

REPORT

Detailed Quantitative Risk Assessment (DQRA) for Controlled Waters

Pfizer, 32 New Lane, Havant, Hampshire, PO9 2NG

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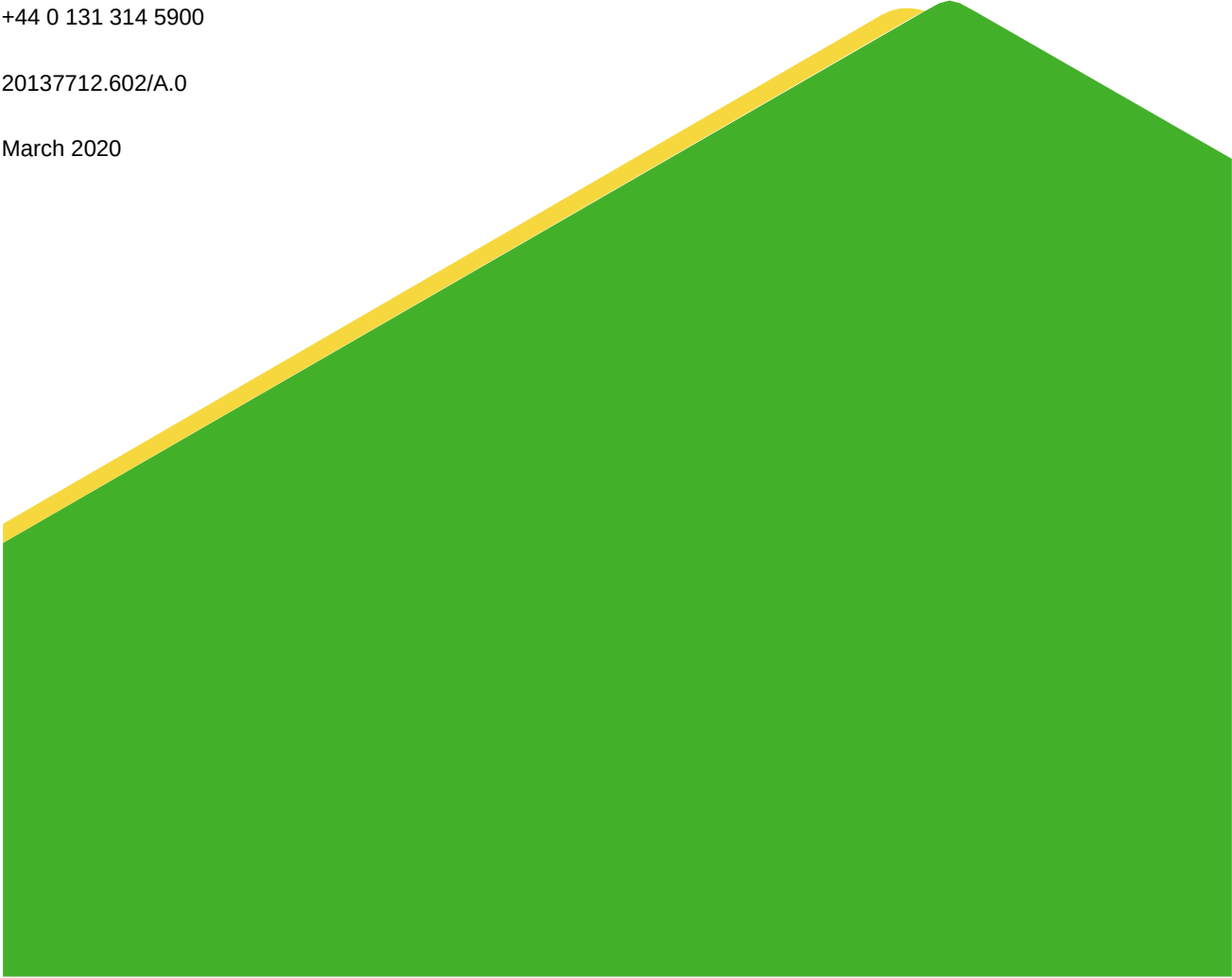
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Executive Summary

Golder Associates (UK) Ltd (Golder) was retained by Pfizer Inc ('the Client'), to undertake a Detailed Quantitative Risk Assessment (DQRA) in order to assess the potential risk to controlled waters from concentrations of substances reported above generic assessment criteria (GAC) in groundwaters located beneath the Pfizer Havant Site, located on New Lane, Havant, Hampshire, PO9 2NG, United Kingdom (hereafter referred to as 'the Site').

The results of the DQRA are summarized in the table below:

Parameter	Screening Criteria (mg/l)	95 Percentile CL Modeled Concentration (mg/l)	Result
Tetrachloroethene (PCE)	1.00E-02	5.01E-13	Below screening Criteria
Trichloroethene (TCE)	1.00E-04	9.14E-09	Below screening Criteria
Dichloroethene (DCE)	5.00E-02	1.45E-09	Below screening Criteria
Vinyl Chloride (VC)	1.00E-04	3.93E-09	Below screening Criteria

Notes: CL – Confidence Limit

The concentrations calculated at the default 50 m compliance point are significantly lower than comparison values considered to be protective of Controlled Waters. It is noted that there are no groundwater abstractions within 1 km of the Site, and the River Lavant is located more than 75 m west (side gradient) of the study area at the Site. On this basis, there are no unacceptable risks to controlled waters with respect to the reported chlorinated solvent concentrations.

