FS Section	Content field	Explanation of content	CSR	eSDS
1. Title	1.1 Title of SPERC	Manufacture of substance (industrial): solvent-borne	Y	Y
	1.2 SPERC code	ESVOC SPERC 1.1.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	Yes	N	N
	2.2 Process domain			
	Description of activities/processes:	Covers the commercial production of solvents and other large volume volatile organic chemicals from basic raw material feedstocks. Activities include recycling/recovery, material transfer, storage, maintenance, loading (including marine vessel/barge, road/rail car and bulk container), sampling, and associated laboratory activities. Manufacturing facilities typically operate at large integrated sites with a high degree of process control that improves resource efficiencies, material recovery, and process flexibility.	Y	Y
	2.3 List of applicable Use Descriptors			
	LCS	M - Manufacture	Y	Y
	SU	SU8 - Manufacture of bulk, large scale chemicals (including petroleum products)	Y	Y
	PC	PC0 – Other	Y	Y
3. Operational conditions	3.1 Conditions of use			
	Location of use	Indoor	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 subject to air emission controls. Wastewater emissions generated from equipment cleaning with water.	Y	Y
	3.2 Waste Handling and Disposal			
	Waste Handling and Disposal:	Residual raw materials and are in some cases recycled and fed back into the process reactor to improve efficiencies. In other cases, residues and by-products are used as raw materials for other downstream applications (EEA, 2016). Wastewater generated during cleaning and maintenance operations is directed to a waste water treatment plant for biological degradation. Atmospheric release of waste vapor may be ameliorated using wet scrubbers, thermal oxidizers, solid adsorbents, membrane separators, biofilters, and/or cold oxidizers for trapping residual vapours. All unrecovered waste is handled as an industrial waste that can be incinerated. EEA (2016). Prevention of hazardous waste in Europe — the status in 2015 European Environment Agency, Report No. 35/2016. Copenhagen, Denmark. https://www.eea.europa.eu/publications/waste-prevention-in-europe/file	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
4. Obligatory RMMs onsite	**RMM limiting release to air:**	No obligatory RMMs.	Y	Y
	RMM Efficiency (air):	Optional RMMs have been assigned a nominal removal efficiency value that is not accounted for in the air release factor. See the background document for more information.	Y	Y
	Reference for RMM Efficiency (air):	EU (2016). Best Available Techniques (BAT) Reference Document for Common Waste Water and Waste Gas Treatment/Management Systems in the Chemical Sector. Report EUR 28112 EN. European IPPC Bureau. Seville, Spain. http://eippcb.jrc.ec.europa.eu/reference/BREF/CWW_Bref_2016_published.pdf	Y	N
	RMM limiting release to water:	Oil-water separation (e.g. *via* oil water separators, oil skimmers, or dissolved air flotation) is required.	Y	Y
	RMM Efficiency (water):	The efficiency of this RMM varies dependent on the treatment technology and the properties of the substance.	Y	Y
	Reference for RMM Efficiency (water):	EU (2016). Best Available Techniques (BAT) Reference Document for Common Waste Water and Waste Gas Treatment/Management Systems in the Chemical Sector. Report EUR 28112 EN. European IPPC Bureau. Seville, Spain. http://eippcb.jrc.ec.europa.eu/reference/BREF/CWW_Bref_2016_published.pdf	Y	N
	RMM limiting release to soil:	The sludge generated from wastewater treatment is not applied to agricultural soil.	Y	Y
	RMM Efficiency (soil):	Not applicable	Y	Y
	Reference for RMM Efficiency (soil):	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
5.3.4 Release Factor – waste	**5.1 Substance use rate**			
	Amount of substance use per day:	2,000,000 kg/day	Y	Y
	Fraction of EU tonnage used in region:	100%	Y	N
	Fraction of Regional tonnage used locally:	100%	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:	300 (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 1.1.a.v3 VP >10000 Pa; WS <0.001 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure >10000 Pa Water solubility <0.001 mg/l	Y	N
	5.3.1 Release Factor – air			

