(mg/kg-d)$^{-1}$	3.0E-05
	Tetrahydrofuran	32.7	µg/m^3	32.7	µg/m^3	M	3.8E-03	mg/kg*day	6.8E-03	(mg/kg-d)$^{-1}$	2.6E-05
	Toluene	159	µg/m^3	159	µg/m^3	M	1.9E-02	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Total Xylenes	761	µg/m^3	761	µg/m^3	M	8.9E-02	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Trichloroethene	52.5	µg/m^3	52.5	µg/m^3	M	6.2E-03	mg/kg*day	6.0E-03	(mg/kg-d)$^{-1}$	3.7E-05
	Vinyl Acetate	39	µg/m^3	39	µg/m^3	M	4.6E-03	mg/kg*day	NA	(mg/kg-d)$^{-1}$	
	Vinyl chloride	0.618	µg/m^3	0.618	µg/m^3	M	7.3E-05	mg/kg*day	3.1E-02	(mg/kg-d)$^{-1}$	2.2E-06
										Total Risk Across All Exposure Routes/Pathways	2.4E-03

(1) Medium Specific (M) EPC selected for risk calculation.

TABLE 8.1B RME
CALCULATION OF CANCER RISKS - INDUSTRIAL/COMMERCIAL EXPOSURE TO INDOOR AIR
REASONABLE MAXIMUM EXPOSURE
REMEDIAL INVESTIGATION
RAYMARK OU2-GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Current/Future
Medium: Indoor air
Exposure Medium: Indoor air
Exposure Point: Commercial Properties
Receptor Population: Industrial/Commercial Workers
Receptor Age: Adults