Study Limitations

IMPORTANT: This section should be read before reliance is placed on any of the opinions, advice, or conclusions set out in this report.

This controlled waters risk assessment is intended for the sole use of Pfizer Inc. Any use of this document or of the findings or conclusions provided in this report by any person other than Pfizer Inc. or other person mentioned in the foregoing is at the sole risk of such user.

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This report was developed using data and information obtained during the 2019 Divestiture Environmental Site Assessment and 2020 Groundwater Investigation conducted by Golder and is also based on information obtained in previous investigations, where Golder has relied in good faith on information provided by others.

In assessing the property, to the extent that Golder has relied in good faith on information provided by others to prepare this report Golder accepts no responsibility for any deficiency, misstatements, or inaccuracies contained in this report as a result of omissions, misinterpretations or fraudulent acts of others.

All work carried out in preparing this report has used, and is based on, Golder's professional knowledge and understanding of current (March 2020) relevant UK and European Community legislation, standards, and guidance. Changes in the legislation, standards, and guidance may cause the opinion, advice, or conclusions in this report to become inappropriate or incorrect. Following delivery of this report, Golder will have no obligation to advise the Client of any changes, or of their repercussions.

Golder acknowledges that it was retained, in part, because of its knowledge of and experience in geotechnical and environmental matters. Golder considered and analysed all information gathered by or provided to it in the context of Golder's knowledge and experience and all other relevant information known to Golder. Provided the information given to Golder was not inconsistent or incompatible therewith, Golder shall be entitled to rely on and assume, without independent verification, the accuracy and completeness of all such information and Golder shall have no obligation to verify the accuracy and completeness of such information.

The environmental, geological, geotechnical, geochemical and hydrogeological conditions that Golder interpreted to exist between sampling points may differ from those that actually exist. Passage of time, natural occurrences, and activities near the Site may substantially alter discovered conditions.

The services described in this report were performed in accordance with the general practices and procedures accepted for geotechnical and environmental consultants. Golder does not provide specialist legal advice.

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1.0 INTRODUCTION

1.1 Terms of Reference

Golder Associates (UK) Ltd (Golder) was retained by Pfizer Inc ('the Client'), to undertake a Detailed Quantitative Risk Assessment (DQRA) in order to assess the potential risk to controlled waters from concentrations of substances reported above Generic Assessment Criteria (GAC) in groundwaters located beneath the Pfizer Havant Site, located on New Lane, Havant, Hampshire, PO9 2NG, United Kingdom (hereafter referred to as 'the Site').

The DQRA was conducted in accordance with the Environment Agency's (EA) controlled waters risk assessment procedures.

1.2 Background

Intrusive investigations conducted by Environmental Resource Management (ERM) in 1996 (ERM, 1996), 1997 (ERM, 1997) and 2008 (ERM, 2008) reported concentrations of certain compounds in groundwater, including trichloroethene (TCE), acetone and phenol, above the adopted screening levels. These substances were however considered unlikely to pose a risk to receptors. Other substances including isopropanol, were also reported in groundwaters, but no GAC were identified for screening.

Golder undertook a Divestiture Environmental Site Assessment (DESA) in 2019 (Golder DESA, 2019) to evaluate the potential for significant environmental issues associated with the Site as a result of past or current operations. The Golder DESA concluded that although a few detections in both soil and groundwater had been previously reported above assessment criteria, no significant areas of environmental concern are known to exist at the Site.

Although no significant environmental issues were reported in the DESA, Pfizer opted to assess the current groundwater conditions at the Site to determine if any residual concentrations remained. Golder undertook a site visit in October 2019 to assess the condition of monitoring wells installed as part of the 1996 investigations. BH-4 was found to be intact and was sampled for groundwater quality (Golder GW Investigation, 2020).

Golder returned to Site between December 2019 and January 2020 (Golder GW Investigation, 2020) to gather further information on the current groundwater conditions relating to those parameters previously reported above the GAC or when detected in groundwater but without a GAC (i.e. acetone, isopropanol, VOC (TCE related) and phenol). The works included the installation, geotechnical logging, groundwater sampling and groundwater level monitoring of eight groundwater monitoring wells (GA01, GA02, GA03, GA04, GA07, GA07A, GA08A and GA09A). In addition, monitoring well BH-4 was sampled for groundwater quality and monitored for groundwater level data.

Results of the Golder investigation for groundwater quality reported groundwater concentrations above the GAC for Tetrachloroethene (PCE) in boreholes BH-4-1996 (October 2019 only); TCE in boreholes BH-4-1996 (October 2019 only), GA04 and GA07; and Vinyl Chloride (VC) in borehole GA04.

Even though the concentrations in 2019 and 2020 were relatively low (generally within the same order of magnitude as the GAC), the current DQRA was commissioned to assess any potential risks to controlled waters.

1.3 Purpose and Scope

The purpose of this report is to undertake a DQRA for Controlled Waters, underpinned by a Conceptual Site Model (CSM) which is, in part, based on information gathered during the Golder Groundwater Investigation in 2020 (Golder GW Investigation, 2020). The scope of works was as follows:

- Develop a CSM of the source-pathway-receptor linkage;

- Select appropriate model input parameters;
- Construct and run the risk assessment model; and
- Report the calculated concentrations of dissolved contaminants in groundwater at compliance point(s) protective of Controlled Waters.

