SOCIETY OF BROWNFIELD RISK ASSESSMENT

Development of Generic Assessment Criteria for Assessing Vapour Risks to Human Health from Volatile Contaminants in Groundwater

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PUBLICATION

This report is published by the Society of Brownfield Risk Assessment (SoBRA). It presents work undertaken by a SoBRA sub-group composed of volunteers listed in the Acknowledgments below. The publication presents a methodology and Generic Assessment Criteria (GAC) that risk assessors may choose to use to help in the assessment of chronic health risks from the inhalation of vapours arising from groundwater (GAC_{gwvap}). As set out in the text, it is imperative that users do not refer solely to the GAC_{gwvap}, but they read and understand their derivation and limitations as described in the supporting text presented herein.

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1 INTRODUCTION

The Society of Brownfield Risk Assessment (SoBRA) is a UK-based learned society that aims to:

- improve technical knowledge in risk-based decision-making related to land contamination applications; and
- enhance the professional status and profile of risk assessment practitioners.

The society has a number of working groups (termed "sub-groups") comprising volunteer SoBRA members working on particular aspects to help achieve these aims. This report presents the outputs of the Groundwater Vapour Generic Assessment Criteria sub-group.

1.1 Background

Volatile contaminants in groundwater have the potential to cause risk to human health via volatilisation and migration of vapours into overlying buildings or outdoor air space followed by inhalation. Where the Conceptual Site Model (CSM) identifies this contaminant linkage as being of possible concern it is usually necessary to assess the risks arising from this pathway further to determine whether these are acceptable or not. One screening method (amongst others) that can be used is to compare the measured concentrations of volatile contaminants in groundwater with suitable Generic Assessment Criteria (GAC). Provided the assumptions that underpin the GAC are suitably precautionary for the site being assessed this comparison can be used to screen out contaminants from more detailed assessment of the groundwater vapour pathway and thus helps to streamline the risk assessment process.

The SoBRA sub-group was initiated to develop a methodology that would be suitable for assessing the long-term (chronic) risk to human health from inhalation of vapours arising from groundwater which was compatible with UK approaches and to subsequently derive GAC for selected contaminants. This report presents the outputs of this work.

1.2 Purpose of the GAC

There are currently no formally published UK GAC for the assessment of vapour risk arising from volatile contaminants in groundwater in the UK. The SoBRA GAC have been developed to provide a free-to-use defensible screening tool to assist practitioners in both the private and public sector in evaluating this important exposure pathway. It is hoped that the availability of the GAC will increase awareness of the groundwater-vapour exposure pathway in risk assessment and, in doing so, will allow practitioners to identify sites where more detailed vapour intrusion risk assessment may be required. Although the SoBRA GAC are freely available, UK-published GAC for assessing the groundwater vapour pathway, this in no way implies that UK risk assessors are obliged to use them.

1.3 Context and Application

The SoBRA groundwater vapour GAC (GAC_{gwvap}) are intended as a conservative screening tool that assessors may choose to use to help assess the long-term (chronic) risks to human health from inhalation of vapours arising from groundwater. They are intended for comparison with measured groundwater concentrations and represent the estimated concentration in groundwater below which the long-term risks to human health from vapour migration and inhalation can be considered low/tolerable, i.e. unlikely to be of concern (for the land use scenarios considered). When used as part of a Generic Quantitative Risk Assessment (GQRA) (which includes consideration of uncertainties – see Defra and Environment Agency, 2004) comparison of the GAC_{gwvap} with measured concentrations in groundwater can be used to screen out contaminants as being unlikely to represent an unacceptable risk to humans living or working above the groundwater plume. Further guidance on how the GAC should be used is given in Section 5.2.

The GAC_{gwvap} have been developed in line with UK risk assessment guidance (e.g. Defra and Environment Agency, 2004; Environment Agency, 2009a) and are intended to be used for sites in the UK. This does not preclude their use in other countries but assessors should first satisfy themselves that the GAC are fit for purpose in that context (i.e. that both the conceptual model and the analytical approach is applicable to the scenario and jurisdiction).

The GAC_{gwvap} are one of a number of screening tools than can be used for assessing the groundwater vapour migration pathway. A brief summary of other methods is given in Section 6. The SoBRA GAC_{gwvap} may be used as an alternative or in addition to these other tools as part of a "lines of evidence" approach.

The GAC have been derived for two land use scenarios for which the vapour intrusion pathway is likely to require assessment: residential and commercial. Generic assumptions have been made for each land use as highlighted in Section 2.2. These include assumptions about the depth to groundwater, soil type in the unsaturated zone, building dimension and foundation type, and receptor behaviour. As described in CLEA SR3 report (Environment Agency, 2009a) the parameter values have been chosen to ensure that the GAC are precautionary for the vast majority of commercial and residential properties in the UK. However, there may be particular situations where the GAC are not protective, for example where non aqueous phase liquid (NAPL) is present or preferential pathways exist. It is the responsibility of the risk assessor to understand how the GAC have been derived and their limitations and to determine whether or not they are suitable for use at the site being assessed. Further discussion on this is given in Sections 3 and 5.2.

2 METHODOLOGY TO DERIVE GAC_{gwvap}

2.1 Evolution of methodology

The groundwater vapour sub-group was initiated in 2011 with a request to the SoBRA membership for volunteers to participate.

A series of initial meetings of the sub group were held through early 2012 which set out the general agreed approach to deriving the GAC_{gwvap}.

This process identified the following key principles:

- the GAC_{gwvap} should be conservative and in line with existing soil GAC;
- the GAC_{gwvap} would be produced using the CLEA v1.06 model in order to provide compatibility with the assessment of other exposure pathways (noting this excluded the effects of the capillary fringe);
- the model would be run with all exposure pathways on, and the default soil gas ingress rate option turned off;
- the model would be set up using a depth of source of 65 cm, which is 50 cm below the base of a typical ground bearing slab of 15 cm thickness, a sand soil type and 1 % soil organic matter (SOM) (although as discussed in Section 3.4.4, the GAC_{gwvap} are not sensitive to SOM);
- physical-chemical property values would be based on those published in the CLEA SR7 (Environment Agency, 2008) and the EIC/CL:AIRE/AGS GAC document (CL:AIRE, 2010);
- the Health Criteria Values (HCVs) would be based on those published by the Environment Agency, Nathanail *et al* (2009) and CL:AIRE, 2010;
- the subsurface soil to indoor air correction factor of 10 would be included for the Total Petroleum Hydrocarbon fractions and BTEX as per the source data used;
- a sensitivity analysis would be performed on selected substances using a variation of model parameters, and a cross check using the US Environmental Protection Agency (USEPA) Johnson & Ettinger (J&E) spreadsheet model; and
- the GAC_{gwvap} would be derived for substances considered to be volatile in accordance with the CIRIA VOCs Handbook (Baker *et al*, 2009) approach (e.g. excluding substances with an air-water partition coefficient (K_{aw}) lower than $4x10^{-4}$).

Subsequent modelling work indicated that the above methodology generally resulted in highly conservative values, with many derived GAC often close to traditional laboratory detection limits and/or below the respective drinking water standard.

Following changes to published chemical databases and exposure parameters (inhalation rates and bodyweights) and updates to the CLEA model in 2014-15 (Defra, 2014, CL:AIRE 2014), a review of the selected input parameters and a second iteration of modelling work was undertaken. New GAC_{gwvap} were derived using CLEA v1.07, taking into account the following changes to the original methodology:

- the Category 4 Screening Levels (C4SL) exposure changes published would be adopted (CL:AIRE, 2014; Defra, 2014);
- physical-chemical property values and HCVs would be based on those published in CLEA SR7 (Environment Agency, 2008), the EIC/CL:AIRE/AGS GAC document (CL:AIRE, 2010) and the LQM Suitable For Use Levels (S4ULs) (Nathanail *et al*, 2015);
- the model would be run with only the vapour inhalation pathways switched on, and the default soil gas ingress rate option turned off.

2.2 Finalised methodology

The finalised methodology included a revised contaminant shortlist of 66 substances. These were chosen from the list of organic contaminants with soil GAC published by the Environment Agency (2009a-f), Nathanail *et al* (2015) and CL:AIRE (2010), where:

- the substance is soluble in groundwater (i.e. the dissolved phase solubility limit is detectable by conventional laboratory methods, e.g. ≥ 1 µg/l); and
- the substance is regarded as being volatile (a K_{aw} lower than $4x10^{-4}$ (Baker *et al*, 2009)).

The GAC were produced using CLEA v1.07, which included the revised inhalation rates from the Defra C4SL project (CL:AIRE, 2014), with only the following two exposure pathways selected:

- indoor vapour inhalation; and
- outdoor vapour inhalation.

It should be noted that the outdoor vapour inhalation pathway was included for completeness even though exposure outdoors is generally predicted to be significantly less than exposure indoors for the standard land use scenarios considered.

The key input parameters used within the model as reported by the CLEA software, along with the chemical database, are included as Appendix 1.

A quality controlled copy of the CLEA model was set up with the appropriate physical–chemical and toxicological databases based on values used to derive the equivalent published soil GAC.

Two land uses were selected to derive GAC, which were based on the default residential C4SL or commercial C4SL contained within CLEA v1.07.

The soil type was based on a sand soil and 1% SOM.

The quality controlled copy of the CLEA model was distributed within the group and GAC derived by three separate individuals running the models on three separate computers. The results were compiled and cross checked to ensure consistency.

2.3 Derivation methodology and rationale

The CLEA software model was originally set up using the algorithms and principles of the CLEA methodology as documented in technical guidance SR3 (Environment Agency, 2009g) for the purposes of deriving generic and site specific assessment criteria for soil rather than groundwater.

Using a series of hidden worksheets and four databases: chemical data, homegrown produce data, land use and receptor data and soil and building data; the CLEA software calculates the concentrations in the different media (e.g. soil, vapour, produce) where the total Average Daily Exposure (ADE) to HCV ratio equals 1. It then back-calculates the soil GAC which would result in these media concentrations. To do this, the software assumes a steady state equilibrium between the sorbed, water and vapour phase concentrations in soil.

Consequently, as part of the process of calculating *soil phase concentrations*, the software calculates the *vapour phase concentrations* (termed the "soil vapour concentration" within the model) and the *pore water dissolved concentration* (termed the "soil solution concentration") at the soil GAC.

Fundamentally, for a given soil GAC derived to be protective of health, calculation of the soil vapour phase concentration at which exposure to the critical receptor from both indoor and outdoor air is deemed to present a tolerable risk, also results in the calculation of a soil solution concentration that would give rise to this vapour concentration.

The methodology used within this assessment essentially identifies the soil solution concentration calculated within the soil GAC model, and with a series of unit conversions, reports this as the groundwater vapour GAC concentration. This methodology therefore allows for consideration of both a soil source and a groundwater source (and thus an element of additivity between the two sources via the vapour exposure pathways).

The phase distribution calculations are within a series of hidden worksheets within the CLEA software.

A step by step guide on how the GAC are derived is included within Appendix 2, however this can be simplified into the following actions.

1. Set up the model using appropriate parameters and calculations.
2. Derive the results.
3. Unhide and unprotect the hidden "Media Calculations" sheet.
4. Convert the reported soil solution concentration from mg/cm^3 to a GAC_{gwvap} in µg/l by multiplying by a factor of $1x10^6$.

The limitations, assumptions and applicability of the CSM used to derive the GAC are discussed further in the following chapters.

3 SENSITIVITY ANALYSIS

3.1 Background

Previous sensitivity analysis of the J&E model is reported by the Environment Agency as being extensive (Environment Agency, 2009a). Table 1 below shows a summary of the relative sensitivity of soil GAC to various parameters for a shallow source in the unsaturated zone.

Table 1 - Relative sensitivity of parameters in the J&E model for a shallow source in the unsaturated zone (Environment Agency, 2009a)

Parameter		Relative Sensitivity
Soil	Fraction of organic carbon (see Environment Agency, 2009a for conversion to SOM)	Moderate to high
	Total porosity	Low
	Water-filled porosity	Low to moderate
	Soil bulk density	Low
	Pressure driven gas flow rate	Moderate to high
	Soil air permeability	Moderate to high
Building	Air pressurisation	Moderate
	Air exchange rate	Moderate
	Height	Moderate
	Foundation area	Low to moderate
	Depth to base of foundation	Low
	Floor to wall crack ratio	Low
	Crack moisture content	Low
	Foundation slab thickness	Low
Chemical	Henry's Law constant	Low to moderate
	Air diffusion coefficient	Low

3.2 Purpose of Sensitivity Analysis

The aims of the sensitivity analysis were to:

- identify potential scenarios in which the GAC_{gwvap} may not be sufficiently protective / over-conservative; and

- provide users of the GAC_{gwvap} with an understanding of the extent to which key site-specific information may be used to adjust the GAC_{gwvap} for more detailed risk assessments.

3.3 Scope and Methodology of Sensitivity Analysis

The sensitivity analysis has been undertaken for anticipated key input parameters for the GAC_{gwvap}. SOM has also been tested even though this is not expected to be a sensitive parameter (see Section 3.4.4). The parameters and range of values tested is shown in Table 2.

Table 2 - Parameters and range of values tested in sensitivity analysis

Variable	Range
Depth to Source (Groundwater)	0.3 m – 4.0 m
Soil Type	All CLEA generic soil types: Sand, Sandy loam, Sandy silt loam, Silt loam, Sandy clay loam, Clay loam, Silty clay loam, Silty clay, Clay
Building Type	All CLEA generic building types for residential land use: Small Terraced House, Bungalow, Medium/Large Terraced House, Semi-detached House, Detached House
Soil organic matter	0.25 – 10 %
Chemical Type	Benzene, carbon disulphide, vinyl chloride (chloroethene), naphthalene, trichloroethene

The analysis has been undertaken using the CLEA software (v1.07) by varying one input parameter at a time between reasonable minimum and maximum values and evaluating the effect this has on the GAC_{gwvap} for residential land use.

The default receptor for all variations in the sensitivity analysis was the female child, with exposure parameters as defined in Defra SP1010 (CL:AIRE 2014; Defra, 2014) (i.e. the CLEA default residential receptor accounting for changes to the SR3 default inhalation rates).

3.4 Results

3.4.1 Depth to Source

The default depth to source adopted in deriving the GAC_{gwvap} was 0.65 m below ground level. This is consistent with the CLEA approach for deriving soil GAC but in this case is assumed to represent the groundwater or perched water table. Alternative source depths ranging from 0.3 m to 4 m below ground level have been assessed to determine the influence of varying groundwater levels. The results of the sensitivity analysis are presented in Figure 1.

The depth to source (i.e. the depth to groundwater) has some influence on the GAC_{gwvap}. Decreasing depth to source to 0.3 m decreases the GAC by approximately 40 %. Increasing depth to source to 4 m increases the GAC by up to 400 % (5 fold). Thus, where groundwater is particularly shallow (less than 0.65 m below ground level) the GAC_{gwvap} may not be suitably protective. Conversely, where groundwater is present at a depth greater than 0.65 m and the GAC is exceeded, practitioners may seek to undertake further data collection and/or site-specific assessment, to better represent the actual depth of groundwater/perched water at the site.

In assessing the depth to groundwater it is important to remember that groundwater elevations are likely to fluctuate and therefore any more detailed site-specific assessment should give due consideration of the likely influence of such fluctuations on the applicability of the GAC_{gwvap}.

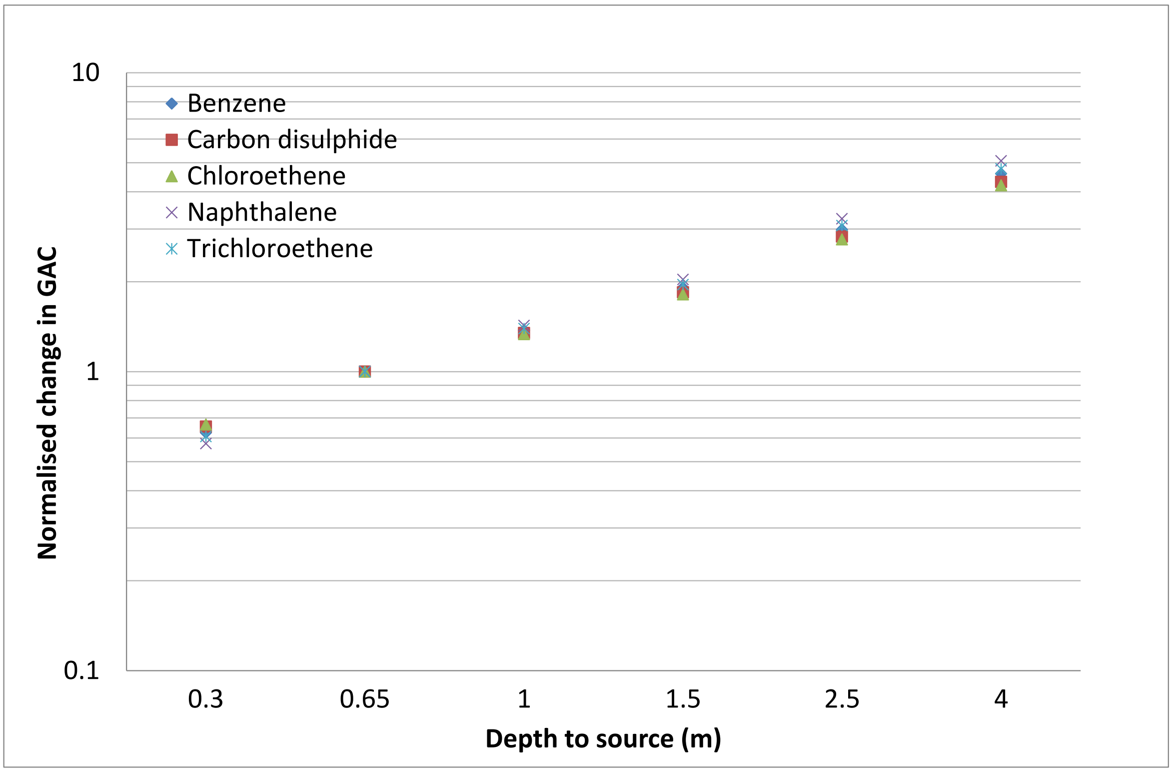

Figure 1 - Influence of Source Depth (i.e. Groundwater Depth) on Residential GAC_{gwvap}

3.4.2 Soil Type

As noted in CLEA SR3 (Environment Agency, 2009a) the *Sand* soil type is the most conservative choice for modelling diffusion and advection transport processes and this is the default soil type adopted in deriving the GAC_{gwvap}. Sensitivity analysis has been undertaken on the alternative pre-defined soil types included in the CLEA software. The results of the sensitivity analysis are presented in Figure 2.

In general, lower permeability soils, i.e. those with a higher silt/clay content, will result in an increased GAC. Use of the sandy loam soil as opposed to a sand soil results in an increase in GAC of up to 200 % (3 fold) whereas use of a clay soil results in an increase in GAC of up to 1800 % (19 fold). This is consistent with the findings reported in CLEA SR3 (Environment Agency, 2009a) describing the influence of water-filled porosity and other physical soil properties on chemical diffusion and advective soil gas flow into buildings.

All contaminants were influenced to some extent although naphthalene (which has the lowest K_{aw} of the contaminants considered) is generally less influenced by changes to the soil type. Where a GAC is exceeded on a site, practitioners may therefore wish to consider whether the default *Sand* soil type is appropriate to the site being assessed.

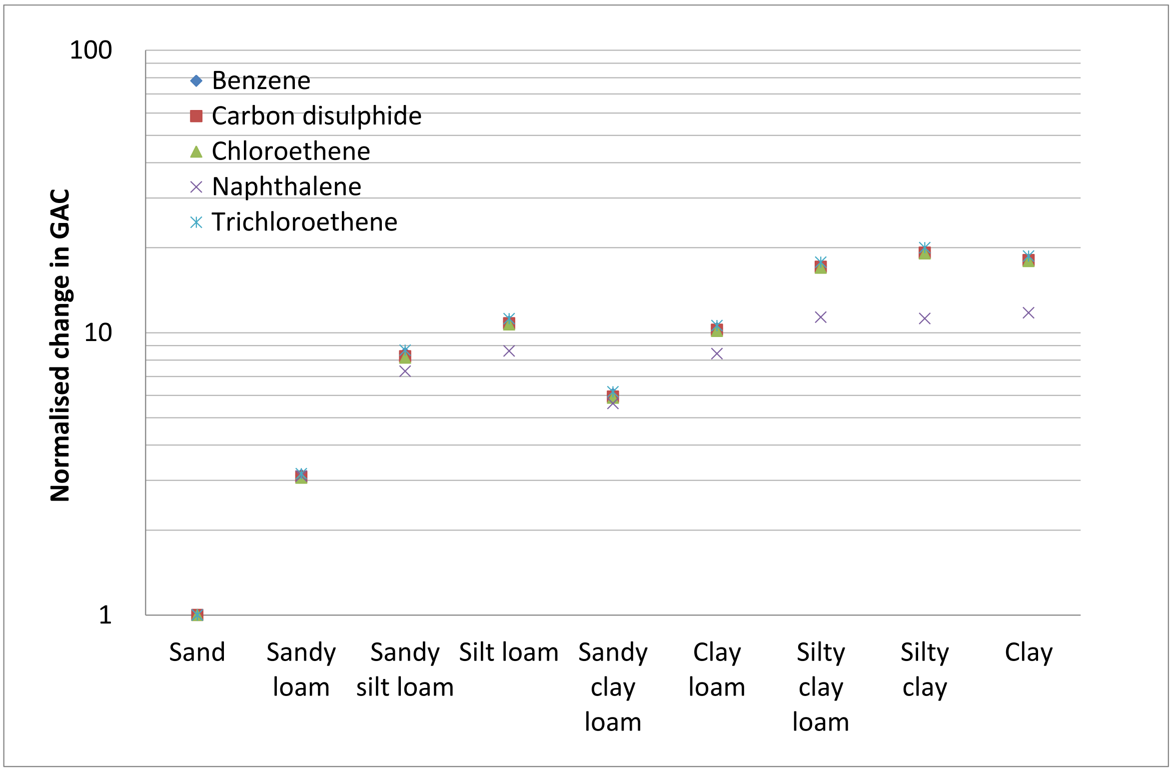

Figure 2 - Influence of Soil Type on Residential GAC_{gwvap}

3.4.3 Building Type

The default building types used in deriving the SoBRA GAC are (1) the *small terraced house* (STH) for the residential GAC; and (2) the *office (pre 1970)* for the commercial GAC. Sensitivity analysis has been undertaken to assess the effect of the alternative pre-defined building types included in the CLEA software on the GAC_{gwvap} for the residential land use. The results of the sensitivity analysis are presented in Figure 3.

Changes to the CLEA residential building type (i.e. other than the small terraced house) and unticking the default *soil gas ingress rate* will result in a marginal increase in the GAC in the region of 9 %-29 %, with the exception of the CLEA *bungalow* building type. For the CLEA *bungalow* the reduced mixing height available for attenuation in the building space will result in a lower GAC. With a decrease in the GAC for a *bungalow* of approximately 25 %-30 %, practitioners should consider whether the GAC_{gwvap} presented in Tables 6 to 10 are sufficiently protective on sites where single-storey residential dwellings are present or proposed and also consider the effect of the proposed foundations by comparison to those used to derive these GAC.

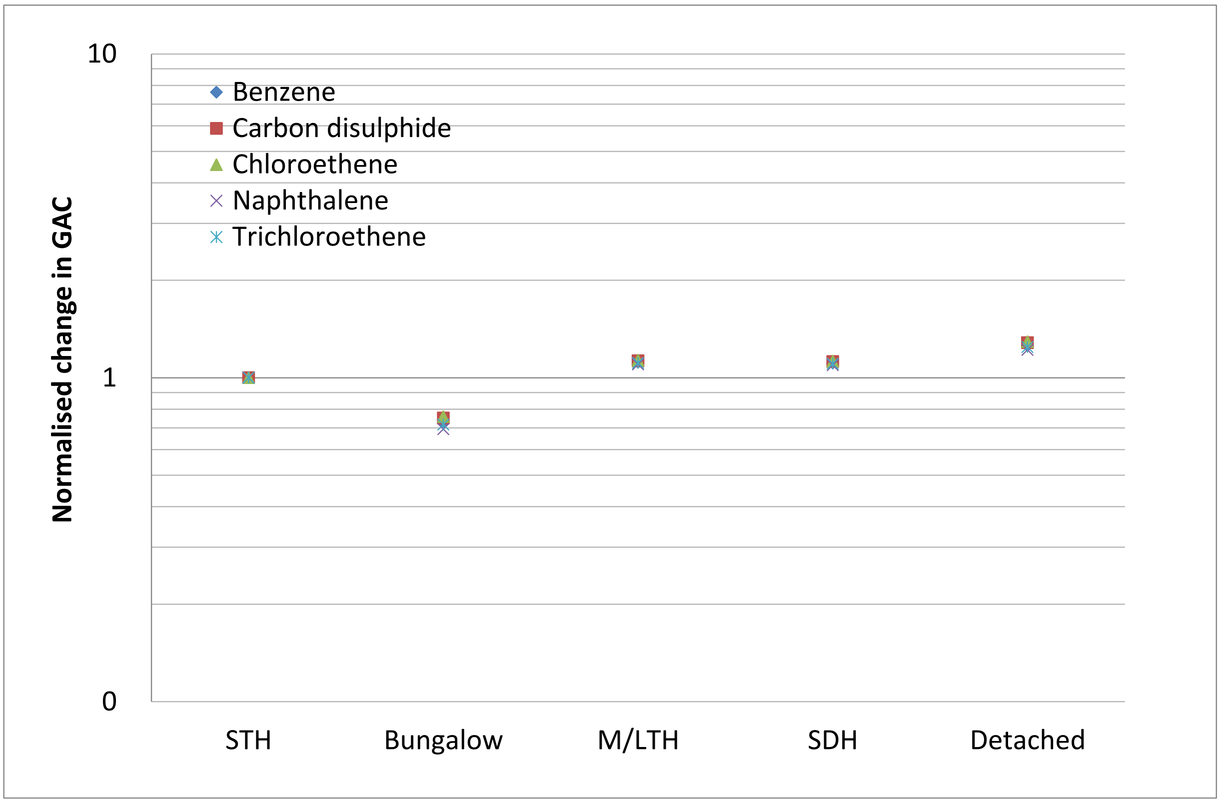

Figure 3 - Influence of Building Type on Residential GAC_{gwvap}

3.4.4 Soil Organic Matter

Soil organic matter content is an important control in the partitioning of volatile organic compounds from the sorbed to the aqueous phase and is therefore a sensitive parameter when assessing vapour risks from soil sorbed contamination (as shown in Table 1). However, where the source medium is groundwater, the media partitioning of interest is between the aqueous and vapour phases and SOM is therefore not a sensitive parameter (indeed it is not an input parameter in the J&E model for a groundwater source). As shown in Figure 4, this has been confirmed by the sensitivity analysis which shows no change in the GAC_{gwvap} with changes in SOM.

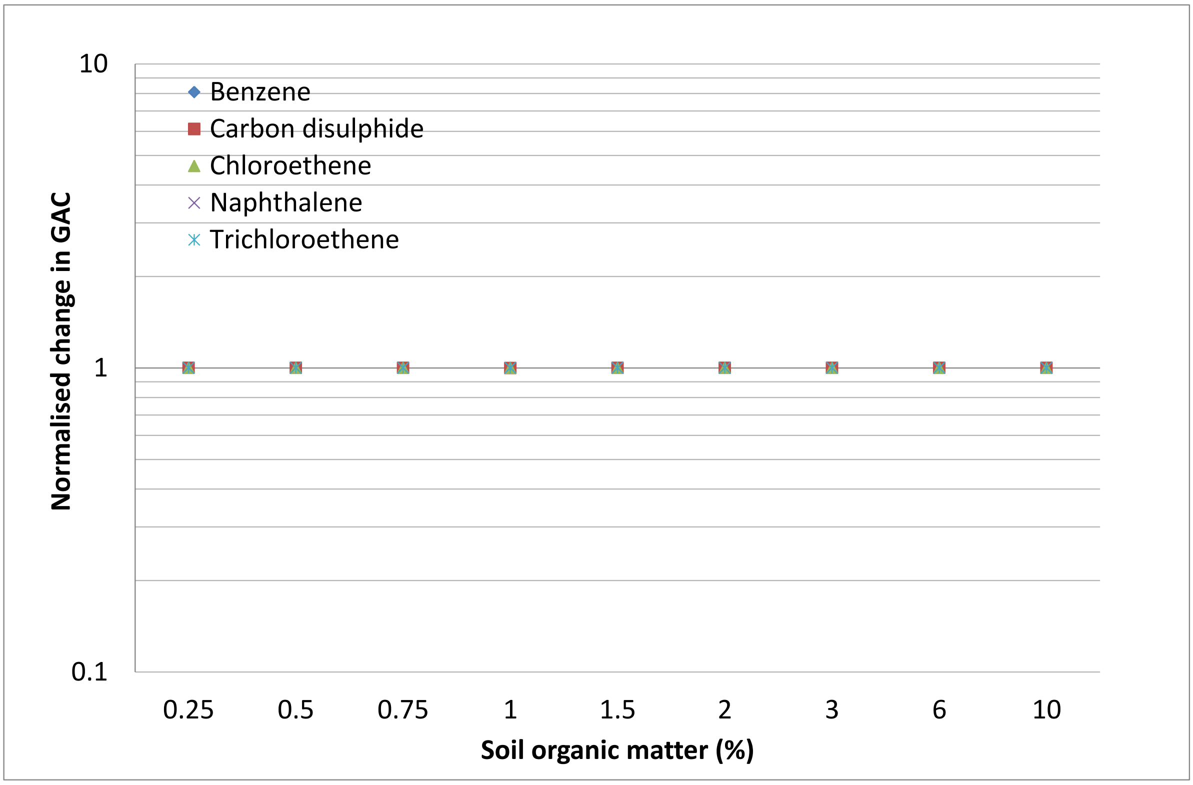

Figure 4 - Influence of Soil Organic Matter on Residential GAC_{gwvap}

3.5 Summary of Findings

Figure 5 shows the results of the sensitivity analysis for all variables expressed as a normalised change in the GAC, i.e. new GAC divided by original GAC. The following key points can be summarised from the combined analysis:

- soil type is the most sensitive parameter assessed and can influence the GAC_{gwvap} by up to a factor of approximately 20 depending on the chemical being assessed;
- SOM has no influence on the GAC_{gwvap};
- residential building type has some influence on the GAC_{gwvap} for residential land use. The bungalow building type gives a GAC 25 % to 30 % lower than that using the small terraced house (note that the rate of vapour ingress into buildings also interlinks with soil type). The small terraced house is the building type adopted for deriving soil GAC such as the S4UL and C4SL and has also been adopted for the SoBRA GAC_{gwvap}. Assessors should therefore consider actual or planned building type when using the GAC_{gwvap}; and

- depth to source has some influence on the GAC_{gwvap}. Decreasing depth to source from 0.65 m to 0.3 m decreases the GAC by approximately 40%. Increasing depth to source to 4 m increases the GAC by up to 400 % (5 times).

It is highlighted that these percentage changes apply to the modelling undertaken. They do not represent rules of thumb to be used to negate actual modelling where concentrations are close to or exceed the GAC_{gwvap} provided and should not be used as such.

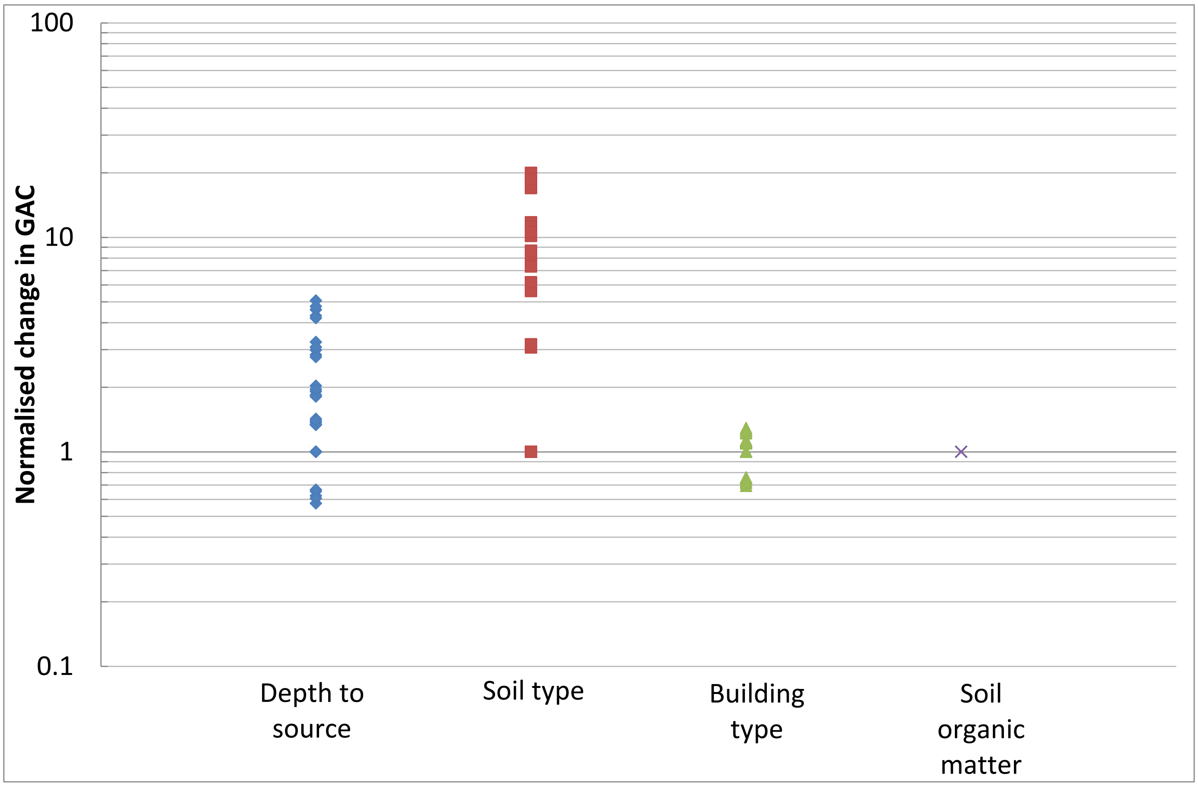

Figure 5 – Parameter Sensitivity – Combined Results

4 CROSS-CHECK WITH JOHNSON-ETTINGER MODEL

This section presents the findings of an exercise to compare the predicted indoor air concentrations derived using the CLEA model with those derived using the J&E model (Johnson and Ettinger, 1991) worksheets published by the USEPA. The cross check was undertaken in order to assess the potential level of conservatism applied when using CLEA.

The J&E model was developed by the USEPA to predict indoor air concentrations from contamination in soil, groundwater, and soil vapour sources. The CLEA model uses an implementation of J&E to predict indoor air concentrations from soil contamination found at shallow depths. The J&E model was selected for use in CLEA following a review of available methods as it was found to be a widely applied model for estimating vapour ingress into buildings (Environment Agency, 2009a). Although the J&E model is widely applied, questions have been raised about its relevance to the UK housing stock, (Wilson, 2008). This is further discussed in Section 6.2.