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
Inhalation	1,1,2,2-Tetrachloroethane	38	$\mu g/m^3$	38	$\mu g/m^3$	M	8.9E-04	mg/kg*day	2.0E-01	$(mg/kg\text{-}d)^{-1}$	1.8E-04
	1,1,2-Trichloroethane	9.89	$\mu g/m^3$	9.89	$\mu g/m^3$	M	2.3E-04	mg/kg*day	5.6E-02	$(mg/kg\text{-}d)^{-1}$	1.3E-05
	1,1-Dichloroethene	48	$\mu g/m^3$	48	$\mu g/m^3$	M	1.1E-03	mg/kg*day	NA	$(mg/kg\text{-}d)^{-1}$	
	1,2,4-Trimethylbenzene	33.1	$\mu g/m^3$	33.1	$\mu g/m^3$	M	7.7E-04	mg/kg*day	NA	$(mg/kg\text{-}d)^{-1}$	
	1,2-Dibromoethane	0.882	$\mu g/m^3$	0.882	$\mu g/m^3$	M	2.1E-05	mg/kg*day	7.7E-01	$(mg/kg\text{-}d)^{-1}$	1.6E-05
	1,2-Dichloroethane	0.326	$\mu g/m^3$	0.326	$\mu g/m^3$	M	7.6E-06	mg/kg*day	9.1E-02	$(mg/kg\text{-}d)^{-1}$	6.9E-07
	1,3,5-Trimethylbenzene	14.8	$\mu g/m^3$	14.8	$\mu g/m^3$	M	3.5E-04	mg/kg*day	NA	$(mg/kg\text{-}d)^{-1}$	
	1,3-Butadiene	7.34	$\mu g/m^3$	7.34	$\mu g/m^3$	M	1.7E-04	mg/kg*day	9.8E-01	$(mg/kg\text{-}d)^{-1}$	1.7E-04
	1,4-Dichlorobenzene	811	$\mu g/m^3$	811	$\mu g/m^3$	M	1.9E-02	mg/kg*day	NA	$(mg/kg\text{-}d)^{-1}$	
	4-Methyl-2-Pentanone	14	$\mu g/m^3$	14	$\mu g/m^3$	M	3.3E-04	mg/kg*day	NA	$(mg/kg\text{-}d)^{-1}$	
	Acetone	95.3	$\mu g/m^3$	95.3	$\mu g/m^3$	M	2.2E-03	mg/kg*day	NA	$(mg/kg\text{-}d)^{-1}$	
	Acrylonitrile	0.241	$\mu g/m^3$	0.241	$\mu g/m^3$	M	5.6E-06	mg/kg*day	2.4E-01	$(mg/kg\text{-}d)^{-1}$	1.4E-06
	Benzene	12.5	$\mu g/m^3$	12.5	$\mu g/m^3$	M	2.9E-04	mg/kg*day	2.7E-02	$(mg/kg\text{-}d)^{-1}$	8.0E-06
	Benzyl Chloride	6.26	$\mu g/m^3$	6.26	$\mu g/m^3$	M	1.5E-04	mg/kg*day	1.7E-01	$(mg/kg\text{-}d)^{-1}$	2.5E-05
	Bromodichloromethane	2.6	$\mu g/m^3$	2.6	$\mu g/m^3$	M	6.1E-05	mg/kg*day	6.2E-02	$(mg/kg\text{-}d)^{-1}$	3.8E-06
	Carbon Tetrachloride	1.07	$\mu g/m^3$	1.07	$\mu g/m^3$	M	2.5E-05	mg/kg*day	5.3E-02	$(mg/kg\text{-}d)^{-1}$	1.3E-06
	Chloroethane	3.99	$\mu g/m^3$	3.99	$\mu g/m^3$	M	9.3E-05	mg/kg*day	2.9E-03	$(mg/kg\text{-}d)^{-1}$	2.7E-07
	Chloroform	5.9	$\mu g/m^3$	5.9	$\mu g/m^3$	M	1.4E-04	mg/kg*day	1.9E-02	$(mg/kg\text{-}d)^{-1}$	2.6E-06
	Chloromethane	3.54	$\mu g/m^3$	3.54	$\mu g/m^3$	M	8.3E-05	mg/kg*day	6.3E-03	$(mg/kg\text{-}d)^{-1}$	5.2E-07
	cis-1,2-Dichloroethene	16.4	$\mu g/m^3$	16.4	$\mu g/m^3$	M	3.8E-04	mg/kg*day	NA	$(mg/kg\text{-}d)^{-1}$	
	Dibromochloromethane	1.69	$\mu g/m^3$	1.69	$\mu g/m^3$	M	4.0E-05	mg/kg*day	8.4E-02	$(mg/kg\text{-}d)^{-1}$	3.3E-06
	Dichlorodifluoromethane	149	$\mu g/m^3$	149	$\mu g/m^3$	M	3.5E-03	mg/kg*day	NA	$(mg/kg\text{-}d)^{-1}$	
	Ethylbenzene	73.8	$\mu g/m^3$	73.8	$\mu g/m^3$	M	1.7E-03	mg/kg*day	3.9E-03	$(mg/kg\text{-}d)^{-1}$	6.7E-06
	Hexane	35.4	$\mu g/m^3$	35.4	$\mu g/m^3$	M	8.3E-04	mg/kg*day	NA	$(mg/kg\text{-}d)^{-1}$	
	Methyl tert-Butyl Ether	69	$\mu g/m^3$	69	$\mu g/m^3$	M	1.6E-03	mg/kg*day	3.5E-04	$(mg/kg\text{-}d)^{-1}$	5.7E-07
	Methylene Chloride	910	$\mu g/m^3$	910	$\mu g/m^3$	M	2.1E-02	mg/kg*day	1.6E-03	$(mg/kg\text{-}d)^{-1}$	3.4E-05
	Tetrachloroethene	25.3	$\mu g/m^3$	25.3	$\mu g/m^3$	M	5.9E-04	mg/kg*day	1.0E-02	$(mg/kg\text{-}d)^{-1}$	5.9E-06
	Tetrahydrofuran	32.7	$\mu g/m^3$	32.7	$\mu g/m^3$	M	7.7E-04	mg/kg*day	6.8E-03	$(mg/kg\text{-}d)^{-1}$	5.2E-06
	Toluene	159	$\mu g/m^3$	159	$\mu g/m^3$	M	3.7E-03	mg/kg*day	NA	$(mg/kg\text{-}d)^{-1}$	
	Total Xylenes	761	$\mu g/m^3$	761	$\mu g/m^3$	M	1.8E-02	mg/kg*day	NA	$(mg/kg\text{-}d)^{-1}$	
	Trichloroethene	52.5	$\mu g/m^3$	52.5	$\mu g/m^3$	M	1.2E-03	mg/kg*day	6.0E-03	$(mg/kg\text{-}d)^{-1}$	7.4E-06
	Vinyl Acetate	39	$\mu g/m^3$	39	$\mu g/m^3$	M	9.1E-04	mg/kg*day	NA	$(mg/kg\text{-}d)^{-1}$	
	Vinyl chloride	0.618	$\mu g/m^3$	0.618	$\mu g/m^3$	M	1.4E-05	mg/kg*day	3.1E-02	$(mg/kg\text{-}d)^{-1}$	4.5E-07
										Total Risk Across All Exposure Routes/Pathways	4.8E-04