This DQRA should be read in conjunction with the Golder Groundwater Investigation Report (Golder GW Investigation, 2020).

2.0 CONCEPTUAL SITE MODEL

The site location, site setting and site surrounds are summarised in the Golder Groundwater Investigation Report (Golder GW Investigation, 2020). This information has been used to develop a CSM to support this Controlled Waters DQRA.

There are three components to the conceptual model that underpins any groundwater risk assessment:

- The source, defined as the potential contamination reported in groundwater;
- The pathways, defined as any routes linking the source with the receptors; and
- The receptors, defined as the groundwater and surface water bodies that are connected to the source by the pathways, such as groundwater, surface watercourses, local supply boreholes, or springs.

These three components are linked within a hydrogeological conceptual model for a site. Should the source, pathway, or receptor linkages be absent from the site setting, negligible risk will be posed to the groundwater and surface water environment.

2.1 Source

The source is dissolved PCE, TCE, DCE and VC in groundwater (Table 1), which was reported in boreholes at the Site as summarised in the Golder Groundwater Investigation report (Golder GW Investigation, 2020). A borehole location plan is provided in Appendix A.

Table 1: Summary of the concentration (µg/l) of PCE and daughter products reported in groundwater samples taken on-Site.

Well ID	Sampling Date	Tetrachloroethene (PCE)	Trichloroethene (TCE)	Cis-1-2-Dichloroethene (DCE)	Vinyl Chloride (VC)
BH-4-1996	22/10/2019	32	25	<3	<0.1
	10/01/2020	7	<3	<3	<0.1
GA04	10/01/2020	<3	10	5	2.1
GA07	10/01/2020	<3	15	<3	<0.1

* Concentrations of PCE, TCE, DCE and VC were reported below the laboratory limit of detection for GA01 and GA03 when sampled in December (2019), and for GA07A, GA08A and GA09A when sampled in January (2020).

For purposes of developing this CSM, the source zone is assumed to have a width (perpendicular to the primary groundwater flow direction) of 50 m. This width covers the distance between boreholes BH4 and GA04 which exhibit PCE concentrations in groundwater above detection limits, as identified from the monitoring data in Table 1. For purposes of developing this CSM, a source zone length of 10 m (i.e. parallel to the flow direction) has

also been selected. The 10 m length was selected for purposes of developing this CSM, in order to enable appropriate discretisation (and to permit dispersion) along the total saturated pathway length (discussed further in section 2.3).

For the purposes of developing the CSM the source zone depth is assumed to be 4 m thick. This is based on the water level recorded across Site (Golder GW Investigation, 2020), and the screen depth of the groundwater monitoring boreholes. For purposes of developing this CSM, the overall volume of the saturated source zone is therefore calculated to be 2,000 m³ (Table 7), located at a depth of 2 to 6 m BGL. For purposes of developing this CSM, the source zone is assumed to be overlain by an unsaturated zone with a thickness of 2 m.

2.2 Potential Pathway

Three key lithological units have been identified within the installed monitoring wells on the Site (Golder GW Investigation, 2020):

- Made Ground, including sands and gravels to a maximum depth of 1.8 m BGL,
- Gravelly Clay with flint Drift Deposits, beneath the Made Ground to a minimum depth of 3.2 m BGL, and
- London Clay comprising silty and sandy clays from a minimum depth of 3.2 m BGL.

For purposes of this CSM, contaminants are assumed to migrate from the source zone by advection along the saturated pathway (Drift Deposits and London Clay) in the direction of groundwater flow. The Drift Deposits are classified as a 'Secondary A aquifer' by the EA (Defra, 2020), which means that they are expected to support the horizontal migration of dissolved contaminants locally.

The active processes considered within the model are volatilisation, organic degradation, and sorption, described as follows:

- Volatilisation involving the movement of the contaminants from the aqueous phase (in the groundwater) to the vapour phase in the unsaturated zone (upper Drift Deposits and Made Ground). Interaction with moisture in the unsaturated zone has been disregarded;
- Organic degradation (by reductive dechlorination) of PCE to TCE; TCE to DCE; DCE to VC; and VC to Ethene¹; and
- Sorption involving the partitioning of contaminants between the aqueous phase and the Drift Deposits.

2.3 Potential Receptor

The UK environment agencies' Joint Agencies Groundwater Directive Advisory Group (JAGDAG) has prepared a methodology and applied it to produce a list of substance that are hazardous. The list has been adopted by the EA. The list of hazardous substances is not fixed and will change over time as JAGDAG's knowledge of the properties and effects of such pollutants improves. The current list (JAGDAG, 2019) contains more than 300 substances including hydrocarbons, organohalogens, organophosphorus, mercury (and its compounds), amongst others. TCE and VC are classified by JAGDAG as hazardous substances. PCE and DCE are classified as non-hazardous pollutants.

In the context of an authorised discharge to groundwater, the EA state that input of hazardous substances to groundwater are to be prevented, whilst the input of non-hazardous pollutants should be limited (EA, 2017b). If hazardous substances or non-hazardous pollutants have already entered groundwater, further entry must be minimised, and reasonable measures must be taken to limit further pollution of, or impact to, groundwater bodies

¹ Ethene has not been considered in the modelling

and their dependencies. The concentrations of the compounds reported at the Site are from historical operations (i.e., the former Fine Chemicals Manufacturing Unit and solvent storage areas). Given the low concentrations reported, it does not appear that an on-going source exists at the Site, but rather these are residual concentrations in the groundwater.

