FS Section	Content field	Explanation of content	CSR	eSDS
1. Title	**1.1 Title of SPERC**	Water treatment chemical use (consumer): solvent-borne	Y	Y
	1.2 SPERC code	ESVOC SPERC 8.22c.v3	Y	Y
2. Scope	**2.1 Substance/Product Domain**			
	Substance types / functions / properties included or excluded	Applicable to petroleum substances and petrochemicals.	Y	N
	Additional specification of product types covered:	Includes a variety of aliphatic and aromatic hydrocarbons, ketones, alcohols, acetates, glycols, glycol ethers, and glycol ether acetates.	Y	N
	Inclusion of sub-SPERCs	No	N	N
	2.2 Process domain			
	Description of activities/processes:	Covers the use of the substance for the treatment of water at industrial facilities in open and closed systems.	Y	Y
	2.3 List of applicable Use Descriptors			
	LCS	C – Consumer use	Y	Y
	SU	SU0 – Other	Y	Y
	PC	PC20 – Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents	Y	Y
3. Operational conditions	**3.1 Conditions of use**			
	Location of use	Outdoor	Y	Y
	Water contact during use	Yes	Y	Y
	Connected to a standard municipal biological STP	Yes	Y	Y
	Rigorously contained system with minimisation of release to the environment	No	Y	N
	Further operational conditions impacting on releases to the environment	Volatile compounds prone to atmospheric release. Wastewater emissions generated from equipment cleaning with water.	Y	Y
	3.2 Waste Handling and Disposal			
	Waste Handling and Disposal:	Although household hazardous waste (HHW) represents a small portion of the total domestic waste produced by consumers, it needs to be separated from normal trash and amassed for special handling. Many regional municipalities have established voluntary procedures for the identification, collection, and disposal of HHW in a safe and efficient manner. Once amassed, the HHW can be transported to collection sites where it is reused, recycled, or incinerated. The handling and disposal of hazardous waste needs to conform with established practices and local/regional regulations in order to minimize environmental release and the potential for ecological harm. Inglezakis, V.J., Moustakas, K. (2015). Household hazardous waste management: A review. Journal of Environmental Management 150, 310-321. doi: 10.1016/j.jenvman.2014.11.021.	Y	N
4. Obligatory RMMs onsite	**RMM limiting release to air:**	No obligatory RMMs.	Y	Y
	RMM Efficiency (air):	Emissions to air are minimized when the product is used in accordance with the manufacturers' instructions and established practices.	Y	Y
	Reference for RMM Efficiency (air):	BCERF, 1999. Safe Use and Storage of Hazardous Household Products. Cornell University, Program on Breast Cancer and Environmental Risk	Y	N

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		Factors. Ithaca, NY. https://extensionhealthyhomes.org/Documents/fs22.safeUse.pdf.		
	RMM limiting release to water:	By default, the release to water is modified after biological treatment at a standard municipal sewage treatment plant (STP) with an effluent flow rate of 2,000 m^3/day. The effluent discharge rate is applicable to a group of 10,000 inhabitants who generate 200 L of wastewater per person.	Y	Y
	RMM Efficiency (water):	The removal efficiency is provided by the SimpleTreat model, which takes into consideration the biodegradability, partitioning behaviour, and volatility of an organic substance. Degradation assumes the operation of an aerobic activated-sludge reactor under steady-state conditions.	Y	Y
	Reference for RMM Efficiency (water):	ECHA (2016). Guidance on Information Requirements and Chemical Safety Assessment. Chapter R.16: Environmental Exposure Assessment Version 3.0. European Chemicals Agency. Helsinki, Finland. https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf	Y	N
	RMM limiting release to soil:	No obligatory RMMs.	Y	Y
	RMM Efficiency (soil):	Emissions to air are minimized when the product is used in accordance with the manufacturers' instructions and established practices.	Y	Y
	Reference for RMM Efficiency (soil):	BCERF, 1999. Safe Use and Storage of Hazardous Household Products. Cornell University, Program on Breast Cancer and Environmental Risk Factors. Ithaca, NY. https://extensionhealthyhomes.org/Documents/fs22.safeUse.pdf.	Y	N
5. Exposure Assessment Input	**5.1 Substance use rate**			
	Amount of substance use per day:	Supplied by registrant **(NB the stated daily use rate of 0.004 kg/day in the original water treatment chemical factsheet cannot be authenticated using information from the OECD ESD for water treatment chemicals and has been modified.)**	Y	Y
	Fraction of EU tonnage used in region:	10% (default value)	Y	N
	Fraction of Regional tonnage used locally:	0.05% (default value)	Y	N
	Justification / information source:	ECHA (2016). Guidance on Information Requirements and Chemical Safety Assessment. Chapter R.16: Environmental Exposure Assessment Version 3.0. European Chemicals Agency. Helsinki, Finland. https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf	Y	N
	5.2 Days emitting			
	Number of emission days per year:	365 (default value)	Y	Y
	Justification / information source:	ECHA, 2016. Guidance on Information Requirements and Chemical Safety Assessment. Chapter R.16: Environmental Exposure Assessment Version 3.0. European Chemicals Agency. Helsinki, Finland. https://echa.europa.eu/documents/10162/13632/information_requirements_r16_en.pdf	Y	N
	5.3 Release factors			
	sub-SPERC identifier:	ESVOC 8.22c.v3	Y	N
	ERC	ERC 8d		
	sub-SPERC applicability:	None	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	5%	Y	Y
	Justification of RFs (Air):	The value considers the leakage of heat transfer fluid from a residential hydronic heating and cooling system. These systems may lose up to 5% of their fluid capacity due to small undetectable leaks where the lost fluid ultimately evaporates and enters the vapor phase (AOS,2019). An	Y	N