The CLEA model was developed to assess exposure risk from soil sources and therefore only the J&E approach to estimate vapour risk from unsaturated soil was implemented within CLEA. A key difference between CLEA’s implementation of the J&E model, and the USEPA spreadsheet for a groundwater source, is that the soil source model used in CLEA does not incorporate the effect of the capillary fringe (see Section 4.1) whilst the USEPA groundwater spreadsheet includes this. Neither CLEA nor the USEPA spreadsheet specifically include other important parameters such as biodegradation in the unsaturated zone.

Uncertainties and assumptions within the J&E approach (as identified in USEPA, 2004) are detailed in Box 1.

Box 1: Key uncertainties and assumptions applicable to the J&E model (USEPA, 2004)

- The top of the capillary fringe must be below the bottom of the building floor in contact with the soil.
- Diffusion through soil moisture is assumed to be insignificant.
- No consideration is given to preferential pathways into buildings (such as through buried pipes or conduits).
- The estimation of soil vapour permeability does not account for potential heterogeneity of soils and variation in soil moisture content, preferential vapour pathways in soil, vegetation root pathways, or the potential for a gravel layer below the floor slab or backfill which could increase the overall vapour permeability of in-situ soils.
- The model is not applicable for where the building foundation is wetted by (or in direct contact with) groundwater.
- The height of the capillary zone is assumed to be level, whereas in reality the capillary fringe is likely to be uneven due to the heterogeneity of soil particle sizes.
- The groundwater level is assumed to be steady state and not subject to variation in depth due to recharge and discharge.
- The model assumes that the capillary fringe is uncontaminated (which is unlikely where groundwater levels vary significantly).
- Diffusion across the capillary zone is estimated based on a combined vapour and aqueous phase effective diffusion coefficient. This is typically reported to result in an over-estimation of the effective diffusion coefficient.

The USEPA (2004) identified the following key parameters affecting the model that relate to the capillary zone, in particular these were:

- Capillary Zone Water-filled Porosity (Moderate to High sensitivity);
- Thickness of Capillary Zone (Moderate to High sensitivity); and
- Soil Vapour Permeability (Moderate to High sensitivity).

4.1 Effect of the Capillary Fringe

The capillary zone (or capillary fringe) is an area within the soil profile located above the water table, whereby water is held in soil pore spaces at less than atmospheric pressure by the effect of surface tension. This water exhibits the tendency for upward movement from the saturated zone (Domenico & Schwartz, 1998). The height of this upward movement of soil pore water is modelled as a factor of the variation in soil texture (specifically the grain diameter) which affects the radius of pore spaces available for water migration through capillary action. Fetter (1994) reports that predicted heights of capillary rise in a very fine sand is in the region of 100 cm and for a very coarse sand in the region of 4 cm. The capillary zone is predicted to be greater in height with decreased grain size due to the increase in water tension within smaller pore spaces.

The upward movement of water through capillary action is modelled in J&E as the rise of a liquid within a capillary tube, assuming that the interstitial space between soil particles is equal to the diameter of the capillary tube and that the water column rises during steady-state conditions. USEPA (2004) state that "*in actuality, the height of the capillary zone is uneven or fingered due to the variation in actual in situ particle size distribution*". It is noted that in some cases the top of the capillary zone could rise to levels above the anticipated floor (but this effect is not possible to model using J&E).

The effect of assumptions used within the J&E model are reported by USEPA (2004) to be largely conservative and likely to over-predict vapour intrusion within indoor air. The sub-group team therefore considered it appropriate that the level of conservatism that may be present as a result of the implementation of the J&E model within CLEA and in particular the exclusion of the capillary fringe, is assessed.

4.2 Cross-Check Methodology

A number of contaminants were selected for modelling in J&E to represent varying physical-chemical and toxicological properties. As with the sensitivity analysis (Section 3) the selected contaminants were benzene, carbon disulphide, naphthalene, trichloroethylene, and vinyl chloride.

To assess the effect of the capillary zone on the derived GAC, the soil type was also varied as a Clay loam, Sandy loam, and a Sand at 1 % SOM with physical properties unit converted from values presented in SR3 (Environment Agency, 2009a). All J&E modelling was undertaken for a residential land use with building dimensions as per CLEA. The depth to groundwater was entered as the depth to contaminated soil in

CLEA. The full input parameters used in the J&E modelling are presented in Appendix 3.

The method to derive GAC using the USEPA J&E spreadsheets was as follows:

1. Physical-chemical and soil properties used in CLEA were converted to appropriate units and entered into the J&E 'VLookup' worksheet.
2. The appropriate building dimensions and properties were entered into the 'DATENTER' spreadsheet.
3. The groundwater source concentration on the 'DATENTER' worksheet (cell F17) was selected as the soil pore water concentration derived in CLEA at the GAC (i.e. where the ADE:HCV=1).
4. The predicted indoor air concentration calculated in 'Infinite source bldg. conc., Cbuilding' in the 'INTERCALCS spreadsheet' (cell I31) was recorded.

4.3 Findings and Results

The comparison of predicted indoor air concentrations based on the CLEA derived GAC_{gwvap} for the three different soil types assessed are presented in Tables 3 to 5. Note that the values in these tables are presented to three significant figures to allow small changes to be observed.

Table 3: Comparison of CLEA and J&E predicted indoor air concentrations associated with the GAC_{gwvap} for residential land use with sand soil

Contaminant	Unit	Benzene	Carbon Disulphide	Naphthalene	Vinyl Chloride	TCE
CLEA Groundwater Residential GAC_{gwvap}	µg/l	211	56.2	216	0.62	5.65
CLEA predicted indoor air concentration	µg/m^3	2.15	22.0	1.06	0.462	0.877
J&E predicted indoor air concentration	µg/m^3	0.301*	3.18	0.262	0.0676	0.126
Ratio of predicted CLEA:J&E indoor air concentrations	-	7.1	6.9	4.0	6.8	7.0

* soil to indoor air correction factor of 10 applied by dividing the J&E predicted indoor air concentration by 10

Table 4: Comparison of CLEA and J&E predicted indoor air concentrations associated with the derived GAC_{gwvap} for residential land use with sandy loam soil

Contaminant	Unit	Benzene	Carbon Disulphide	Naphthalene	Vinyl Chloride	TCE
CLEA Groundwater Residential GAC_{gwvap}	µg/l	662	174	670	1.91	17.9
CLEA predicted indoor air concentration	µg/m^3	2.15	22	1.06	0.462	0.877
J&E predicted indoor air concentration	µg/m^3	0.356*	3.51	0.441	0.0733	0.145
Ratio of predicted CLEA:J&E indoor air concentrations	-	6.0	6.3	2.4	6.3	6.0

* soil to indoor air correction factor of 10 applied by dividing the J&E predicted indoor air concentration by 10

Table 5: Comparison of CLEA and J&E predicted indoor air concentrations associated with the GAC_{gwvap} for residential land use with clay loam soil

Contaminant	Unit	Benzene	Carbon Disulphide	Naphthalene	Vinyl Chloride	TCE
CLEA Groundwater Residential GAC_{gwvap}	µg/l	2190	575	1820	6.33	60
CLEA predicted indoor air concentration	µg/m^3	2.15	22	1.06	0.462	0.877
J&E predicted indoor air concentration	µg/m^3	0.429*	3.78	0.712	0.0769	0.167
Ratio of predicted CLEA:J&E indoor air concentrations	-	5.0	5.8	1.5	6.0	5.3

* soil to indoor air correction factor of 10 applied by dividing the J&E predicted indoor air concentration by 10

The J&E cross check indicates that the predicted indoor air concentrations derived using CLEA are 1.5 to 7.1 times greater than that predicted by J&E using the same groundwater source concentration. The difference appears to decrease with more cohesive soils, presumably because advective flow into the building becomes the dominant limiting factor for cohesive soils.

The cross check suggests that the capillary fringe (which increases in thickness with decreasing soil pore space) has an effect of reducing the predicted indoor air concentrations from a groundwater source. On this basis, the proposed groundwater GAC derived using CLEA can be considered precautionary by up to one order of magnitude relative to the USEPA implementation of the J&E incorporating the capillary fringe.

5 GENERIC ASSESSMENT CRITERIA

5.1 Derived GAC_{gwvap}

The following section provides a summary of the GAC_{gwvap}, presented in the following groups:

- Petroleum Hydrocarbons - Table 6
- Polycyclic Aromatic Hydrocarbons (PAHs) – Table 7
- Pesticides – Table 8
- Halogenated Organics – Table 9
- 'Others' (organic and inorganic) – Table 10

In addition, those substances for which GAC_{gwvap} have not been derived due to having a Kaw lower than $4x10^{-4}$ are listed in Table 11.

Table 6 - GAC_{gwvap} for Petroleum Hydrocarbons

Chemical	CAS	GAC_{gwvap} (µg/l) [1,2]		Aqueous Solubility (µg/l)
		Residential	Commercial	
1,2,4-Trimethylbenzene	95-63-6	24	2,200	559,000
Benzene [3]	71-43-2	210	20,000	1,780,000
Ethylbenzene [3]	100-41-4	10,000	*960,000 (sol)*	180,000
Isopropylbenzene	98-82-8	850	*86,000 (sol)*	56,000
Propylbenzene	103-65-1	2,700	*240,000 (sol)*	54,100
Styrene	100-42-5	8,800	*810,000 (sol)*	290,000
Toluene [3]	108-88-3	230,000	*21,000,000 (sol)*	590,000
TPH Aliphatic EC5-EC6 [3]		1,900	*190,000 (sol)*	35,900
TPH Aliphatic >EC6-EC8 [3]		1,500	*150,000 (sol)*	5,370
TPH Aliphatic >EC8-EC10 [3]		57	*5,700 (sol)*	427
TPH Aliphatic >EC10-EC12 [3]		37	*3,600 (sol)*	34
TPH Aromatic >EC5-EC7 [2,3]		210,000	*20,000,000 (sol)*	1,780,000
TPH Aromatic >EC7-EC8 [3]		220,000	*21,000,000 (sol)*	590,000
TPH Aromatic >EC8-EC10 [3]		1,900	*190,000 (sol)*	64,600
TPH Aromatic >EC10-EC 12 [3]		6,800	*660,000 (sol)*	24,500
TPH Aromatic >EC12-EC16 [3]		39,000	*3,700,000 (sol)*	5,750
meta-Xylene [3,5]	108-38-3	9,500	*940,000 (sol)*	200,000
ortho-Xylene [3,5]	95-47-6	12,000	*1,100,000 (sol)*	173,000
para-Xylene [3,5]	106-42-3	9,900	*980,000 (sol)*	200,000

Notes

1. GAC in *italics* with (sol) exceed aqueous solubility. See Section 5.3.
2. GAC rounded to two significant figures.
3. The GAC for these petroleum hydrocarbon contaminants have been calculated using a sub-surface soil to indoor air correction factor of 10 in line with the physical-chemical data sources
4. The GAC for TPH fractions do not account for genotoxic mutagenic effects. Concentrations of TPH Aromatic >EC5-EC7 should therefore also be compared with the GAC for benzene to ensure that such effects are also assessed.
5. The Health Criteria Value used for each xylene isomer was for total xylene. If site specific additivity assessments are not completed, as a conservative measure the sum of isomer concentrations should be compared to the lowest xylene GAC (as is the case for soil GAC).

Table 7 - GAC$_{gwvap}$ for Polycyclic Aromatic Hydrocarbons (PAH)

Chemical	CAS	GAC$_{gwvap}$ (µg/l) [1,2]		Aqueous Solubility (µg/l)
		Residential	Commercial	
Acenaphthene	83-32-9	*170,000 (sol)*	*15,000,000 (sol)*	4,110
Acenaphthylene	208-96-8	*220,000 (sol)*	*20,000,000 (sol)*	7,950
Fluorene	86-73-7	*210,000 (sol)*	*18,000,000 (sol)*	1,860
Naphthalene	91-20-3	220	*23,000 (sol)*	19,000

Notes

1. GAC in *italics* with (sol) exceed aqueous solubility. See Section 5.3.
2. GAC rounded to two significant figures.

Table 8 - GAC$_{gwvap}$ for Pesticides

Chemical	CAS	GAC$_{gwvap}$ (µg/l) [1,2]		Aqueous Solubility (µg/l)
		Residential	Commercial	
Aldrin	309-00-2	*47 (sol)*	*3,700 (sol)*	20
alpha-Endosulfan	959-98-8	*7,400 (sol)*	*590,000 (sol)*	530
beta-Endosulfan	33213-65-9	*7,500 (sol)*	*600,000 (sol)*	280

Notes

1. GAC in *italics* with (sol) exceed aqueous solubility. See Section 5.3.
2. GAC rounded to two significant figures.

Table 9 - GAC$_{gwvap}$ for Halogenated Organics

Chemical	CAS	GAC$_{gwvap}$ (µg/l) [1,2]		Aqueous Solubility (µg/l)
		Residential	Commercial	
1,1,1,2-Tetrachloroethane	79-34-5	240	22,000	1,110,000
1,1,1-Trichloroethane	71-55-6	3,000	290,000	1,300,000
1,1,2,2-Tetrachloroethane	79-35-4	1,600	150,000	2,930,000
1,1,2-Trichloroethane	79-00-5	520	49,000	4,491,000
1,1-Dichloroethane	75-34-3	2,700	260,000	3,666,000
1,1-Dichloroethene	75-35-4	160	16,000	3,100,000
1,2,3,4-Tetrachlorobenzene	634-66-2	240	*31,000 (sol)*	7,800
1,2,3,5-Tetrachlorobenzene	634-90-2	7.0	600	3,500
1,2,3-Trichlorobenzene	87-61-7	35	3,100	21,000
1,2,4,5-Tetrachlorobenzene	95-94-3	8.1	*700 (sol)*	600
1,2,4-Trichlorobenzene	120-82-1	68	7,200	41,400
1,2-Dichlorobenzene	95-50-1	2,000	*220,000 (sol)*	133,000
1,2-Dichloroethane	107-06-2	8.9	850	8,680,000
1,2-Dichloropropane	78-87-5	22	2,600	2,050,000

Chemical	CAS	GAC$_{gwvap}$ (µg/l) [1,2]		Aqueous Solubility (µg/l)
		Residential	Commercial	
1,3,5-Trichlorobenzene	108-70-3	7.4	660	6,000
1,3-Dichlorobenzene	541-73-1	31	2,800	103,000
1,4-Dichlorobenzene	106-46-7	5,000	*460,000 (sol)*	51,200
Bromobenzene	108-86-1	220	20,000	388,040
Bromodichloromethane	75-27-4	17	1,600	3,000,000
Bromoform (Tribromomethane)	75-25-2	3,100	400,000	3,000,000
Chlorobenzene	108-90-7	98	15,000	387,000
Chloroethane	75-00-3	10,000	1,000,000	5,742,000
Chloroethene (Vinyl Chloride)	75-01-4	0.62	63	2,760,000
Chloromethane	74-87-3	14	1,400	5,350,000
cis-1,2-Dichloroethene	156-59-2	130	13,000	7,550,000
Dichloromethane	75-09-2	3,300	370,000	20,080,000
Hexachlorobenzene	118-74-1	*16 (sol)*	*1,400 (sol)*	10
Hexachlorobutadiene	87-68-3	1.7	230	4,800
Hexachloroethane	67-72-1	8.5	740	49,900
Pentachlorobenzene	608-93-5	140	*12,000 (sol)*	500
Tetrachloroethene	127-18-4	34	4,600	225,000
Tetrachloromethane (Carbon Tetrachloride)	56-23-5	5.3	770	846,000
trans-1,2-Dichloroethene	156-60-5	160	16,000	5,250,000
Trichloroethene	79-01-6	5.7	530	1,370,000
Trichloromethane (Chloroform)	67-66-3	790	85,000	8,950,000

Notes

1. GAC in *italics* with (sol) exceed aqueous solubility. See Section 5.3
2. GAC rounded to two significant figures.

Table 10 - GAC$_{gwvap}$ for Others (organic and inorganic)

Chemical	CAS	GAC$_{gwvap}$ (µg/l) [1,2]		Aqueous Solubility (µg/l)
		Residential	Commercial	
2-Chloronaphthalene	91-58-7	160	*14,000 (sol)*	11,700
Biphenyl (Lemonene)	92-52-4	*15,000 (sol)*	*1,300,000 (sol)*	4,060
Carbon disulphide	75-15-0	56	5,600	2,100,000
Mercury, elemental	7439-97-6	1.1	*95 (sol)*	56
Methyl tertiary butyl ether (MTBE)	1634-04-4	83,000	7,800,000	48,000,000

Notes

1. GAC in *italics* with (sol) exceed aqueous solubility. See Section 5.3.
2. GAC rounded to two significant figures.

Table 11 – Substances for which GAC_{gwvap} have not been derived due to being insufficiently volatile (K_{aw} < $4x10^{-4}$) or aqueous solubility (≤1 µg/L)

Chemical	CAS	Kaw (cm^3/cm^3)	Aqueous Solubility (µg/l)	Reference
Petroleum Hydrocarbons				
Aliphatic C12-C16		171	0.759	1
Aliphatic C16-C35		1070	0.00254	1
Aliphatic C35-C44		1070	0.00254	1
Aromatic C16-C21		6.95E-04	653	1, 3
Aromatic C21-C35		2.48E-05	6.61	1
Aromatic C35-C44		2.48E-05	6.61	1
Aromatic and Aliphatic C44-C70		1.64E-03	0.1	1
PAHs				
Anthracene	120-12-7	1.81E-04	56	1
Benzo[b]fluoranthene	205-99-2	2.05E-06	2	1
Benzo[ghi]perylene	191-24-2	2.86E-06	0.26	1
Benzo[a]anthracene	56-55-3	3.16E-05	3.8	1
Benzo[a]pyrene	50-32-8	1.76E-06	3.8	1
Benzo[k]fluoranthene	207-08-9	1.74E-06	0.8	1
Chrysene	218-01-9	3.18E-06	2	1
Dibenzo[ah]anthracene	53-70-3	5.4E-06	0.6	1
Fluoranthene	206-44-0	6.29E-05	230	1
Indeno[123-cd]pyrene	193-39-5	2.05E-06	0.2	1
Phenanthrene	85-01-8	1.43E-04	1120	1
Pyrene	129-00-0	5.64E-05	130	1
Others				
2,3,4,6-Tetrachlorophenol	58-90-2	2.33E-05	183000	1
2,4,6-Trichlorophenol	88-06-2	3.36E-05	434000	1
2,4,6-Trinitrotoluene	118-96-7	3.32E-07	76400	1
2,4-Dichlorophenol	120-83-2	3.52E-05	4500000	1
2,4-Dimethylphenol	105-67-9	3.57E-04	8106000	2
2,4-Dinitrotoluene	121-14-2	3.67E-07	129000	2
2,6-Dinitrotoluene	606-20-2	1.57E-06	232000	2
2-Chlorophenol	95-57-8	8.08E-05	22700000	1
2-Methylphenol	95-48-7	1.80E-05	12383000	2
3-Methylphenol	108-39-4	1.04E-05	22500000	2
4-Methylphenol	106-44-5	1.63E-05	23392000	2
alpha-Hexachlorocyclohexane	319-84-6	8.11E-05	2000	1

Chemical	CAS	Kaw (cm^3/cm^3)	Aqueous Solubility (µg/l)	Reference
Atrazine	1912-24-9	2.81E-08	70000	1
beta-Hexachlorocyclohexane	319-85-7	4.71E-06	200	1
Bis (2-ethylhexyl) phthalate	117-81-7	3.90E-05	270	2
Butyl benzyl phthalate	85-68-7	5.26E-06	2320	2
Dichlorvos	62-73-7	6.51E-07	16000000	1
Dieldrin	60-57-1	3.51E-04	200	1
Diethyl Phthalate	84-66-2	2.64E-04	1200000	2
Di-n-butyl phthalate	84-74-2	3.00E-04	13300	2
Di-n-octyl phthalate	117-84-0	4.96E-12	75.83076	2
gamma-Hexachlorocyclohexane	58-89-9	3.10E-05	7300	1
HMX	2691-41-0	1.49E-14	1210	1
Pentachlorophenol	87-86-5	5.55E-06	14000	1
Phenol	108-95-2	8.35E-06	84100000	1
RDX	121-82-4	1.31E-10	21900	1
Tributyl tin oxide	56-35-9	4.24E-05	5100	2

References

1. Nathanail et al, 2015
2. CL:AIRE, 2010
3. TPHCWG, 1997 noted that an inhalation reference concentration (health criteria value) could not be determined for this fraction "*because the compounds in this carbon range are not volatile*".

5.2 Use of GAC_{gwvap}

This section provides a brief summary of how the GAC_{gwvap} are intended to be used.

Each GAC_{gwvap} is the theoretical concentration in groundwater / perched water beneath a property that is modelled as resulting in estimated average daily exposure (ADE) to the critical receptor that is equal to the HCV, i.e. ADE=HCV or ADE/HCV =1.

The GAC have been designed to incorporate a number of precautionary assumptions. This means that in most cases the exposure to the critical receptor will actually be significantly lower than the HCV, so that further consideration of the risks to human health from vapour intrusion from groundwater / perched water, is not required. These conservatisms include:

- the assumption that the impacted groundwater / perched water is directly beneath the building, when in fact it may be laterally offset from the receptor;
- the assumption that there is an infinite source term, when in fact the source may be finite;

- the assumption that there is no biodegradation between the source term and the receptor;
- the assumption that the groundwater source is at a depth of 0.65 m below ground level. In many cases the level of the groundwater will be significantly greater than this;
- the use of a Sand soil type (as defined within SR3 (Environment Agency, 2009a) for both the saturated and unsaturated zone. With regard to the unsaturated zone, this may be conservative especially considering that the soil type used with soil GAC (including Soil Guideline Values, C4SL assessment criteria, and LQM/ CIEH S4ULs) have been derived for a less permeable SR3 Sandy loam; and
- the omission of a capillary fringe between the saturated and unsaturated zones (discussed in Section 4).

Therefore, provided the assumptions used for deriving the GAC_{gwvap} are suitably precautionary for the site, if the actual groundwater or perched water concentration is below the GAC_{gwvap} then exposure (via this pathway) will be lower than the HCV.

In the event that the actual water concentrations are higher than the GAC_{gwvap}, it is the responsibility of the risk assessor to understand the inherent conservatisms within the CSM used in their derivation, when compared with the CSM for the site which they are assessing and to discuss these within the risk evaluation. Where a site appears to "fail" due to the use of the GAC_{gwvap}, this risk evaluation will be important in considering what further assessment may be required, to avoid recommendations for unnecessary remediation. The GAC_{gwvap} are not intended to be used to ascertain if remediation is required nor are they intended to be used as remediation targets. The results of the sensitivity analysis (Section 3) provide insight into which parameters could be adjusted to allow a more accurate assessment as part of a Detailed Quantitative Risk Assessment (DQRA).

However, there may also be instances where the CSM inherent within the GAC is not sufficiently protective of the site under consideration, so that even where the actual water concentrations are lower than the GAC, exposure may actually exceed the HCV. As always, this depends on the CSM for the site being assessed, and it is the responsibility of the risk assessor to have a full understanding of conditions prevalent at the site.

Examples of where the CSM may not be sufficiently protective include the following:

- *The potential for additive exposure from other contaminant linkages, both from soil and groundwater sources.*

The methodology used in the derivation of the GAC means that only outdoor and indoor inhalation of vapour pathways are considered. Where both soil and groundwater / perched water sources are present together, i.e. when both are impacted at the same shallow depth, it is important to evaluate whether the estimated exposure from all pathways present at the site will exceed the HCV (i.e. soil ingestion pathways and dust inhalation pathways may also exist).

Other linkages associated with the impacted groundwater / perched water, such as diffusion through drinking water pipes and root uptake into homegrown produce for consumption may also be present especially where water is shallow. In these cases the depth of the impacted water, compared with the depth at which the pipes have been/are likely to be laid and the root zone are likely to be critical. Clearly, where the water supply on site is directly taken from an on-site borehole, there will be numerous other pathways associated with the consumption of drinking water, washing (including the mists generated during showering), and irrigation, and the GAC_{gwvap} may not be protective.

Where soil and groundwater sources are distinct and separate (for example, a shallow soil source and a deep groundwater source), a risk assessor may need to consider the potential for additive exposure via vapour migration between these two sources.

- *The potential for additivity of contaminants which have a similar mode of action.*

  One example of this is xylene, where the HCV used in the modelling is based on toxicological studies of total xylene and if each xylene isomer was present at the GAC, then the hazard index of 1 would be exceeded. Additivity across the three isomers should therefore be considered perhaps by using the methodology reported by the Environment Agency for dioxins, furans and dioxin-like PCBs (Environment Agency, 2009f) or more conservatively by using the lowest GAC for the sum of measured xylene isomer concentrations.

  Another example is the LQM/CIEH guidance (Nathanail *et al*, 2015) which states that the HCV provided for the Total Petroleum Hydrocarbon (TPH) fractions assume that additivity will be taken into account and therefore it will not be appropriate to assume that if each component of the TPH suite is at, or slightly below, the GAC that no further assessment/ action is required. Environment Agency (2005) gives guidance on how to account for additivity for TPH fractions.

- *The potential for the degradation of contaminants into more toxic daughter products.*

  Chlorinated solvents such as tetrachloroethene and trichloroethene will eventually degrade to form the more toxic vinyl chloride. The risk assessor should evaluate what the impact of this might be, either qualitatively or quantitatively, especially recognising that the GAC_{gwvap} for residential land use for vinyl chloride is slightly below the typical analytical detection limit for this contaminant;

- *The potential for groundwater/ perched water to be shallower than 0.65 m.*

  While this may not be particularly likely for most properties, the CSM remains an important consideration;

- *The presence of significant higher permeability soils in the unsaturated and/or the saturated zone, for instance Made Ground with a high proportion of gravel.*

  SR3 (Environment Agency, 2009a) does not contain data for a very gravelly soil and in the absence of this, a risk assessor may choose to use site specific data. Again, a good understanding of the CSM is fundamental to this;

- *Significant differences in the design of the building.*

  This is especially important where actual concentrations within the groundwater are close to the GAC. For instance, some modern housing designs may significantly reduce the air exchange rates compared to the 12 air exchanges a day which is the default within the CLEA model. It is possible that this will be off-set or more than off-set by other changes to other building characteristics, such as a decrease within the wall to floor crack (currently estimated to be 2 mm) used to calculate the floor crack area, but further evaluation may be required.

  It is also important to consider the building design and foundations, as the J&E model assumes a ground-bearing concrete slab foundation, whereas many UK-houses have a suspended wooden floors and modern houses often have beam and block construction with passively vented voids. Further details of these implications are provided in Section 6.2.

- *The GAC do not take account of odour thresholds.*

  For some contaminants, odours could be present in buildings even though concentrations are below the GAC_{gwvap}. In many instances, the toxicity of a contaminant is not linked to the odour threshold.

In addition, the assessor needs to consider the site measurement uncertainties associated with the groundwater concentrations provided. Again, as with the use of all assessment criteria, if these are not representative of the concentrations to which the receptor is exposed on a long-term basis, the assessment will not be valid. With the prior assumption that the measurements were taken correctly, and that samples were appropriately treated, and analysed with sufficient QA/QC processes in place, factors to consider include (but are not limited to):

- to what extent the measured groundwater concentrations are a suitable surrogate for groundwater concentrations directly beneath the property, i.e. whether or not there could there be higher concentrations below the house which are not identified within the monitoring well. This is particularly relevant when the source term is not fully understood. Examples where this is likely to occur include when there are a limited number of monitoring rounds confined to one season, and/or there are a limited number of monitoring wells and unexpected contaminants are detected in one or more of them, especially if previously undetected contaminants are measured on what was scoped to be the final monitoring round. In this instance, further site investigation is likely to be the best way of reducing the uncertainty within the CSM;
- the potential presence of NAPL, as the GAC have been derived using a model which does not account for a fourth free phase state;
- whether the shallowest depth to a water strike, often used for comparison with a GAC within a preliminary assessment, is genuinely representative of a continuous body of groundwater that could constitute an infinite source. Further examination of this conservatism is likely to be sensible where there are a number of monitoring rounds at different depths and contamination within groundwater is associated only with deeper strikes. Refinement of the CSM could be undertaken if there are sufficient data from different strata that take into account seasonal fluctuation and events such as heavy rainfall and/or there may be an argument for not using the shallowest depth; and
- whether the highest measured concentration, typically used for comparison with a GAC, is genuinely representative of the estimated long term exposure to a receptor, especially when there are several monitoring rounds over a long period. If there are sufficient data from representative locations, it may be more appropriate to consider deriving a representative value, or obtain some empirical vapour monitoring data such as soil vapour samples.

5.3 Aqueous Solubility and NAPL

The GAC are designed to be protective of dissolved phase contaminants in groundwater / perched water. They do not take account of vapour risk from NAPL. Where there is evidence that mobile or residual NAPL is present, the vapour risks from NAPL will need to be considered separately.

Where more than one soluble contaminant is present (as will be the case for many sites), it is the effective solubility of a contaminant that provides a measure of the point at which NAPL may form. Measured concentrations in excess of effective solubility indicate that NAPL is likely to be present. The effective solubility will be lower than the pure phase aqueous solubility, as per the following Equation 1 (Keuper *et al*. 2003):

$$C_i^e = X_i S_i$$

Where:

S_i^e *is the effective solubility of component i in water*

X_i *is the mol fraction of component i in NAPL*

S_i *is the single component solubility of component i*

USEPA (2015a,b) presents a rule of thumb for petroleum fuels (LNAPLs) whereby concentrations of benzene ≥ 5 mg/L or TPH ≥ 30 mg/L indicate that NAPL is likely to be present. For chlorinated solvents (DNAPLs), concentrations ≥ 1% of the maximum aqueous solubility may be taken to be indicative of NAPL being present (Keuper *et al*. 2003, USEPA 1992, USEPA 2009). Another rule of thumb mentioned in CL:AIRE (2017) is that dissolved phase concentrations in excess of 10% of effective solubility are also sometimes taken to be indicative of NAPL.

For a number of substances GAC_{gwvap} have been calculated which exceed the aqueous solubility of the pure phase component. Use of the above rules may be useful in identifying what further assessment might be appropriate. Further guidance on assessing vapour risks from NAPL sources are provided in ITRC (2014) and USEPA (2015a,b).

6 OTHER CONSIDERATIONS

The GAC_{gwvap} presented in this report are a tool that can be used to help assess risks to human health from vapours arising from groundwater. This section discusses a number of other approaches that could be in combination with, or instead of the GAC_{gwvap}.

6.1 Other Guidance/Methods for Assessing Vapour Risks from Subsurface Petroleum Hydrocarbon Contamination

The most recent UK authoritative guidance for assessing vapour risks from subsurface contamination is the CIRIA VOCs Handbook (Baker *et al*, 2008). Since the publication of that document there have been a number of more recent documents published by non UK authoritative bodies that provide useful guidance for assessing the risk from vapours, and in particular, petroleum hydrocarbon vapours. In the period 2013 to 2015 several publications and guidance documents were released, including (but not limited to):

- Australian Co-operative Research Centre for Contamination Assessment and Remediation of the Environment (CRC CARE), 2013. Petroleum hydrocarbon vapour intrusion assessment: Australian guidance. Australian Co-operative Research Centre for Contamination Assessment and Remediation of the Environment. CRC CARE Technical Report no. 23.
- Hers, I., Truesdale, R. S., 2013. Evaluation of Empirical Data to Support Soil Vapor Intrusion. Screening Criteria for Petroleum Hydrocarbon Compounds. EPA 510-R-13-001
- ITRC, 2014. Petroleum Vapor Intrusion, Fundamentals of Screening, Investigation and Management report. Interstate Technology Regulatory Council. Washington, US. October 2014.
- Lahvis, M.A., Hers, I., Davis, R.V., Wright, J., and G.E. DeVaull. 2013. Vapor intrusion screening at petroleum UST sites, Groundwater Monitoring & Remediation, 33 (2):53-67
- SoBRA, 2013. Society of Brownfield Risk Assessment Summer Workshop report 2012: risk assessment of petroleum hydrocarbons in groundwater. ISBN: 9780956824158

- USEPA, 2015a. Technical Guide for Addressing Petroleum Vapor Intrusion at Leaking Underground Storage Tank Sites. United States Environmental Protection Agency. June 2015.
- USEPA, 2015b. OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air. United States Environmental Protection Agency Office of Solid Waste and Emergency Response. June 2015.

Whilst the details of the different documents vary, they advocate a similar overall approach. The ITRC guidance provides a user-friendly overview of the main aspects presented in the USEPA documents and is discussed further below.

Academic research on this subject has also been increasing over the last few years. Principal areas of research are:

- effect of aerobic degradation on hydrocarbon vapours;
- use of empirical data that compares measured soil vapour data with soil and groundwater concentrations to derive safe separation distances or screening values;
- the concept of 'weak' and 'strong' vapour sources typically considered as dissolved phase and either mobile or residual NAPL;
- effect of vertical and lateral separation between building and source; and
- effect of building foundation design.

Some of the main findings of the research presented in the above reports and relevant to petroleum vapour intrusion in the UK are:

- where there is sufficient oxygen recharge to soils, and subject to the absence of a number of specified 'Precluding Factors', then aerobic biodegradation of petroleum vapours (in soil) will significantly attenuate vapour intrusion;
- based on a review of hundreds of sites with thousands of paired groundwater and soil gas samples, safe vertical screening distances have been derived where a vapour intrusion risk will not be present;
- the risk of vapour intrusion is significantly greater when NAPL is present than when there is a dissolved phase source. Therefore separate screening distances are proposed for NAPL and for dissolved phase sources. These NAPL sources include residual phase NAPL in soil as well as measureable layers in wells;
- soil vapour samples should be used where possible to estimate risks rather than groundwater data; and

- benzene could be a suitable marker of risks to health from petroleum fuels (i.e. LNAPL).

The typical approach advocated by the above referenced guidance documents for assessing risks from petroleum vapours, as described in ITRC (2014), is:

1. Determine whether there could be acute risks from vapours (acute health risk or explosion). If there are then address those first. If there are no acute risks then proceed to the next step
2. Further develop CSM
3. Evaluate site for Precluding Factors;
    - Determine whether receptor buildings are laterally near enough to be considered at risk ("lateral inclusion screening")
    - Complete screening using vertical separation distance
4. If a potential risk is identified, conduct further investigation and / or evaluation with models that incorporate biodegradation of vapours such as BioVapor™

The schematic flowchart summarizing the approach is illustrated in Figures 6 and 7 below. Essentially, Steps 1 and 2 require knowledge of contamination type, depth and location/ proximity to buildings. Steps 3 and 4a are a check to determine whether there are any reasons that vertical screening should not be undertaken. Step 4b then applies the vertical screening appropriate for the source type/ site setting. Step 5 describes further assessment procedures.