The default compliance point distance for resource protection from the contaminant source (down hydraulic gradient) is 50 metres for:

- All hazardous substances in all aquifers for contaminants already in the groundwater, or from inputs from soils and the unsaturated zone which can't be prevented; and
- Non-hazardous pollutants in groundwater with strategic resource potential.

For non-hazardous pollutants in groundwater with local resource potential, a distance greater than 50 metres may be agreed with the EA but this should not normally exceed 250 metres (EA, 2017b). Concentrations of PCE, TCE, DCE and VC in groundwater will be assessed at a 50 m compliance point (down hydraulic gradient from the source) for the purposes of this DQRA.

The EA state that concentrations of hazardous substances in water should be compared against a published list of 'Minimum Reporting Values' (MRVs). In the absence of an MRV for a hazardous substance, a standard certified laboratory limit of detection was applied.

For non-hazardous substances, the assessment criteria were obtained from the UK's Water Supply (Water Quality) Regulations, in the absence of which World Health Organisation (WHO) Guidelines for Drinking-water Quality were used.

The assessment criteria values used for comparison against modelled concentrations at the compliance point are as follows:

- 1.00E-02 mg/l for PCE taken from the UK's Water Supply (Water Quality) Regulations (2018), Table B, Part 1;
- 1.00E-04 mg/l for TCE taken from the EA's Hazardous Substance Minimum Reporting Values (EA, 2017a) for hazardous substances in clean water;
- 5.00E-02 mg/l for DCE taken from World Health Organisation (WHO) Guidelines for Drinking-Water Quality, 4th Edition Incorporating the First Addendum, Section 12; and
- 1.00E-04 mg/l for VC taken as standard certified laboratory limit of detection, in the absence of a minimum reporting value.

It is noted that the River Lavant is located greater than 75 m (side gradient) from the study area. In addition, previous studies have reported that there are no groundwater abstractions within 1 km of the Site. Therefore, the 50 m default compliance point represents a conservative distance for resource protection from the contaminant source.

3.0 MODEL DEVELOPMENT AND SIMULATION

3.1 Model Construction

This risk assessment has been undertaken using the GoldSim simulation environment (version 12.1.3). GoldSim is an industry standard performance assessment tool and is considered an appropriate choice of software for this risk assessment given its capability in modelling uncertainty and time variant events and processes.

To implement the process of volatilisation into GoldSim, it was necessary to construct two cells: one which represents the saturated material; and the other which represents the overlying unsaturated material. Each of the two cells comprise one larger cell, which represents the full height of either the saturated or unsaturated zone, and a second thin cell located immediately above or below the water table which represents a zone of interaction between the groundwater and the overlying unsaturated zone.

The purpose of the smaller cells is to simulate the zone of interaction across which contaminants have the potential to partition from the groundwater into the air held in the pore spaces of the unsaturated material. The underlying saturated material is assumed to be fully mixed. The model assumes contaminants diffuse upwards from the fully mixed saturated material into the thin saturated material cell, which controls the rate of volatilisation. Once in the pore spaces of the unsaturated material, the volatiles continue to diffuse upwards through the unsaturated zone, finally discharging to the ground surface. The upwards diffusion through the unsaturated zone discharges to a GoldSim sink cell representing the atmosphere. This has been set with a zero-concentration boundary condition to represent the volatiles being removed to the atmosphere.

Organic degradation by reductive dechlorination is assumed to occur throughout both the saturated groundwater pathway, and within the source zone, as is evident by the concentrations of PCE daughter products (TCE, 1,2-DCE, VC, and ethene) reported during the 2020 groundwater investigation. To model the degradation in the source zone, it was necessary to calculate the mass of PCE, TCE, DCE and VC partitioned to both the soil and in groundwater from the known groundwater concentrations (Table 6). The calculation was undertaken using published partition coefficient values (Table 5). Organic degradation and the associated generation of daughter products (Table 2) was then simulated along the length of the saturated pathway.

The saturated aquifer pathway is assumed to be homogenous and isotropic in its solid properties (Table 5), geometry (Table 8) and hydraulic properties (Table 9). The saturated pathway is constructed using a series of linked mixing cells, along which the contaminants are transferred via advection. The sequence of cells represents 10 m length blocks of saturated material until the 50 m compliance point. Neither longitudinal nor transverse dispersivity are explicitly accounted for in the model. The number of cells has been chosen to introduce numerical dispersion approximately equivalent to 10% of the pathway length, therefore accounting for longitudinal dispersion. The 50 m compliance point is represented by a 2 m length cell centred around a distance equivalent to 50 m. An illustration of the conceptual model is provided in Figure 1. A full list of the cell dimensions is provided in Table 8.