(1) Medium Specific (M) EPC selected for risk calculation.

TABLE 9.1A CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
REMEDIAL INVESTIGATION
RAYMARK OU2-GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Current/Future
Receptor Population: Residents
Receptor Age: 0 through 30 years

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
Indoor air	Indoor air	Homes	1,1,2,2-Tetrachloroethane		7.0E-06		7.0E-06	1,1,2,2-Tetrachloroethane			4.57E-03		4.57E-03
			1,1,2-Trichloroethane		1.2E-06		1.2E-06	1,1,2-Trichloroethane	blood		4.11E-02		4.11E-02
			1,1-Dichloroethene					1,1-Dichloroethene	liver		2.40E-02		2.40E-02
			1,2,4-Trimethylbenzene					1,2,4-Trimethylbenzene			4.83E-01		4.83E-01
			1,2-Dibromoethane		1.4E-05		1.4E-05	1,2-Dibromoethane			2.40E+00		2.40E+00
			1,2-Dichloroethane		9.6E-07		9.6E-07	1,2-Dichloroethane			5.87E-02		5.87E-02
			1,3,5-Trimethylbenzene					1,3,5-Trimethylbenzene			1.61E-01		1.61E-01
			1,3-Butadiene		1.7E-05		1.7E-05	1,3-Butadiene	reproductive		4.79E-03		4.79E-03
			1,4-Dichlorobenzene					1,4-Dichlorobenzene	liver		2.10E-01		2.10E-01
			4-Methyl-2-Pentanone					4-Methyl-2-Pentanone					
			Acetone					Acetone	liver/kidney		3.01E-02		3.01E-02
			Acrylonitrile		1.7E-06		1.7E-06	Acrylonitrile	epithelium		9.61E-02		9.61E-02
			Benzene		1.9E-06		1.9E-06	Benzene	lymphocytes		3.22E-01		3.22E-01
			Benzyl Chloride		3.0E-06		3.0E-06	Benzyl Chloride			4.72E-02		4.72E-02
			Bromodichloromethane		2.2E-06		2.2E-06	Bromodichloromethane	kidney		1.37E-02		1.37E-02
			Carbon Tetrachloride		9.3E-07		9.3E-07	Carbon Tetrachloride			1.96E-01		1.96E-01
			Chloroethane		1.0E-07		1.0E-07	Chloroethane			9.45E-05		9.45E-05
			Chloroform		6.7E-07		6.7E-07	Chloroform	liver		3.19E-01		3.19E-01
			Chloromethane		2.2E-07		2.2E-07	Chloromethane			3.19E-03		3.19E-03
			cis-1,2-Dichloroethene					cis-1,2-Dichloroethene	blood		5.48E-02		5.48E-02
			Dibromochloromethane		3.0E-06		3.0E-06	Dibromochloromethane			1.37E-02		1.37E-02
			Dichlorodifluoromethane					Dichlorodifluoromethane	liver		3.85E-02		3.85E-02
			Ethylbenzene		5.4E-07		5.4E-07	Ethylbenzene	developmental		3.78E-03		3.78E-03
			Hexane					Hexane	neurotoxicity		2.88E-02		2.88E-02
			Methyl tert-Butyl Ether		1.1E-07		1.1E-07	Methyl tert-Butyl Ether	liver/kidney		2.87E-03		2.87E-03
			Methylene Chloride		1.4E-06		1.4E-06	Methylene Chloride	liver		7.65E-03		7.65E-03
			Tetrachloroethene		3.5E-07		3.5E-07	Tetrachloroethene	liver		1.61E-03		1.61E-03
			Tetrahydrofuran		7.2E-07		7.2E-07	Tetrahydrofuran			9.56E-03		9.56E-03
			Toluene					Toluene	neurotoxicity		4.98E-02		4.98E-02
			Total Xylenes					Total Xylenes	motor		1.61E+00		1.61E+00
			Trichloroethene		1.1E-06		1.1E-06	Trichloroethene					
			Vinyl Acetate					Vinyl Acetate	epithelial		2.88E-02		2.88E-02
			Vinyl chloride		2.2E-07		2.2E-07	Vinyl chloride	liver		1.92E-03		1.92E-03
						Total Risk Across[Medium]	5.8E-05					Total Hazard Index Across All Media and All Exposure Routes	6.3E+00
						Total Risk Across All Media and All Exposure Routes	5.8E-05						

