

# Final Risk Evaluation for Trichloroethylene

## Systematic Review Supplemental File:

### Data Quality Evaluation of Environmental Releases and Occupational Exposure Data

CASRN: 79-01-6



November 2020

This document is a compilation of tables for the data extraction and evaluation for Tricholoethylene (TCE). Each table shows the data point or set or information element that was extracted and evaluated from a data source in accordance with Appendix D of the Application of Systematic Review in TSCA Risk Evaluations. If the source contains more than one data set or information element, the review provides an overall confidence score for each data set or information element that is found in the source. Therefore, it is possible that a source may have more than one overall quality/ confidence score.

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#### **Explanatory Notes**

These explanatory notes provide context to understand the short comments in the data evaluation tables.

Domain	Metric	Description of Comments Field
Reliability	Methodology	Indicates the sampling/analytical methodology, estimation method, or type of publication
Representativeness	Geographic Scope	Indicates the country of the study, publication, or underlying data
	Applicability	Indicates whether the data are for a condition of use within scope of the Risk Evaluation
	Temporal Representativeness	Provides the year of study, publication, or underlying data
	Sample Size	Describes the distribution of the sample or underlying data
Accessibility / Clarity	Metadata Completeness	Describes the completeness of the metadata
Variability and Uncertainty	Metadata Completeness	Indicates if study or publication addresses variability and uncertainty of the data or information

Releases to the Environment

Source Citation:	Landrigan exposure t	Landrigan, P. J., Stein, G. F., Kominsky, J. R., Ruhe, R. L., Watanabe, A. S., 1987. Common-source community and industrial exposure to trichloroethylene. Archives of Environmental Health.							
Type of Data Source Hero ID	Releases to 65261	Releases to the Environment; Reports for Data or Information Other than Exposure or Release Data; 65261							
EXTRACTION									
Parameter			Data						
Life Cycle Stage:			Use						
Release Source:			Spill/Leak						
Disposal /Treatm	ent Method	:	None						
Environmental M	edia:		water and land	l					
Release Estimation	on Method:		Estimate						
Daily Release Qu	antity (kg/d	ay):	105007						
Annual Release G	Quantity (kg	/yr):	105007						
Release Days per	Year:		1						
Number of Sites:			1						
EVALUATION									
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments			
Domain 1: Reliab	oility Metric 1:	Methodology	Medium	$\times 1$	2	peer revied article, non-standard sources			
Domain 2: Repre	sentative								
	Metric 2:	Geographic Scope	High	$\times 1$	1	US			
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	Accidental release, not in scope			
	Metric 4:	Temporal Representativeness	Low	$\times 2$	6	1979, 39 years old			
	Metric 5:	Sample Size	High	$\times 1$	1	Sample size is sufficiently large to be representative.			
Domain 3: Access	sibility/Clar	ity							
Domain of Treees	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	Time period, number of samples, and mean provided.			
	.1., 1.1.								
Domain 4: Variat	Matuia 7	Mata data Gammalatan ara	Mallin	v 1	0				
	Metric 7:	Metadata Completeness	Medium	× 1	Z	Discusse potential reasons why TCE was not found in certain places.			
Overall Quality I	Determinatio	$\mathbf{n}^{\dagger}$	Unacceptable		4	Metric Mean Score: 2.4.			
		(	Continued on nex	t page					
			, sintina on non	- Page					

	- co	ntinued from pr	evious p	age			
Source Citation:	Landrigan, P. J., Stein, G. F., Kominsky, exposure to trichloroethylene. Archives	J. R.,Ruhe, R. L., of Environmental	Watanabe Health.	e, A. S 1	987. Common-source community and industrial		
Type of Data Source Hero ID	Releases to the Environment; Reports for Data or Information Other than Exposure or Release Data; 65261						
EVALUATION							
Domain	Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments		

\* MWF = Metric Weighting Factor

Source Citation:	U.S, E. P.	A. 2001. Sources, emission and	exposure for tri	chloroeth	nylene (	TCE) and related chemicals.
Hero ID	Releases to 35002	the Environment; Environment	tal Release Data	;		
EXTRACTION						
Parameter			Data			
Life Cruele Stame			Uas			
Dalas as Casaras			Use Englition and and			
Release Source:	and Mathad		Fugitive release	es		
Disposal / Ireatm	ent Method		rugitive air			
Environmental M	edia:		air TDL			
Release Estimatio	on Method:		1 KI reporting			
Annual Release Q	uantity (kg	/yr):	6708081			
Number of Sites:			(83			
EVALUATION						
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments
Domain 1, Daliah	;1;+					
Domain 1. Kenab	Motrie 1.	Mathadalagy	High	$\vee 1$	1	EDA course
	Metric 1:	Methodology	Iligii	× 1	1	EPA source
Domain 2: Repres	sentative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	Release data from historical (pre-2000) TRI reports, EPA ob-
		II S	· · · · · · · ·			tains TRI data directly rather than from secondary sources
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	2001, 17 years old
	Metric 5:	Sample Size	High	$\times 1$	1	Data is industry-wide TRI data with 783 facilities reporting $% \left( \frac{1}{2} \right) = 0$
	·1·1·· / C1	.,				
Domain 3: Access	Maturia C	Ity Mata data Gammilatan ara	Τ	v 1	0	
	Metric 6:	Metadata Completeness	Low	× 1	3	Only includes release media and amount released.
Domain 4: Variab	oility and Ur	acertainty				
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed.
Overall Quality D	eterminatio	$\mathbf{n}^{\dagger}$	Unacceptable		4	Metric Mean Score: 2.3.

\* MWF = Metric Weighting Factor

Source Citation: Type of Data Source	U.S, E. P. Releases to	A 2001. Sources, emission and the Environment; Environment	l exposure for tri tal Release Data:	chloroetl	nylene (	TCE) and related chemicals.
Hero ID	35002	,		, ,		
EXTRACTION						
Parameter			Data			
Life Cycle Stage:			Use			
Disposal /Treatm	ent Method:	:	Stack air			
Environmental M	edia:		air			
Release Estimatio	n Method:		TRI reporting			
Annual Release Q	uantity (kg	/yr):	6841572			
Number of Sites:			783			
EVALUATION						
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments
Domain 1: Reliab	ility					
	Metric 1:	Methodology	High	$\times 1$	1	EPA source
Domain 2. Benres	sontativo					
Domain 2. Repres	Metric 2.	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	Release data from historical (pre-2000) TRI reports, EPA ob-
		TT	I IIIII		-	tains TRI data directly rather than from secondary sources
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	2001, 17 years old
	Metric 5:	Sample Size	High	$\times 1$	1	Data is industry-wide TRI data with 783 facilities reporting
Domain 3: Access	sibility/Clari	ity				
	Metric 6:	Metadata Completeness	Low	$\times 1$	3	Only includes release media and amount released.
Domain 4. Variah	vility and Ur	acertainty				
Domain 4. Variac	Metric 7:	Metadata Completeness	Low	× 1	3	Not addressed
			<u> </u>	// <b>1</b>	9	
Overall Quality D	eterminatio	$\mathbf{n}^{\dagger}$	Unacceptable		4	Metric Mean Score: 2.3.

\* MWF = Metric Weighting Factor

Source Citation: Type of Data Source	U.S, E. P. Releases to	A 2001. Sources, emission and the Environment: Environment	l exposure for tri tal Release Data	chloroetl	nylene (	TCE) and related chemicals.
Hero ID	35002			,		
EXTRACTION						
Parameter			Data			
Life Cycle Stage:			Use			
Disposal /Treatm	ent Method	:	Surface water			
Environmental M	edia:		water			
Release Estimatio	on Method:		TRI reporting			
Annual Release Q	uantity (kg	/yr):	758			
Number of Sites:			783			
EVALUATION						
Domain		Metric	Rating	$MWF^*$	Score	Comments
Domain 1: Reliab	Motrie 1.	Mathadalagy	Ujeh	× 1	1	
	Metric 1:	Methodology	Iligii	× 1	1	EPA source
Domain 2: Repres	sentative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	Release data from historical (pre-2000) TRI reports, EPA ob- tains TRI data directly rather than from secondary sources
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	2001, 17 years old
	Metric 5:	Sample Size	High	$\times 1$	1	Data is industry-wide TRI data with 783 facilities reporting
Domain 3: Access	sibility/Clar	ity				
	Metric 6:	Metadata Completeness	Low	$\times 1$	3	Only includes release media and amount released.
Domain 4. Variah	oility and Ur	ocertainty				
Domain 1. Variat	Metric 7:	Metadata Completeness	Low	× 1	3	Not addressed.
				·· •	,	
Overall Quality D	Determinatio	$\mathbf{n}^{\dagger}$	Unacceptable		4	Metric Mean Score: 2.3.

\* MWF = Metric Weighting Factor

Hero ID       35002         EXTRACTION Parameter       Data         EXTRACTION Parameter       Data         Life Cycle Stage: Disposal /Treatment Method:       Use Underground Injection Environmental Media: Release Estimation Method: Release Estimation Method: Release Quantity (kg/yr): Annual Release Quantity (kg/yr): Number of Sites:       Use TRI reporting 783         EVALUATION       Metric 1:       Metric       Rating       MWF* Score       Comments         Domain 1: Reliability Domain 2: Representative Metric 2:       Methodology       High       × 1       1       EPA source         Domain 2: Representative Metric 3:       Metric Scope Applicability       High       × 1       1       US         Metric 4:       Temporal Representative Metric 5:       Applicability       High       × 1       1       US         Metric 4:       Temporal Representativeness       Medium       × 2       4       2001, 17 years oid         Metric 5:       Sample Size       High       × 1       1       Data is industry-wide TRI data with 783 facilities reporting tains TRI data with 783 facilities reporting	Source Citation: Type of Data Source	U.S, E. P. Releases to	A 2001. Sources, emission and to the Environment; Environment	l exposure for tri tal Release Data	chloroeth;	ylene (	TCE) and related chemicals.
Data         Life Cycle Stage:       Use         Disposal /Treatment Method:       Underground Injection         Environmental Media:       Underground Injection         Release Estimation Method:       TRI reporting         Annual Release Quantity (kg/yr):       TRI         Annual Release Quantity (kg/yr):       TRI         Domain 1: Reliability       Metric 1:         Metric 1:       Metric 2:         Release Estimation 2: Representative       High       × 1         Metric 2:       Geographic Scope         Metric 3:       Applicability       1       US         Metric 4:       Temporal Representative       tain TRI data directly rather than from secondary sources tains rath data directly rather than from secondary sources tains rath data directly rather than from secondary sources tains rath data directly rather than from secondary sources tains rath data directly rather than from secondary sources tains rath data directly rather than from secondary sources tains rath data directly rather than from secondary sources tains rath data directly rather than from secondary sources tains rath data directly rather than from secondary sources tains rath data directly rather than from secondary sources tains rath data directly rather than from secondary sources tains rath data directly rather than from secondary sources tains rath data directly rather than from secondary sources tains rath data directly rather than from secondary sources tains rath data directly rather than from secondary sources tains rath data directly rather th	Hero ID	35002					
ParameterDataLife Cycle Stage: Disposal /Treatment Method:Use Underground InjectionEnvironmental Media: Release Estimation Method:Underground InjectionRelease Estimation Method: Annual Release Quantity (kg/yr):TRI reporting 131 783Mumber of Sites:783EVALUATIONDomainMetricReliability Metric 1:RatingMetric 2:Geographic Scope (Metric 3:Metric 2:Geographic Scope (Metric 3:Metric 3:Applicability UnacceptableMetric 4:Temporal Representativeness (Metric 5:Metric 5:Sample SizeMetric 5:Sample SizeDomain 3: Accessibility/Clarity	EXTRACTION						
Life Cycle Stage:UseDisposal /Treatment Method:Underground InjectionEnvironmental Media:Underground InjectionRelease Estimation Method:TRI reportingAnnual Release Quantity (kg/yr):131Number of Sites:783 <b>EVALUATION</b> DomainMetricRatingMWF*ScoreCommentsDomain 1: Reliability:Metric 1:MethodologyHigh× 11EPA sourceDomain 2: RepresentativeKetric 2:Geographic ScopeHigh× 11USMetric 3:ApplicabilityUnacceptable× 28Release data from historical (pre-2000) TRI reports, EPA ob- tains TRI data directly rather than from secondary sourcesMetric 4:Temporal RepresentativenessMedium× 242001, 17 years oldMetric 5:Sample SizeMedium× 242001, 17 years oldDomain 3: Accessibility/ClarityJoan Si Accessibility/Clarity1Data is industry-wide TRI data with 783 facilities reporting	Parameter			Data			
Disposal /Treatment Method:       Underground Injection         Environmental Media:       Underground Injection         Release Estimation Method:       TRI reporting         Annual Release Quantity (kg/yr):       131         Number of Sites:       783         Comments         EVALUATION         Domain       Metric         Release Istimation       Metric         Metric I:       Methodology         High       × 1       1       US         Metric 3:       Applicability       Unacceptable       × 2       8       Release data from historical (pre-2000) TRI reports, EPA obtains TRI data directly rather than from secondary sources tains TRI data directly rather than from secondary sources Metric 4:       Temporal Representativeness       Medium       × 2       4       2001, 17 years old       10       10 <t< td=""><td>Life Cycle Stage</td><td></td><td></td><td>Use</td><td></td><td></td><td></td></t<>	Life Cycle Stage			Use			
Environmental Media:       Underground Ligertion         Environmental Media:       Underground Ligertion         Release Estimation Method:       TRI reporting         Annual Release Quantity (kg/yr):       131         Number of Sites:       783         EVALUATION       Rating       MWF*         Score       Comments         Domain       Metric 1:       Metric         Metric 1:       Methodology       High       × 1       1         ENDOMAIN 1: Reliability       Metric 2:       Geographic Scope       High       × 1       1       US         Domain 2: Representative       Metric 3:       Applicability       Unacceptable       × 2       8       Release data from historical (pre-2000) TRI reports, EPA obtains TRI data directly rather than from secondary sources tains TRI data directly rather than from secondary sources tains TRI data directly rather than from secondary sources tains TRI data directly rather than from secondary sources tains TRI data directly rather than from secondary sources tains TRI data directly rather than from secondary sources tains TRI data directly rather than from secondary sources tains TRI data directly rather than from secondary sources tains TRI data directly rather than from secondary sources tains TRI data directly rather than from secondary sources tains TRI data directly rather than from secondary sources tains TRI data directly rather than from secondary sources tains TRI data is industry-wide TRI data with 783 facilities reporting <td< td=""><td>Disposal /Treatm</td><td>ent Method</td><td></td><td>Underground I</td><td>niection</td><td></td><td></td></td<>	Disposal /Treatm	ent Method		Underground I	niection		
Release Estimation Method:       TRI reporting         Annual Release Quantity (kg/yr):       131         Number of Sites:       783         EVALUATION       Rating       MWF* Score         Domain       Metric       Rating       MWF* Score         Domain 1: Reliability       Metric 1:       Methodology       High       × 1       1       EPA source         Domain 2: Representative       Metric 2:       Geographic Scope       High       × 1       1       US         Metric 3:       Applicability       Unacceptable       × 2       8       Release data from historical (pre-2000) TRI reports, EPA obtains TRI data directly rather than from secondary sources         Metric 4:       Temporal Representativeness       Medium       × 2       4       2001, 17 years old         Metric 5:       Sample Size       High       × 1       1       Data is industry-wide TRI data with 783 facilities reporting         Domain 3: Accessibility/Clarity       Kerice 5:       Sample Size       Kerice 5:       Kerice 5:       Kerice 5:       Kerice 5:	Environmental M	edia:		Underground I	niection		
Annual Release Quantity (kg/yr):       131         Number of Sites:       783         EVALUATION          Domain       Metric         Reliability       Kating         Metric 1:       Methodology         High       × 1       1         EVALUATION       Ketric 1:         Metric 1:       Methodology         High       × 1       1         EVALUATION       Ketric 2:         Gomain 1:       Reliability         Metric 1:       Methodology         High       × 1       1         EVALUATION       Ketric 2:         Geographic Scope       High       × 1       1         Metric 3:       Applicability       Unacceptable       × 2       8         Release data from historical (pre-2000) TRI reports, EPA ob- tains TRI data directly rather than from secondary sources         Metric 4:       Temporal Representativeness       Medium       × 2       4       2001, 17 years old         Metric 5:       Sample Size       High       × 1       1       Data is industry-wide TRI data with 783 facilities reporting         Domain 3: Accessibility/Clarity       Ketric 5:       Sample Size       Ketric 5:       Ketric 5:       Ketric 5:	Release Estimatio	on Method:		TRI reporting	J		
Number of Sites:       783         EVALUATION       Domain       Metric       Rating       MWF*       Score       Comments         Domain 1: Reliability       Metric 1:       Methodology       High       × 1       1       EPA source         Domain 2: Representative       Metric 2:       Geographic Scope       High       × 1       1       US         Metric 3:       Applicability       Unacceptable       × 2       8       Release data from historical (pre-2000) TRI reports, EPA obtains TRI data directly rather than from secondary sources         Metric 4:       Temporal Representativeness       Medium       × 2       4       2001, 17 years old         Metric 5:       Sample Size       High       × 1       1       Data is industry-wide TRI data with 783 facilities reporting         Domain 3: Accessibility/Clarity       Ker       Ker       Ker       Ker	Annual Release Q	Quantity (kg	/yr):	131			
EVALUATION       Metric       Rating       MWF*       Score       Comments         Domain       Metric 1:       Metric 2:       Rating       MWF*       Score       Comments         Domain 1: Reliability       Metric 1:       Methodology       High       × 1       1       EPA source         Domain 2: Representative       Metric 2:       Geographic Scope       High       × 1       1       US         Metric 3:       Applicability       Unacceptable       × 2       8       Release data from historical (pre-2000) TRI reports, EPA ob- tains TRI data directly rather than from secondary sources         Metric 4:       Temporal Representativeness       Medium       × 2       4       2001, 17 years old         Metric 5:       Sample Size       High       × 1       1       Data is industry-wide TRI data with 783 facilities reporting         Domain 3: Accessibility/Clar:       Sample Size       Ketric 5:       Sample Size       Ketric 5:       Ketric 5:	Number of Sites:			783			
EVALUATIONDomainMetricRatingMWF*ScoreCommentsDomain 1: Reliability Metric 1:MethodogyHigh× 11EPA sourceDomain 2: Representative Metric 2:Geographic Scope ApplicabilityHigh× 11USMetric 2:Geographic Scope ApplicabilityHigh× 24Release TRI data directly rather than from secondary sources trans TRI data directly rather than from secondary sources High× 242001, 17 years old Dota is industry-wide TRI data with 783 facilities reportingDomain 3: Accessibility/ClarityLoreKKKKKK							
DomainMetricMetricRatingMWF*ScoreCommentsDomain 1: Reliability Metric 1:MethodologyHigh× 11EPA sourceDomain 2: Representative Metric 2:Geographic Scope ApplicabilityHigh× 11USMetric 2:Geographic Scope ApplicabilityHigh× 28Release data from historical (pre-2000) TRI reports, EPA ob- tains TRI data directly rather than from secondary sourcesMetric 4:Temporal Representativeness Metric 5:Medium× 242001, 17 years oldDomain 3: Accessibility/ClarityHigh× 11Data is industry-wide TRI data with 783 facilities reporting	EVALUATION						
Domain 1: Reliability       Metric 1:       Methodology       High       × 1       1       EPA source         Domain 2: Representative       Metric 2:       Geographic Scope       High       × 1       1       US         Metric 3:       Applicability       Unacceptable       × 2       8       Release data from historical (pre-2000) TRI reports, EPA ob- tains TRI data directly rather than from secondary sources         Metric 4:       Temporal Representativeness       Medium       × 2       4       2001, 17 years old         Metric 5:       Sample Size       High       × 1       1       Data is industry-wide TRI data with 783 facilities reporting	Domain		Metric	Rating	$MWF^{\star}$	Score	Comments
Domain 1: Rehability       Metric 1:       Methodology       High       × 1       1       EPA source         Domain 2: Representative       Metric 2:       Geographic Scope       High       × 1       1       US         Metric 3:       Applicability       Unacceptable       × 2       8       Release data from historical (pre-2000) TRI reports, EPA obtains TRI data directly rather than from secondary sources         Metric 4:       Temporal Representativeness       Medium       × 2       4       2001, 17 years old         Metric 5:       Sample Size       High       × 1       1       Data is industry-wide TRI data with 783 facilities reporting		•1• .					
Metric 1:       Methodology       High       × 1       1       EPA source         Domain 2:       Representative       Metric 2:       Geographic Scope       High       × 1       1       US         Metric 3:       Applicability       Unacceptable       × 2       8       Release data from historical (pre-2000) TRI reports, EPA obtains TRI data directly rather than from secondary sources         Metric 4:       Temporal Representativeness       Medium       × 2       4       2001, 17 years old         Metric 5:       Sample Size       High       × 1       1       Data is industry-wide TRI data with 783 facilities reporting         Domain 3:       Accessibility/Clarity       Ketric 4:       Ketric 4:       Ketric 4:       Ketric 4:	Domain 1: Reliab	Motrie 1.	Mathadalam	Himb	× 1	1	
Domain 2: Representative       Metric 2:       Geographic Scope       High       × 1       1       US         Metric 3:       Applicability       Unacceptable       × 2       8       Release data from historical (pre-2000) TRI reports, EPA obtains TRI data directly rather than from secondary sources         Metric 4:       Temporal Representativeness       Medium       × 2       4       2001, 17 years old         Metric 5:       Sample Size       High       × 1       1       Data is industry-wide TRI data with 783 facilities reporting		Metric 1:	Methodology	підіі	× 1	1	EPA source
Metric 2:       Geographic Scope       High       × 1       1       US         Metric 3:       Applicability       Unacceptable       × 2       8       Release data from historical (pre-2000) TRI reports, EPA obtains TRI data directly rather than from secondary sources         Metric 4:       Temporal Representativeness       Medium       × 2       4       2001, 17 years old         Metric 5:       Sample Size       High       × 1       1       Data is industry-wide TRI data with 783 facilities reporting	Domain 2. Repres	sentative					
Metric 3:       Applicability       Unacceptable       × 2       8       Release data from historical (pre-2000) TRI reports, EPA obtains TRI data directly rather than from secondary sources         Metric 4:       Temporal Representativeness       Medium       × 2       4       2001, 17 years old         Metric 5:       Sample Size       High       × 1       1       Data is industry-wide TRI data with 783 facilities reporting	Domain 2. Ropro.	Metric 2:	Geographic Scope	High	× 1	1	US
Metric 4:       Temporal Representativeness       Medium       × 2       4       2001, 17 years old         Metric 5:       Sample Size       High       × 1       1       Data is industry-wide TRI data with 783 facilities reporting         Domain 3:       Accessibility/Clarity       V       V       V       V		Metric 3:	Applicability	Unacceptable	$\times 2$	8	Release data from historical (pre-2000) TRI reports, EPA ob-
Metric 4:       Temporal Representativeness       Medium       × 2       4       2001, 17 years old         Metric 5:       Sample Size       High       × 1       1       Data is industry-wide TRI data with 783 facilities reporting         Domain 3:       Accessibility/Clarity       Vertex       Vertex       Vertex       Vertex				-			tains TRI data directly rather than from secondary sources
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	2001, 17 years old
Domain 3: Accessibility/Clarity		Metric 5:	Sample Size	High	$\times 1$	1	Data is industry-wide TRI data with 783 facilities reporting
Domain 9. Accessionery Charty	Domain 3. Access	sibility/Clari	ity				
Metric 6: Metadata Completeness Low $\times 1$ 3 Only includes release media and amount released	Domain 5. Access	Metric 6:	Metadata Completeness	Low	× 1	3	Only includes release media and amount released
			interadata compreteness	10		<u> </u>	
Domain 4: Variability and Uncertainty	Domain 4: Variab	oility and Ur	ncertainty				
Metric 7: Metadata Completeness Low $\times 1$ 3 Not addressed.		Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed.
Overall Quality Determination <sup><math>\dagger</math></sup> Unacceptable 4 Metric Mean Score: 2.3.	Overall Quality D	Determinatio	$\mathbf{n}^{\intercal}$	Unacceptable		4	Metric Mean Score: 2.3.

\* MWF = Metric Weighting Factor

Source Citation:	U.S, E. P.	A. 2001. Sources, emission and	l exposure for tri	chloroeth	nylene (	TCE) and related chemicals.
Type of Data Source	Releases to	the Environment; Environmen	tal Release Data	;		
	55002					
EXTRACTION			Data			
			Data			
Life Cycle Stage:			Use			
Disposal /Treatm	ent Method	:	Land			
Environmental M	edia:		Land			
Release Estimatio	on Method:		TRI reporting			
Annual Release Q	uantity (kg	/yr):	2003			
Number of Sites:			783			
EVALUATION						
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments
Domain 1: Reliab	ility		TT: 1	1	1	
	Metric 1:	Methodology	High	× 1	1	EPA source
Domain 2: Benres	contativo					
Domain 2. Repres	Metric 2.	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	Belease data from historical (pre-2000) TRI reports, EPA ob-
			0 P	–	Ŭ,	tains TRI data directly rather than from secondary sources
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	2001, 17 years old
	Metric 5:	Sample Size	High	$\times 1$	1	Data is industry-wide TRI data with 783 facilities reporting $% \left( {{\left[ {{{\rm{TRI}}} \right]}_{\rm{TRI}}} \right)$
Domain 2. Accord	ibility /Clan	:+				
Domain 5. Access	Motric 6:	Motadata Completeness	Low	$\sim 1$	3	Only includes release medie and amount released
	Metric 0.	Metadata Completeness	LOW	~ 1	5	Only includes release media and amount released.
Domain 4: Variah	oility and Ur	ncertainty				
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed.
		*				
Overall Quality D	eterminatio	$\mathbf{n}^{\dagger}$	Unacceptable		4	Metric Mean Score: 2.3.
2 · · · · · · · · · · · · · · · · · · ·					-	

\* MWF = Metric Weighting Factor

Source Citation: Type of Data Source	U.S, E. P. Releases to	A. 2001. Sources, emission and the Environment; Environment	l exposure for tri tal Release Data	$\frac{chloroeth}{c}$	nylene (	TCE) and related chemicals.
Hero ID	35002					
EXTRACTION						
Parameter			Data			
Life Cycle Stage:			Use			
Disposal /Treatm	ent Method	:	POTW Transfe	er		
Environmental M	edia:		Water			
Release Estimatio	on Method:		TRI reporting			
Annual Release Q	uantity (kg	/yr):	22,827			
Number of Sites:			783			
EVALUATION						
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments
	•1• .					
Domain 1: Reliab	Meterie 1	Matha dala ma	TT:l.	v 1	1	
	Metric 1:	Methodology	nigii	X 1	1	EPA source
Domain 2: Repres	sentative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	Release data from historical (pre-2000) TRI reports, EPA ob-
	Materia 4	Trans and Damage to the second	Madian	<b>.</b>	4	tains TRI data directly rather than from secondary sources
	Metric 4: Motrie 5:	Sample Size	Wedlum	× 2 × 1	4	2001, 17 years old
	Metric 5:	Sample Size	nigii	X 1	T	Data is industry-wide TRI data with 783 facilities reporting
Domain 3: Access	sibility/Clar	ity				
	Metric 6:	Metadata Completeness	Low	$\times 1$	3	Only includes release media and amount released.
Domain 4: Variat	Matria 7	Mata data Completeness	Low	× 1	2	NT / 11 1
	Metric 7:	Metadata Completeness	LOW	× 1	3	Not addressed.
Overall Quality D	Determinatio	$\mathbf{n}^{\dagger}$	Unacceptable		4	Metric Mean Score: 2.3.

\* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	U.S, E. P. Releases to 35002	A 2001. Sources, emission and the Environment; Environment	l exposure for tri tal Release Data;	chloroetł ;	nylene ('	TCE) and related chemicals.
EXTRACTION						
Parameter			Data			
Life Cycle Stage:			Uso			
Disposal /Treatme	ent Method.		Other Transfer	·c		
Belease Estimation	n Method.		TRI reporting	5		
Annual Release O	uantity (kg/	/vr):	19.157.999			
Number of Sites:		5-7-	783			
EVALUATION						
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments
Damain 1. Daliahi	:1:4					
Domain 1: Reliad	Motrie 1.	Mathadalagy	High	$\sim 1$	1	EDA source
	Metric 1.	Methodology	Ingn	~ 1	1	EFA source
Domain 2: Repres	entative					
Domain 2. Ropros	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	Release data from historical (pre-2000) TRI reports, EPA ob-
			1			tains TRI data directly rather than from secondary sources
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	2001, 17 years old
	Metric 5:	Sample Size	High	$\times 1$	1	Data is industry-wide TRI data with 783 facilities reporting
Domain 2. Accord	:h:l:t-r/Clani					
Domain 5: Access	Motric 6:	Motadata Completeness	Low	$\sim 1$	3	Only includes release madie and amount released
	Metho 0.	Metadata Completeness	LOW	~ 1	5	Only includes release media and amount released.
Domain 4: Variab	ility and Ur	ocertainty				
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed.
		*				
Overall Quality D	etermination	$\mathbf{n}^{\dagger}$	Unacceptable		4	Metric Mean Score: 2.3.
•			1			

\* MWF = Metric Weighting Factor

Source Citation:	Hellweg, S.,Demou, E.,Scheringer, M.,McKone, T. E.,Hungerbuhler, K. 2005. Confronting workplace exposure to chemicals with LCA: examples of trichloroethylene and perchloroethylene in metal degreasing and dry cleaning. Environmental Science and Technology.								
Hero ID	88147	88147							
EXTRACTION									
Parameter			Data						
Life Cycle Stage: Release Source: Environmental M Release Estimatio Daily Release Qua	Life Cycle Stage:UseRelease Source:Emissions during Use (open top and closed systems)Environmental Media:Unknown (assume air)Release Estimation Method:Estimated (note units are g/m2 metal surface area)Daily Release Quantity (kg/day):Open Top: 1.4-1.7 g/m2 (min); 22-29 g/m2 (max); 7.2-8.1 g/m2avg;Closed systems: 0.016-0.061 g/m2 (min); 0.16-1.5 g/m2 (max);0.031- 0.18 g/m2 avg;								
EVALUATION									
Domain		Metric	Rating	MWF*	Score	Comments			
Domain 1: Reliab	ility				-				
	Metric 1:	Methodology	High	× 1	1	peer revied article, assumed to use valid methods			
Domain 2: Repres	sentative								
	Metric 2:	Geographic Scope	High	$\times 1$	1	US source			
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	Life cycle analysis is out of scope using air releases to define inhalation exposure			
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	2005, 13 years old but the data it relies on is older.			
	Metric 5:	Sample Size	N/A		N/A	No Comment.			
Domain 2. Accord	ibility/Clar	:+							
Domain 5: Access	Metric 6:	Metadata Completeness	High	$\times 1$	1	LCA modeling approach is clear and well documented.			
Domain 4. Variah	ilitar and H								
Domain 4: Variat	Metric 7:	Metadata Completeness	High	$\times 1$	1	Variability and uncertainty addressed in great detail.			
Overall Quality D	Unacceptable		4	Metric Mean Score: 2.0.					
	Continued on next page								

– continued from previous page								
Source Citation:	Hellweg, S.,Demou, E.,Scheringer, M.,McKone, T. E.,Hungerbuhler, K 2005. Confronting workplace exposure to chemicals with LCA: examples of trichloroethylene and perchloroethylene in metal degreasing and dry cleaning. Environmental Science and Technology.							
Type of Data Source Hero ID	Releases to the Environment; Reports for 88147	Releases to the Environment; Reports for Data or Information Other than Exposure or Release Data; 88147						
EVALUATION								
Domain	Metric	Rating	$MWF^{\star}$	Score	Comments			

\* MWF = Metric Weighting Factor

Source Citation:	CalEpa,. 2005. Appendix D.3 Chronic RELS and toxicity summaries using the previous version of Hot Spots Risk Assessment guidelines (OEHHA 1999).							
Type of Data Source Hero ID	Releases to the Environment; Environmental Release Data; 3982628							
EXTRACTION			_					
Parameter			Data					
Life Cycle Stage: Annual Release Quantity (kg/yr):		Use/Manufacture CA Statewide: 176,908 lbs (1999)						
EVALUATION								
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments		
Domain 1: Reliab	ility							
	Metric 1:	Methodology	High	$\times 1$	1	Cited from CARB		
Domain 2: Repres	sentative							
Domain 2. Hopro.	Metric 2:	Geographic Scope	High	$\times 1$	1	US		
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	Air releases out of scope		
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	2000, 18 years old, but data is much older.		
	Metric 5:	Sample Size	N/A		N/A	No Comment.		
Domain 3. Access	sibility/Clar	ity						
	Metric 6:	Metadata Completeness	Unacceptable	$\times 1$	4	Release data does not include needed metadata.		
Domain 4. Vaniak	ilitar and H	o conto inter						
Domain 4: Variat	Metric 7:	Metadata Completeness	Medium	$\times 1$	2	Limited uncertainty discussion.		
Overall Quality Determination <sup><math>\dagger</math></sup>		Unacceptable		4	Metric Mean Score: 2.5.			

\* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	Hsia,. 2013. TSCA work plan chemicals program. Releases to the Environment; Environmental Release Data; 3982141						
EXTRACTION Parameter			Data				
Life Cycle Stage: Release Source: Environmental Media: Annual Release Quantity (kg/yr): Number of Sites:			Use Vapor degreasing Air Chart from 1988-2011:1988: 56,000,000 lbs2011: 2,600,000 lbs Varies				
<b>EVALUATION</b> Domain		Metric	Rating	$MWF^{\star}$	Score	Comments	
Domain 1: Reliab	ility Metric 1:	Methodology	Low	× 1	3	Data source not cited	
Domain 2: Repres	sentative						
	Metric 2:	Geographic Scope	High	$\times 1$	1	US	
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	Air releases out of scope	
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Provides data from 1998 to 2010	
	Metric 5:	Sample Size	Medium	$\times 1$	2	Distribution of exposures across years, but no characterization within each year.	
Domain 3: Access	sibility/Clar Metric 6:	ity Metadata Completeness	Low	$\times 1$	3	Only provides release media	
Domain 4: Variab	oility and Un Metric 7:	ncertainty Metadata Completeness	Low	$\times 1$	3	Report does not address variability or uncertainty	
Overall Quality D	eterminatio	$\mathbf{n}^{\dagger}$	Unacceptable		4	Metric Mean Score: 2.4.	

\* MWF = Metric Weighting Factor

Source Citation:	D. O. W. Deutschland. 2014. Chemical safety report: Use of trichloroethylene in industrial parts cleaning by vapour degreasing in closed systems where specific requirements (system of use-parameters) exist.							
Type of Data Source Hero ID	Releases to 3970823	o the Environment; Published M	lodels for E	xposures	or Rele	eases;		
EXTRACTION Parameter			Data					
Life Cycle Stage: Release Source: Environmental Media: Release or Emission Factor: Release Estimation Method: Daily Release Quantity (kg/day): Annual Release Quantity (kg/yr): Number of Sites:				Use Vapor degreasing Air, Water, Soil Air: 5.97 percent Water: 5 percent Soil: 5 percent Air: based on the finding of the PhD thesis from Julia von Grote (2003). Air: .4 kg/dWater: .335 kg/dSoil: N/A Air: 167 kgWater: 200 kgSoil: 168 kg 9				
<b>EVALUATION</b> Domain		Metric	Rating	MWF*	Score	Comments		
Domain 1: Reliab	ility Metric 1:	Methodology	High	× 1	1	Releases assessed using EU ERC model, expected to be accurate		
Domain 2: Repres	sentative Metric 2: Metric 3: Metric 4: Metric 5:	Geographic Scope Applicability Temporal Representativeness Sample Size	Medium High High N/A	$\begin{array}{c} \times \ 1 \\ \times \ 2 \\ \times \ 2 \end{array}$	2 2 2 N/A	Germany (OECD) Workplace that utilizes TCE Date of model not given, but source is from 2014 N/A - modeled releases		
Domain 3: Access	sibility/Clar Metric 6:	ity Metadata Completeness	Low	× 1	3	Model inputs, equations, and basis not given		
Domain 4: Variab	ility and Uı Metric 7:	ncertainty Metadata Completeness	Low	$\times 1$	3	Not addressed.		
Overall Quality I	Determinatio	$\mathbf{n}^{\dagger}$	High		1.6			

<sup>\*</sup> MWF = Metric Weighting Factor
<sup>†</sup> If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.</li>

Source Citation: Type of Data Source Hero ID	Echa,. 200 Releases to 3970815	Echa, 2004. Summary risk assessment report: Trichloroethylene. Releases to the Environment; Completed Exposure or Risk Assessments; 3970815						
EXTRACTION								
Parameter			Data					
Life Cycle Stage: Release Source: Environmental M Release Estimatio Daily Release Qua Number of Sites:	edia: on Method: antity (kg/d	lay):	Manufacture Production Air, Water Estimation 214 Many					
EVALUATION								
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments		
Domain 1: Reliab	ility Metric 1:	Methodology	High	× 1	1	EU report		
Demeir 9. Deme								
Domain 2: Repres	Motric 2.	Geographic Scope	Modium	$\sim 1$	2	FU (OFCD)		
	Metric 2:	Applicability	High	$^{\wedge 1}$ $^{\vee 2}$	2	EU (OECD) Workplace that utilizes TCE		
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Report is from 2004, but date of data unknown		
	Metric 5:	Sample Size	Low	$\times 1$	3	Single value given for local, regional, and continental releases, no discussion of statistics		
Domain 3: Access	ibility/Clari Metric 6:	ity Metadata Completeness	Unacceptable	× 1	4	Report does not document methods, sources, or assumptions estimate releases		
Domain 4: Variability and Uncertainty			-	_				
	Metric 7:	Metadata Completeness	Low	× 1	3	Not addressed.		
Overall Quality D	eterminatio	n†	Unacceptable		4	Metric Mean Score: 2.1.		

\* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	Echa,. 200 Releases to 3970815	Echa, 2004. Summary risk assessment report: Trichloroethylene. Releases to the Environment; Completed Exposure or Risk Assessments; 3970815						
EXTRACTION								
Parameter			Data					
Life Cycle Stage: Release Source: Environmental Media: Release Estimation Method: Daily Release Quantity (kg/day): Number of Sites:			Manufacture Intermediate U Air, Water Estimation 68 Many	lse				
EVALUATION								
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments		
Domain 1: Reliab	ility Metric 1:	Methodology	High	$\times 1$	1	EU report		
	, , <b>.</b>							
Domain 2: Repres	Motrie 2.	Coorranhia Saona	Modium	× 1	0			
	Metric 2:	Applicability	High	$\times 1$ $\times 2$	2	EU (OECD) Workplace that utilizes TCE		
	Metric 4:	Temporal Representativeness	Medium	$^{\sim 2}$ $\times 2$	2 4	Report is from 2004, but date of data unknown		
	Metric 5:	Sample Size	Low	$\times 1 \times 1$	3	Single value given for local, regional, and continental releases, no discussion of statistics		
Domain 3: Access	sibility/Clari Metric 6:	ity Metadata Completeness	Unacceptable	$\times 1$	4	Report does not document methods, sources, or assumptions estimate releases		
Domain 4. Variat	vility and Ur	acortainty						
Domain 4. Vallar	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed.		
Overall Quality D	Determinatio	$\mathrm{n}^\dagger$	Unacceptable		4	Metric Mean Score: 2.1.		

\* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	Echa, 2004. Summary risk assessment report: Trichloroethylene. Releases to the Environment; Completed Exposure or Risk Assessments; 3970815						
EXTRACTION							
Parameter			Data				
Life Cycle Stage			Use				
Release Source:			Handling				
Environmental M	edia:		Air. Water				
Release Estimatio	on Method:		Estimation				
Daily Release Qu	antity (kg/d	av):	627				
Number of Sites:	5 ( 0)	.,	Many				
			-				
EVALUATION							
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments	
	.1.,						
Domain 1: Reliab	Motrie 1.	Mathadalam	Himb	× 1	1		
	Metric 1:	Methodology	Підії	X 1	1	EU report	
Domain 2. Benree	sentative						
Domain 2. Repres	Metric 2:	Geographic Scope	Medium	× 1	2	EU (OECD)	
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE	
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Report is from 2004, but date of data unknown	
	Metric 5:	Sample Size	Low	$\times 1$	3	Single value given for local, regional, and continental releases, no discussion of statistics	
Domain 3: Accord	ubility/Clari	;+.,					
Domain 5. Access	Metric 6:	Metadata Completeness	Unacceptable	$\times 1$	4	Report does not document methods, sources, or assumptions estimate releases	
D . 4 V . 1							
Domain 4: Variability and Uncertainty			τ	v 1	9		
	Metric 7:	Metadata Completeness	LOW	× 1	ა	Not addressed.	
Overall Quality D	Determinatio	$\mathbf{n}^{\dagger}$	Unacceptable		4	Metric Mean Score: 2.1.	

\* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	Echa,. 200 Releases to 3970815	Echa,. 2004. Summary risk assessment report: Trichloroethylene. Releases to the Environment; Completed Exposure or Risk Assessments; 3970815						
EXTRACTION								
Parameter			Data					
Life Cycle Stage: Release Source: Environmental Media: Release Estimation Method: Daily Release Quantity (kg/day): Number of Sites:			Use Metal Degreasi Air, Water Estimation 98083 Many	ing				
EVALUATION								
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments		
Domain 1: Reliab	ility Metric 1:	Methodology	High	$\times 1$	1	EU report		
Domain 2: Repres	sentative							
	Metric 2:	Geographic Scope	Medium	$\times 1$	2	EU (OECD)		
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE		
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Report is from 2004, but date of data unknown		
	Metric 5:	Sample Size	Low	$\times 1$	3	Single value given for local, regional, and continental releases, no discussion of statistics		
Domain 3: Access	sibility/Clar Metric 6:	ity Metadata Completeness	Unacceptable	× 1	4	Report does not document methods, sources, or assumptions estimate releases		
Domain 4: Variab	Domain 4: Variability and Uncertainty			_	2			
	Metric 7:	Metadata Completeness	Low	× 1	3	Not addressed.		
Overall Quality D	Determinatio	$\mathbf{n}^{\dagger}$	Unacceptable		4	Metric Mean Score: 2.1.		

\* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	Echa,. 200 Releases to 3970815	Echa, 2004. Summary risk assessment report: Trichloroethylene. Releases to the Environment; Completed Exposure or Risk Assessments; 3970815						
EXTRACTION								
Parameter			Data					
Life Cycle Stage: Release Source: Environmental Media: Release Estimation Method: Daily Release Quantity (kg/day): Number of Sites:			Use Adhesives Formulation Air, Water Estimation 406 Many					
EVALUATION								
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments		
Domain 1: Reliab	ility Metric 1:	Methodology	High	$\times 1$	1	EU report		
DiaD								
Domain 2: Repres	Motrie 2.	Coorrenkie Soone	Modium	× 1	0			
	Metric 2:	Applicability	High	$\times 1$ $\times 2$	2	EU (OECD) Workplace that utilizes TCE		
	Metric 4:	Temporal Representativeness	Medium	$^{^{2}}$	4	Report is from 2004, but date of data upknown		
	Metric 5:	Sample Size	Low	$\times 1 \times 1$	3	Single value given for local, regional, and continental releases, no discussion of statistics		
Domain 3: Access	sibility/Clari Metric 6:	ity Metadata Completeness	Unacceptable	$\times 1$	4	Report does not document methods, sources, or assumptions estimate releases		
Domain 4. Variat	oility and Ur	ncertainty						
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed.		
Overall Quality D	Determinatio	$\mathrm{n}^\dagger$	Unacceptable		4	Metric Mean Score: 2.1.		

\* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	Echa,. 200 Releases to 3970815	Echa, 2004. Summary risk assessment report: Trichloroethylene. Releases to the Environment; Completed Exposure or Risk Assessments; 3970815						
EXTRACTION								
Parameter			Data					
Life Cycle Stage: Release Source: Environmental M Release Estimatic Daily Release Qu Number of Sites:	edia: on Method: antity (kg/d	ay):	Use Adhesives Use Air, Water Estimation 17088 Many					
EVALUATION								
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments		
Domain 1: Reliab	ility Metric 1:	Methodology	High	× 1	1	EU report		
Domain 2: Repres	Sentative	Caamankia Saana	Madium	× 1	0			
	Metric 2:	Geographic Scope	Medium	$\times 1$	2	EU (OECD)		
	Metric 3.	Tomporal Representativeness	Modium	$\times 2$	2 4	Workplace that utilizes ICE		
	Metric 4. Metric 5:	Sample Size	Low	$\times \frac{2}{\times 1}$	3	Single value given for local, regional, and continental releases, no discussion of statistics		
Domain 3: Access	sibility/Clari Metric 6:	ity Metadata Completeness	Unacceptable	× 1	4	Report does not document methods, sources, or assumptions estimate releases		
Domain 4: Variab	oility and Ur Metric 7:	ncertainty Metadata Completeness	Low	× 1	3	Not addressed.		
Overall Quality D	Determinatio	n <sup>†</sup>	Unacceptable		4	Metric Mean Score: 2.1.		

\* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	Echa,. 200 Releases to 3970815	Echa, 2004. Summary risk assessment report: Trichloroethylene. Releases to the Environment; Completed Exposure or Risk Assessments; 3970815						
EXTRACTION								
Parameter			Data					
Life Cycle Stage: Release Source: Environmental Media: Release Estimation Method: Daily Release Quantity (kg/day): Number of Sites:			Use Consumer Product Formulation Air, Water Estimation 285 Many					
EVALUATION								
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments		
Domain 1: Reliab	ility Metric 1:	Methodology	High	$\times 1$	1	EU report		
Domain 2: Repres	Sentative	Communitie Commu	Mallin	1	0			
	Metric 2:	Geographic Scope	Medium	× 1 × 2	2	EU (OECD)		
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE		
	Metric 4: Metric 5:	Sample Size	Low	$\times 2 \times 1$	43	Single value given for local, regional, and continental releases, no discussion of statistics		
Domain 3: Access	sibility/Clari Metric 6:	ity Metadata Completeness	Unacceptable	$\times 1$	4	Report does not document methods, sources, or assumptions estimate releases		
Domain 4. Variak	ilitar and Ha	o conto inter						
Domain 4. Variat	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed.		
Overall Quality D	Determinatio	n <sup>†</sup>	Unacceptable		4	Metric Mean Score: 2.1.		

\* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	Echa,. 200 Releases to 3970815	Echa, 2004. Summary risk assessment report: Trichloroethylene. Releases to the Environment; Completed Exposure or Risk Assessments; 3970815						
EXTRACTION								
Parameter			Data					
Life Cycle Stage: Release Source: Environmental M Release Estimatic Daily Release Qu Number of Sites:	edia: on Method: antity (kg/d	ay):	Use Consumer Use Air, Water Estimation 10523 Many					
EVALUATION								
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments		
Domain 1: Reliab	ility Metric 1:	Methodology	High	× 1	1	EU report		
Demeir 9. Deme								
Domain 2: Repres	Motria 2:	Coographic Scope	Modium	$\sim 1$	9	EU (OECD)		
	Metric 2.	Applicability	High	$^{\land 1}$ $^{\lor 2}$	2	EU (UECD) Workplace that utilizes TCE		
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Report is from 2004, but date of data unknown		
	Metric 5:	Sample Size	Low	$\times 1$	3	Single value given for local, regional, and continental releases, no discussion of statistics		
Domain 3: Access	sibility/Clari Metric 6:	ity Metadata Completeness	Unacceptable	$\times 1$	4	Report does not document methods, sources, or assumptions estimate releases		
Domain 4: Variab	oility and Ur	ncertainty						
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed.		
Overall Quality D	eterminatio	$\mathrm{n}^\dagger$	Unacceptable		4	Metric Mean Score: 2.1.		

\* MWF = Metric Weighting Factor

Source Citation:	2014. Exposure scenario: Use: Trichloroethylene as an extraction solvent for removal of process oil and formation of the porous structure in polyethylene based separators used in lead-acid batteries.									
Type of Data Source Hero ID	Releases to 3970806	Releases to the Environment; Environmental Release Data; 3970806								
EXTRACTION										
Parameter		Data								
Life Cycle Stage:			Use							
Release Source:			Carbon b bag house	ed dischars and ma	arge sta anv pot	ck, oil coalescing filter discharge stacks, dust ential fugitive sources.				
Environmental M	edia:		Air, Wate	er	any pou					
Release or Emissi	on Factor:		Air: 0.037	7 percent	Water:	0.0000031 percent Soil: 0 percent				
Release Estimatio	on Method:		Estimatio	n						
Annual Release G	Quantity (kg	/yr):	$41,878 \mathrm{~kg}$	/yr with	potentia	al to be $112,725,000 \text{ kg/yr}$ worst case scenario.				
Release Days per	Year:		365							
Number of Sites:			1							
EVALUATION										
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments				
Domain 1: Reliat	oility									
	Metric 1:	Methodology	High	$\times 1$	1	Releases based on mass balance, expected to be accurate and cover all releases				
Domain 2: Repre	sentative									
	Metric 2:	Geographic Scope	Medium	$\times 1$	2	EU (OECD)				
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE				
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	2014, 4 years old				
	Metric 5:	Sample Size	Low	$\times 1$	3	Single value, no statistics given				
Domain 3: Accord	aibility/Clar	i+.,								
Domain 5. Access	Metric 6:	Metadata Completeness	High	$\times 1$	1	All metadata given				
Domain 4. Varial	ilitar and U.									
Domain 4. variat	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed.				
					-					
Overall Quality I	Overall Quality Determination <sup><math>\dagger</math></sup>		High		1.6					

\* MWF = Metric Weighting Factor
 † If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.</li>

Source Citation:	Feistritz M	ficroporous, gmbh. 2014. Chemi	ical safety report	: Trichlo	oroethyl	ene used as degreasing solvent in the manufacture
Type of Data Source Hero ID	Releases to 3970808	the Environment; Environment	tteries. tal Release Data;			
EXTRACTION						
Parameter			Data			
Life Cycle Stage:			Use			
Release Source:	1.		Various			
Environmental M	edia:		Air			
Appual Palaaca C	on ractor:	/).	48.08 percent			
Annual Release G	guannity (kg	/ y1).	12170 Kg/yi			
EVALUATION						
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments
Damain 1. Daliah	:1:					
Domain 1: Reliad	Metric 1.	Methodology	Low	× 1	3	Not described (information reducted)
		memodology	1011	× 1	0	
Domain 2: Repre	sentative					
*	Metric 2:	Geographic Scope	Medium	$\times 1$	2	EU
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	Air releases out of scope
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	No date listed, but monitoring data was taken from $2014$
	Metric 5:	Sample Size	Medium	$\times 1$	2	Provides one data point of an annual relase value to air for $2014$ .
Domain 3: Accord	ribility/Clar	i+.,				
Domain 5. Access	Metric 6	Metadata Completeness	Low	$\times 1$	3	Only provides release media
	Metric 0.	Metadata Completeness	LOW	~ 1	5	Only provides release media
Domain 4: Variał	oility and U	ncertainty				
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Report does not address variability or uncertainty
Overall Quality D	Determinatio	$\mathbf{n}^{\intercal}$	Unacceptable		4	Metric Mean Score: 2.6.

\* MWF = Metric Weighting Factor

Source Citation:Wu, C.,Schaum, J 2000. Exposure assessment of trichloroethylene. Environmental Health Perspectives.Type of Data SourceReleases to the Environment; Environmental Release Data;Hero ID724225								
EXTRACTION Parameter		Data						
Life Cycle Stage: Release Source: Disposal /Treatment Method:			Use Various Fugitive, stack air releases, surface water releases, underground injection, land disposal, and POTW transfers					
Environmental Media: Annual Release Quantity (kg, Number of Sites:	/yr):	Air, Water, Soil Data from 1987-1994 broken out by year into disposal method. Ex. 1987, in lbs/yr:Fugitive: 25,978,879Stack air releases: 29,436,952Sur- face water releases: 30,104Underground injection: 18,720Land disposal: 56,733POTW transfers: 130,178 681-959						
EVALUATION								
Domain	Metric	Rating	MWF*	Score	Comments			
Domain 1: Reliability Metric 1:	Methodology	High	$\times 1$	1	Data from US EPA			
Domain 2: Representative								
Metric 2:	Geographic Scope	High	$\times 1$	1	US			
Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE			
Metric 4: Metric 5:	Sample Size	Low Medium	$\times 2$ $\times 1$	0	2000, 18 years old, but data is much older.			
Domain 3: Accessibility/Clarity Metric 6: Metadata Completeness			× 1	3	Minimal Metadata present.			
Domain 4: Variability and Ur Metric 7:	ncertainty Metadata Completeness	Low	× 1	3	Not addressed.			
Overall Quality Determination <sup>†</sup>				2.0				

Source Citation:	McCulloch, A., Midgley, P. M. 1996. The production and global distribution of emissions of trichloroethene, tetrachloroethene and dichloromethane over the period 1988, 1992. Atmospheric Environment									
Type of Data Source Hero ID	Releases to the Environment; Environmental Release Data; 3026800									
	00-0000									
EXTRACTION			Data							
Farameter			Data							
Life Cycle Stage:			Global Emissic	ons						
Environmental M	edia:		Air							
Release Estimation	on Method:		Discussed, but	not nam	led.					
Annual Release Q	uantity (kg	/yr):	197,000 - 260,0	00 metri	c tonsD	ata broken out by region and year.				
			, ,							
EVALUATION										
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments				
Domain 1, Daliah	:1:4									
Domain 1. Kenau	Metric 1.	Methodology	Medium	$\times 1$	2	Process explained and cited				
	Wether 1.	Methodology	Medium	~ 1	2	r locess explained and ched.				
Domain 2: Repres	sentative									
	Metric 2:	Geographic Scope	Medium	$\times 1$	2	Europe				
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	Air releases out of scope				
	Metric 4:	Temporal Representativeness	Low	$\times 2$	6	1995, 23 years old				
	Metric 5:	Sample Size	High	$\times 1$	1	Provides global emissions broken down by region and year.				
Domain 3: Access	sibility/Clar	ity								
	Metric 6:	Metadata Completeness	Unacceptable	$\times 1$	4	Alludes to emisssions to air, but does not specifically state.				
_										
Domain 4: Variab	oility and Ui	ncertainty								
	Metric 7:	Metadata Completeness	High	$\times 1$	1	Discusses uncertainty and provides a potential variance per- centage of $\pm/-5$				
						······································				
Overall Quality F	)eterminatio	$\mathbf{n}^{\dagger}$	Unacceptable		4	Metric Mean Score: 2.7				
Overan Quality L	/0001111114010	11	Chacceptable		т	Neure Mean Score. 2.1.				