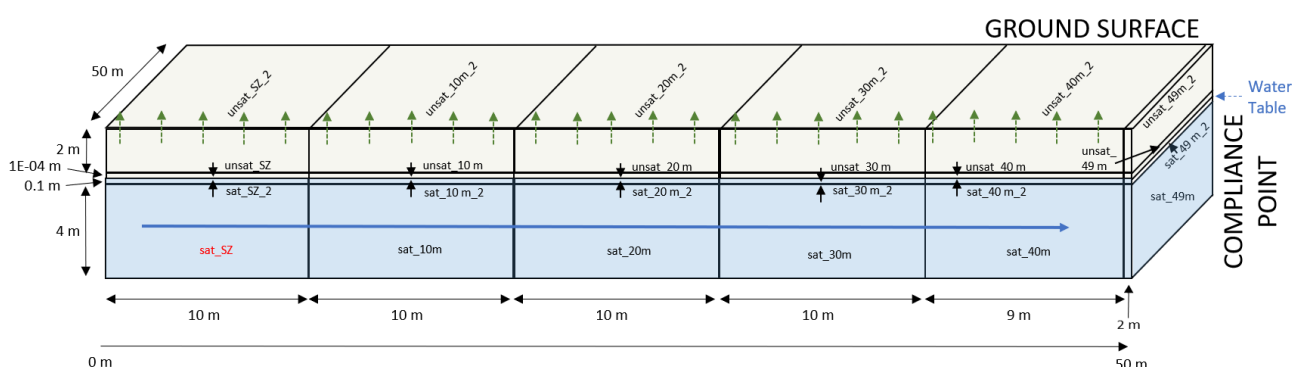


Figure 1: Illustration of Conceptual Site Model

Each cell in the pathway simulates volatilisation as illustrated in Figure 1 above (green arrows) (Henry's Law Partition coefficients are provided in Table 4). Contaminants migrating along the saturated are assumed to undergo retardation (partition coefficients are provided in Table 5).

Solubility is assumed to be unlimited for all modelled contaminants (Table 3). A full list of the model input values is provided in Section 3.2.

3.2 Model Inputs

Table 2: Model input parameters: Species Properties

Species	Molecular Weight (g/mol)	Range of Half-life (days)	Half-life Source	Modelled daughter product
PCE	165.83	Uni(100,1000)	Biotic half-life (anaerobic) for PCE, Consim help files (EA, 2003)	TCE
TCE	96.94	Uni(100, 1000)	Biotic half-life (anaerobic) for TCE, Consim help files (EA, 2003)	DCE
DCE	131.4	Uni(53,147)	Biotic half-life (anaerobic) for 1,2 DCE, Consim help files (EA, 2003)	VC
VC	62.5	Uni(100, 500)	Biotic half-life (anaerobic) for VC, Consim help files (EA, 2003)	none

NB. Uni = Uniform Distribution

Table 3: Model input parameters: Fluid Properties (Water)

Parameter	Species	Unit	Value	Source
Reference Diffusivity		m ² /s	1E-09	Golder Judgment
Relative Diffusivities	PCE, TCE, DCE, VC	-	1	Golder Judgment
Solubilities	PCE, TCE, DCE, VC	mol/l	-1	Conservative Assumption

Table 4: Model input parameters: Fluid Properties (Air)

Parameter	Species	Unit	Value	Source
Reference Diffusivity		m ² /s	1E-05	Golder Judgment
Relative Diffusivities	PCE, TCE, DCE, VC	(-)	1	Golder Judgment
Partition Coefficient (Henry's Law)	PCE	(-)	Uni(0.709, 1.21)	Henry's Law Constant (unitless) for PCE, Consim help file (EA, 2003)
	TCE		Uni(0.417, 0.435)	Henry's Law Constant (unitless) for TCE, Consim help file (EA, 2003)
	DCE		1.07	Chemical Properties for Calculation of Impact to Ground Water Soil Remediation Standards (State of New Jersey Government)

Parameter	Species	Unit	Value	Source
	VC		3.58	Henry's Law Constant (unitless) for VC, Consim help file (EA, 2003)

Table 5: Model input parameters: Solid Properties (Saturated and Unsaturated Material)

Parameter	Species	Unit	Value	Source
Dry Bulk Density		Kg/m ³	Uni(1000, 2400)	Range for Clay obtained from Consim help files (EA, 2003)
Porosity		(-)	Uni(0.01, 0.39)	Range bounding of Clay and Silt from McWhorter and Sunada 1977
Fraction of organic carbon (f _{oc})		g/g	Uni(0.01, 0.1)	Range for Clay (also bounding of Fluvial Silt) from Consim help files (EA, 2003)
Partition Coefficient (K _{oc})	PCE	ml/g	Uni(263, 364)	Koc range for PCE, Consim help files (EA, 2003)
	TCE		Uni(18, 152)	Koc range for TCE, Consim help files (EA, 2003)
	DCE		39	Koc range for 1,2 DCE, Consim help files (EA, 2003)
	VC		57	Koc range for VC, Consim help files (EA, 2003)

Table 6: Model input parameters: Source Concentrations

Parameter	Species	Unit	Value	Source
Source concentration in groundwater	PCE	µg/l	Uni(3, 32)	Range of concentrations in groundwater detected from Site during the October 2019, December 2019 and January 2020 monitoring rounds
	TCE		Uni(3, 25)	
	DCE		Uni(3, 5)	
	VC		Uni(0.1, 2.1)	

Table 7: Model input parameters: Source Dimensions

Parameter	Unit	Value	Source
Length (Parallel to groundwater flow direction)	m	10	Based on distribution of highest recorded contaminant concentrations on site

Parameter	Unit	Value	Source
Width (Perpendicular to groundwater flow direction)	m	50	Approximate distance between monitoring wells with highest recorded groundwater concentrations (BH-4 and GA04)
Height	m	4	Based on known water levels and depth of monitoring wells