TABLE 9.1B CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
REMEDIAL INVESTIGATION
RAYMARK OU2-GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Current/Future
Receptor Population: Industrial/Commercial Workers
Receptor Age: Adults

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
Indoor air	Indoor air	Commercial Properties	1,1,2,2-Tetrachloroethane		1.7E-06		1.7E-06	1,1,2,2-Tetrachloroethane			1.09E-03		1.09E-03
			1,1,2-Trichloroethane		2.8E-07		2.8E-07	1,1,2-Trichloroethane	blood		9.83E-03		9.83E-03
			1,1-Dichloroethene					1,1-Dichloroethene	liver		5.75E-03		5.75E-03
			1,2,4-Trimethylbenzene					1,2,4-Trimethylbenzene			1.16E-01		1.16E-01
			1,2-Dibromoethane		3.2E-06		3.2E-06	1,2-Dibromoethane			5.75E-01		5.75E-01
			1,2-Dichloroethane		2.3E-07		2.3E-07	1,2-Dichloroethane			1.40E-02		1.40E-02
			1,3,5-Trimethylbenzene					1,3,5-Trimethylbenzene			3.86E-02		3.86E-02
			1,3-Butadiene		4.1E-06		4.1E-06	1,3-Butadiene	reproductive		1.15E-03		1.15E-03
			1,4-Dichlorobenzene					1,4-Dichlorobenzene	liver		5.03E-02		5.03E-02
			4-Methyl-2-Pentanone					4-Methyl-2-Pentanone					
			Acetone					Acetone	liver/kidney		7.21E-03		7.21E-03
			Acrylonitrile		4.0E-07		4.0E-07	Acrylonitrile	epithelium		2.30E-02		2.30E-02
			Benzene		4.6E-07		4.6E-07	Benzene	lymphocytes		7.71E-02		7.71E-02
			Benzyl Chloride		7.2E-07		7.2E-07	Benzyl Chloride			1.13E-02		1.13E-02
			Bromodichloromethane		5.2E-07		5.2E-07	Bromodichloromethane	kidney		3.28E-03		3.28E-03
			Carbon Tetrachloride		2.2E-07		2.2E-07	Carbon Tetrachloride			4.68E-02		4.68E-02
			Chloroethane		2.4E-08		2.4E-08	Chloroethane			2.26E-05		2.26E-05
			Chloroform		1.6E-07		1.6E-07	Chloroform	liver		7.62E-02		7.62E-02
			Chloromethane		5.3E-08		5.3E-08	Chloromethane			7.62E-04		7.62E-04
			cis-1,2-Dichloroethene					cis-1,2-Dichloroethene	blood		1.31E-02		1.31E-02
			Dibromochloromethane		7.1E-07		7.1E-07	Dibromochloromethane			3.28E-03		3.28E-03
			Dichlorodifluoromethane					Dichlorodifluoromethane	liver		9.20E-03		9.20E-03
			Ethylbenzene		1.3E-07		1.3E-07	Ethylbenzene	developmental		9.04E-04		9.04E-04
			Hexane					Hexane	neurotoxicity		6.90E-03		6.90E-03
			Methyl tert-Butyl Ether		2.7E-08		2.7E-08	Methyl tert-Butyl Ether	liver/kidney		6.86E-04		6.86E-04
			Methylene Chloride		3.2E-07		3.2E-07	Methylene Chloride	liver		1.83E-03		1.83E-03
			Tetrachloroethene		8.4E-08		8.4E-08	Tetrachloroethene	liver		3.86E-04		3.86E-04
			Tetrahydrofuran		1.7E-07		1.7E-07	Tetrahydrofuran			2.29E-03		2.29E-03
			Toluene					Toluene	neurotoxicity		1.19E-02		1.19E-02
			Total Xylenes					Total Xylenes	motor		3.84E-01		3.84E-01
			Trichloroethene		2.5E-07		2.5E-07	Trichloroethene					
			Vinyl Acetate					Vinyl Acetate	epithelial		6.90E-03		6.90E-03
			Vinyl chloride		5.2E-08		5.2E-08	Vinyl chloride	liver		4.59E-04		4.59E-04
						Total Risk Across[Medium]	1.4E-05					Total Hazard Index Across All Media and All Exposure Routes	1.5E+00
						Total Risk Across All Media and All Exposure Routes	1.4E-05						