\* MWF = Metric Weighting Factor

Source Citation:	U.S, E. P. A. 1980. Waste solvent reclamation.							
Type of Data Source Hero ID	3840001							
EXTRACTION								
Parameter			Data					
Life Cycle Stage			Waste Sol	lvent Rec	lamatic	nc		
Release Source:			Fugitive,	process, :	storage			
Disposal /Treatm	ent Method	:	distillation	n, purific	ation			
Environmental M	edia:		Air, water	r				
Release or Emissi	on Factor:		Many sou	rces in p	process	cited. Example:Storage tank vent: 0.01 kg/ $$		
			MgFugitiv	ve Emissi	ions: $0.4$	46  kg/Mg		
Release Days per	Year:		Continuo	18				
Waste Treatment	Method:		Recycling	and reco	overy			
P2 Control & per	cent Efficier	ncy:	40-99 per	cent reco	very			
EVALUATION								
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments		
Domain 1. Baliah	ility							
	Metric 1:	Methodology	Medium	$\times 1$	2	Well cited, well detailed, but looks to be extracted from a book or manual with no attributes/citation.		
Domain 2: Repres	sentative							
Domain = Teopro	Metric 2:	Geographic Scope	Medium	$\times 1$	2	No Comment.		
	Metric 3:	Applicability	High	$\times 2$	2	Recycling process for solvents such as TCE.		
	Metric 4:	Temporal Representativeness	Low	$\times 2$	6	Unknown		
	Metric 5:	Sample Size	Low	$\times 1$	3	N/a		
Domain 3. Access	vibility/Clar	ity						
Domain 5. Access	Metric 6:	Metadata Completeness	High	× 1	1	Complete metadata		
-	1.100110 0.	Interaduation Compressioness	8		-	comprote metadata		
Domain 4: Variab	oility and U	ncertainty						
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	No Comment.		
Overall Quality Determination <sup>†</sup>			Medium		2.1			

Source Citation: Type of Data Source Hero ID	2017. Poll Releases to 3860453	2017. Pollution prevention search results, envirofacts database. Releases to the Environment; Environmental Release Data; 3860453						
EXTRACTION Parameter			Data					
Life Cycle Stage: Release Source:			Use/Manufactu Many	ıre				
EVALUATION								
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments		
Domain 1: Reliab	ility Metric 1:	Methodology	High	$\times 1$	1	US EPA Envirofacts		
Domain 2: Benre	contativo							
Domain 2. Repres	Metric 2.	Geographic Scope	High	× 1	1	US		
	Metric 3:	Applicability	High	$\times 2$	2	Releases of TCE from facilities that use TCE		
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Spans multiple years, majority coming from 2008 or more recent.		
	Metric 5:	Sample Size	High	$\times 1$	1	site-specific releases given		
Domain 3: Access	sibility/Clar	ity						
	Metric 6:	Metadata Completeness	Unacceptable	$\times 1$	4	No metadata given, including media of release		
Domain 4: Variab	oility and Un Metric 7:	ncertainty Metadata Completeness	Low	$\times 1$	3	Not addressed.		
Overall Quality D	Determinatio	$\mathbf{n}^{\dagger}$	Unacceptable		4	Metric Mean Score: 1.6.		

\* MWF = Metric Weighting Factor

Source Citation: U.S, Type of Data Source Relea Hero ID 39701	E. P. A. 1995. Environmental resea uses to the Environment; Environment 197	rch brief: Pe ntal Release	ollution p Data;	oreventio	on assessment for a manufacturer of locking devices.
EXTRACTION					
Parameter		Data			
Life Cycle Stage: Disposal /Treatment Me Annual Release Quantit Release Days per Year: Number of Sites: Waste Treatment Metho	Waste solvent Shipped offsite for disposal 28700 lb/yr 1 1 Offsite disposal				
EVALUATION					
Domain	Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments
Domain 1: Reliability Metr	ic 1: Methodology	High	× 1	1	US EPA
Domain 2: Representati	ve				
Metr	ic 2: Geographic Scope	High	$\times 1$	1	US
Metr	ic 3: Applicability	High	$\times 2$	2	Waste releases from a degreaser using TCE
Metr	ic 4: Temporal Representativeness	Low	$\times 2$	6	1995, 23 years old
Metr	ic 5: Sample Size	Low	$\times 1$	3	No Comment.
Domain 3: Accessibility Metr	/Clarity ic 6: Metadata Completeness	Low	× 1	3	Does not include citations
Domain 4: Variability a Metr	nd Uncertainty ic 7: Metadata Completeness	Low	× 1	3	No Comment.
Overall Quality Determination <sup>†</sup>				2.1	

<sup>\*</sup> MWF = Metric Weighting Factor
 <sup>†</sup> If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.</li>

Source Citation: Type of Data Source Hero ID	2014. Exp Releases to 3970837	2014. Exposure assessment: Trichloroethylene. Releases to the Environment; Environmental Release Data; 3970837						
EXTRACTION Parameter			Data					
Life Cycle Stage: Release Source: Disposal /Treatm Environmental M Release or Emissi Daily Release Qu Annual Release G Release Days per Number of Sites:	eent Method fedia: on Factor: antity (kg/d Quantity (kg Year:	: lay): /yr):	Use Fugitive e ambient a air, water Water: 0. Water: 0. 180 1	Use Fugitive emissions ambient air, water air, water Water: 0.01 percent Air: 60 percent Water: 0.002 kg/dayAir: 12 kg/day Water: 0.3 kg/yrair: 1800 kg/yr 180 1				
<b>EVALUATION</b> Domain		Metric	Rating	$MWF^{\star}$	Score	Comments		
Domain 1: Reliab	oility Metric 1:	Methodology	Low	$\times 1$	3	Unknown author, reads as if it is written by a manufacturer about their own process.		
Domain 2: Repre	sentative Metric 2: Metric 3: Metric 4: Metric 5:	Geographic Scope Applicability Temporal Representativeness Sample Size	Medium High High Medium	$\begin{array}{c} \times \ 1 \\ \times \ 2 \\ \times \ 2 \\ \times \ 1 \end{array}$	2 2 2 2	EU Facility using small amounts of TCE in pharmaceutical pro- ductions. 2014, 4 years old No Comment.		
Domain 3: Access	sibility/Clar Metric 6:	ity Metadata Completeness	Medium	$\times 1$	2	Includes most metadata		
Domain 4: Varial	oility and Ur Metric 7:	ncertainty Metadata Completeness	Low	$\times 1$	3	No Comment.		
Overall Quality Determination <sup>†</sup>			Medium		1.8			

\* MWF = Metric Weighting Factor
 † If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.</li>

Source Citation: Type of Data Source Hero ID	2014. Exposure assessment: Trichloroethylene, Part 3. Releases to the Environment; Environmental Release Data; 3970842						
EXTRACTION Parameter			Data				
Life Cycle Stage: Release Source: Disposal /Treatm Environmental M Release or Emissi Daily Release Qu Annual Release Q Release Days per Number of Sites:	Use Fugitive emissions ambient air, water air, water Air: 4.38 percent Air 157.7 kg/day Air: 1752 kg/yr 64 days16 batches @ 4 days per batch 1						
<b>EVALUATION</b> Domain		Metric	Metric Rating MWF* Score Comments				
Domain 1: Reliab	oility Metric 1:	Methodology	Low	$\times 1$	3	Unknown author, reads as if it is written by a manufacturer about their own process.	
Domain 2: Repre	sentative Metric 2: Metric 3: Metric 4: Metric 5:	Geographic Scope Applicability Temporal Representativeness Sample Size	Medium High High Medium	$\begin{array}{c} \times \ 1 \\ \times \ 2 \\ \times \ 2 \\ \times \ 1 \end{array}$	2 2 2 2 2	EU Facility using TCE in the synthesis of vulcanization accelerat- ing agents. 2014, 4 years old No Comment.	
Domain 3: Access	sibility/Clar Metric 6:	ity Metadata Completeness	Medium	$\times 1$	2	Includes most metadata	
Domain 4: Varial	oility and Ur Metric 7:	ncertainty Metadata Completeness	Low	× 1	3	No Comment.	
Overall Quality Determination <sup>†</sup>			Medium		1.8		

\* MWF = Metric Weighting Factor
 † If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.</li>

Source Citation: Type of Data Source Hero ID	Japanese I Releases te 3986511	Japanese Ministry of, Environment. 2004. Manual for PRTR release estimation models: Part II materials. Releases to the Environment; Reports for Data or Information Other than Exposure or Release Data; 3986511						
EXTRACTION Parameter		Data						
Life Cycle Stage: Release Source: Environmental M Release or Emissi	edia: on Factor:		Use/Manufacture Manufacture, storage, solvent use, cleaning Atmosphere Manufacture: 0.001 kg/tStorage: 0.23 kg/tSolvent: 979 kg/tCleaning: 838 kg/t					
<b>EVALUATION</b> Domain		Metric	Bating MWF* Score Comments					
Domain 1, Daliah	:1:4							
Domain 1: Kenab	Metric 1:	Methodology	Low	$\times 1$	3	not specified		
Domain 2: Repres	sentative							
*	Metric 2:	Geographic Scope	Medium	$\times 1$	2	Japan		
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	Air releases out of scope		
	Metric 4:	Temporal Representativeness	Low	$\times 2$	6	1996, 22 years old		
	Metric 5:	Sample Size	N/A		N/A	No Comment.		
Domain 3: Access	sibility/Clar Metric 6:	ity Metadata Completeness	Low	$\times 1$	3	Unclear how the given data source is utilized or found.		
Domain 4: Variab	ility and U Metric 7:	ncertainty Metadata Completeness	Low	× 1	3	Report does not address variability or uncertainty		
Overall Quality D	eterminatio	$\mathbf{n}^{\dagger}$	Unacceptable		4	Metric Mean Score: 3.1.		

\* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	2014. Toxic release inventory: Trichloroethylene. Releases to the Environment; Environmental Release Data; 3860483							
EXTRACTION								
Parameter			Data					
Life Cycle Stage: Release Source: Disposal /Treatment Method: Environmental Media: Annual Release Quantity (kg/yr):				Use/Manufacture Landfill, Fugitive and Point Source Emissions, Surface Water, and Other Landfill, other Air, Water, Ground Landfill: 16,697 lbsFugitive Emissions: 1,202,177 lbsPoint Source Emis- sions: 779,765 lbs Surface Water: 14,406 lbsOther: 24,205 lbs				
EVALUATION								
Domain		Metric	Rating $MWF^{\star}$ Score Comments					
Domain 1: Reliab	oility Metric 1:	Methodology	High	× 1	1	EPA		
Domain 2: Repre	sentative		0					
1	Metric 2:	Geographic Scope	High	$\times 1$	1	US		
	Metric 3:	Applicability	Medium	$\times 2$	4	Industry that works with TCE, but is focused on industry - wide big picture.		
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	2016, 2 years old		
	Metric 5:	Sample Size	Low	$\times 1$	3	Not well characterized		
Domain 3: Access	sibility/Clar Metric 6:	ity Metadata Completeness	Low	× 1	3	No Comment.		
Domain 4: Varial	bility and U	ncertainty			-			
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	No Comment.		
Overall Quality Determination <sup>†</sup>			Medium		1.9			
Source Citation:	Landmeyer, J. E., Miller, S., Campbell, B. G., Vroblesky, D., Gill, A., Clark, A. P. 2011. Investigation of the potential source area, contamination pathway, and probable release history of chlorinated-solvent-contaminated groundwater at the Capital City Plume Site, Montgomery, Alabama, 2008-2010.							
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Type of Data Source Hero ID	Releases to 2129107	b the Environment; Reports for	Data or Informa	tion Othe	er than	Exposure or Release Data;		
EXTRACTION								
Parameter			Data					
Life Cycle Stage: Release Source: Disposal /Treatment Method:			Study Post Emission Study sewer					
Environmental M	edia:		ground and gro	oundwate	er			
EVALUATION								
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments		
Domain 1. Baliah	ility							
Domain 1. Renau	Metric 1:	Methodology	High	$\times 1$	1	USGS		
Domain 2: Repre	sentative							
Domain 2. Ropro	Metric 2:	Geographic Scope	High	$\times 1$	1	US		
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	Report details attempt to find the source of a contamination plume, Does not contain applicable occupational scenario.		
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	2010		
	Metric 5:	Sample Size	N/A		N/A	No Comment.		
Domain 3: Access	sibility/Clar	ity						
Domain 0. Access	Metric 6:	Metadata Completeness	High	$\times 1$	1	Study is well documented and process is explained.		
Demois 4. Veriel	·:!:							
Domain 4: Variat	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Report does not address variability or uncertainty		
		1				• • •		
Overall Quality I	Determinatio	$\mathrm{n}^\dagger$	Unacceptable		4	Metric Mean Score: 2.0.		

\* MWF = Metric Weighting Factor

Source Citation:	Ballinger, M. Y., Larson, T. V 2014. Source apportionment of stack emissions from research and development facilities using positive matrix factorization. Atmospheric Environment								
Type of Data Source Hero ID	Releases to 2517711	Releases to the Environment; Environmental Release Data; 2517711							
EXTRACTION									
Parameter			Data						
Life Cycle Stage:			Processing						
Belease Source:			R&D Facilities						
Disposal /Treatm	ent Method:	:	stack air						
Environmental M	edia:	-	Atmosphere						
EVALUATION									
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments			
Domain 1, Polish	:1:+								
Domain 1. Renad	Metric 1:	Methodology	High	$\times 1$	1	Journal article			
Domain 2: Repres	sentative								
	Metric 2:	Geographic Scope	High	$\times 1$	1	US			
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	Report details use of positive matrix factorization to identify the contributing sources to stack emissions. Air releases are out of scope.			
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	2014, 4 years old			
	Metric 5:	Sample Size	Low	$\times 1$	3	Qualitative data as ratios.			
Domain 2. Accord	ibility /Class	:+							
Domain 5. Access	Metric 6.	Metadata Completeness	High	× 1	1	Study is well documented and method is explained			
	Meetre 0.	Metadata Completeness	IIIgii	~ 1	1	Study is well documented and method is explained.			
Domain 4: Variab	Domain 4: Variability and Uncertainty								
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Report does not address variability or uncertainty			
Overall Quality D	eterminatio	$\mathrm{n}^\dagger$	Unacceptable		4	Metric Mean Score: 2.1.			

\* MWF = Metric Weighting Factor

Source Citation:	Yang, J., Wang, K., Zhao, Q., Huang, L., Yuan, C. S., Chen, W. H., Yang, W. B., 2014. Underestimated public health risks caused by overestimated VOC removal in wastewater treatment processes. Environmental Science: Processes & Impacts.								
Type of Data Source Hero ID	Releases to 2544474	the Environment; Environment	tal Release	Data;	F				
EXTRACTION									
Parameter			Data						
Life Cycle Stage:			Release						
Release Source:			Publicly of	owned tre	eatment	works (POTW)			
Disposal /Treatm	ent Method:	:	Screen, ac	erated gri	it cham	ber, primary clarifier, anaerobic tank, anterior			
			oxic tank	, seconda	ry clari	fier			
Environmental Media:			Air, wate	r ationa for		ing treatment 0 55 mg/m2 cirl 5 mg/L motor			
Release of Emissi	Release or Emission Factor:				ina aur	ing treatment:0.55 ug/m5 arr1.5 mg/L water			
EVALUATION									
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments			
Domain 1, Polish	;1;+								
Domain 1. Renau	Metric 1:	Methodology	High	$\times 1$	1	Journal article			
	_								
Domain 2: Repre	sentative		т	1					
	Metric 2:	Geographic Scope	Low	× 1	3 6	China II la china			
	metric 5.	Applicability	LOW	× 2	0	data.			
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	2017			
	Metric 5:	Sample Size	High	$\times 1$	1	Samples fully characterized and taken in multiple seasons.			
Domain 3: Access	vibility/Clari	itv							
Domain 9. Acces	Metric 6:	Metadata Completeness	High	$\times 1$	1	Samples fully characterized and taken in multiple seasons.			
	-	<b>A</b>	0						
Domain 4: Variability and Uncertainty									
	Metric 7:	Metadata Completeness	Medium	× 1	2	Limited variability discussion.			
Overall Quality I	eterminatio	$\mathrm{n}^\dagger$	Medium		1.8				

\* MWF = Metric Weighting Factor

Source Citation:	Chang, C. C., Lo, G. G., Tsai, C. H., Wang, J. L. 2001. Concentration variability of halocarbons over an electronics industrial park and its implication in compliance with the Montreal protocol. Environmental Science and Technology.									
Type of Data Source Hero ID	Releases to 2773680	Releases to the Environment; Environmental Release Data; 2773680								
EXTRACTION			Data							
Parameter			Data							
Life Cycle Stage:	Life Cycle Stage:									
Release Source:			Solvent use in s	emicond	uctor, ci	rcuit chip and circuit board manufacture.				
Disposal /Treatm	ent Method	:	Venting							
Environmental M	edia:		Air							
Release or Emission Factor:			Median concer March 1997	ntration:4	40 PPT	V TCE in July 2000200 PPTV TCE in				
EVALUATION										
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments				
Domain 1: Reliab	oility									
	Metric 1:	Methodology	High	$\times 1$	1	Journal article				
Domain 2: Repre	sentative									
*	Metric 2:	Geographic Scope	Low	$\times 1$	3	Taiwan				
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	Air releases out of scope				
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	2001				
	Metric 5:	Sample Size	Medium	$\times 1$	2	Many samples taken from a broad cross-section of land.				
Domain 3: Access	sibility/Clar	itv								
	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	Data not well characterized, provides qualitative descriptions.				
Domain 4. Variat	oility and Ur	acertainty								
Domain 4. Variat	Metric 7.	Metadata Completeness	Low	× 1	3	Report does not address variability or uncertainty				
			2011	/\ <b>I</b>	0	report does not address variability of uncertainty				
Overall Quality I	Determinatio	$\mathbf{n}^{\dagger}$	Unacceptable		4	Metric Mean Score: 2.6.				

\* MWF = Metric Weighting Factor

Source Citation:	Chen, W. H., Yang, W. B., Yuan, C. S., Yang, J. C., Zhao, Q. L. 2014. Fates of chlorinated volatile organic compounds in aprophic biological treatment processes: the affects of apartien and sludge addition. Chemosphere								
Type of Data Source Hero ID	Releases to the Environment; Reports for Data or Information Other than Exposure or Release Data; 2799543								
EXTRACTION									
Parameter			Data						
Life Cycle Stage:			Study						
Belease Source:			air from WWT	Ρ					
Environmental M	edia:		Air						
EVALUATION									
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments			
	•1•,								
Domain 1: Reliab	ility Motrie 1.	Mathadalagy	Uich	× 1	1	Leven el cod'ale			
	metric 1.	Methodology	Iligii	× 1	1	Journal article			
Domain 2: Repres	sentative								
*	Metric 2:	Geographic Scope	Low	$\times 1$	3	China			
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	Studies removal of TCE from wastewater, out of scope for engineering			
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	2013, 5 years old			
	Metric 5:	Sample Size	Medium	$\times 1$	2	Only one site was used for the study, data collected not fully characterized			
Domain 2. Accord	ibility /Clan	:+							
Domain 5: Access	Motric 6:	Motadata Completeness	High	$\times 1$	1	Study is well documented and method is explained			
	Metric 0.	Metadata Completeness	IIIgii	~ 1	1	Study is well documented and method is explained.			
Domain 4: Variab	ility and Ui	ncertainty							
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Variability and uncertainty is not addressed.			
Overall Quality D	eterminatio	$\mathbf{n}^{\dagger}$	Unacceptable		4	Metric Mean Score: 2.2.			

\* MWF = Metric Weighting Factor

Source Citation:	Devinny, J. S., Webster, T. S., Torres, E., Basrai, S. 1995. Biofiltration for removal of PCE and TCE vapors from contaminated air. Hazardous Waste and Hazardous Materials							
Type of Data Source Hero ID	Releases to the Environment; Reports for Data or Information Other than Exposure or Release Data; 2803108							
EXTRACTION								
Parameter			Data					
Life Cycle Stage:			Study					
Release Source:			air from WWI	P				
Environmental M	edia:		Air					
EVALUATION								
Domain		Metric	Rating	MWF*	Score	Comments		
Demein 1. Delieb	:1:							
Domain 1: Reliad	Metric 1.	Methodology	High	× 1	1	Journal article		
	Meetric 1.	Wiethodology	ingii	~ 1	1			
Domain 2: Repres	sentative							
	Metric 2:	Geographic Scope	High	$\times 1$	1	US		
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	Studies method for removing TCE from air streams, air releases out of scope		
	Metric 4:	Temporal Representativeness	Low	$\times 2$	6	1995, 23 years old		
	Metric 5:	Sample Size	Medium	$\times 1$	2	Study used bench scale biofilters to study		
Domoin 2. Accord	ihiliter /Clam	:+						
Domain 5: Access	Metric 6:	Metadata Completeness	High	$\times 1$	1	Study is well documented and method is explained.		
		I I I I I I I I I I I I I I I I I I I	0					
Domain 4: Variab	oility and U	ncertainty						
	Metric 7:	Metadata Completeness	Medium	$\times 1$	2	Limited discussion on the variability and uncertainty in the study.		
Overall Quality D	eterminatio	$\mathrm{n}^\dagger$	Unacceptable		4	Metric Mean Score: 2.3.		

\* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	Baek, S. O., Suvarapu, L. N., Seo, Y. K 2015. Occurrence and Concentrations of Toxic VOCs in the Ambient Air of Gumi, an Electronics-Industrial City in Korea. Sensors. Releases to the Environment; Environmental Release Data; 3001564							
EXTRACTION Parameter			Data					
Life Cycle Stage: Release Source: Disposal /Treatm Environmental M Release or Emissi Number of Sites:	ent Method edia: on Factor:	:	Processing Solvent use in semiconductor, circuit chip and circuit board manufacture. Venting Air 53.8 tons/yr in 2009 1428					
<b>EVALUATION</b> Domain		Metric	Rating	MWF*	Score	Comments		
Domain 1: Reliab	ility Metric 1:	Methodology	High	× 1	1	Journal article		
Domain 2: Repres	sentative Metric 2: Metric 3: Metric 4: Metric 5:	Geographic Scope Applicability Temporal Representativeness Sample Size	Low Unacceptable High High	$\begin{array}{c} \times \ 1 \\ \times \ 2 \\ \times \ 2 \\ \times \ 1 \end{array}$	3 8 2 1	Korea Air releases out of scope 2014 Large sample size across many sites.		
Domain 3: Access	sibility/Clar Metric 6:	ity Metadata Completeness	High	$\times 1$	1	Study is well documented and method is explained. Data sets are well characterized		
Domain 4: Variab	oility and Ur Metric 7:	ncertainty Metadata Completeness	Low	× 1	3	Variability and uncertainty is not addressed.		
Overall Quality D	Determinatio	$\mathbf{n}^{\dagger}$	Unacceptable		4	Metric Mean Score: 2.1.		

\* MWF = Metric Weighting Factor

Source Citation:	Whittaker, S. G., Taylor, J., Van Hooser, L. M 2015. Characterization of " Hydrocarbon" Dry Cleaning in King County, Washington, Journal of Environmental Health								
Type of Data Source Hero ID	Releases to 3488855	Releases to the Environment; Reports for Data or Information Other than Exposure or Release Data; 3488855							
EXTRACTION									
Parameter			Data						
Life Cycle Stage:			Uso						
Release Source:			Dry Cleaning						
EVALUATION									
Domain		Metric	Rating	$MWF^*$	Score	Comments			
Domain 1: Reliab	ility								
	Metric 1:	Methodology	High	$\times 1$	1	Journal article			
Domain 2: Benres	entativo								
Domain 2. Repres	Metric 2:	Geographic Scope	High	$\times 1$	1	US			
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	Covers waste designations at dry cleaners, water releases not addressed, all other releases out of scope. TCE not addressed gunatitatively.			
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	2017, 1 year old			
	Metric 5:	Sample Size	Medium	$\times 1$	2	Questionaire pulled results from a representative sample size, but does not address samples in a quantitative fashion.			
Demain 2. Access	:1::1::+ /Cl	•							
Domain 5: Access	Metric 6:	Metadata Completeness	High	$\times 1$	1	Study is well documented and method is explained. Data sets are well characterized			
D									
Domain 4: Variab	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Variability and uncertainty is not addressed.			
		*				• •			
Overall Quality D	eterminatio	$\mathrm{n}^\dagger$	Unacceptable		4	Metric Mean Score: 2.0.			

\* MWF = Metric Weighting Factor

Source Citation:	Den, W.,E emissions.	Den, W.,Huang, C.,Li, C. H 2004. Effects of cross-substrate interaction on biotrickling filtration for the control of VOC emissions. Chemosphere.							
Type of Data Source Hero ID	Releases to 3570982	Releases to the Environment; Reports for Data or Information Other than Exposure or Release Data; 3570982							
EXTRACTION									
Parameter			Data						
Life Cycle Stage:			Study VOC						
Environmental M	edia:		air	emissior	is in gas	s-phase biological processes			
EVALUATION									
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments			
	_								
Domain 1: Reliab	ility Motrie 1.	Mathadalam	Uich	× 1	1	Terrore de settede			
	metric 1.	Methodology	Iligii	× 1	1	Journal article			
Domain 2: Repres	sentative								
	Metric 2:	Geographic Scope	Low	$\times 1$	3	China			
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	Studies method for controlling air emissings, air releases out of scope			
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	2004, 14 years old			
	Metric 5:	Sample Size	High	$\times 1$	1	Experimental results are well characterized and described.			
Domain 2. Agaar	ibility /Clan	:+							
Domain 5. Access	Metric 6:	Metadata Completeness	High	$\times 1$	1	Study is well documented and method is explained. Data sets are well characterized			
		, · ,							
Domain 4: Variat	Motrie 7:	Motadata Completeness	Low	$\vee$ 1	2	Variability and uncertainty is not addressed			
	metric 7:	Metadata Completeness	LOW	× 1	9	variability and uncertainty is not addressed.			
Overall Quality D	eterminatio	$\mathbf{n}^{\dagger}$	Unacceptable		4	Metric Mean Score: 2.3.			

\* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	Oecd,. 2009. Emission scenario document on adhesive formulation. Releases to the Environment; Reports for Data or Information Other than Exposure or Release Data; 3827299							
EXTRACTION Parameter			Data					
_								
EVALUATION								
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments		
Domain 1: Reliab	Domain 1. Beliability							
	Metric 1:	Methodology	High	$\times 1$	1	OECD document		
Domain 2: Representative								
	Metric 2:	Geographic Scope	High	$\times 1$	1	US and others		
	Metric 3:	Applicability	High	$\times 2$	2	ESD, not specific to TCE but includes information relevant to TCE		
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Less than 10 years old		
	Metric 5:	Sample Size	N/A		N/A	N/A - ESD		
Domain 3: Access	sibility/Clar	ity						
	Metric 6:	Metadata Completeness	High	$\times 1$	1	All metadata given		
Domain 4: Variab	oility and Un Metric 7:	ncertainty Metadata Completeness	Medium	× 1	2	Variability addressed through different application methods, uncertainty not addressed		
Overall Quality I	Determinatio	$\mathbf{n}^{\dagger}$	High		1.1			

Source Citation: Type of Data Source Hero ID	Oecd,. 2009. Emission scenario documents on coating industry (paints, lacquers and varnishes). Releases to the Environment; Reports for Data or Information Other than Exposure or Release Data; 3827298							
EXTRACTION Parameter			Data					
EVALUATION								
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments		
Domain 1: Reliab	oility Metric 1:	Methodology	High	× 1	1	OECD document		
Domain 2: Representative								
	Metric 2:	Geographic Scope	High	$\times 1$	1	US and others		
	Metric 3:	Applicability	High	$\times 2$	2	ESD, not specific to TCE but includes information relevant to TCE		
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Less than 10 years old		
	Metric 5:	Sample Size	N/A		N/A	N/A - ESD		
Domain 3: Access	sibility/Clar	ity						
	Metric 6:	Metadata Completeness	High	$\times 1$	1	All metadata given		
Domain 4: Variab	bility and Un Metric 7:	ncertainty Metadata Completeness	Medium	× 1	2	Variability addressed through different application methods, uncertainty not addressed		
Overall Quality D	Determinatio	$\mathbf{n}^{\dagger}$	High		1.1			

Source Citation: Type of Data Source Hero ID	U.S, E. P. Releases to 3827323	U.S, E. P. A. 1995. Guidance document for the halogenated solvent cleaner NESHAP. Releases to the Environment; Reports for Data or Information Other than Exposure or Release Data; 3827323							
EXTRACTION			Data						
			Data						
Life Cycle Stage:			EPA Guidance	Docume	ent				
Release Source:			Halogenated Se	olvent Cl	eaner u	sers			
Disposal /Treatm	ent Method	:	For compliance	e with NI	ESHAP				
EVALUATION									
Domain		Metric	Rating	$\mathbf{MWF}^{\star}$	Score	Comments			
Domain 1: Reliab	ility		TT: 1						
	Metric 1:	Methodology	High	$\times 1$	1	EPA			
Domain 2: Repres	sentative								
- • • ••F- ••	Metric 2:	Geographic Scope	High	$\times 1$	1	US			
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	NESHAP covers air emissions, air releases out of scope			
	Metric 4:	Temporal Representativeness	Low	$\times 2$	6	1995, 23 years old			
	Metric 5:	Sample Size	N/A		N/A	No Comment.			
Domain 3: Access	sibility/Clar	ity	*** 1						
	Metric 6:	Metadata Completeness	High	× 1	1	Detailed data and includes test methods. Does not cite any sources, but type of docment is not expected to.			
Domain 4. Variah	ility and Ur	acortainty							
Domain 4. Variau	Motric 7:	Metadata Completeness	N/A		N/A	No Commont			
	MEUIC 7.	metadata Completeness	11/11		IN/A	No comment.			
Overall Quality D	eterminatio	$\mathbf{n}^{\dagger}$	Unacceptable		4	Metric Mean Score: 2.4.			

\* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	Carex, Car Releases to 3978369	Carex, Canada. 2008. Priority occupational carcinogens for surveillance in Canada: Preliminary Priority List. Releases to the Environment; Reports for Data or Information Other than Exposure or Release Data; 3978369						
EXTRACTION Parameter			Data					
Life Cycle Stage:	: Country-scale Releases							
EVALUATION								
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments		
Domain 1: Reliab	ility Motrie 1.	Mathadalagy	Low	× 1	9	N t m c'C l		
	Metric 1:	Methodology	Low	× 1	3	Not specified		
Domain 2: Repres	sentative							
	Metric 2:	Geographic Scope	Medium	$\times 1$	2	Canada (OECD)		
	Metric 3:	Applicability	Medium	$\times 2$	4	country wide release		
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	2006, 12 years old		
	Metric 5:	Sample Size	Low	$\times 1$	3	Single value, no statistics given		
Domain 3: Access	sibility/Clar	ity Matadata Completeness	Unaccontable	× 1	4			
	Metric 6:	Metadata Completeness	Unacceptable	× 1	4	media of release not given		
Domain 4: Variah	vility and U	cortainty						
Domain 4. Variat	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed.		
Overall Quality D	Determinatio	$\mathbf{n}^{\dagger}$	Unacceptable		4	Metric Mean Score: 2.6.		

\* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	U.S, E. P. A. 1977. Control of volatile organic emissions from solvent metal cleaning. Releases to the Environment; Reports for Data or Information Other than Exposure or Release Data; 3827321						
EXTRACTION Parameter			Data				
Life Cycle Stage:			EPA Guidance	Docume	ent		
EVALUATION							
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments	
Domain 1: Reliab	ility Motric 1:	Methodology	High	× 1	1	EDA document	
Domain 2: Repre	sentative Matric 2:	Coographia Scope	High	× 1	1		
	Metric 2: Metric 3:	Applicability	Unacceptable	$\times 1 \times 2$	8	Covers control of air releases, air releases out of scope	
	Metric 4:	Temporal Representativeness	Low	$\times 2$	6	1977, 41 years old	
	Metric 5:	Sample Size	N/A		N/A	No Comment.	
Domain 3: Access	sibility/Clar Metric 6:	ity Metadata Completeness	High	$\times 1$	1	Detailed data and includes test methods. Does not cite any	
Domain 4: Variab	oility and Uı Metric 7:	ncertainty Metadata Completeness	N/A		N/A	Sources, but type of docment is not expected to.	
Overall Quality I	Determinatio	$\mathrm{n}^\dagger$	Unacceptable		4	Metric Mean Score: 2.4.	

\* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	U.S, E. P. Releases to 3827322	U.S, E. P. A. 2001. Guide to industrial assessments for pollution prevention and energy efficiency. Releases to the Environment; Reports for Data or Information Other than Exposure or Release Data; 3827322						
EXTRACTION Parameter			Data					
_								
EVALUATION								
Domain		Metric	Rating	$MWF^*$	Score	Comments		
Domain 1: Reliab	oility							
	Metric 1:	Methodology	High	$\times 1$	1	EPA document		
Domain 2: Representative								
	Metric 2:	Geographic Scope	High	$\times 1$	1	US		
	Metric 3:	Applicability	High	$\times 2$	2	Information for in scope uses		
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	data from 2001 (less than 20 years but older than $10$ )		
	Metric 5:	Sample Size	N/A		N/A	N/A - only qualitative information provided		
Domain 3: Access	sibility/Clar	ity						
	Metric 6:	Metadata Completeness	Low	$\times 1$	3	Results provided but underlying data sources not clearly described		
Domain 4: Variab	bility and U	ncertainty						
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed.		
Overall Quality I	Determinatio	$\mathbf{n}^{\dagger}$	Medium		1.8			

\* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	U.S. Environmental Protection Agency. 2011. The 2011 National Emissions Inventory. Releases to the Environment; Environmental Release Data; 5352399						
EXTRACTION Parameter			Data				
Life Cycle Stage: Release Source: Environmental Media: Release or Emission Factor: Release Days per Year: P2 Control & percent Efficiency:			All Provides unit/process of release. Provides media of release Provides release data Provides annual operating time. Provides controls information.				
<b>EVALUATION</b> Domain		Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliab	ility Metric 1:	Methodology	Medium	× 1	2	Submitters provide general method used to calculate emissions, but details not provided.	
Domain 2: Repres	sentative Metric 2:	Geographic Scope	High	$\times 1$	1	NEI is U.S. based data	
	Metric 3:	Applicability	High	$\times 2$	2	NEI includes industries included in the scopes of TCE.	
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	NEI data are from 2011	
	Metric 5:	Sample Size	Medium	× 1	2	Universe is limited to units subject to NESHAP with threshold potential to emit, although states may have different require- ments; statistical representativeness is unclear.	
Domain 3: Access	sibility/Clar Metric 6:	ity Metadata Completeness	High	$\times 1$	1	NEI includes release media and generally also includes daily and annual operating time, specific unit/process that is the source of release, and presence of engineering controls.	
Domain 4: Variab	ility and Un Metric 7:	ncertainty Metadata Completeness	Low	× 1	3	NEI does not address variability or uncertainty in submitter provided data.	
Overall Quality D	eterminatio	n†	High		1.4		

Occupational Exposure

Source Citation:	Kilburn, K. H. 1999. Neurobehavioral and respiratory findings in jet engine repair workers: a comparison of exposed and unexposed volunteers. Environmental Research						
Type of Data Source Hero ID	Occupation 1576	nal Exposure; Monitoring Data;					
EXTRACTION							
Parameter			Data				
Life Cycle Stage			Use				
Route of Exposur	·e:		Inhalation	1			
Exposure Concer	tration (Uni	t):	4800 (mg	/m3)			
Number of Sites:			1				
Type of Measurer	ment or Met	hod:	8-hr TWA	A			
Number of Worke	ers:		6				
Type of Sampling	5		area				
EVALUATION							
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments	
Domain 1: Reliab	oility						
	Metric 1:	Methodology	Low	$\times 1$	3	Not specified	
Domain 2: Repres	sentative						
×	Metric 2:	Geographic Scope	High	$\times 1$	1	US (1 site in OK)	
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE	
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data older than 10 years (1993), but after PEL	
	Metric 5:	Sample Size	Low	$\times 1$	3	single data point given for 6 workers, unclear what the data represents (e.g., mean, median, etc.)	
Domain 3: Access	sibility/Clar	ity					
	Metric 6:	Metadata Completeness	Low	$\times 1$	3	Data indicates "area" sample but no other metadata given	
Domain 4: Variah	oility and Ur	ncertainty					
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed	
Overall Quality D	Determinatio	$\mathrm{n}^\dagger$	Medium		2.1		

Source Citation: Type of Data Source Hero ID	Nakatsuka, H.,Watanabe, T.,Takeuchi, Y.,Hisanaga, N.,Shibata, E.,Suzuki, H.,Huang, M. Y.,Chen, Z.,Qu, Q. S.,Ikeda, M 1992. Absence of blue-yellow color vision loss among workers exposed to toluene or tetrachloroethylene, mostly at levels below occupational exposure limits. International Archives of Occupational and Environmental Health. Occupational Exposure; Monitoring Data; 58340						
	00010						
Parameter			Data				
			Data				
Life Cycle Stage:			Use				
Physical Form:			vapor				
Route of Exposur	e:		Inhalation	1			
Exposure Concent	tration (Uni	it):	6.1-11.8 (	ppm)			
Type of Measurer	nent or Met	hod:	TWA				
Number of Worke	ers:		23 (14  me)	en; 9 won	nen)		
Type of Sampling	:		personal l	breathing	g zone a	ir samples	
Exposure Duratio	on:		unknown				
EVALUATION							
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments	
Domain 1: Reliab	ility	54 (1 1 1	т	1	0		
	Metric 1:	Methodology	Low	× 1	3	Described as "diffusive sampling" but otherwise not described	
Domain 2. Ponno	ontotivo						
Domani 2. Repres	Motria 2	Coorrenhia Saona	Modium	× 1	9	I	
	Metric 2.	Applicability	High	$^{\land 1}$ $^{\lor 2}$	2	Japan Workplace that utilizes TCE	
	Metric 4:	Temporal Representativeness	Medium	$^{\wedge 2}$ $\times 2$	4	Data older than 10 years (1000) but after PEI	
	Metric 5:	Sample Size	Medium	$\times 1$	2	geometric mean and standard deviation given but range and	
		Sumple Size	mourum	× 1	-	discrete sample values not provided	
Domain 3: Access	sibility/Clar	ity					
	Metric 6:	Metadata Completeness	Low	$\times 1$	3	Data indicates PBZ samples but other metadata not given	
Domain 4: Variat	oility and U	ncertainty	Ŧ				
	Metric 7:	Metadata Completeness	Low	× 1	3	Not addressed with respect to exposure data	
Overall Quality D	eterminatic	$\mathbf{n}^{\dagger}$	Medium		2.1		

\* MWF = Metric Weighting Factor
 † If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.</li>

Source Citation:	Nagaya, T., Ishikawa, N., Hata, H. 1989. Urinary total protein and "beta"-2-microglobulin in workers exposed to trichloroethy- lene. Environmental Research									
Type of Data Source Hero ID	Occupation 61122	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 61122								
EXTRACTION										
Parameter			Data							
Life Cycle Stage:			Use							
Route of Exposur	e:		Inhalation	Inhalation						
Exposure Concent	tration (Uni	t):	15 (ppm)	15 (ppm)						
Number of Sampl	es:		104							
Type of Sampling			urinealysi	s						
EVALUATION										
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments				
Domain 1: Reliab	ility			1	0					
	Metric 1:	Methodology	Medium	× 1	2	Sources documented, but not from frequently used source				
Domain 2: Repres	sentative									
	Metric 2:	Geographic Scope	Medium	$\times 1$	2	Japan (OECD)				
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE				
	Metric 4:	Temporal Representativeness	Low	$\times 2$	6	Prior to 1988				
	Metric 5:	Sample Size	N/A		N/A	$\rm N/A$ - information about use of TCE in semiconductor manufacturing, no quantitative data				
Domain 3: Access	sibility/Clar	ity								
Domain 0. Recess	Metric 6:	Metadata Completeness	High	$\times 1$	1	Sources clearly documented				
Domain 4: Variah	Domain 4: Variability and Uncertainty									
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed				
Overall Quality D	eterminatio	$\mathrm{n}^\dagger$	Medium		2.0					

Source Citation:	Stewart, P. A., Lee, J. S., Marano, D. E., Spirtas, R., Forbes, C. D., Blair, A. 1991. Retrospective cohort mortality study of workers at an aircraft maintenance facility: II. Exposures and their assessment. British Journal of Industrial Medicine.							
Type of Data Source Hero ID	Occupation 65131	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 65131						
EXTRACTION Parameter			Data					
Life Cycle Stage: Exposure Concentration (Unit): Number of Workers: Type of Sampling:			Use 600 ppm (1939-1954)400 ppm (1955-1967)200 ppm (1968-1978)0 ppm (1979-1983) 7282 (over 1939-1982) Estimation					
EVALUATION								
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments		
Domain 1: Reliab	ility Metric 1:	Methodology	Medium	$\times 1$	2	Peer-reviewed article, using data not from a frequently used source		
Domain 2: Ropros	contativo							
Domain 2. Repres	Metric 2:	Geographic Scope	High	× 1	1	US		
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE		
	Metric 4:	Temporal Representativeness	Low	$\times 2$	6	Data from 1939-1983 (older than 20 years)		
	Metric 5:	Sample Size	N/A		N/A	No Comment.		
Domain 3: Access	ibility/Clar Metric 6:	ity Metadata Completeness	Unacceptable	$\times 1$	4	Metadata associated with exposure indices used to estimate exposure not provided		
Domain 4: Variah	ility and Ur	ncertainty						
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed		
Overall Quality D	eterminatio	n <sup>†</sup>	Unacceptable		4	Metric Mean Score: 2.2.		

\* MWF = Metric Weighting Factor

Source Citation:	Landrigan, P. J., Stein, G. F., Kominsky, J. R., Ruhe, R. L., Watanabe, A. S., 1987. Common-source community and industrial exposure to trichloroethylene. Archives of Environmental Health.								
Type of Data Source Hero ID	Occupatio 65261	65261 Cocupational Exposure; Monitoring Data;							
EXTRACTION									
Parameter			Data						
Life Cycle Stage:			Use						
Physical Form:			vapor						
Route of Exposur	re:		Inhalatio	n					
Exposure Concen	tration (Uni	it):	117-357 (	mg/m3)					
Number of Sites:			1						
Type of Measurer	ment or Met	chod:	8-hr TWA	A					
Worker Activity:			degreasin	g using o	pen-top	liquid-vapor degreader with refirgerated free-			
			board chi	ller and a	at cold	degreasers			
Number of Worke	ers:		at least $1$	0					
Type of Sampling:			personal breathing zone air samples						
EVALUATION									
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments			
Domain 1: Reliat	oility								
	Metric 1:	Methodology	High	$\times 1$	1	Method described and appears to be equivalent to NIOSH methods			
Domain 2: Repre	sentative								
	Metric 2:	Geographic Scope	High	$\times 1$	1	US data			
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE			
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data older than 10 years (1980), but after PEL			
	Metric 5:	Sample Size	Medium	$\times 1$	2	Range of results given, but discrete data and other statistics not given			
Domain 3: Access	sibility/Clar	ity							
	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	Critical metadata given but missing sample durations and exposure frequency			
Domain 4: Varial	oility and U	ncertainty							
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed with respect to exposure data			
		Con	tinued on r	next page	)				

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Source Citation:	Landrigan, P. J., Stein, G. F., Kominsky, J. R., Ruhe, R. L., Watanabe, A. S., 1987. Common-source community and industrial exposure to trichloroethylene. Archives of Environmental Health.							
Type of Data Source	Occupational Exposure; Monitorin	Occupational Exposure; Monitoring Data;						
Hero ID	65261							
EVALUATION								
Domain	Metric	Rating M	IWF <sup>*</sup> Score	Comments				
Overall Quality D	$\operatorname{Determination}^\dagger$	Medium	1.7					

\* MWF = Metric Weighting Factor
 † If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.</li>

Source Citation:	Landrigan, P. J., Stein, G. F., Kominsky, J. R., Ruhe, R. L., Watanabe, A. S., 1987. Common-source community and industrial exposure to trichloroethylene. Archives of Environmental Health.								
Type of Data Source Hero ID	Occupatio 65261	65261 Cocupational Exposure; Monitoring Data;							
EXTRACTION									
Parameter			Data						
Life Cycle Stage:			Use						
Physical Form:			vapor						
Route of Exposur	e:		Inhalation	1					
Exposure Concen	tration (Uni	it):	37-144 (m	ng/m3)					
Number of Sites:			1	-, ,					
Type of Measurer	ment or Met	hod:	8-hr TWA	ł					
Worker Activity:			degreasing	g using o	pen-top	liquid-vapor degreader with refirgerated free-			
			board chi	ller and a	at cold	degreasers			
Number of Worke	ers:		at least 1	0					
Type of Sampling	Type of Sampling:			personal breathing zone air samples					
EVALUATION									
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments			
	•1•7								
Domain 1: Reliab	Metric 1:	Methodology	High	$\times 1$	1	Method described and appears to be equivalent to NIOSH methods			
Domain 2: Repres	sentative								
Domain 2. Ropro.	Metric 2	Geographic Scope	High	× 1	1	US data			
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE			
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data older than 10 years (1980), but after PEL			
	Metric 5:	Sample Size	Medium	$\times 1$	2	Range of results given, but discrete data and other statistics not given			
Domain 3. Access	vibility/Clar	ity							
	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	Critical metadata given but missing sample durations and exposure frequency			
Domain 4. Variat	oility and U	ncertainty							
Domain 1. Variat	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed with respect to exposure data			
		*							
		Con	tinued on r	next page	9				

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Source Citation:	Landrigan, P. J., Stein, G. F., Kominsky, J. R., Ruhe, R. L., Watanabe, A. S., 1987. Common-source community and industrial exposure to trichloroethylene. Archives of Environmental Health.							
Type of Data Source	Occupational Exposure; Monitorin	Occupational Exposure; Monitoring Data;						
Hero ID	65261							
EVALUATION								
Domain	Metric	Rating M	IWF <sup>*</sup> Score	Comments				
Overall Quality D	$\operatorname{Determination}^{\dagger}$	Medium	1.7					

\* MWF = Metric Weighting Factor
 † If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.</li>

Source Citation: Type of Data Source Hero ID	U.S, E. P. Occupation 35002	A 2001. Sources, emission and nal Exposure; Monitoring Data;	l exposure f	or trichle	proethyl	lene (TCE) and related chemicals.
EXTRACTION						
Parameter			Data			
Life Cycle Stage:			Use			
Route of Exposur	e:		Inhalation	1		
Exposure Concent	tration (Uni	t):	1.2-5.1 (p	pm)		
Number of Sites:			23225			
Number of Worke	rs:		401000			
Type of Sampling	:		survey			
EVALUATION						
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments
Domain 1: Reliab	ility					
	Metric 1:	Methodology	Low	$\times 1$	3	Unknown testing methods
Domain 2: Repres	entative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data older than 10 years but after PEL
	Metric 5:	Sample Size	Medium	$\times 1$	2	Only range provided
Domain 3. Access	ibility/Clar	ity				
Domain 5. Access	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	Exposure and sample type given
	.1., 1.7.7					
Domain 4: Variab	Matuia 7	Meta data Gaugalatana	τ	1	0	
	Metric /:	Metadata Completeness	LOW	× 1	3	Not addressed
Overall Quality D	eterminatio	$\mathbf{n}^{\dagger}$	Medium		1.9	

<sup>\*</sup> MWF = Metric Weighting Factor
 <sup>†</sup> If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.</li>

Source Citation: Type of Data Source Hero ID	U.S, E. P. Occupation 35002	A 2001. Sources, emission and nal Exposure; Monitoring Data;	l exposure f	or trichle	proethyl	ene (TCE) and related chemicals.
EXTRACTION Parameter			Data			
Life Cycle Stage: Route of Exposure: Exposure Concentration (Unit): Type of Sampling:				n m)		
EVALUATION Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliab	ility Metric 1:	Methodology	Low	× 1	3	Unknown testing methods
Domain 2: Repres	Metric 2: Metric 3: Metric 4: Metric 5:	Geographic Scope Applicability Temporal Representativeness Sample Size	High High Medium Medium	$\begin{array}{c} \times \ 1 \\ \times \ 2 \\ \times \ 2 \\ \times \ 1 \end{array}$	$egin{array}{c} 1 \\ 2 \\ 4 \\ 2 \end{array}$	US Workplace that utilizes TCE Data older than 10 years but after PEL Only range provided
Domain 3: Access	ibility/Clari Metric 6:	ity Metadata Completeness	Medium	$\times 1$	2	Exposure and sample type given
Domain 4: Variab	ility and Ur Metric 7:	ncertainty Metadata Completeness	Low	× 1	3	Not addressed
Overall Quality D	eterminatio	$\mathrm{n}^\dagger$	Medium		1.9	

\* MWF = Metric Weighting Factor

Source Citation:	Ruijten, M. W., Verberk, M. M., Sallé, H. J 1991. Nerve function in workers with long term exposure to trichloroethene. British Journal of Industrial Medicine							
Type of Data Source Hero ID	Occupation 65298	nal Exposure; Monitoring Data;						
EXTRACTION								
Parameter			Data					
Life Cruele Sterror			Uas					
Exposure Concer	tration (Uni	t).	0.80 (ppm)					
Number of Sampl	es.		100 (ppm)					
Number of Sites:			1					
Type of Sampling			area					
EVALUATION								
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments		
Domain 1: Reliab	Motrie 1.	Mathadalam	Low	V 1	9			
	Metric 1:	Methodology	LOW	× 1	0	Not described other than sampling using gas detection tube		
Domain 2: Repre	sentative							
*	Metric 2:	Geographic Scope	Medium	$\times 1$	2	Study from Netherlands (OECD)		
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE		
	Metric 4:	Temporal Representativeness	Low	$\times 2$	6	Data collected prior to PEL (1966)		
	Metric 5:	Sample Size	Medium	$\times 1$	2	Means given but no other statistics		
	·1 ·1·· /C1							
Domain 3: Access	Motrie C	Ity Matadata Completeness	Unaccontable	V 1	4			
	Metric 0:	Metadata Completeness	Unacceptable	× 1	4	No metadata provided		
Domain 4: Varial	oility and Ur	ocertainty						
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed with respect to exposure data		
		*				• • •		
Overall Quality D	Determinatio	$\mathbf{n}^{\dagger}$	Unacceptable		4	Metric Mean Score: 2.4.		
			-					

\* MWF = Metric Weighting Factor

Source Citation:	Ruijten, M. W., Verberk, M. M., Sallé, H. J 1991. Nerve function in workers with long term exposure to trichloroethene. British Journal of Industrial Medicine							
Type of Data Source Hero ID	Occupation 65298	nal Exposure; Monitoring Data;						
EXTRACTION								
Parameter			Data					
Life Cycle Stage:			Uso					
Exposure Concert	tration (Uni	t).	70 (ppm)					
Number of Sampl	es:		90					
Number of Sites:			1					
Type of Sampling	:		area					
EVALUATION								
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments		
	.1.							
Domain 1: Reliab	Motrie 1.	Mathadalagy	Low	× 1	9			
	metric 1.	Methodology	LOW	× 1	ა	Not described other than sampling using gas detection tube		
Domain 2: Repres	sentative							
*	Metric 2:	Geographic Scope	Medium	$\times 1$	2	Study from Netherlands (OECD)		
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE		
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data older than 10 years $(1976)$ but after PEL		
	Metric 5:	Sample Size	Medium	$\times 1$	2	Means given but no other statistics		
	·1 ·1·· /C1							
Domain 3: Access	Motrie 6.	Notadata Completeness	Unaccontable	× 1	4	N		
	Metric 0:	Metadata Completeness	Unacceptable	X 1	4	No metadata provided		
Domain 4: Variat	oility and Ur	ncertainty						
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed with respect to exposure data		
Overall Quality D	Determinatio	$\mathbf{n}^{\dagger}$	Unacceptable		4	Metric Mean Score: 2.2.		