Table 8: Model input parameters: Saturated and Unsaturated Pathway Geometries

Saturated Pathway			Saturated Water Table Layer			Unsaturated Water Table Layer			Unsaturated Material Zone		
ID	L (m)	H (m)	ID	L (m)	H (m)	ID	L (m)	H (m)	ID	L (m)	H (m)
sat_SZ	10	4	sat_SZ_2	10	0.1	unsat_SZ	10	1E-04	unsat_SZ_2	10	2
sat_10m	10		sat_10m_2	10		unsat_10m	10		unsat_10m_2	10	
sat_20m	10		sat_20m_2	10		unsat_20m	10		unsat_20m_2	10	
sat_30m	10		sat_30m_2	10		unsat_30m	10		unsat_30m_2	10	
sat_40m	9		sat_40m_2	9		unsat_40m	9		unsat_40m_2	9	
sat_49m	2		sat_49m_2	2		unsat_49m	2		unsat_49m_2	2	

* All applied widths (perpendicular to groundwater flow direction) 50 m.

Table 9: Model input parameters: Hydraulic Properties

Parameter	Unit	Value	Source
Hydraulic Conductivity (K)	m/s	Uni(5.00E-09, 2.00E-07)	Range between Clay and Fine Silt taken from Domenico & Schwartz 1997, Table 3.2
Hydraulic Gradient (i)	(-)	0.08	Typical hydraulic gradient calculated across Site from GA07 to GA09A.

3.3 Model Simulation

The GoldSim model was run probabilistically for 1,000 years with 1000 realisations. A basic timestep of 1 year was applied. Results are presented in section 3.4.

3.4 Controlled Waters Risk Assessment Results

PCE, TCE, DCE and VC concentrations in groundwater at the 50 m compliance point are presented in Figure 2 to Figure 5 respectively.

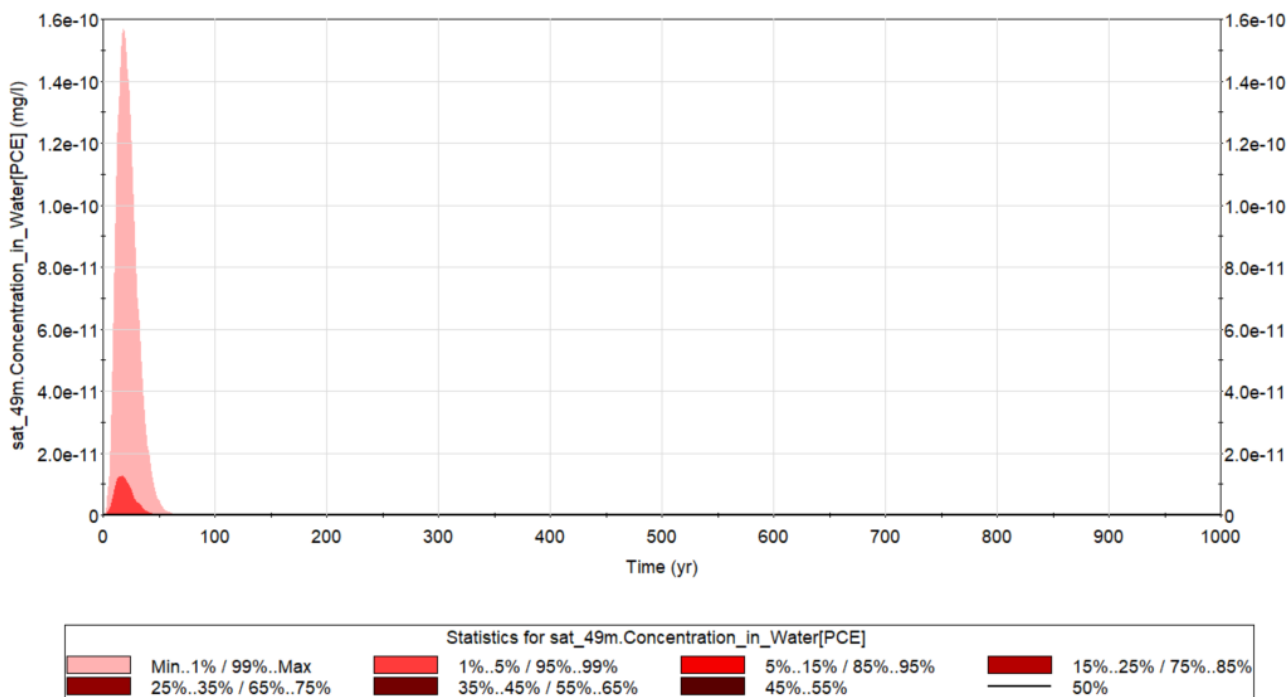


Figure 2: Calculated PCE concentration in groundwater at the 50 m compliance point.

Results indicate a peak 50th percentile PCE concentration in groundwater of $1.44\text{E-}16$ mg/l after 10 years and a peak 95th percentile PCE concentration of $5.01\text{E-}13$ mg/l after 14 years. The PCE concentration in groundwater at the 95th percentile confidence limit does not exceed the comparison value of $1.00\text{E-}02$ mg/l at the 50 m compliance point.