TABLE 9.1A RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
REMEDIAL INVESTIGATION
RAYMARK OU2-GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Current/Future
Receptor Population: Residents
Receptor Age: 0 through 30 years

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
Indoor air	Indoor air	Homes	1,1,2,2-Tetrachloroethane		8.9E-04		8.9E-04	1,1,2,2-Tetrachloroethane			1.74E-01		1.74E-01
			1,1,2-Trichloroethane		6.5E-05		6.5E-05	1,1,2-Trichloroethane	blood		6.77E-01		6.77E-01
			1,1-Dichloroethene					1,1-Dichloroethene	liver		2.31E-01		2.31E-01
			1,2,4-Trimethylbenzene					1,2,4-Trimethylbenzene			5.33E+00		5.33E+00
			1,2-Dibromoethane		8.0E-05		8.0E-05	1,2-Dibromoethane			4.24E+00		4.24E+00
			1,2-Dichloroethane		3.5E-06		3.5E-06	1,2-Dichloroethane			6.38E-02		6.38E-02
			1,3,5-Trimethylbenzene					1,3,5-Trimethylbenzene			2.39E+00		2.39E+00
			1,3-Butadiene		8.4E-04		8.4E-04	1,3-Butadiene	reproductive		7.04E-02		7.04E-02
			1,4-Dichlorobenzene					1,4-Dichlorobenzene	liver		7.41E+00		7.41E+00
			4-Methyl-2-Pentanone					4-Methyl-2-Pentanone					
			Acetone					Acetone	liver/kidney		2.61E-01		2.61E-01
			Acrylonitrile		6.8E-06		6.8E-06	Acrylonitrile	epithelium		1.16E-01		1.16E-01
			Benzene		4.0E-05		4.0E-05	Benzene	lymphocytes		2.01E+00		2.01E+00
			Benzyl Chloride		1.2E-04		1.2E-04	Benzyl Chloride			5.91E-01		5.91E-01
			Bromodichloromethane		1.9E-05		1.9E-05	Bromodichloromethane	kidney		3.56E-02		3.56E-02
			Carbon Tetrachloride		6.7E-06		6.7E-06	Carbon Tetrachloride			4.19E-01		4.19E-01
			Chloroethane		1.4E-06		1.4E-06	Chloroethane			3.77E-04		3.77E-04
			Chloroform		1.3E-05		1.3E-05	Chloroform	liver		1.88E+00		1.88E+00
			Chloromethane		2.6E-06		2.6E-06	Chloromethane			1.13E-02		1.13E-02
			cis-1,2-Dichloroethene					cis-1,2-Dichloroethene	blood		4.49E-01		4.49E-01
			Dibromochloromethane		1.7E-05		1.7E-05	Dibromochloromethane			2.32E-02		2.32E-02
			Dichlorodifluoromethane					Dichlorodifluoromethane	liver		7.16E-01		7.16E-01
			Ethylbenzene		3.3E-05		3.3E-05	Ethylbenzene	developmental		6.97E-02		6.97E-02
			Hexane					Hexane	neurotoxicity		1.70E-01		1.70E-01
			Methyl tert-Butyl Ether		2.8E-06		2.8E-06	Methyl tert-Butyl Ether	liver/kidney		2.20E-02		2.20E-02
			Methylene Chloride		1.7E-04		1.7E-04	Methylene Chloride	liver		2.90E-01		2.90E-01
			Tetrachloroethene		3.0E-05		3.0E-05	Tetrachloroethene	liver		4.08E-02		4.08E-02
			Tetrahydrofuran		2.6E-05		2.6E-05	Tetrahydrofuran			1.04E-01		1.04E-01
			Toluene					Toluene	neurotoxicity		3.96E-01		3.96E-01
			Total Xylenes					Total Xylenes	motor		7.19E+00		7.19E+00
			Trichloroethene		3.7E-05		3.7E-05	Trichloroethene					
			Vinyl Acetate					Vinyl Acetate	epithelial		1.87E-01		1.87E-01
			Vinyl chloride		2.2E-06		2.2E-06	Vinyl chloride	liver		5.93E-03		5.93E-03
						Total Risk Across[Medium]	2.4E-03					Total Hazard Index Across All Media and All Exposure Routes	3.6E+01
						Total Risk Across All Media and All Exposure Routes	2.4E-03						