\* MWF = Metric Weighting Factor

Source Citation:	Ruijten, M. W., Verberk, M. M., Sallé, H. J 1991. Nerve function in workers with long term exposure to trichloroethene. British Journal of Industrial Medicine								
Type of Data Source Hero ID	Occupational Exposure; Monitoring Data; 65298								
EXTRACTION									
Parameter			Data						
Life Cycle Stage:			Uso						
Exposure Concen	tration (Uni	t).	35 (nnm)						
Number of Sampl	es.		not provided						
Number of Sites:			1						
Type of Sampling	•		area						
Engineering Cont	rol & percer	nt Exposure Reduction:	Local exhaust	installed					
• • • • • • • • • • • • • • • • •									
EVALUATION									
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments			
Domain 1. Beliah	ility								
Domain 1. Renae	Metric 1:	Methodology	Low	$\times 1$	3	Not described other than sampling using gas detection tube			
Domain 2: Repre	sentative								
	Metric 2:	Geographic Scope	Medium	$\times 1$	2	Study from Netherlands (OECD)			
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE			
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data older than 10 years $(1976)$ but after PEL			
	Metric 5:	Sample Size	Medium	$\times 1$	2	Means given but no other statistics			
Domain 3: Access	sibility/Clar	ity							
Domain 0. 110005	Metric 6:	Metadata Completeness	Unacceptable	$\times 1$	4	No metadata provided			
Domain 4: Variat	oility and Ui	ncertainty	-						
	Metric 7:	Metadata Completeness	Low	× 1	3	Not addressed with respect to exposure data			
		†	TT		4				
Overall Quality L	eterminatio	·II ·	Unacceptable		4	Metric Mean Score: 2.2.			

\* MWF = Metric Weighting Factor

Source Citation:	Ulander, A., Selden, A., Ahlborg, G., Jr. 1992. Assessment of intermittent trichloroethylene exposure in vapor degreasing.							
Type of Data Source	Occupatio	nal Exposure; Monitoring Data;						
Hero ID	67506							
EXTRACTION								
Parameter			Data					
Life Cycle Stage:			Use					
Exposure Concert	tration (Uni	it):	3-144 (m	p/m3): 16	3 mg/m	3 median		
Number of Sampl	es:		not provi	ded	,			
Number of Sites:			19					
Number of Worke	rs:		31					
Type of Sampling:			personal	breathing	g zone a	ir samples		
EVALUATION								
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments		
Domain 1: Beliah	ility							
	Metric 1:	Methodology	Medium	$\times 1$	2	Method described and appears to be acceptable (peer reviewed journal)		
Domain 2: Repres	sentative							
	Metric 2:	Geographic Scope	Medium	$\times 1$	2	Study from Sweden (OECD)		
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE		
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data older than 10 years (1988-1989) but after PEL		
	Metric 5:	Sample Size	Medium	$\times 1$	2	Median, mean, and range given, but discrete data not available		
Domain 3: Access	ibility/Clar	ity						
	Metric 6:	Metadata Completeness	Low	$\times 1$	3	Indicates PBZ and full-shift exposure values but sample dura- tion, exposure duration, exposure frequency not given		
Domain 4. Variat	ility and U	ncortainty						
Domain 4. Variat	Metric 7:	Metadata Completeness	Medium	× 1	2	Limited characterization of uncertainty/variability		
			manufi	~ ±	-			
Overall Quality D	eterminatio	$\mathbf{n}^{\dagger}$	Medium		1.9			

\* MWF = Metric Weighting Factor

Source Citation:	Skender, L. J., Karacic, V., Prpic-Majic, D. 1991. A comparative study of human levels of trichloroethylene and tetra- chloroethylene after occupational exposure. Archives of Environmental Health									
Type of Data Source Hero ID	Occupation 69136	Occupational Exposure; Monitoring Data; 69136								
EXTRACTION Parameter			Data							
Life Cycle Stage: Exposure Concentration (Unit): Number of Samples: Number of Sites: Number of Workers: Type of Sampling:			Use 25-40 (mg/m3) not provided 4 10 personal breathing zone air samples							
EVALUATION										
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments				
Domain 1: Reliab	ility Metric 1:	Methodology	Medium	$\times 1$	2	Method described and appears to be acceptable (peer reviewed journal)				
Domain 2: Repres	sentative Metric 2: Metric 3:	Geographic Scope Applicability	Medium Unacceptable Medium	$\times 1$ $\times 2$ $\times 2$	2 8 4	Europen study (EU countries are part of OECD) Data for use of TCE as a dry cleaning solvent, not a US use (spot cleaning only)				
	Metric 5:	Sample Size	Medium	$\times \frac{2}{\times 1}$	2	range given but no other statistics				
Domain 3: Access	sibility/Clari Metric 6:	ity Metadata Completeness	Unacceptable	× 1	4	No metadata given				
Domain 4: Variab	oility and Un Metric 7:	ncertainty Metadata Completeness	Low	× 1	3	Not addressed				
Overall Quality Determination <sup><math>\dagger</math></sup>			Unacceptable		4	Metric Mean Score: 2.8.				
Continued on next page										

	- con	tinued from pr	evious pag	ge					
Source Citation:	Skender, L. J., Karacic, V., Prpic-Majic, chloroethylene after occupational exposur	D 1991. A corre. Archives of En	omparative nvironmenta	study of al Health.	human levels of trichloroethylene and tetra-				
Type of Data Source	Occupational Exposure; Monitoring Data	Occupational Exposure; Monitoring Data;							
Hero ID	69136								
EVALUATION									
Domain	Metric	Rating	MWF <sup>*</sup> S	core	Comments				

\* MWF = Metric Weighting Factor

Source Citation:	Ikeda, M. 1977. Metabolism of trichloroethylene and tetrachloroethylene in human subjects. Environmental Health Perspec-							
Type of Data Source	Occupatio	Occupational Exposure: Monitoring Data:						
Hero ID	75160							
EXTRACTION								
Parameter			Data					
			TT					
Life Cycle Stage:		4.).	Use 10.170 (m					
Exposure Concern	tration (Uni	it):	10-170 (ppm)					
Number of Sites:	es:		10 provid	tea				
Number of Worke	re		10 12					
Type of Sampling			12 area					
Exposure Duratio	n:		2-4 hrs					
Exposure Frequer	icv:		1-2/mont	h				
I			/					
EVALUATION								
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments		
Damain 1. Daliah	:1:							
Domain 1: Reliad	Motric 1.	Mathadalagy	Low	$\sim 1$	3	Not described		
	MEULIC 1.	Wethodology	LOW	~ 1	5	Not described		
Domain 2: Repres	sentative							
*	Metric 2:	Geographic Scope	Medium	$\times 1$	2	Japan (OECD)		
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE		
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data older than 10 years $(1977)$ but after PEL		
	Metric 5:	Sample Size	Medium	$\times 1$	2	range given but no other statistics		
D : 0 4		•.						
Domain 3: Access	Matria C.	Ity Matadata Completeness	Madium	× 1	0			
	Metric 6:	Metadata Completeness	Medium	× 1	Z	Only exposure type and duration given		
Domain 4: Variab	ility and U	ncertainty						
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed		
		*						
Overall Quality D	eterminatio	$\mathbf{n}^{\dagger}$	Medium		2.0			
• 0								

\* MWF = Metric Weighting Factor
 † If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.</li>

Source Citation:	Ikeda, M	Ikeda, M. 1977. Metabolism of trichloroethylene and tetrachloroethylene in human subjects. Environmental Health Perspec-							
Type of Data Source	Occupatio	Occupational Exposure: Monitoring Data:							
Hero ID	75160	75160							
EXTRACTION									
Parameter			Data						
Life Cycle Stage:			Uso						
Exposure Concert	tration (Uni	t):	200 (ppm	)					
Number of Sampl	es:		not provi	not provided					
Number of Sites:			10						
Number of Worke	ers:		6						
Type of Sampling	:		area						
Exposure Duratio	on:		Intermitte	ent exp c	over 8hr	/day			
EVALUATION									
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments			
	•1• .								
Domain 1: Reliab	Matula 1	Matha dala ma	т	v 1	9				
	Metric 1:	Methodology	LOW	× 1	3	Not described			
Domain 2: Repres	sentative								
*	Metric 2:	Geographic Scope	Medium	$\times 1$	2	Japan (OECD)			
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE			
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data older than 10 years $(1977)$ but after PEL			
	Metric 5:	Sample Size	Medium	$\times 1$	2	range given but no other statistics			
		•,							
Domain 3: Access	Motrie 6	Ity Matadata Completeness	Madium	~ 1	0				
	Metric 0:	Metadata Completeness	Medium	X 1	2	Only exposure type and duration given			
Domain 4: Variah	oility and U	ncertainty							
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed			
		T			-				
Overall Quality D	eterminatio	$\mathbf{n}^{\dagger}$	Medium		2.0				
2 · · · · · · · · · · · · · · · · · · ·									

\* MWF = Metric Weighting Factor
<sup>†</sup> If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.</li>

Source Citation:	Ikeda, M	Ikeda, M. 1977. Metabolism of trichloroethylene and tetrachloroethylene in human subjects. Environmental Health Perspec-							
Type of Data Source	Occupatio	Occupational Exposure: Monitoring Data:							
Hero ID	75160								
EXTRACTION									
Parameter			Data						
			TT						
Life Cycle Stage:	tration (IIn:		Use 20.40 (nm						
Exposure Concert	tration (Uni	it):	20-40 (pp	m) dod					
Number of Sites:	es:		10 provid	uea					
Number of Worke	rc.		6						
Type of Sampling	···		o						
Exposure Duratio			8  hr/day						
Exposure Frequer	ncv:		5 days/we	eek					
1	5								
EVALUATION									
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments			
Domain 1, Polish	;1;+								
Domain 1. Genau	Metric 1:	Methodology	Low	$\times 1$	3	Not described			
Domain 2: Repres	sentative								
	Metric 2:	Geographic Scope	Medium	$\times 1$	2	Japan (OECD)			
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE			
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data older than 10 years (1977) but after PEL			
	Metric 5:	Sample Size	Medium	$\times 1$	2	range given but no other statistics			
Domain 3: Accord	ubility/Clar	i+							
Domain 5. Access	Metric 6:	Metadata Completeness	Medium	× 1	2	Only exposure type and duration given			
	WICCINC 0.	Metadata Completeness	Medium	~ 1	2	Only exposure type and duration given			
Domain 4: Variab	oility and U	ncertainty							
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed			
Overall Quality D	eterminatio	$\mathbf{n}^{\dagger}$	Medium		2.0				

MWF = Metric Weighting Factor
If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.</li>
Source Citation:	Ikeda, M. 1977. Metabolism of trichloroethylene and tetrachloroethylene in human subjects. Environmental Health Perspec-							
Type of Data Source	Occupatio	nal Exposure; Monitoring Data;						
Hero ID	75160	75160						
EXTRACTION								
Parameter			Data					
Life Cycle Stage:			Use					
Exposure Concen	tration (Uni	t):	50 (ppm)					
Number of Sampl	es:	,	not provie	not provided				
Number of Sites:			10					
Number of Worke	ers:		6					
Type of Sampling	:		area					
Exposure Duratic	on:		Intermitte	ent exp c	over 8hr	/day		
EVALUATION								
Domain		Metric	Rating	MWF*	Score	Comments		
Domain 1: Beliah	vility							
Domain 1. Renae	Metric 1:	Methodology	Low	$\times 1$	3	Not described		
Domain 2: Repre	sentative	~			_			
	Metric 2:	Geographic Scope	Medium	× 1	2	Japan (OECD)		
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE		
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data older than 10 years (1977) but after PEL		
	Metric 5:	Sample Size	Medium	× 1	2	range given but no other statistics		
Domain 3: Access	sibility/Clar	ity						
	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	Only exposure type and duration given		
Domain 4. Variat	vility and U	acortainty						
Domain 4. vanat	Motrie 7	Motadata Completeness	Low	$\sim 1$	2	Not addressed		
	metric 7:	metadata Completeness	LOW	× 1	ა	not addressed		
Overall Quality F	)eterminatio	$\mathbf{n}^{\dagger}$	Medium		2.0			
o vorani Quantiy E			mount		2.0			

Source Citation: Inoue 1989. Ameri	Inoue, O., Seiji, K., Kawai, T., Jin, C., Liu, Y. T., Chen, Z., Cai, S. X., Yin, S. N., Li, G. L., Nakasutka, H., Watanabe, T., Ikeda, M., 1989. Relationship between vapor exposure and urinary metabolite excretion among workers exposed to trichloroethylene. American Journal of Industrial Medicine.						
Type of Data SourceOccuHero ID75359	Occupational Exposure; Monitoring Data; 75359						
EXTRACTION							
Parameter		Data					
Life Cycle Stage:		Manufact	uring				
Exposure Concentration	(Unit):	3-94 (ppn	n) men; 2	2-47 (pp	om) women		
Number of Samples:		not provi	ded				
Number of Sites:		1					
Number of Workers:		61 (men)	17  wom	en			
Type of Sampling:		personal	1.0				
Exposure Duration: 3 x 8 hr shifts							
EVALUATION							
Domain	Metric	Rating	$MWF^{\star}$	Score	Comments		
Domain 1: Reliability Metr	e 1: Methodology	Medium	$\times 1$	2	Method described and appears to be acceptable (peer reviewed journal)		
Domain 2: Representati	٥						
Metr	2: Geographic Scope	Low	× 1	3	China (non-OECD)		
Metr	23: Applicability	High	$\times 2$	2	Workplace that utilizes TCE		
Metr	e 4: Temporal Representativeness	Medium	$\times 2$	4	Data older than 10 years (1989) but after PEL		
Metr	e 5: Sample Size	Medium	$\times 1$	2	range given but no other statistics		
Domain 3: Accessibility	Clarity						
Metr	2 6: Metadata Completeness	Low	$\times 1$	3	Only sample type (PBZ) given		
Domain 4. Vaniability a	d Un containte						
Metr	· 7· Metadata Completeness	Low	× 1	3	Not addressed		
		LOW	~ 1	5	1107 844103004		
Overall Quality Determi	$\operatorname{nation}^{\dagger}$	Medium		2.1			

Source Citation:	Inoue, O., Seiji, K., Kawai, T., Jin, C., Liu, Y. T., Chen, Z., Cai, S. X., Yin, S. N., Li, G. L., Nakasutka, H., Watanabe, T., Ikeda, M., 1989. Relationship between vapor exposure and urinary metabolite excretion among workers exposed to trichloroethylene. American Journal of Industrial Medicine.						
Type of Data Source	Occupational Exposure; Monitoring Data;						
Hero ID	75359						
EXTRACTION							
Parameter			Data				
Life Cruele Sterrer			Uae				
Exposure Concent	ration (Uni	i+)·	0.se 1-63 (ppp	a) men 9	2_13 (nn	m) women	
Number of Sample	es:		not provid	$\frac{1}{2}$ ded	-10 (pp	in) women	
Number of Sites:			1				
Number of Worke	rs:		52  (men);	10 wom	en		
Type of Sampling	:		personal				
Exposure Duratio	n:		$3 \ge 8 $ hr s	hifts			
EVALUATION							
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments	
Damain 1. Daliah	·1:						
Domain 1: Reliad	Metric 1	Methodology	Medium	× 1	2	Method described and appears to be acceptable (peer reviewed	
			intodram	~ ±		journal)	
Danain 9. Danai							
Domain 2: Repres	Motric 2.	Coographic Scope	Low	$\sim 1$	3	China (non OECD)	
	Metric 3.	Applicability	High	$\times 2$	2	Workplace that utilizes TCE	
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data older than 10 years (1989) but after PEL	
	Metric 5:	Sample Size	Medium	$\times 1$	2	range given but no other statistics	
Domain 3: Access	ibility/Clar	ity	т	1	0		
	Metric 6:	Metadata Completeness	Low	× 1	3	Only sample type (PBZ) given	
Domain 4: Variah	ility and U	ncertainty					
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed	
Overall Quality D	eterminatio	$\mathbf{n}^{\dagger}$	Medium		2.1		

Source Citation:	Ogata, M., Kihara, T., Kamoi, R., Taguchi, T., Oda, J., Kenmotsu, K. 1988. A report of worker suffering from pneumatosis cystoides intestinalis following trichloroethylene exposure. Industrial Health.								
Type of Data Source Hero ID	Occupatio 75409	Occupational Exposure; Monitoring Data; 75409							
EXTRACTION									
Parameter			Data						
Life Cycle Stage:			Use						
Exposure Concent	tration (Uni	it):	32 ppm (	geometri	c mean)	; 18-56 ppm (90 percent range)			
Number of Sampl	es:	,	not provi	ded	,	, <b>11</b> ( <b>1</b> ( <b>0</b> )			
Number of Sites:			1						
Worker Activity:			soaking n	netal par	rts in T	'RI tank under ultrasonic waves to degrease;			
			additiona	l acitivty	- washi	ng process for 1 minute at least 1/day exposed			
			to higher	concentr	ations t	than general air of working environment.			
Number of Worke	rs:		1						
Type of Sampling	:		area 5 complin	a nointa	in unit				
Sampling Location:			5 sampling points in unit work area						
EVALUATION									
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments			
Domain 1: Beliah	ility								
	Metric 1:	Methodology	Medium	× 1	2	Method described and appears to be acceptable (peer reviewed journal)			
Domain 2: Benres	sentative								
Domain 2. Repres	Metric 2:	Geographic Scope	Medium	× 1	2	Japan (OECD)			
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE			
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data older than 10 years (1988) but after PEL			
	Metric 5:	Sample Size	Medium	$\times 1$	2	range and mean given but no discrete data			
Domain 3: Access	Motrie 6	Motodoto Completeness	Low	× 1	9				
	Metric 0:	Metadata Completeness	LOW	X 1	3	Only sample type (area) given			
Domain 4: Variah	ility and U	ncertainty							
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed			
Overall Quality D	eterminatio	$\mathrm{n}^\dagger$	Medium		2.0				
Continued on next page									

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Source Citation:	Ogata, M.,Kihara, T.,Kamoi, R.,Taguchi, cystoides intestinalis following trichloroethy	T.,Oda, J. dene expos	,Kenmot sure. Ind	u, K 19 Istrial Hea	88. A report of worker suffering from pneumatosis lth.		
Type of Data Source	Occupational Exposure; Monitoring Data;						
Hero ID	75409						
EVALUATION							
Domain	Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments		

Source Citation: Sei exp Oc Type of Data Source Oc Hero ID 754	Seiji, K.,Jin, C.,Watanabe, T.,Nakatsuka, H.,Ikeda, M 1990. Sister chromatid exchanges in peripheral lymphocytes of workers exposed to benzene, trichloroethylene, or tetrachloroethylene, with reference to smoking habits. International Archives of Occupational and Environmental Health. Occupational Exposure; Monitoring Data; 75419						
EXTRACTION							
Parameter			Data				
Life Cycle Stage: Exposure Concentration (Unit): Number of Samples: Number of Sites: Type of Measurement or Method: Number of Workers: Type of Sampling:			Mfg and Use 7 ppm (geometric mean); 13 ppm (75 percentile); 32 ppm (max) not provided unknown 8-hr TWA 22 (men); 16 (women) assumed area				
EVALUATION							
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments	
Domain 1: Reliability Me	etric 1:	Methodology	Medium	$\times 1$	2	Method described and appears to be acceptable (peer reviewed journal)	
Domain 2: Representa Me	ative etric 2:	Geographic Scope	Low	× 1	3	Data from China (non-OECD country) and Japan (OECD	
1110		Coographic Scope	2011		0	country)	
Me	etric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE	
Me	etric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data older than 10 years $(1987)$ but after PEL	
Me	etric 5:	Sample Size	Medium	$\times 1$	2	Geometric mean and 75 percent -tile given, no discrete data	
Domain 3: Accessibili Me	ty/Clari etric 6:	ty Metadata Completeness	Medium	$\times 1$	2	Sample type (PBZ) and exposure type given; missing worker	
						activities, sample duration, and exposure frequency	
Domain 4: Variability	and Un	certainty					
Me	etric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed	
Overall Quality Determination <sup>†</sup>		Medium		2.0			
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Source Citation:	Seiji, K., Jin, C., Watanabe, T., Nakatsuka, H., Ik exposed to benzene, trichloroethylene, or tetr Occupational and Environmental Health.	keda, M 1990. S rachloroethylene,	ister chromatid exchanges in p with reference to smoking h	peripheral lymphocytes of workers nabits. International Archives of			
Type of Data Source Hero ID	Occupational Exposure; Monitoring Data; 75419						
EVALUATION							
Domain	Metric R	Rating MWF*	Score	Comments			

Source Citation:	Chia, S. E Journal of	.,Goh, V. H.,Ong, C. N. 1997. Industrial Medicine.	Endocrine	profiles	of male	workers with exposure to trichloroethylene. American
Type of Data Source Hero ID	Occupation 630431	nal Exposure; Monitoring Data;				
EXTRACTION						
Parameter			Data			
Life Cycle Stage			Use			
Exposure Concen	tration (Uni	t):	9 -131 pp	m (29.6 ı	oom me	ean)
Number of Sites:		-)-	1	( 1	r <b>r</b>	·
Type of Measurer	ment or Met	hod:	8-hr TWA	4		
Number of Worke	ers:		12			
Type of Sampling			personal			
Sampling Locatio	n:		various lo	cations v	vithin tl	he facility
Exposure Duratio	on:		8 hr shift			
EVALUATION						
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments
Domain 1: Reliab	oility					
	Metric 1:	Methodology	High	$\times 1$	1	Cite NIOSH method
Domain 2: Repres	sentative					
*	Metric 2:	Geographic Scope	Low	$\times 1$	3	Singapore (non-OECD)
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data older than 10 years (1997) but after PEL
	Metric 5:	Sample Size	High	$\times 1$	1	Discrete samples given
Domain 3. Access	sibility/Clar	ity				
	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	Sample type (PBZ) and exposure type given; missing worker activities, sample duration, and exposure frequency
Domain 4. Variat	vility and Ur	acertainty				
Domain 4. Vallar	Metric 7.	Metadata Completeness	Low	× 1	3	Not addressed
			2011	<u></u>	0	
Overall Quality D	Determinatio	$\mathbf{n}^{\dagger}$	Medium		1.8	

Source Citation:ImbrType of Data SourceOccuHero ID6639	iani, M.,Niu, Q.,Negri, S.,Ghittori, S. pational Exposure; Monitoring Data; 55	. 2001. Tric	chloroeth	ylene in	n urine as biological exposure index. Industrial Health.	
EXTRACTION Parameter		Data				
Life Cycle Stage: Exposure Concentration (Unit): Number of Samples: Number of Sites: Type of Measurement or Method: Number of Workers: Type of Sampling: Exposure Duration:			Use 27-387 (mg/m3); mean: 83.31 (mg/m3) assumeed 49 based on number of workers 1 8-hr TWA 8 (men); 41 (women) personal 8 hr shift			
EVALUATION Domain	Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliability Metr	ic 1: Methodology	Medium	× 1	2	Method described and appears to be acceptable (peer reviewed journal)	
Domain 2: Representati Metr Metr Metr Metr	ve ic 2: Geographic Scope ic 3: Applicability ic 4: Temporal Representativeness ic 5: Sample Size	Medium High Medium Medium	$\begin{array}{c} \times \ 1 \\ \times \ 2 \\ \times \ 2 \\ \times \ 1 \end{array}$	2 2 4 2	Italy (OECD) Workplace that utilizes TCE Data older than 10 years (2000) but after PEL Range, arithmetic mean, geometric mean, ASD, GSD all given, no discrete samples	
Domain 3: Accessibility Metr	/Clarity ic 6: Metadata Completeness	Medium	× 1	2	Sample type (PBZ), exposure type given, sample duration given; missing worker activities and exposure frequency	
Domain 4: Variability a Metr	nd Uncertainty ic 7: Metadata Completeness	Low	$\times 1$	3	Not addressed with respect to exposure data	
Overall Quality Determ	ination <sup>†</sup>	Medium		1.9		

YTRACTION						
Parameter		Data				
Life Cycle Stage:		Uso				
Dhysical Form:		Vapor				
Boute of Exposure:		inhalation	h			
Exposure Concentration (Uni	it).	1_7ppm	1			
Number of Samples:		4				
Number of Sites:		1				
Type of Measurement or Met	hod:	Short-ter	m			
Worker Activity:		Ultrasoni	c Parts (	Cleaning		
Number of Workers:		1		0	·	
Type of Sampling:		Personal				
Exposure Frequency:		Infrequen	t			
PPE:		Respirator				
VALUATION						
Domain	Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments	
Domain 1. Reliability						
Metric 1:	Methodology	High	$\times 1$	1	Not described, but NIOSH HHE, assumed to use NIOS method	
Domain 2: Representative						
Metric 2:	Geographic Scope	High	$\times 1$	1	US	
Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE	
Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data older than 10 years $(1978)$ but after PEL	
Metric 5:	Sample Size	High	$\times 1$	1	Discrete samples given	
Domain 3: Accessibility/Clar	ity					
Metric 6:	Metadata Completeness	Medium	$\times 1$	2	Critical metadata present	
Domain 4: Variability and U	ncertainty					
Domain 4. Variability and Of	iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii	-	-	0		

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Source Citation: Type of Data Source Hero ID	Cdc, 1978. Health hazard Occupational Exposure; M 3994172	evaluation report n onitoring Data;	no. HETA	A-78-38-	512: Tra	as World Airlines Corporation.		
EVALUATION								
Domain	Me	tric I	Rating	$\rm MWF^{\star}$	Score	Comments		
Overall Quality D	$\operatorname{Petermination}^{\dagger}$	Н	ligh		1.6			

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\* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	Osha, 1989. 1988 OSHA Pel Project documentation: Trichloroethyle. Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 3986441						
EXTRACTION							
Parameter			Data				
EVALUATION							
Domain		Metric	Rating	$MWF^*$	Score	Comments	
Domain 1: Reliab	ility						
	Metric 1:	Methodology	High	$\times 1$	1	OSHA documet	
Domain 2: Repres	sentative						
	Metric 2:	Geographic Scope	High	$\times 1$	1	US	
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	Discussion on health effects and rule making, not workplace	
	Metric 4:	Temporal Representativeness	Low	$\times 2$	6	1988 - 30 years old	
	Metric 5:	Sample Size	N/A		N/A	No Comment.	
Domain 3: Access	sibility/Clar	ity					
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.	
Domain 4: Variability and Uncertainty					N/		
	Metric 7:	Metadata Completeness	IN/A		1N/A	N/a	
Overall Quality D	eterminatio	$\mathrm{n}^\dagger$	Unacceptable		4	Metric Mean Score: 2.7.	

\*\* Consistent with our Application of Systematic Review in TSCARisk Evaluations document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

\* MWF = Metric Weighting Factor

Source Citation:	CalEpa,. 2 guidelines	2005. Appendix D.3 Chronic RE (OEHHA 1999).	LS and toxi	city sum	maries ı	using the previous version of Hot Spots Risk Assessment
Type of Data Source Hero ID	Occupation 3982628	nal Exposure; Monitoring Data;				
EXTRACTION						
Parameter			Data			
Life Cycle Stage:			Manufact	ure		
Physical Form:			Vapor	uio		
Route of Exposure	9:		inhalatior	1		
Exposure Concent	ration (Uni	t):	0-200 ppr	n		
Worker Activity:			Multiple,	findings	from m	ultiple occupational studies
Number of Worker	rs:		79			
Exposure Duration	n:		Varies			
Exposure Frequen	cy:		Varies			
EVALUATION						
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments
Domain 1. Reliabi	lity					
Domain 1. Renabi	Metric 1:	Methodology	Low	$\times 1$	3	Not specified
Domain 2: Repres	entative					
Domain 2. Ropros	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	2000 - 18 years old (after PEL)
	Metric 5:	Sample Size	Medium	$\times 1$	2	Only range provideds
Domain 3: Access	ibility/Clar	ity				
	Metric 6:	Metadata Completeness	Low	$\times 1$	3	Only sample type given
Domoir 4 Vo 1	:1:4 o1 TT					
Domain 4: Variab	Motrie 7:	Metadata Completeness	Low	$\sim 1$	2	Not addressed with respect to superson data
	metric 7:	metadata Completeness	LOW	× 1	ა	Not addressed with respect to exposure data
Overall Quality D	eterminatio	$\mathrm{n}^\dagger$	Medium		2.0	

Source Citation: Type of Data Source	Osha, 201 Occupation	7. WTC OSHA non-asbestos sa nal Exposure; Monitoring Data;	mpling data for	Southeas	st area.	
	3982438					
EXTRACTION			Data			
rarameter			Data			
Life Cycle Stage:			Manufacture/U	Jse		
Route of Exposur	e:		inhalation			
Exposure Concent	tration (Uni	t):	0  ppm			
Number of Sampl	es:		37			
Type of Measurer	ment or Met	hod:	TWA			
Worker Activity:			Various			
Type of Sampling	5:		Personal			
EVALUATION						
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments
Domain 1: Boliah	ility					
Domain 1. Renab	Metric 1:	Methodology	High	$\times 1$	1	Not described, but OSHA, assumed to use OSHA method
Domain 2: Repres	sentative	~	*** 1		_	
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	All TCE samples are 0 and no context given to results; there- fore, it is unclear if TCE is being used
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data older than 10 years $(2002)$ but after PEL
	Metric 5:	Sample Size	High	$\times 1$	1	Discrete samples given
Domain 3: Access	ubility/Clari	i+.,				
Domain 5. Access	Metric 6	Metadata Completeness	Medium	× 1	2	Critical metadata present
		nietadata compreteness	mourum	<u> </u>	-	
Domain 4: Variab	oility and Ur	ncertainty				
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed
Overall Quality D	Determinatio	$\mathrm{n}^\dagger$	Unacceptable		4	Metric Mean Score: 2.2.

\*\* Consistent with our Application of Systematic Review in TSCARisk Evaluations document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

\* MWF = Metric Weighting Factor

Source Citation:	Doe,. 2003. A needs assessment for medical screening of construction workers at the Portsmouth and Paducah gaseous diffusion plants.							
Type of Data Source Hero ID	Occupation 3974976	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 3974976						
EXTRACTION								
Parameter			Data					
Life Could Sterre			T.T.					
Number of Sites:			Use					
Worker Activity			2 Dogrooging					
Number of Worke	<b>r</b> a•		> 1000					
Number of Worke	15.		>1000					
EVALUATION								
Domain		Metric	Rating	$MWF^*$	Score	Comments		
	•1•7							
Domain 1: Reliab	Ility	Matha dala ma	TT:l.	v 1	1			
	Metric 1:	Methodology	High	× 1	1	University of Cincinnati, NIOSH, DOE		
Domain 2: Repres	sentative							
	Metric 2:	Geographic Scope	High	$\times 1$	1	US		
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	Retroactive look at a workplace scenario		
	Metric 4:	Temporal Representativeness	Low	$\times 2$	6	2003, but uses older data		
	Metric 5:	Sample Size	N/A		N/A	No Comment.		
Domain 3: Access	ibility/Clar	ity						
	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	Well documented, but little to no citations inline with the text		
Domain 4. Variah	ilitar and Us							
Domain 4: Variat	Motrie 7	Metadata Completeness	Low	× 1	9	Net a llarge l		
	Metric 7:	Metadata Completeness	LOW	× 1	3	Not addressed		
Overall Quality D	eterminatio	$\mathbf{n}^{\dagger}$	Unacceptable		4	Metric Mean Score: 2.6.		

\*\* Consistent with our Application of Systematic Review in TSCARisk Evaluations document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

\* MWF = Metric Weighting Factor

Source Citation: N	Niosh, 19	82. Health hazard evaluation re	port no. HETA-	-82-136-1	175, U.	S. Army Research Office, Research Triangle Park,
Type of Data SourceIHero ID3	Occupation 974950	nal Exposure; Monitoring Data;				
EXTRACTION						
Parameter			Data			
Life Cycle Stage:			Use			
Physical Form:			Vapor			
Route of Exposure:			inhalation			
Exposure Concentra	ation (Uni	t):	0.75-1.34 ppm			
Number of Samples:	:		7			
Number of Sites:			1			
Type of Sampling:			Area, Personal			
Sampling Location:			Work Table			
Bulk and Dust Part	icle Size I	Distribution:	0.35-0.56  mg/r	n3		
Engineering Control	l & percen	t Exposure Reduction:	Exhaust Fans,			
EVALUATION						
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments
Domain 1: Reliabili N	ty Metric 1:	Methodology	High	$\times 1$	1	Not described, but NIOSH HHE, assumed to use NIOSH method
Domain 2. Ponyagar	atativo					
Domain 2. Represer	Motric 2.	Geographic Scope	High	× 1	1	US
I.	Metric 3.	Applicability	High	$\times 1$ $\times 2$	2	Workplace that utilizes TCF
1 N	Metric 4.	Temporal Bepresentativeness	Medium	$\times 2$	4	Data older than 10 years (1982) but after PEL
N	Metric 5:	Sample Size	Low	$\times 1$	3	Described as up to 1.34 ppm of TCE, no other sample data given
Domain 3: Accessib	ility/Clari	ity				
N	Metric 6:	Metadata Completeness	Unacceptable	$\times 1$	4	Indicates both PBZ and area samples taken but not clear which is applicable to the TCE value given
Domain 4 <sup>.</sup> Variabili	ty and Ur	ocertainty				
Normani 4. Variabili	Metric 7.	Metadata Completeness	Low	× 1	3	Not addressed
1		metadata compreteness	LOW	~ 1	0	itor addressed
		C	Continued on nex	t page		

Source Citation:	Niosh, 1982. Health hazard evaluation rep North Carolina.	port no. HETA-	82-136-1	175, U.S	5. Army Research Office, Research Triangle Park,
Type of Data Source Hero ID	Occupational Exposure; Monitoring Data; 3974950				
EVALUATION					
Domain	Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments
Overall Quality I	$\operatorname{Determination}^{\dagger}$	Unacceptable		4	Metric Mean Score: 2.0.

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\*\* Consistent with our Application of Systematic Review in TSCARisk Evaluations document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

\* MWF = Metric Weighting Factor

Source Citation: Seitz, T.,I Type of Data Source Occupatio	Driscoll, R.: 1989. Health hazard onal Exposure; Monitoring Data;	evaluation	report no	b. HETA	A 88-082-1971, Jostens Incorporated, Princeton, Illinois.			
EXTRACTION								
Parameter		Data						
Life Cycle Stage:		Use						
Physical Form:		Vapor						
Route of Exposure:		inhalatior	ı					
Exposure Concentration (Un	it):	14.7 - 33.4	$_{\rm ppm}$					
Number of Samples:		15						
Number of Sites:		1						
Type of Measurement or Me	thod:	TWA						
Worker Activity:		Cleaning/	degreasi	ng				
Number of Workers:		35						
Type of Sampling:		Area, Per	sonal					
Sampling Location:		Polishing	and plat	ing dep	artments			
Engineering Control & perce	nt Exposure Reduction:	Local exh	Local exhaust ventilation					
PPE:		Gloves, go	oggles					
Analytic Method:		NIOSH Method 1022						
EVALUATION								
Domain	Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments			
Domain 1. Reliability								
Metric 1:	Methodology	High	× 1	1	NIOSH Method 1022			
	Wiethodology	mgn	~ 1	1	NIOSII Method 1022			
Domain 2: Representative								
Metric 2:	Geographic Scope	High	$\times 1$	1	US			
Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE			
Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data older than 10 years (1989) but after PEL			
Metric 5:	Sample Size	High	$\times 1$	1	Discrete samples given			
Domain 3: Accessibility/Class	ity							
Metric 6:	Metadata Completeness	High	× 1	1	All metadata present			
	The second se	0			1 ·····			
Domain 4: Variability and U	ncertainty							
	Continued on next page							

Source Citation: Type of Data Source Hero ID	Seitz, T.,Driscoll, R.: 1989. Health hazard evaluation report no. HETA 88-082-1971, Jostens Incorporated, Princeton, Illino Occupational Exposure; Monitoring Data; 3970562						
EVALUATION							
Domain		Metric	Rating	$\rm MWF^{\star}$	Score	Comments	
	Metric 7:	Metadata Completeness	Medium	$\times 1$	2	None discussed, but NIOSH method addresses variability/ uncertainty in the method	
Overall Quality D	Determination	$\mathbf{n}^{\dagger}$	High		1.3		

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Source Citation:Okawa, MType of Data SourceOccupationHero ID3970618	I. T., 1973. Health hazard evaluational Exposure; Monitoring Data;	ation report	no. HHI	E 72-74	-51, Western Electric Company, Dublic, California.
EXTRACTION					
Parameter		Data			
Life Cycle Stage		Uso			
Physical Form:		Vapor			
Boute of Exposure:		inhalation	h		
Exposure Concentration (Un	it):	6-106 ppr	n		
Number of Samples:		43			
Number of Sites:		1			
Worker Activity:		Paint spra	aving, cle	aning.	washing
Type of Sampling:		Personal	0, 0,	- 0)	0
Engineering Control & perce	nt Exposure Reduction:	Local exh	aust vent	ilation,	vent hoods
PPE:		respirator	s	,	
Analytic Method:		NIOSH n	nethod		
EVALUATION					
Domain	Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments
Domain 1: Reliability Metric 1:	Methodology	High	× 1	1	NIOSH report
	momodology	111811	× 1	1	
Domain 2: Representative					
Metric 2:	Geographic Scope	High	$\times 1$	1	US
Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE
Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data older than 10 years (1979) but after PEL
Metric 5:	Sample Size	High	$\times 1$	1	Discrete samples given
Domain 3: Accessibility/Clar Matric 6:	rity Matadata Completeness	High	× 1	1	All metadata present
	metadata Completeness	111811	^ I	T	An incrauara present
Domain 4: Variability and U	ncertainty				
Metric 7:	Metadata Completeness	Medium	$\times 1$	2	None discussed, but NIOSH method addresses variability/ uncertainty in the method
Overall Quality Determination	$\mathrm{on}^{\dagger}$	High		1.3	
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Source Citation: Type of Data Source Hero ID	Okawa, M. T., 1973. Health hazard eval Occupational Exposure; Monitoring Dat 3970618	luation report a;	5 no. HHE 72-74-51, We	estern Electric Company, Dublic, California.
EVALUATION				
Domain	Metric	Rating	$MWF^{\star}$ Score	Comments

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 $\star$  MWF = Metric Weighting Factor

Source Citation:R. A. G. Aktiengesellschaft. 2014. Chemical safety report: Trichloroethylene.Type of Data SourceOccupational Exposure; Monitoring Data;Hero ID3970841						
EXTRACTION		Data				
1 ai ainetei		Data				
Life Cycle Stage:		Use				
Physical Form:		liquid, va	por			
Route of Exposure:		inhalatior	n, dermal			
Exposure Concentration (Un	it):	2.4 - 95.5	mg/m3			
Number of Sites:		2				
Worker Activity:		repairing	belts in a	coal mir	nes	
Sampling Location:		coal mine	belts			
Exposure Duration:		<4 hours				
Exposure Frequency:		varies				
Engineering Control & perce	nt Exposure Reduction:	Good mir	ne ventila	tion		
PPE:		Protective	e gloves,	suits an	d eye protection	
EVALUATION						
Domain	Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments	
Domain 1: Reliability Metric 1:	Methodology	Low	$\times 1$	3	Not described	
Domain 2: Representative						
Metric 2:	Geographic Scope	Medium	$\times 1$	2	Germany (OECD)	
Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE	
Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data from sources from 2011 and 2005; therefore, scored based on oldest data which is older than 10 years but after PEL	
Metric 5:	Sample Size	High	$\times 1$	1	Discrete samples given	
Domain 3: Accessibility/Clar	rity			_		
Metric 6:	Metadata Completeness	Medium	$\times 1$	2	Only Sample type and exposure type give	
Domain 4: Variability and Uncertainty			× 1	2	лт , 11 1	
	metadata Completeness	LOW	× 1	3	not addressed	
Overall Quality Determination	Overall Quality Determination <sup>†</sup> Medium 1.9					
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Source Citation:R. A. G. Aktiengesellschaft. 2014. Chemical safety report: Trichloroethylene.Type of Data SourceOccupational Exposure; Monitoring Data; 3970841									
EVALUATION									
Domain	Metric	Rating MWF* Score	Comments						

Source Citation:2014. Exposure assessment: Trichloroethylene, Part 2.Type of Data SourceOccupational Exposure; Monitoring Data;Harra ID2070840								
EXTRACTION Parameter		Data						
		Data						
Life Cycle Stage:		Use						
Physical Form:		liquid, va	por					
Route of Exposure:		inhalation	n, derma	1				
Exposure Concentration (U	Jnit):	<LoD (14	$4.6 \mathrm{ug/m}^3$	3) - 11 n	ng/m3			
Number of Samples:		29						
Number of Sites:		1						
Worker Activity:		loading, ι	ınloading	g TCE s	torage tanks, and sampling			
Type of Sampling:		Personal,	area					
Sampling Location:		around si	te and o	ffsite.				
Exposure Duration:		$15-60 \min$	1.					
Exposure Frequency:		daily						
PPE:		Gloves	Gloves					
Analytic Method:		PN-89/Z-04016/03 and IR-TL-73						
EVALUATION								
Domain	Metric	Rating	$MWF^{\star}$	Score	Comments			
Domain 1: Reliability				0				
Metric	: Methodology	Medium	× 1	2	Polish method, assumed to be acceptable			
Domain 2: Representative								
Metric :	2: Geographic Scope	Medium	× 1	2	Poland (OECD)			
Metric	B: Applicability	High	$\times 2$	2	Workplace that utilizes TCE			
Metric	1: Temporal Representativeness	High	$\times 2$	2	data from 2014			
Metric	5: Sample Size	Medium	$\times 1$	2	Most samples are provided as a range, no discrete data given			
Domain 3: Accessibility/C	larity							
Metric	5: Metadata Completeness	Medium	$\times 1$	2	sample type and exposure type given, but missing other meta-data $% \left( {{{\rm{D}}_{{\rm{D}}}}_{{\rm{D}}}} \right)$			
Demain 4. Veniahilti	The second strates							
Domain 4: Variability and	Uncertainty Motodata Completeness	Low	× 1	9				
Metric	Metadata Completeness	LOW	× 1	3	NOT addressed			
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Source Citation: Type of Data Source Hero ID	2014. Exposure assessment: Trichloroethylene, Part 2. Occupational Exposure; Monitoring Data; 3970840						
<b>EVALUATION</b> Domain	Met	ric Rating	MWF* Score	Comments			
Overall Quality I	$\operatorname{Petermination}^{\dagger}$	Medium	1.7				

Source Citation:	D. O. W. Deutschland. 2014. Chemical safety report: Use of trichloroethylene in industrial parts cleaning by vapour degreasing in closed systems where specific requirements (system of use parameters) exist							
Type of Data Source Hero ID	Occupatio 3970823	nal Exposure; Monitoring Data;	nts (system	or use-p	aramete	-15) CA150.		
EXTRACTION								
Parameter			Data					
Life Cycle Stage:			Use					
Physical Form:			liquid, va	por				
Route of Exposur	e:		inhalation	n, dermal				
Exposure Concen	tration (Uni	it):	4.61  mg/m	m3 – 13.6	59  mg/r	n3 (90th percentile measured data)		
Number of Sampl	es:		9941 area	, 58 pers	onal			
Number of Sites:			9	. –				
Type of Measurer	ment or Met	thod:	8 hr TWA	A				
Worker Activity:			Vapor deg	greasing				
Type of Sampling			Personal,	area				
Analytic Method:			methodology NF X 43-267/INRS 029-01/09					
EVALUATION								
Demain		Matria	Dating	MWE*	Coore	Commente		
Domain		Metric	nating	IVI VV F	Score	Comments		
Domain 1. Boliah	ility							
Domain 1. Renac	Metric 1:	Methodology	Medium	$\times 1$	2	Methods provided, sampling completed by UKAS acreddited lab; therefore, assumed to be acceptable		
	, .·							
Domain 2: Repre	sentative			1	0			
	Metric 2:	Geographic Scope	Medium	× 1	2	Data from UK and France (OECD)		
	Metric 3:	Applicability	High	× 2	2	Workplace that utilizes TCE		
	Metric 4:	Sample Size	High High	× 2 × 1	2 1	No date listed, but monitoring data was taken from 2009-2014		
	metric 5.	Sample Size	Ingn	× 1	1	Discrete samples given		
Domain 3. Access	sibility/Clar	ity						
Domain 9. Hooos	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	Most metadata given, missing exposure frequency		
		*						
Domain 4: Variat	oility and U	ncertainty						
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed		
Overall Quality F	otorminatic	, n <sup>†</sup>	High		1.6			
Overan Quality L	eterminatio	)II :	IIIgii		1.0			
		Con	ntinued on r	next page	è			

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Source Citation:	D. O. W. Deutschland. 2014. Chemical saf	ety report: ents (system	Use of tri n of use-p	chloroeth arameters	ylene in industrial parts cleaning by vapour degreasing e) exist.		
Type of Data Source	Occupational Exposure; Monitoring Data;	Occupational Exposure; Monitoring Data;					
Hero ID	3970823						
EVALUATION							
Domain	Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments		

INACTION								
Parameter			Data					
Life Cycle Stage		Uso						
Dhysical Form:		Use liquid yop on						
Pouto of Exposure:		inholotion	por dormal					
Exposure Concentration (Uni	+).	0.0004 1	5 ppm					
Number of Samples:		0.0004 - 1	.o ppm					
Number of Sites:		47						
Tumo of Monsurement or Mot	had							
Worker Activity:	nou.	Filling Be	rrole and	l fill ton	k trucks and traincars			
Number of Workers		Philip Da	and and	i iiii tai	ik frucks and framears.			
Type of Sampling:		personal						
Sympling Location:			g station	harrel	filling station			
Exposure Duration:			8					
Exposure Frequency:								
Engineering Control & percent Exposure Reduction:		Ventilatio	n and ex	hause a	ir			
PPE.		TCE resis	stant glov	ves gog	øles			
					8			
ALUATION								
ALUATION Domain	Metric	Rating	MWF*	Score	Comments			
ALUATION Domain	Metric	Rating	MWF*	Score	Comments			
ALUATION Domain Domain 1: Reliability Metric 1:	Metric	Rating	MWF*	Score	Comments			
ALUATION Domain Domain 1: Reliability Metric 1:	Metric Methodology	Rating	MWF* $\times 1$	Score	Comments Not specified			
ALUATION Domain Domain 1: Reliability Metric 1: Domain 2: Representative	Metric	Rating	MWF*	Score	Comments			
ALUATION Domain Domain 1: Reliability Metric 1: Domain 2: Representative Metric 2:	Metric Methodology Geographic Scope	Rating Low Medium	$\frac{MWF^{\star}}{\times 1}$	Score 3	Comments Not specified			
ALUATION Domain Domain 1: Reliability Metric 1: Domain 2: Representative Metric 2: Metric 3:	Metric Methodology Geographic Scope Applicability	Rating Low Medium High	$MWF^{\star}$ $\times 1$ $\times 1$ $\times 2$	Score 3 2 2	Comments Not specified EU data (OECD) Workplace that utilizes TCE			
ALUATION Domain Domain 1: Reliability Metric 1: Domain 2: Representative Metric 2: Metric 3: Metric 4:	Metric Methodology Geographic Scope Applicability Temporal Representativeness	Rating Low Medium High High	$MWF^{\star}$ $\times 1$ $\times 1$ $\times 2$ $\times 2$	Score 3 2 2 2	Comments Not specified EU data (OECD) Workplace that utilizes TCE 2014. 4 years old			
ALUATION Domain Domain 1: Reliability Metric 1: Domain 2: Representative Metric 2: Metric 3: Metric 4: Metric 5:	Metric Methodology Geographic Scope Applicability Temporal Representativeness Sample Size	Rating Low Medium High High High	$MWF^{\star}$ $\times 1$ $\times 1$ $\times 2$ $\times 2$ $\times 1$	Score 3 2 2 2 2 1	Comments Not specified EU data (OECD) Workplace that utilizes TCE 2014, 4 years old Discrete samples given			
ALUATION Domain Domain 1: Reliability Metric 1: Domain 2: Representative Metric 2: Metric 3: Metric 4: Metric 5:	Metric Methodology Geographic Scope Applicability Temporal Representativeness Sample Size	Rating Low Medium High High High	$MWF^{\star}$ $\times 1$ $\times 1$ $\times 2$ $\times 2$ $\times 1$	Score 3 2 2 2 2 1	Comments Not specified EU data (OECD) Workplace that utilizes TCE 2014, 4 years old Discrete samples given			
ALUATION Domain Domain 1: Reliability Metric 1: Domain 2: Representative Metric 2: Metric 3: Metric 4: Metric 5: Domain 3: Accessibility/Clar	Metric Methodology Geographic Scope Applicability Temporal Representativeness Sample Size	Rating Low Medium High High High	$\begin{array}{c} \text{MWF}^{\star} \\ \times 1 \\ \times 2 \\ \times 2 \\ \times 2 \\ \times 1 \end{array}$	Score 3 2 2 2 2 1	Comments Not specified EU data (OECD) Workplace that utilizes TCE 2014, 4 years old Discrete samples given			

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Source Citation: Type of Data Source Hero ID	D. O. W. Deutschland. 2014. Chemical safety report: Use of trichloroethylene in packaging. Occupational Exposure; Monitoring Data; 3970813						
EVALUATION							
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comm	nents
	Metric 7:	Metadata Completeness	Low	× 1	3	Not addressed	
Overall Quality Determination <sup>†</sup> High 1.6							

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Source Citation:	Domo Cap	proleuna GmbH. 2015. Chemical	safety repo	ort: Indu	strial us	se as an extractive solvent for the purification of capro-			
Type of Data Source Hero ID	Occupatio 3970812	nal Exposure; Monitoring Data;							
EXTRACTION									
Parameter			Data						
Life Cycle Stage			Use						
Physical Form:			liquid, va	por					
Route of Exposur	e:		inhalation	ı. derma	1				
Exposure Concen	tration (Uni	it):	0.4-38 mg	g/m3					
Number of Sites:	× ×	,	1	, , , , , , , , , , , , , , , , , , ,					
Type of Measurer	nent or Met	hod:	8 hour T	WA					
Worker Activity:			Tank disc	harge, so	olvent ex	straction, and lab sample handling			
Number of Worke	ers:		15						
Type of Sampling	:		personal						
Sampling Location:									
Exposure Duratio	on:		varies	varies					
Exposure Frequer	ncy:		365						
Analytic Method:			German 7	German Technical Rule TRGS 402					
EVALUATION									
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments			
Domain 1: Reliab	oility								
	Metric 1:	Methodology	Medium	$\times 1$	2	German Technical Rule TRGS 402, assumed to be acceptable			
Domain 2. Ponno	antativa								
Domain 2. Repres	Motric 2.	Coographic Scope	Modium	$\sim 1$	2	EU data (OECD)			
	Metric 3:	Applicability	High	$\times 1$ $\times 2$	2	Workplace that utilizes TCE			
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	2015 but utilizes monitoring data from 2013			
	Metric 5:	Sample Size	Low	$\times 1$	3	unclear if sample values given are discrete samples or based on			
		I			-	a median, mean, etc.			
Domain 3. Access	sibility/Clar	ity							
Domain of Troood	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	Exposure type and sample type given, no other metadata			
		I to the second							
Domain 4: Variab	bility and U	ncertainty							
		Cor	tinued on r	next page	e				

			P		F0-				
Source Citation:	Domo Cap lactam from	oroleuna GmbH. 2015. ( m caprolactam oil.	Chemical safety repo	rt: Indu	strial us	se as an extracti	ive solvent for the purification of capro-		
Type of Data Source	Occupation	Occupational Exposure: Monitoring Data:							
Hero ID	3970812	3970812							
EVALUATION									
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score		Comments		
	Metric 7:	Metadata Completene	ss Low	$\times 1$	3	Not addressed			
Overall Quality D	Determinatio	$\mathbf{n}^{\dagger}$	Medium		1.8				

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Source Chatton.D. O. W. 1Type of Data SourceOccupatioHero ID3970810	nal Exposure; Monitoring Data;	lety report:	Uses of	triciilor						
EXTRACTION Parameter		Data								
Life Cycle Stage:		Use								
Physical Form:		liquid va	nor							
Boute of Exposure		inhalatior	n dermal							
Exposure Concentration (Uni	it):	90th perc	entile cal	culated	: 0.0172 ppm. Range: ND - 1.9 ppm					
Number of Samples:		49	0110110 000	calatoa	i oloria ppini rumgo riz i ilo ppini					
Type of Measurement or Met	hod:	TWA								
Worker Activity:		Sampling	and mai	ntenanc	e on tanks					
Type of Sampling:		Personal,	area							
Exposure Duration:		<4 hours								
Exposure Frequency:		6/month								
PPE:			Chem. Resistant gloves, safety glasses, safety shoes, and usual protective clothing.							
EVALUATION										
Domain	Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments					
Domain 1: Reliability										
Metric 1:	Methodology	Low	$\times 1$	3	Not specified					
Domain 2: Representative										
Metric 2:	Geographic Scope	Medium	$\times 1$	2	EU data (OECD)					
Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE					
Metric 4:	Temporal Representativeness	High	$\times 2$	2	No date, but samples were pulled from 2011-2014					
Metric 5:	Sample Size	High	$\times 1$	1	Discrete samples given					
Domain 3: Accessibility/Clar	ity									
Metric 6:	Metadata Completeness	High	$\times 1$	1	All metadata present					
Domain 4: Variability and U	ncertainty									
Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed					
Wieth CT. Wietadata Completeness Low X I 3 Not addressed										
					Overall Quality Determination <sup>†</sup> High 1.6					
Overall Quality Determinatio	$\mathbf{n}^{\dagger}$	High		1.6						