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		average 3- or 4-bedroom home with ten radiators requiring a medium sized boiler with a power rating of 30 kW will use14 L of circulating fluid per kilowatt of boiler power (USBC, 2019). This value yields an overall circulating volume of 410 L (Cooper, 2022). A leakage loss of 5% would result in the displacement of 21 L of the boiler fluid or 10.5 L of transfer fluid assuming a 50:50 fluid-to-water ratio. The resulting air release factor following evaporation would therefore be 5% (21/410 x 100), which provides a cogent and suitably prudent value for the consumer use of water treatment chemicals AOS (2019). ProLine® XE Combi Boiler Installation & Service Manual. AO Smith, Milwaukee, WI. Available from: https://www.hotwater.com/lit/im/res_boilers/100298550.pdf Cooper J. (2022). How to calculate closed circuit system volumes. B&V Chemicals, Northhamptonshire, United Kingdom. Available from: https://www.bvwater.co.uk/b-v-water-news/how-to-calculate-closed-circuit-volumes USBC (2019). What Size Boiler Do I Need for My House? U.S. Boiler Company, Lancaster, PA. Available from: https://www.usboiler.net/what-size-boiler-do-i-need-for-my-house.html		
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	79.95%	Y	Y
	Justification of RFs (Water):	Closed-loop geothermal boilers and heat pumps using a thermal exchange fluid must be serviced on a regular basis. This includes the periodic drain down and replacement of the heat exchange fluid which is typically disposed of via a residential floor drain that is connected to a municipal sewer system (Inspectapedia, 2022). Using a mass balance approach, the water release factor can be calculated as the remainder needed to achieve an overall environmental release of 100%. Summing the air, soil, and waste factors of 5%, 0.05%, and 15% yields a subtotal of 20.05%. Assuming an overall conservation of mass, the water release factor is predicted to be 79.95% taking into account the partitioning into other environmental compartments. InspectAPedia. (2022). Heating Boiler Anti-Freeze Installation. Available from: https://inspectapedia.com/heat/Boiler_Antifreeze.php.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.05%	Y	Y
	Justification of RFs (Soil):	The value is based on the leakage that can occur in residential geothermal heat transfer units. A residential installation may require the use of up to 450 feet of buried one-inch diameter plastic pipe to achieve sufficient heating or cooling (Lung, 1990). The fluid flowrate in a typical residential geothermal unit has been reported to range from 5 to 15 gallons per minute or a minimum of 7,200 gallons per day (Butts, 2018). The fluid flowrate in a typical residential geothermal unit has been reported to range from 5 to 15 gallons per minute or a minimum of 7,200 gallons per day. Homeowners with leaking geothermal units have reported fluid losses of about a quart month or 0.008 gallons per day (Leakingloop, 2010). At a fluid flowrate of 7,200 gallons per day, this loss rate would result in a soil release factor of 0.0001%. To account for the possibility of larger undetectable leaks the value was increased 500-fold to yield a final recommended soil release factor of 0.05%. Lund J. W. (1990). Geothermal heat pump utilization in the United States. Oregon Institute of Technology, Geo-Heat Centre, Klamath Falls, OR. Butts E. (2018). Geothermal system design: Part 2: Design techniques. Water Well Journal; February. LeakingLoop. (2010). Help, leaking horizontal loop, what do I do? Geoexchange Forum. https://www.geoexchange.org/forum/threads/help-leaking-horizontal-loop-what-do-i-do.4280/	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	15%	Y	N

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	Justification of RFs:	The value was derived from published information on the rate of generation rate of household hazardous waste (HHW) and the sales volume for formulated consumer products containing a volatile solvent. The production of HHW in the US was estimated to of 8.8 kg/person/yr (PSI, 2004). A survey of the sales volume for solvent-containing consumer products in California was 5944 tonnes/day and the total state population that same year was 39 million people (CARB, 2018). A ratio of the annual per capita HHW production rate with the annual per capita sales volume of volatile consumer products yielded a waste release factor of 15%. Since this value considers a large array of consumer products capable of producing a waste fraction that can vary considerably, an uncertainty factor has not been applied. PSI (2004). Paint Product Stewardship: A Background Report for the National Dialogue on Paint Product Stewardship. Product Stewardship Institute. Lowell, MA. https://cdn.ymaws.com/productstewardship.site-ym.com/resource/resmgr/Resources_-_PS-Products/Background_Report_for_the_Na.pdf. CARB (2018). Draft 2013, 2014, and 2015 Consumer & Commercial Product Survey Data Summaries. California Air Resources Board. Sacramento, CA. https://www.arb.ca.gov/consprod/survey/2013-2014-2015-data_release.htm.	Y	N
References to SPERC Background Document				
	Reference to Background Document	ESIG/ESVOC (2023). SpERC Background Document (2nd edition). Specific Environmental Release Categories (SpERCs) for the consumer use of solvents and solvent-borne substances for agrochemical use, de-icing applications, and water treatment chemicals. European Solvents Industry Group. Brussels, Belgium.	Y	N