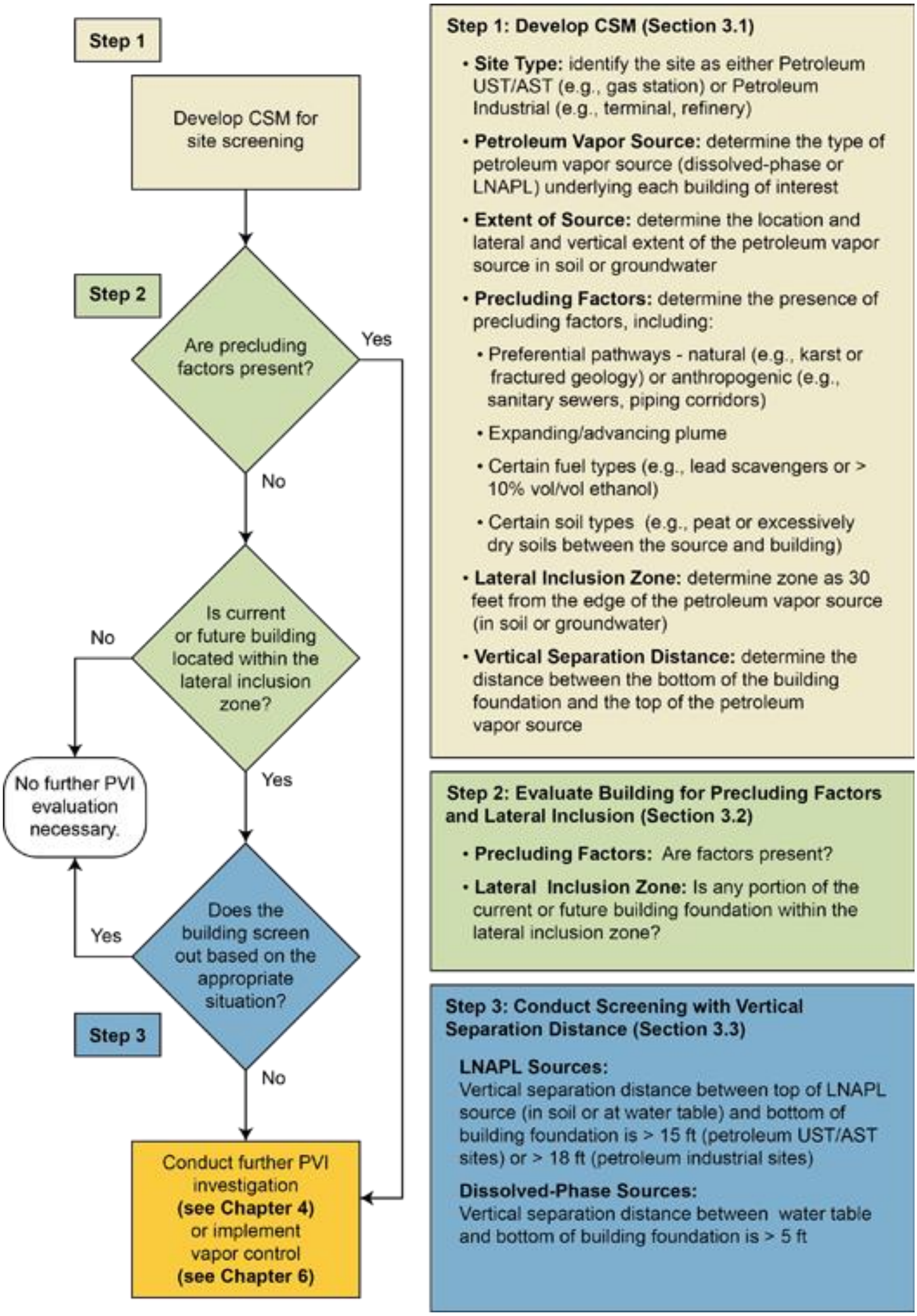

Figure 6 – Flowchart for Petroleum Vapour Intrusion Screening Application (Part 1) (ITRC, 2014) [Please note ITRC disclaimer section at the beginning of this report]

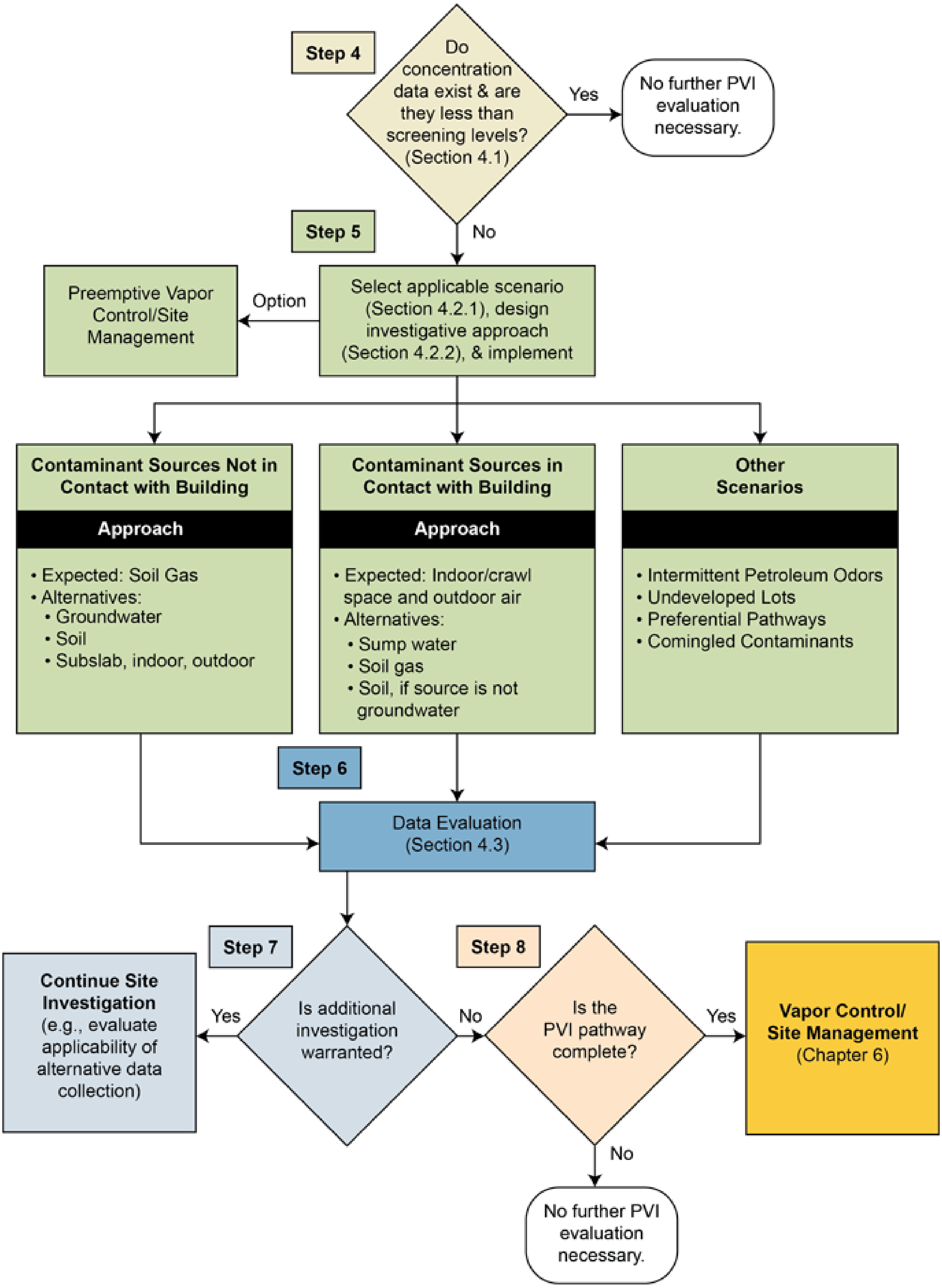

Figure 7 – Flowchart for Petroleum Vapour Intrusion Screening Application (Part 2) (ITRC, 2014) **[Please note ITRC disclaimer section at the beginning of this report]**

The ITRC guidance states that for dissolved phase hydrocarbon sources where there are no Precluding Factors then a vapour intrusion pathway will not be present if the vertical distance between the water table and the bottom of the building foundation is greater than 5' (1.5 m). The USEPA (2015a) proposes an equivalent vertical screening distance of greater than 6' (1.82 m) and suggests limits of ≤5 mg/l benzene and ≤30 mg/l TPH as indicative of a dissolved phase source. If a mobile or residual phase NAPL source is observed or indicated by exceedance of these concentration limits then a vertical screening distance of 15' >(4.6 m) is proposed.

The screening distances proposed by ITRC and the USEPA are largely based on US data and toxicological thresholds, but this should not preclude their use from the UK for a number of reasons:

- the 'acceptable' benzene soil vapour concentrations used to assess risk from the soil/vapour sample pairs were of the same order as those typically used in the UK;
- assessment of risks to buildings included both those with ground bearing slabs and ventilated voids; and
- the sites assessed included a range of soil types, and assessment of the potential effect of temperature found little effect, including at sites with colder climate than the UK.

Nevertheless care should be adopted if applying the screening criteria to the UK. Certainly, the screening distances should not be applied without first reading the guidance documents to understand whether their use is applicable at specific sites.

6.2 Diffusion versus Advection and Building Construction

The J&E model is based on a generalised assumption regarding building construction where the building foundation comprises a concrete ground bearing slab or basement with cracks, and vapour migration into the building is under advection as a result a zone of negative pressure in the soils adjacent to the foundation slab and within the building due to wind and stack effects.

This broad assumption regarding building construction is not directly relevant for a large proportion of the UK residential housing stock, with solid foundations found in about half of all residential properties, and in between 70 % and 75 % of houses built since the late 1960s (Environment Agency, 2009a). Suspended floors are likely to be found in properties built prior to the 1940s and according to Environment Agency, (2009a), the "*Johnson and Ettinger model should be applied more cautiously in these situations, since gas ingress rates could be considerably higher*".

For sites with ventilated underfloor voids, advective vapour flow into the overlying building may not be active, and diffusion may be the only dominant mechanism of soil vapour migration. As a result, the GAC_{gwvap} presented in this report are likely to be particularly conservative for this building design.

Wilson (2008) argued that the J&E model is also highly conservative with regard to a large proportion of modern UK housing stock, where ventilated underfloor voids are a "*common form of construction on brownfield sites in the UK*". Wilson set out a modular approach to calculating vapour migration through a series of basic equations, which can be adapted according to the building construction (e.g. suspended floor / slab) and vapour source present. This modular approach may be appropriate as an alternative methodology where the building construction under consideration does not meet the assumptions used within J&E / CLEA or where more detailed assessment is required.

6.3 Recommendations for Further Work

Further works that could be undertaken to build on this report are:

- development of a simple spreadsheet model incorporating the J&E algorithms for the capillary fringe effect to allow calculation of less conservative GAC;
- development of a simple spreadsheet model that incorporates the equations of Wilson (2008) (or similar) to allow calculation of GAC for floor construction types; and
- a formal review and consultation with UK regulators on the applicability of the screening distance approach within a UK context for assessing risks from hydrocarbon vapours.

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APPENDIX 1

CLEA INPUTS

Chemical	Chemical type	oral HCV						inhal HCV							Oral MDI for adults		Inhalation MDI for adults		Air-water partition coefficient (K_{aw})	
		Type	$\mu g\ kg^{-1}$ BW day^{-1}	Notes	Compare with oral exposure	Compare with dermal exposure	Compare with inhalation exposure	Type	$\mu g\ kg^{-1}$ BW day^{-1}	Notes	Compare with oral exposure	Compare with dermal exposure	Compare with inhalation exposure	Combine oral and inhalation AC	$\mu g\ day^{-1}$	Notes	$\mu g\ day^{-1}$	Notes	$cm^3\ cm^{-3}$	Notes (measured or calculated at 283K unless stated)
1,1,1,2-Tetrachloroethane	Organic	NR						TDI	5.80E+00	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		2.00E+00	Nathanail et al. 2015. LQM/CIEH S4UL	4.80E-02	CLEA SR7, EA 2008
1,1,1-Trichloroethane	Organic	NR						TDI	6.00E+02	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		3.30E+02	Nathanail et al. 2015. LQM/CIEH S4UL	3.60E-01	CLEA SR7, EA 2008
1,1,2,2-Tetrachloroethane	Organic	NR						TDI	5.80E+00	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		2.00E+00	Nathanail et al. 2015. LQM/CIEH S4UL	7.08E-03	CLEA SR7, EA 2008
1,1,2-Trichloroethane	Organic	TDI	4.00E+00	EIC/AGS/CL:AIRE GAC, 2010	Yes	Yes	No	TDI	4.85E+00	EIC/AGS/CL:AIRE GAC, 2010	No	No	Yes	Yes	2.40E-01	EIC/AGS/CL:AIRE GAC, 2010	1.00E+00	EIC/AGS/CL:AIRE GAC, 2010	1.75E-02	EIC/AGS/CL:AIRE GAC, 2010
1,1-Dichloroethane	Organic	TDI	2.00E+02	EIC/AGS/CL:AIRE GAC, 2010	Yes	Yes	Yes	NR		EIC/AGS/CL:AIRE GAC, 2010	No	No	No	NR	2.00E+01	EIC/AGS/CL:AIRE GAC, 2010	4.00E+00	EIC/AGS/CL:AIRE GAC, 2010	1.29E-01	EIC/AGS/CL:AIRE GAC, 2010
1,1-Dichloroethene	Organic	TDI	4.60E+01	EIC/AGS/CL:AIRE GAC, 2010	Yes	Yes	No	TDI	5.70E+01	EIC/AGS/CL:AIRE GAC, 2010	No	No	Yes	Yes	6.00E+00	EIC/AGS/CL:AIRE GAC, 2010	4.00E-01	EIC/AGS/CL:AIRE GAC, 2010	5.93E-01	EIC/AGS/CL:AIRE GAC, 2010
1,2,3,4-Tetrachlorobenzene	Organic	NR						TDI	3.40E+00	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		6.30E+01	Nathanail et al. 2015. LQM/CIEH S4UL	1.58E-02	CLEA SR7, EA 2008
1,2,3,5-Tetrachlorobenzene	Organic	NR						TDI	4.10E-01	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		6.30E+01	Nathanail et al. 2015. LQM/CIEH S4UL	6.61E-02	CLEA SR7, EA 2008
1,2,3-Trichlorobenzene	Organic	NR						TDI	1.00E+00	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		6.30E+01	Nathanail et al. 2015. LQM/CIEH S4UL	3.07E-02	CLEA SR7, EA 2008
1,2,4,5-Tetrachlorobenzene	Organic	NR						TDI	1.00E-01	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		6.30E+01	Nathanail et al. 2015. LQM/CIEH S4UL	1.38E-02	CLEA SR7, EA 2008
1,2,4-Trichlorobenzene	Organic	NR						TDI	2.30E+00	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		6.30E+01	Nathanail et al. 2015. LQM/CIEH S4UL	3.65E-02	CLEA SR7, EA 2008
1,2,4-Trimethylbenzene	Organic	NR		EIC/AGS/CL:AIRE GAC, 2010	No	No	No	TDI	2.00E+00	EIC/AGS/CL:AIRE GAC, 2010	Yes	Yes	Yes	Yes	2.40E+01	EIC/AGS/CL:AIRE GAC, 2010	8.60E+01	EIC/AGS/CL:AIRE GAC, 2010	8.56E-02	EIC/AGS/CL:AIRE GAC, 2010
1,2-Dichlorobenzene	Organic	NR						TDI	4.30E+01	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		1.66E+02	Nathanail et al. 2015. LQM/CIEH S4UL	3.38E-02	CLEA SR7, EA 2008
1,2-Dichloroethane	Organic	NR						ID	1.20E-01	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		NR		2.38E-02	CLEA SR7, EA 2008
1,2-Dichloropropane	Organic	TDI	1.40E+01	EIC/AGS/CL:AIRE GAC, 2010	Yes	Yes	No	TDI	1.14E+00	EIC/AGS/CL:AIRE GAC, 2010	No	No	Yes	Yes	3.80E+01	EIC/AGS/CL:AIRE GAC, 2010	5.20E+00	EIC/AGS/CL:AIRE GAC, 2010	7.19E-02	EIC/AGS/CL:AIRE GAC, 2010
1,3,5-Trichlorobenzene	Organic	NR						TDI	1.00E+00	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		6.30E+01	Nathanail et al. 2015. LQM/CIEH S4UL	1.44E-01	CLEA SR7, EA 2008
1,3-Dichlorobenzene	Organic	NR						TDI	2.00E+00	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		7.40E+01	Nathanail et al. 2015. LQM/CIEH S4UL	6.61E-02	CLEA SR7, EA 2008
1,4-Dichlorobenzene	Organic	NR						TDI	1.20E+02	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		7.30E+01	Nathanail et al. 2015. LQM/CIEH S4UL	4.70E-02	CLEA SR7, EA 2008
2-Chloronaphthalene	Organic	TDI	8.00E+01	EIC/AGS/CL:AIRE GAC, 2010	Yes	Yes	No	TDI	2.86E-01	EIC/AGS/CL:AIRE GAC, 2010	No	No	Yes	Yes	1.00E-04	EIC/AGS/CL:AIRE GAC, 2010	2.00E-02	EIC/AGS/CL:AIRE GAC, 2010	3.78E-03	EIC/AGS/CL:AIRE GAC, 2010
Acenaphthene	Organic	NR						TDI	6.00E+01	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		2.50E-02	Nathanail et al. 2015. LQM/CIEH S4UL	7.59E-04	Nathanail et al. 2015. LQM/CIEH S4UL
Acenaphthylene	Organic	NR						TDI	6.00E+01	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		1.10E-02	Nathanail et al. 2015. LQM/CIEH S4UL	5.68E-04	Nathanail et al. 2015. LQM/CIEH S4UL
Aldrin	Organic	NR						TDI	1.00E-01	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		4.00E-02	Nathanail et al. 2015. LQM/CIEH S4UL	5.79E-03	CLEA SR7, EA 2008
alpha-Endosulfan	Organic	NR						TDI	5.00E+00	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		4.00E-02	Nathanail et al. 2015. LQM/CIEH S4UL	1.89E-03	CLEA SR7, EA 2008
Benzene	Organic	NR						ID	1.40E+00	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		NR		1.16E-01	CLEA SR7, EA 2008
beta-Endosulfan	Organic	NR						TDI	5.00E+00	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		4.00E-02	Nathanail et al. 2015. LQM/CIEH S4UL	1.88E-03	At 25oC. CLEA SR7, EA 2008
Biphenyl	Organic	TDI	3.80E+01	EIC/AGS/CL:AIRE GAC, 2010	Yes	Yes	Yes	NR		EIC/AGS/CL:AIRE GAC, 2010	No	No	No	NR	4.49E+00	EIC/AGS/CL:AIRE GAC, 2010	5.24E-01	EIC/AGS/CL:AIRE GAC, 2010	5.78E-03	EIC/AGS/CL:AIRE GAC, 2010
Bromobenzene	Organic	TDI	2.40E+01	EIC/AGS/CL:AIRE GAC, 2010	Yes	Yes	No	TDI	3.43E+00	EIC/AGS/CL:AIRE GAC, 2010	No	No	Yes	Yes	0.00E+00	EIC/AGS/CL:AIRE GAC, 2010	0.00E+00	EIC/AGS/CL:AIRE GAC, 2010	3.10E-02	EIC/AGS/CL:AIRE GAC, 2010
Bromodichloromethane	Organic	ID	3.00E-01	EIC/AGS/CL:AIRE GAC, 2010	Yes	Yes	Yes	NR		EIC/AGS/CL:AIRE GAC, 2010	No	No	No	NR	NR	EIC/AGS/CL:AIRE GAC, 2010	NR	EIC/AGS/CL:AIRE GAC, 2010	3.19E-02	EIC/AGS/CL:AIRE GAC, 2010
Bromoform	Organic	TDI	2.00E+01	EIC/AGS/CL:AIRE GAC, 2010	Yes	Yes	Yes	NR		EIC/AGS/CL:AIRE GAC, 2010	No	No	No	NR	4.20E+01	EIC/AGS/CL:AIRE GAC, 2010	7.00E+01	EIC/AGS/CL:AIRE GAC, 2010	8.09E-03	EIC/AGS/CL:AIRE GAC, 2010
Carbon disulphide	Organic	NR						TDI	2.86E+01	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		1.00E+03	Nathanail et al. 2015. LQM/CIEH S4UL	4.08E-01	CLEA SR7, EA 2008
Chlorobenzene	Organic	NR						TDI	8.10E+00	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		6.30E+01	Nathanail et al. 2015. LQM/CIEH S4UL	8.31E-02	CLEA SR7, EA 2008
Chloroethane	Organic	NR		EIC/AGS/CL:AIRE GAC, 2010	No	No	No	TDI	2.86E+03	EIC/AGS/CL:AIRE GAC, 2010	Yes	Yes	Yes	NR	0.00E+00	EIC/AGS/CL:AIRE GAC, 2010	1.35E+01	EIC/AGS/CL:AIRE GAC, 2010	4.45E-01	EIC/AGS/CL:AIRE GAC, 2010
Chloroethene (Vinyl Chloride)	Organic	NR						ID	3.00E-01	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		NR		7.47E-01	CLEA SR7, EA 2008
Chloromethane	Organic	NR		EIC/AGS/CL:AIRE GAC, 2010	No	No	No	TDI	5.14E+00	EIC/AGS/CL:AIRE GAC, 2010	Yes	Yes	Yes	NR	0.00E+00	EIC/AGS/CL:AIRE GAC, 2010	2.12E+02	EIC/AGS/CL:AIRE GAC, 2010	2.71E-01	EIC/AGS/CL:AIRE GAC, 2010
Cis-1,2-Dichloroethene	Organic	TDI	6.00E+00	EIC/AGS/CL:AIRE GAC, 2010	Yes	Yes	Yes	NR		EIC/AGS/CL:AIRE GAC, 2010	No	No	No	NR	4.00E+00	EIC/AGS/CL:AIRE GAC, 2010	6.00E+00	EIC/AGS/CL:AIRE GAC, 2010	7.46E-02	EIC/AGS/CL:AIRE GAC, 2010
Dichloromethane	Organic	TDI	6.00E+00	EIC/AGS/CL:AIRE GAC, 2010	Yes	Yes	No	TDI	1.34E+02	EIC/AGS/CL:AIRE GAC, 2010	No	No	Yes	Yes	8.81E+01	EIC/AGS/CL:AIRE GAC, 2010	3.50E+02	EIC/AGS/CL:AIRE GAC, 2010	5.64E-02	EIC/AGS/CL:AIRE GAC, 2010
Ethylbenzene	Organic	NR						TDI	7.43E+01	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		1.86E+01	Nathanail et al. 2015. LQM/CIEH S4UL	1.39E-01	CLEA SR7, EA 2008
Fluorene	Organic	NR						TDI	4.00E+01	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		9.60E-02	Nathanail et al. 2015. LQM/CIEH S4UL	4.12E-04	Nathanail et al. 2015. LQM/CIEH S4UL
Hexachlorobenzene	Organic	NR						TDI	7.00E-02	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		2.00E-02	Nathanail et al. 2015. LQM/CIEH S4UL	1.04E-02	CLEA SR7, EA 2008
Hexachlorobutadiene	Organic	NR						TDI	2.00E-01	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		1.40E+00	Nathanail et al. 2015. LQM/CIEH S4UL	1.55E-01	CLEA SR7, EA 2008
Hexachloroethane	Organic	TDI	1.00E+00	EIC/AGS/CL:AIRE GAC, 2010	Yes	Yes	Yes	NR		EIC/AGS/CL:AIRE GAC, 2010	No	No	No	Yes	1.40E+01	EIC/AGS/CL:AIRE GAC, 2010	8.64E+01	EIC/AGS/CL:AIRE GAC, 2010	1.31E-01	EIC/AGS/CL:AIRE GAC, 2010
Isopropylbenzene	Organic	TDI	1.00E+02	EIC/AGS/CL:AIRE GAC, 2010	Yes	Yes	No	TDI	1.14E+02	EIC/AGS/CL:AIRE GAC, 2010	No	No	Yes	Yes	0.00E+00	EIC/AGS/CL:AIRE GAC, 2010	2.94E+02	EIC/AGS/CL:AIRE GAC, 2010	2.37E-01	EIC/AGS/CL:AIRE GAC, 2010
Mercury, elemental	Organic	NR						TDI	6.00E-02	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		2.60E-02	Nathanail et al. 2015. LQM/CIEH S4UL	1.17E-01	SGV for Mercury, EA 2009
meta-Xylene	Organic	NR						TDI	6.00E+01	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		1.04E+02	Nathanail et al. 2015. LQM/CIEH S4UL	1.12E-01	CLEA SR7, EA 2008
Methyl tertiary butyl ether	Organic	TDI	3.00E+02	EIC/AGS/CL:AIRE GAC, 2010	Yes	Yes	No	TDI	7.22E+02	EIC/AGS/CL:AIRE GAC, 2010	No	No	Yes	Yes	1.00E+00	EIC/AGS/CL:AIRE GAC, 2010	2.00E+02	EIC/AGS/CL:AIRE GAC, 2010	1.60E-02	EIC/AGS/CL:AIRE GAC, 2010
Naphthalene	Organic	NR						TDI	8.60E-01	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		2.80E+00	Nathanail et al. 2015. LQM/CIEH S4UL	6.62E-03	CLEA SR7, EA 2008
ortho-Xylene	Organic	NR						TDI	6.00E+01	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		1.04E+02	Nathanail et al. 2015. LQM/CIEH S4UL	9.20E-02	CLEA SR7, EA 2008
para-Xylene	Organic	NR						TDI	6.00E+01	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		1.04E+02	Nathanail et al. 2015. LQM/CIEH S4UL	1.07E-01	CLEA SR7, EA 2008
Pentachlorobenzene	Organic	NR						TDI	5.00E-01	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		3.40E-01	Nathanail et al. 2015. LQM/CIEH S4UL	8.30E-03	CLEA SR7, EA 2008
Propylbenzene	Organic	TDI	1.00E+02	EIC/AGS/CL:AIRE GAC, 2010	Yes	Yes	No	TDI	2.20E+02	EIC/AGS/CL:AIRE GAC, 2010	No	No	Yes	Yes	0.00E+00	EIC/AGS/CL:AIRE GAC, 2010	1.64E+01	EIC/AGS/CL:AIRE GAC, 2010	1.70E-01	EIC/AGS/CL:AIRE GAC, 2010
Styrene	Organic	TDI	1.20E+01	EIC/AGS/CL:AIRE GAC, 2010	Yes	Yes	No	TDI	2.40E+02	EIC/AGS/CL:AIRE GAC, 2010	No	No	Yes	Yes	1.00E+00	EIC/AGS/CL:AIRE GAC, 2010	5.60E+00	EIC/AGS/CL:AIRE GAC, 2010	5.33E-02	EIC/AGS/CL:AIRE GAC, 2010
Tetrachloroethene	Organic	NR						TDI	1.10E+01	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		2.00E+02	Nathanail et al. 2015. LQM/CIEH S4UL	3.16E-01	CLEA SR7, EA 2008
Tetrachloromethane (Carbon Tetrachloride)	Organic	NR						TDI	3.26E+00	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		5.00E+01	Nathanail et al. 2015. LQM/CIEH S4UL	5.82E-01	CLEA SR7, EA 2008
Toluene	Organic	NR						TDI	1.40E+03	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		9.20E+01	Nathanail et al. 2015. LQM/CIEH S4UL	1.15E-01	CLEA SR7, EA 2008
TPH Aliphatic >EC10-EC12	Organic	NR						TDI	2.90E+02	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		9.99E+99	Nathanail et al. 2015. LQM/CIEH S4UL	6.44E+01	Nathanail et al. 2015. LQM/CIEH S4UL
TPH Aliphatic >EC6-EC8	Organic	NR						TDI	5.00E+03	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		9.99E+99	Nathanail et al. 2015. LQM/CIEH S4UL	2.73E+01	Nathanail et al. 2015. LQM/CIEH S4UL
TPH Aliphatic >EC8-EC10	Organic	NR						TDI	2.90E+02	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		9.99E+99	Nathanail et al. 2015. LQM/CIEH S4UL	4.15E+01	Nathanail et al. 2015. LQM/CIEH S4UL
TPH Aliphatic EC5-EC6	Organic	NR						TDI	5.00E+03	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		9.99E+99	Nathanail et al. 2015. LQM/CIEH S4UL	2.10E+01	Nathanail et al. 2015. LQM/CIEH S4UL
TPH Aromatic >EC10-EC12	Organic	NR						TDI	6.00E+01	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		9.99E+99	Nathanail et al. 2015. LQM/CIEH S4UL	7.22E-02	Nathanail et al. 2015. LQM/CIEH S4UL
TPH Aromatic >EC12-EC16	Organic	NR						TDI	6.00E+01	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		9.99E+99	Nathanail et al. 2015. LQM/CIEH S4UL	1.26E-02	Nathanail et al. 2015. LQM/CIEH S4UL
TPH Aromatic >EC5-EC7	Organic	NR						TDI	1.40E+03	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		2.00E+02	Nathanail et al. 2015. LQM/CIEH S4UL	1.16E-01	CLEA SR7, EA 2008
TPH Aromatic >EC7-EC8	Organic	NR						TDI	1.40E+03	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		5.20E+02	Nathanail et al. 2015. LQM/CIEH S4UL	1.15E-01	CLEA SR7, EA 2008
TPH Aromatic >EC8-EC10	Organic	NR						TDI	6.00E+01	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		9.99E+99	Nathanail et al. 2015. LQM/CIEH S4UL	2.53E-01	Nathanail et al. 2015. LQM/CIEH S4UL
Trans-1,2-Dichloroethene	Organic	TDI	1.70E+01	EIC/AGS/CL:AIRE GAC, 2010	Yes	Yes	No	TDI	1.70E+01	EIC/AGS/CL:AIRE GAC, 2010	No	No	Yes	Yes	4.00E+00	EIC/AGS/CL:AIRE GAC, 2010	6.00E+00	EIC/AGS/CL:AIRE GAC, 2010	1.77E-01	EIC/AGS/CL:AIRE GAC, 2010
Trichloroethene	Organic	NR						ID	5.70E-01	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		NR		1.87E-01	CLEA SR7, EA 2008
Trichloromethane (Chloroform)	Organic	NR						TDI	4.00E+01	Nathanail et al. 2015. LQM/CIEH S4UL	No	No	Yes	NR	NR		1.00E+02	Nathanail et al. 2015. LQM/CIEH S4UL	7.65E-02	CLEA SR7, EA 2008