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Source Citation:D. O. W. Deutschland. 2014. Chemical safety report: Uses of trichloroethylene in formulation.Type of Data SourceOccupational Exposure; Monitoring Data; 3970810						
<b>EVALUATION</b> Domain	Metric	Rating	MWF*	Score	Comments	

Source Citation: Domo	Caproleuna GmbH. 2014. Chemic	al safety rep	ort: Indu	strial u	se as an extractive solvent for the purification of capro-				
Type of Data Source Occup Hero ID 39708	ational Exposure; Monitoring Data 09	a;							
EXTRACTION									
Parameter		Data							
Life Cycle Stage:		Use							
Physical Form:	Physical Form:								
Route of Exposure:		inhalatio	n. dermal	l					
Exposure Concentration	Exposure Concentration (Unit):			mg/m3	$(\mathrm{some~estimated}).\mathrm{Dermal:}0.34\text{-}2.7~\mathrm{mg/kg}$ (es-				
Type of Massurement or	Mothod:	8 hour T	<b>X</b> 7A						
Worker Activity:	method.	Varies	WA						
Type of Sampling		Personal							
Exposure Duration:		Varies							
Exposure Frequency:		Varies							
PPE:		Chem. R	Chem. Resistant gloves, safety glasses, safety shoes, and usual protective						
				clothing.					
Analytic Method:		German	German technical rule TRGS 402						
EVALUATION									
Domain	Metric	Rating	$MWF^{\star}$	Score	Comments				
Domain 1: Reliability									
Metrie	1: Methodology	Medium	$\times 1$	2	German Technical Rule TRGS 402, assumed to be acceptable				
Domain 2: Representativ	5								
Metrie	2: Geographic Scope	Medium	$\times 1$	2	EU data (OECD)				
Metrie	3: Applicability	High	$\times 2$	2	Workplace that utilizes TCE				
Metrie	4: Temporal Representativeness	s High	$\times 2$	2	2015, but utilizes monitoring data from 2013				
Metrie	5: Sample Size	Low	$\times 1$	3	unclear if sample values given are discrete samples or based on a median, mean, etc.				
Domain 3: Accessibility/	Clarity								
Metrie	6: Metadata Completeness	Medium	$\times 1$	2	Exposure type and sample type given, no other metadata				
Domain 4: Variability an	d Uncertainty								
	C	ontinued on a	next page	9					

			comunaca nom p	retreat	Page				
Source Citation:	Domo Cap lactam from	roleuna GmbH. 2014. ( m caprolactam oil.	Chemical safety repo	rt: Indu	strial us	se as an extract	ive solvent for the purification of capro-		
Type of Data Source	Occupation	Occupational Exposure: Monitoring Data;							
Hero ID	3970809								
EVALUATION									
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score		Comments		
	Metric 7:	Metadata Completene	ess Low	$\times 1$	3	Not addressed			
Overall Quality E	Determination	$\mathbf{n}^{\dagger}$	Medium		1.8				

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Source Citation: Type of Data Source Hero ID	Spolana, a Occupation 3970807	s. 2014. Chemical safety report nal Exposure; Monitoring Data;	: Trichloro	ethylene.					
EXTRACTION			_						
Parameter			Data						
Life Cycle Stage:			Use						
Physical Form:			liquid, va	por					
Route of Exposur	e:		inhalation	n, dermal					
Exposure Concen	tration (Uni	t):	0-13.3 (ui	nitless) a	nd 0.2 -	19.2  mg/m3			
EVALUATION									
Domain		Metric	Rating	MWF*	Score	Comments			
Domain 1: Beliah	ility								
Domain 1. Itenae	Metric 1:	Methodology	Low	$\times 1$	3	Not specified			
Domain 2. Poppa	antativo								
Domain 2. Repres	Motria 2	Coographic Scope	Modium	$\vee$ 1	9	Creek Deruklie (OECD)			
	Metric 2:	Applicability	High	$\times 1$ $\times 2$	2	Workplace that utilizes TCF			
	Metric 4:	Temporal Representativeness	High	$\times 2$	$\frac{2}{2}$	Samples from 2011-2013			
	Metric 5:	Sample Size	High	$\times 1$	1	Discrete samples given			
		L	0			1 0			
Domain 3: Access	sibility/Clar	ity							
	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	Exposure type and sample type given, no other metadata			
Domoin 4. V	ilitar and T								
Domain 4: Variat	Motio $7$	Matadata Completeness	Low	× 1	9	лт , 11 I			
	Metric 7:	Metadata Completeness	LOW	× 1	3	Not addressed			
Overall Quality D	eterminatio	$\mathbf{n}^{\dagger}$	Medium		1.7				
Source Citation:	2014. Exposure scenario: Use: Trichloroethylene as an extraction solvent for removal of process oil and formation of the								
--------------------------------	--	--	----------------	------------------------	-----------	--	--	--	--
Type of Data Source Hero ID	porous str Occupatio 3970806	ucture in polyethylene based sep nal Exposure; Monitoring Data;	parators use	d in lead	-acid da	atteries.			
EXTRACTION									
Parameter			Data						
Life Cycle Starry			Uco						
Dire Oycle Stage:		Use liquid you	nor						
Route of Exposur	· ·		inhalation	por v					
Exposure Concent	c. tration (Uni	it):	Personal:	0.48-44.8	8 mg/m	13Area: 26.7-1001 mg/m3			
Number of Sampl	es:		36	0.10 110					
Number of Sites:			1						
Type of Measurer	nent or Met	hod:	12 hour T	WA					
Worker Activity:		Varies							
Number of Workers:		91							
Type of Sampling:		Personal,	Personal, area						
Sampling Location:		Multiple	Multiple						
Exposure Duration:		10.66 hou	rs						
Exposure Frequer	ncy:		3.5  days/	week					
PPE:			Respirato	rs during	g certair	n tasks.			
Analytic Method:			EN 482:2012						
EVALUATION									
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments			
	•1•7								
Domain 1: Reliad	Motrie 1.	Mathadalagy	Modium	× 1	0	De las acceltacione			
	metric 1.	Methodology	meannin	× 1	2	Badge monitoring			
Domain 2: Repres	sentative								
-	Metric 2:	Geographic Scope	Medium	$\times 1$	2	EU data (OECD)			
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE			
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	2014, 4 years old			
	Metric 5: Sample Size Medium $\times 1$ 2 75th percentile given, no other statistics					75th percentile given, no other statistics			
Domain 2. Acces	.:h:l:+ /Cl	:+							
Domain 5: Access	Motrie 6	Motodoto Completeness	Modium	√ 1	0	For some time and completions of the section of the			
	metric 0:	metadata Completeness	meanum	× 1	2	Exposure type and sample type given, no other metadata			
		Con	ntinued on r	next page	è				

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Source Citation:	2014. Exposure scenario: Use: Trichloroethylene as an extraction solvent for removal of process oil and formation of the porous structure in polyethylene based separators used in lead-acid batteries.							
Type of Data Source	Occupational Exposure; Monitoring Data;							
Hero ID	3970806							
EVALUATION								
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments		
Domain 4: Variab	oility and Ur Metric 7:	ncertainty Metadata Completeness	Low	$\times 1$	3	Not addressed		
Overall Quality D	Determinatio	$\mathbf{n}^{\dagger}$	Medium		1.7			

Source Citation:	Chimcomp	olex, S. A. Borzesti. 2014. Che agent in closed systems	emical safety rep	oort: Ind	lustrial	use of trichloroethylene (TCE) as a solvent as a	
Type of Data Source Hero ID	Source Occupational Exposure; Published Models for Exposures or Releases; 3970803						
EXTRACTION							
Parameter			Data				
Life Cycle Stage:			Use				
Physical Form:			liquid, vapor				
Route of Exposur	e:		inhalation, der	mal			
Exposure Concent	tration (Uni	t):	Estimated: 0.0	5-19.2 m	g/m3		
Number of Sites:			1		-,		
Type of Sampling	:		Estimation				
Analytic Method:			Estimation Me	thod: E0	CETOC	TRA v3	
EVALUATION							
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments	
Domain 1: Reliab	ility						
	Metric 1:	Methodology	High	$\times 1$	1	Model details not included in the report but model is used in a chemical safety report for the EU; and, therefore, assumed to be of high quality	
Domain 2: Donno	antativa						
Domain 2: Repres	Motric 2.	Geographic Scope	Modium	$\sim 1$	2	EU (OECD)	
	Metric 3:	Applicability	High	$^{\wedge 1}$ $^{\vee 2}$	2	Workplace that utilizes TCE	
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	No date but references a risk assessment from 2014	
	Metric 5:	Sample Size	N/A	~~ <b>_</b>	N/A	No Comment.	
Domain 2. Accord	ibility/Clan	:+					
Domain 5. Access	Metric 6:	Metadata Completeness	Unacceptable	$\times 1$	4	Document does not contain necessary metadata to understand the model	
Domain 4: Variab	ility and U	acortainty					
Domain 4. Variat	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed	
Overall Quality D	eterminatio	$\mathbf{n}^{\dagger}$	Unacceptable		4	Metric Mean Score: 1.8.	
		(	Continued on nex	t page			
				10.			

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Source Citation:	Source Citation: Chimcomplex, S. A. Borzesti. 2014. Chemical safety report: Industrial use of trichloroethylene (TCE) as a solvent as a degreasing agent in closed systems.							
Type of Data Source	Occupational Exposure; Published Models for	Occupational Exposure; Published Models for Exposures or Releases;						
Hero ID	3970803							
EVALUATION								
Domain	Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments			

\*\* Consistent with our Application of Systematic Review in TSCARisk Evaluations document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

\* MWF = Metric Weighting Factor

<sup>†</sup> If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High:  $\geq 1$  to < 1.7; Medium:  $\geq 1.7$  to < 2.3; Low:  $\geq 2.3$  to  $\leq 3$ .

Source Citation:	Source Citation: D. O. W. Deutschland. 2017. Chemical safety report: Use of trichloroethylene as extraction solvent for bitumen in asphalt						
Type of Data Source Hero ID	Occupation 3970802	nal Exposure; Monitoring Data;					
EXTRACTION			Data				
Parameter			Data				
Life Cycle Stage:			Use				
Physical Form:			liquid, va	por			
Route of Exposure	:		inhalation	n, dermal			
Exposure Concentr	ration (Uni	t):	2.6 - 2.73	7  mg/m	:		
Number of Sample	s:		65 (sets o	of 13, ave	raged in	nto one point)	
Number of Sites:			1		_	- ,	
Type of Measurem	ent or Met	hod:	8 hour T	WA			
Worker Activity:	Worker Activity:		Cleaning,	TCE red	covery o	operations, etc.	
Type of Sampling:		Area					
Sampling Location:		Multiple					
Exposure Duration:		<8 hours					
Exposure Frequency:		Varies					
Engineering Contro	Engineering Control & percent Exposure Reduction:		SAFET 7	lainer sys	$\operatorname{stem}$		
PPE:			Varies				
EVALUATION							
Domain		Metric	Rating	$MWF^*$	Score	Comments	
Domain 1: Reliabil	lity						
	Metric 1:	Methodology	Medium	$\times 1$	2	German Technical Rule TRGS 402, assumed to be acceptable	
Domain 2: Represe	entative						
	Metric 2:	Geographic Scope	Medium	× 1	2	EU data (OECD)	
	Metric 3:	Applicability	High	$\times 2$	$\overline{2}$	Workplace that utilizes TCE	
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	data from 2013	
	Metric 5:	Sample Size	Medium	$\times 1$	2	All results indicated as less the the LOQ	
Domain 3. Accessi	hility/Clari	ity					
Domain of Treessi	Metric 6: Metadata Completeness		Medium	$\times 1$	2	Exposure type and sample type given, no other metadata	
	-	<b>L</b>					
Domain 4: Variabi	lity and Ur	ncertainty					
		Cor	tinued on r	next page	<i>.</i>		

				aca nom p	10110 db	Page		
Source Citation:	D. O. W. analysis.	D. O. W. Deutschland. 2017. Chemical safety report: Use of trichloroethylene as extraction solvent for bitumen in asphalt analysis.						
Type of Data Source	Occupation	nal Exposure; Monit	oring Data:	;				
Hero ID	3970802	3970802						
EVALUATION								
Domain		Metric		Rating	$\mathrm{MWF}^{\star}$	Score		Comments
	Metric 7:	Metadata Complet	eness	Low	$\times 1$	3	Not addressed	
Overall Quality E	Determinatio	$\mathbf{n}^{\dagger}$		Medium		1.7		

Source Citation:	Feistritz Microporous, gmbh. 2014. Chemical safety report: Trichloroethylene used as degreasing solvent in the manufacture of polyethylene separators for lead-acid batteries							
Type of Data Source Hero ID	Occupatio 3970808	Occupational Exposure; Monitoring Data; 3970808						
EXTRACTION								
Parameter			Data					
Life Cycle Stage:			Uso					
Physical Form:			liquid va	por				
Route of Exposur	e:		inhalatior	n. dermal				
Exposure Concen	tration (Uni	it):	36.9 mg/r	m3				
Number of Sampl	es:	,	22					
Number of Sites:		1						
Type of Measurement or Method:		8 hour TV	WA					
Worker Activity:	Worker Activity:		Chopping	, cutting	, windir	ng and packaging the product.		
Type of Sampling:		Likely are	ea.					
EVALUATION								
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments		
	.1.,							
Domain 1: Reliab	Motrie 1.	Mathadalam	Low	× 1	2			
	metric 1.	Methodology	LOW	× 1	3	Not specified		
Domain 2: Repres	sentative							
*	Metric 2:	Geographic Scope	Medium	$\times 1$	2	EU data (OECD)		
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE		
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Sampling from 2014		
	Metric 5:	Sample Size	Medium	$\times 1$	2	only 90th percentile given		
	·1 ·1· / / / / 1	•,						
Domain 3: Access	Motrie C	Ity Matadata Completeness	Low	× 1	2			
	Metric 0:	Metadata Completeness	LOW	X 1	3	Sample type given, but no other metadata		
Domain 4: Varial	oility and U	ncertainty						
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed		
		*						
Overall Quality D	Oeterminatio	$\mathbf{n}^{\dagger}$	Medium		1.9			
2 · · · · · · · · · · · · · · · · · · ·								

Source Citation:	Vlisco Net	therlands, B. V 2014. Chemic f regin from dyad gloth	al safety re	port Par	t A: Us	e of trichloroethylene as a solvent for the removal and		
Type of Data Source Hero ID	Occupatio 3970833	nal Exposure; Monitoring Data;						
EXTRACTION			_					
Parameter			Data					
Life Cycle Stage:			Use					
Physical Form:		liquid, va	por					
Route of Exposure:		inhalation, dermal						
Exposure Concent	tration (Uni	it):	0.7-27.4 n	ng/m3				
Number of Samples:		37	·					
Number of Sites:			1					
Type of Measurement or Method:		Long terr	n					
Worker Activity:		Operation	ns, Wash	ing clot	h, operating wax recovery unit, general office			
			work.					
Type of Sampling:			Personal					
Sampling Location:			Multiple					
Exposure Duratio	n:		< 8  hours					
PPE:			Standard	PPE				
EVALUATION								
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments		
Domain 1: Reliab	ility							
	Metric 1:	Methodology	Medium	$\times 1$	2	Well described, but method not cited		
Domain 9. Panno	ontotivo							
Domain 2: Repres	Motric 2	Coographic Scope	Modium	$\sim 1$	2	Ell data (OECD)		
	Metric 3:	Applicability	High	$^{\wedge 1}$ $^{\vee 2}$	2	Workplace that utilizes TCF		
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	2016 2 years old		
	Metric 5:	Sample Size	High	$\times 1$	1	Discrete samples given		
		*						
Domain 3: Access	ibility/Clar	ity						
	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	Exposure type, sample type, worker activities given, no other metadata		
Domain 4: Variab	ility and U	ncertainty						
		Con	tinued on r	next page	<u>)</u>			

Source Citation:	Vlisco Netherlands, B. V 2014. Chemical safety report Part A: Use of trichloroethylene as a solvent for the removal and recovery of resin from dyed cloth.						
Type of Data Source	Occupation	nal Exposure; Monitoring	Data;				
Hero ID	3970833	3970833					
EVALUATION							
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score		Comments
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed	
Overall Quality D	Determinatio	n†	High		1.6		

Source Citation:	Lewis, F.	A 1980. Health hazard eva	luation rep	ort no.	HHE 8	30-87-708, Harowe Servo Contorls Inc., West Chester,
Type of Data Source Hero ID	Occupation 3970663	nal Exposure; Monitoring Data;				
EXTRACTION						
Parameter			Data			
Life Cycle Stage:			Use			
Physical Form:	Physical Form:			por		
Route of Exposur	e:		inhalatio	n, dermal	1	
Exposure Concent	tration (Uni	t):	0.32-21 p	pmTWA	: 10.8-12	2.3 ppmCeiling:10.6 - 27.3 ppm
Number of Sampl	es:		16			
Number of Sites:			1			
Type of Measurer	ment or Met	hod:	Short-ter	m, 8 hou	r TWA	
Worker Activity:	Worker Activity:			greasing		
Type of Sampling:			Personal,	area		
Exposure Duration:			Varies			
Exposure Frequer	Exposure Frequency:					
PPE:			Standard	PPE		
EVALUATION			D II		a	C
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Beliah	ility					
Domain 1. Itenad	Metric 1	Methodology	High	× 1	1	No analytical method given, but completed by NIOSH
		memodology	111811	~ 1	-	The analysical method given, but completed by 110011
Domain 2: Repres	sentative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data older than 10 years (1980) but after PEL
	Metric 5:	Sample Size	High	$\times 1$	1	Discrete samples given
Domain 3: Access	vibility/Clar	itz				
Domain 5. Access	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	Most metadata given, missing exposure frequency
		*				· · · · · · ·
Domain 4: Variab	oility and Ui	ncertainty				
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed
		Con	tinued on i	next page	e	

		commuca nom	proviou	puge	
Source Citation:	Lewis, F. A 1980. Health Pennsylvania.	n hazard evaluation rep	oort no.	HHE 80-87-708,	Harowe Servo Contorls Inc., West Chester,
Type of Data Source Hero ID	Occupational Exposure; Mon 3970663	itoring Data;			
EVALUATION					
Domain	Metrie	c Rating	$MWF^{\star}$	Score	Comments
Overall Quality I	$\operatorname{Petermination}^{\dagger}$	High		1.6	

Source Citation: Hills, B.	W.,Kawamoto, M. M., 1992. Hea Huron Michigan	lth hazard o	evaluatio	n repor	t no. HETA 90-029-2212; United Technologies Automo-			
Type of Data Source Occupati Hero ID 3970662	onal Exposure; Monitoring Data;							
EXTRACTION								
Parameter								
Life Cycle Stage:		Use						
Physical Form:		vapor						
Route of Exposure:		inhalation	n, derma	1				
Exposure Concentration (U	nit):	3.6-21.4 p	pm					
Number of Samples:	,	4	1					
Number of Sites:		1						
Type of Measurement or Me	ethod:	Long terr	n					
Worker Activity:		laminatio	n, cuttin	g lamin	ation			
Number of Workers:		132	,	0				
Type of Sampling:		Area						
Sampling Location:		Multiple						
Exposure Duration:		Varies						
Exposure Frequency:		Varies						
Analytic Method:		NIOSH M	fethod 1	022				
EVALUATION								
Domain	Metric	Rating	MWF*	Score	Comments			
Domain 1: Reliability								
Metric 1:	Methodology	High	$\times 1$	1	NIOSH Method 1022			
Domain 2: Representative	Coordination Coordination	TT:l.		1				
Metric 2: Metric 2:	Applicability	ПIGП Uimh	× 1 × 2	1				
Metric 3:	Applicability	High	× 2	2	Workplace that utilizes TCE			
Metric 4:	Sample Size	Medium	× 2	4	Data older than 10 years (1992) but after PEL			
Metric 5:	Sample Size	High	× 1	1	Discrete samples given			
Domain 3: Accessibility/Cla	rity							
Metric 6: Metadata Completeness			$\times 1$	2	Most metadata given, missing exposure frequency			
	1				⊖ ,			
Domain 4: Variability and U	Incertainty							
	Cor	ntinued on r	next page	э				

Source Citation:	Hills, B. W tive, Port	.,Kawamoto, M. M 1992. Hea Huron, Michigan.	lth hazard o	evaluation	n report	t no. HETA 90-029-2212; United Technologies Automo-
Type of Data Source	Occupation	nal Exposure; Monitoring Data;				
	3970002					
EVALUATION						
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments
	Metric 7:	Metadata Completeness	Medium	$\times 1$	2	None discussed, but NIOSH method addresses variability/ uncertainty in the method
Overall Quality D	Determination	$\mathbf{n}^{\dagger}$	High		1.4	

Source Citation:	Vandervort, R., Polakoff, P. L. 1973. Health hazard evaluation report no. HHE 72-84-31, Dunham-Bush, Incroprated, West Hartford Connecticut Part 2						
Type of Data Source Hero ID	Occupatio 3970657	nal Exposure; Monitoring Data;					
EXTRACTION							
Parameter			Data				
Life Cruele Sterrey			Uas				
Physical Form:			liquid va	nor			
Boute of Exposur	e.		inhalation	n dermal			
Exposure Concent	tration (Uni	it):	170-420 n	ng/m3			
Number of Sampl	es:		30				
Number of Sites:			1				
Type of Measurer	ment or Met	chod:	Short-terr	m			
Worker Activity:			Degresasi	ng and a	ssembli	ng air conditioners	
Number of Worke	rs:		480				
Type of Sampling	:		Personal,	area			
EVALUATION							
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments	
Demein 1. Delieb	:1:						
Domain 1: Keliab	Metric 1:	Methodology	High	$\times 1$	1	No analytical method given, but completed by NIOSH and includes well described process	
Domain 2: Repres	sentative		TT: 1	1	1		
	Metric 2:	Geographic Scope	Hign Hisub	× 1	1		
	Metric 3:	Applicability	High	× 2	2	Workplace that utilizes TCE	
	Metric 4: Motric 5:	Sample Size	High	$\times 2$ $\times 1$	4	Data older than 10 years (1973) but after PEL	
	metric 5.	Sample Size	IIIgii	~ 1	1	Discrete samples given	
Domain 3: Access	sibility/Clar	ity					
	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	Most metadata given, missing exposure frequency	
Domain 4: Variab	oility and U	ncertainty					
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed	
Quenell Quelite D	at amainsti-	t	Himb		1.6		
Overall Quality D	eterminatio	011.	nıgn		1.0		
Continued on next page							

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Source Citation:	Vandervort, R., Polakoff, P. L. 1973. Healt Hartford, Connecticut, Part 2.	th hazard e	evaluation	n report no	HHE 72-84-31, Dunham-Bush, Incroprated, West	
Type of Data Source	rce Occupational Exposure; Monitoring Data;					
Hero ID	3970657					
EVALUATION						
Domain	Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments	

Source Citation:Straub,Type of Data SourceOccupatHero ID3970655	W. E.,Meyer, C., 1977. Health ha ional Exposure; Monitoring Data;	zard evalua	tion repo	ort no. I	HHE 77-3-420, Essex International, Kittaning, PA.
EXTRACTION Parameter		Data			
Life Cycle Stage:		Use			
Physical Form:		liquid, va	por		
Route of Exposure:	• • •	inhalation	n, dermal		
Exposure Concentration (U	nit):	1-15 ppm			
Number of Samples:		50 1			
Number of Sites:	athad.	I Short torr	-		
Worker Activity:	etilou.	Soldering	ui assombl	v of olo	ctronic chin hoards
Type of Sampling		Personal	A rea	y or ere	ctronic chip boards
Type of Sampling.		i oisoitai,	11100		
EVALUATION					
Domain	Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments
Domain 1: Beliability					
Metric 1	: Methodology	High	$\times 1$	1	No analytical method given, but completed by NIOSH and includes well described process
Domain 2: Representative					
Metric 2	: Geographic Scope	High	$\times 1$	1	US
Metric 3	: Applicability	High	$\times 2$	2	Workplace that utilizes TCE
Metric 4	: Temporal Representativeness	Medium	$\times 2$	4	Data older than 10 years (1976) but after PEL
Metric 5	: Sample Size	High	$\times 1$	1	Discrete samples given
Domain 3: Accossibility/Cl	arity				
Metric 6	: Metadata Completeness	Low	× 1	3	Sample type given no other metadata
		1011			Sampio of po Brion no ochor moradata
Domain 4: Variability and	Uncertainty				
Metric 7	: Metadata Completeness	Low	$\times 1$	3	Not addressed
Overall Quality Determinat	$\mathrm{ion}^\dagger$	Medium		1.7	

Source Citation: Kramkowski, Peru Illinois	, R. S. 1978. Health hazard	evaluation	report no	o. HHE	E 78-56-511, Westclox-Division of General Time Corp.,
Type of Data SourceOccupationaHero ID3970653	l Exposure; Monitoring Data;				
EXTRACTION					
Parameter		Data			
		**			
Life Cycle Stage:		Use			
Physical Form:		liquid, vaj	por		
Function Concentration (Unit)		5 61 ppm	i, dermai		
Number of Semples:		6			
Number of Sites:		1			
Type of Measurement or Metho	od:	Long tern	n		
Worker Activity:		Degreasin	ø.		
Type of Sampling:		Personal.	Area		
		,			
EVALUATION					
Domain	Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	No analytical method given, but completed by NIOSH and includes well described process
Domain 2: Representative	Geometric Geome	TT:l.	1	1	
Metric 2: 0	Geographic Scope	High Hisub	× 1	1	
Metric 3: A	Applicability	піді Madium	× 2 × 2	2 4	Workplace that utilizes TCE
Metric 4:	Semple Size	Medium	× 2 × 1	4	Data older than 10 years (1978) but after PEL
metric 5.	Sample Size	Iligii	× 1	1	Discrete samples given
Domain 3: Accessibility/Clarity	7				
Metric 6: 1	Metadata Completeness	Medium	$\times 1$	2	Most metadata given, missing exposure frequency
Domain 4: Variability and Unce	ertainty	Ŧ	1	0	
Metric 7: 1	Metadata Completeness	Low	× 1	3	Not addressed
Overall Quality Determination <sup>†</sup>		High		1.6	
		8		1.0	

Source Citation:	Finely, M. Illinois	Page, E 2005. Health hazard	evaluation i	report no	. HETA	A 2003-0203-2952, Wallace Computer Services, Clinton,
Type of Data Source Hero ID	Occupation 3970650	nal Exposure; Monitoring Data;				
EXTRACTION						
Parameter			Data			
Dhusical Farma			Use			
Physical Form			vapor			
Function Concern	e: tration (IIni	+).	ND 25m	1		
Exposure Concert Number of Sempl		t <i>)</i> :	ND - 20p	рш		
Number of Sites:	es.		20 1			
Worker Activity:			Printing 1	Drogg		
Number of Worke	rs.		81	1055		
Type of Sampling	····		Personal			
Type of sampling	.•		1 orboniai			
EVALUATION						
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments
Domain 1: Reliab	ility		TT· 1	1	1	
	Metric 1:	Methodology	High	× 1	1	No analytical method given, but completed by NIOSH and includes well described process
Domain 9. Doma						
Domain 2: Repres	Motria 2.	Coorrenhia Saona	Ujeh	× 1	1	110
	Metric 2.	Appliesbility	High Ligh	× 1 × 9	1	US
	Metric 3.	Tomporal Poprogentativeness	Modium	× 2 × 9	2 4	workplace that utilizes ICE
	Metric 4:	Sample Size	High	$\times 2$ $\times 1$	4	2005, 13 years old (after PEL)
	Metric 5:	Sample Size	mgn	× 1	1	Discrete samples given
Domain 3: Access	sibility/Clar	ity				
20111111 01 110000	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	Most metadata given, missing exposure frequency
Domain 4: Variat	oility and Ur	ncertainty	Ŧ			
	Metric 7:	Metadata Completeness	Low	× 1	3	Not addressed
Orronall Orreliter D	otominatio	nţ	Uich		16	
Overall Quality L	eterminatio	11.	mgn		1.0	

Source Citation:Gunter, BType of Data SourceOccupationHero ID3970648	. J 1977. Health hazard evalua nal Exposure; Monitoring Data;	tion report	no. HHE	2 76-101	-376, FMC Corporation, Broomfield, Colorado.		
EXTRACTION Parameter		Data					
Life Cycle Stage: Physical Form: Route of Exposure: Exposure Concentration (Unit): Number of Samples: Number of Sites: Worker Activity: Type of Sampling: Engineering Control & percent Exposure Reduction: PPE:			Use liquid, vapor inhalation, dermal 2-57 mg/m3 10 1 Degreasing, Polishing, Engraving, Painting, Personal, area Well Ventilated Hoods Appropriate PPE				
EVALUATION Domain	Metric	Rating	MWF*	Score	Comments		
Domain 1: Reliability Metric 1:	Methodology	High	× 1	1	No analytical method given, but completed by NIOSH and includes well described process		
Domain 2: Representative Metric 2: Metric 3: Metric 4: Metric 5:	Geographic Scope Applicability Temporal Representativeness Sample Size	High High Medium High	$\begin{array}{c} \times \ 1 \\ \times \ 2 \\ \times \ 2 \\ \times \ 1 \end{array}$	$\begin{array}{c} 1\\ 2\\ 4\\ 1\end{array}$	US Workplace that utilizes TCE Data older than 10 years (1976) but after PEL Discrete samples given		
Domain 3: Accessibility/Clar Metric 6:	ity Metadata Completeness	Medium	× 1	2	Most metadata given, missing exposure frequency		
Domain 4: Variability and U Metric 7:	ncertainty Metadata Completeness	Low	× 1	3	Not addressed		
Overall Quality Determination	on <sup>†</sup>	High		1.6			

Source Citation:	Finely, M., Tapp, L. 2004. Health hazard evaluation report no. HETA 2003-0029-2923, Ward Brodt Music Mall, Madison, Wisconsin.								
Type of Data Source	Occupation	nal Exposure; Monitoring Data;							
Hero ID	3970649								
EXTRACTION									
Parameter	Data								
			TT						
Life Cycle Stage:			Use lignid rea						
Physical Form:			include, va	por					
Function Concentre	: notion (Uni	+).		i, dermai	l				
Number of Semales	ation (Om	<i>t</i> ).	699ppm						
Number of Sites:	5.		0						
Type of Messurem	ont or Mot	hod	Long torr	o /Full S	hift				
Worker Activity:		nou.	Instrume	nt Renair	variou	is tasks			
Number of Workers	s:		126. with	8 workir	ng with	TCE			
Type of Sampling:			Personal.	area	-6	102			
Exposure Duration	:		Short						
Exposure Frequenc	v:		Frequent						
Engineering Contro	ol & percer	t Exposure Reduction:	Local Exhaust Ventilation, Vent hoods						
PPE:	1	1.	Gloves, eye goggles, aprons, and dustmasks.						
Analytic Method:			NIOSH method 2549						
EVALUATION									
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments			
Domain 1. Roliabil	ity								
Domain 1. Reliabil	Metric 1.	Methodology	High	× 1	1	NIOSH method 2549			
		Methodology	IIIgii	~ 1	1	N10511 Inctified 2545			
Domain 2: Represe	entative								
-	Metric 2:	Geographic Scope	High	$\times 1$	1	US			
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE			
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	2004, 14 years old (after PEL)			
	Metric 5:	Sample Size	High	$\times 1$	1	Discrete samples given			
Domain 2. Assessi	aility /Class								
Domain 5: Accessi	Motria 6:	Motadata Completeness	Modium	√ 1	0	Mast matadata sinan missing a sure for sure			
	metric 0:	Metadata Completeness	meaium	X 1	2	Most metadata given, missing exposure frequency			

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Source Citation:	Finely, M., Tapp, L 2004. Health Wisconsin.	n hazard evaluation	report n	o. HET	FA 2003-0029-2923, Ward Brodt Music Mall, Madison,
Type of Data Source	Occupational Exposure; Monitorir	ng Data;			
Hero ID	3970649				
EVALUATION					
Domain	Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments
Domain 4: Variab	pility and Uncertainty Metric 7: Metadata Completene	ss Medium	× 1	2	None discussed, but NIOSH method addresses variability/ uncertainty in the method
Overall Quality D	$\operatorname{Petermination}^{\dagger}$	High		1.4	

Source Citation: Burr, O	Source Citation: Burr, G. 2003. Health hazard evaluation report no. HETA 2002-0184-2888, Aero-Classics, Ltd., Huron, Ohio.							
Hero ID 397064	ational Exposure; Monitoring Data 7	;						
EXTRACTION								
Parameter		Data						
Life Cycle Stare:		Uco						
Physical Form:		Vapor						
Boute of Exposure		inhalatio	n					
Exposure Concentration (	Unit):	7.1-7.6 pi	pm					
Number of Samples:	· · · · · · · · · · · · · · · · · · ·	3	F					
Number of Sites:		1						
Type of Measurement or 1	Method:	Long teri	m					
Worker Activity:		Welding						
Number of Workers:		15						
Type of Sampling:		Personal,	area					
Engineering Control & pe	rcent Exposure Reduction:	Local Ex	haust Ve	ntilation	l			
PPE:		Half face	Half face respirator					
Analytic Method:		NIOSH N	Method N	lo. 1003				
EVALUATION								
Domain	Metric	Rating	$MWF^{\star}$	Score	Comments			
Domain 1. Beliability								
Metric	1: Methodology	High	$\times 1$	1	NIOSH Method No 1003			
		0						
Domain 2: Representative								
Metric	2: Geographic Scope	High	$\times 1$	1	US			
Metric	3: Applicability	High	$\times 2$	2	Workplace that utilizes TCE			
Metric	4: Temporal Representativeness	Medium	$\times 2$	4	2003, 15 years old (after PEL)			
Metric	5: Sample Size	High	$\times 1$	1	Discrete samples given			
Domain 3: Accessibility/(	larity							
Metric	6: Metadata Completeness	Medium	$\times 1$	2	Most metadata given, missing exposure frequency			
	*				_ · V			
Domain 4: Variability and	l Uncertainty							
Metric	7: Metadata Completeness	Medium	$\times 1$	2	None discussed, but NIOSH method addresses variability/			
					uncertainty in the method			
Continued on next page								

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Source Citation: Type of Data Source Hero ID	Burr, G. 2003. Health hazard evaluation Occupational Exposure; Monitoring Data 3970647	n report no. ] a;	HETA 20	02-0184-2	888, Aero-Classics, Ltd., Huron, Ohio.
<b>EVALUATION</b> Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality D	Petermination <sup>†</sup>	High		1.4	

Source Citation:	Kinnes, G	. M 1998. Health hazard eva	luation rep	ort no.	HETA	97-0214-2689, Dorma Door Controls, Inc., Reamstown
Type of Data Source Hero ID	Occupatio 3970645	nal Exposure; Monitoring Data;				
EXTRACTION						
Parameter			Data			
Life Cycle Sterrey			Uco			
Physical Form			Vapor			
Route of Exposu	e:		inhalatior	ı		
Exposure Concen	tration (Uni	it):	0.71 - 3.5	ppm		
Number of Samp	les:		3	r r		
Number of Sites:			1			
Type of Measure	ment or Met	hod:	Partial Sh	nift, TWA	A	
Worker Activity:			Degreaser	•		
Type of Sampling	r:		Area			
Analytic Method	:		NIOSH M	fethod 10	022	
EVALUATION						
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments
Domain 1. Daliak	.:1:					
Domain 1: Kenat	Metric 1:	Methodology	High	× 1	1	NIOSH Method 1022
			8			
Domain 2: Repre	sentative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data older than 10 years (1998) but after PEL
	Metric 5:	Sample Size	High	$\times 1$	1	Discrete samples given
	:L:1:4_/CU	:				
Domain 3: Access	sibility/Clar	Nete lete Generaleter ere	M. J	1	0	
	Metric 6:	Metadata Completeness	Medium	× 1	2	Most metadata given, missing exposure frequency
Domain 4. Varial	oility and U	ncertainty				
	Metric 7:	Metadata Completeness	Medium	$\times 1$	2	None discussed, but NIOSH method addresses variability/ uncertainty in the method
	Set	†	TT:]		14	
Overall Quality I	Peterminatic	on'	High		1.4	
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Source Citation:	Kinnes, G. M 1998. Health hazard eva Pennsylvania.	aluation report n	р. НЕТА 97-0	214-2689, Dorma Door Controls, Inc., Reamstown
Type of Data Source	Occupational Exposure; Monitoring Data;			
Hero ID	3970645			
EVALUATION				
Domain	Metric	Rating MW	F <sup>*</sup> Score	Comments

Source Citation:	Gunter, B Colorodo.	. J.,Lucas, J. B 1975. H	ealth hazard e	valuation	report	no. HHE 74-61-232, Gates Rubber Company, Denver
Type of Data Source Hero ID	Occupatio 3970644	nal Exposure; Monitoring D	Pata;			
EXTRACTION						
Parameter			Data			
Life Cycle Stage:			Use			
Physical Form:			liquid, va	apor	1	
Route of Exposur	e: hation (IIn:		innalatio	n, dermai	l	
Number of Sampl		it).	<.05 mg	/ 1113		
Number of Sites:	es.		4			
Worker Activity:			Rubber l	ose knitt	ing mad	chine
Number of Worke	rs:		6	10000 1111100		
Type of Sampling	:		Personal			
Sampling Location	n:		Knitting	Station		
Exposure Duratio	n:		Full shift	;		
Engineering Cont	rol & percer	nt Exposure Reduction:	Not asses	ssed.		
PPE:			Cannot v	vear glove	es.	
EVALUATION						
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments
Domain 1: Reliab	ility					
	Metric 1:	Methodology	High	$\times 1$	1	No method given, but HHE done by NIOSH.
Domain 2: Repres	sentative					
Domain = Teopro	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE
	Metric 4:	Temporal Representativen	less Medium	$\times 2$	4	Data older than 10 years $(1975)$ but after PEL
	Metric 5:	Sample Size	High	$\times 1$	1	Discrete samples given
		•,				
Domain 3: Access	ability/Clar	ity	N. 1.	1	0	
	Metric 6:	Metadata Completeness	Medium	× 1	2	Most metadata given, missing exposure frequency
Domain 4. Variah	ility and U	ncertainty				
Domain 4. Variat	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed
		*	Continued on	nevt nage		
			Commueu oli	nent page	, ,	

Source Citation: Type of Data Source Hero ID	Gunter, B. J.,Lucas, J. B. 1975. Colorodo. Occupational Exposure; Monitoring 3970644	Health hazard eva g Data;	aluation re	eport no.	HHE 74-61-232, Gates Rubber Company, Denver
EVALUATION					
Domain	Metric	Rating	MWF* S	Score	Comments
Overall Quality I	$\operatorname{Petermination}^\dagger$	High		1.6	

Source Citation:	Crandall, I	M. S., Galson, S., Hartle, R. W	1988. Hea	lth hazai	rd evalu	ation report no. HETA 87-095-1927, G & L Recovery			
Type of Data Source Hero ID	Occupation 3970640	nal Exposure; Monitoring Data;							
EXTRACTION									
Parameter	Parameter Data								
Life Cycle Stage:			Use						
Physical Form:			liquid, va	por					
Route of Exposur	e:		inhalation	n, dermal					
Exposure Concent	tration (Uni	t):	Personal:	4.9 - 35.	5 ppmA	Area: 0.1 - 42.3 ppm			
Number of Sampl	es:		23						
Number of Sites:			1						
Worker Activity:			Stripping	and recy	cling w	vire.			
Type of Sampling			Personal,	area					
Exposure Duration	on:		Full shift						
Exposure Frequer	Exposure Frequency:								
Engineering Cont	Engineering Control & percent Exposure Reduction:		Local exh	Local exhaust hoods and general building exhaust fans.					
PPE:			Tyvek suits, steel toed rubber boots, hard hats, splash shields, double						
			gloves, respirator (as needed)						
Analytic Method:			NIOSH M	fethod 15	501				
EVALUATION									
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments			
Domain 1: Reliab	oility								
	Metric 1:	Methodology	High	$\times 1$	1	NIOSH Method 1501			
Domoin 9. Donno	antativa								
Domain 2: Repres	Motrie 2.	Coorrenhia Saona	Uigh	× 1	1	IIC			
	Metric 2.	Applicability	High	× 1 × 9	1	US Workplace that utilizes TCE			
	Metric 4:	Tomporal Boprosontativonoss	Modium	$^{\land 2}$ $^{\lor 2}$	2 1	Deta older than 10 years (1088) but ofter PEI			
	Metric 5:	Sample Size	High	× 1	1	Discrete samples given			
	Wittile 0.	Sample Size	Ingn	~ 1	1	Discrete samples given			
Domain 3. Access	sibility/Clari	ty							
Domain 9. Meees	Metric 6:	Metadata Completeness	Medium	× 1	2	Most metadata given missing exposure frequency			
						0)			
Domain 4: Variab	oility and Ur	ncertainty							
		Con	ntinued on 1	next page	;				

Source Citation: Type of Data Source	Crandall, I Systems, In Occupation	M. S.,Galson, S.,Hartle, R. W., ncorporated, Ashtabula, Ohio, nal Exposure: Monitoring Data:	1988. Hea	lth hazar	rd evalu	nation report no. HETA 87-095-1927, G & L Recovery
Hero ID	3970640					
EVALUATION						
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments
	Metric 7:	Metadata Completeness	Medium	$\times 1$	2	None discussed, but NIOSH method addresses variability/ uncertainty in the method
Overall Quality D	Determination	$\mathrm{n}^\dagger$	High		1.4	

Source Citation:	Gilles, D.,	Philbin, E. 1976. Health hazard	l evaluation	report n	o. HHI	E 76-61-337, TRW Incorporated, Philadelphia, Pennsyl-
Type of Data Source Hero ID	Occupatio 3970635	nal Exposure; Monitoring Data;				
EXTRACTION						
Parameter			Data			
Life Cycle Stage:			Use			
Physical Form:			liquid, va	por		
Route of Exposur	e:		inhalatior	n, dermal		
Exposure Concen	tration (Un	it):	76 - 90 pp	om		
Number of Sampl	es:		3			
Number of Sites:			1			
Type of Measurer	nent or Met	thod:	Long term	n		
Worker Activity:			Machine 1	lubricatic	m	
Type of Sampling	;:		Personal			
PPE:			Uniforms,	, gloves		
FUALLATION						
Durain		Materia	Deting	MWD*	<b>C</b>	Commente
Domain		Metric	Rating	IVI VV F	Score	Comments
Domain 1: Beliah	vility					
	Metric 1:	Methodology	High	$\times 1$	1	No method given, but HHE done by NIOSH.
Damain 9. Dama						
Domain 2: Repre	Matria 2	Coorrenkie Coore	Himb	× 1	1	110
	Metric 2:	Applicability	High	× 1 × 9	1	US Werbelass that utilizes TCE
	Metric 4:	Tomporal Representativeness	Modium	$^{\land 2}$ $^{\lor 2}$	2 1	Data older than 10 years (1076) but ofter PEI
	Metric 5:	Sample Size	High	$\times 1$	1	Discrete samples given
			111.511	~ 1	1	Discrete sumpto given
Domain 3: Access	sibility/Clar	rity				
	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	Most metadata given, missing exposure frequency
Domain 4: Varial	oility and U	ncertainty				
	Metric 7:	Metadata Completeness	Low	× 1	3	Not addressed
Overall Quality I	Determinatio	$\mathrm{on}^\dagger$	High		1.6	
Continued on next page						

	comma	ou nom r	or or rotab	P~80	
Source Citation:	Gilles, D., Philbin, E 1976. Health hazard vania.	evaluation	report n	o. HHE 76-61-337, TRW Inc	corporated, Philadelphia, Pennsyl-
Type of Data Source Hero ID	Occupational Exposure; Monitoring Data; 3970635				
EVALUATION					
Domain	Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments

 $\star$  MWF = Metric Weighting Factor

<sup>†</sup> If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High:  $\geq 1$  to < 1.7; Medium:  $\geq 1.7$  to < 2.3; Low:  $\geq 2.3$  to  $\leq 3$ .

Source Citation:Snyder, E.Type of Data SourceOccupationHero ID3970634	M 2003. Health hazard evalua nal Exposure; Monitoring Data;	ation report	no. HE'	FA 2001	I-0150-2917, IKI Manufacturing, Edgerton, Wisconsin.
EXTRACTION Parameter		Data			
Life Cycle Stage: Physical Form: Route of Exposure: Exposure Concentration (Uni Worker Activity: Number of Workers: Type of Sampling: Analytic Method:	t):	Use liquid, vap inhalation 0.045 - 1.5 De-icer ca 10 Personal NIOSH M	por a, dermal 5 ppm an filling. Iethod 15	500	
<b>EVALUATION</b> Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability Metric 1:	Methodology	High	× 1	1	NIOSH Method 1500
Domain 2: Representative Metric 2: Metric 3: Metric 4: Metric 5:	Geographic Scope Applicability Temporal Representativeness Sample Size	High High Medium Medium	$\begin{array}{c} \times 1 \\ \times 2 \\ \times 2 \\ \times 1 \end{array}$	$egin{array}{c} 1 \\ 2 \\ 4 \\ 2 \end{array}$	US Workplace that utilizes TCE Data older than 10 years (2003) but after PEL Only given a range
Domain 3: Accessibility/Clar Metric 6:	ity Metadata Completeness	Medium	× 1	2	Exposure type and sample type given, no other metadata
Domain 4: Variability and Ur Metric 7:	ncertainty Metadata Completeness	Medium	× 1	2	None discussed, but NIOSH method addresses variability/ uncertainty in the method
Overall Quality Determinatio	$\mathbf{n}^{\dagger}$	High		1.6	

Source Citation:	Chrostek, Incorp., W	W. J. Levine M. S., 1981. He Villiamsport, Pennsylvania.	ealth hazar	d evaluat	tion rep	ort no. HHE 30-153-881, Palmer Industrial Coatings
Type of Data Source Hero ID	Occupatio 3970632	nal Exposure; Monitoring Data;				
EXTRACTION						
Parameter			Data			
Life Cycle Stage:			Uso			
Exposure Concen	tration (Uni	t):	1.1-10.4 n	ng/m31-7	7.3  mg/r	m3 TWA
Number of Sampl	es:		13		10 1118/	
Number of Sites:			1			
Type of Measurer	nent or Met	hod:	8 hour TV	WA		
Type of Sampling	:		Personal			
Engineering Cont	rol & percer	nt Exposure Reduction:	Minimal			
PPE:			Single car	rtridge re	spirator	rs, helmet, goggles
Analytic Method:			NIOSH M	fethod P	&CAM	127
EVALUATION						
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments
Domain 1, Polish	;1;+					
Domain 1. Renau	Metric 1:	Methodology	High	$\times 1$	1	NIOSH Method P&CAM 127
Domain 2: Repres	sentative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data older than 10 years $(1981)$ but after PEL
	Metric 5:	Sample Size	High	$\times 1$	1	Discrete samples given
Domain 2. Agaar	yihility /Clan	+				
Domain 5. Access	Metric 6	Metadata Completeness	Medium	$\times 1$	2	Most motodata given missing exposure frequency
	Meerre 0.	Metadata Completeness	meanin	~ 1	4	Most includata given, inissing exposure inequency
Domain 4: Variał	oility and Ui	ncertainty				
	Metric 7:	Metadata Completeness	Medium	$\times 1$	2	None discussed, but NIOSH method addresses variability/ uncertainty in the method
Overall Quality I	Peterminatio	$\mathbf{n}^{\dagger}$	High		1.4	

Source Citation:	Gilles, D., Illinois	Anania, T. L.,Ilka, R., 1977.	Health haz	ard evalu	uation r	eport no. HHE 77-12-418, Airtex Products, Fairfield,	
Type of Data Source Hero ID	Occupation 3970629	nal Exposure; Monitoring Data;					
EXTRACTION Parameter			Data				
			Data				
Life Cycle Stage:			Use				
Physical Form:			liquid, va	por			
Route of Exposur	e:		inhalation	, dermal			
Exposure Concer	tration (Uni	t):	.44ppm	,			
Number of Sampl	les:	,	1				
Number of Sites:			1				
Worker Activity:			Area besi	de degrea	aser		
Type of Sampling	<b>;</b> :		Area				
Sampling Locatio	n:		Area besi	de degrea	aser		
Exposure Duratio	on:		Full shift				
Engineering Cont	rol & percer	t Exposure Reduction:	Local exhaust ventilation, vent hoods				
EVALUATION							
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments	
Domain 1. Roliah	, ilitar						
Domain 1. Renau	Metric 1:	Methodology	High	× 1	1	No method given, but HHE done by NIOSH	
			111511	/\ I	-	no method given, but fifth done by fiftobil.	
Domain 2: Repres	sentative						
Domain 2: Repres	sentative Metric 2:	Geographic Scope	High	× 1	1	US	
Domain 2: Repres	sentative Metric 2: Metric 3:	Geographic Scope Applicability	High High	$ \times 1 \ \times 2 $	$\frac{1}{2}$	US Workplace that utilizes TCE	
Domain 2: Repres	sentative Metric 2: Metric 3: Metric 4:	Geographic Scope Applicability Temporal Representativeness	High High Medium	$\begin{array}{c} \times \ 1 \\ \times \ 2 \\ \times \ 2 \end{array}$	1     2     4	US Workplace that utilizes TCE Data older than 10 years (1977) but after PEL	
Domain 2: Repres	sentative Metric 2: Metric 3: Metric 4: Metric 5:	Geographic Scope Applicability Temporal Representativeness Sample Size	High High Medium High	$\begin{array}{c} \times \ 1 \\ \times \ 2 \\ \times \ 2 \\ \times \ 1 \end{array}$	$egin{array}{c} 1 \\ 2 \\ 4 \\ 1 \end{array}$	US Workplace that utilizes TCE Data older than 10 years (1977) but after PEL Discrete samples given	
Domain 2: Repres	sentative Metric 2: Metric 3: Metric 4: Metric 5:	Geographic Scope Applicability Temporal Representativeness Sample Size	High High Medium High	$\begin{array}{c} \times \ 1 \\ \times \ 2 \\ \times \ 2 \\ \times \ 1 \end{array}$	$\begin{array}{c} 1\\ 2\\ 4\\ 1\end{array}$	US Workplace that utilizes TCE Data older than 10 years (1977) but after PEL Discrete samples given	
Domain 2: Repres	sentative Metric 2: Metric 3: Metric 4: Metric 5: sibility/Clari	Geographic Scope Applicability Temporal Representativeness Sample Size	High High Medium High	$\begin{array}{c} \times \ 1 \\ \times \ 2 \\ \times \ 2 \\ \times \ 1 \end{array}$	$\begin{array}{c}1\\2\\4\\1\end{array}$	US Workplace that utilizes TCE Data older than 10 years (1977) but after PEL Discrete samples given	
Domain 2: Repres	sentative Metric 2: Metric 3: Metric 4: Metric 5: sibility/Clari Metric 6:	Geographic Scope Applicability Temporal Representativeness Sample Size ity Metadata Completeness	High High Medium High Medium	$ \begin{array}{c} \times 1 \\ \times 2 \\ \times 2 \\ \times 1 \end{array} $	$\begin{array}{c}1\\2\\4\\1\end{array}$	US Workplace that utilizes TCE Data older than 10 years (1977) but after PEL Discrete samples given Most metadata given, missing exposure frequency	
Domain 2: Repres	sentative Metric 2: Metric 3: Metric 4: Metric 5: sibility/Clari Metric 6:	Geographic Scope Applicability Temporal Representativeness Sample Size ity Metadata Completeness	High High Medium High Medium	$ \begin{array}{c} \times 1 \\ \times 2 \\ \times 2 \\ \times 1 \end{array} $	$\begin{array}{c}1\\2\\4\\1\end{array}$	US Workplace that utilizes TCE Data older than 10 years (1977) but after PEL Discrete samples given Most metadata given, missing exposure frequency	
Domain 2: Repres	sentative Metric 2: Metric 3: Metric 4: Metric 5: sibility/Clari Metric 6: pility and Ur Metric 7:	Geographic Scope Applicability Temporal Representativeness Sample Size ity Metadata Completeness neertainty Metadata Completeness	High High Medium High Medium	$ \begin{array}{c} \times 1 \\ \times 2 \\ \times 2 \\ \times 1 \end{array} $		US Workplace that utilizes TCE Data older than 10 years (1977) but after PEL Discrete samples given Most metadata given, missing exposure frequency	
Domain 2: Repres	sentative Metric 2: Metric 3: Metric 4: Metric 5: sibility/Clar: Metric 6: bility and Ur Metric 7:	Geographic Scope Applicability Temporal Representativeness Sample Size ity Metadata Completeness ncertainty Metadata Completeness	High High Medium High Medium	$ \begin{array}{c} \times 1 \\ \times 2 \\ \times 2 \\ \times 1 \end{array} $ $ \times 1 $	$     \begin{array}{c}       1 \\       2 \\       4 \\       1 \\       2 \\       3     \end{array} $	US Workplace that utilizes TCE Data older than 10 years (1977) but after PEL Discrete samples given Most metadata given, missing exposure frequency Not addressed	
Domain 2: Repres	sentative Metric 2: Metric 3: Metric 4: Metric 5: sibility/Clar Metric 6: oility and Ur Metric 7:	Geographic Scope Applicability Temporal Representativeness Sample Size ity Metadata Completeness neertainty Metadata Completeness	High High Medium High Medium Low	$\begin{array}{c} \times 1 \\ \times 2 \\ \times 2 \\ \times 1 \end{array}$ $\times 1$ $\times 1$	$     \begin{array}{c}       1 \\       2 \\       4 \\       1 \\       2 \\       3 \\       16 \\      $	US Workplace that utilizes TCE Data older than 10 years (1977) but after PEL Discrete samples given Most metadata given, missing exposure frequency Not addressed	
Domain 2: Repres	sentative Metric 2: Metric 3: Metric 4: Metric 5: sibility/Clar: Metric 6: Dility and Ur Metric 7: Determinatio	Geographic Scope Applicability Temporal Representativeness Sample Size ity Metadata Completeness ncertainty Metadata Completeness n <sup>†</sup>	High High Medium High Low High	$ \begin{array}{c} \times 1 \\ \times 2 \\ \times 2 \\ \times 1 \end{array} \\ \times 1 \\ \times 1 \end{array} $	$     \begin{array}{c}       1 \\       2 \\       4 \\       1 \\       2 \\       3 \\       1.6 \\       \end{array} $	US Workplace that utilizes TCE Data older than 10 years (1977) but after PEL Discrete samples given Most metadata given, missing exposure frequency Not addressed	

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Source Citation:	Gilles, D.,Anania, T. L.,Ilka, R 1977. Illinois.	Health haza	ard evalu	ation report no.	HHE 77-12-418, Airtex Products, Fairfield,
Type of Data Source	Occupational Exposure; Monitoring Data	;			
Hero ID	3970629				
EVALUATION					
Domain	Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments

Source Citation:	Johnson, F	P. 1980. Health hazard evaluation	on report no. HI	HE 80-48	-689, M	iami Carey Inc., Monroe, Ohio.	
Type of Data Source	Occupation	nal Exposure; Monitoring Data;					
Hero ID	3970628						
EXTRACTION							
Parameter	arameter Data						
Life Cycle Stage			Uso				
Exposure Concent	ration (Uni	+).	4.0-11.9  mg/m	3			
Worker Activity		0).	Hanging produ	o icts to be	din nai	inted	
Type of Sampling			Personal, area		up pu		
Exposure Duratio	n:		2 hours				
Exposure Frequen	cv:		6-8 hours/40 h	our week	:		
Engineering Contr	rol & percer	t Exposure Reduction:	Slot exhaust he	bod			
EVALUATION							
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments	
Domain 1: Beliab	ility						
	Metric 1:	Methodology	High	$\times 1$	1	No method given, but HHE done by NIOSH.	
Domain 2: Repres	sentative	a					
	Metric 2:	Geographic Scope	High	× 1	1	US	
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE	
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data older than 10 years $(1980)$ but after PEL	
	Metric 5:	Sample Size	Medium	$\times 1$	2	range given but no other statistics	
Domain 3: Access	ibility/Clari	ity					
Domain 9. Access	Metric 6:	Metadata Completeness	Unacceptable	$\times 1$	4	No metadata given	
		I					
Domain 4: Variab	ility and Ur	ncertainty					
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed	
Overall Quality D	eterminatio	$n^{\dagger}$	Unacceptable		4	Metric Mean Score: 1.9.	