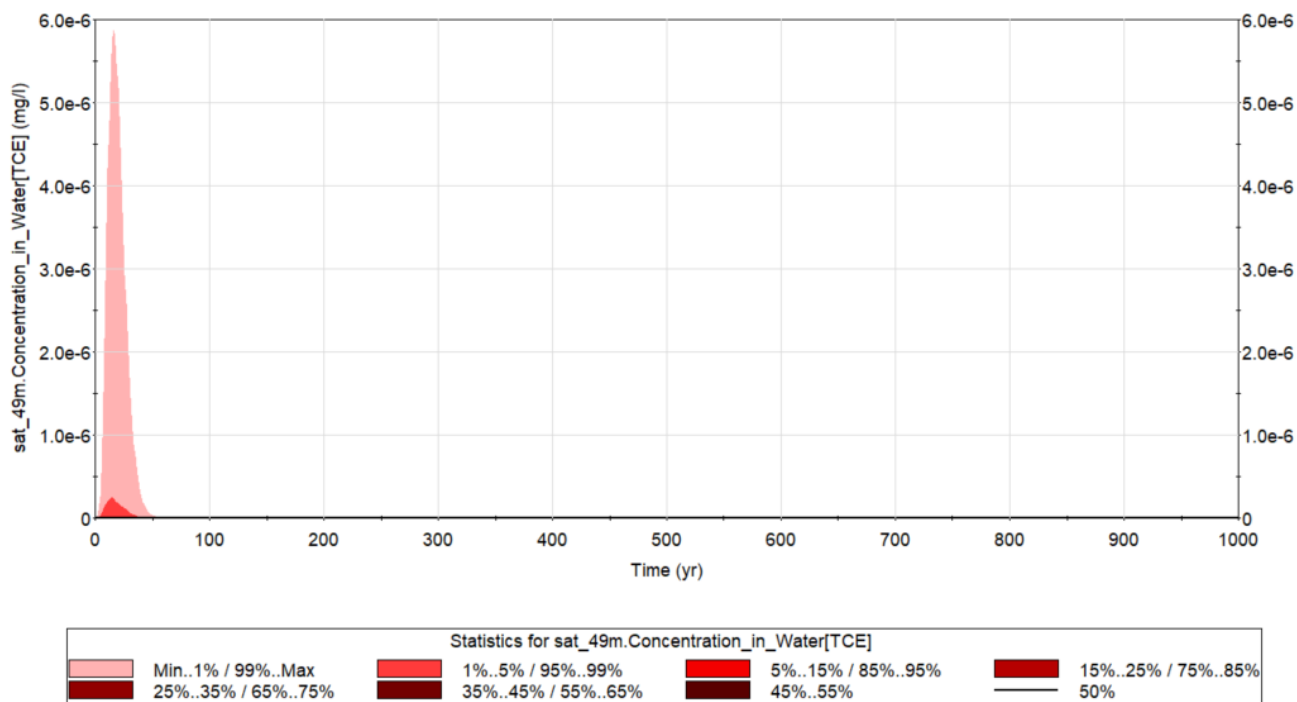


Figure 3: Calculated TCE concentration in groundwater at the 50 m compliance point.

Results indicate a peak 50th percentile TCE concentration in groundwater of $6.26\text{E-}13$ mg/l after 12 years and a peak 95th percentile TCE concentration of $9.14\text{E-}09$ mg/l after 15 years. The TCE concentration in groundwater at the 95th percentile confidence limit does not exceed the comparison value of $1.00\text{E-}04$ mg/l at the 50 m compliance point.

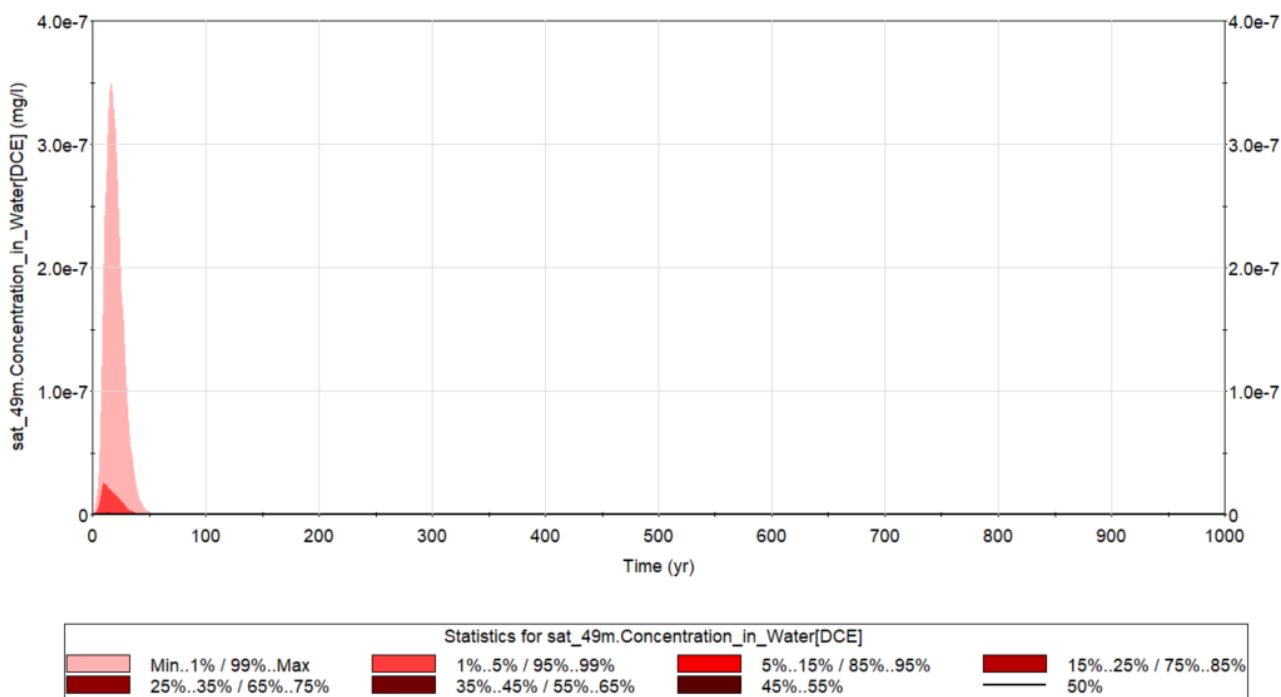


Figure 4: Calculated DCE concentration in groundwater at the 50 m compliance point.