TABLE 9.1B RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
REMEDIAL INVESTIGATION
RAYMARK OU2-GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Current/Future
Receptor Population: Industrial/Commercial Workers
Receptor Age: Adults

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
Indoor air	Indoor air	Commercial Properties	1,1,2,2-Tetrachloroethane		1.8E-04		1.8E-04	1,1,2,2-Tetrachloroethane			4.15E-02		4.15E-02
			1,1,2-Trichloroethane		1.3E-05		1.3E-05	1,1,2-Trichloroethane	blood		1.62E-01		1.62E-01
			1,1-Dichloroethene					1,1-Dichloroethene	liver		5.52E-02		5.52E-02
			1,2,4-Trimethylbenzene					1,2,4-Trimethylbenzene			1.28E+00		1.28E+00
			1,2-Dibromoethane		1.6E-05		1.6E-05	1,2-Dibromoethane			1.01E+00		1.01E+00
			1,2-Dichloroethane		6.9E-07		6.9E-07	1,2-Dichloroethane			1.53E-02		1.53E-02
			1,3,5-Trimethylbenzene					1,3,5-Trimethylbenzene			5.71E-01		5.71E-01
			1,3-Butadiene		1.7E-04		1.7E-04	1,3-Butadiene	reproductive		1.68E-02		1.68E-02
			1,4-Dichlorobenzene					1,4-Dichlorobenzene	liver		1.77E+00		1.77E+00
			4-Methyl-2-Pentanone					4-Methyl-2-Pentanone					
			Acetone					Acetone	liver/kidney		6.25E-02		6.25E-02
			Acrylonitrile		1.4E-06		1.4E-06	Acrylonitrile	epithelium		2.77E-02		2.77E-02
			Benzene		8.0E-06		8.0E-06	Benzene	lymphocytes		4.82E-01		4.82E-01
			Benzyl Chloride		2.5E-05		2.5E-05	Benzyl Chloride			1.42E-01		1.42E-01
			Bromodichloromethane		3.8E-06		3.8E-06	Bromodichloromethane	kidney		8.52E-03		8.52E-03
			Carbon Tetrachloride		1.3E-06		1.3E-06	Carbon Tetrachloride			1.00E-01		1.00E-01
			Chloroethane		2.7E-07		2.7E-07	Chloroethane			9.02E-05		9.02E-05
			Chloroform		2.6E-06		2.6E-06	Chloroform	liver		4.50E-01		4.50E-01
			Chloromethane		5.2E-07		5.2E-07	Chloromethane			2.70E-03		2.70E-03
			cis-1,2-Dichloroethene					cis-1,2-Dichloroethene	blood		1.08E-01		1.08E-01
			Dibromochloromethane		3.3E-06		3.3E-06	Dibromochloromethane			5.54E-03		5.54E-03
			Dichlorodifluoromethane					Dichlorodifluoromethane	liver		1.71E-01		1.71E-01
			Ethylbenzene		6.7E-06		6.7E-06	Ethylbenzene	developmental		1.67E-02		1.67E-02
			Hexane					Hexane	neurotoxicity		4.07E-02		4.07E-02
			Methyl tert-Butyl Ether		5.7E-07		5.7E-07	Methyl tert-Butyl Ether	liver/kidney		5.26E-03		5.26E-03
			Methylene Chloride		3.4E-05		3.4E-05	Methylene Chloride	liver		6.94E-02		6.94E-02
			Tetrachloroethene		5.9E-06		5.9E-06	Tetrachloroethene	liver		9.76E-03		9.76E-03
			Tetrahydrofuran		5.2E-06		5.2E-06	Tetrahydrofuran			2.49E-02		2.49E-02
			Toluene					Toluene	neurotoxicity		9.48E-02		9.48E-02
			Total Xylenes					Total Xylenes	motor		1.72E+00		1.72E+00
			Trichloroethene		7.4E-06		7.4E-06	Trichloroethene					
			Vinyl Acetate					Vinyl Acetate	epithelial		4.49E-02		4.49E-02
			Vinyl chloride		4.5E-07		4.5E-07	Vinyl chloride	liver		1.42E-03		1.42E-03
						Total Risk Across[Medium]	4.8E-04					Total Hazard Index Across All Media and All Exposure Routes	8.5E+00
						Total Risk Across All Media and All Exposure Routes	4.8E-04						