\*\* Consistent with our Application of Systematic Review in TSCARisk Evaluations document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

\* MWF = Metric Weighting Factor

<sup>†</sup> If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High:  $\geq 1$  to < 1.7; Medium:  $\geq 1.7$  to < 2.3; Low:  $\geq 2.3$  to  $\leq 3$ .
Source Citation: Kominsky Type of Data Source Occupatio	, J. R. 1976. Health hazard eva nal Exposure; Monitoring Data;	luation repo	ort no. H	HE 76-1	24-350, Dana Corporation, Tipon, Indiana.
11e10 1D 3970025					
EXTRACTION					
Parameter		Data			
Life Cycle Stage		Use			
Physical Form:		liquid va	por		
Boute of Exposure:		inhalation	n dermal		
Exposure Concentration (Un	it):	7 - 797 pi	om		
Number of Samples:		20			
Number of Sites:		1			
Worker Activity:		Degrease	Operato	or	
Number of Workers:		157; 12 in	directly	and 8 d	irectly affected.
Type of Sampling:		Personal			
Engineering Control & perce	nt Exposure Reduction:	Local Exi	naust ven	tilation	
	-				
EVALUATION					
Domain	Metric	Rating	$MWF^{\star}$	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	$\times 1$	1	No method given, but HHE done by NIOSH.
Domain 2: Representative					
Metric 2:	Geographic Scope	High	$\times 1$	1	US
Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE
Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data older than 10 years $(1976)$ but after PEL
Metric 5:	Sample Size	High	$\times 1$	1	Discrete samples given
Domain 3: Accessibility/Clar	ity				
Metric 6:	Metadata Completeness	Medium	$\times 1$	2	Most metadata given, missing exposure frequency
Domain 4: Variability and U	ncertainty	т	1	9	
Metric 7:	Metadata Completeness	LOW	× 1	3	Not addressed
	+				
Overall Quality Determination	on'	High		1.6	

Source Citation:	Fannick, N New York	N 1979. Health hazard evaluat	ion report	no. HHI	E 79-18-	627, Standard Folding Cartons, Inc., Jackson Heights,
Type of Data Source Hero ID	Occupatio 3970623	nal Exposure; Monitoring Data;				
EXTRACTION						
Parameter			Data			
Life Cycle Stage:			Use			
Physical Form: Route of Exposur	· · ·		inholotion	por dormal		
Exposure Concert	e. tration (Uni	i+)•	10-16	i, uermai		
Number of Sampl	es.		4			
Number of Sites:			1			
Worker Activity:			Gluing ca	rdboard	boxes	
Type of Sampling	:		Area			
EVALUATION						
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments
	•1•4					
Domain 1: Reliad	Motric 1.	Mathadalagy	High	$\sim 1$	1	No method given but HUE done by NIOSH
	MEULIC 1.	Wethodology	Ingn	~ 1	1	No method given, but fifth done by N10511.
Domain 2: Repres	sentative					
1	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data older than 10 years $(1979)$ but after PEL
	Metric 5:	Sample Size	High	$\times 1$	1	Discrete samples given
	·1 ·1· / / / / 1	•,				
Domain 3: Access	Motrie 6	Ity Motodata Completeness	Modium	× 1	0	
	Metric 0:	Metadata Completeness	Medium	× 1	2	Exposure type and sample type given, no other metadata
Domain 4: Variah	oility and U	ncertainty				
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed
		*				
Overall Quality D	eterminatio	$\mathrm{on}^\dagger$	High		1.6	
- 0			0			

Source Citation:	Bloom, T. Corporatio	F.,Kramkowski, R. S.,Cromer, on Kenton Ohio	J. W 19	74. Heal	th haza	rd evaluation report no. HHE 73-151-141, Essex Wire			
Type of Data Source Hero ID	Occupation 3970621	nal Exposure; Monitoring Data;							
EXTRACTION									
Parameter			Data						
Life Cycle Stage			Use						
Physical Form:			liquid va	por					
Route of Exposure	:		inhalatio	n. dermal	1				
Exposure Concent	ration (Uni	t):	0-100 ppr	n					
Number of Sample	s:	,	12						
Number of Sites:			1						
Type of Measurem	ent or Met	hod:	short-terr	n					
Worker Activity:			Die clean	ing, degr	easer				
Number of Worker	's:		311						
Type of Sampling:			Area						
Engineering Contr	Engineering Control & percent Exposure Reduction:			Some Local Exhaust Ventilation					
EVALUATION									
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments			
Domain 1: Beliabi	lity								
	Metric 1:	Methodology	High	$\times 1$	1	No method given, but HHE done by NIOSH.			
Domain 2: Repres	entative								
Domain 2. Ropros	Metric 2:	Geographic Scope	High	× 1	1	US			
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE			
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data older than 10 years (1974) but after PEL			
	Metric 5:	Sample Size	Medium	$\times 1$	2	range given but no other statistics			
Domain 3: Accessi	bility/Clar	ity							
	Metric 6:	Metadata Completeness	Low	$\times 1$	3	Only sample type given			
Domain 4. Variabi	lity and U	ncertainty							
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed			
Overall Quality D	eterminatio	$\mathbf{n}^{\dagger}$	Medium		18				
			tinued on a	nevt nam	1.0				
		Col	itilitied off I	nevi hage	5				

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Source Citation:	Bloom, T. F.,Kramkowski, R. S.,Cromer, J Corporation, Kenton, Ohio.	J. W 19	74. Healt	th hazard evaluation report n	o. HHE 73-151-141, Essex Wire
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	3970621				
EVALUATION					
Domain	Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments

Source Citation:	Hervin, R.	L.,Reifschneider, R., 1973. H	Health hazard ev	valuation	report	no. HHE 72-42-76, Steel Tool and Engineering
Type of Data Source Hero ID	Occupation 3970620	nal Exposure; Monitoring Data;				
EXTRACTION						
Parameter			Data			
Life Cycle Stage:			Use			
Physical Form:			liquid, vapor			
Route of Exposure	:		inhalation, der	mal		
Exposure Concentr	ation (Uni	t):	Em ratio given	. No con	centrati	on provided.
Number of Samples	s:		18			-
Number of Sites:			1			
Worker Activity:			Degreasing, Ac	ryloid gl	uing	
Engineering Contro	ol & percen	t Exposure Reduction:	Some Local Ex	haust Ve	entilatio	n
EVALUATION						
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments
Domain 1: Reliabil	ity					
	Metric 1:	Methodology	High	$\times 1$	1	No method given, but HHE done by NIOSH.
Domain 2: Represe	entative					
*	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data older than 10 years $(1972)$ but after PEL
	Metric 5:	Sample Size	Low	$\times 1$	3	All discussed with respect to equivalent exposure
Domain 3: Accessi	bility/Clari	tv				
	Metric 6:	Metadata Completeness	Unacceptable	$\times 1$	4	No metadata since no sampling details were given.
Domain 4: Variabil	lity and Ur	ncertainty				
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed
Overall Quality De	eterminatio	n†	Unacceptable		4	Metric Mean Score: 2.0.
		(	Continued on nex	t page		

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Source Citation:	Hervin, R. L.,Reifschneider, R 1973 Company, Taylor Michigan.	. Health hazard e	valuation report no	o. HHE 72-42-76, Steel Tool and Engineering
Type of Data Source Hero ID	Occupational Exposure; Monitoring Da 3970620	nta;		
EVALUATION				
Domain	Metric	Rating	$MWF^{\star}$ Score	Comments

\*\* Consistent with our Application of Systematic Review in TSCARisk Evaluations document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

\* MWF = Metric Weighting Factor

<sup>†</sup> If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High:  $\geq 1$  to < 1.7; Medium:  $\geq 1.7$  to < 2.3; Low:  $\geq 2.3$  to  $\leq 3$ .

Source Citation:Okawa, MType of Data SourceOccupationHero ID3970619	. T., 1975. Health hazard evalua nal Exposure; Monitoring Data;	ation report	no. HH	E 74-96-	-173, Richdel Corporation, Carson City, Nevada.
EXTRACTION		Data			
Farameter		Data			
Life Cycle Stage:		Use			
Physical Form:		liquid, va	por		
Route of Exposure:		inhalation	ı, dermal		
Exposure Concentration (Un	it):	1.7 - 2.9 p	opm		
Number of Samples:		3			
Number of Sites:		1			
Worker Activity:		Degreasin	g		
Type of Sampling:		Personal			
Engineering Control & percent Exposure Reduction:		Some Loc	al Exhau	ist Vent	ilation
EVALUATION					
Demoir	Mataia	Dettern	MMTD+	C	Commente
Domain	Metric	nating	IVI VV F	Score	Comments
Domain I: Reliability		TT: 1	-	1	
Metric 1:	Methodology	High	$\times 1$	1	No method given, but HHE done by NIOSH.
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE
Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data older than 10 years (1975) but after PEL
Metric 5:	Sample Size	High	$\times 1$	1	Discrete samples given
	L	0			1 0
Domain 3: Accessibility/Clar	ity				
Metric 6:	Metadata Completeness	Low	$\times 1$	3	Only sample type given
Domain 4: Variability and U	ncertainty	т	1	9	
Metric 7:	Metadata Completeness	LOW	× 1	3	Not addressed
Overall Quality Determination	$\mathrm{n}^\dagger$	Medium		1.7	

Source Citation:	Ruhe, R. I	L.,Watanabe, A.,Stein, G., 1981	I. Health h	azard ev	aluation	n report no. HHE 80-49-808, Superior Tube Company,	
Type of Data Source Hero ID	Occupatio 3970617	nal Exposure; Monitoring Data;					
EXTRACTION							
Parameter			Data				
Life Cycle Stage: Physical Form: Route of Exposure: Exposure Concentration (Unit): Number of Samples: Number of Sites: Type of Measurement or Method: Worker Activity: Type of Sampling: Analytic Method:			Use liquid, vapor inhalation, dermal 32-357 mg/m3 33 1 Short term, 8 hour TWA Degreasing Personal, Area NIOSH method P &CAM 127				
<b>EVALUATION</b> Domain		Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliabi	llity Metric 1:	Methodology	High	× 1	1	NIOSH method P &CAM 127	
Domain 2: Repres	entative Metric 2: Metric 3: Metric 4: Metric 5:	Geographic Scope Applicability Temporal Representativeness Sample Size	High High Medium High	$\begin{array}{c} \times 1 \\ \times 2 \\ \times 2 \\ \times 1 \end{array}$	$\begin{array}{c} 1\\ 2\\ 4\\ 1\end{array}$	US Workplace that utilizes TCE Data older than 10 years (1981) but after PEL Discrete samples given	
Domain 3: Access	ibility/Clar Metric 6:	ity Metadata Completeness	Medium	× 1	2	Most metadata given, missing exposure frequency	
Domain 4: Variab	ility and U Metric 7:	ncertainty Metadata Completeness	Medium	$\times 1$	2	None discussed, but NIOSH method addresses variability/ uncertainty in the method	
Overall Quality D	eterminatio	$\mathbf{n}^{\dagger}$	High		1.4		
		Con	tinued on r	next page			

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Source Citation:	Ruhe, R. L., Watanabe, A., Stein, G. 1981. Collegeville, Pennsylvania.	Health h	azard eva	aluation report no.	HHE 80-49-808,	Superior Tube Company,
Type of Data Source	Occupational Exposure; Monitoring Data;					
Hero ID	3970617					
EVALUATION						
Domain	Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comm	ents

Source Citation:	Baumann, A., Page, E., Mueller, C., Burr, G., Hitchcok, E 2008. Health hazard evaluation report no. HETA 2004-0372-3054,							
Type of Data Source Hero ID	Occupation 3970616	nal Exposure; Monitoring Data;	ong workers	s exposed		moroethylene, Entek International, Lebanon, Oregon.		
EXTRACTION			_					
Parameter	Data							
Life Cycle Stage			Use					
Physical Form:			liquid, va	por				
Route of Exposur	e:		inhalation	n 1. dermal				
Exposure Concent	tration (Uni	t):	2.0 - 130.	0 ppm				
Number of Sampl	es:		517					
Type of Measurer	nent or Met	hod:	Short ter	m. 8 hou	r TWA			
Worker Activity:			Varied	,				
Number of Worke	ers:		142					
Type of Sampling	:		Personal,	Area				
Sampling Location	n:		multiple					
Exposure Duratio	n:		12 hour work day					
Exposure Frequen	ncy:		3.5  d/w					
Analytic Method:	-		NMAM N	fethod 1	022			
EVALUATION								
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments		
Domain 1: Beliah	ility							
Domain 1. Renab	Metric 1:	Methodology	High	× 1	1	NMAM Method 1022 completed by NIOSH		
		ineene deregy	8		-			
Domain 2: Repres	sentative							
	Metric 2:	Geographic Scope	High	$\times 1$	1	US		
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE		
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	2004, 14 years old (after PEL)		
	Metric 5:	Sample Size	High	$\times 1$	1	Discrete samples given		
Domain 3: Access	sibility/Clar	ity						
	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	Most metadata given, missing exposure frequency		
Domain 4: Variab	oility and U	ncertainty						
	and of	~						
		Con	tinued on r	iext page	)			

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Source Citation:	Baumann,	Baumann, A., Page, E., Mueller, C., Burr, G., Hitchcok, E 2008. Health hazard evaluation report no. HETA 2004-0372-3054,							
Type of Data Source Hero ID	Occupation 3970616	Evaluation of neurological dystunction among workers exposed to trichloroethylene, Entek International, Lebanon, Oregon. Occupational Exposure; Monitoring Data; 3970616							
EVALUATION									
Domain		Metric	Rating	$\rm MWF^{\star}$	Score	Comments			
	Metric 7:	Metadata Completeness	Medium	$\times 1$	2	None discussed, but NIOSH method addresses variability/ uncertainty in the method			
Overall Quality I	Determination	$\mathbf{n}^{\dagger}$	High		1.4				

Source Citation:HType of Data SourceOHero IDO	Ruhe, R. I Occupation 3970595	1982. Health hazard evaluati nal Exposure; Monitoring Data;	on report n	o. HETA	A 82-040	0-119, Synthes Ltd. (USA), Monument, Colorado.				
EXTRACTION Parameter			Data							
Life Cycle Stage:			Use							
Physical Form:			liquid, va	por						
Route of Exposure:	/		inhalatior	i, dermal						
Exposure Concentra	ation (Uni	t):	Personal:	4-9 mg/	m3Area	a: 1-16 mg/m3				
Number of Samples			7							
Number of Sites:			1	<b>T</b> T A						
Type of Measureme	ent or Met.	hod:	8 hour T	WA						
Worker Activity:			Electropo	lisning a	na aegr	easing				
Turne of Sempling			100 Demonal	1 200						
Eurosumo Duration			feisonai,	Alea						
Exposure Erecuence	Exposure Duration:				0-8 nours					
Exposure Frequency	y. 1 & porcor	t Exposure Reduction	Vontilator	l open si	irfaco ta	anke				
Analytic Method:	i & percen	it Exposure reduction.	NIOSH N	fethod N	D = P & C	CAM 127				
EVALUATION										
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments				
Domain 1: Reliabili N	ity Metric 1:	Methodology	High	$\times 1$	1	NIOSH Method No. P&CAM 127				
Domain 2: Bepreser	ntative									
Domain 2. Represer	Metric 2:	Geographic Scope	High	× 1	1	US				
-	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE				
Ν	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data older than 10 years (1982) but after PEL				
I	Metric 5:	Sample Size	High	$\times 1$	1	Discrete samples given				
Domain 3. Accessib	nility/Clari	ty								
Domain 0. Neccosio	Metric 6:	Metadata Completeness	Medium	× 1	2	Most metadata given, missing exposure frequency				
<u>+</u>			mouraili	// ±	-	most metadata given, mosing exposure nequency				
Domain 4: Variabili	ity and Ur	ncertainty								
		Con	tinued on r	next page	)					

Source Citation: Type of Data Source Hero ID	Ruhe, R. I Occupation 3970595	1982. Health hazard evalua nal Exposure; Monitoring Data	tion report n a;	o. HETA	82-040	-119, Synthes Ltd. (USA), Monument, Colorado.
EVALUATION						
Domain		Metric	Rating	$\rm MWF^{\star}$	Score	Comments
	Metric 7:	Metadata Completeness	Medium	$\times 1$	2	None discussed, but NIOSH method addresses variability/ uncertainty in the method
Overall Quality D	Peterminatio	$\mathbf{n}^{\dagger}$	High		1.4	

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Source Citation:	Burton, N Shawano	. C.,Monesterskey, J 1996. He Wisconsin	alth hazard	l evaluati	on repo	ort no. HETA 96-0135-2612, Eagle Knitting Mills, Inc.,			
Type of Data Source Hero ID	Occupation 3970594	nal Exposure; Monitoring Data;							
EXTRACTION									
Parameter			Data						
Life Cycle Stage:	Life Cycle Stage:								
Physical Form:			liquid, va	liquid, vapor					
Route of Exposur	e:		inhalation, dermal						
Exposure Concen	tration (Uni	t):	Personal:	0.24 - 1.	68  ppm	Area: ND - 7.05 ppm			
Number of Sampl	les:		6						
Number of Sites:			1						
Type of Measurer	ment or Met	hod:	8 hour T	WA					
Worker Activity:			Sewing, s	pot clear	ing fab	ric			
Number of Worke	ers:		85						
Type of Sampling	Type of Sampling:			area					
Sampling Locatio	Sampling Location:			multiple					
Exposure Frequer	ncy:		53 hours/	week					
Engineering Cont	rol & percer	it Exposure Reduction:	Ceiling fa	ns • • •	a				
PPE:			Johnson (	& Johnse	on Germ	1 filter masks			
EVALUATION									
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments			
Domain 1: Reliab	oility								
	Metric 1:	Methodology	High	$\times 1$	1	No method given, but HHE done by NIOSH.			
Domain 2: Bapro	contativo								
Domain 2. Repres	Motric 2	Geographic Scope	High	$\vee 1$	1	IIS			
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE			
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data older than 10 years (1996) but after PEL			
	Metric 5:	Sample Size	High	× 1	1	Discrete samples given			
		I	0			I GOL			
Domain 3: Access	sibility/Clar	ity							
	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	Most metadata given, missing exposure frequency			
Domain 4: Variat	Domain 4: Variability and Uncertainty								
Continued on next page									

Source Citation:	Burton, N. Shawano, V	. C.,Monesterskey, J 1996. Wisconsin.	Health hazard	evaluati	on repo	ort no. HETA 96	6-0135-2612, Eagle Knitting Mills, Inc.,		
Type of Data Source	Occupation	Occupational Exposure; Monitoring Data;							
Hero ID	3970594	3970594							
EVALUATION									
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score		Comments		
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed			
Overall Quality D	Determination	$\mathrm{n}^\dagger$	High		1.6				

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Source Citation:	Rosensteel	l, R. E.,Lucas, J. B., 1975. Healt	th hazard ev	valuation	report	no. HHE 74-28-212, Westinghouse Air Brake Company,			
Type of Data Source Hero ID	Occupatio 3970582	anal Exposure; Monitoring Data;							
EXTRACTION									
Parameter			Data						
Life Cycle Stage:			Use						
Physical Form			liquid va	nor					
Route of Exposur	e:		inhalation	inhalation dermal					
Exposure Concen	tration (Un	it):	Personal:	ND - 53	5 mg/m	13			
Number of Samp	es:		6		- 0/				
Number of Sites:			1						
Type of Measurer	nent or Met	thod:	TWA						
Worker Activity:			Painting,	degreasi	ng				
Number of Worke	ers:		400	-	-				
Type of Sampling	;:		Personal						
EVALUATION									
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments			
Domain 1: Reliat	oility								
	Metric 1:	Methodology	Hıgh	× 1	1	No method given, but HHE done by NIOSH.			
Domain 2: Bopro	contativo								
Domain 2. Repre	Metric 2	Geographic Scope	High	× 1	1	US			
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE			
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data older than 10 years (1975) but after PEL			
	Metric 5:	Sample Size	High	$\times 1$	1	Discrete samples given			
		John Provide	8						
Domain 3: Access	sibility/Clar	rity							
	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	Most metadata given, missing exposure frequency			
Domain 4: Varial	oility and U	ncertainty							
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed			
		+	TT: 1		1.0				
Overall Quality Determination'			High		1.0				
Continued on next page									

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Source Citation:	Rosensteel, R. E.,Lucas, J. B., 1975. Health Wilmerding, Pennsyvlania.	hazard eva	luation	report no.	HHE 74-28-212, Westinghouse Air Brake Company,		
Type of Data Source	Occupational Exposure; Monitoring Data;						
Hero ID	3970582						
EVALUATION							
Domain	Metric	Rating	$MWF^{\star}$	Score	Comments		

 $\star$  MWF = Metric Weighting Factor

<sup>†</sup> If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High:  $\geq 1$  to < 1.7; Medium:  $\geq 1.7$  to < 2.3; Low:  $\geq 2.3$  to  $\leq 3$ .

Type of Data Source Occupational Exposure; Monitoring Data; Hero ID 2070554 EXTRACTION Parameter Data Life Cycle Stage: Physical Form: Induktion, dernal Exposure Concentration (Unit): Personal: 4.5-5.2 ppmArea: 1.1-5.3 ppm Number of States: 1 Type of Measurement or Method: TWA Worker Activity: Open top degreaser Type of Sampling Domain 1: Reliability Metric 1: Methodology High × 1 1 NIOSH method 1002 Domain 1: Reliability Metric 3: Applicability Metric 4: Temporal Representativeness Medium × 2 4 Medium × 1 2 Most metadata given, missing exposure frequency Domain 3: Accessibility/Clarity Metric 6: Metadata Completeness Medium × 1 2 Nore: Active States are	Source Citation:	Barsan, M Decatur, I	I. E., 1991. Health hazard evalua	ation report	t no. HE'	ГА 90-3	44-2159, A.W. Cash Valve Manufacturing Corporation,			
Data         Data         Life Cycle Stage:       Use       Use         Physical Form:       inhalation, dormal       status of Exposure:       inhalation, dormal         Route of Exposure:       inhalation, dormal       status of Exposure:       inhalation, dormal         Number of Samples:       8       status of Exposure:       1         Number of Sites:       1       Type of Measurement or Method:       TWA         Worker Activity:       Open top degreaser       Sampling Location:       Around the degreaser         Sampling Location:       Around the degreaser       Comments         Domain       Metric       Rating       MWF*       Score       Comments         Domain 1: Reliability       Metric 1:       Methodology       High       × 1       1       NIOSH method 1022         Domain 2: Representative       Metric 3:       Applicability       High       × 1       1       US         Metric 4:       Temporal Representativees       Medium       × 2       4       Data older than 10 years (1991) but after PEL         Metric 6:       Mapplicability       High       × 1       1       Discrete sample given, missing exposure frequency         Domain 3: Acccessibility/Clarity       Metric 6:<	Type of Data Source Hero ID	Occupatio 3970554	nal Exposure; Monitoring Data;							
Parameter         Data           Life Cycle Stage:         Use           Physical Form:         liquid, vapor           Route of Exposure:         inhalation, dermal           Exposure Concentration (Unit):         Personal: 4.5-5.2 ppmArea: 1.1-5.3 ppm           Number of Samples:         8           Number of Samples:         8           Number of Samples:         1           Type of Measurement or Method:         TWA           Worker Activity:         Open top degreaser           Type of Sampling:         Personal, area           Sampling Location:         Around the degreaser           EVALUATION         Domain           Domain 1: Reliability         Metric 1:           Metric 2:         Geographic Scope           High         × 1         1           Metric 3:         Applicability           Metric 4:         Temporal Representativeness           Metric 5:         Sample Size           Metric 5:         Sample Size           Metric 6:         Metalata Completeness           Metric 6:         Metadata Completeness           Metric 7:         Metadata Completeness           Metric 7:         Metric 8:           Metric 6:         Metric 8:	EXTRACTION									
Life Cycle Stage:       Use         Physical Form:       liquid, vapor         Route of Exposure:       inhalation, dermal         Exposure Concentration (Unit):       Personal: 4.5-5.2 ppmArea: 1.1-5.3 ppm         Number of Samples:       8         Number of Sites:       1         Type of Measurement or Method:       TWA         Worker Activity:       Open top degreaser         Type of Sampling:       Personal, area         Sampling Location:       Around the degreaser         EVALUATION       Metric 1:         Domain       Metric         Metric 2:       Geographic Scope         Metric 3:       Applicability         Metric 4:       Temporal Representative         Metric 4:       Fersonal, area         Metric 5:       Sampling × 2         Metric 4:       Fersonal, area         Metric 2:       Geographic Scope         Metric 4:       Fersonal, area         Metric 5:       Sample Size         High       × 1       1         Metric 5:       Sample Size         High       × 1       1         Domain 3: Accessibility/Clarity       Load or than 10 years (1901) but after PEL         Metric 6:       Metad	Parameter			Data						
Physical Form:       Iquid, vapor         Route of Exposure:       inhalation, dermal         Exposure Concentration (Unit):       Personal: 4.5-5.2 ppmArea: 1.1-5.3 ppm         Number of Samples:       8         Number of Sites:       1         Type of Measurement or Method:       TWA         Worker Activity:       Open top degreaser         Type of Sampling:       Personal: area         Sampling Location:       Around the degreaser         EVALUATION       Domain         Domain 1: Reliability       Metric 1: Methodology         Metric 1: Methodology       High       × 1         Metric 2: Geographic Scope       High       × 1       1         Metric 3: Applicability       High       × 2       2         Metric 4: Temporal Representativeness       Medium       × 2       2         Metric 5: Sample Size       High       × 1       1       US         Metric 6: Metadata Completeness       Medium       × 1       2       Most metadata given, missing exposure frequency         Domain 4: Variability and Uncertainty       Medium       × 1       2       None discussed, but NIOSH method addresses variability/         Metric 7: Metadata Completeness       Medium       × 1       2       None discussed	Life Cycle Stage:			Use						
Route of Exposure:       inhalation, dermal         Exposure Concentration (Unit):       Personal: 4.5-5.2 ppmArea: 1.1-5.3 ppm         Number of Samples:       8         Number of Stites:       1         Type of Measurement or Method:       TWA         Worker Activity:       Open top degreaser         Type of Sampling:       Personal, area         Sampling Location:       Around the degreaser         EVALUATION       Domain         Metric 1:       Metric         Reduct 2:       Geographic Scope         Metric 2:       Geographic Scope         Metric 3:       Applicability         Metric 5:       Sample Size         Metric 5:       Sample Size         Metric 6:       Metadata Completeness         Metric 7:	Physical Form:			liquid, va	por					
Exposure Concentration (Unit):       Personal: 4.5-5.2 ppmArea: 1.1-5.3 ppm         Number of Sites:       1         Type of Measurement or Method:       TWA         Worker Activity:       Open top degreaser         Type of Sampling:       Personal, area         Sampling Location:       Around the degreaser         EVALUATION       Pomain         Metric 1:       Metric         Rating       MWF* Score       Comments         Domain 1: Reliability       Metric 1:       Methodology         Metric 2:       Geographic Scope       High       × 1       1         Metric 3:       Applicability       High       × 2       2         Metric 4:       Temporal Representative       Medium       × 2       4       Data older than 10 years (1991) but after PEL         Metric 5:       Sample Size       High       × 1       1       Discrete samples given         Domain 3:       Accessibility/Clarity       Medium       × 1       2       Most metadata given, missing exposure frequency         Domain 4:       Variability and Uncertainty       Medium       × 1       2       None discussed, but NOSH method addresses variability/ uncertainty in the method         Overall Quality Determination <sup>1</sup> High       1.4       <	Route of Exposur	e:		inhalation	inhalation. dermal					
Number of Samples:     8     1       Number of Sites:     1       Type of Measurement or Method:     TWA       Worker Activity:     Open top degreaser       Type of Sampling:     Personal, area       Sampling Location:     Around the degreaser       EVALUATION     Domain     Metric     Rating     MWF* Score     Comments       Domain 1: Reliability     Metric 1:     Methodology     High     × 1     1     NIOSH method 1022       Domain 2: Representative     Metric 2:     Geographic Scope     High     × 1     1     US       Metric 3:     Applicability     High     × 2     2     Workplace that utilizes TCE       Metric 4:     Temporal Representativeness     Medium     × 2     4     Data older than 10 years (1991) but after PEL       Metric 5:     Sample Size     High     × 1     1     Discrete samples given       Domain 3: Accessibility/Clarity     Metric 6:     Metadata Completeness     Medium     × 1     2     Most metadata given, missing exposure frequency       Domain 4: Variability and Uncertainty     Medium     × 1     2     None discussed, but NIOSH method addresses variability/ uncertainty in the method       Overall Quality Determination <sup>†</sup> High     1.4     Continued on next nage	Exposure Concen	tration (Uni	it):	Personal:	Personal: 4.5-5.2 ppmArea: 1.1-5.3 ppm					
Number of Sites:       1         Type of Measurement or Method:       TWA         Worker Activity:       Open top degreaser         Type of Sampling:       Personal, area         Sampling Location:       Around the degreaser         EVALUATION       Around the degreaser         Domain       Metric         Retric 1:       Methodology         High       × 1       1         NIOSH method 1022         Domain 2:       Representative         Metric 2:       Geographic Scope         Metric 3:       Applicability         Metric 4:       Temporal Representativenees         Metric 5:       Sample Size         Metric 5:       Sample Size         Metric 6:       Metadata Completeness         Metric 6:       Metadata Completeness         Medium       × 1       2         Domain 4:       Variability and Uncertainty         Metric 7:       Metadata Completeness         Medium       × 1       2         None discussed, but NIOSH method addresses variability/ uncertainty in the method         Overall Quality Determination <sup>†</sup> High       1.4	Number of Samp	les:	,	8	1		11			
Type of Measurement or Method:       TWA         Worker Activity:       Open top degreaser         Type of Sampling:       Personal, area         Sampling Location:       Around the degreaser         EVALUATION       Metric       Rating       MWF*       Score       Comments         Domain       Metric       Rating       MWF*       Score       Comments         Domain 1: Reliability       Metric 1:       Methodology       High       × 1       1       NIOSH method 1022         Domain 2: Representative       Metric 2:       Geographic Scope       High       × 1       1       US         Metric 3:       Applicability       High       × 1       1       US         Metric 4:       Temporal Representativeeness       Medium       × 2       2       Workplace that utilizes TCE         Metric 5:       Sample Size       High       × 1       1       Discrete samples given         Domain 3: Accessibility/Clarity       Medium       × 1       2       Most metadata given, missing exposure frequency         Domain 4: Variability and Uncertainty       Medium       × 1       2       None discussed, but NIOSH method addresses variability/         Metric 7:       Metadata Completeness       Medium       × 1	Number of Sites:			1						
Worker Activity: Type of Sampling: Sampling Location:       Open top degreaser Personal, area Around the degreaser         EVALUATION       Domain       Metric       Rating       MWF*       Score       Comments         Domain 1: Reliability Metric 1:       Metric       Rating       MWF*       Score       Comments         Domain 2:       Representative Metric 2:       Geographic Scope       High       × 1       1       US         Metric 3:       Applicability       High       × 2       2       Workplace that utilizes TCE         Metric 4:       Temporal Representativeness       Medium       × 2       4       Data older than 10 years (1991) but after PEL         Metric 5:       Sample Size       High       × 1       1       Discrete samples given         Domain 3:       Accessibility/Clarity Metric 6:       Metadata Completeness       Medium       × 1       2       Most metadata given, missing exposure frequency         Domain 4:       Variability and Uncertainty Metric 7:       Metadata Completeness       Medium       × 1       2       None discussed, but NOSH method addresses variability/ uncertainty in the method         Overall Quality Determination <sup>†</sup> High       1.4       Continued on next page	Type of Measure	ment or Met	hod:	TWA						
Type of Sampling: Sampling Location:       Personal, area Around the degreaser         EVALUATION Domain       Metric       Rating       MWF*       Score       Comments         Domain       Metric       Rating       MWF*       Score       Comments         Domain 1:       Reliability       Metric 1:       Methodology       High $\times 1$ 1       NIOSH method 1022         Domain 2:       Representative Metric 3:       High $\times 1$ 1       US         Metric 3:       Applicability High $\times 2$ 2       Workplace that utilizes TCE Discrete samples given         Domain 3:       Accessibility/Clarity Metric 6:       Medium $\times 1$ 2       Most metadata given, missing exposure frequency         Domain 4:       Variability and Uncertainty Metric 7:       Mediata Completeness       Medium $\times 1$ 2       None discussed, but NIOSH method addresses variability/ uncertainty in the method         Overall Quality Determination <sup>†</sup> High       1.4       Continued on next page	Worker Activity:			Open top	degrease	er				
Sampling Location:       Around the degreaser         EVALUATION       Domain       Metric       Rating       MWF*       Score       Comments         Domain       Metric       Rating       MWF*       Score       Comments         Domain 1: Reliability       Metric 1:       Methodology       High       × 1       1       NIOSH method 1022         Domain 2: Representative       Metric 2:       Geographic Scope       High       × 1       1       US         Metric 3:       Applicability       High       × 2       2       Workplace that utilizes TCE         Metric 4:       Temporal Representativeness       Medium       × 2       4       Data older than 10 years (1991) but after PEL         Metric 5:       Sample Size       High       × 1       1       Discrete samples given         Domain 3: Accessibility/Clarity       Metric 6:       Metadata Completeness       Medium       × 1       2       Most metadata given, missing exposure frequency         Domain 4: Variability and Uncertainty       Metric 7:       Metadata Completeness       Medium       × 1       2       None discussed, but NIOSH method addresses variability/         Overall Quality Determination <sup>†</sup> High       1.4       Continued on next page       14 <td>Type of Sampling</td> <td>g:</td> <td></td> <td>Personal,</td> <td>area</td> <td></td> <td></td>	Type of Sampling	g:		Personal,	area					
EVALUATION       Domain       Metric       Rating       MWF*       Score       Comments         Domain 1: Reliability       Metric 1:       Methodology       High $\times 1$ 1       NIOSH method 1022         Domain 2: Representative       Metric 2:       Geographic Scope       High $\times 1$ 1       US         Metric 3:       Applicability       High $\times 2$ 2       Workplace that utilizes TCE         Metric 4:       Temporal Representativeness       Medium $\times 2$ 4       Data older than 10 years (1991) but after PEL         Metric 5:       Sample Size       High $\times 1$ 1       Discrete samples given         Domain 3: Accessibility/Clarity       Metric 6:       Metadata Completeness       Medium $\times 1$ 2         Domain 4: Variability and Uncertainty       Metric 7:       Metadata Completeness       Medium $\times 1$ 2         Overall Quality Determination <sup>†</sup> High       1.4       Continued on next nage	Sampling Locatio	n:		Around t	he degrea	aser				
EVALUATION         Domain       Metric       Rating       MWF*       Score       Comments         Domain 1: Reliability       Metric 1:       Methodology       High $\times 1$ 1       NIOSH method 1022         Domain 2: Representative       Metric 2:       Geographic Scope       High $\times 1$ 1       US         Metric 3:       Applicability       High $\times 2$ 2       Workplace that utilizes TCE         Metric 4:       Temporal Representativeness       Medium $\times 2$ 4       Data older than 10 years (1991) but after PEL         Metric 5:       Sample Size       High $\times 1$ 1       Discrete samples given         Domain 3: Accessibility/Clarity       Medium $\times 1$ 2       Most metadata given, missing exposure frequency         Domain 4: Variability and Uncertainty       Medium $\times 1$ 2       None discussed, but NIOSH method addresses variability/         Overall Quality Determination <sup>†</sup> High       1.4       L										
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	EVALUATION									
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments			
Domain 1: Renability       Metric 1:       Methodology       High $\times 1$ 1       NIOSH method 1022         Domain 2: Representative       Metric 2:       Geographic Scope       High $\times 1$ 1       US         Metric 3:       Applicability       High $\times 2$ 2       Workplace that utilizes TCE         Metric 4:       Temporal Representativeness       Medium $\times 2$ 4       Data older than 10 years (1991) but after PEL         Metric 5:       Sample Size       High $\times 1$ 1       Discrete samples given         Domain 3:       Accessibility/Clarity       Metric 6:       Metadata Completeness       Medium $\times 1$ 2       Most metadata given, missing exposure frequency         Domain 4:       Variability and Uncertainty       Metric 7:       Metadata Completeness       Medium $\times 1$ 2       None discussed, but NIOSH method addresses variability/         Overall Quality Determination <sup>†</sup> High       1.4       Continued on next page	Domain 1, Paliak	;];+								
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Domain 1. Kenak	Metric 1:	Methodology	High	$\times 1$	1	NIOSH method 1022			
Domain 2: Representative       Metric 2:       Geographic Scope       High $\times 1$ 1       US         Metric 3:       Applicability       High $\times 2$ 2       Workplace that utilizes TCE         Metric 4:       Temporal Representativeness       Medium $\times 2$ 4       Data older than 10 years (1991) but after PEL         Metric 5:       Sample Size       High $\times 1$ 1       Discrete samples given         Domain 3:       Accessibility/Clarity       Metric 6:       Metadata Completeness       Medium $\times 1$ 2       Most metadata given, missing exposure frequency         Domain 4:       Variability and Uncertainty Metric 7:       Metadata Completeness       Medium $\times 1$ 2       None discussed, but NIOSH method addresses variability/ uncertainty in the method         Overall Quality Determination <sup>†</sup> High       1.4       Continued on next page										
Metric 2:       Geographic Scope       High $\times 1$ 1       US         Metric 3:       Applicability       High $\times 2$ 2       Workplace that utilizes TCE         Metric 4:       Temporal Representativeness       Medium $\times 2$ 4       Data older than 10 years (1991) but after PEL         Metric 5:       Sample Size       High $\times 1$ 1       Discrete samples given         Domain 3:       Accessibility/Clarity       Metric 6:       Metadata Completeness       Medium $\times 1$ 2       Most metadata given, missing exposure frequency         Domain 4:       Variability and Uncertainty       Metric 7:       Metadata Completeness       Medium $\times 1$ 2       None discussed, but NIOSH method addresses variability/         Overall Quality Determination <sup>†</sup> High       1.4       Continued on next page	Domain 2: Repre	sentative	~	*** 1	_					
Metric 3:       Applicability       High $\times 2$ 2       Workplace that utilizes TCE         Metric 4:       Temporal Representativeness       Medium $\times 2$ 4       Data older than 10 years (1991) but after PEL         Metric 5:       Sample Size       High $\times 1$ 1       Discrete samples given         Domain 3:       Accessibility/Clarity       Metric 6:       Metadata Completeness       Medium $\times 1$ 2       Most metadata given, missing exposure frequency         Domain 4:       Variability and Uncertainty       Metric 7:       Metadata Completeness       Medium $\times 1$ 2       None discussed, but NIOSH method addresses variability/ uncertainty in the method         Overall Quality Determination <sup>†</sup> High       1.4       Continued on next page		Metric 2:	Geographic Scope	High	× 1	1	US			
Metric 4:       Temporal Representativeness       Medium $\times 2$ 4       Data older than 10 years (1991) but after PEL         Metric 5:       Sample Size       High $\times 1$ 1       Discrete samples given         Domain 3:       Accessibility/Clarity       Metric 6:       Metadata Completeness       Medium $\times 1$ 2       Most metadata given, missing exposure frequency         Domain 4:       Variability and Uncertainty       Metric 7:       Metadata Completeness       Medium $\times 1$ 2       None discussed, but NIOSH method addresses variability/         Overall Quality Determination <sup>†</sup> High       1.4       Continued on next page		Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE			
Metric 5:       Sample Size       High $\times$ 1       1       Discrete samples given         Domain 3:       Accessibility/Clarity       Metric 6:       Metadata Completeness       Medium $\times$ 1       2       Most metadata given, missing exposure frequency         Domain 4:       Variability and Uncertainty       Metric 7:       Metadata Completeness       Medium $\times$ 1       2       None discussed, but NIOSH method addresses variability/         Overall Quality Determination <sup>†</sup> High       1.4       Continued on next page		Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data older than 10 years $(1991)$ but after PEL			
Domain 3: Accessibility/Clarity       Metric 6: Metadata Completeness       Medium       × 1       2       Most metadata given, missing exposure frequency         Domain 4: Variability and Uncertainty       Metric 7: Metadata Completeness       Medium       × 1       2       None discussed, but NIOSH method addresses variability/ <ul> <li>Metric 7: Metadata Completeness</li> <li>Medium</li> <li>Medium</li> <li>Medium</li> <li>Medium</li> <li>Medium</li> <li>Medium</li> <li>Medium</li> <li>Most metadata given, missing exposure frequency</li> <li>Metric 7: Metadata Completeness</li> <li>Medium</li> <li>Medium<td></td><td>Metric 5:</td><td>Sample Size</td><td>High</td><td>× 1</td><td>1</td><td>Discrete samples given</td></li></ul>		Metric 5:	Sample Size	High	× 1	1	Discrete samples given			
Domain of Recessions)/ Caulty       Metadata Completeness       Medium       × 1       2       Most metadata given, missing exposure frequency         Domain 4: Variability and Uncertainty       Metric 7:       Metadata Completeness       Medium       × 1       2       None discussed, but NIOSH method addresses variability/ <ul> <li>Overall Quality Determination<sup>†</sup></li> <li>High</li> <li>1.4</li> <li>Continued on next page</li> </ul>	Domain 3. Acces	sibility/Clar	ity							
Domain 4: Variability and Uncertainty Metric 7: Metadata Completeness       Medium × 1       2       None discussed, but NIOSH method addresses variability/ uncertainty in the method         Overall Quality Determination <sup>†</sup> High       1.4         Continued on next page	Domain of Treess	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	Most metadata given, missing exposure frequency			
Domain 4: Variability and Uncertainty Metric 7: Metadata Completeness       Medium       × 1       2       None discussed, but NIOSH method addresses variability/ uncertainty in the method         Overall Quality Determination <sup>†</sup> High       1.4										
Metric 7:       Metadata Completeness       Medium $\times 1$ 2       None discussed, but NIOSH method addresses variability/ uncertainty in the method         Overall Quality Determination <sup>†</sup> High       1.4         Continued on next page	Domain 4: Varial	oility and U	ncertainty							
Overall Quality Determination <sup>†</sup> High 1.4 Continued on next page		Metric 7:	Metadata Completeness	Medium	× 1	2	None discussed, but NIOSH method addresses variability/ uncertainty in the method			
Continued on next page	Overall Quality I	Determinatio	$\mathrm{n}^{\dagger}$	High		1.4				
	• 0		Cor	tinued on a	next nage	2				

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Source Citation:	Barsan, M. E., 1991. Health hazard evaluat Decatur, Illinois.	tion report	no. HE	FA 90-344-215	9, A.W. Cash Valve Manufacturing Corporation,	
Type of Data Source	Occupational Exposure; Monitoring Data;					
Hero ID	3970554					
EVALUATION						
Domain	Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments	

Source Citation:	urce Citation: Gorman, R.,Rinsky, R.,Stein, G.,Anderson, K. 1984. Health hazard evaluation report no. HETA 82-075-1545, Pratt & Whitney Aircraft, West Palm Beach, Florida.									
Type of Data Source Hero ID	Occupatio 3970552	nal Exposure; Monitoring Data;								
EXTRACTION										
Parameter			Data							
Life Cruele Sterror			Uas							
Physical Form:			Use liquid va	por						
Route of Exposur	· · ·		inhalation dermal ingestion							
Exposure Concen	tration (Uni	t):	TWA - 0.3-22.9 ppmOnly while operating degreaser: N.D 233 pp-							
Linposure concen	(011		mArea: .4	4 - 22.5 p	pm o m pm	, while operating degreaters (112) _00 pp				
Number of Sampl	les:		62	p	piii					
Number of Sites:			1							
Type of Measurer	ment or Met	hod:	8 hour TV	WA						
Worker Activity:			Degreasin	g						
Number of Worke	ers:		7200 tota	l, 29 degi	easer o	perators				
Type of Sampling	Type of Sampling:		Personal, area							
Sampling Locatio	n:		Around 1	Around 10 different degreasers						
Exposure Duratic	on:		Varies							
Engineering Cont	rol & percer	nt Exposure Reduction:	roll tops t	to degrea	sers, hig	gh temp safety switches				
Analytic Method:			NIOSH Method No. P&CAM 127							
EVALUATION										
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments				
Domain 1. Beliah	oility									
	Metric 1:	Methodology	High	$\times 1$	1	NIOSH Method No. P&CAM 127				
Domain 2: Bopro	contativo									
Domain 2. Repres	Metric 2.	Geographic Scope	High	× 1	1	US				
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE				
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data older than 10 years (1982) but after PEL				
	Metric 5:	Sample Size	High	$\times 1$	1	Discrete samples given				
		*	<u> </u>			A U				
Domain 3: Access	sibility/Clar	ity								
	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	Most metadata given, missing exposure frequency				
Continued on next page										

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Source Citation:	Gorman, R.,Rinsky, R.,Stein, G.,Anderse Whitney Aircraft, West Palm Beach, Flor	on, K 198 ida.	4. Healt	h hazaı	rd evaluation report no. HETA 82-075-1545, Pratt &				
Type of Data Source	Occupational Exposure: Monitoring Data:								
Hero ID	3970552	3070552							
	0010002								
EVALUATION									
Domain	Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments				
Domain 4: Variab	pility and Uncertainty Metric 7: Metadata Completeness	Medium	$\times 1$	2	None discussed, but NIOSH method addresses variability/ uncertainty in the method				
Overall Quality D	$\operatorname{Petermination}^{\dagger}$	High		1.4					

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Source Citation:Niosh, 199Type of Data SourceOccupationHero ID3974943	92. Health hazard evaluation rep nal Exposure; Monitoring Data;	port no. HI	ETA-90-2	23-2211	, Thomson Consumer Electronics, Marion, Indiana.
EXTRACTION Parameter		Data			
Life Cycle Stage: Physical Form: Route of Exposure: Exposure Concentration (Uni Number of Samples: Number of Sites: Worker Activity: Number of Workers: Type of Sampling: Sampling Location:	Use liquid, vapor inhalation, dermal Personal: 0.01 - 11 ppmArea: 0.02 - 50 ppm 11 1 Degreasing 1900 Personal, area Degreasers 1, 2, 3, and 4				
<b>EVALUATION</b> Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability Metric 1:	Methodology	High	× 1	1	NIOSH Method 1003
Domain 2: Representative Metric 2: Metric 3: Metric 4: Metric 5:	Geographic Scope Applicability Temporal Representativeness Sample Size	High High Medium High	$\begin{array}{c} \times \ 1 \\ \times \ 2 \\ \times \ 2 \\ \times \ 1 \end{array}$	$\begin{array}{c} 1\\ 2\\ 4\\ 1\end{array}$	US Workplace that utilizes TCE Data older than 10 years (1992) but after PEL Discrete samples given
Domain 3: Accessibility/Clari Metric 6:	ity Metadata Completeness	Medium	$\times 1$	2	Most metadata given, missing exposure frequency
Domain 4: Variability and Ur Metric 7:	ncertainty Metadata Completeness	Medium	× 1	2	None discussed, but NIOSH method addresses variability/ uncertainty in the method
Overall Quality Determinatio	n†	High		1.4	

\* MWF = Metric Weighting Factor

<sup>†</sup> If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High:  $\geq 1$  to < 1.7; Medium:  $\geq 1.7$  to < 2.3; Low:  $\geq 2.3$  to  $\leq 3$ .