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Chemical	Diffusion coefficient in air		Diffusion coefficient in water		Relative molecular mass		Vapour pressure		Water solubility		Organic carbon - water partition coefficient (K_{oc})	
	$m^2 s^{-1}$	Notes (measured or calculated at 283K unless stated)	$m^2 s^{-1}$	Notes (measured or calculated at 283K unless stated)	$g mol^{-1}$	Notes	Pa	Notes (measured or calculated at 283K and standard pressure unless stated)	$mg L^{-1}$	Notes (measured or calculated at 283K unless stated)	Log ($cm^3 g^{-1}$)	Notes
1,1,1,2-Tetrachloroethane	6.90E-06	CLEA SR7, EA 2008	5.43E-10	CLEA SR7, EA 2008	167.85	CLEA SR7, EA 2008	7.48E+02	CLEA SR7, EA 2008	1.11E+03	CLEA SR7, EA 2008	2.55E+00	CLEA SR7, EA 2008
1,1,1-Trichloroethane	7.75E-06	CLEA SR7, EA 2008	5.99E-10	CLEA SR7, EA 2008	133.4	CLEA SR7, EA 2008	8.25E+03	CLEA SR7, EA 2008	1.30E+03	CLEA SR7, EA 2008	2.12E+00	CLEA SR7, EA 2008
1,1,2,2-Tetrachloroethane	6.84E-06	CLEA SR7, EA 2008	5.43E-10	CLEA SR7, EA 2008	167.85	CLEA SR7, EA 2008	2.91E+02	CLEA SR7, EA 2008	2.93E+03	CLEA SR7, EA 2008	2.04E+00	CLEA SR7, EA 2008
1,1,2-Trichloroethane	7.58E-06	EIC/AGS/CL:AIRE GAC, 2010	5.99E-10	EIC/AGS/CL:AIRE GAC, 2010	133.4033	EIC/AGS/CL:AIRE GAC, 2010	1.39E+03	EIC/AGS/CL:AIRE GAC, 2010	4.49E+03	EIC/AGS/CL:AIRE GAC, 2010	2.03E+00	EIC/AGS/CL:AIRE GAC, 2010
1,1-Dichloroethane	8.73E-06	EIC/AGS/CL:AIRE GAC, 2010	6.74E-10	EIC/AGS/CL:AIRE GAC, 2010	98.96	EIC/AGS/CL:AIRE GAC, 2010	1.55E+04	EIC/AGS/CL:AIRE GAC, 2010	3.67E+03	EIC/AGS/CL:AIRE GAC, 2010	1.55E+00	EIC/AGS/CL:AIRE GAC, 2010
1,1-Dichloroethene	9.18E-06	EIC/AGS/CL:AIRE GAC, 2010	7.08E-10	EIC/AGS/CL:AIRE GAC, 2010	96.9427	EIC/AGS/CL:AIRE GAC, 2010	4.20E+04	EIC/AGS/CL:AIRE GAC, 2010	3.10E+03	EIC/AGS/CL:AIRE GAC, 2010	1.83E+00	EIC/AGS/CL:AIRE GAC, 2010
1,2,3,4-Tetrachlorobenzene	5.69E-06	CLEA SR7, EA 2008	4.59E-10	CLEA SR7, EA 2008	215.89	CLEA SR7, EA 2008	5.97E-01	CLEA SR7, EA 2008	7.80E+00	At 25oC. CLEA SR7, EA 2008	3.78E+00	CLEA SR7, EA 2008
1,2,3,5-Tetrachlorobenzene	5.71E-06	CLEA SR7, EA 2008	4.59E-10	CLEA SR7, EA 2008	215.89	CLEA SR7, EA 2008	7.53E-01	CLEA SR7, EA 2008	3.50E+00	At 25oC. CLEA SR7, EA 2008	3.81E+00	CLEA SR7, EA 2008
1,2,3-Trichlorobenzene	6.16E-06	CLEA SR7, EA 2008	4.94E-10	CLEA SR7, EA 2008	181.45	CLEA SR7, EA 2008	3.50E+00	CLEA SR7, EA 2008	2.10E+01	At 25oC. CLEA SR7, EA 2008	3.41E+00	CLEA SR7, EA 2008
1,2,4,5-Tetrachlorobenzene	5.72E-06	CLEA SR7, EA 2008	4.59E-10	CLEA SR7, EA 2008	215.89	CLEA SR7, EA 2008	9.04E-02	CLEA SR7, EA 2008	6.00E-01	At 25oC. CLEA SR7, EA 2008	3.75E+00	CLEA SR7, EA 2008
1,2,4-Trichlorobenzene	6.17E-06	CLEA SR7, EA 2008	4.94E-10	CLEA SR7, EA 2008	181.45	CLEA SR7, EA 2008	1.11E+01	CLEA SR7, EA 2008	4.14E+01	At 25oC. CLEA SR7, EA 2008	3.36E+00	CLEA SR7, EA 2008
1,2,4-Trimethylbenzene	6.44E-06	EIC/AGS/CL:AIRE GAC, 2010	4.87E-10	EIC/AGS/CL:AIRE GAC, 2010	120.191	EIC/AGS/CL:AIRE GAC, 2010	1.10E+02	EIC/AGS/CL:AIRE GAC, 2010	5.59E+02	EIC/AGS/CL:AIRE GAC, 2010	3.15E+00	EIC/AGS/CL:AIRE GAC, 2010
1,2-Dichlorobenzene	6.75E-06	CLEA SR7, EA 2008	5.37E-10	CLEA SR7, EA 2008	147	CLEA SR7, EA 2008	7.21E+01	CLEA SR7, EA 2008	1.33E+02	CLEA SR7, EA 2008	2.84E+00	CLEA SR7, EA 2008
1,2-Dichloroethane	8.60E-06	CLEA SR7, EA 2008	6.74E-10	CLEA SR7, EA 2008	98.96	CLEA SR7, EA 2008	4.92E+03	CLEA SR7, EA 2008	8.68E+03	CLEA SR7, EA 2008	1.30E+00	CLEA SR7, EA 2008
1,2-Dichloropropane	7.74E-06	EIC/AGS/CL:AIRE GAC, 2010	5.95E-10	EIC/AGS/CL:AIRE GAC, 2010	112.99	EIC/AGS/CL:AIRE GAC, 2010	3.07E+03	EIC/AGS/CL:AIRE GAC, 2010	2.05E+03	EIC/AGS/CL:AIRE GAC, 2010	1.71E+00	EIC/AGS/CL:AIRE GAC, 2010
1,3,5-Trichlorobenzene	6.19E-06	CLEA SR7, EA 2008	4.94E-10	CLEA SR7, EA 2008	181.45	CLEA SR7, EA 2008	4.41E+00	CLEA SR7, EA 2008	6.00E+00	At 25oC. CLEA SR7, EA 2008	3.42E+00	CLEA SR7, EA 2008
1,3-Dichlorobenzene	6.77E-06	CLEA SR7, EA 2008	5.37E-10	CLEA SR7, EA 2008	147	CLEA SR7, EA 2008	1.09E+02	CLEA SR7, EA 2008	1.03E+02	CLEA SR7, EA 2008	2.92E+00	CLEA SR7, EA 2008
1,4-Dichlorobenzene	6.77E-06	CLEA SR7, EA 2008	5.37E-10	CLEA SR7, EA 2008	147	CLEA SR7, EA 2008	3.85E+01	CLEA SR7, EA 2008	5.12E+01	CLEA SR7, EA 2008	2.85E+00	CLEA SR7, EA 2008
2-Chloronaphthalene	5.95E-06	EIC/AGS/CL:AIRE GAC, 2010	4.77E-10	EIC/AGS/CL:AIRE GAC, 2010	162.62	EIC/AGS/CL:AIRE GAC, 2010	5.01E-01	EIC/AGS/CL:AIRE GAC, 2010	1.17E+01	EIC/AGS/CL:AIRE GAC, 2010	3.32E+00	EIC/AGS/CL:AIRE GAC, 2010
Acenaphthene	5.85E-06	Nathanail et al. 2015. LQM/CIEH S4UL	4.70E-10	Nathanail et al. 2015. LQM/CIEH S4UL	154.21	Nathanail et al. 2015. LQM/CIEH S4UL	7.37E-02	Nathanail et al. 2015. LQM/CIEH S4UL	4.11E+00	Nathanail et al. 2015. LQM/CIEH S4UL	3.37E+00	Nathanail et al. 2015. LQM/CIEH S4UL
Acenaphthylene	5.97E-06	Nathanail et al. 2015. LQM/CIEH S4UL	4.82E-10	Nathanail et al. 2015. LQM/CIEH S4UL	152.19	Nathanail et al. 2015. LQM/CIEH S4UL	7.08E-02	Nathanail et al. 2015. LQM/CIEH S4UL	7.95E+00	Nathanail et al. 2015. LQM/CIEH S4UL	3.26E+00	Nathanail et al. 2015. LQM/CIEH S4UL
Aldrin	4.12E-06	CLEA SR7, EA 2008	3.29E-10	CLEA SR7, EA 2008	364.91	CLEA SR7, EA 2008	1.35E-02	CLEA SR7, EA 2008	2.00E-02	At 25oC. CLEA SR7, EA 2008	5.34E+00	CLEA SR7, EA 2008
alpha-Endosulfan	4.08E-06	CLEA SR7, EA 2008	3.31E-10	CLEA SR7, EA 2008	406.93	CLEA SR7, EA 2008	6.11E-03	At 25oC. CLEA SR7, EA 2008	5.30E-01	At 25oC. CLEA SR7, EA 2008	2.94E+00	CLEA SR7, EA 2008
Benzene	8.77E-06	CLEA SR7, EA 2008	6.64E-10	CLEA SR7, EA 2008	78.11	CLEA SR7, EA 2008	6.24E+03	CLEA SR7, EA 2008	1.78E+03	CLEA SR7, EA 2008	1.83E+00	CLEA SR7, EA 2008
beta-Endosulfan	4.01E-06	CLEA SR7, EA 2008	3.31E-10	CLEA SR7, EA 2008	406.93	CLEA SR7, EA 2008	3.20E-03	At 25oC. CLEA SR7, EA 2008	2.80E-01	At 25oC. CLEA SR7, EA 2008	2.90E+00	CLEA SR7, EA 2008
Biphenyl	5.74E-06	EIC/AGS/CL:AIRE GAC, 2010	4.51E-10	EIC/AGS/CL:AIRE GAC, 2010	154.21	EIC/AGS/CL:AIRE GAC, 2010	3.58E-01	EIC/AGS/CL:AIRE GAC, 2010	4.06E+00	EIC/AGS/CL:AIRE GAC, 2010	3.15E+00	EIC/AGS/CL:AIRE GAC, 2010
Bromobenzene	7.21E-06	EIC/AGS/CL:AIRE GAC, 2010	5.85E-10	EIC/AGS/CL:AIRE GAC, 2010	157.01	EIC/AGS/CL:AIRE GAC, 2010	1.80E+02	EIC/AGS/CL:AIRE GAC, 2010	3.88E+02	EIC/AGS/CL:AIRE GAC, 2010	2.52E+00	EIC/AGS/CL:AIRE GAC, 2010
Bromodichloromethane	8.16E-06	EIC/AGS/CL:AIRE GAC, 2010	6.70E-10	EIC/AGS/CL:AIRE GAC, 2010	163.83	EIC/AGS/CL:AIRE GAC, 2010	3.79E+03	EIC/AGS/CL:AIRE GAC, 2010	3.00E+03	EIC/AGS/CL:AIRE GAC, 2010	1.74E+00	EIC/AGS/CL:AIRE GAC, 2010
Bromoform	7.56E-06	EIC/AGS/CL:AIRE GAC, 2010	6.51E-10	EIC/AGS/CL:AIRE GAC, 2010	252.73	EIC/AGS/CL:AIRE GAC, 2010	3.05E+02	EIC/AGS/CL:AIRE GAC, 2010	3.00E+03	EIC/AGS/CL:AIRE GAC, 2010	2.03E+00	EIC/AGS/CL:AIRE GAC, 2010
Carbon disulphide	1.04E-05	CLEA SR7, EA 2008	8.28E-10	CLEA SR7, EA 2008	76.14	CLEA SR7, EA 2008	2.65E+04	CLEA SR7, EA 2008	2.10E+03	At 20oC. CLEA SR7, EA 2008	2.06E+00	CLEA SR7, EA 2008
Chlorobenzene	7.57E-06	CLEA SR7, EA 2008	5.92E-10	CLEA SR7, EA 2008	112.56	CLEA SR7, EA 2008	6.73E+02	CLEA SR7, EA 2008	3.87E+02	CLEA SR7, EA 2008	2.40E+00	CLEA SR7, EA 2008
Chloroethane	1.05E-05	EIC/AGS/CL:AIRE GAC, 2010	7.83E-10	EIC/AGS/CL:AIRE GAC, 2010	64.51	EIC/AGS/CL:AIRE GAC, 2010	9.33E+04	EIC/AGS/CL:AIRE GAC, 2010	5.74E+03	EIC/AGS/CL:AIRE GAC, 2010	1.27E+00	EIC/AGS/CL:AIRE GAC, 2010
Chloroethene (Vinyl Chloride)	1.11E-05	CLEA SR7, EA 2008	8.34E-10	CLEA SR7, EA 2008	62.5	CLEA SR7, EA 2008	2.20E+05	CLEA SR7, EA 2008	2.76E+03	At 25oC. CLEA SR7, EA 2008	1.22E+00	CLEA SR7, EA 2008
Chloromethane	1.28E-05	EIC/AGS/CL:AIRE GAC, 2010	9.70E-10	EIC/AGS/CL:AIRE GAC, 2010	50.488	EIC/AGS/CL:AIRE GAC, 2010	3.31E+05	EIC/AGS/CL:AIRE GAC, 2010	5.35E+03	EIC/AGS/CL:AIRE GAC, 2010	8.40E-01	EIC/AGS/CL:AIRE GAC, 2010
Cis-1,2-Dichloroethene	9.02E-06	EIC/AGS/CL:AIRE GAC, 2010	7.08E-10	EIC/AGS/CL:AIRE GAC, 2010	96.941	EIC/AGS/CL:AIRE GAC, 2010	1.37E+04	EIC/AGS/CL:AIRE GAC, 2010	7.55E+03	EIC/AGS/CL:AIRE GAC, 2010	1.61E+00	EIC/AGS/CL:AIRE GAC, 2010
Dichloromethane	9.97E-06	EIC/AGS/CL:AIRE GAC, 2010	7.91E-10	EIC/AGS/CL:AIRE GAC, 2010	84.93	EIC/AGS/CL:AIRE GAC, 2010	3.14E+04	EIC/AGS/CL:AIRE GAC, 2010	2.01E+04	EIC/AGS/CL:AIRE GAC, 2010	1.14E+00	EIC/AGS/CL:AIRE GAC, 2010
Ethylbenzene	7.04E-06	CLEA SR7, EA 2008	5.31E-10	CLEA SR7, EA 2008	106.17	CLEA SR7, EA 2008	5.53E+02	CLEA SR7, EA 2008	1.80E+02	CLEA SR7, EA 2008	2.65E+00	CLEA SR7, EA 2008
Fluorene	5.58E-06	Nathanail et al. 2015. LQM/CIEH S4UL	4.47E-10	Nathanail et al. 2015. LQM/CIEH S4UL	166.22	Nathanail et al. 2015. LQM/CIEH S4UL	1.56E-02	Nathanail et al. 2015. LQM/CIEH S4UL	1.86E+00	Nathanail et al. 2015. LQM/CIEH S4UL	3.45E+00	Nathanail et al. 2015. LQM/CIEH S4UL
Hexachlorobenzene	4.99E-06	CLEA SR7, EA 2008	4.06E-10	CLEA SR7, EA 2008	284.78	CLEA SR7, EA 2008	8.69E-05	CLEA SR7, EA 2008	9.60E-03	At 25oC. CLEA SR7, EA 2008	4.53E+00	CLEA SR7, EA 2008
Hexachlorobutadiene	5.40E-06	CLEA SR7, EA 2008	4.23E-10	CLEA SR7, EA 2008	260.76	CLEA SR7, EA 2008	3.30E+01	CLEA SR7, EA 2008	4.80E+00	At 25oC. CLEA SR7, EA 2008	4.04E+00	CLEA SR7, EA 2008
Hexachloroethane	5.87E-06	EIC/AGS/CL:AIRE GAC, 2010	4.63E-10	EIC/AGS/CL:AIRE GAC, 2010	236.74	EIC/AGS/CL:AIRE GAC, 2010	8.19E-01	EIC/AGS/CL:AIRE GAC, 2010	4.99E+01	EIC/AGS/CL:AIRE GAC, 2010	3.34E+00	EIC/AGS/CL:AIRE GAC, 2010
Isopropylbenzene	6.49E-06	EIC/AGS/CL:AIRE GAC, 2010	4.87E-10	EIC/AGS/CL:AIRE GAC, 2010	120.19	EIC/AGS/CL:AIRE GAC, 2010	2.67E+02	EIC/AGS/CL:AIRE GAC, 2010	5.60E+01	EIC/AGS/CL:AIRE GAC, 2010	3.06E+00	EIC/AGS/CL:AIRE GAC, 2010
Mercury, elemental	6.34E-06	SGV for Mercury, EA 2009	2.00E-09	SGV for Mercury, EA 2009	200.59	SGV for Mercury, EA 2009	7.03E-02	SGV for Mercury, EA 2009	5.60E-02	SGV for Mercury, EA 2009	4.16E+00	SGV for Mercury, EA 2009
meta-Xylene	7.03E-06	CLEA SR7, EA 2008	5.31E-10	CLEA SR7, EA 2008	106.17	CLEA SR7, EA 2008	4.95E+02	CLEA SR7, EA 2008	2.00E+02	CLEA SR7, EA 2008	2.69E+00	CLEA SR7, EA 2008
Methyl tertiary butyl ether	7.82E-06	EIC/AGS/CL:AIRE GAC, 2010	5.62E-10	EIC/AGS/CL:AIRE GAC, 2010	88.1482	EIC/AGS/CL:AIRE GAC, 2010	1.84E+04	EIC/AGS/CL:AIRE GAC, 2010	4.80E+04	EIC/AGS/CL:AIRE GAC, 2010	1.53E+00	EIC/AGS/CL:AIRE GAC, 2010
Naphthalene	6.52E-06	CLEA SR7, EA 2008	5.16E-10	CLEA SR7, EA 2008	128.17	CLEA SR7, EA 2008	2.31E+00	CLEA SR7, EA 2008	1.90E+01	CLEA SR7, EA 2008	2.81E+00	CLEA SR7, EA 2008
ortho-Xylene	7.01E-06	CLEA SR7, EA 2008	5.31E-10	CLEA SR7, EA 2008	106.17	CLEA SR7, EA 2008	3.86E+02	CLEA SR7, EA 2008	1.73E+02	At 25oC. CLEA SR7, EA 2008	2.63E+00	CLEA SR7, EA 2008
para-Xylene	7.04E-06	CLEA SR7, EA 2008	5.31E-10	CLEA SR7, EA 2008	106.17	CLEA SR7, EA 2008	4.75E+02	CLEA SR7, EA 2008	2.00E+02	CLEA SR7, EA 2008	2.65E+00	CLEA SR7, EA 2008
Pentachlorobenzene	5.34E-06	CLEA SR7, EA 2008	4.31E-10	CLEA SR7, EA 2008	250.34	CLEA SR7, EA 2008	6.33E-02	CLEA SR7, EA 2008	5.00E-01	At 25oC. CLEA SR7, EA 2008	4.17E+00	CLEA SR7, EA 2008
Propylbenzene	6.35E-06	EIC/AGS/CL:AIRE GAC, 2010	4.75E-10	EIC/AGS/CL:AIRE GAC, 2010	120.19	EIC/AGS/CL:AIRE GAC, 2010	1.80E+02	EIC/AGS/CL:AIRE GAC, 2010	5.41E+01	EIC/AGS/CL:AIRE GAC, 2010	3.09E+00	EIC/AGS/CL:AIRE GAC, 2010
Styrene	7.19E-06	EIC/AGS/CL:AIRE GAC, 2010	5.48E-10	EIC/AGS/CL:AIRE GAC, 2010	104.15	EIC/AGS/CL:AIRE GAC, 2010	3.50E+02	EIC/AGS/CL:AIRE GAC, 2010	2.90E+02	EIC/AGS/CL:AIRE GAC, 2010	2.51E+00	EIC/AGS/CL:AIRE GAC, 2010
Tetrachloroethene	7.10E-06	CLEA SR7, EA 2008	5.61E-10	CLEA SR7, EA 2008	165.83	CLEA SR7, EA 2008	1.01E+03	CLEA SR7, EA 2008	2.25E+02	CLEA SR7, EA 2008	2.43E+00	CLEA SR7, EA 2008
Tetrachloromethane (Carbon Tetrachloride)	7.69E-06	CLEA SR7, EA 2008	6.03E-10	CLEA SR7, EA 2008	153.82	CLEA SR7, EA 2008	7.53E+03	CLEA SR7, EA 2008	8.46E+02	CLEA SR7, EA 2008	2.39E+00	CLEA SR7, EA 2008
Toluene	7.78E-06	CLEA SR7, EA 2008	5.88E-10	CLEA SR7, EA 2008	92.14	CLEA SR7, EA 2008	1.73E+03	CLEA SR7, EA 2008	5.90E+02	CLEA SR7, EA 2008	2.31E+00	CLEA SR7, EA 2008
TPH Aliphatic >EC10-EC12	1.00E-05	Nathanail et al. 2015. LQM/CIEH S4UL	1.00E-09	Nathanail et al. 2015. LQM/CIEH S4UL	160	Nathanail et al. 2015. LQM/CIEH S4UL	3.21E+01	Nathanail et al. 2015. LQM/CIEH S4UL	3.39E-02	Nathanail et al. 2015. LQM/CIEH S4UL	5.38E+00	Nathanail et al. 2015. LQM/CIEH S4UL
TPH Aliphatic >EC6-EC8	1.00E-05	Nathanail et al. 2015. LQM/CIEH S4UL	1.00E-09	Nathanail et al. 2015. LQM/CIEH S4UL	100	Nathanail et al. 2015. LQM/CIEH S4UL	3.45E+03	Nathanail et al. 2015. LQM/CIEH S4UL	5.37E+00	Nathanail et al. 2015. LQM/CIEH S4UL	3.58E+00	Nathanail et al. 2015. LQM/CIEH S4UL
TPH Aliphatic >EC8-EC10	1.00E-05	Nathanail et al. 2015. LQM/CIEH S4UL	1.00E-09	Nathanail et al. 2015. LQM/CIEH S4UL	130	Nathanail et al. 2015. LQM/CIEH S4UL	3.20E+02	Nathanail et al. 2015. LQM/CIEH S4UL	4.27E-01	Nathanail et al. 2015. LQM/CIEH S4UL	4.48E+00	Nathanail et al. 2015. LQM/CIEH S4UL
TPH Aliphatic EC5-EC6	1.00E-05	Nathanail et al. 2015. LQM/CIEH S4UL	1.00E-09	Nathanail et al. 2015. LQM/CIEH S4UL	81	Nathanail et al. 2015. LQM/CIEH S4UL	2.19E+04	Nathanail et al. 2015. LQM/CIEH S4UL	3.59E+01	Nathanail et al. 2015. LQM/CIEH S4UL	2.91E+00	Nathanail et al. 2015. LQM/CIEH S4UL
TPH Aromatic >EC10-EC12	1.00E-05	Nathanail et al. 2015. LQM/CIEH S4UL	1.00E-09	Nathanail et al. 2015. LQM/CIEH S4UL	130	Nathanail et al. 2015. LQM/CIEH S4UL	3.21E+01	Nathanail et al. 2015. LQM/CIEH S4UL	2.45E+01	Nathanail et al. 2015. LQM/CIEH S4UL	3.40E+00	Nathanail et al. 2015. LQM/CIEH S4UL
TPH Aromatic >EC12-EC16	1.00E-05	Nathanail et al. 2015. LQM/CIEH S4UL	1.00E-09	Nathanail et al. 2015. LQM/CIEH S4UL	150	Nathanail et al. 2015. LQM/CIEH S4UL	1.14E+00	Nathanail et al. 2015. LQM/CIEH S4UL	5.75E+00	Nathanail et al. 2015. LQM/CIEH S4UL	3.70E+00	Nathanail et al. 2015. LQM/CIEH S4UL
TPH Aromatic >EC5-EC7	8.77E-06	CLEA SR7, EA 2008	6.64E-10	CLEA SR7, EA 2008	78.11	CLEA SR7, EA 2008	6.24E+03	CLEA SR7, EA 2008	1.78E+03	CLEA SR7, EA 2008	1.83E+00	CLEA SR7, EA 2008
TPH Aromatic >EC7-EC8	7.78E-06	CLEA SR7, EA 2008	5.88E-10	CLEA SR7, EA 2008	92.14	CLEA SR7, EA 2008	1.73E+03	CLEA SR7, EA 2008	5.90E+02	CLEA SR7, EA 2008	2.31E+00	CLEA SR7, EA 2008
TPH Aromatic >EC8-EC10	1.00E-05	Nathanail et al. 2015. LQM/CIEH S4UL	1.00E-09	Nathanail et al. 2015. LQM/CIEH S4UL	120	Nathanail et al. 2015. LQM/CIEH S4UL	3.20E+02	Nathanail et al. 2015. LQM/CIEH S4UL	6.46E+01	Nathanail et al. 2015. LQM/CIEH S4UL	3.20E+00	Nathanail et al. 2015. LQM/CIEH S4UL
Trans-1,2-Dichloroethene	9.09E-06	EIC/AGS/CL:AIRE GAC, 2010	7.08E-10	EIC/AGS/CL:AIRE GAC, 2010	96.94	EIC/AGS/CL:AIRE GAC, 2010	2.26E+04	EIC/AGS/CL:AIRE GAC, 2010	5.25E+03	EIC/AGS/CL:AIRE GAC, 2010	1.78E+00	EIC/AGS/CL:AIRE GAC, 2010
Trichloroethene	7.91E-06	CLEA SR7, EA 2008	6.23E-10	CLEA SR7, EA 2008	131.39	CLEA SR7, EA 2008	4.58E+03	CLEA SR7, EA 2008	1.37E+03	CLEA SR7, EA 2008	2.15E+00	CLEA SR7, EA 2008
Trichloromethane (Chloroform)	8.60E-06	CLEA SR7, EA 2008	6.80E-10	CLEA SR7, EA 2008	119.38	CLEA SR7, EA 2008	1.35E+04	CLEA SR7, EA 2008	8.95E+03	CLEA SR7, EA 2008	1.70E+00	CLEA SR7, EA 2008

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Chemical	Octanol - water partition coefficient (K_{ow})		Soil-water partition coefficient (K_d)		Dermal absorption fraction		Soil-plant availability correction	Root - shoot correction factor	Root - root store correction factor	Root - tuber correction factor	Root - fruit correction factor	Soil-to-plant concentration factor (green vegetables)			Soil-to-plant concentration factor (root vegetables)		
	Log (dimensionless)	Notes	$cm^3 g^{-1}$	Notes	dimensionless	Notes	dimensionless	dimensonless	dimensonless	dimensonless	dimensonless	mg g^{-1} plant (DW or FW basis) over mg g^{-1} DW soil	Type	Notes	mg g^{-1} plant (DW or FW basis) over mg g^{-1} DW soil	Type	Notes
1,1,1,2-Tetrachloroethane	3.03E+00	CLEA SR7, EA 2008	NR		1.10E+00	CLEA SR3. EA 2009	NR	NR	NR	NR	NR		Model			Model	
1,1,1-Trichloroethane	2.49E+00	CLEA SR7, EA 2008	NR		1.00E-01	CLEA SR3. EA 2009	NR	NR	NR	NR	NR		Model			Model	
1,1,2,2-Tetrachloroethane	2.39E+00	CLEA SR7, EA 2008	NR		1.00E-01	CLEA SR3. EA 2009	NR	NR	NR	NR	NR		Model			Model	
1,1,2-Trichloroethane	2.38E+00	EIC/AGS/CL:AIRE GAC, 2010	NR		1.00E-01	EIC/AGS/CL:AIRE GAC, 2010	NR	NR	NR	NR	NR		Model			Model	
1,1-Dichloroethane	1.79E+00	EIC/AGS/CL:AIRE GAC, 2010	NR		1.00E-01	EIC/AGS/CL:AIRE GAC, 2010	NR	NR	NR	NR	NR		Model			Model	
1,1-Dichloroethene	2.13E+00	EIC/AGS/CL:AIRE GAC, 2010	NR		1.00E-01	EIC/AGS/CL:AIRE GAC, 2010	NR	NR	NR	NR	NR		Model			Model	
1,2,3,4-Tetrachlorobenzene	4.54E+00	CLEA SR7, EA 2008	NR		1.00E-01	CLEA SR3. EA 2009	NR	NR	NR	NR	NR		Model			Model	
1,2,3,5-Tetrachlorobenzene	4.58E+00	CLEA SR7, EA 2008	NR		1.00E-01	CLEA SR3. EA 2009	NR	NR	NR	NR	NR		Model			Model	
1,2,3-Trichlorobenzene	4.09E+00	CLEA SR7, EA 2008	NR		1.00E-01	CLEA SR3. EA 2009	NR	NR	NR	NR	NR		Model			Model	
1,2,4,5-Tetrachlorobenzene	4.51E+00	CLEA SR7, EA 2008	NR		1.00E-01	CLEA SR3. EA 2009	NR	NR	NR	NR	NR		Model			Model	
1,2,4-Trichlorobenzene	4.03E+00	CLEA SR7, EA 2008	NR		1.00E-01	CLEA SR3. EA 2009	NR	NR	NR	NR	NR		Model			Model	
1,2,4-Trimethylbenzene	3.76E+00	EIC/AGS/CL:AIRE GAC, 2010	NR		1.00E-01	EIC/AGS/CL:AIRE GAC, 2010	NR	NR	NR	NR	NR		Model			Model	
1,2-Dichlorobenzene	3.38E+00	CLEA SR7, EA 2008	NR		1.00E-01	CLEA SR3. EA 2009	NR	NR	NR	NR	NR		Model			Model	
1,2-Dichloroethane	1.48E+00	CLEA SR7, EA 2008	NR		1.00E-01	CLEA SR3. EA 2009	NR	NR	NR	NR	NR		Model			Model	
1,2-Dichloropropane	1.99E+00	EIC/AGS/CL:AIRE GAC, 2010	NR		1.00E-01	EIC/AGS/CL:AIRE GAC, 2010	NR	NR	NR	NR	NR		Model			Model	
1,3,5-Trichlorobenzene	4.10E+00	CLEA SR7, EA 2008	NR		1.00E-01	CLEA SR3. EA 2009	NR	NR	NR	NR	NR		Model			Model	
1,3-Dichlorobenzene	3.48E+00	CLEA SR7, EA 2008	NR		1.00E-01	CLEA SR3. EA 2009	NR	NR	NR	NR	NR		Model			Model	
1,4-Dichlorobenzene	3.40E+00	CLEA SR7, EA 2008	NR		1.00E-01	CLEA SR3. EA 2009	NR	NR	NR	NR	NR		Model			Model	
2-Chloronaphthalene	3.98E+00	EIC/AGS/CL:AIRE GAC, 2010	NR		1.00E-01	EIC/AGS/CL:AIRE GAC, 2010	NR	NR	NR	NR	NR		Model			Model	
Acenaphthene	4.03E+00	Nathanail et al. 2015. LQM/CIEH S4UL	NR		1.30E-01	Nathanail et al. 2015. LQM/CIEH S4UL	NR	NR	NR	NR	NR		Model			Model	
Acenaphthylene	3.91E+00	Nathanail et al. 2015. LQM/CIEH S4UL	NR		1.30E-01	Nathanail et al. 2015. LQM/CIEH S4UL	NR	NR	NR	NR	NR		Model			Model	
Aldrin	6.47E+00	CLEA SR7, EA 2008	NR		1.00E-01	CLEA SR3. EA 2009	NR	NR	NR	NR	NR		Model			Model	
alpha-Endosulfan	3.69E+00	CLEA SR7, EA 2008	NR		1.00E-01	CLEA SR3. EA 2009	NR	NR	NR	NR	NR		Model			Model	
Benzene	2.13E+00	CLEA SR7, EA 2008	NR		1.00E-01	CLEA SR3. EA 2009	NR	NR	NR	NR	NR		Model			Model	
beta-Endosulfan	3.62E+00	CLEA SR7, EA 2008	NR		1.00E-01	CLEA SR3. EA 2009	NR	NR	NR	NR	NR		Model			Model	
Biphenyl	3.76E+00	EIC/AGS/CL:AIRE GAC, 2010	NR		1.00E-01	EIC/AGS/CL:AIRE GAC, 2010	NR	NR	NR	NR	NR		Model			Model	
Bromobenzene	2.99E+00	EIC/AGS/CL:AIRE GAC, 2010	NR		1.00E-01	EIC/AGS/CL:AIRE GAC, 2010	NR	NR	NR	NR	NR		Model			Model	
Bromodichloromethane	2.02E+00	EIC/AGS/CL:AIRE GAC, 2010	NR		1.00E-01	EIC/AGS/CL:AIRE GAC, 2010	NR	NR	NR	NR	NR		Model			Model	
Bromoform	2.38E+00	EIC/AGS/CL:AIRE GAC, 2010	NR		1.00E-01	EIC/AGS/CL:AIRE GAC, 2010	NR	NR	NR	NR	NR		Model			Model	
Carbon disulphide	2.00E+00	CLEA SR7, EA 2008	NR		1.00E-01	CLEA SR3. EA 2009	NR	NR	NR	NR	NR		Model			Model	
Chlorobenzene	2.84E+00	CLEA SR7, EA 2008	NR		1.00E-01	CLEA SR3. EA 2009	NR	NR	NR	NR	NR		Model			Model	
Chloroethane	1.44E+00	EIC/AGS/CL:AIRE GAC, 2010	NR		1.00E-01	EIC/AGS/CL:AIRE GAC, 2010	NR	NR	NR	NR	NR		Model			Model	
Chloroethene (Vinyl Chloride)	1.38E+00	CLEA SR7, EA 2008	NR		1.00E-01	CLEA SR3. EA 2009	NR	NR	NR	NR	NR		Model			Model	
Chloromethane	9.10E-01	EIC/AGS/CL:AIRE GAC, 2010	NR		1.00E-01	EIC/AGS/CL:AIRE GAC, 2010	NR	NR	NR	NR	NR		Model			Model	
Cis-1,2-Dichloroethene	1.86E+00	EIC/AGS/CL:AIRE GAC, 2010	NR		1.00E-01	EIC/AGS/CL:AIRE GAC, 2010	NR	NR	NR	NR	NR		Model			Model	
Dichloromethane	1.28E+00	EIC/AGS/CL:AIRE GAC, 2010	NR		1.00E-01	EIC/AGS/CL:AIRE GAC, 2010	NR	NR	NR	NR	NR		Model			Model	
Ethylbenzene	3.15E+00	CLEA SR7, EA 2008	NR		1.00E-01	CLEA SR3. EA 2009	NR	NR	NR	NR	NR		Model			Model	
Fluorene	4.13E+00	Nathanail et al. 2015. LQM/CIEH S4UL	NR		1.30E-01	Nathanail et al. 2015. LQM/CIEH S4UL	NR	NR	NR	NR	NR		Model			Model	
Hexachlorobenzene	5.47E+00	CLEA SR7, EA 2008	NR		1.00E-01	CLEA SR3. EA 2009	NR	NR	NR	NR	NR		Model			Model	
Hexachlorobutadiene	4.86E+00	CLEA SR7, EA 2008	NR		1.00E-01	CLEA SR3. EA 2009	NR	NR	NR	NR	NR		Model			Model	
Hexachloroethane	4.00E+00	EIC/AGS/CL:AIRE GAC, 2010	NR		1.00E-01	EIC/AGS/CL:AIRE GAC, 2010	NR	NR	NR	NR	NR		Model			Model	
Isopropylbenzene	3.65E+00	EIC/AGS/CL:AIRE GAC, 2010	NR		1.00E-01	EIC/AGS/CL:AIRE GAC, 2010	NR	NR	NR	NR	NR		Model			Model	
Mercury, elemental	6.20E-01	SGV for Mercury, EA 2009	NR		1.00E-01	EA. 2009. SGV for Mercury	NR	NR	NR	NR	NR		Model			Model	
meta-Xylene	3.20E+00	CLEA SR7, EA 2008	NR		1.00E-01	CLEA SR3. EA 2009	NR	NR	NR	NR	NR		Model			Model	
Methyl tertiary butyl ether	9.40E-01	EIC/AGS/CL:AIRE GAC, 2010	NR		1.00E-01	EIC/AGS/CL:AIRE GAC, 2010	NR	NR	NR	NR	NR		Model			Model	
Naphthalene	3.34E+00	CLEA SR7, EA 2008	NR		1.30E-01	Nathanail et al. 2015. LQM/CIEH S4UL	NR	NR	NR	NR	NR		Model			Model	
ortho-Xylene	3.12E+00	CLEA SR7, EA 2008	NR		1.00E-01	CLEA SR3. EA 2009	NR	NR	NR	NR	NR		Model			Model	
para-Xylene	3.15E+00	CLEA SR7, EA 2008	NR		1.00E-01	CLEA SR3. EA 2009	NR	NR	NR	NR	NR		Model			Model	
Pentachlorobenzene	5.03E+00	CLEA SR7, EA 2008	NR		1.00E-01	CLEA SR3. EA 2009	NR	NR	NR	NR	NR		Model			Model	
Propylbenzene	3.69E+00	EIC/AGS/CL:AIRE GAC, 2010	NR		1.00E-01	EIC/AGS/CL:AIRE GAC, 2010	NR	NR	NR	NR	NR		Model			Model	
Styrene	2.98E+00	EIC/AGS/CL:AIRE GAC, 2010	NR		1.00E-01	EIC/AGS/CL:AIRE GAC, 2010	NR	NR	NR	NR	NR		Model			Model	
Tetrachloroethene	2.88E+00	CLEA SR7, EA 2008	NR		1.00E-01	CLEA SR3. EA 2009	NR	NR	NR	NR	NR		Model			Model	
Tetrachloromethane (Carbon Tetrachloride)	2.83E+00	CLEA SR7, EA 2008	NR		1.00E-01	CLEA SR3. EA 2009	NR	NR	NR	NR	NR		Model			Model	
Toluene	2.73E+00	CLEA SR7, EA 2008	NR		1.00E-01	CLEA SR3. EA 2009	NR	NR	NR	NR	NR		Model			Model	
TPH Aliphatic >EC10-EC12	6.30E+00	Nathanail et al. 2015. LQM/CIEH S4UL	NR		1.00E-01	CLEA SR3. EA 2009	NR	NR	NR	NR	NR		Model			Model	
TPH Aliphatic >EC6-EC8	4.13E+00	Nathanail et al. 2015. LQM/CIEH S4UL	NR		1.00E-01	CLEA SR3. EA 2009	NR	NR	NR	NR	NR		Model			Model	
TPH Aliphatic >EC8-EC10	5.22E+00	Nathanail et al. 2015. LQM/CIEH S4UL	NR		1.00E-01	CLEA SR3. EA 2009	NR	NR	NR	NR	NR		Model			Model	
TPH Aliphatic EC5-EC6	3.31E+00	Nathanail et al. 2015. LQM/CIEH S4UL	NR		1.00E-01	CLEA SR3. EA 2009	NR	NR	NR	NR	NR		Model			Model	
TPH Aromatic >EC10-EC12	3.93E+00	Nathanail et al. 2015. LQM/CIEH S4UL	NR		1.00E-01	CLEA SR3. EA 2009	NR	NR	NR	NR	NR		Model			Model	
TPH Aromatic >EC12-EC16	4.29E+00	Nathanail et al. 2015. LQM/CIEH S4UL	NR		1.00E-01	CLEA SR3. EA 2009	NR	NR	NR	NR	NR		Model			Model	
TPH Aromatic >EC5-EC7	2.13E+00	CLEA SR7, EA 2008	NR		1.00E-01	CLEA SR3. EA 2009	NR	NR	NR	NR	NR		Model			Model	
TPH Aromatic >EC7-EC8	2.73E+00	CLEA SR7, EA 2008	NR		1.00E-01	CLEA SR3. EA 2009	NR	NR	NR	NR	NR		Model			Model	
TPH Aromatic >EC8-EC10	3.69E+00	Nathanail et al. 2015. LQM/CIEH S4UL	NR		1.00E-01	CLEA SR3. EA 2009	NR	NR	NR	NR	NR		Model			Model	
Trans-1,2-Dichloroethene	2.08E+00	EIC/AGS/CL:AIRE GAC, 2010	NR		1.00E-01	EIC/AGS/CL:AIRE GAC, 2010	NR	NR	NR	NR	NR		Model			Model	
Trichloroethene	2.53E+00	CLEA SR7, EA 2008	NR		1.00E-01	CLEA SR3. EA 2009	NR	NR	NR	NR	NR		Model			Model	
Trichloromethane (Chloroform)	1.97E+00	CLEA SR7, EA 2008	NR		1.00E-01	CLEA SR3. EA 2009	NR	NR	NR	NR	NR		Model			Model	