TABLE 10.1A CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
REMEDIAL INVESTIGATION
RAYMARK OU2-GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Current/Future
Receptor Population: Residents
Receptor Age: 0 through 30 years

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
Indoor air	Indoor air	Homes	1,1,2,2-Tetrachloroethane		7.0E-06		7.0E-06						
			1,1,2-Trichloroethane		1.2E-06		1.2E-06						
			1,2-Dibromoethane		1.4E-05		1.4E-05	1,2-Dibromoethane			2.40E+00		2.40E+00
			1,3-Butadiene		1.7E-05		1.7E-05						
			Acrylonitrile		1.7E-06		1.7E-06						
			Benzene		1.9E-06		1.9E-06						
			Benzyl Chloride		3.0E-06		3.0E-06						
			Bromodichloromethane		2.2E-06		2.2E-06						
			Dibromochloromethane		3.0E-06		3.0E-06						
			Methylene Chloride		1.4E-06		1.4E-06						
								Total Xylenes	motor		1.61E+00		1.61E+00
			Trichloroethene		1.1E-06		1.1E-06						
						Total Risk Across[Medium]	5.3E-05					Total Hazard Index Across All Media and All Exposure Routes	4.0E+00
						Total Risk Across All Media and All Exposure Routes	5.3E-05						

TABLE 10.1B CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
REMEDIAL INVESTIGATION
RAYMARK OU2-GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Current/Future
Receptor Population: Industrial/Commercial Workers
Receptor Age: Adults

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
Indoor air	Indoor air	Commercial Properties	1,1,2,2-Tetrachloroethane		1.7E-06		1.7E-06						
			1,2-Dibromoethane		3.2E-06		3.2E-06						
			1,3-Butadiene		4.1E-06		4.1E-06						
						Total Risk Across[Medium]	9.1E-06					Total Hazard Index Across All Media and All Exposure Routes	0.0E+00
						Total Risk Across All Media and All Exposure Routes	9.1E-06						

TABLE 10.1A RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
REMEDIAL INVESTIGATION
RAYMARK OU2-GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Current/Future
Receptor Population: Residents
Receptor Age: 0 through 30 years