Results indicate a peak 50th percentile DCE concentration in groundwater of $3.55\text{E-}13$ mg/l after 10 years and a peak 95th percentile DCE concentration of $1.45\text{E-}09$ mg/l after 14 years. The DCE concentration in groundwater at the 95th percentile confidence limit does not exceed the comparison value of $5.00\text{E-}02$ mg/l at the 50 m compliance point.

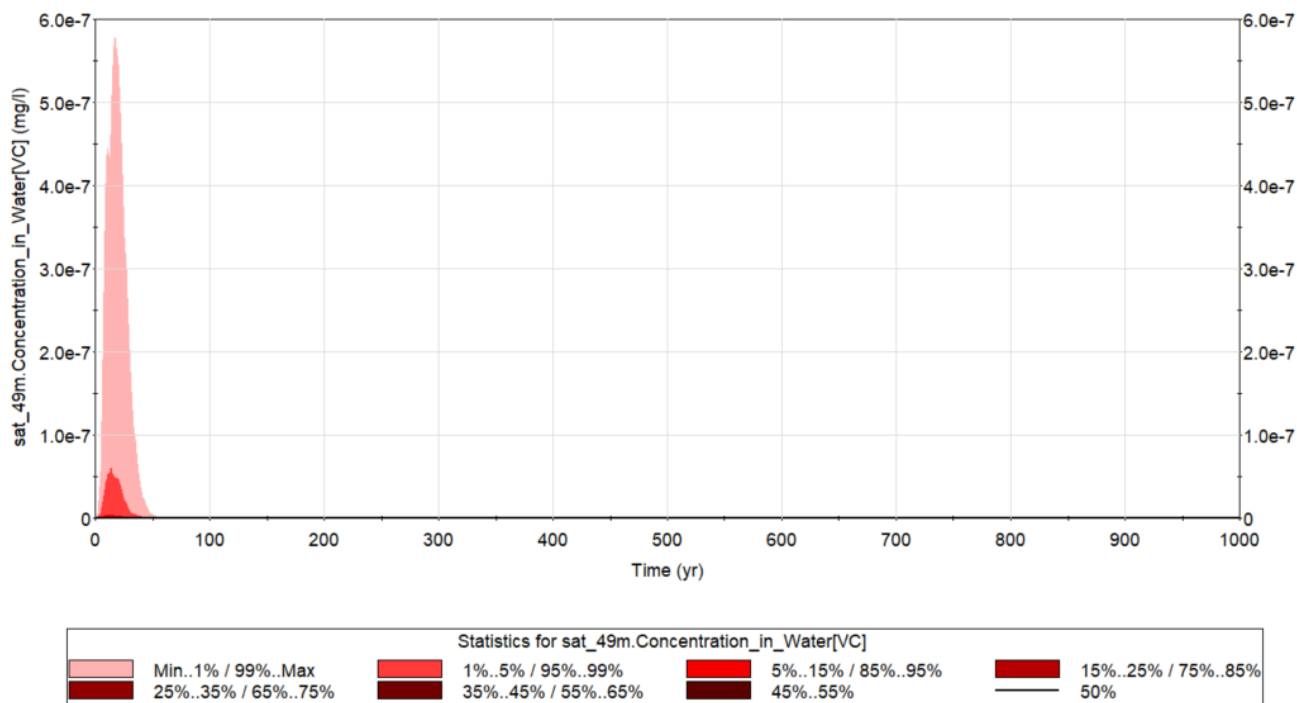


Figure 5: Calculated VC concentration in groundwater at the 50 m compliance point.

Results indicate a peak 50th percentile VC concentration in groundwater of $2.92\text{E-}12$ mg/l after 13 years and a peak 95th percentile VC concentration of $3.93\text{E-}09$ mg/l after 12 years. The VC concentration in groundwater at the 95th percentile confidence limit does not exceed the comparison value of $1.00\text{E-}04$ mg/l at the 50 m compliance point.

4.0 CONCLUSION

A DQRA which considers the risk to Controlled Waters has been carried out using GoldSim with respect to shallow chlorinated solvent concentrations reported in groundwater at the Pfizer Havant Site. The concentrations calculated at the default 50 m compliance point are significantly lower than comparison values considered to be protective of Controlled Waters. It is noted that there are no groundwater abstractions within 1 km of the Site, and the River Lavant is located more than 75 m west (side gradient) of the study area at the Site. On this basis, there are no unacceptable risks to controlled waters with respect to the previously reported chlorinated solvent concentrations.

5.0 REFERENCES

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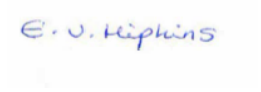
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APPENDIX A

Borehole Location Plan



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