Source Citation:	Love, J. F Washingto	R.,Kern, M 1981. Health ha	zard evalua	tion rep	ort no.	HETA-81-065-938, METRO Bus Maintenance Shop,
Type of Data Source Hero ID	Occupation 3859376	nal Exposure; Monitoring Data;				
EXTRACTION						
Parameter			Data			
Life Cycle Stage:			Use			
Physical Form:			liquid, va	por		
Route of Exposur	e:		inhalation	n, dermal	1	
Exposure Concent	tration (Uni	t):	ND - 3.8	mg/m3		
Number of Sampl	es:		3			
Number of Sites:			1			
Type of Measuren	nent or Met	hod:	Short ter	m		
Worker Activity:			Degreasir	ıg		
Number of Worke	rs:		17 - 2 deg	greasing of	operator	rs.
Type of Sampling	:		Area			
Sampling Location	n:		Degrease	ר גיו וא		NANA 107
Analytic Method:			NIOSH N	letnod N	10. P&C	AM 127
EVALUATION						
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments
Domain 1: Reliab	ility					
Domain 1. Ronab	Metric 1:	Methodology	High	$\times 1$	1	NIOSH Method No. P&CAM 127
			0			
Domain 2: Repres	sentative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data older than 10 years (1981) but after PEL
	Metric 5:	Sample Size	High	$\times 1$	1	Discrete samples given
		•,				
Domain 3: Access	Matuia C	Ity Mata lata Gammalatan an	M - 1		0	
	Metric 6:	Metadata Completeness	Medium	× 1	2	Most metadata given, missing exposure frequency
Domain 4. Variah	ility and U	acortainty				
Domain F. Vallau	Metric 7.	Metadata Completeness	Medium	× 1	2	None discussed but NIOSH method addresses variability/
		interaction compreteness	mourum	// ±	-	uncertainty in the method
		Cor	ntinued on 1	next page	9	

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Source Citation:	Love, J. R.,Kern, M 1981. Health ha Washington, DC.	azard evalua	tion repo	ort no.	HETA-81-065-938, METRO Bus Maintenance Shop,		
Type of Data Source Here ID	Occupational Exposure; Monitoring Data	;					
	3033310						
EVALUATION							
Domain	Metric	Rating	$MWF^*$	Score	Comments		
Overall Quality I	$\operatorname{Petermination}^{\dagger}$	High		1.4			

Source Citation:	Baya, M. P., Figa-Talamanca, I., Siskos, P. A. 1998. Determination of selected volatile organic compounds in the air of dry-cleaning shops in the Athens area: Pilot study. Indoor and Built Environment.							
Type of Data Source Hero ID	Occupatio 3545708	nal Exposure; Monitoring Data;	ot study. II	luoor and	1 Dunt	Environment.		
EXTRACTION								
Parameter			Data					
Life Cycle Stage			Use					
Physical Form:			liquid, va	por				
Route of Exposur	e:		inhalation	1				
Exposure Concent	tration (Uni	it):	ND - 1.96	mg/m3				
Number of Sampl	es:		14	-,				
Number of Sites:			19					
Type of Measurer	nent or Met	hod:	short term	n				
Worker Activity:			Dry clean	ing				
EVALUATION								
Domain		Metric	Rating	$MWF^*$	Score	Comments		
Domain 1: Reliab	ility							
	Metric 1:	Methodology	Medium	$\times 1$	2	Method described, in peer review journal assumed to use acceptable methods		
Domain 2: Repres	sentative							
1	Metric 2:	Geographic Scope	Medium	$\times 1$	2	Greece (OECD country)		
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE		
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data older than 10 years $(1998)$ but after PEL		
	Metric 5:	Sample Size	High	$\times 1$	1	Discrete samples given		
Domain 3: Access	ibility/Clar	ity						
Domain 0. Access	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	Exposure type and sample type given, no other metadata		
	.1., 1.1.							
Domain 4: Variab	Matria $7$	Mata data Canadatan ara	M. J	v 1	0			
	Metric 7:	Metadata Completeness	Mealum	× 1	2	Addressed through sampling multiple shops		
Overall Quality D	eterminatio	$\mathbf{n}^{\dagger}$	Medium		1.7			

Source Citation: Type of Data Source Hero ID	Von Grote lene and T Journal of Occupatio 3045042	Von Grote, J.,J. C. Hurlimann,Scheringer, M.,Hungerbuhler, K 2003. Reduction of Occupational Exposure to Perchloroethy- lene and Trichloroethylene in Metal Degreasing over the Last 30 years: Influence of Technology Innovation and Legislation. Journal of Exposure Analysis and Environmental Epidemiology. Occupational Exposure; Published Models for Exposures or Releases; 3045042						
EXTRACTION								
Parameter			Data					
Life Cycle Stage: Physical Form: Route of Exposur Type of Measurer Worker Activity:	e: nent or Met	Use vapor inhalation Estimation Model Modeling degreaser exposure						
EVALUATION								
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments		
Domain 1: Reliab	ility Metric 1:	Methodology	High	$\times 1$	1	Published Journal Article: Journal of Exposure analysis and Environmental Epidemiology		
Domain 2: Repres	sentative							
Domain 2. Hopro.	Metric 2:	Geographic Scope	Medium	$\times 1$	2	Data based on German facilities (OECD country).		
	Metric 3:	Applicability	High	$\times 2$	2	Degreaser exposure modeling		
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	2003, 15 years old		
	Metric 5:	Sample Size	N/A		N/A	N/A - modeled exposures		
	1.11. (CI	•						
Domain 3: Access	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	Sources are cited, but does not provide details on how reported values were derived from cited sources.		
Domain 4: Variab	ility and Un Metric 7:	ncertainty Metadata Completeness	Medium	× 1	2	Variability in parameter values discussed, but no discussion of uncertainties.		
Overall Quality D	eterminatio	$\mathrm{n}^\dagger$	High		1.6			

Source Citation:	burce Citation: Niosh, 1997. Control of health and safety hazards in commercial drycleaners: chemical exposures, fire hazards, and ergonomic						
Type of Data Source Hero ID	Occupatio 3044963	s. nal Exposure; Monitoring Data;					
EXTRACTION							
Parameter			Data				
Life Cycle Stage			Use				
Physical Form:			liquid, va	por			
Route of Exposure	e:		inhalation	ı, dermal	l		
Exposure Concent	tration (Uni	t):	ND - 9.16	j ppmTV	VA: 0.3	- 3.11 ppm	
Number of Sample	es:	,	67			**	
Type of Measuren	nent or Met	hod:	Long terr	n, TWA			
Worker Activity:			Spot trea	ting garn	nents in	drycleaning.	
Type of Sampling	:		Personal				
Sampling Location	n:		Spotting	Station			
Engineering Contr	rol & percei	nt Exposure Reduction:	Kitchen e	exhaust h	ood, ma	akeup air unit	
PPE:			None				
EVALUATION							
Domain		Metric	Rating	MWF*	Score	Comments	
			0				
Domain 1: Reliab	ility						
	Metric 1:	Methodology	High	$\times 1$	1	NIOSH Method 1003	
Domain 2: Repres	entative						
Domain 2. Ropros	Metric 2:	Geographic Scope	High	$\times 1$	1	US	
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE	
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data older than 10 years (1997) but after PEL	
	Metric 5:	Sample Size	High	$\times 1$	1	Discrete samples given	
Domain 2. Agaaga	ibility /Clan	:+					
Domain 5: Access	Motrie 6:	Motodoto Completeness	Modium	$\vee$ 1	9	Most motodata river, missian auroques factureres	
	Metric 0.	Metadata Completeness	meanni	~ 1	4	Most metadata given, missing exposure frequency	
Domain 4. Variab	ility and U	certainty					
	Metric 7:	Metadata Completeness	Medium	$\times 1$	2	None discussed, but NIOSH method addresses variability/ uncertainty in the method	
		Cor	ntinued on r	next page	9		

			-		
Source Citation:	Niosh, 1997. Control of health and safety risk factors.	hazards in o	commerci	al drycleane	rs: chemical exposures, fire hazards, and ergonomic
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	3044963				
EVALUATION					
Domain	Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments
Overall Quality I	$\operatorname{Determination}^\dagger$	High		1.4	

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Source Citation:	Baumann, Exposed t	A.,Page, E.,Mueller, C.,Burr, G.	G.,Hitchcoo	k, E 2	008. E	Avaluation of Neurological Dysfunction among Workers			
Type of Data Source Hero ID	be of Data Source Occupational Exposure; Monitoring Data; to ID 2947998								
EXTRACTION									
Parameter			Data						
Life Cycle Stage			Use						
Physical Form:			liquid va	por					
Route of Exposure	e٠		inhalation	o dermal					
Exposure Concent	ration (Uni	t):	Full Shift	TWA: 2	.0 - 130	ppmShort Term: 30 - 450 ppm			
Number of Sample	es:		273		.0 100	ppmonore remines a ree ppm			
Number of Sites:			1						
Type of Measuren	nent or Met	hod:	Full shift	TWA. SI	hort ter	·m			
Worker Activity:			Productio	on of Mic	roporou	is polyethylene battery separators			
Number of Worke	rs:		142			I J J J J J J J J J J J J J J J J J J J			
Type of Sampling	:		Personal,	Area					
Sampling Location	Sampling Location:			ocess					
Exposure Duration	Exposure Duration:			12 hr work day					
Exposure Frequen	cy:		3.5  days a	a week					
Analytic Method:	Analytic Method:			MAM M	lethod 1	1022 [NIOSH 2006].			
EVALUATION									
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments			
Domain 1. Boliab	ility								
Domain 1. Renab	Metric 1	Methodology	High	× 1	1	NIOSH NMAM Method 1022 [NIOSH 2006]			
	Micoric 1.	Methodology	111511	~ 1	1	NIODII NIMMI Method 1022 [NIODII 2000].			
Domain 2: Repres	entative								
*	Metric 2:	Geographic Scope	High	$\times 1$	1	US			
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE			
	Metric 4:	Temporal Representativeness	s Medium × 2 4 Source dataed 2008, but data from earlier; older than 10 yea but after PEL						
	Metric 5:	Sample Size	High	$\times 1$	1	Discrete samples given			
Domain 3: Access	ibility/Clar	ity							
	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	Most metadata given, missing exposure frequency			
Domain 4: Variab	ility and U	ncertainty							
		Con	tinued on r	next page	;				

Source Citation:	Baumann, Exposed to	A.,Page, E.,Mueller, C.,Burr, O D Trichloroethylene.	G.,Hitchcoc	k, E 2	2008. E	Evaluation of Neurological Dysfunction among Workers
Type of Data Source	Occupation	nal Exposure; Monitoring Data;				
Hero ID	2947998	<b>i</b> , <b>b</b> ,				
EVALUATION						
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments
	Metric 7:	Metadata Completeness	Medium	$\times 1$	2	None discussed, but NIOSH method addresses variability/ uncertainty in the method
Overall Quality E	Determination	$\mathrm{n}^\dagger$	High		1.4	

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Source Citation:	Wadden, l Activity fo	Wadden, R. A., Hawkins, J. L., Scheff, P. A., Franke, J. E. 1991. Characterization of Emission Factors Related to Source Activity for Trichloroethylene Degreasing and Chrome Plating Processes. American Industrial Hygiene Association Journal.							
Type of Data Source Hero ID	Occupatio 2800647	nal Exposure; Published Models	for Exposu	tres or Re	eleases;				
EXTRACTION									
Parameter			Data						
Life Cycle Stage:			Use						
Dire Oycle Stage:			vapor						
Route of Exposur	e:		inhalation	inhalation					
Type of Measurer	nent or Met	hod:	Estimatic	n Model					
Worker Activity:			Modeling	degrease	r expos	ure			
EVALUATION									
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments			
Domain 1: Reliab	ility								
	Metric 1:	Methodology	High	$\times 1$	1	Journal of Exposure analysis and Environmental Epidemiology			
Domain 2: Repres	sentative								
	Metric 2:	Geographic Scope	High	$\times 1$	1	Location of plants not indicated, but US-based study			
	Metric 3:	Applicability	High	$\times 2$	2	Degreaser exposure modeling			
	Metric 4:	Temporal Representativeness	Low	$\times 2$	6	1991, 27 years old			
	Metric 5:	Sample Size	N/A		N/A	N/A - modeled exposures			
Domain 3: Access	sibility/Clar	ity							
	Metric 6:	Metadata Completeness	High	$\times 1$	1	Transparent and well presented. Well documented.			
Domain 4: Variah	oility and U	ncertainty							
	Metric 7:	Metadata Completeness	Medium	× 1	2	Variability in machine types, but no discussion of uncertainties.			
Overall Quality D	eterminatio	$\mathrm{n}^\dagger$	High		1.6				

Source Citation:	Kowalska, J., SzewczyÅska, M., PoÅniak, M. 2014. Measurements of chlorinated volatile organic compounds emitted from office printers and photocopiers. Environmental Science and Pollution Research							
Type of Data Source Hero ID	Occupation 2534318	nal Exposure; Monitoring Data;	lental Science an	a i onun	on nese	arch.		
EXTRACTION								
Parameter			Data					
Life Cycle Stage:			Uso					
Physical Form:			vapor					
Route of Exposur	e:		inhalation					
Exposure Concent	tration (Uni	t):	ND- 11 ug/m3					
Number of Sampl	es:	,	7					
Number of Sites:			1					
Type of Measurer	ment or Met	hod:	Short term					
Worker Activity:			Testing printer	VOC pr	oductio	n		
Type of Sampling	•		Area					
EVALUATION					~	~		
Domain		Metric	Rating	MWF'*	Score	Comments		
Domain 1: Reliab	ility							
	Metric 1:	Methodology	Medium	$\times 1$	2	Method described and in peer reviewed journal article, as- sumed to be acceptable		
Damain 9. Damai								
Domain 2: Repres	Motrie 2.	Coorrephie Seene	Modium	× 1	0			
	Metric 2:	Applicability	Unaccontable	$\times 1$	2	EU (OECD)		
	Metric 5.	Applicability	Unacceptable	X 2	0	Data taken inside test chamber, not expected to be represen- tative of occupational exposures		
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	2015, 3 years old		
	Metric 5:	Sample Size	Medium	$\times 1$	2	Range, mean, and STD given		
Domain 2. Accord	sibility /Clan	:+						
Domain 5: Access	Motrie 6:	Motadata Completeness	Low	$\vee$ 1	2	Only some la turn a river		
	Metric 0.	Metadata Completeness	LOW	~ 1	5	Only sample type given		
Domain 4. Variah	vility and Ur	acertainty						
Domain 1. Varias	Metric 7:	Metadata Completeness	Low	× 1	3	Not addressed		
				·· •	· ·			
Overall Quality D	eterminatio	$\mathbf{n}^{\dagger}$	Unacceptable		4	Metric Mean Score: 2.4.		
		(	Continued on nex	t page				

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Source Citation:	Kowalska, J.,SzewczyÅska, M.,PoÅniak office printers and photocopiers. Enviro	, M 2014. Mea nmental Science a	surements .nd Polluti	of chlorinated on Research.	volatile organic compounds emitted from		
Type of Data Source	Occupational Exposure; Monitoring Dat	Occupational Exposure; Monitoring Data;					
Hero ID	2534318	2534318					
EVALUATION							
Domain	Metric	Rating	$MWF^{\star}$	Score	Comments		

\*\* Consistent with our Application of Systematic Review in TSCARisk Evaluations document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

\* MWF = Metric Weighting Factor

<sup>†</sup> If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High:  $\geq 1$  to < 1.7; Medium:  $\geq 1.7$  to < 2.3; Low:  $\geq 2.3$  to  $\leq 3$ .

Source Citation:	Fleming, D. A., Woskie, S. R., Jones, J. H., Silver, S. R., Luo, L., Bertke, S. J. 2014. Retrospective Assessment of Exposure to Chemicals for a Microelectronics and Business Machine Manufacturing Facility. Journal of Occupational and Environmental Hygiene.							
Type of Data Source Hero ID	Occupation 2128566	nal Exposure; Reports for Data	or Informat	tion Othe	er than	Exposure or Release Data;		
EXTRACTION								
Parameter			Data					
Life Cycle Stage: Physical Form: Route of Exposur Number of Sites: Worker Activity: Number of Worke	Stage: Form: Exposure: f Sites: ctivity: f Workers:			Use liquid, vapor inhalation 1 Etch and strip resist circuit board 5,028				
EVALUATION		Motric	Bating	MWF*	Scoro	Commonte		
Domani		Metric	Natilig	IVI VV F	Score	Comments		
Domain 1: Reliab	ility							
	Metric 1:	Methodology	Medium	$\times 1$	2	Peer-reviewed article, using data not from a frequently used source		
Domain 2. Benree	sentative							
Domain 2. Ropro	Metric 2:	Geographic Scope	High	$\times 1$	1	US		
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE		
	Metric 4:	Temporal Representativeness	Low	$\times 2$	6	Completed in 2013, but uses data that is over 20 years old.		
	Metric 5:	Sample Size	N/A		N/A	N/A - qualitative information only		
Domain 2. Access	ihiliter /Clam	:						
Domain 5: Access	Metric 6:	Metadata Completeness	High	× 1	1	Sources clearly documented		
	1.100110 01		8		-			
Domain 4: Variab	oility and U	ncertainty						
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed		
Overall Quality D	eterminatio	$\mathrm{n}^\dagger$	Medium		1.9			

Source Citation:	Strelec, F., 2012. Trichloroethylene Overexposure in an Automotive Stamping Facility. Journal of Occupational and Envi-							
Type of Data Source Hero ID	Occupation 2128379	nal Exposure; Monitoring Data;						
EXTRACTION								
Parameter			Data					
Life Cycle Stage:			Uso					
Physical Form:			liquid, va	por				
Route of Exposur	e:		inhalatio	1				
Exposure Concen	tration (Uni	t):	140 ppm TWA342.5 -832.5 ppm ceiling					
Number of Sites:	× ×	,	1					
Type of Measurer	nent or Met	hod:	TWA, she	ort term				
Worker Activity:			Degreasir	ıg				
Type of Sampling			Personal					
Sampling Locatio	n:		degreaser	operator	•			
Exposure Duration	on:		8 hour					
Analytic Method:			OSHA 1001					
EVALUATION								
Domain		Metric	Rating	$MWF^*$	Score	Comments		
	_							
Domain 1: Reliab	oility		**. 1	_	_			
	Metric 1:	Methodology	High	× 1	1	OSHA 1001		
Domain 2: Repres	sentative							
	Metric 2:	Geographic Scope	High	$\times 1$	1	US		
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE		
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	2012, 6 years old		
	Metric 5:	Sample Size	High	$\times 1$	1	Discrete samples given		
Domain 3: Access	zibility/Clar	ity						
Domain 5. Access	Metric 6:	Metadata Completeness	Medium	× 1	2	Most metadata given, missing exposure frequency		
		included completeness	mourain		_	nose medadada green, misenig enposare nequency		
Domain 4: Variab	oility and Ui	ncertainty						
	Metric 7:	Metadata Completeness	Medium	× 1	2	None discussed, but NIOSH method addresses variability/ uncertainty in the method		
		Con	tinued on 1	next page	)			

Source Citation:	Strelec, F 2012. Trichloroethylene Over ronmental Hygiene.	rexposure in	an Auto	omotive Sta	mping Facility. Journal of Occupational and Envi-
Type of Data Source Hero ID	Occupational Exposure; Monitoring Data 2128379	;			
EVALUATION					
Domain	Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments
Overall Quality D	$\operatorname{Determination}^\dagger$	High		1.2	

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Source Citation:	Rastkari, N., Yunesian, M., Ahmadkhaniha, R 2011. Exposure Assessment to Trichloroethylene and Perchloroethylene for Workers in the Dry Cleaning Industry, Bulletin of Environmental Contamination and Toxicology							
Type of Data Source Hero ID	Occupation 2128295	Occupational Exposure; Monitoring Data; 2128295						
EXTRACTION Parameter			Data					
Life Cycle Stage: Physical Form: Route of Exposure: Exposure Concentration (Unit): Number of Samples: Worker Activity: Type of Sampling: Sampling Location:		Use liquid, vapor inhalation, dermal 0.98 - 2.40 mg/m3 40 Dry-cleaning Personal operator						
<b>EVALUATION</b> Domain		Metric	Rating	MWF*	Score	Comments		
			8					
Domain 1: Reliab	ility Metric 1:	Methodology	Medium	$\times 1$	2	Method described and published Journal Article; therefore, method assumed to be acceptable		
Domain 2: Repres	sentative							
	Metric 2:	Geographic Scope	Low	$\times 1$	3	Iran (non-OECD)		
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE		
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	2011, 7 years old		
	Metric 5:	Sample Size	Medium	$\times 1$	2	Mean and STD given but no discrete data		
Domain 3: Access	ibility/Clar	ity	T	-	0			
	Metric 6:	Metadata Completeness	Low	$\times 1$	3	Sample type given, but no other metadata		
Domain 4: Variab	ility and Ur	ncertainty						
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed		
Overall Quality D	eterminatio	$\mathbf{n}^{\dagger}$	Medium		1.9			

Source Citation:	Crandall,	M. S., Albrecht, W. N 1989.	Health Ha	azard Ev	aluation	n Report No. HETA-86-380-1957, York International				
Type of Data Source Hero ID	Occupation 2072185	nal Exposure; Monitoring Data;								
EXTRACTION										
Parameter			Data							
Life Charle Sterrey			II							
Physical Form:			Use liquid vo	nor						
Route of Exposure	· ·		inhalation	inquia, vapor inhalation dermal						
Exposure Concent	ration (Uni	t):	31.1 - 38.	4 ppm						
Number of Sample	s:	.).	33	- ppm						
Number of Sites:			1							
Type of Measurem	ent or Met	hod:	Full Shift							
Worker Activity:			Metal De	greasing						
Number of Worker	's:		40							
Type of Sampling:			Personal							
Analytic Method:			NIOSH Method 1022							
EVALUATION										
Domain		Matria	Doting		Secre	Comments				
Domain		Metric	nating	IVI VV F	Score	Comments				
Domain 1: Reliabi	lity									
Domain 1. Renabi	Metric 1:	Methodology	High	$\times 1$	1	NIOSH Method 1022				
Domain 2: Ropros	ontotivo									
Domain 2. Represe	Metric 2.	Geographic Scope	High	× 1	1	US				
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE				
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data older than 10 years (1989) but after PEL				
	Metric 5:	Sample Size	High	$\times 1$	1	Discrete samples given				
Domain 3: Accessi	bility/Clari	ity		-	2					
	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	Most metadata given, missing exposure frequency				
Domoin 4. Variahi	liter and He	a conta inter								
Domain 4: Variabi	Metric 7:	Metadata Completeness	Medium	$\times 1$	2	None discussed, but NIOSH method addresses variability/ uncertainty in the method				
		Con	tinued on r	next page	9					

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Source Citation:	Crandall, M. S., Albrecht, W. N 1989. Corporation, Madisonville, Kentucky.	Health H	lazard Ev	aluation Report	No. HETA-86-380-1957,	York International
Type of Data Source	Occupational Exposure; Monitoring Data;					
Hero ID	2072185					
EVALUATION						
Domain	Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments	
Overall Quality D	$\operatorname{etermination}^\dagger$	High		1.4		

Source Citation:	Daniels, W. J., Orris, P., Kramkowski, R., Almaguer, D. 1988. Health Hazard Evaluation Report No. HETA-86-121-1923, Modern Plating Corporation Exceptrt Illinois						
Type of Data Source Hero ID	Occupatio 1877748	and Exposure; Monitoring Data;					
EXTRACTION							
Parameter			Data				
Life Cycle Stage:			Uso				
Physical Form:		liquid, va	por				
Route of Exposur	·e:		inhalation	1			
Exposure Concen	tration (Un	it):	82.1 - 84.	2 ppm			
Number of Sampl	les:	,	2				
Type of Measurer	ment or Met	thod:	TWA				
Worker Activity:			Metal De	greasing			
Number of Worke	ers:		87				
Type of Sampling	g:		area				
Analytic Method:			NIOSH Method 1003				
EVALUATION							
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments	
Domain 1: Reliab	oility						
	Metric 1:	Methodology	High	$\times 1$	1	NIOSH Method 1003	
Domain 2: Repre	sentative						
	Metric 2:	Geographic Scope	High	$\times 1$	1	US	
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE	
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data older than 10 years $(1988)$ but after PEL	
	Metric 5:	Sample Size	High	$\times 1$	1	Discrete samples given	
Domain 3: Access	zibility/Clar	it.					
Domain 5. Access	Metric 6	Metadata Completeness	Medium	× 1	2	Most metadata given missing exposure frequency	
			meanum	× 1	-	Nost metadata given, missing exposure nequency	
Domain 4: Varial	bility and U	ncertainty					
	Metric 7:	Metadata Completeness	Medium	$\times 1$	2	None discussed, but NIOSH method addresses variability/ uncertainty in the method	
Overall Quality I	Determinatio	$\mathrm{on}^{\dagger}$	High		1.4		
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		001	innueu oli i	icht page	,		

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Source Citation:	Daniels, W. J., Orris, P., Kramkowski, R., A Modern Plating Corporation, Freeport, Illin	lmaguer, I 10is.	D 1988.	. Health Hazard E	valuation Report No.	HETA-86-121-1923,
Type of Data Source	Occupational Exposure; Monitoring Data;					
Hero ID	1877748					
EVALUATION						
Domain	Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments	

Source Citation:	Dodson, R. E., Houseman, E. A., Levy, J. I., Spengler, J. D., Shine, J. P., Bennett, D. H 2007. Measured and modeled personal exposures to and risks from volatile organic compounds. Environmental Science and Technology.						
Type of Data Source Hero ID	Occupation 1067092	Occupational Exposure; Completed Exposure or Risk Assessments; 1067092					
EXTRACTION Parameter			Data				
Life Cycle Stage: Physical Form: Route of Exposure: Type of Measurement or Method: Worker Activity:			Environment gas/vapor inhalation Estimation Model Modeling ambient exposure to VOCs				
EVALUATION Domain		Metric	Rating	$MWF^{\star}$	Score	Comments	
			0				
Domain 1: Reliab	oility Metric 1:	Methodology	High	$\times 1$	1	Model appears to based on sound approaches and is in peer reviewed journal, assumed to be of acceptable quality	
Domain 2: Bopro	contativo						
Domain 2. Repres	Metric 2.	Geographic Scope	High	× 1	1	US	
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	Relates to general ambient exposure to VOCs (not in scope)	
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	2007. 11 years old	
	Metric 5:	Sample Size	N/A		N/A	No Comment.	
Domain 3: Access	sibility/Clar Metric 6:	ity Matadata Completeness	High	× 1	1	Transment and well presented Well decomparted	
	Metric 0.	Metadata Completeness	IIIgii	× 1	1	Transparent and well presented. well documented.	
Domain 4: Varial	oility and U	ncertainty					
	Metric 7:	Metadata Completeness	Medium	$\times 1$	2	Briefly discussed variations in the data.	
Overall Quality I	Determinatio	$\mathrm{n}^\dagger$	Unacceptable		4	Metric Mean Score: 2.1.	

\* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	Teschke, K.,Ahrens, W.,Andersen, A.,Boffetta, P.,Fincham, S.,Finkelstein, M.,Henneberger, P.,Kauppinen, T.,Kogevinas, M.,Korhonen, K.,Liss, G.,Liukkonnen, T.,Osvoll, P.,Savela, A.,Szadkowska-Stanczyk, I.,Westberg, H.,Widerkiewicz, K. 1999. Occupational exposure to chemical and biological agents in the nonproduction departments of pulp, paper, and paper product mills: an international study. American Industrial Hygiene Association Journal. Occupational Exposure; Monitoring Data; 1022908						
EXTRACTION							
Parameter			Data				
Life Cycle Stage: Exposure Concen Number of Sampl Number of Sites: Type of Measurer	tration (Uni es: nent or Met	t): hod:	Use 0 - 1006 ( 10 4 Short terr	no units) m	I		
EVALUATION							
Domain		Metric	Rating	$MWF^*$	Score	Comments	
Domain 1: Reliab	ility Metric 1:	Methodology	Low	× 1	3	Not described	
		0,					
Domain 2: Repres	sentative	aa	*** 1				
	Metric 2:	Geographic Scope	High	× 1	1	US, Canada, and EU	
	Metric 3:	Applicability	Medium	$\times 2$	4	Use of TCE in workplace not clear	
	Metric 4:	Temporal Representativeness	Medium	× 2	4	1999, 19 years old	
	Metric 5:	Sample Size	Medium	× 1	Z	Mean, median, and range given	
Domain 3: Access	sibility/Clar	ity					
	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	Exposure type and sample type given, no other metadata	
Domain 4. Variak	iliter and H	o conto inter					
Domain 4: Variat	Metric 7.	Metadata Completeness	Low	$\times 1$	3	Not addressed	
	MEULIC 1.	Metadata Completeness	цом	^ 1	J	NOT AUTESSEU	
Overall Quality D	eterminatio	$\mathbf{n}^{\dagger}$	Medium		2.1		

Source Citation: Type of Data Source	Chiang, H. L., Lin, W. H., Lai, J. S., Wang, W. C 2010. Inhalation risk assessment of exposure to the selected volatile organic compounds (VOCs) emitted from the facilities of a steel plant. Journal of Environmental Science and Health, Part A: Toxic/ Hazardous Substances and Environmental Engineering. Occupational Exposure; Monitoring Data;							
Hero ID	832709	<b>r</b> <sup>(1)</sup> , <b>r</b> <sup>(1</sup>						
EXTRACTION								
Parameter			Data					
Life Cycle Stage: Route of Exposure: Exposure Concentration (Unit): Number of Samples: Type of Measurement or Method: Worker Activity: Type of Sampling: Sampling Location: Analytic Method:			Use inhalation 0 - 246 ppb 72 Long-term Steel Production Area Various areas of the steel plant U.S. EPA Method TO-14					
<b>EVALUATION</b> Domain		Metric	Rating	MWF*	Score	Comments		
Domain 1: Reliab	ility Metric 1:	Methodology	High	× 1	1	Method described and stated to be certified by EPA Method TO-14		
Domain 2: Repres	entative							
Domain 2. Ropro.	Metric 2:	Geographic Scope	Low	$\times 1$	3	Taiwan (non-OECD)		
	Metric 3:	Applicability	Medium	$\times 2$	4	Use of TCE in workplace not clear		
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	2010, 8 years old		
	Metric 5:	Sample Size	Medium	$\times 1$	2	mean and 10th, 50th, and 90th percentile given		
Domain 3: Access	ibility/Clar Metric 6:	ity Metadata Completeness	Medium	$\times 1$	2	Exposure type and sample type given, no other metadata		
Domain 4: Variab	ility and U Metric 7:	ncertainty Metadata Completeness	Low	× 1	3	Not addressed		
Overall Quality D	eterminatic	$\mathbf{n}^{\dagger}$	Medium		1.9			
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Source Citation:	Chiang, H. L., Lin, W. H., Lai, J. S., Wang, W. C. 2010. I compounds (VOCs) emitted from the facilities of a steel Hazardous Substances and Environmental Engineering.	nhalation risk assessment of exposu plant. Journal of Environmental Sc	re to the selected volatile organic ience and Health, Part A: Toxic/				
Type of Data Source Hero ID	Occupational Exposure; Monitoring Data; 832709	Occupational Exposure; Monitoring Data; 832709					
EVALUATION							
Domain	Metric Rating M	WF <sup>*</sup> Score	Comments				

Source Citation:	Hsieh, L. L., Chang, C. C., Sree, U., Lo, J. G 2006. Determination of volatile organic compounds in indoor air of buildings in nuclear power plants, Taiwan. Water, Air, and Soil Pollution.							
Type of Data Source Hero ID	Occupation 824990	Occupational Exposure; Monitoring Data; 824990						
EXTRACTION Parameter			Data					
Life Cycle Stage: Physical Form: Route of Exposur Exposure Concent Number of Sites: Type of Sampling	e: tration (Uni ;:	t):	Use gas/vapor inhalation Average: 212.9 4 Area	) ppb				
<b>EVALUATION</b> Domain		Metric	Rating	MWF*	Score	Comments		
Domain 1: Reliab	ility Metric 1:	Methodology	Medium	× 1	2	Method described but unclear if it is equivalent to NIOSH/ OSHA		
Domain 2: Repres	Sentative Metric 2: Metric 3: Metric 4: Metric 5:	Geographic Scope Applicability Temporal Representativeness Sample Size	Low Medium Medium Medium	$\begin{array}{c} \times \ 1 \\ \times \ 2 \\ \times \ 2 \\ \times \ 1 \end{array}$	$egin{array}{c} 3 \\ 4 \\ 4 \\ 2 \end{array}$	Taiwan (non-OECD) Use of TCE in workplace not clear 2005, 13 years old (after PEL) Average and STD given		
Domain 3: Access	sibility/Clari Metric 6:	ty Metadata Completeness	Unacceptable	$\times 1$	4	No metadata given		
Domain 4: Variab	oility and Ur Metric 7:	ncertainty Metadata Completeness	Low	$\times 1$	3	Not addressed		
Overall Quality D	Determination	$\mathbf{n}^{\dagger}$	Unacceptable		4	Metric Mean Score: 2.4.		

\* MWF = Metric Weighting Factor

Source Citation:	Xu, X.,Ya and liver of	ng, R.,Wu, N.,Zhong, P.,Ke, Y.,Z dysfunction induced by occupation	Zhou, L.,Yu onal exposi	an, J.,Li, re to trie	G.,Hua chloroet	ng, H., Wu, B. 2009. Severe hypersensitivity dermatitis hylene. Industrial Health.
Type of Data Source Hero ID	Occupatio 730058	nal Exposure; Monitoring Data;				
EXTRACTION						
Parameter			Data			
			TT			
Life Cycle Stage:			Use			
Physical Form: Route of Exposur	· · ·		inhalation	por dormo	1	
Exposure Concert	e. tration (Un <sup>:</sup>	it).	18 - 683 1	$m_{\sigma}/m_{\gamma}$	L	
Number of Sampl	es.		60-80	.11g/ 1110		
Number of Sites:			21			
Type of Measurer	nent or Met	hod:	TWA			
Worker Activity:			general fa	actory wo	orker - n	ot detailed activity given.
Number of Worke	ers:		21	v		200
Type of Sampling	:		Area			
Exposure Duratio	on:		5-90  days	;		
EVALUATION						
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments
Domain 1: Reliab	ollity		A.C. 11	-	0	
	Metric 1:	Methodology	Medium	× 1	2	Method described and peer reviewed journal, assumed to use acceptable method
						, , , , , , , , , , , , , , , , , , ,
Domain 2: Repres	sentative					
	Metric 2:	Geographic Scope	Low	$\times 1$	3	China (non-OECD)
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	2009, 9 years old
	Metric 5:	Sample Size	Medium	$\times 1$	2	range given but no other statistics
<b>D</b>						
Domain 3: Access	sibility/Clar	ity			0	
	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	Exposure type and sample type given, no other metadata
Domain 4. Variah	ility and U	ncontainty				
Domain 4. variat	Motric 7	Motadata Completeness	Low	$\vee 1$	3	Not addressed
	TATEOLIC 7.	metadata Completeness	LOW	~ 1	J	1101 autresseu
		Cor	tinued on i	next page	Э	

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Source Citation:	tation: Xu, X., Yang, R., Wu, N., Zhong, P., Ke, Y., Zhou, L., Yuan, J., Li, G., Huang, H., Wu, B. 2009. Severe hypersensitivity dermatitis and liver dysfunction induced by occupational exposure to trichloroethylene. Industrial Health.						
Type of Data Source	Occupational Exposure: Monitoring Data:						
Hero ID	730058	0 ,					
EVALUATION							
Domain	Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments		
Overall Quality D	$\operatorname{Determination}^\dagger$	Medium		1.8			

Source Citation:	Hein, M. J., Waters, M. A., Ruder, A. M., Stenzel, M. R., Blair, A., Stewart, P. A., 2010. Statistical modeling of occupational chlorinated solvent exposures for case-control studies using a literature-based database. Annals of Occupational Hygiene.								
Type of Data Source Hero ID	Occupation 729521	Occupational Exposure; Published Models for Exposures or Releases; 729521							
EXTRACTION									
Parameter			Data						
Life Cycle Starrow			Ugo						
Physical Form:			vapor						
Route of Exposur	e.		inhalation						
Number of Sampl	es:		484						
Type of Measurer	ment or Met	hod:	short term. lon	ng term					
Worker Activity:			Variety of indu	istries					
EVALUATION									
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments			
Damain 1. Daliah	:1:								
Domain 1: Kellad	Motrie 1.	Mathadalagy	High	$\vee$ 1	1	Deer reviewed article authored by employees of the CDC Na			
	Metric 1.	Methodology	Ingn	~ 1	1	tional Cancer Institute, et al. Published in an Occupational Hygiene journal.			
Domain 2: Bepres	contativo								
Domain 2. Repres	Metric 2.	Geographic Scope	High	× 1	1	US			
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	Model predicts exposures for non-specific work scenario not			
	1.100110 0.	Typhoasing	e nacceptable	~ =	0	applicable to any specific condition of use for TCE			
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	2010, 8 years old			
	Metric 5:	Sample Size	N/A		N/A	N/A - modeled exposures			
Domain 3: Access	vibility/Clar	ity							
Domain 5. Access	Metric 6:	Metadata Completeness	High	$\times 1$	1	Transparent and well presented. Well documented.			
-		-	0						
Domain 4: Variab	oility and Ur	ncertainty							
	Metric 7:	Metadata Completeness	Low	× 1	3	Not addressed			
Overall Quality D	eterminatio	$\mathbf{n}^{\dagger}$	Unacceptable		4	Metric Mean Score: 2.0.			
		(	Continued on new	rt nage					
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Source Citation: Hein, M. J., Waters, M. A., Ruder, A. M., Stenzel, M. R., Blair, A., Stewart, P. A. 2010. Statistical modeling of occupational chlorinated solvent exposures for case-control studies using a literature-based database. Annals of Occupational Hygiene.								
Type of Data Source Hero ID	Occupational Exposure; Published Models for Exposures or Releases; 729521							
EVALUATION	EVALUATION							
Domain	Metric Rating $MWF^*$ Score Comments							

\* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	Kamijima, M.,Wang, H.,Huang, H.,Li, L.,Shibata, E.,Lin, B.,Sakai, K.,Liu, H.,Tsuchiyama, F.,Chen, J.,Okamura, A.,Huang, X.,Hisanaga, N.,Huang, Z.,Ito, Y.,Takeuchi, Y.,Nakajima, T 2008. Trichloroethylene causes generalized hypersensitivity skin disorders complicated by hepatitis. Journal of Occupational Health. Occupational Exposure; Monitoring Data; 729431						
EXTRACTION							
Parameter			Data				
Life Cycle Stage: Physical Form: Route of Exposure Exposure Concent Number of Sites: Type of Measuren Type of Sampling Sampling Location Exposure Duratio Exposure Frequen	age:Usen:liquid, vaporosure:inhalation, dermalacentration (Unit):2.1-2330 mg/m3tes:4surement or Method:TWApling:Personal, areacation:on worker and at site where he spends the most of his time.ration:8-12 hequency:6 day/week					ere he spends the most of his time.	
EVALUATION					a		
Domain		Metric	Rating	MWF'*	Score	Comments	
Domain 1: Reliab	ility Metric 1:	Methodology	Medium	× 1	2	Method described and in peer reviewed journal article, as- sumed to be acceptable	
	, , <b>.</b>						
Domain 2: Repres	Motrio 2.	Coorresphie Coope	Low	~ 1	9		
	Metric 2:	Appliesbility	Low	× 1 × 2	ა ი	Mattich sites that still a TCE is the sed along	
	Metric 4:	Temporal Representativeness	Medium	$\times 2 \times 2$	4	source from 2008, but data collected in 2002-2003 (older than 10 years but after PEL)	
	Metric 5:	Sample Size	Medium	$\times 1$	2	Range, mean, and STD given	
Domain 3: Access	ibility/Clar	Nete dete Generaleten ere	M - J		0		
	metric 6:	Metadata Completeness	medium	× 1	2	Exposure type and sample type given, no other metadata	
Domain 4. Variab	ility and U	ncertainty					
Domain 4. Variab	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed	
		<b>T</b>			-		
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Source Citation:	Kamijima, M.,Wang, H.,Huang, H.,Li, L.,Shibata, E.,Lin, B.,Sakai, K.,Liu, H.,Tsuchiyama, F.,Chen, J.,Okamura, A.,Huang, X.,Hisanaga, N.,Huang, Z.,Ito, Y.,Takeuchi, Y.,Nakajima, T 2008. Trichloroethylene causes generalized hypersensitivity skin disorders complicated by hepatitis. Journal of Occupational Health.							
Type of Data Source	Occupational Exposure; Monitoring D	Occupational Exposure; Monitoring Data;						
Hero ID	729431							
EVALUATION								
Domain	Metric	Rating	$MWF^*$ Score	Comments				
Overall Quality I	$\operatorname{Determination}^\dagger$	Medium	2.0					

\* MWF = Metric Weighting Factor

Source Citation:	Fevotte, J., Charbotel, B., Muller-Beauté, P., Martin, J. L., Hours, M., Bergeret, A. 2006. Case-control study on renal cell cancer and occupational exposure to trichloroethylene. Part I: Exposure assessment. Annals of Occupational Hygiene.							
Type of Data Source Hero ID	Occupation 729415	Occupational Exposure; Monitoring Data; 729415						
EXTRACTION								
Parameter			Data					
Life Cycle Stage: Physical Form:			Use liquid vapor					
Route of Exposur	e:		inhalation. der	mal				
Exposure Concent	tration (Uni	t):	Estimated 0-10	00+ ppm				
Number of Sites:	×	,	750					
Worker Activity:			Degreasing					
Number of Worke	ers:		12000					
EVALUATION								
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments		
Domain 1: Reliab	ility							
	Metric 1:	Methodology	Low	$\times 1$	3	Not specified		
Domain 9. Doma								
Domain 2: Repres	Motric 2.	Geographic Scope	Modium	$\sim 1$	9	UK study (OECD)		
	Metric 3:	Applicability	High	$^{\wedge 1}$ $\times 2$	2	Multiple sites that utilize TCE in the workplace		
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Report from 2005 but cites older data (all after PEL)		
	Metric 5:	Sample Size	Low	$\times 1$	3	Some ranges given, but some values with unknown statistics		
		1				given		
Domain 3: Access	sibility/Clari	ity						
Domain 0. Meees.	Metric 6:	Metadata Completeness	Unacceptable	$\times 1$	4	No metadata given		
-		*	*					
Domain 4: Variab	oility and Ur	ncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	Not addressed		
Overall Quality D	eterminatio	$\mathrm{n}^\dagger$	Unacceptable		4	Metric Mean Score: 2.3.		
		(	Continued on nex	t page				
				10.				

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Source Citation:	Fevotte, J., Charbotel, B., Muller-Beaut cancer and occupational exposure to tri	é, P.,Martin, J. chloroethylene. Pa	L.,Hours, rt I: Expo	M.,Berge sure asse	eret, A 2006. Case-control study on renal cell ssment. Annals of Occupational Hygiene.			
Type of Data Source Hero ID	Occupational Exposure; Monitoring Data; 729415							
EVALUATION								
Domain	Metric Rating MWF <sup>*</sup> Score Comments							

\* MWF = Metric Weighting Factor

Source Citation:	Iavicoli, I., Marinaccio, A., Carelli, G 2005. Effects of occupational trichloroethylene exposure on cytokine levels in workers.							
Type of Data Source Hero ID	Occupational Exposure; Monitoring Data; 700401							
EXTRACTION								
Parameter			Data					
Life Cycle Stage:			Uso					
Physical Form			liquid va	por				
Route of Exposure	:		inhalatior	)				
Exposure Concent	ration (Uni	t):	Mean of 3	- 30.75 - 36	3.50  mg	/m3		
Number of Sample	s:	,	24		0,			
Number of Sites:			1					
Worker Activity:			Degreasin	g				
Number of Worker	s:		105	0				
Type of Sampling:			Personal					
Analytic Method:			NIOSH M	fethod 10	)22			
EVALUATION								
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments		
Domain 1. Daliahi	1:4							
Domain 1: Reliabl	Metric 1:	Methodology	High	$\times 1$	1	NIOSH Method 1022		
Domain 2: Repres	entative							
1	Metric 2:	Geographic Scope	High	$\times 1$	1	US		
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE		
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	2005, 13 years old (after PEL)		
	Metric 5:	Sample Size	Medium	$\times 1$	2	Mean and STD given but no discrete data		
Domain 2. Accord	hility/Clar	:+						
Domain 5: Accessi	Motric 6:	Motadata Completeness	Modium	$\sim 1$	2	Experimentation and completions given no other metadate		
	Wether 0.	Metadata Completeness	Weuluiii	~ 1	2	Exposure type and sample type given, no other metadata		
Domain 4: Variabi	lity and U	ncertainty						
	Metric 7:	Metadata Completeness	Medium	$\times 1$	2	None discussed, but NIOSH method addresses variability/ uncertainty in the method		
Overall Quality De	eterminatio	$\mathbf{n}^{\dagger}$	High		1.6			
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Source Citation:	Iavicoli, I., Marinaccio, A., Carelli, G. 2005. Journal of Occupational and Environmental	Effects of Medicine.	occupat	ional trichloro	bethylene exposure on cytokine levels in workers.			
Type of Data Source	Occupational Exposure; Monitoring Data;	Occupational Exposure; Monitoring Data;						
Hero ID	700401							
EVALUATION								
Domain	Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments			

Source Citation:	Bakke, B., Stewart, P., Waters, M 2007. Uses of and exposure to trichloroethylene in U.S. industry: A systematic literature review. Journal of Occupational and Environmental Hygiene.							
Type of Data Source Hero ID	Occupational Exposure; Monitoring Data; 699224							
EXTRACTION								
Parameter			Data					
Life Cycle Stage			Use					
Physical Form:			liquid, va	por				
Route of Exposure	e:		inhalation	n, dermal				
Exposure Concent	tration (Uni	it):	Range of	0 ppm -	637 ppr	n		
Number of Sample	es:		1700 +					
Number of Sites:			Many					
Type of Measuren	nent or Met	hod:	short terr	n, long te	erm			
Worker Activity:			Many					
Type of Sampling	:		Personal,	area				
EVALUATION								
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments		
Domain 1: Boliah	ility							
	Metric 1:	Methodology	High	× 1	1	Data pulled from MEDLINE, TOXLINE, NIOSHTIC, the NIOSHHealth Hazard Evaluation database and co-written by NIOSH for the Journal of Occupational and Environmental Hy- giene		
Domain 2: Repres	entative							
	Metric 2:	Geographic Scope	High	$\times 1$	1	US		
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE		
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	2007, 11 years old (after PEL)		
	Metric 5:	Sample Size	Medium	× 1	2	Range, arthimetic mean, geometric mean, and geometric STD given		
Domain 3: Access	ibility/Clar	ity						
Domain 9. Access	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	Exposure type and sample type given, no other metadata		
Domain 4. Variab	ility and U	ncortainty						
	$\begin{array}{ccc} \text{Domain 4: variability and Uncertainty} \\ \text{Metric 7: Metadata Completeness} & \text{High} & \times 1 & 1 & \text{Well addressed.} \end{array}$					Well addressed.		
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Source Citation:	Bakke, B., Stewart, P., Waters, M. 2007. Uses of and exposure to trichloroethylene in U.S. industry: A systematic literature review. Journal of Occupational and Environmental Hygiene.							
Type of Data Source	Occupational Exposure; Monitorin	Occupational Exposure; Monitoring Data;						
Hero ID	699224							
EVALUATION								
Domain	Metric	Rating MWF	* Score	Comments				
Overall Quality I	$\operatorname{Petermination}^{\dagger}$	High	1.4					

Source Citation:	Jiun-Horng, T., Kuo-Hsiung, L., Chih-Yu, C., Nina, L., Sen-Yi, M., Hung-Lung, C. 2008. Volatile organic compound constituents from an integrated iron and steel facility. Journal of Hazardous Materials.							
Type of Data Source Hero ID	Occupational Exposure; Monitoring Data; 609426							
EXTRACTION								
Parameter			Data					
Life Cycle Stage			Use					
Physical Form			vapor					
Route of Exposur	e:		inhalation	ı				
Exposure Concen	tration (Uni	it):	104-427 p	opby				
Number of Sampl	es:		15	L · ·				
Number of Sites:			1					
Type of Measurer	ment or Met	hod:	short terr	n				
Worker Activity:			coke mak	ing, sinte	ering, ho	ot forming, and cold forming		
Type of Sampling	:		area					
Analytic Method:			US EPA	Method 1	18			
EVALUATION								
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments		
	•1•,							
Domain I: Reliab	ility		TT: 1	1	1			
	Metric 1:	Methodology	High	× 1	1	Uesed Method certified by US EPA Method TO-14		
Domain 2: Repres	sentative							
	Metric 2:	Geographic Scope	Low	$\times 1$	3	Taiwan (non-OECD)		
	Metric 3:	Applicability	Medium	$\times 2$	4	Use of TCE in workplace not clear		
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	2008, less than 10 years old		
	Metric 5:	Sample Size	Medium	$\times 1$	2	Average and STD given		
Domain 3: Access	sibility/Clar	ity						
	Metric 6:	Metadata Completeness	Low	$\times 1$	3	Only sample type given		
Domain 4: Variat	Mity and U	ncertainty	т	1	0			
	Metric 7:	Metadata Completeness	LOW	× 1	3	Not addressed		
Overall Quality P	otorminatio	m <sup>†</sup>	Modium		2 ∩			
Overall Quality Determination		meanni		2.0				
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Source Citation:	ze Citation: Jiun-Horng, T.,Kuo-Hsiung, L.,Chih-Yu, C.,Nina, L.,Sen-Yi, M.,Hung-Lung, C 2008. Volatile organic compound constituents from an integrated iron and steel facility. Journal of Hazardous Materials.							
Type of Data Source	Occupational Exposure; Monitoring Data;							
Hero ID	609426							
EVALUATION								
Domain	Metric Rating MWF <sup>*</sup> Score Comments							

Source Citation:	Pantucharoensri, S.,Boontee, P.,Likhitsan, P.,Padungtod, C.,Prasartsansoui, S. 2004. Generalized eruption accompanied by							
Type of Data Source Hero ID	Occupatio 707342	Occupational Exposure; Monitoring Data; 707342						
EXTRACTION								
Parameter	Data							
Life Cruele Sterror			Uas					
Dire Cycle Stage:			Use liquid va	DOR				
Route of Exposur	· ·		inhalation	poi 1 derma				
Exposure Concen	tration (Uni	t).	3.08 - 40	n, uerma nom	L			
Number of Sampl	es:		11	ppin				
Number of Sites:			1					
Type of Measurer	nent or Met	hod:	short terr	n				
Worker Activity:			degreasin	g/cleanii	ng metal	l		
Number of Worke	ers:		130	_,				
Type of Sampling			Area, Per	sonal				
PPE:			cloth gloves, cloth dust mask					
EVALUATION								
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments		
	•1• /							
Domain 1: Relian	Matula 1		Mallin	1	0			
	Metric 1:	Methodology	Medium	× 1	Ζ	Method described, in peer review journal assumed to use ac- ceptable methods		
Domain 2: Repre	sentative							
	Metric 2:	Geographic Scope	Low	$\times 1$	3	Thailand (non-OECD)		
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE		
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	2004, 14 years old (after PEL)		
	Metric 5:	Sample Size	High	$\times 1$	1	Discrete samples given		
Domain 3: Access	yibility/Clar	ity						
Domain 5. Access	Metric 6	Metadata Completeness	Medium	× 1	2	Exposure type and sample type given, no other metadata		
			mount	× 1	-	Exposure type and sample type given, no other metadata		
Domain 4: Variab	oility and U	ncertainty						
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed		
		~						
		Cor	tinued on a	out new				
		Cor	umuea on i	iext page	;			

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Source Citation:	Pantucharoensri, S.,Boontee, P., hepatitis in two Thai metal clear	Likhitsan, P.,Padungt ners exposed to trichle	od, C.,Prasartsans proethylene. Indus	soui, S 2004. Generalized eruption accompanied by trial Health.
Type of Data Source	Occupational Exposure; Monitor	ring Data;	U	
Hero ID	707342	0 /		
EVALUATION				
Domain	Metric	Rating	$MWF^{\star}$ Score	Comments
Overall Quality D	$\operatorname{Petermination}^\dagger$	Medium	1.9	

Source Citation: Type of Data Source Hero ID	Friesen, M. C.,Locke, S. J.,Chen, Y. C.,Coble, J. B.,Stewart, P. A.,Ji, B. T.,Bassig, B.,Lu, W.,Xue, S.,Chow, W. H.,Lan, Q.,Purdue, M. P.,Rothman, N.,Vermeulen, R 2015. Historical occupational trichloroethylene air concentrations based on inspection measurements from shanghai, china. Annals of Occupational Hygiene. Occupational Exposure; Monitoring Data; 2799661						
EXTRACTION							
Parameter			Data				
Life Cycle Stage:			Use				
Physical Form:			vapor				
Route of Exposur	e:		inhalatior	1	,		
Exposure Concent	tration (Uni	it):	Arithmeti	ic mean t	oroken o	but across industries:<3 - 770 mg/m3	
Number of Sampl	es:		932 70				
Number of Sites:	oont on Mot	had	70 short torr	~			
Type of Measuren	ient or met.	.1100:	short tern	11			
Type of Sampling			area				
EVALUATION							
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments	
Domain 1: Reliab	ility Metric 1:	Methodology	Low	$\times 1$	3	Not known (likely method described but could not be verified for all samples)	
Domain 2: Repres	Motrie 2.	Coormanhia Soona	Low	V 1	9		
	Metric 2: Motrie 2:	Appliesbility	LOW	$\times 1$	ა ე	Shanghai, China (non-OECD)	
	Metric 3.	Temporal Permeantativeness	High	× 2 × 2	2	Covers multiple in scope uses	
	Metric 5.	Sample Size	Medium	× 4 × 1	2	2013, 5 years old Mean and STD given but no discrete data	
	Metric 5.	Sample Size	meulum	~ 1	2	Mean and 51D given but no discrete data	
Domain 3: Access	ibility/Clar	ity					
	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	Exposure type and sample type given, no other metadata	
	•1•, 1 11						
Domain 4: Variab	Methic 7	Mata data Canadatan ara	TT:l.	<b>1</b>	1		
	Metric /:	Metadata Completeness	пıgn	× 1	1	Well addressed.	
Overall Quality D	eterminatio	$\mathbf{n}^{\dagger}$	Medium		1.7		