Chemical	Soil-to-plant concentration factor (tuber vegetables)			Soil-to-plant concentration factor (herbaceous fruit)			Soil-to-plant concentration factor (shrub fruit)			Soil-to-plant concentration factor (tree fruit)			Apply Top 2 Method to Produce Groups						Soil-to-dust transport factor (g g-1 DW)	Sub-surface soil to indoor air correction factor (dimensionless)	Relative bioavailability ($RBA_{soil,tox}$)	
	mg g-1 plant (DW or FW basis) over mg g-1 DW soil	Type	Notes	mg g-1 plant (DW or FW basis) over mg g-1 DW soil	Type	Notes	mg g-1 plant (DW or FW basis) over mg g-1 DW soil	Type	Notes	mg g-1 plant (DW or FW basis) over mg g-1 DW soil	Type	Notes	Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit			Soil	Airborne dust
1,1,1,2-Tetrachloroethane		Model			Model			Model			Model								0.5	1	1.00	1.00
1,1,1-Trichloroethane		Model			Model			Model			Model								0.5	1	1.00	1.00
1,1,2,2-Tetrachloroethane		Model			Model			Model			Model								0.5	1	1.00	1.00
1,1,2-Trichloroethane		Model			Model			Model			Model								0.5	1	1.00	1.00
1,1-Dichloroethane		Model			Model			Model			Model								0.5	1	1.00	1.00
1,1-Dichloroethene		Model			Model			Model			Model								0.5	1	1.00	1.00
1,2,3,4-Tetrachlorobenzene		Model			Model			Model			Model								0.5	1	1.00	1.00
1,2,3,5-Tetrachlorobenzene		Model			Model			Model			Model								0.5	1	1.00	1.00
1,2,3-Trichlorobenzene		Model			Model			Model			Model								0.5	1	1.00	1.00
1,2,4,5-Tetrachlorobenzene		Model			Model			Model			Model								0.5	1	1.00	1.00
1,2,4-Trichlorobenzene		Model			Model			Model			Model								0.5	1	1.00	1.00
1,2,4-Trimethylbenzene		Model			Model			Model			Model								0.5	1	1.00	1.00
1,2-Dichlorobenzene		Model			Model			Model			Model								0.5	1	1.00	1.00
1,2-Dichloroethane		Model			Model			Model			Model								0.5	1	1.00	1.00
1,2-Dichloropropane		Model			Model			Model			Model								0.5	1	1.00	1.00
1,3,5-Trichlorobenzene		Model			Model			Model			Model								0.5	1	1.00	1.00
1,3-Dichlorobenzene		Model			Model			Model			Model								0.5	1	1.00	1.00
1,4-Dichlorobenzene		Model			Model			Model			Model								0.5	1	1.00	1.00
2-Chloronaphthalene		Model			Model			Model			Model								0.5	1	1.00	1.00
Acenaphthene		Model			Model			Model			Model								0.5	1	1.00	1.00
Acenaphthylene		Model			Model			Model			Model								0.5	1	1.00	1.00
Aldrin		Model			Model			Model			Model								0.5	1	1.00	1.00
alpha-Endosulfan		Model			Model			Model			Model								0.5	1	1.00	1.00
Benzene		Model			Model			Model			Model								0.5	10	1.00	1.00
beta-Endosulfan		Model			Model			Model			Model								0.5	1	1.00	1.00
Biphenyl		Model			Model			Model			Model								0.5	1	1.00	1.00
Bromobenzene		Model			Model			Model			Model								0.5	1	1.00	1.00
Bromodichloromethane		Model			Model			Model			Model								0.5	1	1.00	1.00
Bromoform		Model			Model			Model			Model								0.5	1	1.00	1.00
Carbon disulphide		Model			Model			Model			Model								0.5	1	1.00	1.00
Chlorobenzene		Model			Model			Model			Model								0.5	1	1.00	1.00
Chloroethane		Model			Model			Model			Model								0.5	1	1.00	1.00
Chloroethene (Vinyl Chloride)		Model			Model			Model			Model								0.5	1	1.00	1.00
Chloromethane		Model			Model			Model			Model								0.5	1	1.00	1.00
Cis-1,2-Dichloroethene		Model			Model			Model			Model								0.5	1	1.00	1.00
Dichloromethane		Model			Model			Model			Model								0.5	1	1.00	1.00
Ethylbenzene		Model			Model			Model			Model								0.5	10	1.00	1.00
Fluorene		Model			Model			Model			Model								0.5	1	1.00	1.00
Hexachlorobenzene		Model			Model			Model			Model								0.5	1	1.00	1.00
Hexachlorobutadiene		Model			Model			Model			Model								0.5	1	1.00	1.00
Hexachloroethane		Model			Model			Model			Model								0.5	1	1.00	1.00
Isopropylbenzene		Model			Model			Model			Model								0.5	1	1.00	1.00
Mercury, elemental		Model			Model			Model			Model								0.5	1	1.00	1.00
meta-Xylene		Model			Model			Model			Model								0.5	10	1.00	1.00
Methyl tertiary butyl ether		Model			Model			Model			Model								0.5	1	1.00	1.00
Naphthalene		Model			Model			Model			Model								0.5	1	1.00	1.00
ortho-Xylene		Model			Model			Model			Model								0.5	10	1.00	1.00
para-Xylene		Model			Model			Model			Model								0.5	10	1.00	1.00
Pentachlorobenzene		Model			Model			Model			Model								0.5	1	1.00	1.00
Propylbenzene		Model			Model			Model			Model								0.5	1	1.00	1.00
Styrene		Model			Model			Model			Model								0.5	1	1.00	1.00
Tetrachloroethene		Model			Model			Model			Model								0.5	1	1.00	1.00
Tetrachloromethane (Carbon Tetrachloride)		Model			Model			Model			Model								0.5	1	1.00	1.00
Toluene		Model			Model			Model			Model								0.5	10	1.00	1.00
TPH Aliphatic >EC10-EC12		Model			Model			Model			Model								0.5	10	1.00	1.00
TPH Aliphatic >EC6-EC8		Model			Model			Model			Model								0.5	10	1.00	1.00
TPH Aliphatic >EC8-EC10		Model			Model			Model			Model								0.5	10	1.00	1.00
TPH Aliphatic EC5-EC6		Model			Model			Model			Model								0.5	10	1.00	1.00
TPH Aromatic >EC10-EC12		Model			Model			Model			Model								0.5	10	1.00	1.00
TPH Aromatic >EC12-EC16		Model			Model			Model			Model								0.5	10	1.00	1.00
TPH Aromatic >EC5-EC7		Model			Model			Model			Model								0.5	10	1.00	1.00
TPH Aromatic >EC7-EC8		Model			Model			Model			Model								0.5	10	1.00	1.00
TPH Aromatic >EC8-EC10		Model			Model			Model			Model								0.5	10	1.00	1.00
Trans-1,2-Dichloroethene		Model			Model			Model			Model								0.5	1	1.00	1.00
Trichloroethene		Model			Model			Model			Model								0.5	1	1.00	1.00
Trichloromethane (Chloroform)		Model			Model			Model			Model								0.5	1	1.00	1.00

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BASIC SETTINGS

Land Use	Residential with produce (C4SL)							
Building	Small terraced house							
Receptor	Female (res C4SL)	Start age class	1	End age class	6	Exposure Duration	6	years
Soil	Sand							

Exposure Pathways

Direct soil and dust ingestion	✗	Dermal contact with indoor dust	✗	Inhalation of indoor dust	✗
Consumption of homegrown produce	✗	Dermal contact with soil	✗	Inhalation of soil dust	✗
Soil attached to homegrown produce	✗			Inhalation of indoor vapour	✓
				Inhalation of outdoor vapour	✓

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Land Use Residential with produce (C4SL) **Receptor** Female (res C4SL)

Age Class	Exposure Frequencies (days yr^{-1}): Direct soil ingestion	Consumption of homegrown produce	Dermal contact with indoor dust	Dermal contact with soil	Inhalation of dust and vapour, indoor	Inhalation of dust and vapour, outdoor	Occupation Periods (hr day^{-1}): Indoors	Outdoors	Soil to skin adherence factors (mg cm^{2}): Indoor	Outdoor	Direct soil ingestion rate (g day^{-1})	Body weight (kg)	Body height (m)	Inhalation rate (m^3 day^{-1})	Max exposed skin factor: Indoor (m^2 m^{-2})	Outdoor (m^2 m^{-2})	Total skin area (m^2)
1	180	180	180	170	365	365	23.0	1.0	0.06	0.10	0.10	5.60	0.7	5.4	0.32	0.26	3.43E-01
2	365	365	365	170	365	365	23.0	1.0	0.06	0.10	0.10	9.80	0.8	8.0	0.33	0.26	4.84E-01
3	365	365	365	170	365	365	23.0	1.0	0.06	0.10	0.10	12.70	0.9	8.9	0.32	0.25	5.82E-01
4	365	365	365	170	365	365	23.0	1.0	0.06	0.10	0.10	15.10	0.9	10.1	0.35	0.28	6.36E-01
5	365	365	365	170	365	365	19.0	1.0	0.06	0.10	0.10	16.90	1.0	10.1	0.35	0.28	7.04E-01
6	365	365	365	170	365	365	19.0	1.0	0.06	0.10	0.10	19.70	1.1	10.1	0.33	0.26	7.94E-01
7	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	22.10	1.2	12.0	0.22	0.15	8.73E-01
8	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	25.30	1.2	12.0	0.22	0.15	9.36E-01
9	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	27.50	1.3	12.0	0.22	0.15	1.01E+00
10	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	31.40	1.3	12.0	0.22	0.15	1.08E+00
11	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	35.70	1.4	12.0	0.22	0.14	1.19E+00
12	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	41.30	1.4	15.2	0.22	0.14	1.29E+00
13	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	47.20	1.5	15.2	0.22	0.14	1.42E+00
14	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	51.20	1.6	15.2	0.22	0.14	1.52E+00
15	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	56.70	1.6	15.2	0.21	0.14	1.60E+00
16	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	59.00	1.6	15.2	0.21	0.14	1.63E+00
17	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	70.00	1.6	15.7	0.33	0.27	1.78E+00
18	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	70.90	1.6	13.6	0.33	0.27	1.80E+00

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Consumption Rates

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Consumption rates (g FW kg^{-1} bodyweight day^{-1}) by Produce Group

Age Class	MEAN RATES						90TH PERCENTILE RATES					
	Green veg	Root veg	Tuber veg	Herb. Fruit	Shrub fruit	Tree fruit	Green veg	Root veg	Tuber veg	Herb. Fruit	Shrub fruit	Tree fruit
1	3.47E+00	5.22E+00	9.22E+00	8.90E-01	1.07E+00	1.87E+00	7.12E+00	1.07E+01	1.60E+01	1.83E+00	2.23E+00	3.82E+00
2	3.34E+00	1.61E+00	3.14E+00	1.93E+00	2.60E-01	5.84E+00	5.87E+00	2.83E+00	6.60E+00	3.39E+00	4.60E-01	1.03E+01
3	3.34E+00	1.61E+00	3.14E+00	1.93E+00	2.60E-01	5.84E+00	5.87E+00	2.83E+00	6.60E+00	3.39E+00	4.60E-01	1.03E+01
4	3.34E+00	1.61E+00	3.14E+00	1.93E+00	2.60E-01	5.84E+00	5.87E+00	2.83E+00	6.60E+00	3.39E+00	4.60E-01	1.03E+01
5	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
6	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
7	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
8	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
9	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
10	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
11	2.54E+00	1.20E+00	2.65E+00	1.25E+00	1.10E-01	2.89E+00	4.53E+00	2.14E+00	4.95E+00	2.24E+00	1.90E-01	5.16E+00
12	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
13	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
14	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
15	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
16	1.03E+00	4.90E-01	1.60E+00	5.10E-01	4.00E-02	1.18E+00	1.87E+00	8.90E-01	3.05E+00	9.30E-01	8.00E-02	2.13E+00
17	1.26E+00	6.00E-01	1.18E+00	6.90E-01	9.00E-02	1.27E+00	2.36E+00	1.12E+00	2.35E+00	1.29E+00	1.80E-01	2.38E+00
18	1.35E+00	6.40E-01	1.25E+00	7.40E-01	1.00E-01	1.36E+00	2.34E+00	1.12E+00	2.36E+00	1.28E+00	1.80E-01	2.37E+00

Top 2 applied? Yes

Where top 2 method is applied, two produce categories use 90th percentile rates, while the remainder use the mean. Produce categories vary on a chemical-by-chemical basis. Where top 2 method is not used, all produce categories for all chemicals assume 90th percentile rates.

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Building Small terraced house

Building footprint (m^2)	2.80E+01
Living space air exchange rate (hr^{-1})	5.00E-01
Living space height (above ground, m)	4.80E+00
Living space height (below ground, m)	0.00E+00
Pressure difference (soil to enclosed space, Pa)	3.10E+00
Foundation thickness (m)	1.50E-01
Floor crack area (cm^2)	4.23E+02
Dust loading factor ($\mu g\ m^{-3}$)	5.00E+01

Soil Sand

Environment Agency

Porosity, Total ($cm^3\ cm^{-3}$)	5.40E-01
Porosity, Air-Filled ($cm^3\ cm^{-3}$)	3.00E-01
Porosity, Water-Filled ($cm^3\ cm^{-3}$)	2.40E-01
Residual soil water content ($cm^3\ cm^{-3}$)	7.00E-02
Saturated hydraulic conductivity ($cm\ s^{-1}$)	7.36E-03
van Genuchten shape parameter *m* (dimensionless)	3.51E-01
Bulk density ($g\ cm^{-3}$)	1.18E+00
Threshold value of wind speed at 10m ($m\ s^{-1}$)	7.20E+00
Empirical function (F_x) for dust model (dimensionless)	1.22E+00
Ambient soil temperature (K)	2.83E+02
Soil pH	7.00E+00
Soil Organic Matter content (%)	1.00E+00
Fraction of organic carbon ($g\ g^{-1}$)	5.80E-03
Effective total fluid saturation (unitless)	3.62E-01
Intrinsic soil permeability (cm^2)	9.83E-08
Relative soil air permeability (unitless)	7.68E-01
Effective air permeability (cm^2)	7.54E-08

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Soil - Vapour Model

Depth to top of source (no building) (cm)	0
Depth to top of source (beneath building) (cm)	65
Default soil gas ingress rate?	**No**
Soil gas ingress rate (cm^3 s^{-1})	3.54E+01
Building ventilation rate (cm^3 s^{-1})	1.87E+04
Averaging time surface emissions (yr)	6
Finite vapour source model?	No
Thickness of contaminated layer (cm)	200

Air Dispersion Model

Mean annual windspeed at 10m (m s^{-1})	5.00
Air dispersion factor at height of 0.8m *	2400.00
Air dispersion factor at height of 1.6m *	0.00
Fraction of site cover (m^2 m^{-2})	0.75

* Air dispersion factor in g m^{-2} s^{-1} per kg m^{-3}

Soil - Plant Model

	Dry weight conversion factor	Homegrown fraction Average	Homegrown fraction High	Soil loading factor	Preparation correction factor
	g DW g^{-1} FW	dimensionless	dimensionless	g g^{-1} DW	dimensionless
Green vegetables	0.096	0.05	0.33	1.00E-03	2.00E-01
Root vegetables	0.103	0.06	0.40	1.00E-03	1.00E+00
Tuber vegetables	0.210	0.02	0.13	1.00E-03	1.00E+00
Herbaceous fruit	0.058	0.06	0.40	1.00E-03	6.00E-01
Shrub fruit	0.166	0.09	0.60	1.00E-03	6.00E-01
Tree fruit	0.157	0.04	0.27	1.00E-03	6.00E-01

Gardener type Average

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BASIC SETTINGS

Land Use	Commercial (C4SL)						
Building	Office (pre 1970)						
Receptor	Female (com C4SL)	Start age class	17	End age class	17	Exposure Duration	49 years
Soil	Sand						

Exposure Pathways

Direct soil and dust ingestion	×	Dermal contact with indoor dust	×	Inhalation of indoor dust	×
Consumption of homegrown produce	×	Dermal contact with soil	×	Inhalation of soil dust	×
Soil attached to homegrown produce	×			Inhalation of indoor vapour	✓
				Inhalation of outdoor vapour	✓

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Land Use Commercial (C4SL)

Receptor Female (com C4SL)

Age Class	Exposure Frequencies (days yr^{-1}): Direct soil ingestion	Consumption of homegrown produce	Dermal contact with indoor dust	Dermal contact with soil	Inhalation of dust and vapour, indoor	Inhalation of dust and vapour, outdoor	Occupation Periods (hr day^{-1}): Indoors	Outdoors	Soil to skin adherence factors (mg cm^{2}): Indoor	Outdoor	Direct soil ingestion rate (g day^{-1})	Body weight (kg)	Body height (m)	Inhalation rate (m^3 day^{-1})	Max exposed skin factor: Indoor (m^2 m^{-2})	Outdoor (m^2 m^{-2})	Total skin area (m^2)
1	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	5.60	0.7	5.4	0.00	0.00	3.43E-01
2	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	9.80	0.8	8.0	0.00	0.00	4.84E-01
3	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	12.70	0.9	8.9	0.00	0.00	5.82E-01
4	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	15.10	0.9	10.1	0.00	0.00	6.36E-01
5	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	16.90	1.0	10.1	0.00	0.00	7.04E-01
6	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	19.70	1.1	10.1	0.00	0.00	7.94E-01
7	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	22.10	1.2	12.0	0.00	0.00	8.73E-01
8	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	25.30	1.2	12.0	0.00	0.00	9.36E-01
9	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	27.50	1.3	12.0	0.00	0.00	1.01E+00
10	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	31.40	1.3	12.0	0.00	0.00	1.08E+00
11	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	35.70	1.4	12.0	0.00	0.00	1.19E+00
12	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	41.30	1.4	15.2	0.00	0.00	1.29E+00
13	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	47.20	1.5	15.2	0.00	0.00	1.42E+00
14	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	51.20	1.6	15.2	0.00	0.00	1.52E+00
15	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	56.70	1.6	15.2	0.00	0.00	1.60E+00
16	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	59.00	1.6	15.2	0.00	0.00	1.63E+00
17	230	0	230	170	230	170	8.3	0.7	0.14	0.14	0.05	70.00	1.6	15.7	0.08	0.08	1.78E+00
18	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00	70.90	1.6	13.6	0.00	0.00	1.80E+00

Consumption Rates

Environment Agency

Consumption rates (g FW kg^{-1} bodyweight day^{-1}) by Produce Group

Age Class	MEAN RATES						90TH PERCENTILE RATES					
	Green veg	Root veg	Tuber veg	Herb. Fruit	Shrub fruit	Tree fruit	Green veg	Root veg	Tuber veg	Herb. Fruit	Shrub fruit	Tree fruit
1							7.12E+00	1.07E+01	1.60E+01	1.83E+00	2.23E+00	3.82E+00
2							6.85E+00	3.30E+00	5.46E+00	3.96E+00	5.40E-01	1.20E+01
3							6.85E+00	3.30E+00	5.46E+00	3.96E+00	5.40E-01	1.20E+01
4							6.85E+00	3.30E+00	5.46E+00	3.96E+00	5.40E-01	1.20E+01
5							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
6							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
7							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
8							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
9							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
10							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
11							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
12							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
13							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
14							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
15							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
16							3.74E+00	1.77E+00	3.38E+00	1.85E+00	1.60E-01	4.26E+00
17							2.94E+00	1.40E+00	1.79E+00	1.61E+00	2.20E-01	2.97E+00
18							2.94E+00	1.40E+00	1.79E+00	1.61E+00	2.20E-01	2.97E+00

Top 2 applied? No

Where top 2 method is applied, two produce categories use 90th percentile rates, while the remainder use the mean. Produce categories vary on a chemical-by-chemical basis. Where top 2 method is not used, all produce categories for all chemicals assume 90th percentile rates.

Building Office (pre 1970) **Soil** Sand

Environment Agency

Building footprint (m^2)	4.24E+02
Living space air exchange rate (hr^{-1})	1.00E+00
Living space height (above ground, m)	9.60E+00
Living space height (below ground, m)	0.00E+00
Pressure difference (soil to enclosed space, Pa)	4.40E+00
Foundation thickness (m)	1.50E-01
Floor crack area (cm^2)	1.65E+03
Dust loading factor ($\mu g\ m^{-3}$)	1.00E+02

Porosity, Total ($cm^3\ cm^{-3}$)	5.40E-01
Porosity, Air-Filled ($cm^3\ cm^{-3}$)	3.00E-01
Porosity, Water-Filled ($cm^3\ cm^{-3}$)	2.40E-01
Residual soil water content ($cm^3\ cm^{-3}$)	7.00E-02
Saturated hydraulic conductivity ($cm\ s^{-1}$)	7.36E-03
van Genuchten shape parameter *m* (dimensionless)	3.51E-01
Bulk density ($g\ cm^{-3}$)	1.18E+00
Threshold value of wind speed at 10m ($m\ s^{-1}$)	7.20E+00
Empirical function (F_x) for dust model (dimensionless)	1.22E+00
Ambient soil temperature (K)	2.83E+02
Soil pH	7.00E+00
Soil Organic Matter content (%)	1.00E+00
Fraction of organic carbon ($g\ g^{-1}$)	5.80E-03
Effective total fluid saturation (unitless)	3.62E-01
Intrinsic soil permeability (cm^2)	9.83E-08
Relative soil air permeability (unitless)	7.68E-01
Effective air permeability (cm^2)	7.54E-08

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Environment Agency

Soil - Vapour Model	
Depth to top of source (no building) (cm)	0
Depth to top of source (beneath building) (cm)	65
Default soil gas ingress rate?	**No**
Soil gas ingress rate (cm^3 s^{-1})	1.95E+02
Building ventilation rate (cm^3 s^{-1})	1.13E+06
Averaging time surface emissions (yr)	49
Finite vapour source model?	No
Thickness of contaminated layer (cm)	200

Air Dispersion Model	
Mean annual windspeed at 10m (m s^{-1})	5.00
Air dispersion factor at height of 0.8m *	68.00
Air dispersion factor at height of 1.6m *	120.00
Fraction of site cover (m^2 m^{-2})	0.8

* Air dispersion factor in g m^{-2} s^{-1} per kg m^{-3}

Soil - Plant Model	Dry weight conversion factor	Homegrown fraction Average	Homegrown fraction High	Soil loading factor	Preparation correction factor
	g DW g^{-1} FW	dimensionless		g g^{-1} DW	dimensionless
Green vegetables	0.096	0.05	0.33	1.00E-03	2.00E-01
Root vegetables	0.103	0.06	0.40	1.00E-03	1.00E+00
Tuber vegetables	0.210	0.02	0.13	1.00E-03	1.00E+00
Herbaceous fruit	0.058	0.06	0.40	1.00E-03	6.00E-01
Shrub fruit	0.166	0.09	0.60	1.00E-03	6.00E-01
Tree fruit	0.157	0.04	0.27	1.00E-03	6.00E-01

Gardener type None

APPENDIX 2

STEP-BY-STEP GUIDE TO DERIVING

GAC_{gwvap} USING CLEA v1.07

1 INTRODUCTION

The whole architecture and workflow of the CLEA software is designed to express *soil phase* concentrations in milligrams contaminant per kilogram soil.

Therefore, in order to use the CLEA software to derive generic and site specific assessment criteria for *water or dissolved phase* concentrations, hidden calculation sheets within the model are required to be unlocked.

1.1 Basic settings

- Unprotect sheet
- Select 'residential C4SL' or 'commercial C4SL' land use
- Sand soil type
- SOM 1%
- Indoor and outdoor vapour pathways only

1.2 Select Chemicals

- Select chemicals using the database provided in Appendix 1.

1.3 Advanced settings

- Unprotect sheet
- **Soil and Building Data** – uncheck "Use default soil gas ingress"

1.4 Find Results

- Find AC

1.5 Extract Soil Solution Concentrations

- Unhide and unprotect "Media Calculations" worksheet
- Copy/paste or link to Soil Solution Concentration
- Multiply Soil Solution Concentration (mg/cm^3) by 1x 10^6 (mg -> µg, cm^3 -> L) to give the groundwater vapour concentration in µg/L

APPENDIX 3

J&E INPUTS

GW-ADV
Version 3.1; 02/04

Reset to

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
71432	2.11E+02	Benzene

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm²)
10	15	65	65	0	0	A	S	S		

Totals must add up to value of L_{WT} (cell G28)

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm³)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm³/cm³)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm³)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm³/cm³)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm³)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm³/cm³)
S	1.18	0.540	0.24								

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-s²)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
15	31	529.15	529.15	480	0.2	0.5	

MORE ↓

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)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	30	30	350	1.0E-06	1

Used to calculate risk-based groundwater concentration.

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JEM DATA ENTRY SHEET - SANDY LOAM (BENZENE)

GW-ADV
Version 3.1; 02/04

Reset to

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
71432	6.62E+02	Benzene

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm²)
10	15	65	65	0	0	A	SL	SL		

Totals must add up to value of L_{WT} (cell G28)

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm³)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm³/cm³)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm³)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm³/cm³)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm³)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm³/cm³)
SL	1.21	0.530	0.33								

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-s²)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
15	31	529.15	529.15	480	0.2	0.5	

MORE ↓

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)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	30	30	350	1.0E-06	1

Used to calculate risk-based groundwater concentration.

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JEM DATA ENTRY SHEET - CLAY LOAM (BENZENE)

GW-ADV
Version 3.1; 02/04

Reset to

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
71432	2.19E+03	Benzene

MORE ↓

ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER Thickness of soil stratum A, h_A (cm)	ENTER Thickness of soil stratum B, (Enter value or 0) h_B (cm)	ENTER Thickness of soil stratum C, (Enter value or 0) h_C (cm)	ENTER Soil stratum directly above water table, (Enter A, B, or C)	ENTER SCS soil type directly above water table	ENTER Soil stratum A SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined stratum A soil vapor permeability, k_v (cm²)
10	15	65	65	0	0	A	CL	CL		

Totals must add up to value of L_{WT} (cell G28)

MORE ↓

ENTER Stratum A SCS soil type (Lookup Soil)	ENTER Stratum A soil dry bulk density, ρ_b^A (g/cm³)	ENTER Stratum A soil total porosity, n^A (unitless)	ENTER Stratum A soil water-filled porosity, θ_w^A (cm³/cm³)	ENTER Stratum B SCS soil type (Lookup Soil Parameters)	ENTER Stratum B soil dry bulk density, ρ_b^B (g/cm³)	ENTER Stratum B soil total porosity, n^B (unitless)	ENTER Stratum B soil water-filled porosity, θ_w^B (cm³/cm³)	ENTER Stratum C SCS soil type (Lookup Soil Parameters)	ENTER Stratum C soil dry bulk density, ρ_b^C (g/cm³)	ENTER Stratum C soil total porosity, n^C (unitless)	ENTER Stratum C soil water-filled porosity, θ_w^C (cm³/cm³)
CL	1.14	0.560	0.42								

MORE ↓

ENTER Enclosed space floor thickness, L_{crack} (cm)	ENTER Soil-bldg. pressure differential, ΔP (g/cm-s²)	ENTER Enclosed space floor length, L_B (cm)	ENTER Enclosed space floor width, W_B (cm)	ENTER Enclosed space height, H_B (cm)	ENTER Floor-wall seam crack width, w (cm)	ENTER Indoor air exchange rate, ER (1/h)	ENTER Average vapor flow rate into bldg. OR Leave blank to calculate Q_{soil} (L/m)
15	31	529.15	529.15	480	0.2	0.5	

MORE ↓

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)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	30	30	350	1.0E-06	1

Used to calculate risk-based groundwater concentration.

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JEM VLOOKUP TABLES

Soil Properties Lookup Table

SCS Soil Type	K_s (cm/h)	α_1 (1/cm)	N (unitless)	M (unitless)	n (cm^3/cm^3)	θ_r (cm^3/cm^3)	Mean Grain Diameter (cm)	Bulk Density (g/cm^3)	θ_w (cm^3/cm^3)	SCS Soil Name	
CL	5.44	0.04370	1.436	0.3040	0.560	0.190	0.016	1.14	0.420	Clay Loam	Updated to SR3 for clay loam (other than grain size)
S	26.50	0.12210	1.541	0.3509	0.540	0.070	0.044	1.18	0.240	Sand	Updated to SR3 for sand (other than grain size)
SL	12.82	0.06890	1.470	0.3201	0.530	0.120	0.030	1.21	0.330	Sandy Loam	Updated to SR3 for sandy loam (other than grain size)

Chemical Properties Lookup Table

CAS No.	Chemical	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Pure component water solubility, S (mg/L)	Henry's law constant H' (unitless)	Henry's law constant at reference temperature, H ($atm\text{-}m^3/mol$)	Henry's law constant reference temperature, T_R (^oC)	Normal boiling point, T_B (^oK)	Critical temperature, T_C (^oK)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	
71432	Benzene	6.76E+01	8.77E-02	6.64E-06	1.78E+03	1.16E-01	5.50E-03	25	353.20	562.00	7,342	Converted to SR7 values physchem only
75014	Vinyl chloride (chloroethene)	1.66E+01	1.11E-01	8.34E-06	2.76E+03	7.47E-01	2.65E-02	25	259.40	432.00	4,971	Converted to SR7 values physchem only
75150	Carbon disulfide	1.15E+02	1.04E-01	8.28E-06	2.10E+03	4.08E-01	1.72E-02	25	319.20	552.00	6,391	Converted to SR7 values physchem only
79016	Trichloroethylene	1.41E+02	7.91E-02	6.23E-06	1.37E+03	1.87E-01	1.01E-02	25	360.40	544.20	7,504	Converted to SR7 values physchem only
91203	Naphthalene	6.46E+02	6.52E-02	5.16E-06	1.90E+01	6.62E-03	4.24E-04	25	491.10	748.40	10,325	Converted to SR7 values physchem only