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
Indoor air	Indoor air	Homes	1,1,2,2-Tetrachloroethane		8.9E-04		8.9E-04						
			1,1,2-Trichloroethane		6.5E-05		6.5E-05						
								1,2,4-Trimethylbenzene			5.33E+00		5.33E+00
			1,2-Dibromoethane		8.0E-05		8.0E-05	1,2-Dibromoethane			4.24E+00		4.24E+00
			1,2-Dichloroethane		3.5E-06		3.5E-06						
								1,3,5-Trimethylbenzene			2.39E+00		2.39E+00
			1,3-Butadiene		8.4E-04		8.4E-04						
								1,4-Dichlorobenzene	liver		7.41E+00		7.41E+00
			Acrylonitrile		6.8E-06		6.8E-06						
			Benzene		4.0E-05		4.0E-05	Benzene	lymphocytes		2.01E+00		2.01E+00
			Benzyl Chloride		1.2E-04		1.2E-04						
			Bromodichloromethane		1.9E-05		1.9E-05						
			Carbon Tetrachloride		6.7E-06		6.7E-06						
			Chloroethane		1.4E-06		1.4E-06						
			Chloroform		1.3E-05		1.3E-05	Chloroform	liver		1.88E+00		1.88E+00
			Chloromethane		2.6E-06		2.6E-06						
			Dibromochloromethane		1.7E-05		1.7E-05						
			Ethylbenzene		3.3E-05		3.3E-05						
			Methyl tert-Butyl Ether		2.8E-06		2.8E-06						
			Methylene Chloride		1.7E-04		1.7E-04						
			Tetrachloroethene		3.0E-05		3.0E-05						
			Tetrahydrofuran		2.6E-05		2.6E-05						
								Total Xylenes	motor		7.19E+00		7.19E+00
			Trichloroethene		3.7E-05		3.7E-05						
			Vinyl chloride		2.2E-06		2.2E-06	Vinyl chloride	liver		5.93E-03		5.93E-03
						Total Risk Across[Medium]	2.4E-03					Total Hazard Index Across All Media and All Exposure Routes	3.0E+01
						Total Risk Across All Media and All Exposure Routes	2.4E-03						

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TABLE 10.1B RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
REMEDIAL INVESTIGATION
RAYMARK OU2-GROUNDWATER
STRATFORD, CONNECTICUT

Scenario Timeframe: Current/Future
Receptor Population: Industrial/Commercial Workers
Receptor Age: Adults

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
Indoor air	Indoor air	Commercial Properties	1,1,2,2-Tetrachloroethane		1.8E-04		1.8E-04						
			1,1,2-Trichloroethane		1.3E-05		1.3E-05						
								1,2,4-Trimethylbenzene			1.28E+00		1.28E+00
			1,2-Dibromoethane		1.6E-05		1.6E-05	1,2-Dibromoethane			1.01E+00		1.01E+00
			1,3-Butadiene		1.7E-04		1.7E-04						
								1,4-Dichlorobenzene	liver		1.77E+00		1.77E+00
			Acrylonitrile		1.4E-06		1.4E-06						
			Benzene		8.0E-06		8.0E-06						
			Benzyl Chloride		2.5E-05		2.5E-05						
			Bromodichloromethane		3.8E-06		3.8E-06						
			Carbon Tetrachloride		1.3E-06		1.3E-06						
			Chloroform		2.6E-06		2.6E-06						
			Dibromochloromethane		3.3E-06		3.3E-06						
			Ethylbenzene		6.7E-06		6.7E-06						
			Methylene Chloride		3.4E-05		3.4E-05						
			Tetrachloroethene		5.9E-06		5.9E-06						
			Tetrahydrofuran		5.2E-06		5.2E-06						
			Total Xylenes					Total Xylenes	motor		1.72E+00		1.72E+00
			Trichloroethene		7.4E-06		7.4E-06						
						Total Risk Across[Medium]	4.8E-04					Total Hazard Index Across All Media and All Exposure Routes	5.8E+00
						Total Risk Across All Media and All Exposure Routes	4.8E-04						