$ \begin{array}{c cccc} Type of Data Source Occupational Exposure: Monitoring Data; \\ \hline Got Di \\ \hline Got Di \\ \hline Got CTION \\ \hline Parameter \\ \hline Data \\ \hline \\ \hline EXTRACTION \\ \hline Parameter \\ \hline \\ Physical Form: \\ Exposure Concentration (Unit): \\ \hline \\ Physical Form: \\ Exposure Concentration (Unit): \\ \hline \\ Physical Form: \\ \hline \\ Continue of Samples: \\ \hline \\ \\ \hline \\ Varbox of States \\ \hline \\ $	Source Citation:	Shipman, A. J., Whim, B. P., 1980. Occupational exposure to trichloroethylene in metal cleaning processes and to tetra-						
EXTRACTION Parameter     Data       Life Cycle Stage: Physical Form: Route of Exposure: Boute of Exposure: Concentration (Unit): Exposure Concentration (Unit): Exposure Concentration (Unit): Exposure Concentration (Unit): Exposure of Samples: Exposure of Samples: Exposure of Samples: Exposurement or Method: Exposurement or Method: Metric 1: Metric 2: Metric 2: Metric 2: Metric 2: Metric 3: Applicability Metric 4: Metric 4: Metric 4: Metric 5: Sample Size Metric 4: Metric 5: Sample Size Metric 4: Metric 6: Metadata Completeness Metric 7: Metric 6: Metadata Completeness Metric 7: Metric	Type of Data Source Hero ID	Occupatio 632849	nal Exposure; Monitoring Data;	in the OX.	Annais	or Occu	pational Hygiene.	
Parameter       Data         Life Cycle Stage:       Use         Physical Form:       vapor         Rotte of Exposure:       inhalation         Exposure Concentration (Unit):       0-100 ppm99 percent < 100 ppm97 percent < 50 ppm91 percent < 30 ppm	EXTRACTION							
Life Cycle Stage:       Use         Physical Form:       vapor         Route of Exposure:       inhalation         Exposure: Concentration (Unit):       0-100 ppm99 percent < 100 ppm97 percent < 50 ppm91 percent < 30 ppm	Parameter			Data				
Dife Cycle Stage:       Use         Physical Form:       vapor         Route of Exposure:       inhalation         Exposure Concentration (Unit):       0-100 ppm99 percent < 100 ppm97 percent < 50 ppm91 percent < 30 ppm				TT				
Route of Exposure:       inhalation         Route of Exposure:       inhalation         Exposure Concentration (Unit):       0-100 ppm99 percent < 100 ppm97 percent < 50 ppm91 percent < 30 ppm	Life Cycle Stage:			Use				
Inductor of report.       Inductor         Exposite.       0-100 ppm9 percent < 100 ppm97 percent < 50 ppm91 percent < 30 ppm	Route of Exposur	<u>م</u> .		inhalation				
Depender of Sites:       212         Number of Sites:       212         Type of Measurement or Method:       time weighted average         Worker Activity:       Metal Cleaning         Type of Sampling:       personal         EVALUATION       Domain         Metric 1:       Metric C         Rating       MWF* Score       Comments         Domain 1:       Reliability         Metric 2:       Geographic Scope       Medium       × 1       2       Method described, in peer review journal assumed to use acceptable methods         Domain 2:       Representative       Metric 2:       Geographic Scope       Medium       × 1       2       Workplace that utilizes TCE         Metric 3:       Applicability       High       × 2       2       Workplace that utilizes TCE         Metric 5:       Sample Size       Low       × 1       3       Only qualitatively described         Domain 3:       Accessibility/Clarity       Metric 6:       Metadata Completeness       Medium       × 1       2       Exposure type and sample type given, no other metadata         Domain 4:       Variability and Uncertainty       Metric 7:       Metadata Completeness       Low       × 1       3       Not addressed         Overall Quality	Exposure Concent	ration (Un <sup>i</sup>	it):	0-100 ppr	n99  perc	ent < 1	00 ppm97 percent $< 50$ ppm91 percent $< 30$	
Number of Samples:       212         Number of Sites:       25         Type of Measurement or Method:       time weighted average         Worker Activity:       Metal Cleaning         Type of Sampling:       personal         EVALUATION	Exposure concent			DDM	noo pere		so ppinor percent < of ppinor percent < of	
Number of Sites:       25         Type of Measurement or Method:       time weighted average         Worker Activity:       Metal Cleaning         Type of Sampling:       personal         EVALUATION       Domain         Domain 1: Reliability       Metric 1:         Metric 1:       Methodology         Metric 2:       Geographic Scope         Metric 2:       Geographic Scope         Metric 2:       Geographic Scope         Metric 3:       Applicability         Metric 4:       Temporal Representative         Metric 5:       Sample Size         Low       × 1       3         Ounain 3: Accessibility/Clarity       Medium       × 1       2         Exposure type and sample type given, no other metadata         Domain 4: Variability and Uncertainty       Low       × 1       3       Not addressed         Overall Quality Determination <sup>†</sup> Medium       2.0       Continued on next page	Number of Sample	es:		212				
Type of Measurement or Method:       time weighted average Metal Cleaning personal         Worker Activity:       Metal Cleaning personal         EVALUATION       Domain       Metric       Rating       MWF*       Score       Comments         Domain       Metric       Rating       MWF*       Score       Comments         Domain 1: Reliability       Metric 1:       Methodology       Medium       × 1       2       Method described, in peer review journal assumed to use acceptable methods         Domain 2: Representative       Metric 2:       Geographic Scope       Medium       × 1       2       UK (OECD)         Metric 3:       Applicability       High       × 2       2       Workplace that utilizes TCE         Metric 4:       Temporal Representativeness       Medium       × 2       4       Data older than 10 years (1980) but after PEL         Metric 5:       Sample Size       Low       × 1       3       Only qualitatively described         Domain 3:       Accessibility/Clarity       Medium       × 1       2       Exposure type and sample type given, no other metadata         Domain 4: Variability and Uncertainty       Metric 7:       Metadata Completeness       Low       × 1       3       Not addressed         Overall Quality Determination <sup>†</sup>	Number of Sites:			25				
Worker Activity: Type of Sampling:       Metal Cleaning personal         EVALUATION       Domain       Metric       Rating       MWF*       Score       Comments         Domain       Metric       Rating       MWF*       Score       Comments         Domain       1: Reliability       Metric 1:       Methodology       Medium       × 1       2       Method described, in peer review journal assumed to use acceptable methods         Domain 2: Representative       Metric 3:       Applicability       High       × 2       2       Workplace that utilizes TCE         Metric 4:       Temporal Representativeness       Medium       × 2       4       Data older than 10 years (1980) but after PEL         Metric 5:       Sample Size       Low       × 1       3       Only qualitatively described         Domain 3: Accessibility/Clarity       Metric 6:       Medium       × 1       2       Exposure type and sample type given, no other metadata         Domain 4: Variability and Uncertainty       Metric 7:       Metadata Completeness       Low       × 1       3       Not addressed         Overall Quality Determination <sup>†</sup> Medium       2.0       Continued on next page       Continued on next page	Type of Measuren	nent or Met	thod:	time weig	hted ave	rage		
Type of Sampling:     personal       EVALUATION     Domain     Metric     Rating     MWF*     Score     Comments       Domain     Metric     Rating     MWF*     Score     Comments       Domain 1: Reliability     Metric 1:     Methodology     Medium     × 1     2     Method described, in peer review journal assumed to use acceptable methods       Domain 2: Representative     Metric 2:     Geographic Scope     Medium     × 1     2     UK (OECD)       Metric 3:     Applicability     High     × 2     2     Workplace that utilizes TCE       Metric 4:     Temporal Representativeness     Medium     × 2     4     Data older than 10 years (1980) but after PEL       Metric 5:     Sample Size     Low     × 1     3     Only qualitatively described       Domain 3:     Accessibility/Clarity     Metric 6:     Metadata Completeness     Medium     × 1     2     Exposure type and sample type given, no other metadata       Domain 4:     Variability and Uncertainty     Low     × 1     3     Not addressed       Overall Quality Determination <sup>†</sup> Medium     2.0     Continued on next page	Worker Activity:			Metal Cle	eaning	0		
EVALUATION       Domain       Metric       Rating       MWF*       Score       Comments         Domain 1: Reliability       Metric 1:       Methodology       Medium $\times 1$ 2       Method described, in peer review journal assumed to use acceptable methods         Domain 2: Representative       Metric 2:       Geographic Scope       Medium $\times 1$ 2       UK (OECD)         Metric 3:       Applicability       High $\times 2$ 2       Workplace that utilizes TCE         Metric 4:       Temporal Representativeness       Medium $\times 2$ 4       Data older than 10 years (1980) but after PEL         Metric 5:       Sample Size       Low $\times 1$ 3       Only qualitatively described         Domain 3: Accessibility/Clarity       Metric 6:       Metadata Completeness       Medium $\times 1$ 2       Exposure type and sample type given, no other metadata         Domain 4: Variability and Uncertainty       Metric 7:       Metadata Completeness       Low $\times 1$ 3       Not addressed         Overall Quality Determination <sup>†</sup> Medium       2.0       Continued on next page       2.0	Type of Sampling	:		personal				
EVALUATION       Domain       Metric       Rating       MWF*       Score       Comments         Domain 1: Reliability       Metric 1:       Methodology       Medium $\times 1$ 2       Method described, in peer review journal assumed to use acceptable methods         Domain 2: Representative       Metric 2:       Geographic Scope       Medium $\times 1$ 2       UK (OECD)         Metric 3:       Applicability       High $\times 2$ 2       Workplace that utilizes TCE         Metric 4:       Temporal Representativeness       Medium $\times 2$ 4       Data older than 10 years (1980) but after PEL         Metric 5:       Sample Size       Low $\times 1$ 3       Only qualitatively described         Domain 3:       Accessibility/Clarity       Metric 6:       Metadata Completeness       Medium $\times 1$ 2       Exposure type and sample type given, no other metadata         Domain 4:       Variability and Uncertainty       Metric 7:       Metadata Completeness       Low $\times 1$ 3       Not addressed         Overall Quality Determination <sup>†</sup> Medium       2.0       Continued on next page $2.0$								
Domain     Metric     Rating     MWF*     Score     Comments       Domain 1: Reliability     Metric 1:     Methodology     Medium     × 1     2     Method described, in peer review journal assumed to use acceptable methods       Domain 2: Representative     Metric 2:     Geographic Scope     Medium     × 1     2     UK (OECD)       Metric 3:     Applicability     High     × 2     2     Workplace that utilizes TCE       Metric 4:     Temporal Representativeness     Medium     × 2     4     Data older than 10 years (1980) but after PEL       Metric 5:     Sample Size     Low     × 1     3     Only qualitatively described       Domain 3: Accessibility/Clarity     Metric 6:     Metadata Completeness     Medium     × 1     2     Exposure type and sample type given, no other metadata       Domain 4: Variability and Uncertainty     Metric 7:     Mediata Completeness     Low     × 1     3     Not addressed       Overall Quality Determination <sup>†</sup> Medium     2.0     Continued on next page     2.0     Continued on next page	EVALUATION							
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Domain		Metric	Rating	$MWF^{\star}$	Score	Comments	
Domain 1: Rehability       Metric 1: Methodology       Medium $\times 1$ 2       Method described, in peer review journal assumed to use acceptable methods         Domain 2: Representative       Metric 2: Geographic Scope       Medium $\times 1$ 2       UK (OECD)         Metric 3: Applicability       High $\times 2$ 2       Workplace that utilizes TCE         Metric 4: Temporal Representativeness       Medium $\times 2$ 4       Data older than 10 years (1980) but after PEL         Metric 5: Sample Size       Low $\times 1$ 3       Only qualitatively described         Domain 3: Accessibility/Clarity       Metric 6: Metadata Completeness       Medium $\times 1$ 2       Exposure type and sample type given, no other metadata         Domain 4: Variability and Uncertainty       Metric 7: Metadata Completeness       Low $\times 1$ 3       Not addressed         Overall Quality Determination <sup>†</sup> Medium       2.0       Continued on next page $2.0$								
Method described, in peer review journal assumed to use acceptable methods         Domain 2: Representative         Metric 2:       Geographic Scope         Metric 3:       Applicability         High       × 2         Workplace that utilizes TCE         Metric 4:       Temporal Representativeness         Metric 5:       Sample Size         Low       × 1         Metric 6:       Metadata Completeness         Metric 7:       Metadata Completeness         Low       × 1         Overall Quality Determination <sup>†</sup> Medium         Quality Determination <sup>†</sup> Medium         2.0	Domain 1: Reliab	Ility Motrie 1.	Methodology	Modium	× 1	9	Mathed described in mean region isourced second to use on	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		MEULC 1.	Methodology	meannin	~ 1	2	ceptable methods	
Domain 2: Representative       Metric 2: Geographic Scope       Medium $\times 1$ 2       UK (OECD)         Metric 3: Applicability       High $\times 2$ 2       Workplace that utilizes TCE         Metric 4: Temporal Representativeness       Medium $\times 2$ 4       Data older than 10 years (1980) but after PEL         Metric 5: Sample Size       Low $\times 1$ 3       Only qualitatively described         Domain 3: Accessibility/Clarity       Metric 6: Metadata Completeness       Medium $\times 1$ 2       Exposure type and sample type given, no other metadata         Domain 4: Variability and Uncertainty       Metric 7: Metadata Completeness       Low $\times 1$ 3       Not addressed         Overall Quality Determination <sup>†</sup> Medium $2.0$ Continued on next page $2.0$								
Metric 2:       Geographic Scope       Medium $\times 1$ 2       UK (OECD)         Metric 3:       Applicability       High $\times 2$ 2       Workplace that utilizes TCE         Metric 4:       Temporal Representativeness       Medium $\times 2$ 4       Data older than 10 years (1980) but after PEL         Metric 5:       Sample Size       Low $\times 1$ 3       Only qualitatively described         Domain 3:       Accessibility/Clarity       Metric 6:       Metadata Completeness       Medium $\times 1$ 2       Exposure type and sample type given, no other metadata         Domain 4:       Variability and Uncertainty       Metric 7:       Metadata Completeness       Low $\times 1$ 3       Not addressed         Overall Quality Determination <sup>†</sup> Medium $2.0$ Continued on next page $2.0$	Domain 2: Repres	sentative	~			-		
Metric 3:       Applicability       High $\times 2$ 2       Workplace that utilizes TCE         Metric 4:       Temporal Representativeness       Medium $\times 2$ 4       Data older than 10 years (1980) but after PEL         Metric 5:       Sample Size       Low $\times 1$ 3       Only qualitatively described         Domain 3:       Accessibility/Clarity       Metric 6:       Metadata Completeness       Medium $\times 1$ 2       Exposure type and sample type given, no other metadata         Domain 4:       Variability and Uncertainty       Metric 7:       Metadata Completeness       Low $\times 1$ 3       Not addressed         Overall Quality Determination <sup>†</sup> Medium       2.0       Continued on next page $2.0$		Metric 2:	Geographic Scope	Medium	$\times 1$	2	UK (OECD)	
Metric 4:       Temporal Representativeness       Medium $\times 2$ 4       Data older than 10 years (1980) but after PEL         Metric 5:       Sample Size       Low $\times 1$ 3       Only qualitatively described         Domain 3:       Accessibility/Clarity       Metric 6:       Metadata Completeness       Medium $\times 1$ 2       Exposure type and sample type given, no other metadata         Domain 4:       Variability and Uncertainty       Metric 7:       Metadata Completeness       Low $\times 1$ 3       Not addressed         Overall Quality Determination <sup>†</sup> Medium       2.0       Continued on next page       Continued on next page		Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE	
Metric 5:       Sample Size       Low $\times 1$ 3       Only qualitatively described         Domain 3:       Accessibility/Clarity       Metric 6:       Metadata Completeness       Medium $\times 1$ 2       Exposure type and sample type given, no other metadata         Domain 4:       Variability and Uncertainty       Metric 7:       Metadata Completeness       Low $\times 1$ 3       Not addressed         Overall Quality Determination <sup>†</sup> Medium       2.0       Continued on next page		Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data older than 10 years $(1980)$ but after PEL	
Domain 3: Accessibility/Clarity       Metric 6: Metadata Completeness       Medium       × 1       2       Exposure type and sample type given, no other metadata         Domain 4: Variability and Uncertainty       Metric 7: Metadata Completeness       Low       × 1       3       Not addressed         Overall Quality Determination <sup>†</sup> Medium       2.0       Continued on next page		Metric 5:	Sample Size	Low	$\times 1$	3	Only qualitatively described	
Domain 3: Accessionity/Clarity       Metric 6: Metadata Completeness       Medium $\times 1$ 2       Exposure type and sample type given, no other metadata         Domain 4: Variability and Uncertainty       Metric 7: Metadata Completeness       Low $\times 1$ 3       Not addressed         Overall Quality Determination <sup>†</sup> Medium       2.0         Continued on next page	Domain 2. Access	:h:l:t-r/Clar						
Metric 0.     Metric Completeness     Medium     × 1     2     Exposure type and sample type given, no other metadata       Domain 4: Variability and Uncertainty     Metric 7:     Metadata Completeness     Low     × 1     3     Not addressed       Overall Quality Determination <sup>†</sup> Medium     2.0     Continued on next page	Domain 5: Access	Motrie 6	Motodoto Completeness	Modium	$\sim 1$	9	For some type and completions river, no other metalete	
Domain 4: Variability and Uncertainty Metric 7: Metadata Completeness       Low       × 1       3       Not addressed         Overall Quality Determination <sup>†</sup> Medium       2.0         Continued on next page		Metric 0.	Metadata Completeness	meanni	~ 1	2	Exposure type and sample type given, no other metadata	
Domain I. Variability and Chertainity       Metric 7: Metadata Completeness       Low $\times 1$ 3       Not addressed         Overall Quality Determination <sup>†</sup> Medium       2.0         Continued on next page	Domain 4: Variab	ility and U	ncertainty					
Overall Quality Determination <sup>†</sup> Medium     2.0       Continued on next page	Domain 1. Variab	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed	
Overall Quality Determination <sup>†</sup> Medium     2.0       Continued on next page						~		
Continued on next page	Overall Quality D	eterminatio	$\mathrm{on}^{\dagger}$	Medium		2.0		
CONTRACTOR OF ANY			Con	ntinued on r	next page	9		

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Source Citation:	Shipman, A. J., Whim, B. P., 1980. Occur chloroethylene in the drycleaning industry	pational e in the UK	exposure Annals	to trichloroe of Occupatio	hylene in metal cleaning processes and to tetra- nal Hygiene.
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	632849				
EVALUATION					
Domain	Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments

Source Citation:	Atsdr., 2007. Health consultation: Evaluation of indoor air migration in building on-site and adjacent to the Omega Chemical site: Whittier, Los Apeolos County, Colifornia: EPA facility, ID: CAD042245001						
Type of Data Source Hero ID	Occupation 3978063	nal Exposure; Monitoring Data;	rina. Er A facht,	y ID. OA	D04224		
EXTRACTION							
Parameter			Data				
Life Cycle Stage:			Use				
Physical Form:			vapor				
Route of Exposur	e:		inhalation				
Exposure Concen	tration (Uni	t):	1.7 - 270 ug/m	3			
Number of Sampl	les:		60				
Number of Sites:			8				
Exposure Frequer	ncy:		continuous				
Analytic Method:	:		US EPA Metho	od TO-1	5 SIM		
EVALUATION							
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments	
Domain 1. Daliah	.:1:4						
Domain 1: Kenad	Metric 1:	Methodology	High	$\times 1$	1	US EPA Method TO-15 SIM	
Domain 2. Benre	sentative						
Domani 2. Ropio	Metric 2.	Geographic Scope	High	× 1	1	US	
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	Ambient and building measurements not related to work sce-	
			• P •••••	=	Ŭ,	nario	
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	2007, 11 years old	
	Metric 5:	Sample Size	Medium	$\times 1$	2	Moderately well characterized	
Domain 3: Access	sibility/Clar	Ity Mata lata Gammalatan an	TT	v 1	4		
	Metric o:	Metadata Completeness	Unacceptable	× 1	4	Missing sampling data, type, etc.	
Domain 4. Variak	ility and Ur	acontainty					
Domain 4. variat	Motrie 7:	Metadata Completeness	Low	$\vee$ 1	2	not addressed	
	Metric 7:	Metadata Completeness	LOW	× 1	ა	not addressed	
Overall Quality I	Determinatio	$\mathbf{n}^{\dagger}$	Unacceptable		4	Metric Mean Score: 2.6.	
		(	Continued on nov	t nage			
		C	John mueu on mex	t page			

– continued from previous page							
Source Citation:	Atsdr,. 2007. Health consultation: Evaluation site: Whittier, Los Angeles County, Californ	on of indoor ai nia: EPA facili	r migratio ity ID: CA	n in build .D042245(	ing on-site and adjacent to the Omega Chemical 001.		
Type of Data Source	Occupational Exposure; Monitoring Data;	Occupational Exposure; Monitoring Data;					
Hero ID	3978063						
EVALUATION							
Domain	Metric	Rating	$MWF^{\star}$	Score	Comments		

\* MWF = Metric Weighting Factor

Source Citation:	Fan, A. 1988. Trichloroethylene: Water contamination and health risk assessment. Reviews of Environmental Contamination and Toxicology.								
Type of Data Source Hero ID	Occupation 701917	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 701917							
EXTRACTION									
Parameter			Data						
Life Cycle Stage:			Use						
Route of Exposur	e:		Inhalation						
Exposure Concent	tration (Uni	t):	200-8,000 ppm	(article ]	page 57	); below 100 ppm (pages 58 and 59) $($			
Number of Worke	rs:		73 workers exp	osed to co	oncentra	ations 14-85 ppm (page $63$ ); 2646 employ-			
			ees who worked	l in a mai	nufactu	ring plant that used TCE as a degreasing			
			agent (page 70	).					
EVALUATION									
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments			
Domain 1: Reliab	ility								
	Metric 1:	Methodology	High	$\times 1$	1	Trusted author i.e., California Dept. of Health Services			
Domain 2: Repres	sentative								
Domain 2: Repres	sentative Metric 2:	Geographic Scope	High	$\times 1$	1	US			
Domain 2: Repres	sentative Metric 2: Metric 3:	Geographic Scope Applicability	High Unacceptable	$ \times 1 \ \times 2 $	$\frac{1}{8}$	US Covers exposure to contaminated groundwater			
Domain 2: Repres	sentative Metric 2: Metric 3: Metric 4:	Geographic Scope Applicability Temporal Representativeness	High Unacceptable Low	$\begin{array}{c} \times \ 1 \\ \times \ 2 \\ \times \ 2 \end{array}$	1     8     6	US Covers exposure to contaminated groundwater Published 1988 (approx. 30 years old).			
Domain 2: Repres	sentative Metric 2: Metric 3: Metric 4: Metric 5:	Geographic Scope Applicability Temporal Representativeness Sample Size	High Unacceptable Low N/A	$\begin{array}{c} \times \ 1 \\ \times \ 2 \\ \times \ 2 \end{array}$	1 8 6 N/A	US Covers exposure to contaminated groundwater Published 1988 (approx. 30 years old). No Comment.			
Domain 2: Repres	Metric 2: Metric 2: Metric 3: Metric 4: Metric 5:	Geographic Scope Applicability Temporal Representativeness Sample Size	High Unacceptable Low N/A	$\begin{array}{c} \times \ 1 \\ \times \ 2 \\ \times \ 2 \end{array}$	1 8 6 N/A	US Covers exposure to contaminated groundwater Published 1988 (approx. 30 years old). No Comment.			
Domain 2: Repres	Metric 2: Metric 2: Metric 3: Metric 4: Metric 5: Sibility/Clar Metric 6:	Geographic Scope Applicability Temporal Representativeness Sample Size ity Metadata Completeness	High Unacceptable Low N/A High	$ \begin{array}{c} \times 1 \\ \times 2 \\ \times 2 \end{array} $	1 8 6 N/A	US Covers exposure to contaminated groundwater Published 1988 (approx. 30 years old). No Comment.			
Domain 2: Repres	Metric 2: Metric 3: Metric 4: Metric 5: Sibility/Clar. Metric 6:	Geographic Scope Applicability Temporal Representativeness Sample Size ity Metadata Completeness	High Unacceptable Low N/A High	$\begin{array}{c} \times 1 \\ \times 2 \\ \times 2 \end{array}$ $\times 1$	1 8 6 N/A 1	US Covers exposure to contaminated groundwater Published 1988 (approx. 30 years old). No Comment. Transparent and well presented. Well documented.			
Domain 2: Repres	sentative Metric 2: Metric 3: Metric 4: Metric 5: sibility/Clar Metric 6: bility and Un	Geographic Scope Applicability Temporal Representativeness Sample Size ity Metadata Completeness neertainty	High Unacceptable Low N/A High	$\begin{array}{c} \times 1 \\ \times 2 \\ \times 2 \end{array}$ $\times 1$	1 8 6 N/A 1	US Covers exposure to contaminated groundwater Published 1988 (approx. 30 years old). No Comment. Transparent and well presented. Well documented.			
Domain 2: Repres	Metric 2: Metric 2: Metric 3: Metric 4: Metric 5: Metric 5: Metric 6: Metric 6: Metric 7:	Geographic Scope Applicability Temporal Representativeness Sample Size ity Metadata Completeness ncertainty Metadata Completeness	High Unacceptable Low N/A High Low	$ \begin{array}{c} \times 1 \\ \times 2 \\ \times 2 \end{array} \\ \times 1 \\ \times 1 \end{array} $	1 8 6 N/A 1 3	US Covers exposure to contaminated groundwater Published 1988 (approx. 30 years old). No Comment. Transparent and well presented. Well documented. Not addressed			
Domain 2: Repres	Metric 2: Metric 2: Metric 3: Metric 4: Metric 5: Sibility/Clar: Metric 6: Sibility and Un Metric 7:	Geographic Scope Applicability Temporal Representativeness Sample Size ity Metadata Completeness neertainty Metadata Completeness	High Unacceptable Low N/A High Low	$\begin{array}{c} \times 1 \\ \times 2 \\ \times 2 \end{array}$ $\times 1$ $\times 1$	1 8 6 N/A 1 3	US Covers exposure to contaminated groundwater Published 1988 (approx. 30 years old). No Comment. Transparent and well presented. Well documented. Not addressed			

\* MWF = Metric Weighting Factor

Source Citation: Type of Data Source	Dobaradaran, S.,Mahvi, A. H.,Nabizadeh, R.,Mesdaghinia, A.,Naddafi, K.,Yunesian, M.,Rastkari, N.,Nazmara, S. 2010. Hazardous Organic Compounds in Groundwater Near Tehran Automobile Industry. Bulletin of Environmental Contamination and Toxicology. Occupational Exposure: Monitoring Data:						
Hero ID	2127942						
EXTRACTION							
Parameter			Data				
Life Cycle Stage: Physical Form: Route of Exposure Exposure Concent Number of Sample Number of Sites:	: ration (Uni s:	t):	Environment liquid ingestion 97.7-1345.7 ug, 24 6	/L			
EVALUATION							
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments	
Domain 1: Reliabi	lity Metric 1:	Methodology	Medium	$\times 1$	2	Method described, in peer review journal assumed to use acceptable methods	
Domain 2: Represe	entative		_				
	Metric 2:	Geographic Scope	Low	$\times 1$	3	Iran (non-OECD)	
	Metric 3: Motric 4:	Applicability Tomporal Boprosontativonoss	Unacceptable	$\times 2$ $\times 2$	8	Data for groundwater contamination	
	Metric 5:	Sample Size	Low	$ \times 1 $	$\frac{2}{3}$	Not well characterized	
Domain 3: Accessi	bility/Clari Metric 6:	ty Metadata Completeness	Low	× 1	3	Basic metadata present	
Domain 4: Variabi	lity and Un Metric 7:	certainty Metadata Completeness	Low	× 1	3	Not addressed.	
Overall Quality De	etermination	$\mathbf{a}^{\dagger}$	Unacceptable		4	Metric Mean Score: 2.7.	
	Continued on next page						

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Source Citation:	Dobaradaran, S.,Mahvi, A. H.,Nabizadel Hazardous Organic Compounds in Ground and Toxicology.	h, R.,Mesdaghin dwater Near Tehi	ia, A.,Naddafi, K.,Yunes can Automobile Industry.	sian, M.,Rastkari, N.,Nazmara, S 2010. Bulletin of Environmental Contamination
Type of Data Source Hero ID	Occupational Exposure; Monitoring Data 2127942	;		
EVALUATION				
Domain	Metric	Rating	$MWF^{\star}$ Score	Comments

\* MWF = Metric Weighting Factor

Source Citation:U.S,Type of Data SourceOccuHero ID3045	E. P. patio 553	A 2014. Degreasing with TCE nal Exposure; Reports for Data	in comm or Inform	nercial fac ation Ot	cilities: her tha	Protecting workers. n Exposure or Release Data;	
EXTRACTION							
Parameter			Data				
Life Cycle Stage: Physical Form: Route of Exposure: Engineering Control & percent Exposure Reduction: PPE:				Use liquid, vapor inhalation, dermal Closed-loop vapor degreasers/up to 98 percent emission reduction Solvent-resistant gloves, long sleeves, coveralls, chemical splash eye pro- tection, full-face respirators.			
EVALUATION							
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments	
Domain 1: Reliability Metr	ric 1:	Methodology	High	$\times 1$	1	Cites frequently used sources	
Domain 2: Representati	ive						
Metr	tic $2$ :	Geographic Scope	High	$\times 1$	1	US	
Metr	ric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE	
Metr	tic 4:	Temporal Representativeness	High	$\times 2$	2	2014 report	
Metr	ric 5:	Sample Size	N/A		N/A	No Comment.	
Domain 3: Accessibility	/Clar	ity					
Metr	ric 6:	Metadata Completeness	High	$\times 1$	1	Transparent and well presented. Well documented.	
Domain 4: Variability a Metr	nd Ui ric 7:	ncertainty Metadata Completeness	Low	$\times 1$	3	Not addressed	
Overall Quality Determ	inatio	$\mathbf{n}^{\dagger}$	High		1.3		

Source Citation:	U.S, E. P. A 2016. TSCA work plan chemical risk assessment: Peer review draft 1-bromopropane: (n-Propyl bromide) spray adhesives, dry cleaning, and degreasing uses CASRN: 106-94-5.							
Hero ID	3355305							
EXTRACTION Parameter			Data					
EVALUATION								
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments		
Domain 1: Reliab	oility							
	Metric 1:	Methodology	High	$\times 1$	1	EPA peer reviewed draft risk evaluation, assumed to use high quality data		
Domain 2: Repres	sentative							
	Metric 2:	Geographic Scope	High	$\times 1$	1	US		
	Metric 3:	Applicability	High	$\times 2$	2	Data is for 1-BP; however, has information (worker activities, process descriptions, etc.) directly applicable to TCE occupational scenarios		
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Report from 2016		
	Metric 5:	Sample Size	N/A		N/A	N/A - sample data for 1-BP not TCE		
Domain 3: Access	sibility/Clar	ity						
	Metric 6:	Metadata Completeness	High	$\times 1$	1	All data sources clearly documented		
Domain 4: Variat	Motrie 7	Matadata Completeness	Ujeh	× 1	1			
	Metric 7:	Metadata Completeness	IIIgii	× 1	1	Detailed uncertainty section		
Overall Quality D	eterminatio	$\mathbf{n}^{\dagger}$	High		1.0			
Source Citation:	Ruijten, M. W., Verberk, M. M., SallÃc, H. J. 1991. Nerve function in workers with long term exposure to trichloroethene.							
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	British Journal of Industrial Medicine.							
Type of Data Source	Occupational Exposure; Monitoring Data;							
Hero ID	65298							
EXTRACTION								
Parameter	Data							

EVALUATION						
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments
Domain 1: Reliabilit	У			_	_	
M	letric 1:	Methodology	High	$\times 1$	1	Not specified
Domain 2: Represent	tative					
Μ	fetric 2:	Geographic Scope	Medium	$\times 1$	2	European Study (OECD)
Μ	fetric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE
Μ	fetric 4:	Temporal Representativeness	Low	$\times 2$	6	Both pre- and post-PEL data
Μ	fetric 5:	Sample Size	Low	$\times 1$	3	mean given, no other statistics
Domain 3: Accessibil	lity/Clari	ity				
M	fetric 6:	Metadata Completeness	Low	$\times 1$	3	Moderately well documented
Domain 4: Variabilit	Domain 4: Variability and Uncertainty					
M	letric 7:	Metadata Completeness	Low	× 1	3	No discussion of uncertainty or variability
Overall Quality Dete	erminatio	$\mathbf{n}^{\dagger}$	Medium		2.2	

Source Citation:EuType of Data SourceOcHero ID382	ropean cupation 27429	Chemicals Bureau. 2004. Europ nal Exposure; Completed Expos	ean Union ure or Risk	risk asse Assessm	ssment i nents;	report: Trichloroethylene. EUR 21057 EN.	
EXTRACTION Parameter			Data				
Life Cycle Stage:			MFG				
Physical Form:			liquid va	por			
Boute of Exposure:			inhalatio	ı. derma	1		
Exposure Concentrati	ion (Uni	t):	Geometri	c mean 0	6 (ppm	Max 128 (ppm)98.5 percent sample <10 ppm	
Number of Samples:	(	-)-	837		(PP	) (FF) FF ( FF	
Number of Sites:			1				
Type of Measurement	or Met	hod:	8-hr TWA	A			
Worker Activity:			Process o	perators	, mainte	enance, and overall plant employees.	
Number of Workers:			75  staff +	- - up to 6	0 contra	actors	
Type of Sampling:			PBZ				
Sampling Location:			Everywhe	ere			
PPE:			Wear resp	piratory j	protectiv	ve equipment when doing maintenance on pro-	
			duction lines.				
EVALUATION							
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments	
Domain 1: Reliability							
Me	etric 1:	Methodology	Low	$\times 1$	3	Specific methods not provided for exposures. Peer-reviewed by the Scientific Committee on Toxicity, Ecotoxicity, and the Environment (CSTEE)	
Domain 2: Represent	ative						
Me	etric 2:	Geographic Scope	Medium	× 1	2	European Study (OECD)	
Me	etric 3:	Applicability	High	$\times 2$	2	Workplace occupational scenario within scope of risk evalua- tion.	
Me	etric 4:	Temporal Representativeness	Low	$\times 2$	6	Data is from 1991, 27 years old	
Me	etric 5:	Sample Size	Medium	$\times 1$	2	837 data points, well characterized with statistics but no discrete data points beyond max.	
Domain 3: Accessibili	ity/Clari	ity					
Me	etric 6:	Metadata Completeness	Medium	$\times 1$	2	Sample type, duration, time period, and other metrics provided.	
		Con	tinued on 1	next page	e		

Source Citation: Type of Data Source Hero ID	European Chemicals Bureau. 2004. European Union risk assessment report: Trichloroethylene. EUR 21057 EN. Occupational Exposure; Completed Exposure or Risk Assessments; 3827429							
EVALUATION								
Domain		Metric	Rating	$\rm MWF^{\star}$	Score	Comments		
Domain 4: Variab	oility and Un Metric 7:	ncertainty Metadata Completeness	Low	× 1	3	Not addressed.		
Overall Quality Determination <sup><math>\dagger</math></sup>			Medium		2.2			

EVTRACTION									
Parameter		Data							
Life Cycle Stage:		Recycling							
Physical Form:		liquid, vapor							
Route of Exposure:		inhalation							
Exposure Concentration (Unit	):	<1 to 9ppm	nean, 2.7 p	opm					
Number of Samples:	,	unknown	, <b>-</b>	-					
Number of Sites:		1							
Type of Measurement or Meth	nod:	unknown							
Number of Workers:		unknown							
Type of Sampling:		Area							
Sampling Location:		unknown							
Exposure Duration:		unknown							
Exposure Frequency:	unknown								
Bulk and Dust Particle Size D	unknown								
Engineering Control & percent	t Exposure Reduction:	unknown							
		UNKNOWN MDUS 79							
Analytic Method:		MDHS 72							
EVALUATION									
Domain	Metric	Rating	$MWF^{\star}$	Score	Comments				
Domain 1: Reliability									
Metric 1:	Methodology	Low	× 1	3	Specific methods not provided for exposures. Peer-reviewed by the Scientific Committee on Toxicity, Ecotoxicity, and the Environment (CSTEE)				
Domain 2: Representative									
Metric 2:	Geographic Scope	Medium	$\times 1$	2	European Study (OECD)				
Metric 3:	Applicability	High	$\times 2$	2	Workplace occupational scenario within scope of risk evalua- tion.				
Metric 4:	Temporal Representativeness	Low	$\times 2$	6	Data is from unknown time period				
	Sample Size	Low	$\vee 1$	3	Unknown comple size				

Continued on next page

Source Citation: Type of Data Source Hero ID	European Occupation 3827429	European Chemicals Bureau. 2004. European Union risk assessment report: Trichloroethylene. EUR 21057 EN. Occupational Exposure; Completed Exposure or Risk Assessments; 3827429						
EVALUATION								
Domain		Metric	Rating	$\mathbf{MWF}^{\star}$	Score	Comments		
	Metric 6:	Metadata Completeness	Unacceptable	$\times 1$	4	Dataset provides method but does not detail the sample type		
Domain 4: Variat	Domain 4: Variability and Uncertainty							
	Metric 7:	Metadata Completeness	LOW	× 1	3	Not addressed.		
Overall Quality Determination <sup><math>\dagger</math></sup>			Unacceptable		4	Metric Mean Score: 2.6.		

\*\* Consistent with our Application of Systematic Review in TSCARisk Evaluations document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

\* MWF = Metric Weighting Factor

<sup>†</sup> If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High:  $\geq 1$  to < 1.7; Medium:  $\geq 1.7$  to < 2.3; Low:  $\geq 2.3$  to  $\leq 3$ .

Cype of Data Source Occu Iero ID 3827	Occupational Exposure; Completed Exposure or Risk Assessments; 3827429							
EXTRACTION Parameter		Data						
Life Cycle Stage		Metal Cl	aning -F	ISE inst	pectors			
Physical Form:		liquid va	nor					
Boute of Exposure		inhalatio	n 1					
Exposure Concentration	(Unit):	24 sample	es <30 pi	om.All s	samples < 50 ppm			
Number of Samples:	()	25						
Number of Sites:		12						
Type of Measurement of	Method:	8-hr TW	4					
Worker Activity:		degreasin	g operate	ors				
Number of Workers:		unknown						
Type of Sampling:		PBZ						
Sampling Location:								
Exposure Duration:								
Exposure Frequency:			unknown					
Bulk and Dust Particle Size Distribution:		unknown	unknown					
Engineering Control &	ercent Exposure Reduction:	unknown						
PPE:		unknown	unknown					
EVALUATION								
Domain	Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments			
Domain 1: Reliability								
Met	c 1: Methodology	Low	$\times 1$	3	Specific methods not provided for exposures. Peer-reviewe by the Scientific Committee on Toxicity, Ecotoxicity, and th Environment (CSTEE)			
Domain 2: Representat	76							
Meta	c 2: Geographic Scope	Medium	× 1	2	European Study (OECD)			
Metr	c 3: Applicability	High	$\times 2$	2	Workplace occupational scenario within scope of risk evaluation.			
Met	c 4: Temporal Representativer	ness Low	$\times 2$	6	Data is from 1984s-1994			
Met	c 5: Sample Size	Medium	$\times 1$	2	25 data points, but does not provide a true range of data-jus a percenentage of data points that are under set concentratio metrics			

Source Citation: Type of Data Source Hero ID	European Occupation 3827429	European Chemicals Bureau. 2004. European Union risk assessment report: Trichloroethylene. EUR 21057 EN. Occupational Exposure; Completed Exposure or Risk Assessments; 3827429						
EVALUATION								
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments		
Domain 3: Access	sibility/Clar Metric 6:	ity Metadata Completeness	Medium	$\times 1$	2	Sample type and exposure type provided but other key metrics are not.		
Domain 4: Variab	oility and Ur Metric 7:	ncertainty Metadata Completeness	Low	$\times 1$	3	Not addressed.		
Overall Quality D	Determinatio	$\mathrm{n}^\dagger$	Medium		2.2			

Source Citation:EurType of Data SourceOccHero ID382'	<ul> <li>European Chemicals Bureau. 2004. European Union risk assessment report: Trichloroethylene. EUR 21057 EN.</li> <li>Occupational Exposure; Completed Exposure or Risk Assessments; 3827429</li> </ul>									
EXTRACTION Parameter			Data							
Life Cycle Stage:			Metal Cle	eaning - 1	Industry	<sup>7</sup> data				
Physical Form:			liquid, va	por	v					
Route of Exposure:			inhalation	1						
Exposure Concentratio	n (Uni	it):	86 percen	t sample	es <30 j	ppm,94 percent samples ${<}50$ ppm96 percent				
Number of Semples			samples <	100 ppi	1					
Number of Sites:			500 50							
Type of Measurement	or Mot	hod	$\frac{30}{8}$ hr TWA	۱.						
Worker Activity:	or wice	libu.	degreasing	n onerati	re					
Number of Workers			unknown	5 operation	515					
Type of Sampling:			PBZ							
Sampling Location:	Sampling Location:									
Exposure Duration:	Exposure Duration:			unknown						
Exposure Frequency:			unknown							
Bulk and Dust Particle	e Size I	Distribution:	unknown							
Engineering Control &	percer	nt Exposure Reduction:	unknown							
PPE:			unknown							
EVALUATION										
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments				
Domain 1: Reliability										
Met	ric 1:	Methodology	Low	× 1	3	Specific methods not provided for exposures. Peer-reviewed by the Scientific Committee on Toxicity, Ecotoxicity, and the Environment (CSTEE)				
Domain 2: Representat	ive									
Met	ric 2:	Geographic Scope	Medium	$\times 1$	2	European Study (OECD)				
Met	ric 3:	Applicability	High	$\times 2$	2	Workplace occupational scenario within scope of risk evalua- tion.				
Met	ric 4:	Temporal Representativeness	Low	$\times 2$	6	Data is from 1970s-1994				
Met	ric 5:	Sample Size	Medium	$\times 1$	2	306 data points, but does not provide a true range of data-just a percenentage of data points that are under set concentration metrics.				
Continued on next page										

Source Citation: Type of Data Source Hero ID	European Chemicals Bureau. 2004. European Union risk assessment report: Trichloroethylene. EUR 21057 EN. Occupational Exposure; Completed Exposure or Risk Assessments; 3827429							
EVALUATION								
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments		
Domain 3: Access	sibility/Clari Metric 6:	ty Metadata Completeness	Medium	$\times 1$	2	Sample type and exposure type provided but other key metrics are not.		
Domain 4: Variab	oility and Un Metric 7:	acertainty Metadata Completeness	Medium	$\times 1$	2	Limited discussion about how the range of exposure can be influenced.		
Overall Quality D	Determination	n†	Medium		2.1			

Source Citation: Type of Data Source Hero ID	European Chemicals Bureau. 2004. European Union risk assessment report: Trichloroethylene. EUR 21057 EN. Occupational Exposure; Completed Exposure or Risk Assessments; 3827429									
EXTRACTION Parameter			Data							
Life Cycle Stage:			Use as int	ermedia	te: man	ufacture of HCFC 133a and HFC 134a				
Physical Form:			liquid, va	por						
Route of Exposure	:		inhalation	ı						
Exposure Concentr	ration (Uni	t):	Process C	) perators	mean (	(0.2 ppm) max (11.5 ppm).Maintenance mean				
			(0.2  ppm)	), max $(2$	.7 ppm)	)				
Number of Sample	s:		Process C	)perators	: 219M	aintenance Operators: 41				
Number of Sites:			unknown							
Type of Measurem	ent or Met	hod:	8-hr TWA	A						
Worker Activity:			process a	nd maint	enace o	perators				
Number of Worker	s:		unknown							
Type of Sampling:	Type of Sampling:									
Sampling Location	Sampling Location:			unknown						
Exposure Duration	1:		unknown							
Exposure Frequence	ey:	N: 4 '1 4'	unknown							
Bulk and Dust Par	ticle Size I	Distribution:	unknown							
DDF.	or & percer	it Exposure Reduction:	unknown							
1112.			ulikilowii							
EVALUATION										
Domain		Metric	Rating	$MWF^*$	Score	Comments				
Domain 1. Beliabil	lity									
	Metric 1:	Methodology	Low	$\times 1$	3	Specific methods not provided for exposures. Peer-reviewed by the Scientific Committee on Toxicity, Ecotoxicity, and the Environment (CSTEE)				
Demeir 9. Demee										
Domain 2: Represe	Motria 2.	Coographic Scope	Modium	$\vee$ 1	9	European Study (OECD)				
	Metric 2.	Applicability	High	$\times 1$ $\times 2$	2	Workplace accupational scenario within scene of rick avalua				
	MEULC D:	тррисалиту	111511	~ 4	4	tion.				
	Metric 4:	Temporal Representativeness	Low	$\times 2$	6	Data is from 1991-1994				
	Metric 5:	Sample Size	Medium	$\times 1$	2	280 data points, but only provides mean and max.				
		Cor	tinued on r	next page	2					

Source Citation: Type of Data Source Hero ID	European Occupation 3827429	European Chemicals Bureau. 2004. European Union risk assessment report: Trichloroethylene. EUR 21057 EN. Occupational Exposure; Completed Exposure or Risk Assessments; 3827429						
EVALUATION								
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments		
Domain 3: Access	ibility/Clar Metric 6:	ity Metadata Completeness	Medium	$\times 1$	2	Sample type and exposure type provided but other key metrics are not.		
Domain 4: Variab	oility and Ur Metric 7:	ncertainty Metadata Completeness	Low	$\times 1$	3	Not addressed.		
Overall Quality D	eterminatio	$\mathbf{n}^{\dagger}$	Medium		2.2			

Source Citation:	Halogenat 0103.	ed Solvents Industry Alliance, In	nc 2018. F	e: Docke	et no. E	ЕРА-НQ-ОРРТ-2016-0737. ЕРА-НQ-ОРРТ-2016-0737-		
Type of Data Source Hero ID	Occupatio 5176415	nal Exposure; Monitoring Data;						
EXTRACTION								
Parameter			Data					
Life Cycle Stage:			MFG					
Physical Form:			liquid, va	por				
Route of Exposure:			inhalation	1				
Exposure Concentration (Unit):			BDL - 6.9	) ppm				
Number of Sampl	les:		57					
Number of Sites:			unknown					
Type of Measurer	ment or Met	chod:	Task, 8-h	our TWA	L			
Worker Activity:			Manufact	uring				
Type of Sampling	g:		Personal					
Exposure Duratio	on:		8 hours					
EVALUATION								
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments		
Domain 1: Reliab	oility		<b>.</b>		2			
	Metric 1:	Methodology	Low	× 1	3	No method provided by the HSIA Industry organization		
Domain 2: Bepre	sentative							
Domain 2. Repre	Metric 2.	Geographic Scope	High	× 1	1	US		
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that MFGs TCE		
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Data is from $2016$ (<10 years)		
	Metric 5:	Sample Size	High	× 1	1	Discrete samples given		
			8		-	Diserve samples given		
Domain 3: Access	sibility/Clar	ity						
	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	Most metadata given, missing exposure frequency		
Domain 4: Varial	oility and U	ncertainty						
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not addressed.		
	) at amos in a t i	t	II: "ŀ		1.0			
Overall Quality L	Peterminatio	)11 '	пıgn		1.0			
			tinued on a	ovt para				
		COL	nutured off I	iext page				

	continue	u nom	previous	page		
Source Citation:	Halogenated Solvents Industry Alliance, Inc 0103.	2018. ]	Re: Docke	et no. EPA-HO	Q-OPPT-2016-0737.	EPA-HQ-OPPT-2016-0737-
Type of Data Source	Occupational Exposure; Monitoring Data;					
Hero ID	5176415					
EVALUATION						
Domain	Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Co	mments

 $\star$  MWF = Metric Weighting Factor

<sup>†</sup> If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High:  $\geq 1$  to < 1.7; Medium:  $\geq 1.7$  to < 2.3; Low:  $\geq 2.3$  to  $\leq 3$ .