APPENDIX 4

MODELLING OUTPUTS

Chemical Name	Chemical type	Fraction of organic carbon in soil	Total soil concentration (Soil Concentrations)	Soil vapour concentration (Soil Concentrations)	Soil solution concentration (Soil Concentrations)	Total amount of sorbed chemical in soil (Soil Concentrations)	Total sorbed concentration on a mass basis (Soil Distribution (mg g-1))	Soil solution concentration on a mass basis (Soil Distribution (mg g-1))	Vapour concentration on a mass basis (Soil Distribution (mg g-1))	Total soil concentration (Soil Distribution (mg g-1))	SORBED (Soil Distribution (%))	DISSOLVED (Soil Distribution (%))	VAPOUR (Soil Distribution (%))	TOTAL (Soil Distribution (%))	At 0.8 metres (infinite model)	At 0.8 metres (user soil gas)	At 0.8 metres (finite model)
		$g\ g^{-1}$	$mg\ g^{-1}$ DW	$mg\ cm^{-3}$	$mg\ cm^{-3}$	$mg\ g^{-1}$	$mg\ g^{-1}$	$mg\ g^{-1}$	$mg\ g^{-1}$	$mg\ g^{-1}$ DW	%	%	%	%	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$
1,1,2-Trichloroethane (GWVapou	Organic	0.0058	4.31E-04	9.09E-06	5.19E-04	3.23E-04	3.23E-04	1.06E-04	2.31E-06	4.31E-04	7.49E+01	2.45E+01	5.36E-01	1.00E+02	1.60E-06	NR	NR
1,1-Dichloroethane (GWVapour)	Organic	0.0058	1.19E-03	3.49E-04	2.70E-03	5.56E-04	5.56E-04	5.50E-04	8.87E-05	1.19E-03	4.66E+01	4.60E+01	7.42E+00	1.00E+02	1.77E-05	NR	NR
1,1-Dichloroethene (GWVapour)	Organic	0.0058	1.23E-04	9.74E-05	1.64E-04	6.44E-05	6.44E-05	3.34E-05	2.48E-05	1.23E-04	5.25E+01	2.73E+01	2.02E+01	1.00E+02	3.07E-06	NR	NR
1,2,4-Trimethylbenzene (GWVap	Organic	0.0058	2.06E-04	2.09E-06	2.44E-05	2.00E-04	2.00E-04	4.97E-06	5.32E-07	2.06E-04	9.73E+01	2.42E+00	2.59E-01	1.00E+02	4.88E-07	NR	NR
1,2-Dichloropropane (GWVapou	Organic	0.0058	1.12E-05	1.55E-06	2.15E-05	6.40E-06	6.40E-06	4.38E-06	3.93E-07	1.12E-05	5.73E+01	3.92E+01	3.52E+00	1.00E+02	1.07E-07	NR	NR
2-Chloronaphthalene (GWVapou	Organic	0.0058	2.03E-03	6.22E-07	1.64E-04	1.99E-03	1.99E-03	3.35E-05	1.58E-07	2.03E-03	9.83E+01	1.65E+00	7.80E-03	1.00E+02	8.06E-07	NR	NR
Biphenyl (GWVapour)	Organic	0.0058	1.23E-01	8.44E-05	1.46E-02	1.20E-01	1.20E-01	2.97E-03	2.15E-05	1.23E-01	9.76E+01	2.42E+00	1.75E-02	1.00E+02	7.16E-05	NR	NR
Bromobenzene (GWVapour)	Organic	0.0058	4.61E-04	6.70E-06	2.16E-04	4.15E-04	4.15E-04	4.40E-05	1.70E-06	4.61E-04	9.01E+01	9.54E+00	3.70E-01	1.00E+02	1.38E-06	NR	NR
Bromodichloromethane (GWVap	Organic	0.0058	9.07E-06	5.46E-07	1.71E-05	5.45E-06	5.45E-06	3.48E-06	1.39E-07	9.07E-06	6.01E+01	3.84E+01	1.53E+00	1.00E+02	5.89E-08	NR	NR
Bromoform (GWVapour)	Organic	0.0058	2.60E-03	2.54E-05	3.14E-03	1.95E-03	1.95E-03	6.39E-04	6.46E-06	2.60E-03	7.52E+01	2.46E+01	2.49E-01	1.00E+02	6.56E-06	NR	NR
Chloroethane (GWVapour)	Organic	0.0058	4.36E-03	4.57E-03	1.03E-02	1.11E-03	1.11E-03	2.09E-03	1.16E-03	4.36E-03	2.54E+01	4.79E+01	2.67E+01	1.00E+02	1.34E-04	NR	NR
Chloromethane (GWVapour)	Organic	0.0058	4.32E-06	3.75E-06	1.38E-05	5.55E-07	5.55E-07	2.82E-06	9.53E-07	4.32E-06	1.28E+01	6.51E+01	2.20E+01	1.00E+02	1.33E-07	NR	NR
Cis-1,2-Dichloroethene (GWVap	Organic	0.0058	5.74E-05	9.34E-06	1.25E-04	2.96E-05	2.96E-05	2.55E-05	2.37E-06	5.74E-05	5.15E+01	4.43E+01	4.14E+00	1.00E+02	6.44E-07	NR	NR
Dichloromethane (GWVapour)	Organic	0.0058	9.78E-04	1.85E-04	3.28E-03	2.63E-04	2.63E-04	6.68E-04	4.71E-05	9.78E-04	2.69E+01	6.83E+01	4.82E+00	1.00E+02	1.25E-05	NR	NR
Hexachloroethane (GWVapour)	Organic	0.0058	1.09E-04	1.11E-06	8.45E-06	1.07E-04	1.07E-04	1.72E-06	2.82E-07	1.09E-04	9.82E+01	1.57E+00	2.58E-01	1.00E+02	2.47E-07	NR	NR
Isopropylbenzene (GWVapour)	Organic	0.0058	5.87E-03	0.000201	8.48E-04	5.64E-03	5.64E-03	1.72E-04	5.11E-05	5.87E-03	9.62E+01	2.94E+00	8.70E-01	1.00E+02	2.56E-05	NR	NR
Methyl tertiary butyl ether (GWV	Organic	0.0058	3.34E-02	0.001323	8.27E-02	1.63E-02	1.63E-02	1.68E-02	3.36E-04	3.34E-02	4.86E+01	5.03E+01	1.01E+00	1.00E+02	1.72E-04	NR	NR
Propylbenzene (GWVapour)	Organic	0.0058	2.01E-02	0.000462	2.72E-03	1.94E-02	1.94E-02	5.53E-04	1.17E-04	2.01E-02	9.67E+01	2.76E+00	5.85E-01	1.00E+02	7.11E-05	NR	NR
Styrene (GWVapour)	Organic	0.0058	1.84E-02	0.000469	8.80E-03	1.65E-02	1.65E-02	1.79E-03	1.19E-04	1.84E-02	8.96E+01	9.71E+00	6.47E-01	1.00E+02	7.31E-05	NR	NR
Trans-1,2-Dichloroethene (GWV	Organic	0.0058	9.66E-05	2.86E-05	1.62E-04	5.65E-05	5.65E-05	3.29E-05	7.27E-06	9.66E-05	5.85E+01	3.40E+01	7.52E+00	1.00E+02	1.47E-06	NR	NR
1,2-Dichloroethane (GWVapour)	Organic	0.0058	2.90E-06	2.12E-07	8.92E-06	1.03E-06	1.03E-06	1.81E-06	5.40E-08	2.90E-06	3.56E+01	6.25E+01	1.86E+00	1.00E+02	2.13E-08	NR	NR
1,1,1,2-Tetrachloroethane (GWV	Organic	0.0058	5.39E-04	1.14E-05	2.37E-04	4.88E-04	4.88E-04	4.83E-05	2.90E-06	5.39E-04	9.05E+01	8.95E+00	5.37E-01	1.00E+02	1.91E-06	NR	NR
1,1,2,2-Tetrachloroethane (GWV	Organic	0.0058	1.36E-03	1.14E-05	1.61E-03	1.03E-03	1.03E-03	3.28E-04	2.90E-06	1.36E-03	7.56E+01	2.42E+01	2.14E-01	1.00E+02	3.02E-06	NR	NR
Tetrachloroethene (GWVapour)	Organic	0.0058	6.33E-05	1.08E-05	3.43E-05	5.36E-05	5.36E-05	6.98E-06	2.76E-06	6.33E-05	8.46E+01	1.10E+01	4.35E+00	1.00E+02	6.47E-07	NR	NR
1,1,1-Trichloroethane (GWVapou	Organic	0.0058	3.20E-03	0.001088	3.02E-03	2.31E-03	2.31E-03	6.15E-04	2.77E-04	3.20E-03	7.22E+01	1.92E+01	8.64E+00	1.00E+02	4.81E-05	NR	NR
Naphthalene (GWVapour)	Organic	0.0058	8.52E-04	1.43E-06	2.16E-04	8.08E-04	8.08E-04	4.39E-05	3.63E-07	8.52E-04	9.48E+01	5.15E+00	4.26E-02	1.00E+02	8.27E-07	NR	NR
Chloroethene (Vinyl Chloride) (G	Organic	0.0058	3.06E-07	4.66E-07	6.24E-07	6.01E-08	6.01E-08	1.27E-07	1.19E-07	3.06E-07	1.97E+01	4.15E+01	3.88E+01	1.00E+02	1.17E-08	NR	NR
Acenaphthene (GWVapour)	Organic	0.0058	2.35E+00	0.000129	1.70E-01	2.31E+00	2.31E+00	3.46E-02	3.28E-05	2.35E+00	9.85E+01	1.47E+00	1.40E-03	1.00E+02	4.00E-04	NR	NR
Acenaphthylene (GWVapour)	Organic	0.0058	2.39E+00	0.000126	2.22E-01	2.35E+00	2.35E+00	4.52E-02	3.21E-05	2.39E+00	9.81E+01	1.89E+00	1.34E-03	1.00E+02	4.06E-04	NR	NR
Fluorene (GWVapour)	Organic	0.0058	3.48E+00	8.65E-05	2.10E-01	3.43E+00	3.43E+00	4.27E-02	2.20E-05	3.48E+00	9.88E+01	1.23E+00	6.33E-04	1.00E+02	3.97E-04	NR	NR

Chemical Name	Outdoor Air Concentration of Vapours						Outdoor Air Concentration in Dust				
	At 0.8 metres (selected)	At 1.6 metres (infinite model)	At 1.6 metres (user soil gas)	At 1.6 metres (finite model)	At 1.6 metres (selected)	Indoor Air Concentration of Vapours	PM10 emission flux	PEF at child height	Outdoor contaminant concentration in respirable dust at child height	PEF at adult height	Outdoor contaminant concentration in respirable dust at adult height
	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$g\ m^{-2}\ s^{-1}$	$m^3\ kg^{-1}$	$mg\ m^{-3}$	$m^3\ kg^{-1}$	$mg\ m^{-3}$
1,1,2-Trichloroethane (GWVapou	1.60E-06	NR	NR	0.00E+00	0.00E+00	7.37E-03	1.02E-06	2.35E+09	1.83E-10	0.00E+00	0.00E+00
1,1-Dichloroethane (GWVapour)	1.77E-05	NR	NR	0.00E+00	0.00E+00	3.06E-01	1.02E-06	2.35E+09	5.09E-10	0.00E+00	0.00E+00
1,1-Dichloroethene (GWVapour)	3.07E-06	NR	NR	0.00E+00	0.00E+00	8.77E-02	1.02E-06	2.35E+09	5.22E-11	0.00E+00	0.00E+00
1,2,4-Trimethylbenzene (GWVap	4.88E-07	NR	NR	0.00E+00	0.00E+00	1.54E-03	1.02E-06	2.35E+09	8.75E-11	0.00E+00	0.00E+00
1,2-Dichloropropane (GWVapou	1.07E-07	NR	NR	0.00E+00	0.00E+00	1.27E-03	1.02E-06	2.35E+09	4.76E-12	0.00E+00	0.00E+00
2-Chloronaphthalene (GWVapou	8.06E-07	NR	NR	0.00E+00	0.00E+00	4.38E-04	1.02E-06	2.35E+09	8.63E-10	0.00E+00	0.00E+00
Biphenyl (GWVapour)	7.16E-05	NR	NR	0.00E+00	0.00E+00	5.81E-02	1.02E-06	2.35E+09	5.22E-08	0.00E+00	0.00E+00
Bromobenzene (GWVapour)	1.38E-06	NR	NR	0.00E+00	0.00E+00	5.28E-03	1.02E-06	2.35E+09	1.96E-10	0.00E+00	0.00E+00
Bromodichloromethane (GWVap	5.89E-08	NR	NR	0.00E+00	0.00E+00	4.62E-04	1.02E-06	2.35E+09	3.86E-12	0.00E+00	0.00E+00
Bromoform (GWVapour)	6.56E-06	NR	NR	0.00E+00	0.00E+00	2.06E-02	1.02E-06	2.35E+09	1.11E-09	0.00E+00	0.00E+00
Chloroethane (GWVapour)	1.34E-04	NR	NR	0.00E+00	0.00E+00	4.40E+00	1.02E-06	2.35E+09	1.86E-09	0.00E+00	0.00E+00
Chloromethane (GWVapour)	1.33E-07	NR	NR	0.00E+00	0.00E+00	3.96E-03	1.02E-06	2.35E+09	1.84E-12	0.00E+00	0.00E+00
Cis-1,2-Dichloroethene (GWVap	6.44E-07	NR	NR	0.00E+00	0.00E+00	8.33E-03	1.02E-06	2.35E+09	2.44E-11	0.00E+00	0.00E+00
Dichloromethane (GWVapour)	1.25E-05	NR	NR	0.00E+00	0.00E+00	1.74E-01	1.02E-06	2.35E+09	4.16E-10	0.00E+00	0.00E+00
Hexachloroethane (GWVapour)	2.47E-07	NR	NR	0.00E+00	0.00E+00	7.69E-04	1.02E-06	2.35E+09	4.65E-11	0.00E+00	0.00E+00
Isopropylbenzene (GWVapour)	2.56E-05	NR	NR	0.00E+00	0.00E+00	1.49E-01	1.02E-06	2.35E+09	2.50E-09	0.00E+00	0.00E+00
Methyl tertiary butyl ether (GWV	1.72E-04	NR	NR	0.00E+00	0.00E+00	1.09E+00	1.02E-06	2.35E+09	1.42E-08	0.00E+00	0.00E+00
Propylbenzene (GWVapour)	7.11E-05	NR	NR	0.00E+00	0.00E+00	3.37E-01	1.02E-06	2.35E+09	8.54E-09	0.00E+00	0.00E+00
Styrene (GWVapour)	7.31E-05	NR	NR	0.00E+00	0.00E+00	3.69E-01	1.02E-06	2.35E+09	7.84E-09	0.00E+00	0.00E+00
Trans-1,2-Dichloroethene (GWV	1.47E-06	NR	NR	0.00E+00	0.00E+00	2.56E-02	1.02E-06	2.35E+09	4.11E-11	0.00E+00	0.00E+00
1,2-Dichloroethane (GWVapour)	2.13E-08	NR	NR	0.00E+00	0.00E+00	1.85E-04	1.02E-06	2.35E+09	1.23E-12	0.00E+00	0.00E+00
1,1,1,2-Tetrachloroethane (GWV	1.91E-06	NR	NR	0.00E+00	0.00E+00	8.74E-03	1.02E-06	2.35E+09	2.30E-10	0.00E+00	0.00E+00
1,1,2,2-Tetrachloroethane (GWV	3.02E-06	NR	NR	0.00E+00	0.00E+00	8.74E-03	1.02E-06	2.35E+09	5.77E-10	0.00E+00	0.00E+00
Tetrachloroethene (GWVapour)	6.47E-07	NR	NR	0.00E+00	0.00E+00	8.46E-03	1.02E-06	2.35E+09	2.69E-11	0.00E+00	0.00E+00
1,1,1-Trichloroethane (GWVapou	4.81E-05	NR	NR	0.00E+00	0.00E+00	8.93E-01	1.02E-06	2.35E+09	1.36E-09	0.00E+00	0.00E+00
Naphthalene (GWVapour)	8.27E-07	NR	NR	0.00E+00	0.00E+00	1.06E-03	1.02E-06	2.35E+09	3.63E-10	0.00E+00	0.00E+00
Chloroethene (Vinyl Chloride) (G	1.17E-08	NR	NR	0.00E+00	0.00E+00	4.62E-04	1.02E-06	2.35E+09	1.30E-13	0.00E+00	0.00E+00
Acenaphthene (GWVapour)	4.00E-04	NR	NR	0.00E+00	0.00E+00	9.23E-02	1.02E-06	2.35E+09	1.00E-06	0.00E+00	0.00E+00
Acenaphthylene (GWVapour)	4.06E-04	NR	NR	0.00E+00	0.00E+00	9.23E-02	1.02E-06	2.35E+09	1.02E-06	0.00E+00	0.00E+00
Fluorene (GWVapour)	3.97E-04	NR	NR	0.00E+00	0.00E+00	6.15E-02	1.02E-06	2.35E+09	1.48E-06	0.00E+00	0.00E+00

Chemical Name	Indoor Air Concentration in Dust	Concentration in Indoor Dust	Concentration in Homegrown Produce: Green Vegetables	Root Vegetables	Tuber Vegetables	Herbaceous Fruits	Shrub Fruits	Tree Fruits	Soil Saturation Limits: Solubility Based	Vapour Based
	$mg\ m^{-3}$	$mg\ g^{-1}$ DW	$mg\ g^{-1}$ FW	$mg\ g^{-1}$ FW	$mg\ g^{-1}$ FW	$mg\ g^{-1}$ FW	$mg\ g^{-1}$ FW	$mg\ g^{-1}$ FW	$mg\ kg^{-1}$	$mg\ kg^{-1}$
1,1,2-Trichloroethane (GWVapou	1.09E-08	2.15E-04	8.64E-04	1.58E-03	5.18E-04	0.00E+00	0.00E+00	1.25E-03	3.72E+03	3.72E+03
1,1-Dichloroethane (GWVapour)	3.04E-08	5.97E-04	2.90E-03	8.09E-03	2.35E-03	0.00E+00	0.00E+00	5.38E-03	1.62E+03	2.23E+03
1,1-Dichloroethene (GWVapour)	3.12E-09	6.13E-05	2.70E-04	5.68E-04	1.62E-04	0.00E+00	0.00E+00	3.77E-04	2.31E+03	2.18E+03
1,2,4-Trimethylbenzene (GWVap	5.23E-09	1.03E-04	1.31E-04	1.79E-04	4.38E-05	0.00E+00	0.00E+00	3.19E-05	4.71E+03	5.53E+02
1,2-Dichloropropane (GWVapour	2.84E-10	5.59E-06	2.60E-05	6.07E-05	1.88E-05	0.00E+00	0.00E+00	4.71E-05	1.06E+03	1.07E+03
2-Chloronaphthalene (GWVapou	5.15E-08	1.01E-03	9.71E-04	1.31E-03	3.43E-04	0.00E+00	0.00E+00	1.70E-04	1.44E+02	1.13E+02
Biphenyl (GWVapour)	3.12E-06	6.13E-02	7.84E-02	1.07E-01	2.58E-02	0.00E+00	0.00E+00	1.91E-02	3.41E+01	3.41E+01
Bromobenzene (GWVapour)	1.17E-08	2.30E-04	6.53E-04	9.89E-04	2.44E-04	0.00E+00	0.00E+00	4.76E-04	8.27E+02	8.28E+02
Bromodichloromethane (GWVap	2.31E-10	4.54E-06	2.07E-05	4.71E-05	1.66E-05	0.00E+00	0.00E+00	3.78E-05	1.59E+03	4.38E+03
Bromoform (GWVapour)	6.60E-08	1.30E-03	5.21E-03	9.55E-03	3.15E-03	0.00E+00	0.00E+00	7.55E-03	2.48E+03	3.35E+03
Chloroethane (GWVapour)	1.11E-07	2.18E-03	1.08E-02	4.59E-02	8.86E-03	0.00E+00	0.00E+00	1.61E-02	2.44E+03	2.44E+03
Chloromethane (GWVapour)	1.10E-10	2.16E-06	9.04E-06	1.02E-04	1.11E-05	0.00E+00	0.00E+00	1.26E-05	1.67E+03	8.18E+03
Cis-1,2-Dichloroethene (GWVap	1.46E-09	2.87E-05	1.37E-04	3.56E-04	1.09E-04	0.00E+00	0.00E+00	2.58E-04	3.46E+03	3.47E+03
Dichloromethane (GWVapour)	2.49E-08	4.89E-04	2.36E-03	1.29E-02	2.83E-03	0.00E+00	0.00E+00	4.46E-03	5.98E+03	5.98E+03
Hexachloroethane (GWVapour)	2.78E-09	5.46E-05	5.04E-05	6.80E-05	1.89E-05	0.00E+00	0.00E+00	8.52E-06	6.45E+02	8.13E+00
Isopropylbenzene (GWVapour)	1.49E-07	2.93E-03	4.32E-03	5.93E-03	1.42E-03	0.00E+00	0.00E+00	1.23E-03	3.88E+02	3.98E+02
Methyl tertiary butyl ether (GWV	8.49E-07	1.67E-02	4.36E-02	1.62E-01	6.48E-02	0.00E+00	0.00E+00	7.79E-02	1.94E+04	1.74E+04
Propylbenzene (GWVapour)	5.10E-07	1.00E-02	1.41E-02	1.93E-02	4.64E-03	0.00E+00	0.00E+00	3.79E-03	3.99E+02	3.99E+02
Styrene (GWVapour)	4.69E-07	9.22E-03	2.64E-02	4.01E-02	9.86E-03	0.00E+00	0.00E+00	1.95E-02	6.07E+02	6.09E+02
Trans-1,2-Dichloroethene (GWV	2.46E-09	4.83E-05	2.20E-04	4.81E-04	1.58E-04	0.00E+00	0.00E+00	3.65E-04	3.14E+03	3.14E+03
1,2-Dichloroethane (GWVapour)	7.37E-11	1.45E-06	7.19E-06	2.90E-05	7.64E-06	0.00E+00	0.00E+00	1.44E-05	2.82E+03	2.83E+03
1,1,1,2-Tetrachloroethane (GWV	1.37E-08	2.70E-04	7.45E-04	1.12E-03	3.10E-04	0.00E+00	0.00E+00	5.14E-04	2.52E+03	2.53E+03
1,1,2,2-Tetrachloroethane (GWV	3.45E-08	6.78E-04	2.70E-03	4.92E-03	1.60E-03	0.00E+00	0.00E+00	3.88E-03	2.46E+03	2.47E+03
Tetrachloroethene (GWVapour)	1.61E-09	3.17E-05	9.72E-05	1.51E-04	3.74E-05	0.00E+00	0.00E+00	7.85E-05	4.15E+02	4.16E+02
1,1,1-Trichloroethane (GWVapou	8.14E-08	1.60E-03	6.09E-03	1.06E-02	3.06E-03	0.00E+00	0.00E+00	7.31E-03	1.38E+03	1.38E+03
Naphthalene (GWVapour)	2.17E-08	4.26E-04	8.80E-04	1.25E-03	3.12E-04	0.00E+00	0.00E+00	3.96E-04	7.50E+01	7.51E+01
Chloroethene (Vinyl Chloride) (G	7.77E-12	1.53E-07	7.51E-07	3.51E-06	5.40E-07	0.00E+00	0.00E+00	9.29E-07	1.35E+03	3.83E+03
Acenaphthene (GWVapour)	5.97E-05	1.17E+00	1.02E+00	1.38E+00	3.89E-01	0.00E+00	0.00E+00	1.66E-01	5.67E+01	8.78E+01
Acenaphthylene (GWVapour)	6.08E-05	1.20E+00	1.28E+00	1.73E+00	4.41E-01	0.00E+00	0.00E+00	2.48E-01	8.55E+01	8.67E+01
Fluorene (GWVapour)	8.84E-05	1.74E+00	1.30E+00	1.75E+00	5.11E-01	0.00E+00	0.00E+00	1.81E-01	3.08E+01	4.43E+01

Chemical Name	Chemical type	Fraction of organic carbon in soil	Soil Concentrations				Soil Distribution (mg g-1)				Soil Distribution (%)						
			Total soil concentration	Soil vapour concentration	Soil solution concentration	Total amount of sorbed chemical in soil	Total sorbed concentration on a mass basis	Soil solution concentration on a mass basis	Vapour concentration on a mass basis	Total soil concentration	SORBED	DISSOLVED	VAPOUR	TOTAL	At 0.8 metres (infinite model)	At 0.8 metres (user soil gas)	At 0.8 metres (finite model)
		$g\ g^{-1}$	$mg\ g^{-1}$ DW	$mg\ cm^{-3}$	$mg\ cm^{-3}$	$mg\ g^{-1}$	$mg\ g^{-1}$	$mg\ g^{-1}$	$mg\ g^{-1}$	$mg\ g^{-1}$ DW	%	%	%	%	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$
TPH Aliphatic EC5-EC6 (GWVa	Organic	0.0058	2.00E-02	4.09E-02	1.95E-03	9.19E-03	9.19E-03	3.96E-04	1.04E-02	2.00E-02	4.60E+01	1.98E+00	5.21E+01	1.00E+02	8.38E-04	NR	NR
TPH Aliphatic >EC6-EC8 (GWV	Organic	0.0058	4.37E-02	4.09E-02	1.50E-03	3.30E-02	3.30E-02	3.05E-04	1.04E-02	4.37E-02	7.55E+01	6.97E-01	2.38E+01	1.00E+02	1.24E-03	NR	NR
TPH Aliphatic >EC8-EC10 (GW	Organic	0.0058	1.06E-02	2.37E-03	5.72E-05	1.00E-02	1.00E-02	1.16E-05	6.03E-04	1.06E-02	9.42E+01	1.09E-01	5.68E+00	1.00E+02	1.47E-04	NR	NR
TPH Aliphatic >EC10-EC12 (GW	Organic	0.0058	5.19E-02	2.37E-03	3.68E-05	5.13E-02	5.13E-02	7.49E-06	6.03E-04	5.19E-02	9.88E+01	1.44E-02	1.16E+00	1.00E+02	3.25E-04	NR	NR
TPH Aromatic >EC5-EC7 (GWV	Organic	0.0058	1.31E-01	2.43E-02	2.10E-01	8.22E-02	8.22E-02	4.26E-02	6.18E-03	1.31E-01	6.27E+01	3.25E+01	4.72E+00	1.00E+02	1.55E-03	NR	NR
TPH Aromatic >EC7-EC8 (GWV	Organic	0.0058	3.15E-01	2.56E-02	2.23E-01	2.64E-01	2.64E-01	4.53E-02	6.51E-03	3.15E-01	8.36E+01	1.44E+01	2.06E+00	1.00E+02	2.32E-03	NR	NR
TPH Aromatic >EC8-EC10 (GW	Organic	0.0058	1.84E-02	4.91E-04	1.94E-03	1.78E-02	1.78E-02	3.95E-04	1.25E-04	1.84E-02	9.72E+01	2.15E+00	6.80E-01	1.00E+02	8.79E-05	NR	NR
TPH Aromatic >EC10-EC12 (GV	Organic	0.0058	1.01E-01	4.91E-04	6.80E-03	9.90E-02	9.90E-02	1.38E-03	1.25E-04	1.01E-01	9.85E+01	1.38E+00	1.24E-01	1.00E+02	2.06E-04	NR	NR
TPH Aromatic >EC12-EC16 (GV	Organic	0.0058	1.14E+00	4.90E-04	3.89E-02	1.13E+00	1.13E+00	7.90E-03	1.24E-04	1.14E+00	9.93E+01	6.95E-01	1.09E-02	1.00E+02	6.93E-04	NR	NR
Benzene (GWVapour)	Organic	0.0058	1.32E-04	2.45E-05	2.11E-04	8.29E-05	8.29E-05	4.30E-05	6.23E-06	1.32E-04	6.27E+01	3.25E+01	4.72E+00	1.00E+02	1.56E-06	NR	NR
Toluene (GWVapour)	Organic	0.0058	3.21E-01	2.61E-02	2.27E-01	2.69E-01	2.69E-01	4.61E-02	6.63E-03	3.21E-01	8.36E+01	1.44E+01	2.06E+00	1.00E+02	2.37E-03	NR	NR
Ethylbenzene (GWVapour)	Organic	0.0058	2.95E-02	1.45E-03	1.04E-02	2.70E-02	2.70E-02	2.12E-03	3.69E-04	2.95E-02	9.16E+01	7.19E+00	1.25E+00	1.00E+02	1.61E-04	NR	NR
meta-Xylene (GWVapour)	Organic	0.0058	2.92E-02	1.07E-03	9.51E-03	2.70E-02	2.70E-02	1.93E-03	2.71E-04	2.92E-02	9.25E+01	6.62E+00	9.27E-01	1.00E+02	1.37E-04	NR	NR
ortho-Xylene (GWVapour)	Organic	0.0058	3.13E-02	1.07E-03	1.16E-02	2.87E-02	2.87E-02	2.36E-03	2.71E-04	3.13E-02	9.16E+01	7.53E+00	8.66E-01	1.00E+02	1.42E-04	NR	NR
para-Xylene (GWVapour)	Organic	0.0058	2.81E-02	1.06E-03	9.95E-03	2.58E-02	2.58E-02	2.02E-03	2.71E-04	2.81E-02	9.18E+01	7.21E+00	9.64E-01	1.00E+02	1.34E-04	NR	NR
Trichloroethene (GWVapour)	Organic	0.0058	6.05E-06	1.06E-06	5.65E-06	4.63E-06	4.63E-06	1.15E-06	2.69E-07	6.05E-06	7.66E+01	1.90E+01	4.44E+00	1.00E+02	6.59E-08	NR	NR
Tetrachloromethane (Carbon Tetr	Organic	0.0058	9.37E-06	3.07E-06	5.28E-06	7.51E-06	7.51E-06	1.07E-06	7.81E-07	9.37E-06	8.02E+01	1.15E+01	8.34E+00	1.00E+02	1.38E-07	NR	NR
Mercury, elemental (GWVapour)	Organic	0.0058	8.86E-05	1.23E-07	1.05E-06	8.83E-05	8.83E-05	2.14E-07	3.13E-08	8.86E-05	9.97E+01	2.42E-01	3.54E-02	1.00E+02	7.71E-08	NR	NR
Trichloromethane (Chloroform) (	Organic	0.0058	4.03E-04	6.01E-05	7.85E-04	2.28E-04	2.28E-04	1.60E-04	1.53E-05	4.03E-04	5.66E+01	3.96E+01	3.79E+00	1.00E+02	4.23E-06	NR	NR
Aldrin (GWVapour)	Organic	0.0058	5.98E-02	2.73E-07	4.71E-05	5.98E-02	5.98E-02	9.59E-06	6.94E-08	5.98E-02	1.00E+02	1.60E-02	1.16E-04	1.00E+02	2.41E-06	NR	NR
alpha-Endosulfan (GWVapour)	Organic	0.0058	3.88E-02	1.4E-05	7.38E-03	3.73E-02	3.73E-02	1.50E-03	3.55E-06	3.88E-02	9.61E+01	3.87E+00	9.14E-03	1.00E+02	1.39E-05	NR	NR
beta-Endosulfan (GWVapour)	Organic	0.0058	3.61E-02	1.41E-05	7.51E-03	3.46E-02	3.46E-02	1.53E-03	3.59E-06	3.61E-02	9.58E+01	4.23E+00	9.93E-03	1.00E+02	1.34E-05	NR	NR
Chlorobenzene (GWVapour)	Organic	0.0058	1.65E-04	8.14E-06	9.79E-05	1.43E-04	1.43E-04	1.99E-05	2.07E-06	1.65E-04	8.66E+01	1.21E+01	1.26E+00	1.00E+02	9.33E-07	NR	NR
1,2-Dichlorobenzene (GWVapou	Organic	0.0058	8.36E-03	6.69E-05	1.98E-03	7.94E-03	7.94E-03	4.03E-04	1.70E-05	8.36E-03	9.50E+01	4.81E+00	2.03E-01	1.00E+02	1.80E-05	NR	NR
1,3-Dichlorobenzene (GWVapou	Organic	0.0058	1.55E-04	2.03E-06	3.07E-05	1.48E-04	1.48E-04	6.25E-06	5.16E-07	1.55E-04	9.56E+01	4.03E+00	3.33E-01	1.00E+02	4.27E-07	NR	NR
1,4-Dichlorobenzene (GWVapou	Organic	0.0058	2.16E-02	0.000234	4.99E-03	2.05E-02	2.05E-02	1.01E-03	5.96E-05	2.16E-02	9.50E+01	4.71E+00	2.77E-01	1.00E+02	5.42E-05	NR	NR
1,2,3-Trichlorobenzene (GWVap	Organic	0.0058	5.29E-04	1.07E-06	3.50E-05	5.22E-04	5.22E-04	7.12E-06	2.73E-07	5.29E-04	9.86E+01	1.35E+00	5.16E-02	1.00E+02	5.48E-07	NR	NR
1,2,4-Trichlorobenzene (GWVap	Organic	0.0058	9.13E-04	2.47E-06	6.76E-05	8.99E-04	8.99E-04	1.38E-05	6.28E-07	9.13E-04	9.84E+01	1.51E+00	6.87E-02	1.00E+02	1.09E-06	NR	NR
1,3,5-Trichlorobenzene (GWVap	Organic	0.0058	1.15E-04	1.07E-06	7.44E-06	1.13E-04	1.13E-04	1.51E-06	2.72E-07	1.15E-04	9.85E+01	1.31E+00	2.36E-01	1.00E+02	2.56E-07	NR	NR
1,2,3,4-Tetrachlorobenzene (GW	Organic	0.0058	8.54E-03	3.84E-06	2.43E-04	8.49E-03	8.49E-03	4.94E-05	9.76E-07	8.54E-03	9.94E+01	5.79E-01	1.14E-02	1.00E+02	4.00E-06	NR	NR

	Outdoor Air Concentration of Vapours						Outdoor Air Concentration in Dust				
Chemical Name	At 0.8 metres (selected)	At 1.6 metres (infinite model)	At 1.6 metres (user soil gas)	At 1.6 metres (finite model)	At 1.6 metres (selected)	Indoor Air Concentration of Vapours	PM10 emission flux	PEF at child height	Outdoor contaminant concentration in respirable dust at child height	PEF at adult height	Outdoor contaminant concentration in respirable dust at adult height
	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$g\ m^{-2}\ s^{-1}$	$m^3\ kg^{-1}$	$mg\ m^{-3}$	$m^3\ kg^{-1}$	$mg\ m^{-3}$
TPH Aliphatic EC5-EC6 (GWVa	8.38E-04	NR	NR	0.00E+00	0.00E+00	3.85E+00	1.02E-06	2.35E+09	8.51E-09	0.00E+00	0.00E+00
TPH Aliphatic >EC6-EC8 (GWV	1.24E-03	NR	NR	0.00E+00	0.00E+00	3.85E+00	1.02E-06	2.35E+09	1.86E-08	0.00E+00	0.00E+00
TPH Aliphatic >EC8-EC10 (GW	1.47E-04	NR	NR	0.00E+00	0.00E+00	2.23E-01	1.02E-06	2.35E+09	4.52E-09	0.00E+00	0.00E+00
TPH Aliphatic >EC10-EC12 (GW	3.25E-04	NR	NR	0.00E+00	0.00E+00	2.23E-01	1.02E-06	2.35E+09	2.21E-08	0.00E+00	0.00E+00
TPH Aromatic >EC5-EC7 (GWV	1.55E-03	NR	NR	0.00E+00	0.00E+00	2.14E+00	1.02E-06	2.35E+09	5.57E-08	0.00E+00	0.00E+00
TPH Aromatic >EC7-EC8 (GWV	2.32E-03	NR	NR	0.00E+00	0.00E+00	2.11E+00	1.02E-06	2.35E+09	1.34E-07	0.00E+00	0.00E+00
TPH Aromatic >EC8-EC10 (GW	8.79E-05	NR	NR	0.00E+00	0.00E+00	4.62E-02	1.02E-06	2.35E+09	7.81E-09	0.00E+00	0.00E+00
TPH Aromatic >EC10-EC12 (GV	2.06E-04	NR	NR	0.00E+00	0.00E+00	4.62E-02	1.02E-06	2.35E+09	4.28E-08	0.00E+00	0.00E+00
TPH Aromatic >EC12-EC16 (GV	6.93E-04	NR	NR	0.00E+00	0.00E+00	4.61E-02	1.02E-06	2.35E+09	4.84E-07	0.00E+00	0.00E+00
Benzene (GWVapour)	1.56E-06	NR	NR	0.00E+00	0.00E+00	2.15E-03	1.02E-06	2.35E+09	5.62E-11	0.00E+00	0.00E+00
Toluene (GWVapour)	2.37E-03	NR	NR	0.00E+00	0.00E+00	2.15E+00	1.02E-06	2.35E+09	1.37E-07	0.00E+00	0.00E+00
Ethylbenzene (GWVapour)	1.61E-04	NR	NR	0.00E+00	0.00E+00	1.13E-01	1.02E-06	2.35E+09	1.26E-08	0.00E+00	0.00E+00
meta-Xylene (GWVapour)	1.37E-04	NR	NR	0.00E+00	0.00E+00	8.26E-02	1.02E-06	2.35E+09	1.24E-08	0.00E+00	0.00E+00
ortho-Xylene (GWVapour)	1.42E-04	NR	NR	0.00E+00	0.00E+00	8.26E-02	1.02E-06	2.35E+09	1.33E-08	0.00E+00	0.00E+00
para-Xylene (GWVapour)	1.34E-04	NR	NR	0.00E+00	0.00E+00	8.26E-02	1.02E-06	2.35E+09	1.19E-08	0.00E+00	0.00E+00
Trichloroethene (GWVapour)	6.59E-08	NR	NR	0.00E+00	0.00E+00	8.77E-04	1.02E-06	2.35E+09	2.57E-12	0.00E+00	0.00E+00
Tetrachloromethane (Carbon Tetr	1.38E-07	NR	NR	0.00E+00	0.00E+00	2.51E-03	1.02E-06	2.35E+09	3.99E-12	0.00E+00	0.00E+00
Mercury, elemental (GWVapour)	7.71E-08	NR	NR	0.00E+00	0.00E+00	8.99E-05	1.02E-06	2.35E+09	3.77E-11	0.00E+00	0.00E+00
Trichloromethane (Chloroform) (	4.23E-06	NR	NR	0.00E+00	0.00E+00	5.22E-02	1.02E-06	2.35E+09	1.72E-10	0.00E+00	0.00E+00
Aldrin (GWVapour)	2.41E-06	NR	NR	0.00E+00	0.00E+00	1.50E-04	1.02E-06	2.35E+09	2.55E-08	0.00E+00	0.00E+00
alpha-Endosulfan (GWVapour)	1.39E-05	NR	NR	0.00E+00	0.00E+00	7.69E-03	1.02E-06	2.35E+09	1.65E-08	0.00E+00	0.00E+00
beta-Endosulfan (GWVapour)	1.34E-05	NR	NR	0.00E+00	0.00E+00	7.69E-03	1.02E-06	2.35E+09	1.54E-08	0.00E+00	0.00E+00
Chlorobenzene (GWVapour)	9.33E-07	NR	NR	0.00E+00	0.00E+00	6.59E-03	1.02E-06	2.35E+09	7.01E-11	0.00E+00	0.00E+00
1,2-Dichlorobenzene (GWVapou	1.80E-05	NR	NR	0.00E+00	0.00E+00	5.07E-02	1.02E-06	2.35E+09	3.56E-09	0.00E+00	0.00E+00
1,3-Dichlorobenzene (GWVapou	4.27E-07	NR	NR	0.00E+00	0.00E+00	1.54E-03	1.02E-06	2.35E+09	6.59E-11	0.00E+00	0.00E+00
1,4-Dichlorobenzene (GWVapou	5.42E-05	NR	NR	0.00E+00	0.00E+00	1.78E-01	1.02E-06	2.35E+09	9.17E-09	0.00E+00	0.00E+00
1,2,3-Trichlorobenzene (GWVap	5.48E-07	NR	NR	0.00E+00	0.00E+00	7.70E-04	1.02E-06	2.35E+09	2.25E-10	0.00E+00	0.00E+00
1,2,4-Trichlorobenzene (GWVap	1.09E-06	NR	NR	0.00E+00	0.00E+00	1.77E-03	1.02E-06	2.35E+09	3.89E-10	0.00E+00	0.00E+00
1,3,5-Trichlorobenzene (GWVap	2.56E-07	NR	NR	0.00E+00	0.00E+00	7.69E-04	1.02E-06	2.35E+09	4.91E-11	0.00E+00	0.00E+00
1,2,3,4-Tetrachlorobenzene (GW	4.00E-06	NR	NR	0.00E+00	0.00E+00	2.62E-03	1.02E-06	2.35E+09	3.63E-09	0.00E+00	0.00E+00

Chemical Name	Indoor Air Concentration in Dust	Concentration in Indoor Dust	Concentration in Homegrown Produce: Green Vegetables	Root Vegetables	Tuber Vegetables	Herbaceous Fruits	Shrub Fruits	Tree Fruits	Soil Saturation Limits: Solubility Based	Vapour Based
	mg m^{-3}	mg g^{-1} DW	mg g^{-1} FW	mg g^{-1} FW	mg g^{-1} FW	mg g^{-1} FW	mg g^{-1} FW	mg g^{-1} FW	mg kg^{-1}	mg kg^{-1}
TPH Aliphatic EC5-EC6 (GWVa	5.08E-07	9.99E-03	1.62E-02	2.28E-02	2.97E-03	0.00E+00	0.00E+00	3.65E-03	3.68E+02	3.69E+02
TPH Aliphatic >EC6-EC8 (GWV	1.11E-06	2.19E-02	1.21E-02	1.64E-02	4.24E-03	0.00E+00	0.00E+00	1.29E-03	1.57E+02	1.57E+02
TPH Aliphatic >EC8-EC10 (GW	2.70E-07	5.31E-03	3.03E-04	5.88E-04	4.87E-04	0.00E+00	0.00E+00	7.70E-06	7.94E+01	7.92E+01
TPH Aliphatic >EC10-EC12 (GV	1.32E-06	2.59E-02	5.85E-05	3.71E-04	6.33E-04	0.00E+00	0.00E+00	3.00E-07	4.77E+01	4.77E+01
TPH Aromatic >EC5-EC7 (GWV	3.33E-06	6.55E-02	2.89E-01	6.07E-01	2.05E-01	0.00E+00	0.00E+00	4.81E-01	1.11E+03	1.12E+03
TPH Aromatic >EC7-EC8 (GWV	8.02E-06	1.58E-01	5.31E-01	8.58E-01	2.35E-01	0.00E+00	0.00E+00	5.27E-01	8.36E+02	8.35E+02
TPH Aromatic >EC8-EC10 (GW	4.67E-07	9.18E-03	1.01E-02	1.37E-02	3.64E-03	0.00E+00	0.00E+00	2.70E-03	6.11E+02	6.10E+02
TPH Aromatic >EC10-EC12 (GV	2.56E-06	5.03E-02	3.94E-02	5.30E-02	1.52E-02	0.00E+00	0.00E+00	7.42E-03	3.62E+02	3.63E+02
TPH Aromatic >EC12-EC16 (GV	2.89E-05	5.69E-01	2.47E-01	3.37E-01	1.27E-01	0.00E+00	0.00E+00	2.70E-02	1.68E+02	1.69E+02
Benzene (GWVapour)	3.36E-09	6.61E-05	2.91E-04	6.12E-04	2.07E-04	0.00E+00	0.00E+00	4.85E-04	1.11E+03	1.12E+03
Toluene (GWVapour)	8.17E-06	1.61E-01	5.42E-01	8.74E-01	2.40E-01	0.00E+00	0.00E+00	5.37E-01	8.36E+02	8.35E+02
Ethylbenzene (GWVapour)	7.51E-07	1.48E-02	3.68E-02	5.40E-02	1.41E-02	0.00E+00	0.00E+00	2.14E-02	5.09E+02	5.08E+02
meta-Xylene (GWVapour)	7.43E-07	1.46E-02	3.49E-02	5.08E-02	1.31E-02	0.00E+00	0.00E+00	1.90E-02	6.15E+02	6.13E+02
ortho-Xylene (GWVapour)	7.97E-07	1.57E-02	3.97E-02	5.85E-02	1.55E-02	0.00E+00	0.00E+00	2.42E-02	4.67E+02	5.11E+02
para-Xylene (GWVapour)	7.14E-07	1.40E-02	3.50E-02	5.14E-02	1.34E-02	0.00E+00	0.00E+00	2.04E-02	5.64E+02	5.65E+02
Trichloroethene (GWVapour)	1.54E-10	3.02E-06	1.13E-05	1.95E-05	5.78E-06	0.00E+00	0.00E+00	1.37E-05	1.47E+03	1.46E+03
Tetrachloromethane (Carbon Tetr	2.38E-10	4.68E-06	1.49E-05	2.33E-05	5.72E-06	0.00E+00	0.00E+00	1.22E-05	1.50E+03	1.50E+03
Mercury, elemental (GWVapour)	2.25E-09	4.43E-05	4.07E-07	9.45E-07	8.64E-07	0.00E+00	0.00E+00	6.48E-07	4.71E+00	4.30E+00
Trichloromethane (Chloroform) (	1.03E-08	2.02E-04	9.35E-04	2.21E-03	6.89E-04	0.00E+00	0.00E+00	1.70E-03	4.60E+03	4.60E+03
Aldrin (GWVapour)	1.52E-06	2.99E-02	5.65E-05	4.70E-04	3.12E-04	0.00E+00	0.00E+00	2.24E-07	2.54E+01	4.59E+02
alpha-Endosulfan (GWVapour)	9.86E-07	1.94E-02	3.81E-02	5.28E-02	1.17E-02	0.00E+00	0.00E+00	1.03E-02	2.79E+00	2.94E+00
beta-Endosulfan (GWVapour)	9.19E-07	1.81E-02	3.73E-02	5.19E-02	1.15E-02	0.00E+00	0.00E+00	1.12E-02	1.35E+00	1.42E+00
Chlorobenzene (GWVapour)	4.19E-09	8.23E-05	2.58E-04	4.05E-04	1.06E-04	0.00E+00	0.00E+00	2.26E-04	6.51E+02	6.51E+02
1,2-Dichlorobenzene (GWVapou	2.13E-07	4.18E-03	8.34E-03	1.18E-02	2.93E-03	0.00E+00	0.00E+00	3.54E-03	5.62E+02	5.63E+02
1,3-Dichlorobenzene (GWVapou	3.94E-09	7.74E-05	1.39E-04	1.95E-04	4.76E-05	0.00E+00	0.00E+00	5.11E-05	5.20E+02	5.20E+02
1,4-Dichlorobenzene (GWVapou	5.48E-07	1.08E-02	2.14E-02	3.02E-02	7.44E-03	0.00E+00	0.00E+00	8.80E-03	2.21E+02	2.21E+02
1,2,3-Trichlorobenzene (GWVap	1.35E-08	2.65E-04	2.14E-04	2.89E-04	8.46E-05	0.00E+00	0.00E+00	3.16E-05	3.18E+02	1.33E+02
1,2,4-Trichlorobenzene (GWVap	2.32E-08	4.56E-04	4.06E-04	5.48E-04	1.56E-04	0.00E+00	0.00E+00	6.58E-05	5.59E+02	3.17E+02
1,3,5-Trichlorobenzene (GWVap	2.93E-09	5.76E-05	4.57E-05	6.17E-05	1.81E-05	0.00E+00	0.00E+00	6.65E-06	9.30E+01	3.66E+01
1,2,3,4-Tetrachlorobenzene (GW	2.17E-07	4.27E-03	1.55E-03	2.21E-03	8.29E-04	0.00E+00	0.00E+00	1.16E-04	2.74E+02	1.22E+02

			Soil Concentrations				Soil Distribution (mg g-1)				Soil Distribution (%)						
Chemical Name	Chemical type	Fraction of organic carbon in soil	Total soil concentration	Soil vapour concentration	Soil solution concentration	Total amount of sorbed chemical in soil	Total sorbed concentration on a mass basis	Soil solution concentration on a mass basis	Vapour concentration on a mass basis	Total soil concentration	SORBED	DISSOLVED	VAPOUR	TOTAL	At 0.8 metres (infinite model)	At 0.8 metres (user soil gas)	At 0.8 metres (finite model)
		$g\ g^{-1}$	$mg\ g^{-1}$ DW	$mg\ cm^{-3}$	$mg\ cm^{-3}$	$mg\ g^{-1}$	$mg\ g^{-1}$	$mg\ g^{-1}$	$mg\ g^{-1}$	$mg\ g^{-1}$ DW	%	%	%	%	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$
1,2,3,5-Tetrachlorobenzene (GW	Organic	0.0058	2.63E-04	4.62E-07	6.99E-06	2.62E-04	2.62E-04	1.42E-06	1.18E-07	2.63E-04	9.94E+01	5.40E-01	4.46E-02	1.00E+02	2.44E-07	NR	NR
1,2,4,5-Tetrachlorobenzene (GW	Organic	0.0058	2.67E-04	1.12E-07	8.15E-06	2.66E-04	2.66E-04	1.66E-06	2.86E-08	2.67E-04	9.94E+01	6.20E-01	1.07E-02	1.00E+02	1.22E-07	NR	NR
Pentachlorobenzene (GWVapour	Organic	0.0058	1.17E-02	1.13E-06	1.36E-04	1.16E-02	1.16E-02	2.76E-05	2.86E-07	1.17E-02	9.98E+01	2.37E-01	2.45E-03	1.00E+02	2.46E-06	NR	NR
Hexachlorobenzene (GWVapour)	Organic	0.0058	3.20E-03	1.69E-07	1.63E-05	3.19E-03	3.19E-03	3.31E-06	4.30E-08	3.20E-03	9.99E+01	1.03E-01	1.34E-03	1.00E+02	4.82E-07	NR	NR
Carbon disulphide (GWVapour)	Organic	0.0058	5.47E-05	2.29E-05	5.62E-05	3.74E-05	3.74E-05	1.14E-05	5.83E-06	5.47E-05	6.84E+01	2.09E+01	1.07E+01	1.00E+02	1.06E-06	NR	NR
Hexachlorobutadiene (GWVapou	Organic	0.0058	1.11E-04	2.69E-07	1.74E-06	1.10E-04	1.10E-04	3.53E-07	6.84E-08	1.11E-04	9.96E+01	3.19E-01	6.17E-02	1.00E+02	1.18E-07	NR	NR

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Chemical Name	Outdoor Air Concentration of Vapours: At 0.8 metres (selected)	At 1.6 metres (infinite model)	At 1.6 metres (user soil gas)	At 1.6 metres (finite model)	At 1.6 metres (selected)	Indoor Air Concentration of Vapours	Outdoor Air Concentration in Dust: PM10 emission flux	PEF at child height	Outdoor contaminant concentration in respirable dust at child height	PEF at adult height	Outdoor contaminant concentration in respirable dust at adult height
	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$g\ m^{-2}\ s^{-1}$	$m^3\ kg^{-1}$	$mg\ m^{-3}$	$m^3\ kg^{-1}$	$mg\ m^{-3}$
1,2,3,5-Tetrachlorobenzene (GW	2.44E-07	NR	NR	0.00E+00	0.00E+00	3.16E-04	1.02E-06	2.35E+09	1.12E-10	0.00E+00	0.00E+00
1,2,4,5-Tetrachlorobenzene (GW	1.22E-07	NR	NR	0.00E+00	0.00E+00	7.70E-05	1.02E-06	2.35E+09	1.14E-10	0.00E+00	0.00E+00
Pentachlorobenzene (GWVapour	2.46E-06	NR	NR	0.00E+00	0.00E+00	7.38E-04	1.02E-06	2.35E+09	4.96E-09	0.00E+00	0.00E+00
Hexachlorobenzene (GWVapour)	4.82E-07	NR	NR	0.00E+00	0.00E+00	1.06E-04	1.02E-06	2.35E+09	1.36E-09	0.00E+00	0.00E+00
Carbon disulphide (GWVapour)	1.06E-06	NR	NR	0.00E+00	0.00E+00	2.20E-02	1.02E-06	2.35E+09	2.33E-11	0.00E+00	0.00E+00
Hexachlorobutadiene (GWVapou	1.18E-07	NR	NR	0.00E+00	0.00E+00	1.77E-04	1.02E-06	2.35E+09	4.72E-11	0.00E+00	0.00E+00

Chemical Name	Indoor Air Concentration in Dust	Concentration in Indoor Dust	Concentration in Homegrown Produce: Green Vegetables	Root Vegetables	Tuber Vegetables	Herbaceous Fruits	Shrub Fruits	Tree Fruits	Soil Saturation Limits: Solubility Based	Vapour Based
	$mg\ m^{-3}$	$mg\ g^{-1}$ DW	$mg\ g^{-1}$ FW	$mg\ g^{-1}$ FW	$mg\ g^{-1}$ FW	$mg\ g^{-1}$ FW	$mg\ g^{-1}$ FW	$mg\ g^{-1}$ FW	$mg\ kg^{-1}$	$mg\ kg^{-1}$
1,2,3,5-Tetrachlorobenzene (GW	6.70E-09	1.32E-04	4.44E-05	6.41E-05	2.47E-05	0.00E+00	0.00E+00	3.14E-06	1.32E+02	3.94E+01
1,2,4,5-Tetrachlorobenzene (GW	6.80E-09	1.34E-04	5.20E-05	7.39E-05	2.71E-05	0.00E+00	0.00E+00	4.09E-06	1.97E+01	1.97E+01
Pentachlorobenzene (GWVapour	2.97E-07	5.83E-03	7.54E-04	1.30E-03	6.65E-04	0.00E+00	0.00E+00	2.70E-05	4.30E+01	6.98E+01
Hexachlorobenzene (GWVapour)	8.13E-08	1.60E-03	6.76E-05	1.59E-04	1.00E-04	0.00E+00	0.00E+00	1.25E-06	1.89E+00	1.99E-01
Carbon disulphide (GWVapour)	1.39E-09	2.73E-05	7.39E-05	1.34E-04	5.53E-05	0.00E+00	0.00E+00	1.23E-04	2.04E+03	2.05E+03
Hexachlorobutadiene (GWVapou	2.82E-09	5.54E-05	1.04E-05	1.65E-05	7.44E-06	0.00E+00	0.00E+00	4.79E-07	3.06E+02	1.51E+03

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			Soil Concentrations				Soil Distribution (mg g-1)				Soil Distribution (%)						
Chemical Name	Chemical type	Fraction of organic carbon in soil	Total soil concentration	Soil vapour concentration	Soil solution concentration	Total amount of sorbed chemical in soil	Total sorbed concentration on a mass basis	Soil solution concentration on a mass basis	Vapour concentration on a mass basis	Total soil concentration	SORBED	DISSOLVED	VAPOUR	TOTAL	At 0.8 metres (infinite model)	At 0.8 metres (user soil gas)	At 0.8 metres (finite model)
		$g\ g^{-1}$	$mg\ g^{-1}$ DW	$mg\ cm^{-3}$	$mg\ cm^{-3}$	$mg\ g^{-1}$	$mg\ g^{-1}$	$mg\ g^{-1}$	$mg\ g^{-1}$	$mg\ g^{-1}$ DW	%	%	%	%	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$
1,1,2-Trichloroethane (GWVapou	Organic	0.0058	4.03E-02	8.51E-04	4.86E-02	3.02E-02	3.02E-02	9.89E-03	2.16E-04	4.03E-02	7.49E+01	2.45E+01	5.36E-01	1.00E+02	1.85E-03	NR	NR
1,1-Dichloroethane (GWVapour)	Organic	0.0058	1.15E-01	3.36E-02	2.61E-01	5.37E-02	5.37E-02	5.30E-02	8.55E-03	1.15E-01	4.66E+01	4.60E+01	7.42E+00	1.00E+02	2.11E-02	NR	NR
1,1-Dichloroethene (GWVapour)	Organic	0.0058	1.19E-02	9.46E-03	1.60E-02	6.26E-03	6.26E-03	3.25E-03	2.41E-03	1.19E-02	5.25E+01	2.73E+01	2.02E+01	1.00E+02	3.68E-03	NR	NR
1,2,4-Trimethylbenzene (GWVap	Organic	0.0058	1.83E-02	1.86E-04	2.18E-03	1.78E-02	1.78E-02	4.42E-04	4.73E-05	1.83E-02	9.73E+01	2.42E+00	2.59E-01	1.00E+02	5.36E-04	NR	NR
1,2-Dichloropropane (GWVapou	Organic	0.0058	1.35E-03	1.86E-04	2.59E-03	7.71E-04	7.71E-04	5.27E-04	4.74E-05	1.35E-03	5.73E+01	3.92E+01	3.52E+00	1.00E+02	1.59E-04	NR	NR
2-Chloronaphthalene (GWVapou	Organic	0.0058	1.77E-01	5.44E-05	1.44E-02	1.74E-01	1.74E-01	2.92E-03	1.38E-05	1.77E-01	9.83E+01	1.65E+00	7.80E-03	1.00E+02	8.70E-04	NR	NR
Biphenyl (GWVapour)	Organic	0.0058	1.07E+01	7.34E-03	1.27E+00	1.04E+01	1.04E+01	2.58E-01	1.87E-03	1.07E+01	9.76E+01	2.42E+00	1.75E-02	1.00E+02	7.69E-02	NR	NR
Bromobenzene (GWVapour)	Organic	0.0058	4.22E-02	6.14E-04	1.98E-02	3.80E-02	3.80E-02	4.03E-03	1.56E-04	4.22E-02	9.01E+01	9.54E+00	3.70E-01	1.00E+02	1.56E-03	NR	NR
Bromodichloromethane (GWVap	Organic	0.0058	8.56E-04	5.16E-05	1.61E-03	5.15E-04	5.15E-04	3.28E-04	1.31E-05	8.56E-04	6.01E+01	3.84E+01	1.53E+00	1.00E+02	6.87E-05	NR	NR
Bromoform (GWVapour)	Organic	0.0058	3.31E-01	3.24E-03	4.00E-01	2.49E-01	2.49E-01	8.13E-02	8.23E-04	3.31E-01	7.52E+01	2.46E+01	2.49E-01	1.00E+02	1.03E-02	NR	NR
Chloroethane (GWVapour)	Organic	0.0058	4.37E-01	4.58E-01	1.03E+00	1.11E-01	1.11E-01	2.09E-01	1.16E-01	4.37E-01	2.54E+01	4.79E+01	2.67E+01	1.00E+02	1.65E-01	NR	NR
Chloromethane (GWVapour)	Organic	0.0058	4.53E-04	3.92E-04	1.45E-03	5.81E-05	5.81E-05	2.95E-04	9.98E-05	4.53E-04	1.28E+01	6.51E+01	2.20E+01	1.00E+02	1.72E-04	NR	NR
Cis-1,2-Dichloroethene (GWVap	Organic	0.0058	6.01E-03	9.77E-04	1.31E-02	3.10E-03	3.10E-03	2.66E-03	2.48E-04	6.01E-03	5.15E+01	4.43E+01	4.14E+00	1.00E+02	8.33E-04	NR	NR
Dichloromethane (GWVapour)	Organic	0.0058	1.11E-01	2.10E-02	3.72E-01	2.98E-02	2.98E-02	7.56E-02	5.33E-03	1.11E-01	2.69E+01	6.83E+01	4.82E+00	1.00E+02	1.74E-02	NR	NR
Hexachloroethane (GWVapour)	Organic	0.0058	9.51E-03	9.64E-05	7.36E-04	9.34E-03	9.34E-03	1.50E-04	2.45E-05	9.51E-03	9.82E+01	1.57E+00	2.58E-01	1.00E+02	2.65E-04	NR	NR
Isopropylbenzene (GWVapour)	Organic	0.0058	5.97E-01	0.020453	8.63E-02	5.75E-01	5.75E-01	1.76E-02	5.20E-03	5.97E-01	9.62E+01	2.94E+00	8.70E-01	1.00E+02	3.22E-02	NR	NR
Methyl tertiary butyl ether (GWV	Organic	0.0058	3.16E+00	0.125262	7.83E+00	1.54E+00	1.54E+00	1.59E+00	3.18E-02	3.16E+00	4.86E+01	5.03E+01	1.01E+00	1.00E+02	2.02E-01	NR	NR
Propylbenzene (GWVapour)	Organic	0.0058	1.79E+00	0.041147	2.42E-01	1.73E+00	1.73E+00	4.92E-02	1.05E-02	1.79E+00	9.67E+01	2.76E+00	5.85E-01	1.00E+02	7.82E-02	NR	NR
Styrene (GWVapour)	Organic	0.0058	1.69E+00	0.042982	8.06E-01	1.51E+00	1.51E+00	1.64E-01	1.09E-02	1.69E+00	8.96E+01	9.71E+00	6.47E-01	1.00E+02	8.27E-02	NR	NR
Trans-1,2-Dichloroethene (GWV	Organic	0.0058	9.52E-03	0.002816	1.59E-02	5.56E-03	5.56E-03	3.24E-03	7.16E-04	9.52E-03	5.85E+01	3.40E+01	7.52E+00	1.00E+02	1.79E-03	NR	NR
1,2-Dichloroethane (GWVapour)	Organic	0.0058	2.77E-04	2.03E-05	8.53E-04	9.87E-05	9.87E-05	1.73E-04	5.16E-06	2.77E-04	3.56E+01	6.25E+01	1.86E+00	1.00E+02	2.52E-05	NR	NR
1,1,1,2-Tetrachloroethane (GWV	Organic	0.0058	4.97E-02	0.001049	2.18E-02	4.50E-02	4.50E-02	4.44E-03	2.67E-04	4.97E-02	9.05E+01	8.95E+00	5.37E-01	1.00E+02	2.17E-03	NR	NR
1,1,2,2-Tetrachloroethane (GWV	Organic	0.0058	1.25E-01	0.00105	1.48E-01	9.43E-02	9.43E-02	3.02E-02	2.67E-04	1.25E-01	7.56E+01	2.42E+01	2.14E-01	1.00E+02	3.43E-03	NR	NR
Tetrachloroethene (GWVapour)	Organic	0.0058	8.56E-03	0.001466	4.64E-03	7.24E-03	7.24E-03	9.44E-04	3.73E-04	8.56E-03	8.46E+01	1.10E+01	4.35E+00	1.00E+02	1.08E-03	NR	NR
1,1,1-Trichloroethane (GWVapou	Organic	0.0058	3.06E-01	0.104091	2.89E-01	2.21E-01	2.21E-01	5.88E-02	2.65E-02	3.06E-01	7.22E+01	1.92E+01	8.64E+00	1.00E+02	5.69E-02	NR	NR
Naphthalene (GWVapour)	Organic	0.0058	9.04E-02	0.000152	2.29E-02	8.57E-02	8.57E-02	4.65E-03	3.85E-05	9.04E-02	9.48E+01	5.15E+00	4.26E-02	1.00E+02	1.08E-03	NR	NR
Chloroethene (Vinyl Chloride) (G	Organic	0.0058	3.10E-05	4.73E-05	6.34E-05	6.10E-06	6.10E-06	1.29E-05	1.20E-05	3.10E-05	1.97E+01	4.15E+01	3.88E+01	1.00E+02	1.46E-05	NR	NR
Acenaphthene (GWVapour)	Organic	0.0058	2.04E+02	0.011239	1.48E+01	2.01E+02	2.01E+02	3.01E+00	2.86E-03	2.04E+02	9.85E+01	1.47E+00	1.40E-03	1.00E+02	4.30E-01	NR	NR
Acenaphthylene (GWVapour)	Organic	0.0058	2.10E+02	0.011084	1.95E+01	2.06E+02	2.06E+02	3.97E+00	2.82E-03	2.10E+02	9.81E+01	1.89E+00	1.34E-03	1.00E+02	4.41E-01	NR	NR
Fluorene (GWVapour)	Organic	0.0058	3.00E+02	0.00747	1.81E+01	2.96E+02	2.96E+02	3.69E+00	1.90E-03	3.00E+02	9.88E+01	1.23E+00	6.33E-04	1.00E+02	4.23E-01	NR	NR

	Outdoor Air Concentration of Vapours						Outdoor Air Concentration in Dust				
Chemical Name	At 0.8 metres (selected)	At 1.6 metres (infinite model)	At 1.6 metres (user soil gas)	At 1.6 metres (finite model)	At 1.6 metres (selected)	Indoor Air Concentration of Vapours	PM10 emission flux	PEF at child height	Outdoor contaminant concentration in respirable dust at child height	PEF at adult height	Outdoor contaminant concentration in respirable dust at adult height
	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$g\ m^{-2}\ s^{-1}$	$m^3\ kg^{-1}$	$mg\ m^{-3}$	$m^3\ kg^{-1}$	$mg\ m^{-3}$
1,1,2-Trichloroethane (GWVapou	1.85E-03	1.05E-03	NR	NR	1.05E-03	9.89E-02	8.17E-07	8.32E+07	4.84E-07	1.47E+08	2.75E-07
1,1-Dichloroethane (GWVapour)	2.11E-02	1.19E-02	NR	NR	1.19E-02	4.08E+00	8.17E-07	8.32E+07	1.39E-06	1.47E+08	7.85E-07
1,1-Dichloroethene (GWVapour)	3.68E-03	2.09E-03	NR	NR	2.09E-03	1.17E+00	8.17E-07	8.32E+07	1.43E-07	1.47E+08	8.11E-08
1,2,4-Trimethylbenzene (GWVap	5.36E-04	3.04E-04	NR	NR	3.04E-04	2.04E-02	8.17E-07	8.32E+07	2.20E-07	1.47E+08	1.25E-07
1,2-Dichloropropane (GWVapou	1.59E-04	9.03E-05	NR	NR	9.03E-05	2.18E-02	8.17E-07	8.32E+07	1.62E-08	1.47E+08	9.16E-09
2-Chloronaphthalene (GWVapou	8.70E-04	4.93E-04	NR	NR	4.93E-04	5.81E-03	8.17E-07	8.32E+07	2.13E-06	1.47E+08	1.21E-06
Biphenyl (GWVapour)	7.69E-02	4.36E-02	NR	NR	4.36E-02	7.73E-01	8.17E-07	8.32E+07	1.28E-04	1.47E+08	7.26E-05
Bromobenzene (GWVapour)	1.56E-03	8.86E-04	NR	NR	8.86E-04	7.01E-02	8.17E-07	8.32E+07	5.07E-07	1.47E+08	2.87E-07
Bromodichloromethane (GWVap	6.87E-05	3.89E-05	NR	NR	3.89E-05	6.14E-03	8.17E-07	8.32E+07	1.03E-08	1.47E+08	5.83E-09
Bromoform (GWVapour)	1.03E-02	5.85E-03	NR	NR	5.85E-03	3.76E-01	8.17E-07	8.32E+07	3.97E-06	1.47E+08	2.25E-06
Chloroethane (GWVapour)	1.65E-01	9.37E-02	NR	NR	9.37E-02	5.84E+01	8.17E-07	8.32E+07	5.25E-06	1.47E+08	2.97E-06
Chloromethane (GWVapour)	1.72E-04	9.76E-05	NR	NR	9.76E-05	5.26E-02	8.17E-07	8.32E+07	5.44E-09	1.47E+08	3.08E-09
Cis-1,2-Dichloroethene (GWVap	8.33E-04	4.72E-04	NR	NR	4.72E-04	1.20E-01	8.17E-07	8.32E+07	7.22E-08	1.47E+08	4.09E-08
Dichloromethane (GWVapour)	1.74E-02	9.87E-03	NR	NR	9.87E-03	2.64E+00	8.17E-07	8.32E+07	1.33E-06	1.47E+08	7.54E-07
Hexachloroethane (GWVapour)	2.65E-04	1.50E-04	NR	NR	1.50E-04	1.02E-02	8.17E-07	8.32E+07	1.14E-07	1.47E+08	6.48E-08
Isopropylbenzene (GWVapour)	3.22E-02	1.83E-02	NR	NR	1.83E-02	2.25E+00	8.17E-07	8.32E+07	7.18E-06	1.47E+08	4.07E-06
Methyl tertiary butyl ether (GWV	2.02E-01	1.14E-01	NR	NR	1.14E-01	1.47E+01	8.17E-07	8.32E+07	3.80E-05	1.47E+08	2.15E-05
Propylbenzene (GWVapour)	7.82E-02	4.43E-02	NR	NR	4.43E-02	4.49E+00	8.17E-07	8.32E+07	2.15E-05	1.47E+08	1.22E-05
Styrene (GWVapour)	8.27E-02	4.68E-02	NR	NR	4.68E-02	4.91E+00	8.17E-07	8.32E+07	2.03E-05	1.47E+08	1.15E-05
Trans-1,2-Dichloroethene (GWV	1.79E-03	1.01E-03	NR	NR	1.01E-03	3.46E-01	8.17E-07	8.32E+07	1.14E-07	1.47E+08	6.48E-08
1,2-Dichloroethane (GWVapour)	2.52E-05	1.43E-05	NR	NR	1.43E-05	2.45E-03	8.17E-07	8.32E+07	3.33E-09	1.47E+08	1.89E-09
1,1,1,2-Tetrachloroethane (GWV	2.17E-03	1.23E-03	NR	NR	1.23E-03	1.18E-01	8.17E-07	8.32E+07	5.97E-07	1.47E+08	3.38E-07
1,1,2,2-Tetrachloroethane (GWV	3.43E-03	1.95E-03	NR	NR	1.95E-03	1.18E-01	8.17E-07	8.32E+07	1.50E-06	1.47E+08	8.49E-07
Tetrachloroethene (GWVapour)	1.08E-03	6.12E-04	NR	NR	6.12E-04	1.67E-01	8.17E-07	8.32E+07	1.03E-07	1.47E+08	5.83E-08
1,1,1-Trichloroethane (GWVapou	5.69E-02	3.22E-02	NR	NR	3.22E-02	1.22E+01	8.17E-07	8.32E+07	3.68E-06	1.47E+08	2.09E-06
Naphthalene (GWVapour)	1.08E-03	6.14E-04	NR	NR	6.14E-04	1.67E-02	8.17E-07	8.32E+07	1.09E-06	1.47E+08	6.16E-07
Chloroethene (Vinyl Chloride) (G	1.46E-05	8.28E-06	NR	NR	8.28E-06	6.14E-03	8.17E-07	8.32E+07	3.73E-10	1.47E+08	2.11E-10
Acenaphthene (GWVapour)	4.30E-01	2.44E-01	NR	NR	2.44E-01	1.21E+00	8.17E-07	8.32E+07	2.46E-03	1.47E+08	1.39E-03
Acenaphthylene (GWVapour)	4.41E-01	2.50E-01	NR	NR	2.50E-01	1.21E+00	8.17E-07	8.32E+07	2.52E-03	1.47E+08	1.43E-03
Fluorene (GWVapour)	4.23E-01	2.40E-01	NR	NR	2.40E-01	8.03E-01	8.17E-07	8.32E+07	3.61E-03	1.47E+08	2.04E-03