## Facility

Source Citation: Type of Data Source Hero ID	U.S, E. P. Facility; R 35002	A. 2001. Sources, emission and eports for Data or Information (	l exposure Other tha	e for tricl n Expos	hloroeth ure or R	nylene (TCE) and related chemicals. Release Data;
EXTRACTION Parameter			Data			
Life Cycle Stage: Process Descriptio Total Annual U.S	on: . Volume (a	nd percent of PV):	Manufa No 145,000	cture ,000 kg/:	yr	
EVALUATION		Metric	Bating	MWF*	Score	Comments
Domain 1: Reliab	ility Metric 1:	Methodology	High	× 1	1	EPA document
Domain 2: Repres	entative Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3: Metric 4: Metric 5:	Applicability Temporal Representativeness Sample Size	Low Low Low	$\begin{array}{c} \times \ 2 \\ \times \ 2 \\ \times \ 1 \end{array}$	$\begin{array}{c} 6 \\ 6 \\ 3 \end{array}$	1992 Nearly 30+ yrs old single value, no statistics
Domain 3: Access	ibility/Clar Metric 6:	ity Metadata Completeness	High	× 1	1	Cites sources for all data used.
Domain 4: Variab	ility and Ur Metric 7:	ncertainty Metadata Completeness	Low	× 1	3	No discussion of uncertainty or variability
Overall Quality D	eterminatio	$\mathbf{n}^{\dagger}$	Low		2.3	

Source Citation: Type of Data Source Hero ID	U.S, E. P. Facility; R 35002	A. 2001. Sources, emission and eports for Data or Information (	l exposure Other tha	e for tricl n Expos	hloroeth ure or R	ylene (TCE) and related chemicals. Release Data;
EXTRACTION Parameter			Data			
Life Cycle Stage:			Import			
Total Annual U.S	on: . Volume (a	nd percent of PV):	No 19,800,0	000  kg/y	r	
EVALUATION						
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments
Domain 1: Reliab	ility Metric 1:	Methodology	High	$\times 1$	1	EPA document
Domain 2: Repres	sentative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3: Motrie 4:	Applicability Tomporal Representativeness	Low	$\times 2$	6	1985 Over 20 very ald
	Metric 4: Metric 5:	Sample Size	Low	$\times 1^{\times 2}$	3	single value, no statistics
Domain 3: Access	sibility/Clar Metric 6:	ity Metadata Completeness	High	× 1	1	Cites sources for all data used.
			mgn	× 1	-	Cites sources for an data used.
Domain 4: Variab	oility and U	ncertainty				
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	No discussion of uncertainty or variability
Overall Quality D	Determinatio	$\mathbf{n}^{\dagger}$	Low		2.3	

Source Citation: Type of Data Source Hero ID	U.S, E. P. Facility; R 35002	A. 2001. Sources, emission and eports for Data or Information (	l exposure Other tha	e for tricl n Expos	hloroeth ure or R	ylene (TCE) and related chemicals. Release Data;
EXTRACTION			Data			
Parameter			Data			
Life Cycle Stage:			Export			
Process Description	on:		No			
Total Annual U.S	. Volume (a	nd percent of PV):	10,600,0	000  kg/y	r	
EVALUATION						
Domain		Metric	Rating	$\rm MWF^{\star}$	Score	Comments
Domain 1: Reliab	ility					
	Metric 1:	Methodology	High	$\times 1$	1	EPA document
Domain 2: Repres	sentative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	Low	$\times 2$	6	1985
	Metric 4:	Temporal Representativeness	Low	$\times 2$	6	Over 30 yrs old
	Metric 5:	Sample Size	Low	$\times 1$	3	single value, no statistics
Domain 3: Access	sibility/Clar	ity				
	Metric 6:	Metadata Completeness	High	$\times 1$	1	Cites sources for all data used.
Domain 4. Variak	ility and U	naartaintu				
Domain 4. Variat	Metric 7:	Metadata Completeness	Low	$\times 1$	3	No discussion of uncertainty or variability
Overall Quality D	Determinatio	$\mathbf{n}^{\dagger}$	Low		2.3	

Source Citation:	Hellweg, S with LCA: and Techn	.,Demou, E.,Scheringer, M.,McF examples of trichloroethylene a ology.	Kone, T. E., nd perchlor	Hungerb oethylen	uhler, Þ e in met	K 2005. Confronting workplace exposure to chemicals tal degreasing and dry cleaning. Environmental Science
Type of Data Source Hero ID	Facility; P 88147	ublished Models for Exposures of	or Releases;			
EXTRACTION Parameter			Data			
Life Cycle Stage: Life Cycle Descrip Process Descriptio	otion (Subca on:	ategory of Use):	Use Degreasin No	ıg		
EVALUATION						
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments
Domain 1: Reliab	ility Metric 1:	Methodology	High	$\times 1$	1	Well cited.
Domain 2: Bapros	antativo					
Domain 2. Repres	Metric 2.	Geographic Scope	Low	× 1	3	Unknown
	Metric 3:	Applicability	Medium	$\times 2$	4	2005
	Metric 4:	Temporal Representativeness	Low	$\times 2$	6	< 15 years old
	Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Access	ibility/Clar	ity				
Domain 9. Access	Metric 6:	Metadata Completeness	High	$\times 1$	1	Cites sources for all data used.
Domain 4: Variab	ility and Uı Metric 7:	ncertainty Metadata Completeness	Low	× 1	3	No discussion of uncertainty or variability
Overall Quality D	eterminatio	n†	Low		2.3	

Source Citation: Type of Data Source Hero ID	Nih,. 2016 Facility; R 3982332	. Report on carcinogens: Trichle eports for Data or Information (	oroethyleı Other tha	ne. In Exposi	ure or R	Release Data;
EXTRACTION						
Parameter			Data			
Life Cycle Stage			Manufa	cture		
Life Cycle Description (Subcategory of Use):			Manufa	cture of '	TCE	
Process Description	n:		No			
Total Annual U.S.	. Volume (a	nd percent of PV):	2002: 3	30,000,00	00  lbs	
Number of Sites:			2			
EVALUATION						
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments
Domain 1, Paliahi	:1:+					
Domain 1. Reliabl	Metric 1:	Methodology	High	$\times 1$	1	ICIS sourced data
Domain 2: Repres	entative	~				
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	$\times 2$	2	TCE Producers
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	First published in 2000, but updated 2014
	Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Access	ibility/Clari	ity				
Domain 9. Hooos	Metric 6:	Metadata Completeness	High	$\times 1$	1	Cites sources for all data used.
Domain 4: Variab	ility and Ur	ncertainty	_		_	
	Metric 7:	Metadata Completeness	Low	× 1	3	No discussion of uncertainty or variability
Overall Quality D	eterminatio	$\mathbf{n}^{\dagger}$	High		1.3	

Source Citation: Type of Data Source Hero ID	Hsia,. 2008 Facility; R 3982144	3. Chlorinated solvents - The ke eports for Data or Information (	y to surfa Other tha	ice cleani n Exposi	ng perfe ure or R	ormance. Release Data;
EXTRACTION			<b>D</b> /			
Parameter			Data			
Life Cycle Stage:			Use			
Life Cycle Descrip	otion (Subca	tegory of Use):	Degreas	ing		
Process Description	on:		Yes			
Possible Physical	Form:		Liquid,	Vapor		
EVALUATION						
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments
Domain 1: Reliab	ility					
	Metric 1:	Methodology	High	$\times 1$	1	Halogenated Solvents Industry Alliance document.
Domain 2: Repres	sentative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	High	$\times 2$	2	Operation that uses TCE
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	2008 - 10 years old
	Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3. Access	sibility/Clar	tv				
Domain 5. Access	Metric 6:	Metadata Completeness	Low	$\times 1$	3	Nothing cited/documented
Domain 4. Variah	ility and Ur	ocertainty				
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality D	eterminatio	n†	High		1.3	

Source Citation:	Iarc, 1999	Iarc, 1999. IARC Monographs on the evaluation of carcinogenic risks to humans: Trichloroethylene, tetrachloroethylene, and						
Type of Data Source Hero ID	Facility; R 3970844	Facility; Reports for Data or Information Other than Exposure or Release Data; 3970844						
EXTRACTION								
Parameter			Data					
Life Cycle Stare:			Manufact	1110				
Life Cycle Description (Subcategory of Use):			85 percen	t metal c	leaning	15 percent other		
Process Descripti	on:	acceptly of oboli	Yes	ti inotar e	100111116	, to percent other		
Total Annual U.S.	S. Volume (a	nd percent of PV):	USA proc	luces 150	,000,00	0 pounds annually		
	, , , , , , , , , , , , , , , , , , ,	- /	ŕ					
EVALUATION								
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments		
Domain 1. Boliał	vility							
Domain 1. Renar	Metric 1:	Methodology	High	$\times 1$	1	IARC/WHO document		
Domain 2: Repre	sentative				2			
	Metric 2:	Geographic Scope	Medium	$\times 1$	2	Data from World Health Organization, includes both US and non-US, OECD countries		
	Metric 3:	Applicability	High	$\times 2$	2	information covers in scope uses		
	Metric 4:	Temporal Representativeness	Low	$\times 2$	6	Report from 2014, but cites data over 20 years old		
	Metric 5:	Sample Size	N/A		N/A	No Comment.		
	1.11. / CI	•,						
Domain 3: Acces	Sibility/Clar	Ity Matadata Completeness	II: mh	× 1	1			
	Metric 0:	Metadata Completeness	підп	X 1	1	Sources, methods, assumptions clearly documented		
Domain 4. Varial	oility and U	ncertainty						
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.		
		r r r r r r r r r r r r r r r r r r r	1		/ -			
Overall Quality I	Determinatio	$\mathbf{n}^{\dagger}$	Medium		1.7			
0								

Source Citation:	2014. Exp	2014. Exposure scenario: Use: Trichloroethylene as an extraction solvent for removal of process oil and formation of the					
Type of Data Source Hero ID	Facility; R 3970806	eports for Data or Information (	Other than	Exposure	e or Rel	lease Data;	
EXTRACTION							
Parameter			Data				
Life Cycle Stage:			Use				
Life Cycle Description (Subcategory of Use):			Manufact	ure of po	lyethyle	ene battery separators	
Process Description:			Yes				
Number of Sites:	on Voor ond	Batchag non Daw	1				
Operating Days p	er rear and	Datches per Day:	309				
EVALUATION							
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments	
Domain 1, Polish	;];+						
Domain 1. Reliad	Metric 1:	Methodology	High	$\times 1$	1	Clear description of operation, procedures, etc.	
			0				
Domain 2: Repres	sentative						
	Metric 2:	Geographic Scope	Medium	$\times 1$	2	EU	
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE	
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	2014, 4 years old	
	Metric 5:	Sample Size	High	$\times 1$	1	Reasonably well characterized.	
Domain 3. Access	sibility/Clar	ity					
Domain 6. Treess	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	Basic Metadata present.	
Domain 4: Variab	ility and Ui	ncertainty			_		
	Metric 7:	Metadata Completeness	Medium	× 1	2	Addressed in a general sense.	
		†	TT:l.		19		
Overall Quality D	eterminatio	n'	High		1.3		

Source Citation:	Vlisco Netherlands, B. V 2014. Chemical safety report Part A: Use of trichloroethylene as a solvent for the removal and recovery of resin from dyed cloth.						
Type of Data Source Hero ID	Facility; R 3970833	eports for Data or Information (	Other than	Exposure	e or Rel	lease Data;	
EXTRACTION Parameter			Data				
Life Cycle Stage: Life Cycle Descrip Process Deceminitie	otion (Subca	tegory of Use):	Use Resin Ext Vec	traction f	rom Fa	bric	
Number of Sites:	511:		res 1				
Possible Physical	Form:		Liquid, va	apor			
Chemical Concent	tration:		Pure	-F			
EVALUATION							
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments	
Domain 1. Roliah	ility						
Domain 1. Renad	Metric 1:	Methodology	High	$\times 1$	1	Reliable, trusted source	
D : 0 D	, . <b>.</b>						
Domain 2: Repres	Motria 2:	Coographic Scope	Modium	$\sim 1$	9	1151	
	Metric 3:	Applicability	High	$^{\land 1}$ $\times 2$	2	Workplace that utilizes TCE	
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	2016	
	Metric 5:	Sample Size	N/A	~ -	N/A	No Comment.	
Domain 3: Access	sibility/Clari	tv					
	Metric 6:	Metadata Completeness	High	$\times 1$	1	Well documented	
Domain 4: Variat	oility and Ur	ncertainty	NT / A		NT / A		
	Metric <i>i</i> :	Metadata Completeness	IN/A		N/A	No Comment.	
Overall Quality D	eterminatio	$\mathbf{n}^{\dagger}$	High		1.1		

Source Citation:	Parker Hat	Parker Hannifin, Manufacturing. 2014. Chemical safety report: Use of trichloroethylene as a process solvent for the manufac-						
Type of Data Source Hero ID	Facility; R 3970838	eports for Data or Information (	Other than	Exposure	e or Rel	lease Data;		
EXTRACTION								
Parameter			Data					
Life Cycle Stage:	tion (Cubo	tomore of Use).	Use Use of the	ablana at k		a a process column for manufacturing ballow		
Life Cycle Description (Subcategory of Ose).			fiber gas	chloroeti	n mome	shranes out of polyphonylone oxide		
Process Description	on•		Yes	separatio	ii iiieiiie	containes out of polyphenylene oxide.		
Total Annual U.S	. Volume (a	nd percent of PV):	20.3  tonn	es TCE r	nade in	EU		
Number of Sites:			1					
Possible Physical	Form:		Liquid, va	por				
EVALUATION								
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments		
	•1•4							
Domain 1: Reliab	Motrie 1.	Mathadalagy	Ujerh	× 1	1	Dullally transfel second		
	metric 1.	Methodology	Ingn	~ 1	1	Reliable, trusted source		
Domain 2: Repres	sentative							
Domain 2: Repres	sentative Metric 2:	Geographic Scope	Medium	$\times 1$	2	EU		
Domain 2: Repres	sentative Metric 2: Metric 3:	Geographic Scope Applicability	Medium High	$\times 1 \times 2$	$\frac{2}{2}$	EU Workplace that utilizes TCE		
Domain 2: Repres	sentative Metric 2: Metric 3: Metric 4:	Geographic Scope Applicability Temporal Representativeness	Medium High High	$\begin{array}{c} \times \ 1 \\ \times \ 2 \\ \times \ 2 \end{array}$	2 2 2	EU Workplace that utilizes TCE 2013, 5 years old.		
Domain 2: Repres	sentative Metric 2: Metric 3: Metric 4: Metric 5:	Geographic Scope Applicability Temporal Representativeness Sample Size	Medium High High N/A	$\begin{array}{c} \times \ 1 \\ \times \ 2 \\ \times \ 2 \end{array}$	2 2 2 N/A	EU Workplace that utilizes TCE 2013, 5 years old. No Comment.		
Domain 2: Repres	Sentative Metric 2: Metric 3: Metric 4: Metric 5:	Geographic Scope Applicability Temporal Representativeness Sample Size	Medium High High N/A	$\begin{array}{c} \times \ 1 \\ \times \ 2 \\ \times \ 2 \end{array}$	2 2 2 N/A	EU Workplace that utilizes TCE 2013, 5 years old. No Comment.		
Domain 2: Repres	sentative Metric 2: Metric 3: Metric 4: Metric 5: sibility/Clar Metric 6:	Geographic Scope Applicability Temporal Representativeness Sample Size ity Metadata Completeness	Medium High High N/A Medium	$ \begin{array}{c} \times 1 \\ \times 2 \\ \times 2 \end{array} $	2 2 2 N/A	EU Workplace that utilizes TCE 2013, 5 years old. No Comment.		
Domain 2: Repres	sentative Metric 2: Metric 3: Metric 4: Metric 5: sibility/Clar Metric 6:	Geographic Scope Applicability Temporal Representativeness Sample Size ity Metadata Completeness	Medium High High N/A Medium	$\begin{array}{c} \times 1 \\ \times 2 \\ \times 2 \end{array}$ $\times 1$	2 2 2 N/A 2	EU Workplace that utilizes TCE 2013, 5 years old. No Comment. Moderately well documented		
Domain 2: Repres	Sentative Metric 2: Metric 3: Metric 4: Metric 5: Sibility/Clar Metric 6: Dility and Un	Geographic Scope Applicability Temporal Representativeness Sample Size ity Metadata Completeness ncertainty	Medium High High N/A Medium	$\begin{array}{c} \times 1 \\ \times 2 \\ \times 2 \end{array}$ $\times 1$	2 2 2 N/A 2	EU Workplace that utilizes TCE 2013, 5 years old. No Comment. Moderately well documented		
Domain 2: Repres	Sentative Metric 2: Metric 3: Metric 4: Metric 5: Sibility/Clar Metric 6: Sibility and Un Metric 7:	Geographic Scope Applicability Temporal Representativeness Sample Size ity Metadata Completeness icertainty Metadata Completeness	Medium High N/A Medium	$ \begin{array}{c} \times 1 \\ \times 2 \\ \times 2 \end{array} \\ \times 1 \end{array} $	2 2 2 N/A 2	EU Workplace that utilizes TCE 2013, 5 years old. No Comment. Moderately well documented No Comment.		
Domain 2: Repres	Sentative Metric 2: Metric 3: Metric 4: Metric 5: Sibility/Clar Metric 6: Sibility and Un Metric 7:	Geographic Scope Applicability Temporal Representativeness Sample Size ity Metadata Completeness heertainty Metadata Completeness	Medium High N/A Medium N/A	$\begin{array}{c} \times 1 \\ \times 2 \\ \times 2 \end{array}$ $\times 1$	2 2 2 N/A 2 N/A	EU Workplace that utilizes TCE 2013, 5 years old. No Comment. Moderately well documented No Comment.		
Domain 2: Repres	Sentative Metric 2: Metric 3: Metric 4: Metric 5: Sibility/Clar Metric 6: Sibility and Un Metric 7: Determinatio	Geographic Scope Applicability Temporal Representativeness Sample Size ity Metadata Completeness ncertainty Metadata Completeness n <sup>†</sup>	Medium High N/A Medium N/A High	$\begin{array}{c} \times 1 \\ \times 2 \\ \times 2 \end{array}$ $\times 1$	2 2 2 N/A 2 N/A 1.3	EU Workplace that utilizes TCE 2013, 5 years old. No Comment. Moderately well documented No Comment.		

Source Citation: Type of Data Source Hero ID	Pubchem,. Facility; R 3970252	2017. PubChem: Trichloroethy eports for Data or Information (	vlene. Other tha	n Exposi	ure or R	Release Data;			
EXTRACTION Parameter			Data						
Life Cycle Stage: Life Cycle Description (Subcategory of Use): Process Description: Total Annual U.S. Volume (and percent of PV): Number of Sites: Possible Physical Form:			Manufacture Manufacture Yes 1976: 610,000,000 lbs1981: 258,182 lbs1985: 170,196,866 lbs1991: 320,000,000 lbs1992: 160,000,000 lbs All US producers Liquid, Vapor						
<b>EVALUATION</b> Domain		Metric	Rating	$MWF^{\star}$	Score	Comments			
Domain 1: Reliab	ility Metric 1:	Methodology	High	× 1	1	Pubmed source that compiles data from many other reliable sources such as EPA, NIOSH, and OSHA			
Domain 2: Repres	Sentative Metric 2: Metric 3: Metric 4: Metric 5:	Geographic Scope Applicability Temporal Representativeness Sample Size	High High Low N/A	$\begin{array}{c} \times \ 1 \\ \times \ 2 \\ \times \ 2 \end{array}$	1 2 6 N/A	US Industry that makes TCE Pubmed accessed in 2017, but data is from 80's and 90's: 20-30 years old. No Comment.			
Domain 3: Access	ibility/Clar Metric 6:	ity Metadata Completeness	High	$\times 1$	1	Well documented			
Domain 4: Variability and Uncertainty Metric 7: Metadata Completeness		N/A		N/A	N/a				
Overall Quality D	eterminatio	$\mathrm{n}^\dagger$	High		1.6				

\* MWF = Metric Weighting Factor

<sup>†</sup> If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High:  $\geq 1$  to < 1.7; Medium:  $\geq 1.7$  to < 2.3; Low:  $\geq 2.3$  to  $\leq 3$ .

Source Citation:Atsdr., 2014. Draft toxicological profile for trichloroethylene.Type of Data SourceFacility; Reports for Data or Information Other than Exposure or Release Data; 3982339								
EXTRACTION Parameter			Data					
Life Cycle Stage: Life Cycle Description (Subcategory of Use): Process Description: Total Annual U.S. Volume (and percent of PV): Number of Sites: Possible Physical Form:			Manufacture Manufacture Yes 1960: 354,000,000 lbs1970: 612,000,000 lbs1980: 267,000,000 lbs1987: 195,000,000 lbs2005: est. 320,000,000 lbs2011: est. 270,000,000 lbs All US producers: DOW Chemical in Freeport, TX,PPG Industries, Lake Charles, LA Liquid, Vapor					
<b>EVALUATION</b> Domain		Metric	Rating	$\rm MWF^{\star}$	Score	Comments		
Domain 1: Reliab	ility Metric 1:	Methodology	High	$\times 1$	1	US Dept. of Health and Human Services - Agency for Toxic Substances and Disease Registry		
Domain 2: Repres	Metric 2: Metric 3: Metric 3: Metric 4: Metric 5:	Geographic Scope Applicability Temporal Representativeness Sample Size	High High High N/A	$\begin{array}{c} \times \ 1 \\ \times \ 2 \\ \times \ 2 \end{array}$	1 2 2 N/A	US Industry that makes TCE 2014, 4 years old. No Comment.		
Domain 3: Access	ibility/Clar Metric 6:	ity Metadata Completeness	High	$\times 1$	1	Well documented		
Domain 4: Variability and Uncertainty Metric 7: Metadata Completeness		N/A		N/A	No Comment.			
Overall Quality D	eterminatio	n†	High		1.0			

Source Citation: Type of Data Source Hero ID	Jordan, B. Facility; R 3860917	Jordan, B. ruce C. 1994. Memorandum: Transmittal of alternative control technology documents. Facility; Reports for Data or Information Other than Exposure or Release Data; 3860917							
EXTRACTION Parameter			Data						
Life Cycle Stage: Life Cycle Description (Subcategory of Use): Process Description:		EPA Industry Guidance on VOC reduction No							
EVALUATION									
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments			
Domain 1: Reliab	ility Metric 1:	Methodology	High	$\times 1$	1	EPA			
Domain 2: Repres	sentative Metric 2:	Geographic Scope	High	× 1	1				
	Metric 3:	Applicability	Unacceptable	$\times 1 \times 2$	8	Report is on control of emissions to air from industrial wastew- ater. Releases to air out of scope and fate of TCE after entering industrial wastewater stream outside perview of engineers			
	Metric 4:	Temporal Representativeness	Low	$\times 2$	6	1994, 24 years old			
	Metric 5:	Sample Size	Low	$\times 1$	3	No Comment.			
Domain 3: Access	sibility/Clar Metric 6:	ity Metadata Completeness	Low	$\times 1$	3	Sources cited, but not well described or attributed to data.			
Domain 4: Variab	oility and Ur Metric 7:	ncertainty Metadata Completeness	N/A		N/A	No Comment.			
Overall Quality D	Determinatio	n <sup>†</sup>	Unacceptable		4	Metric Mean Score: 2.8.			

\*\* Consistent with our Application of Systematic Review in TSCARisk Evaluations document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

\* MWF = Metric Weighting Factor

<sup>†</sup> If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High:  $\geq 1$  to < 1.7; Medium:  $\geq 1.7$  to < 2.3; Low:  $\geq 2.3$  to  $\leq 3$ .

Source Citation:	Chimcomplex, S. A. Borzesti. 2014. Analysis of alternatives: Industrial use of trichloroethylene (TCE) as a solvent as a degreasing agent in closed systems.							
Type of Data Source Hero ID	Facility; Reports for Data or Information Other than Exposure or Release Data; 3970830							
EXTRACTION								
Parameter			Data					
Life Cycle Stage:			Manufact	11170				
Life Cycle Descrir	otion (Subca	ategory of Use).	Manufact	ure and i	use of T	CE		
Process Descriptio	on:	seeger, er ezej.	Yes	are and	400 01 1			
Total Annual U.S	. Volume (a	nd percent of PV):	Global Co	onsumpti	on: 429	500 tonnes		
	, ,	- ,		-				
EVALUATION								
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments		
Domain 1. Deliah	:1:4							
Domain 1. Reliad	Metric 1:	Methodology	Medium	$\times 1$	2	Company that produces TCE		
		5,						
Domain 2: Repres	sentative							
	Metric 2:	Geographic Scope	Medium	$\times 1$	2	EU		
	Metric 3:	Applicability	High	$\times 2$	2	Industry that makes TCE		
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	2014, 4 years old		
	Metric 5:	Sample Size	N/A		N/A	No Comment.		
Domain 2. Access	ihiliter /Clam							
Domain 5: Access	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	Primary source, but no documentation provided.		
		X				v , .		
Domain 4: Variab	ility and Ui	ncertainty						
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.		
Overall Quality D	eterminatio	$\mathbf{n}^{\dagger}$	High		1.4			

Source Citation: Type of Data Source Hero ID	Spin,. 201 Facility; R 3981134	Spin, 2017. SPIN substances in preparations in nordic countries tetrachloroethylene, Part 2. Facility; Reports for Data or Information Other than Exposure or Release Data; 3981134							
EXTRACTION Parameter			Data						
Life Cycle Stage: Life Cycle Description (Subcategory of Use): Process Description: Total Annual U.S. Volume (and percent of PV):			Manufacture Manufacture of TCE No 2014 TCE in preparationsSE: 22 tonnesNO: 17.1 tonnesDK: 1.9 ton- nesFI: –						
EVALUATION		N/ / 1	D. (	MM177+	G				
Domain		Metric	Rating	M W F ^	Score	Comments			
Domain 1: Reliab	ility Metric 1:	Methodology	Low	$\times 1$	3	Methods not specified			
Domain 2: Repres	sentative								
×.	Metric 2:	Geographic Scope	Medium	$\times 1$	2	SE, FI, DK, NO (OECD countries)			
	Metric 3:	Applicability	High	$\times 2$	2	in scope uses			
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	2014, 4 years old			
	Metric 5:	Sample Size	N/A		N/A	No Comment.			
Domain 3: Access	sibility/Clar Metric 6:	ity Metadata Completeness	Unacceptable	× 1	4	No metadata given			
Domain 4: Variab	oility and Un Metric 7:	ncertainty Metadata Completeness	N/A		N/A	No Comment.			
Overall Quality D	Determinatio	n <sup>†</sup>	Unacceptable		4	Metric Mean Score: 1.9.			

\*\* Consistent with our Application of Systematic Review in TSCARisk Evaluations document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

\* MWF = Metric Weighting Factor

<sup>†</sup> If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High:  $\geq 1$  to < 1.7; Medium:  $\geq 1.7$  to < 2.3; Low:  $\geq 2.3$  to  $\leq 3$ .

Source Citation:	Carex, Canada. 2008. Priority environmental carcinogens for surveillance in Canada: Preliminary priority list.							
Hero ID	3978370	eports for Data or Information	Other than	Exposur	e or Rei	ease Data;		
EXTRACTION								
Parameter			Data					
Life Cycle Stage:			Use					
Life Cycle Descrip	otion (Subca	ategory of Use):	Variety					
Process Description	on:		No	<b>710</b>				
Total Annual U.S	. Volume (a	nd percent of PV):	Canada:	710 tonn	es			
Number of Sites:			49					
EVALUATION								
Domain		Metric	Rating	$MWF^*$	Score	Comments		
Domain 1, Polish	:1:+							
Domain 1. Kenab	Metric 1:	Methodology	Medium	$\times 1$	2	School of Environmental Health, Department of Health Care & Epidemiology, and Department of Geography, Canada		
Domain 9. Doma								
Domain 2: Repres	Motric 2.	Geographic Scope	Modium	$\sim 1$	9	Canada (OECD)		
	Metric 3:	Applicability	High	$\times 1$ $\times 2$	2	in scope uses		
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	2008. 10 years old		
	Metric 5:	Sample Size	N/A		N/A	No Comment.		
		Å	1		/			
Domain 3: Access	sibility/Clar	ity						
	Metric 6:	Metadata Completeness	Low	$\times 1$	3	Sources documented, but no other metadata		
Domain 4. V	ilitar and II-							
Domain 4: Variat	Motric 7.	Motadata Completeness	N/A		N/A	No Commont		
	metric 7:	metadata Completeness	1 <b>N</b> / <b>A</b>		IN/A	no Comment.		
Overall Quality F	otorminatio	$\mathbf{n}^{\dagger}$	Modium		1.0			
Overan Quality L	eterminatio	11	meurum		1.9			

Source Citation:	Doherty, R. E 2000. A history of the production and use of carbon tetrachloride, tetrachloroethylene, trichloroethylene and 1,1,1-trichloroethane in the United States: Part 1"historical background; carbon tetrachloride and tetrachloroethylene.
	Environmental Forensics.
Type of Data Source	Facility; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	194808

## EXTRACTION Parameter

Parameter	Data
Life Cycle Stage: Life Cycle Description (Subcategory of Use): Process Description:	Manufacture cleaning and degreasing solvents PCE was typically manufactured as a co-product with either TCE or CTC. One of the earliest manufacturing methods was a multi-step process beginning with the chlorination of acetylene, followed by lime dehydro-chlorination and chlorination steps (Seiler, 1960). This method, which yielded TCE as a co-product, gradually became obsolete in the 1970s due to the high price of acetylene. Hooker Chemical closed down the last plant to use this process in 1978 (Kroschwitz and Howe-Grant, 1991). More recent processes include (1) the high-temperature chlorina- tion of ethylene or 1,2-dichlor-ethane (with TCE as a co-product)
Total Annual U.S. Volume (and percent of PV):	Includes insight into the origins of US chemical manufacturing (e.g., Mil- itary) without providing actual production totals" environmental regu- lations increased the use of TCE and reduced demand for related dry- cleaning and degreasing solvent (e.g., CTC). TCE also was a regulated pollutant (e.g., land dispoal treatment standards, drinking water stan- dards).
Number of Sites:	Dow constructed a new CTC, PCE and TCE facility in Plaquemine, Louisiana between 1956 and 1958 (Chem. Eng. News, 1958)" In 1963, Pittsburgh Plate Glass announced plans to build a new PCE/TCE pro- duction facility in Lake Charles, Louisiana, to supplement the 35 million pound annual PCE output of its Barberton, Ohio facility (Chem. Eng. News, 1963c).

EVALUATION					
Domain	Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments
Domain 1: Reliability Metric 1:	Methodology	Medium	× 1	2	Peer reviewed article, uses acceptable but not frequently used sources
	(	Continued on n	ext page		

– continued from previous page									
Source Citation:	Doherty, R. E 2000. A history of the production and use of carbon tetrachloride, tetrachloroethylene, trichloroethylene and 1,1,1-trichloroethane in the United States: Part 1"historical background; carbon tetrachloride and tetrachloroethylene. Environmental Forensics.								
Type of Data Source Hero ID	Facility; Reports for Data or Information Other than Exposure or Release Data; 194808								
EVALUATION									
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments			
Domain 2: Repres	sentative								
	Metric 2:	Geographic Scope	High	$\times 1$	1	US			
	Metric 3:	Applicability	High	$\times 2$	2	in scope uses			
	Metric 4:	Temporal Representativeness	Low	$\times 2$	6	Report is from 2000 (less than 20 years old) but most data cited is older than 20 years $% \left( 1,1,2,2,2,2,2,2,2,2,2,2,2,2,2,2,2,2,2,2$			
	Metric 5:	Sample Size	N/A		N/A	No Comment.			
Domain 3: Access	sibility/Clar Metric 6:	ity Metadata Completeness	High	× 1	1	Sources, methods, assumptions clearly documented			
Domain 4. Variah	iliter and Ur		8						
Domain 4. Variat	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.			
Overall Quality D	Peterminatio	n†	Medium		1.7				

 $^{\star}$  MWF = Metric Weighting Factor

<sup>†</sup> If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale: High:  $\geq 1$  to < 1.7; Medium:  $\geq 1.7$  to < 2.3; Low:  $\geq 2.3$  to  $\leq 3$ .

Source Citation: Type of Data Source Hero ID	U.S, E. P. Facility; R 3827394	A 2017. Preliminary information eports for Data or Information (	on on manu Other than	facturing Exposure	, proces e or Rel	ssing, distribution, use, and disposal: Trichloroethylene. ease Data;
EXTRACTION						
Parameter			Data			
Life Cycle Stage:			Manufact	ure		
Life Cycle Descrip	otion (Subca	ategory of Use):	TCE Mar	nufacture	and Im	aport
Total Annual U.S.	. Volume (a	nd percent of PV):	2012: 220	),536,812	lbs2013	3: $198,987,532$ lbs2014: $191,996,578$ lbs2015:
Number of Sites:			171,929,40 13	00 lbs		
EVALUATION						
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments
Domain 1: Reliab	ility					
	Metric 1:	Methodology	High	$\times 1$	1	EPA
Domain 2: Repres	sentative					
Domain 2. Ropros	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	High	$\times 2$	2	Industry that makes TCE
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	2017, 1 year old
	Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3. Access	ibility/Clar	ity				
	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	Basic Metadata present.
Domain 4. Variah	ilitar and Ha	- containte				
Domain 4: Variab	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality D	eterminatio	$\mathbf{n}^{\dagger}$	High		1.1	

Source Citation:1989. Alternative control technology document – Halogenated solvent cleaners.Type of Data SourceFacility; Reports for Data or Information Other than Exposure or Release Data;Hero ID3860356									
EXTRACTION									
Parameter		Data							
Life Cycle Stage:		Use	Use						
Life Cycle Description (S	ubcategory of Use):	Degreas	sing						
Process Description:	0, ,	Yes, de	scription	of mult	iple degreasing systems				
Batch Size:		Varies							
Operating Days per Year	and Batches per Day:	Varies							
Possible Physical Form:		Liquid,	vapor						
EVALUATION									
Domain	Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments				
Domain 1: Reliability		TT: 1	1	1					
Metric	1: Methodology	High	× 1	1	EPA				
Domain 2: Representativ	3								
Metric	2: Geographic Scope	High	× 1	1	US				
Metric	3: Applicability	High	$\times 2$	2	Industry that uses TCE				
Metric	4: Temporal Representativeness	Low	$\times 2$	6	1989, 29 years old				
Metric	5: Sample Size	N/A		N/A	No Comment.				
Domain 3: Accessibility/	Clarity								
Metric	6: Metadata Completeness	High	$\times 1$	1	Sources are well cited. Meta data complete.				
Demoir 4. Verial 11									
Domain 4: Variability an	1 Uncertainty 7. Motodoto Completeness	NI / A		NI / A	N. Comment				
Metric	7. Metadata Completeness	N/A		1N/A	No Comment.				
	t	TT: 1		1.0					
Overall Quality Determin	ation'	Hıgh		1.6					

Source Citation: Type of Data Source Hero ID	U.S, E. P. A. 1980. Waste solvent reclamation. Facility; Reports for Data or Information Other than Exposure or Release Data; 3840001									
EXTRACTION Parameter			Data							
Life Cycle Stage: Life Cycle Description (Subcategory of Use): Process Description:			Manufacture Recovery Yes, description of multiple recovery processes							
<b>EVALUATION</b> Domain		Metric	Rating	MWF*	Score	Comments				
Domain 1: Reliab	ility Metric 1:	Methodology	High	× 1	1	EPA document				
Domain 2: Repres	Metric 2: Metric 3: Metric 4: Metric 5:	Geographic Scope Applicability Temporal Representativeness Sample Size	High High Low N/A	$\begin{array}{c} \times \ 1 \\ \times \ 2 \\ \times \ 2 \end{array}$	1 2 6 N/A	US information for solvent recovery 1995, 23 years old No Comment.				
Domain 3: Access	ibility/Clari Metric 6:	ity Metadata Completeness	High	× 1	1	Sources, methods, assumptions clearly documented				
Domain 4: Variability and Uncertainty Metric 7: Metadata Completeness		N/A		N/A	No Comment.					
Overall Quality Determination <sup><math>\dagger</math></sup>			High		1.6					

Source Citation: Type of Data Source	Doherty, R. E 2000. A history of the production and use of carbon tetrachloride, tetrachloroethylene, trichloroethylene and 1,1,1-trichloroethane in the United States: Part 2 - Trichloroethylene and 1,1,1-trichloroethane. Environmental Forensics. Facility; Reports for Data or Information Other than Exposure or Release Data; 2023308									
	2923308									
Parameter			Data							
Life Cycle Stage: Life Cycle Description (Subcategory of Use): Total Annual U.S. Volume (and percent of PV): Number of Sites:			Use Solvents (for cleaning and degreasing) approximately 115 million pounds in 1996 2							
EVALUATION										
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments				
Domain 1: Reliab	ility Metric 1:	Methodology	Medium	$\times 1$	2	Peer reviewed article, uses acceptable but not frequently used sources				
Domain 2. Ponno	contativo									
Domain 2: Repres	Metric 2:	Geographic Scope	High	× 1	1	US				
	Metric 3:	Applicability	High	$\times 2$	2	in scope uses				
	Metric 4:	Temporal Representativeness	Low	$\times 2$	6	Report is from 2000 (less than 20 years old) but most data cited is older than 20 years				
	Metric 5:	Sample Size	N/A		N/A	No Comment.				
Domain 3: Accessibility/Clarity			Ujeh	× 1	1					
	Metric 6:	Metadata Completeness	High	× 1	1	Sources, methods, assumptions clearly documented				
Domain 4: Varial	ncertainty									
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.				
Overall Quality Determination <sup><math>\dagger</math></sup>			Medium		1.7					
Source Citation: Type of Data Source Hero ID	Newmoa,. 2001. Pollution prevention technology profile - Closed loop vapor degreasing. Facility; Reports for Data or Information Other than Exposure or Release Data; 3044986									
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EXTRACTION Parameter			Data							
Life Cycle Stage: Life Cycle Description (Subcategory of Use):			Use Batch Va	por degre	easer					
EVALUATION										
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments				
Domain 1: Reliab	oility Metric 1:	Methodology	Medium	× 1	2	Northeast Waste Management Officials' Association - uses high-quality non-standard sources				
Domain 2: Repre	sentative									
	Metric 2:	Geographic Scope	High	$\times 1$	1	US				
	Metric 3:	Applicability	High	$\times 2$	2	Workplace that utilizes TCE				
	Metric 4: Metric 5:	Sample Size	N/A	× 2	4 N/A	Data older than 10 years but less than 20 years $N/A$ - only process description information given				
Domain 3: Access	sibility/Clar Metric 6:	ity Metadata Completeness	High	× 1	1	sources clearly documented				
-										
Domain 4: Variat	bility and U	ncertainty	T	1	0					
	Metric 7:	Metadata Completeness	Low	× 1	3	No discussion of uncertainty or variability				
Overall Quality I	Determinatio	$\mathrm{n}^\dagger$	High		1.6					

Source Citation:	U.S, E. P. A 2015. List of lists: Consolidated list of chemicals subject to the Emergency Planning and Community Right- To-Know Act (EPCRA), Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and Section 112(r) of the Clean Air Act.									
Type of Data Source Hero ID	Facility; R 3378218	Facility; Reports for Data or Information Other than Exposure or Release Data; 3378218								
EXTRACTION Parameter			Data							
Life Cycle Stage: Life Cycle Description (Subcategory of Use): Process Description:			EPA EPA List of Chemicals No							
EVALUATION		Metric	Bating	MWF*	Score	Comments				
			14401118		00010					
Domain 1: Reliab	oility		TT. 1		-					
	Metric 1:	Methodology	High	× 1	1	EPA				
Domain 2: Repres	sentative									
1	Metric 2:	Geographic Scope	High	$\times 1$	1	US				
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	List of chemicals subject to emergency planning, no informa- tion relevant to TCE conditions of use				
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	2015, 3 years old				
	Metric 5:	Sample Size	N/A		N/A	No Comment.				
Domain 3: Accoss	ribility/Clar	it v								
Domain 5. Access	Metric 6:	Metadata Completeness	High	$\times 1$	1	Sources cited and clearly described.				
D . 4 V . 1	.1., 1.1.									
Domain 4: Variat	Metric 7:	ncertainty Metadata Completeness	N/A		N/A	No Comment.				
Overall Quality D	Determinatio	$\mathrm{n}^\dagger$	Unacceptable		4	Metric Mean Score: 1.9.				

\*\* Consistent with our Application of Systematic Review in TSCARisk Evaluations document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

\* MWF = Metric Weighting Factor

Source Citation:	Dyer, M Geology.	Dyer, M. 2003. Field investigation into the biodegradation of TCE and BTEX at a former metal plating works. Engineering Geology.							
Type of Data Source Hero ID	Facility; R 3570965	Facility; Reports for Data or Information Other than Exposure or Release Data; 3570965							
EXTRACTION									
Parameter			Data						
Life Cycle Stage: Life Cycle Descrip Process Description Number of Sites: Possible Physical	ption (Subca on: Form:	ategory of Use):	Groundwater Groundwater S No 1 Liquid	Study					
i ospipio i nybiotai	1 01111.		Liquid						
EVALUATION									
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments			
Domain 1: Reliab	oility								
	Metric 1:	Methodology	High	$\times 1$	1	Journal article			
Domain 2: Repres	sentative								
1	Metric 2:	Geographic Scope	Medium	$\times 1$	2	UK			
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	Field work looking at biodegradation of TCE in groundwater near a closed metal plating factory. Outside scope.			
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	2003, 15 years old			
	Metric 5:	Sample Size	N/A		N/A	No Comment.			
Domain 3: Access	sibility/Clar	ity							
	Metric 6:	Metadata Completeness	High	$\times 1$	1	Sources cited and clearly described.			
Domain 4: Variab	oility and Ur	ncertainty							
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.			
Overall Quality D	Determinatio	$\mathrm{n}^\dagger$	Unacceptable		4	Metric Mean Score: 2.3.			

\*\* Consistent with our Application of Systematic Review in TSCARisk Evaluations document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

\* MWF = Metric Weighting Factor

Source Citation:UType of Data SourceFHero ID3	J.S, E. P. 4 Facility; Re 827321	A 1977. Control of volatile org eports for Data or Information (	ganic emissions f Other than Expo	rom solve sure or F	ent meta Release l	al cleaning. Data;
EXTRACTION						
Parameter			Data			
Life Cycle Stage:			EPA			
Life Cycle Description	on (Subca	tegory of Use):	Guidance to in	spectors	on VOC	C reduction
Process Description:			No			
Possible Physical Form:			Vapor			
EVALUATION						
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments
Domain 1: Reliabilit	ty					
N	Aetric 1:	Methodology	High	$\times 1$	1	EPA document
Domain 2: Represen	ntative					
N	Aetric 2:	Geographic Scope	High	$\times 1$	1	US
Ν	Aetric 3:	Applicability	Unacceptable	$\times 2$	8	Old 1977 guidelines on controling VOCs from metal cleaning. Outdated, no new data
Ν	Aetric 4:	Temporal Representativeness	Low	$\times 2$	6	1977, 42 years old
N	Aetric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibi	ilitv/Clari	tv				
N	Aetric 6:	Metadata Completeness	Low	$\times 1$	3	Sources cited, but not well described or attributed to data.
Domain 4: Variabili	tv and Un	certainty				
N	Aetric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Det	ermination	a <sup>†</sup>	Unaccentable		4	Matric Maan Score: 2.7
Overan Quanty Det	ci illiliati01	1	Chacceptable		4	MELLIC MEAL SCOLE. 2.1.

\*\* Consistent with our Application of Systematic Review in TSCARisk Evaluations document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

\* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	European Chemicals Bureau. 2004. European Union risk assessment report: Trichloroethylene. EUR 21057 EN. Facility; Completed Exposure or Risk Assessments; 3827429							
EXTRACTION Parameter			Data					
Life Cycle Stage:			Manufact	ure				
Process Description	on:		No		<b>r</b> 000 00			
Total Annual U.S	5. Volume (a	nd percent of PV):	EU: 51,00	0,000-22	5,000,00	10 kg		
EVALUATION								
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments		
Domain 1: Reliab	oility							
	Metric 1:	Methodology	High	$\times 1$	1	EU Chemicals Bureau peer reviewed risk assessment for TCE		
Domain 2: Benre	sentative							
Domain 2. Repres	Metric 2:	Geographic Scope	Medium	× 1	2	European Study (OECD)		
	Metric 3:	Applicability	High	$\times 2$	2	Workplace scenario within scope of risk evaluation.		
	Metric 4:	Temporal Representativeness	Low	$\times 2$	6	Most data from <1996		
	Metric 5:	Sample Size	Medium	$\times 1$	2	Provides a large range of possible values and is uncertain.		
Domain 3: Access	sibility/Clar	itv						
	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	Cleary documented sources and reasonably articulated as- sumptions, but not fully transparent		
Domain 4. Variat	ality and U	ncortainty						
Domain 4. Vallat	Metric 7:	Metadata Completeness	Medium	$\times 1$	2	Discusses uncertainty in overall production and importation		
Overall Quality I	Determinatio	$\mathbf{n}^{\dagger}$	Medium		1.9			

Source Citation: Type of Data Source Hero ID	European Chemicals Bureau. 2004. European Union risk assessment report: Trichloroethylene. EUR 21057 EN. Facility; Completed Exposure or Risk Assessments; 3827429									
EXTRACTION										
Parameter			Data							
Life Cycle Stage:			Use							
Life Cycle Descrip	otion (Subca	ategory of Use):	Metal De	greasing						
Process Description	on:	,	No							
Total Annual U.S	. Volume (a	nd percent of PV):	EU: 63,14	40,000kg						
EVALUATION										
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments				
Domain 1. Beliability										
	Metric 1:	Methodology	High	$\times 1$	1	EU Chemicals Bureau peer reviewed risk assessment for TCE				
Domain 2: Repres	sentative									
-	Metric 2:	Geographic Scope	Medium	$\times 1$	2	European Study (OECD)				
	Metric 3:	Applicability	High	$\times 2$	2	Workplace scenario within scope of risk evaluation.				
	Metric 4:	Temporal Representativeness	Low	$\times 2$	6	Most data from $<1996$				
	Metric 5:	Sample Size	Medium	$\times 1$	2	Provides annual use across all of the EU				
Domain 3: Access	sibility/Clar	ity								
	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	Cleary documented sources and reasonably articulated as- sumptions, but not fully transparent				
Domain 4: Variat	vility and U	ncertainty								
	Metric 7:	Metadata Completeness	Medium	$\times 1$	2	Discusses uncertainty in amount used in production.				
Overall Quality D	eterminatio	$\mathbf{n}^{\dagger}$	Medium		1.9					

Source Citation: Type of Data Source Hero ID	European Chemicals Bureau. 2004. European Union risk assessment report: Trichloroethylene. EUR 21057 EN. Facility; Completed Exposure or Risk Assessments; 3827429							
EXTRACTION								
Parameter			Data					
Life Cycle Stage:			Use					
Life Cycle Descrip	ption (Subca	ategory of Use):	Adhesives	3				
Process Description	on:	0 0 /	No					
Total Annual U.S	. Volume (a	nd percent of PV):	EU: 6,930	),000kg				
EVALUATION								
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments		
Domain 1. Beliability								
	Metric 1:	Methodology	High	$\times 1$	1	EU Chemicals Bureau peer reviewed risk assessment for TCE		
Domain 2: Repres	sentative							
1	Metric 2:	Geographic Scope	Medium	$\times 1$	2	European Study (OECD)		
	Metric 3:	Applicability	High	$\times 2$	2	Workplace scenario within scope of risk evaluation.		
	Metric 4:	Temporal Representativeness	Low	$\times 2$	6	Most data from <1996		
	Metric 5:	Sample Size	Medium	$\times 1$	2	Provides annual use across all of the EU		
Domain 3: Access	sibility/Clar	ity						
	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	Cleary documented sources and reasonably articulated as- sumptions, but not fully transparent		
Domain 4: Variat	oility and U	ncertainty						
	Metric 7:	Metadata Completeness	Medium	$\times 1$	2	Discusses uncertainty in amount used in production.		
Overall Quality D	Determinatio	$\mathbf{n}^{\dagger}$	Medium		1.9			

Source Citation: Type of Data Source Hero ID	European Chemicals Bureau. 2004. European Union risk assessment report: Trichloroethylene. EUR 21057 EN. Facility; Completed Exposure or Risk Assessments; 3827429							
EXTRACTION								
Parameter			Data					
Life Cycle Stage:	Life Cycle Stage							
Life Cycle Descrip	ption (Subca	ategory of Use):	Intermedi	iate				
Process Description	on:		No					
Total Annual U.S	. Volume (a	nd percent of PV):	EU: 45,00	00,000 kg				
EVALUATION								
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments		
Domain 1. Reliability								
	Metric 1:	Methodology	High	$\times 1$	1	EU Chemicals Bureau peer reviewed risk assessment for TCE		
Domain 2: Repres	sentative							
	Metric 2:	Geographic Scope	Medium	$\times 1$	2	European Study (OECD)		
	Metric 3:	Applicability	High	$\times 2$	2	Workplace scenario within scope of risk evaluation.		
	Metric 4:	Temporal Representativeness	Low	$\times 2$	6	Most data from <1996		
	Metric 5:	Sample Size	Medium	$\times 1$	2	Provides annual use across all of the EU		
Domain 3. Access	sibility/Clar	ity						
	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	Cleary documented sources and reasonably articulated as- sumptions, but not fully transparent		
Domain 4: Variat	ality and U	ncertainty						
Domain 4. Variat	Metric 7:	Metadata Completeness	Medium	$\times 1$	2	Discusses uncertainty in amount used in production.		
Overall Quality D	Determinatio	$\mathrm{n}^\dagger$	Medium		1.9			

Source Citation:Snedecor, G.,Hickman, J. C.,Mertens, J. A 2004. Chloroethylenes and chloroethanes.Type of Data SourceFacility; Reports for Data or Information Other than Exposure or Release Data;Hero ID3859422									
EXTRACTION			_						
Parameter			Data						
Life Cycle Stage:			Maufacture						
Life Cycle Descrip	Life Cycle Description (Subcategory of Use):			ure					
Process Description	on:		Yes						
Total Annual U.S	. Volume (a	nd percent of PV):	2004:Dow	: 59,000	$\operatorname{tonsPP}$	G: 91,000 tons			
Number of Sites:			2						
EVALUATION									
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments			
Domain 1: Reliab	ility Metric 1:	Methodology	High	$\times 1$	1	Kirk-Othmer ecyclopedia of chemical technology (frequently used source)			
						,			
Domain 2: Repres	Sentative	Communitie Commu	TT:l.	v 1	1				
	Metric 2:	Applicability	High	× 1 × 2	1	USA Waalahaa ayaa iyo idhir ayaa afaish a ahadiya			
	Metric 4:	Tomporal Boprosontativonoss	Modium	$^{\land 2}$ $^{\lor 2}$	2 1	workplace scenario within scope of risk evaluation. 2004  data (> 10  but  < 20  work old)			
	Metric 5:	Sample Size	High	× 1	1	Discrete data for each US production facility			
	Metric 5.	Sample Size	IIIgii	~ 1	1	Discrete data for each 05 production facility			
Domain 3: Access	sibility/Clar	ity							
	Metric 6:	Metadata Completeness	High	$\times 1$	1	In-text citations for all sources used and fully transparent			
Domain 4: Variab	ility and Ur	ncertainty							
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not discussed			
Overall Quality D	eterminatio	$\mathbf{n}^{\dagger}$	High		1.4				

Source Citation:	Entek International Limited. 2014. Analysis of alternatives: Use of trichloroethylene as an extraction solvent for removal of process oil and formation of the porous structure in polyethylene based separators used in lead-acid batteries. Facility: Reports for Data or Information Other than Exposure or Release Data:							
Hero ID	3970832		other than	Exposure		case Dava,		
EXTRACTION								
Parameter			Data					
Life Cycle Stage:			Use					
Life Cycle Descrip	otion (Subca	ategory of Use):	Battery S	eparators	s			
Process Description	on:		Yes					
Total Annual U.S	. Volume (a	nd percent of PV):	10-100 me	etric tons	3			
Number of Sites:	_		1					
Possible Physical	Form:		liquid, va	por				
EVALUATION								
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments		
Domain 1: Reliah	ility							
	Metric 1:	Methodology	Medium	$\times 1$	2	Data from site using TCE, assumed to have reliable process description information		
Domain 2: Repres	sentative							
	Metric 2:	Geographic Scope	Medium	$\times 1$	2	UK based company		
	Metric 3:	Applicability	High	$\times 2$	2	Workplace scenario within scope of risk evaluation.		
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Data from 2014 ( $<10$ years old)		
	Metric 5:	Sample Size	High	$\times 1$	1	All data is fully characterized		
Domain 3: Access	sibility/Clar	ity						
	Metric 6:	Metadata Completeness	High	$\times 1$	1	Data provided directly from manufacturer on the facility's process.		
Domain 4. Variah	ility and U	acertainty						
Domain 4. Vallat	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.		
		•	,		,			
Overall Quality D	eterminatio	$\mathbf{n}^{\dagger}$	High		1.3			

\* MWF = Metric Weighting Factor

Source Citation:Niosh., 2002. In-depth survey report: Control of perchloroethylene exposure (PCE) in vapor degreasing operations, site #3.Type of Data SourceFacility; Reports for Data or Information Other than Exposure or Release Data;Hero ID3974920							
EXTRACTION Parameter			Data				
Life Cycle Stage: Life Cycle Description (Subcategory of Use): Process Description: Number of Sites: Batch Size:			Surrogate Use OTVD Yes 1 255 gallon capacity				
EVALUATION Domain		Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliabil	ity Metric 1:	Methodology	High	× 1	1	NIOSH (frequently used source)	
Domain 2: Represe	entative Metric 2: Metric 3: Metric 4: Metric 5:	Geographic Scope Applicability Temporal Representativeness Sample Size	High High Medium Low	$\begin{array}{c} \times 1 \\ \times 2 \\ \times 2 \\ \times 1 \end{array}$	$\begin{array}{c} 1\\ 2\\ 4\\ 3\end{array}$	USA Process description for directy applicable workplace scenario Data from 2002 (>10 years) that is expected to be similar to current degreasing processes. single value, no statistics	
Domain 3: Accessi	bility/Clari Metric 6:	ity Metadata Completeness	High	$\times 1$	1	NIOSH assessment that clearly describes assessment methods.	
Domain 4: Variabil	lity and Ur Metric 7:	ncertainty Metadata Completeness	N/A		N/A	No Comment.	
Overall Quality De	terminatio	n†	High		1.5		

Source Citation:	U.S, E. P. substances	A.,I. C. F. Consulting. 2004.	The U.S.	. solvent	cleanin	g industry and the transition to non ozone depleting		
Type of Data Source Hero ID	Facility; Reports for Data or Information Other than Exposure or Release Data; 3982140							
EXTRACTION								
Parameter			Data					
Life Cycle Stage:			Uso					
Life Cycle Descrit	otion (Subc	ategory of Use).	Solvent c	leaning				
Process Description	on:	and going of elsey.	Yes	iouiiing				
EVALUATION								
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments		
Domain 1: Reliab	Metal 1	Matha dala ma	TT:1.	<b>1</b>	1			
	Metric 1:	Methodology	High	× 1	1	US EPA (frequently used source)		
Domain 2: Repres	sentative							
	Metric 2:	Geographic Scope	High	$\times 1$	1	USA		
	Metric 3:	Applicability	High	$\times 2$	2	Workplace scenario within scope of risk evaluation.		
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data from 2004 (>10 years) that is expected to be similar to current degreasing processes.		
	Metric 5:	Sample Size	N/A		N/A	No Comment.		
	1.11. (CI	•						
Domain 3: Access	Metric 6:	ity Metadata Completeness	High	$\times 1$	1	Assessment clearly documents where data is coming from and is fully transparent		
Domain 4: Variab	Motrie 7:	Motadata Completeness	N / A		N/A	No Comment		
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.		
Overall Quality D	eterminatio	$\mathrm{n}^\dagger$	High		1.3			

Source Citation:	National Institute for Occupational Safety and Health (NIOSH). 2002. In-depth survey report: control of perchloroethylene (PCF) in yappr degraasing operations, site #4, EPHB 256 18b.							
Type of Data Source Hero ID	Facility; Reports for Data or Information Other than Exposure or Release Data; 5071453							
EXTRACTION								
Parameter			Data					
			a					
Life Cycle Stage:			Surrogate Use					
Life Cycle Description (Subcategory of Use):			Vacuum Degreasing					
Number of Sites:	on:		res					
Operating Days n	or Voor ond	Batchog por Dav:	I Fach batch is 20-20 minute					
Operating Days per Year and Batches per Day:			Each batch is 20-50 minuts					
EVALUATION								
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments		
Damain 1. Daliah	:1:4							
Domain 1: Reliab	Motrie 1.	Mathadalam	Uich	× 1	1			
	metric 1.	Methodology	Ingn	× 1	1	NIOSH (frequently used source)		
Domain 2: Repres	sentative							
Domain = Teopro	Metric 2:	Geographic Scope	High	$\times 1$	1	USA		
	Metric 3:	Applicability	High	$\times 2$	2	Process description for directy applicable workplace scenario		
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data from 2002 (>10 years) that is expected to be similar to current degreasing processes.		
	Metric 5:	Sample Size	N/A		N/A	No Comment.		
Domain 5: Access	Motrie 6	Motodoto Completeness	Uich	× 1	1			
	Metric 0:	Metadata Completeness	підп	X 1	1	NIOSH assessment that clearly describes assessment methods.		
Domain 4: Variability and Uncertainty								
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.		
		L .	/		/			
Overall Quality Determination <sup><math>\dagger</math></sup>		High		1.3				

Source Citation:	National Institute for Occupational Safety and Health (NIOSH). 2002. In-depth survey report: control of perchloroethylene (PCE) in vapor degreasing operations site #1. EPHB 256-19b.							
Type of Data Source Hero ID	(FCE) in vapor degreasing operations, site #1. EFHB 256-19b. Facility; Reports for Data or Information Other than Exposure or Release Data; 5071461							
EXTRACTION								
Parameter			Data					
Life Cycle Stage: Life Cycle Description (Subcategory of Use): Process Description: Number of Sites:			Surrogate Use Vacuum and OTV Degreasing Yes 1					
EVALUATION								
Domain		Metric	Rating	$\mathrm{MWF}^{\star}$	Score	Comments		
Domain 1: Reliab	ility Metric 1:	Methodology	High	$\times 1$	1	NIOSH (frequently used source)		
	_							
Domain 2: Repres	sentative		TT: 1	1	1			
	Metric 2:	Geographic Scope	High	× 1	1	USA		
	Metric 3: Metric 4:	Applicability Temporal Representativeness	Hign Medium	$\times 2 \times 2$	$\frac{2}{4}$	Process description for directly applicable workplace scenario Data from 2002 (>10 years) that is expected to be similar to current degreasing processes.		
	Metric 5:	Sample Size	N/A		N/A	No Comment.		
Domain 3: Accessibility/Clarity Metric 6: Metadata Completeness			High	× 1	1	NIOSH assessment that clearly describes assessment methods.		
Domain 4: Variability and Uncertainty Metric 7: Metadata Completeness		N/A		N/A	No Comment.			
Overall Quality Determination <sup>†</sup>			High		1.3			

Source Citation:OType of Data SourceHHero ID5	Orris, P; Daniels, W. 1981. Health Hazard Evaluation Report 80-201-816: Peterson/Puritan Company. HE 80-201-816. Facility; Reports for Data or Information Other than Exposure or Release Data; 5099140							
EXTRACTION								
Parameter			Data					
Life Cycle Stage:			Surrogate Use					
Life Cycle Description (Subcategory of Use):			Use- packaging commercial aerosols.					
Process Description:			Yes					
Total Annual U.S. Volume (and percent of PV):			unknown					
Number of Sites:			1					
EVALUATION								
Domain		Metric	Rating	$MWF^{\star}$	Score	Comments		
Domain 1. Renabin	Metric 1:	Methodology	High	$\times 1$	1	NIOSH (frequently used source)		
Danain & Danas								
Domain 2: Represen	Motrie 2:	Coographic Scope	High	$\sim 1$	1	TIC A		
1. M	Metric 3.	Applicability	High	$^{\land 1}$ $^{\lor 2}$	1	USA Process description for directly applicable workplace scenario		
Ì	Metric 4:	Temporal Representativeness	Low	$\times 2 \times 2$	6	Data from 1980 (>20 years)		
ľ	Metric 5:	Sample Size	N/A	~ -	N/A	No Comment.		
Domain 3: Accessibility/Clarity								
N	Metric 6:	Metadata Completeness	High	$\times 1$	1	NIOSH assessment that clearly describes assessment methods.		
Domain 4. Variability and Uncertainty								
Domani 4. variabin	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.		
		r	/		/			
Overall Quality Determination <sup>†</sup>			High		1.6			

\* MWF = Metric Weighting Factor