Chemical Name	Indoor Air Concentration in Dust		Concentration in Homegrown Produce						Soil Saturation Limits	
		Concentration in Indoor Dust	Green Vegetables	Root Vegetables	Tuber Vegetables	Herbaceous Fruits	Shrub Fruits	Tree Fruits	Solubility Based	Vapour Based
	$mg\ m^{-3}$	$mg\ g^{-1}$ DW	$mg\ g^{-1}$ FW	$mg\ g^{-1}$ FW	$mg\ g^{-1}$ FW	$mg\ g^{-1}$ FW	$mg\ g^{-1}$ FW	$mg\ g^{-1}$ FW	$mg\ kg^{-1}$	$mg\ kg^{-1}$
1,1,2-Trichloroethane (GWVapou	2.50E-06	2.02E-02	8.09E-02	1.48E-01	4.85E-02	0.00E+00	0.00E+00	1.17E-01	3.72E+03	3.72E+03
1,1-Dichloroethane (GWVapour)	7.15E-06	5.76E-02	2.80E-01	7.80E-01	2.26E-01	0.00E+00	0.00E+00	5.19E-01	1.62E+03	2.23E+03
1,1-Dichloroethene (GWVapour)	7.39E-07	5.96E-03	2.63E-02	5.52E-02	1.57E-02	0.00E+00	0.00E+00	3.66E-02	2.31E+03	2.18E+03
1,2,4-Trimethylbenzene (GWVap	1.14E-06	9.16E-03	1.17E-02	1.59E-02	3.90E-03	0.00E+00	0.00E+00	2.84E-03	4.71E+03	5.53E+02
1,2-Dichloropropane (GWVapour	8.35E-08	6.73E-04	3.13E-03	7.32E-03	2.26E-03	0.00E+00	0.00E+00	5.67E-03	1.06E+03	1.07E+03
2-Chloronaphthalene (GWVapou	1.10E-05	8.86E-02	8.49E-02	1.15E-01	3.00E-02	0.00E+00	0.00E+00	1.48E-02	1.44E+02	1.13E+02
Biphenyl (GWVapour)	6.61E-04	5.33E+00	6.81E+00	9.28E+00	2.25E+00	0.00E+00	0.00E+00	1.66E+00	3.41E+01	3.41E+01
Bromobenzene (GWVapour)	2.62E-06	2.11E-02	5.98E-02	9.05E-02	2.24E-02	0.00E+00	0.00E+00	4.36E-02	8.27E+02	8.28E+02
Bromodichloromethane (GWVap	5.31E-08	4.28E-04	1.96E-03	4.45E-03	1.57E-03	0.00E+00	0.00E+00	3.57E-03	1.59E+03	4.38E+03
Bromoform (GWVapour)	2.05E-05	1.65E-01	6.63E-01	1.22E+00	4.01E-01	0.00E+00	0.00E+00	9.62E-01	2.48E+03	3.35E+03
Chloroethane (GWVapour)	2.71E-05	2.18E-01	1.08E+00	4.59E+00	8.88E-01	0.00E+00	0.00E+00	1.61E+00	2.44E+03	2.44E+03
Chloromethane (GWVapour)	2.81E-08	2.26E-04	9.46E-04	1.07E-02	1.17E-03	0.00E+00	0.00E+00	1.32E-03	1.67E+03	8.18E+03
Cis-1,2-Dichloroethene (GWVap	3.73E-07	3.00E-03	1.43E-02	3.72E-02	1.14E-02	0.00E+00	0.00E+00	2.70E-02	3.46E+03	3.47E+03
Dichloromethane (GWVapour)	6.87E-06	5.54E-02	2.67E-01	1.47E+00	3.20E-01	0.00E+00	0.00E+00	5.05E-01	5.98E+03	5.98E+03
Hexachloroethane (GWVapour)	5.90E-07	4.76E-03	4.39E-03	5.92E-03	1.64E-03	0.00E+00	0.00E+00	7.42E-04	6.45E+02	8.13E+00
Isopropylbenzene (GWVapour)	3.71E-05	2.99E-01	4.40E-01	6.04E-01	1.45E-01	0.00E+00	0.00E+00	1.25E-01	3.88E+02	3.98E+02
Methyl tertiary butyl ether (GWV	1.96E-04	1.58E+00	4.13E+00	1.53E+01	6.13E+00	0.00E+00	0.00E+00	7.37E+00	1.94E+04	1.74E+04
Propylbenzene (GWVapour)	1.11E-04	8.93E-01	1.26E+00	1.72E+00	4.13E-01	0.00E+00	0.00E+00	3.37E-01	3.99E+02	3.99E+02
Styrene (GWVapour)	1.05E-04	8.44E-01	2.42E+00	3.67E+00	9.04E-01	0.00E+00	0.00E+00	1.78E+00	6.07E+02	6.09E+02
Trans-1,2-Dichloroethene (GWV	5.90E-07	4.76E-03	2.16E-02	4.74E-02	1.56E-02	0.00E+00	0.00E+00	3.60E-02	3.14E+03	3.14E+03
1,2-Dichloroethane (GWVapour)	1.72E-08	1.39E-04	6.88E-04	2.78E-03	7.31E-04	0.00E+00	0.00E+00	1.38E-03	2.82E+03	2.83E+03
1,1,1,2-Tetrachloroethane (GWV	3.08E-06	2.48E-02	6.86E-02	1.03E-01	2.85E-02	0.00E+00	0.00E+00	4.74E-02	2.52E+03	2.53E+03
1,1,2,2-Tetrachloroethane (GWV	7.73E-06	6.24E-02	2.48E-01	4.53E-01	1.47E-01	0.00E+00	0.00E+00	3.57E-01	2.46E+03	2.47E+03
Tetrachloroethene (GWVapour)	5.31E-07	4.28E-03	1.31E-02	2.04E-02	5.06E-03	0.00E+00	0.00E+00	1.06E-02	4.15E+02	4.16E+02
1,1,1-Trichloroethane (GWVapou	1.90E-05	1.53E-01	5.83E-01	1.02E+00	2.93E-01	0.00E+00	0.00E+00	6.99E-01	1.38E+03	1.38E+03
Naphthalene (GWVapour)	5.61E-06	4.52E-02	9.34E-02	1.33E-01	3.31E-02	0.00E+00	0.00E+00	4.21E-02	7.50E+01	7.51E+01
Chloroethene (Vinyl Chloride) (G	1.92E-09	1.55E-05	7.62E-05	3.56E-04	5.48E-05	0.00E+00	0.00E+00	9.43E-05	1.35E+03	3.83E+03
Acenaphthene (GWVapour)	1.27E-02	1.02E+02	8.89E+01	1.20E+02	3.39E+01	0.00E+00	0.00E+00	1.44E+01	5.67E+01	8.78E+01
Acenaphthylene (GWVapour)	1.30E-02	1.05E+02	1.12E+02	1.52E+02	3.87E+01	0.00E+00	0.00E+00	2.18E+01	8.55E+01	8.67E+01
Fluorene (GWVapour)	1.86E-02	1.50E+02	1.12E+02	1.51E+02	4.41E+01	0.00E+00	0.00E+00	1.56E+01	3.08E+01	4.43E+01

			Soil Concentrations				Soil Distribution (mg g-1)				Soil Distribution (%)						
Chemical Name	Chemical type	Fraction of organic carbon in soil	Total soil concentration	Soil vapour concentration	Soil solution concentration	Total amount of sorbed chemical in soil	Total sorbed concentration on a mass basis	Soil solution concentration on a mass basis	Vapour concentration on a mass basis	Total soil concentration	SORBED	DISSOLVED	VAPOUR	TOTAL	At 0.8 metres (infinite model)	At 0.8 metres (user soil gas)	At 0.8 metres (finite model)
		$g\ g^{-1}$	$mg\ g^{-1}$ DW	$mg\ cm^{-3}$	$mg\ cm^{-3}$	$mg\ g^{-1}$	$mg\ g^{-1}$	$mg\ g^{-1}$	$mg\ g^{-1}$	$mg\ g^{-1}$ DW	%	%	%	%	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$
TPH Aliphatic EC5-EC6 (GWVa	Organic	0.0058	1.98E+00	4.05E+00	1.93E-01	9.09E-01	9.09E-01	3.92E-02	1.03E+00	1.98E+00	4.60E+01	1.98E+00	5.21E+01	1.00E+02	1.02E+00	NR	NR
TPH Aliphatic >EC6-EC8 (GWV	Organic	0.0058	4.33E+00	4.05E+00	1.48E-01	3.27E+00	3.27E+00	3.02E-02	1.03E+00	4.33E+00	7.55E+01	6.97E-01	2.38E+01	1.00E+02	1.52E+00	NR	NR
TPH Aliphatic >EC8-EC10 (GW	Organic	0.0058	1.05E+00	2.35E-01	5.65E-03	9.90E-01	9.90E-01	1.15E-03	5.97E-02	1.05E+00	9.42E+01	1.09E-01	5.68E+00	1.00E+02	1.80E-01	NR	NR
TPH Aliphatic >EC10-EC12 (GW	Organic	0.0058	5.12E+00	2.34E-01	3.64E-03	5.06E+00	5.06E+00	7.39E-04	5.95E-02	5.12E+00	9.88E+01	1.44E-02	1.16E+00	1.00E+02	3.96E-01	NR	NR
TPH Aromatic >EC5-EC7 (GWV	Organic	0.0058	1.26E+01	2.35E+00	2.02E+01	7.93E+00	7.93E+00	4.11E+00	5.96E-01	1.26E+01	6.27E+01	3.25E+01	4.72E+00	1.00E+02	1.85E+00	NR	NR
TPH Aromatic >EC7-EC8 (GWV	Organic	0.0058	2.99E+01	2.42E+00	2.11E+01	2.50E+01	2.50E+01	4.29E+00	6.16E-01	2.99E+01	8.36E+01	1.44E+01	2.06E+00	1.00E+02	2.72E+00	NR	NR
TPH Aromatic >EC8-EC10 (GW	Organic	0.0058	1.81E+00	4.83E-02	1.91E-01	1.76E+00	1.76E+00	3.89E-02	1.23E-02	1.81E+00	9.72E+01	2.15E+00	6.80E-01	1.00E+02	1.07E-01	NR	NR
TPH Aromatic >EC10-EC12 (GW	Organic	0.0058	9.82E+00	4.80E-02	6.64E-01	9.68E+00	9.68E+00	1.35E-01	1.22E-02	9.82E+00	9.85E+01	1.38E+00	1.24E-01	1.00E+02	2.48E-01	NR	NR
TPH Aromatic >EC12-EC16 (GW	Organic	0.0058	1.08E+02	4.63E-02	3.68E+00	1.07E+02	1.07E+02	7.48E-01	1.18E-02	1.08E+02	9.93E+01	6.95E-01	1.09E-02	1.00E+02	8.10E-01	NR	NR
Benzene (GWVapour)	Organic	0.0058	1.27E-02	2.35E-03	2.03E-02	7.95E-03	7.95E-03	4.12E-03	5.98E-04	1.27E-02	6.27E+01	3.25E+01	4.72E+00	1.00E+02	1.85E-03	NR	NR
Toluene (GWVapour)	Organic	0.0058	3.00E+01	2.43E+00	2.12E+01	2.51E+01	2.51E+01	4.31E+00	6.19E-01	3.00E+01	8.36E+01	1.44E+01	2.06E+00	1.00E+02	2.73E+00	NR	NR
Ethylbenzene (GWVapour)	Organic	0.0058	2.71E+00	1.33E-01	9.58E-01	2.48E+00	2.48E+00	1.95E-01	3.38E-02	2.71E+00	9.16E+01	7.19E+00	1.25E+00	1.00E+02	1.82E-01	NR	NR
meta-Xylene (GWVapour)	Organic	0.0058	2.89E+00	1.05E-01	9.39E-01	2.67E+00	2.67E+00	1.91E-01	2.67E-02	2.89E+00	9.25E+01	6.62E+00	9.27E-01	1.00E+02	1.67E-01	NR	NR
ortho-Xylene (GWVapour)	Organic	0.0058	3.09E+00	1.05E-01	1.14E+00	2.83E+00	2.83E+00	2.33E-01	2.68E-02	3.09E+00	9.16E+01	7.53E+00	8.66E-01	1.00E+02	1.73E-01	NR	NR
para-Xylene (GWVapour)	Organic	0.0058	2.77E+00	1.05E-01	9.83E-01	2.55E+00	2.55E+00	2.00E-01	2.67E-02	2.77E+00	9.18E+01	7.21E+00	9.64E-01	1.00E+02	1.64E-01	NR	NR
Trichloroethene (GWVapour)	Organic	0.0058	5.67E-04	9.9E-05	5.29E-04	4.34E-04	4.34E-04	1.08E-04	2.52E-05	5.67E-04	7.66E+01	1.90E+01	4.44E+00	1.00E+02	7.62E-05	NR	NR
Tetrachloromethane (Carbon Tetr	Organic	0.0058	1.36E-03	0.000446	7.67E-04	1.09E-03	1.09E-03	1.56E-04	1.13E-04	1.36E-03	8.02E+01	1.15E+01	8.34E+00	1.00E+02	2.47E-04	NR	NR
Mercury, elemental (GWVapour)	Organic	0.0058	8.01E-03	1.11E-05	9.53E-05	7.99E-03	7.99E-03	1.94E-05	2.83E-06	8.01E-03	9.97E+01	2.42E-01	3.54E-02	1.00E+02	8.61E-05	NR	NR
Trichloromethane (Chloroform) (	Organic	0.0058	4.38E-02	0.006528	8.53E-02	2.48E-02	2.48E-02	1.74E-02	1.66E-03	4.38E-02	5.66E+01	3.96E+01	3.79E+00	1.00E+02	5.67E-03	NR	NR
Aldrin (GWVapour)	Organic	0.0058	4.68E+00	2.14E-05	3.69E-03	4.68E+00	4.68E+00	7.51E-04	5.43E-06	4.68E+00	1.00E+02	1.60E-02	1.16E-04	1.00E+02	2.33E-03	NR	NR
alpha-Endosulfan (GWVapour)	Organic	0.0058	3.09E+00	0.001113	5.89E-01	2.97E+00	2.97E+00	1.20E-01	2.83E-04	3.09E+00	9.61E+01	3.87E+00	9.14E-03	1.00E+02	1.37E-02	NR	NR
beta-Endosulfan (GWVapour)	Organic	0.0058	2.87E+00	0.001122	5.97E-01	2.75E+00	2.75E+00	1.21E-01	2.85E-04	2.87E+00	9.58E+01	4.23E+00	9.93E-03	1.00E+02	1.31E-02	NR	NR
Chlorobenzene (GWVapour)	Organic	0.0058	2.57E-02	0.001268	1.53E-02	2.22E-02	2.22E-02	3.10E-03	3.22E-04	2.57E-02	8.66E+01	1.21E+01	1.26E+00	1.00E+02	1.80E-03	NR	NR
1,2-Dichlorobenzene (GWVapou	Organic	0.0058	9.29E-01	0.007435	2.20E-01	8.83E-01	8.83E-01	4.47E-02	1.89E-03	9.29E-01	9.50E+01	4.81E+00	2.03E-01	1.00E+02	2.47E-02	NR	NR
1,3-Dichlorobenzene (GWVapou	Organic	0.0058	1.40E-02	0.000183	2.77E-03	1.33E-02	1.33E-02	5.63E-04	4.65E-05	1.40E-02	9.56E+01	4.03E+00	3.33E-01	1.00E+02	4.76E-04	NR	NR
1,4-Dichlorobenzene (GWVapou	Organic	0.0058	2.00E+00	0.021753	4.63E-01	1.90E+00	1.90E+00	9.41E-02	5.53E-03	2.00E+00	9.50E+01	4.71E+00	2.77E-01	1.00E+02	6.21E-02	NR	NR
1,2,3-Trichlorobenzene (GWVap	Organic	0.0058	4.65E-02	9.45E-05	3.08E-03	4.59E-02	4.59E-02	6.26E-04	2.40E-05	4.65E-02	9.86E+01	1.35E+00	5.16E-02	1.00E+02	5.96E-04	NR	NR
1,2,4-Trichlorobenzene (GWVap	Organic	0.0058	9.78E-02	0.000265	7.25E-03	9.63E-02	9.63E-02	1.47E-03	6.73E-05	9.78E-02	9.84E+01	1.51E+00	6.87E-02	1.00E+02	1.45E-03	NR	NR
1,3,5-Trichlorobenzene (GWVap	Organic	0.0058	1.02E-02	9.45E-05	6.56E-04	1.00E-02	1.00E-02	1.33E-04	2.40E-05	1.02E-02	9.85E+01	1.31E+00	2.36E-01	1.00E+02	2.79E-04	NR	NR
1,2,3,4-Tetrachlorobenzene (GW	Organic	0.0058	1.08E+00	0.000486	3.07E-02	1.07E+00	1.07E+00	6.25E-03	1.24E-04	1.08E+00	9.94E+01	5.79E-01	1.14E-02	1.00E+02	6.26E-03	NR	NR

	Outdoor Air Concentration of Vapours						Outdoor Air Concentration in Dust				
Chemical Name	At 0.8 metres (selected)	At 1.6 metres (infinite model)	At 1.6 metres (user soil gas)	At 1.6 metres (finite model)	At 1.6 metres (selected)	Indoor Air Concentration of Vapours	PM10 emission flux	PEF at child height	Outdoor contaminant concentration in respirable dust at child height	PEF at adult height	Outdoor contaminant concentration in respirable dust at adult height
	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$g\ m^{-2}\ s^{-1}$	$m^3\ kg^{-1}$	$mg\ m^{-3}$	$m^3\ kg^{-1}$	$mg\ m^{-3}$
TPH Aliphatic EC5-EC6 (GWVa	1.02E+00	5.80E-01	NR	NR	5.80E-01	5.11E+01	8.17E-07	8.32E+07	2.38E-05	1.47E+08	1.35E-05
TPH Aliphatic >EC6-EC8 (GWV	1.52E+00	8.59E-01	NR	NR	8.59E-01	5.11E+01	8.17E-07	8.32E+07	5.20E-05	1.47E+08	2.95E-05
TPH Aliphatic >EC8-EC10 (GW	1.80E-01	1.02E-01	NR	NR	1.02E-01	2.96E+00	8.17E-07	8.32E+07	1.26E-05	1.47E+08	7.16E-06
TPH Aliphatic >EC10-EC12 (GW	3.96E-01	2.24E-01	NR	NR	2.24E-01	2.95E+00	8.17E-07	8.32E+07	6.15E-05	1.47E+08	3.49E-05
TPH Aromatic >EC5-EC7 (GWV	1.85E+00	1.05E+00	NR	NR	1.05E+00	2.85E+01	8.17E-07	8.32E+07	1.52E-04	1.47E+08	8.61E-05
TPH Aromatic >EC7-EC8 (GWV	2.72E+00	1.54E+00	NR	NR	1.54E+00	2.84E+01	8.17E-07	8.32E+07	3.59E-04	1.47E+08	2.03E-04
TPH Aromatic >EC8-EC10 (GW	1.07E-01	6.06E-02	NR	NR	6.06E-02	6.10E-01	8.17E-07	8.32E+07	2.17E-05	1.47E+08	1.23E-05
TPH Aromatic >EC10-EC12 (GW	2.48E-01	1.41E-01	NR	NR	1.41E-01	6.05E-01	8.17E-07	8.32E+07	1.18E-04	1.47E+08	6.69E-05
TPH Aromatic >EC12-EC16 (GW	8.10E-01	4.59E-01	NR	NR	4.59E-01	5.85E-01	8.17E-07	8.32E+07	1.29E-03	1.47E+08	7.33E-04
Benzene (GWVapour)	1.85E-03	1.05E-03	NR	NR	1.05E-03	2.86E-02	8.17E-07	8.32E+07	1.52E-07	1.47E+08	8.63E-08
Toluene (GWVapour)	2.73E+00	1.55E+00	NR	NR	1.55E+00	2.85E+01	8.17E-07	8.32E+07	3.60E-04	1.47E+08	2.04E-04
Ethylbenzene (GWVapour)	1.82E-01	1.03E-01	NR	NR	1.03E-01	1.51E+00	8.17E-07	8.32E+07	3.26E-05	1.47E+08	1.85E-05
meta-Xylene (GWVapour)	1.67E-01	9.47E-02	NR	NR	9.47E-02	1.19E+00	8.17E-07	8.32E+07	3.47E-05	1.47E+08	1.97E-05
ortho-Xylene (GWVapour)	1.73E-01	9.79E-02	NR	NR	9.79E-02	1.19E+00	8.17E-07	8.32E+07	3.71E-05	1.47E+08	2.10E-05
para-Xylene (GWVapour)	1.64E-01	9.29E-02	NR	NR	9.29E-02	1.19E+00	8.17E-07	8.32E+07	3.33E-05	1.47E+08	1.89E-05
Trichloroethene (GWVapour)	7.62E-05	4.32E-05	NR	NR	4.32E-05	1.17E-02	8.17E-07	8.32E+07	6.81E-09	1.47E+08	3.86E-09
Tetrachloromethane (Carbon Tetr	2.47E-04	1.40E-04	NR	NR	1.40E-04	5.21E-02	8.17E-07	8.32E+07	1.64E-08	1.47E+08	9.27E-09
Mercury, elemental (GWVapour)	8.61E-05	4.88E-05	NR	NR	4.88E-05	1.22E-03	8.17E-07	8.32E+07	9.62E-08	1.47E+08	5.45E-08
Trichloromethane (Chloroform) (	5.67E-03	3.22E-03	NR	NR	3.22E-03	7.89E-01	8.17E-07	8.32E+07	5.27E-07	1.47E+08	2.98E-07
Aldrin (GWVapour)	2.33E-03	1.32E-03	NR	NR	1.32E-03	1.95E-03	8.17E-07	8.32E+07	5.63E-05	1.47E+08	3.19E-05
alpha-Endosulfan (GWVapour)	1.37E-02	7.76E-03	NR	NR	7.76E-03	1.02E-01	8.17E-07	8.32E+07	3.72E-05	1.47E+08	2.11E-05
beta-Endosulfan (GWVapour)	1.31E-02	7.44E-03	NR	NR	7.44E-03	1.02E-01	8.17E-07	8.32E+07	3.45E-05	1.47E+08	1.95E-05
Chlorobenzene (GWVapour)	1.80E-03	1.02E-03	NR	NR	1.02E-03	1.47E-01	8.17E-07	8.32E+07	3.08E-07	1.47E+08	1.75E-07
1,2-Dichlorobenzene (GWVapou	2.47E-02	1.40E-02	NR	NR	1.40E-02	8.30E-01	8.17E-07	8.32E+07	1.12E-05	1.47E+08	6.33E-06
1,3-Dichlorobenzene (GWVapou	4.76E-04	2.70E-04	NR	NR	2.70E-04	2.04E-02	8.17E-07	8.32E+07	1.68E-07	1.47E+08	9.50E-08
1,4-Dichlorobenzene (GWVapou	6.21E-02	3.52E-02	NR	NR	3.52E-02	2.43E+00	8.17E-07	8.32E+07	2.40E-05	1.47E+08	1.36E-05
1,2,3-Trichlorobenzene (GWVap	5.96E-04	3.38E-04	NR	NR	3.38E-04	1.02E-02	8.17E-07	8.32E+07	5.59E-07	1.47E+08	3.17E-07
1,2,4-Trichlorobenzene (GWVap	1.45E-03	8.20E-04	NR	NR	8.20E-04	2.86E-02	8.17E-07	8.32E+07	1.18E-06	1.47E+08	6.66E-07
1,3,5-Trichlorobenzene (GWVap	2.79E-04	1.58E-04	NR	NR	1.58E-04	1.02E-02	8.17E-07	8.32E+07	1.22E-07	1.47E+08	6.92E-08
1,2,3,4-Tetrachlorobenzene (GW	6.26E-03	3.55E-03	NR	NR	3.55E-03	5.09E-02	8.17E-07	8.32E+07	1.30E-05	1.47E+08	7.36E-06

Chemical Name	Indoor Air Concentration in Dust		Concentration in Homegrown Produce						Soil Saturation Limits	
		Concentration in Indoor Dust	Green Vegetables	Root Vegetables	Tuber Vegetables	Herbaceous Fruits	Shrub Fruits	Tree Fruits	Solubility Based	Vapour Based
	$mg\ m^{-3}$	$mg\ g^{-1}$ DW	$mg\ g^{-1}$ FW	$mg\ g^{-1}$ FW	$mg\ g^{-1}$ FW	$mg\ g^{-1}$ FW	$mg\ g^{-1}$ FW	$mg\ g^{-1}$ FW	$mg\ kg^{-1}$	$mg\ kg^{-1}$
TPH Aliphatic EC5-EC6 (GWVa	1.23E-04	9.89E-01	1.60E+00	2.26E+00	2.94E-01	0.00E+00	0.00E+00	3.61E-01	3.68E+02	3.69E+02
TPH Aliphatic >EC6-EC8 (GWV	2.69E-04	2.17E+00	1.20E+00	1.62E+00	4.20E-01	0.00E+00	0.00E+00	1.28E-01	1.57E+02	1.57E+02
TPH Aliphatic >EC8-EC10 (GW	6.52E-05	5.26E-01	3.00E-02	5.82E-02	4.81E-02	0.00E+00	0.00E+00	7.61E-04	7.94E+01	7.92E+01
TPH Aliphatic >EC10-EC12 (GV	3.17E-04	2.56E+00	5.77E-03	3.66E-02	6.24E-02	0.00E+00	0.00E+00	2.96E-05	4.77E+01	4.77E+01
TPH Aromatic >EC5-EC7 (GWV	7.84E-04	6.32E+00	2.79E+01	5.86E+01	1.98E+01	0.00E+00	0.00E+00	4.64E+01	1.11E+03	1.12E+03
TPH Aromatic >EC7-EC8 (GWV	1.85E-03	1.49E+01	5.03E+01	8.12E+01	2.23E+01	0.00E+00	0.00E+00	4.99E+01	8.36E+02	8.35E+02
TPH Aromatic >EC8-EC10 (GW	1.12E-04	9.04E-01	9.94E-01	1.35E+00	3.58E-01	0.00E+00	0.00E+00	2.66E-01	6.11E+02	6.10E+02
TPH Aromatic >EC10-EC12 (GV	6.09E-04	4.91E+00	3.85E+00	5.19E+00	1.49E+00	0.00E+00	0.00E+00	7.25E-01	3.62E+02	3.63E+02
TPH Aromatic >EC12-EC16 (GV	6.68E-03	5.38E+01	2.33E+01	3.19E+01	1.20E+01	0.00E+00	0.00E+00	2.56E+00	1.68E+02	1.69E+02
Benzene (GWVapour)	7.86E-07	6.33E-03	2.79E-02	5.87E-02	1.98E-02	0.00E+00	0.00E+00	4.65E-02	1.11E+03	1.12E+03
Toluene (GWVapour)	1.86E-03	1.50E+01	5.05E+01	8.16E+01	2.24E+01	0.00E+00	0.00E+00	5.01E+01	8.36E+02	8.35E+02
Ethylbenzene (GWVapour)	1.68E-04	1.35E+00	3.38E+00	4.96E+00	1.29E+00	0.00E+00	0.00E+00	1.96E+00	5.09E+02	5.08E+02
meta-Xylene (GWVapour)	1.79E-04	1.44E+00	3.45E+00	5.02E+00	1.29E+00	0.00E+00	0.00E+00	1.88E+00	6.15E+02	6.13E+02
ortho-Xylene (GWVapour)	1.92E-04	1.55E+00	3.91E+00	5.77E+00	1.53E+00	0.00E+00	0.00E+00	2.38E+00	4.67E+02	5.11E+02
para-Xylene (GWVapour)	1.72E-04	1.39E+00	3.46E+00	5.07E+00	1.33E+00	0.00E+00	0.00E+00	2.02E+00	5.64E+02	5.65E+02
Trichloroethene (GWVapour)	3.51E-08	2.83E-04	1.06E-03	1.83E-03	5.41E-04	0.00E+00	0.00E+00	1.28E-03	1.47E+03	1.46E+03
Tetrachloromethane (Carbon Tetr	8.44E-08	6.81E-04	2.16E-03	3.39E-03	8.31E-04	0.00E+00	0.00E+00	1.78E-03	1.50E+03	1.50E+03
Mercury, elemental (GWVapour)	4.97E-07	4.00E-03	3.68E-05	8.54E-05	7.81E-05	0.00E+00	0.00E+00	5.86E-05	4.71E+00	4.30E+00
Trichloromethane (Chloroform) (	2.72E-06	2.19E-02	1.02E-01	2.40E-01	7.49E-02	0.00E+00	0.00E+00	1.85E-01	4.60E+03	4.60E+03
Aldrin (GWVapour)	2.91E-04	2.34E+00	4.42E-03	3.68E-02	2.45E-02	0.00E+00	0.00E+00	1.75E-05	2.54E+01	4.59E+02
alpha-Endosulfan (GWVapour)	1.92E-04	1.55E+00	3.04E+00	4.21E+00	9.37E-01	0.00E+00	0.00E+00	8.21E-01	2.79E+00	2.94E+00
beta-Endosulfan (GWVapour)	1.78E-04	1.44E+00	2.96E+00	4.12E+00	9.14E-01	0.00E+00	0.00E+00	8.86E-01	1.35E+00	1.42E+00
Chlorobenzene (GWVapour)	1.59E-06	1.28E-02	4.03E-02	6.31E-02	1.66E-02	0.00E+00	0.00E+00	3.53E-02	6.51E+02	6.51E+02
1,2-Dichlorobenzene (GWVapou	5.76E-05	4.65E-01	9.27E-01	1.31E+00	3.25E-01	0.00E+00	0.00E+00	3.94E-01	5.62E+02	5.63E+02
1,3-Dichlorobenzene (GWVapou	8.66E-07	6.98E-03	1.26E-02	1.76E-02	4.29E-03	0.00E+00	0.00E+00	4.61E-03	5.20E+02	5.20E+02
1,4-Dichlorobenzene (GWVapou	1.24E-04	1.00E+00	1.98E+00	2.80E+00	6.90E-01	0.00E+00	0.00E+00	8.17E-01	2.21E+02	2.21E+02
1,2,3-Trichlorobenzene (GWVap	2.89E-06	2.33E-02	1.88E-02	2.54E-02	7.44E-03	0.00E+00	0.00E+00	2.78E-03	3.18E+02	1.33E+02
1,2,4-Trichlorobenzene (GWVap	6.07E-06	4.89E-02	4.35E-02	5.88E-02	1.68E-02	0.00E+00	0.00E+00	7.05E-03	5.59E+02	3.17E+02
1,3,5-Trichlorobenzene (GWVap	6.30E-07	5.08E-03	4.03E-03	5.44E-03	1.60E-03	0.00E+00	0.00E+00	5.86E-04	9.30E+01	3.66E+01
1,2,3,4-Tetrachlorobenzene (GW	6.70E-05	5.41E-01	1.96E-01	2.80E-01	1.05E-01	0.00E+00	0.00E+00	1.47E-02	2.74E+02	1.22E+02

			Soil Concentrations				Soil Distribution (mg g-1)				Soil Distribution (%)						
Chemical Name	Chemical type	Fraction of organic carbon in soil	Total soil concentration	Soil vapour concentration	Soil solution concentration	Total amount of sorbed chemical in soil	Total sorbed concentration on a mass basis	Soil solution concentration on a mass basis	Vapour concentration on a mass basis	Total soil concentration	SORBED	DISSOLVED	VAPOUR	TOTAL	At 0.8 metres (infinite model)	At 0.8 metres (user soil gas)	At 0.8 metres (finite model)
		$g\ g^{-1}$	$mg\ g^{-1}$ DW	$mg\ cm^{-3}$	$mg\ cm^{-3}$	$mg\ g^{-1}$	$mg\ g^{-1}$	$mg\ g^{-1}$	$mg\ g^{-1}$	$mg\ g^{-1}$ DW	%	%	%	%	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$
1,2,3,5-Tetrachlorobenzene (GW	Organic	0.0058	2.27E-02	3.99E-05	6.04E-04	2.26E-02	2.26E-02	1.23E-04	1.01E-05	2.27E-02	9.94E+01	5.40E-01	4.46E-02	1.00E+02	2.60E-04	NR	NR
1,2,4,5-Tetrachlorobenzene (GW	Organic	0.0058	2.31E-02	9.69E-06	7.02E-04	2.29E-02	2.29E-02	1.43E-04	2.46E-06	2.31E-02	9.94E+01	6.20E-01	1.07E-02	1.00E+02	1.30E-04	NR	NR
Pentachlorobenzene (GWVapour	Organic	0.0058	1.02E+00	9.81E-05	1.18E-02	1.01E+00	1.01E+00	2.40E-03	2.49E-05	1.02E+00	9.98E+01	2.37E-01	2.45E-03	1.00E+02	2.65E-03	NR	NR
Hexachlorobenzene (GWVapour)	Organic	0.0058	2.68E-01	1.42E-05	1.36E-03	2.68E-01	2.68E-01	2.77E-04	3.60E-06	2.68E-01	9.99E+01	1.03E-01	1.34E-03	1.00E+02	4.99E-04	NR	NR
Carbon disulphide (GWVapour)	Organic	0.0058	5.47E-03	2.29E-03	5.62E-03	3.74E-03	3.74E-03	1.14E-03	5.83E-04	5.47E-03	6.84E+01	2.09E+01	1.07E+01	1.00E+02	1.31E-03	NR	NR
Hexachlorobutadiene (GWVapou	Organic	0.0058	1.48E-02	3.58E-05	2.31E-04	1.47E-02	1.47E-02	4.70E-05	9.11E-06	1.48E-02	9.96E+01	3.19E-01	6.17E-02	1.00E+02	1.93E-04	NR	NR

Chemical Name	Outdoor Air Concentration of Vapours: At 0.8 metres (selected)	Outdoor Air Concentration of Vapours: At 1.6 metres (infinite model)	Outdoor Air Concentration of Vapours: At 1.6 metres (user soil gas)	Outdoor Air Concentration of Vapours: At 1.6 metres (finite model)	Outdoor Air Concentration of Vapours: At 1.6 metres (selected)	Indoor Air Concentration of Vapours	Outdoor Air Concentration in Dust: PM10 emission flux	Outdoor Air Concentration in Dust: PEF at child height	Outdoor Air Concentration in Dust: Outdoor contaminant concentration in respirable dust at child height	Outdoor Air Concentration in Dust: PEF at adult height	Outdoor Air Concentration in Dust: Outdoor contaminant concentration in respirable dust at adult height
	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$mg\ m^{-3}$	$g\ m^{-2}\ s^{-1}$	$m^3\ kg^{-1}$	$mg\ m^{-3}$	$m^3\ kg^{-1}$	$mg\ m^{-3}$
1,2,3,5-Tetrachlorobenzene (GW	2.60E-04	1.48E-04	NR	NR	1.48E-04	4.18E-03	8.17E-07	8.32E+07	2.73E-07	1.47E+08	1.55E-07
1,2,4,5-Tetrachlorobenzene (GW	1.30E-04	7.34E-05	NR	NR	7.34E-05	1.02E-03	8.17E-07	8.32E+07	2.77E-07	1.47E+08	1.57E-07
Pentachlorobenzene (GWVapour	2.65E-03	1.50E-03	NR	NR	1.50E-03	1.00E-02	8.17E-07	8.32E+07	1.22E-05	1.47E+08	6.92E-06
Hexachlorobenzene (GWVapour)	4.99E-04	2.83E-04	NR	NR	2.83E-04	1.41E-03	8.17E-07	8.32E+07	3.22E-06	1.47E+08	1.83E-06
Carbon disulphide (GWVapour)	1.31E-03	7.41E-04	NR	NR	7.41E-04	2.93E-01	8.17E-07	8.32E+07	6.58E-08	1.47E+08	3.73E-08
Hexachlorobutadiene (GWVapou	1.93E-04	1.10E-04	NR	NR	1.10E-04	3.68E-03	8.17E-07	8.32E+07	1.77E-07	1.47E+08	1.01E-07

Chemical Name	Indoor Air Concentration in Dust	Concentration in Indoor Dust	Concentration in Homegrown Produce: Green Vegetables	Root Vegetables	Tuber Vegetables	Herbaceous Fruits	Shrub Fruits	Tree Fruits	Soil Saturation Limits: Solubility Based	Vapour Based
	mg m^{-3}	mg g^{-1} DW	mg g^{-1} FW	mg g^{-1} FW	mg g^{-1} FW	mg g^{-1} FW	mg g^{-1} FW	mg g^{-1} FW	mg kg^{-1}	mg kg^{-1}
1,2,3,5-Tetrachlorobenzene (GW	1.41E-06	1.14E-02	3.83E-03	5.54E-03	2.13E-03	0.00E+00	0.00E+00	2.71E-04	1.32E+02	3.94E+01
1,2,4,5-Tetrachlorobenzene (GW	1.43E-06	1.15E-02	4.49E-03	6.37E-03	2.34E-03	0.00E+00	0.00E+00	3.52E-04	1.97E+01	1.97E+01
Pentachlorobenzene (GWVapour	6.31E-05	5.08E-01	6.57E-02	1.14E-01	5.80E-02	0.00E+00	0.00E+00	2.35E-03	4.30E+01	6.98E+01
Hexachlorobenzene (GWVapour)	1.66E-05	1.34E-01	5.67E-03	1.34E-02	8.39E-03	0.00E+00	0.00E+00	1.05E-04	1.89E+00	1.99E-01
Carbon disulphide (GWVapour)	3.39E-07	2.74E-03	7.39E-03	1.34E-02	5.53E-03	0.00E+00	0.00E+00	1.23E-02	2.04E+03	2.05E+03
Hexachlorobutadiene (GWVapou	9.15E-07	7.38E-03	1.38E-03	2.19E-03	9.90E-04	0.00E+00	0.00E+00	6.38E-05	3.06E+02	1.51E+03