FS Section	Content field	Explanation of content	CSR	eSDS
	Numeric value / percent of input amount (Air)	5.0%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.0000005%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m^3/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 1.1.b.v3 VP >10000 Pa; WS 0.001-0.01 mg/l	Y	N
	ERC	ERC 1		

FS Section	Content field	Explanation of content	CSR	eSDS
	sub-SPERC applicability:	Vapour pressure >10000 Pa Water solubility 0.001-0.01 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	5.0%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.000002%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m³/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m³/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
	sub-SPERC identifier:	ESVOC 1.1.c.v3 VP >10000 Pa; WS 0.01-0.1 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure >10000 Pa Water solubility 0.01-0.1 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	5.0%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.00002%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m³/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m³/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017).	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.		
	sub-SPERC identifier:	ESVOC 1.1.d.v3 VP >10000 Pa; WS 0.1-1.0 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure >10000 Pa Water solubility 0.1-1.0 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	5.0%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.0002%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m³/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m³/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.		
	sub-SPERC identifier:	ESVOC 1.1.e.v3 VP >10000 Pa; WS 1-10 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure >10000 Pa Water solubility 1-10 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	5.0%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.002%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m³/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m³/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 1.1.f.v3 VP >10000 Pa; WS 10-100 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure >10000 Pa Water solubility 10-100 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	5.0%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.02%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m^3/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 1.1.g.v3 VP >10000 Pa; WS 100-1000 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure >10000 Pa Water solubility 100-1000 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	5.0%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.2%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m^3/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC.	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.		
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 1.1.h.v3 VP >10000 Pa; WS >1000 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure >10000 Pa Water solubility >1000 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	5.0%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.5%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m^3/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		leakage volume 0.16 m³/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.		
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 1.1.i.v3 VP 1000-10000 Pa; WS <0.001 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure 1000-10000 Pa Water solubility <0.001 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	5.0%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.0000005%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m³/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y

FS Section	Content field	Explanation of content	CSR	eSDS
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m³/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 1.1.j.v3 VP 1000-10000 Pa; WS 0.001-0.01 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure 1000-10000 Pa Water solubility 0.001-0.01 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	5.0%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.000002%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m³/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m³/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 1.1.k.v3 VP 1000-10000 Pa; WS 0.01-0.1 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure 1000-10000 Pa Water solubility 0.01-0.1 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	5.0%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.00002%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m³/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor.	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.		
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 1.1.l.v3 VP 1000-10000 Pa; WS 0.1-1.0 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure 1000-10000 Pa Water solubility 0.1-1.0 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	5.0%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.0002%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product.	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		The average volume of effluent wastewater from up to 98 European refineries was 1.0 m³/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.		
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m³/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 1.1.m.v3 VP 1000-10000 Pa; WS 1-10 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure 1000-10000 Pa Water solubility 1-10 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	5.0%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			

FS Section	Content field	Explanation of content	CSR	eSDS
	Numeric value / percent of input amount (Water):	0.002%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m³/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m³/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 1.1.n.v3 VP 1000-10000 Pa; WS 10-100 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure 1000-10000 Pa Water solubility 10-100 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	5.0%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2,	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)		
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.02%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m³/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m³/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 1.1.o.v3 VP 1000-10000 Pa; WS 100-1000 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure 1000-10000 Pa Water solubility 100-1000 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	5.0%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)		
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.2%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m³/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m³/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 1.1.p.v3 VP 1000-10000 Pa; WS >1000 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure 1000-10000 Pa Water solubility >1000 mg/l	Y	N
	5.3.1 Release Factor – air			

FS Section	Content field	Explanation of content	CSR	eSDS
	Numeric value / percent of input amount (Air)	5.0%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.5%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m³/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m³/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 1.1.q.v3 VP 100-1000 Pa; WS <0.001 mg/l	Y	N
	ERC	ERC 1		

FS Section	Content field	Explanation of content	CSR	eSDS
	sub-SPERC applicability:	Vapour pressure 100-1000 Pa Water solubility <0.001 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	1.0%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.0000005%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m³/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m³/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
	sub-SPERC identifier:	ESVOC 1.1.r.v3 VP 100-1000 Pa; WS 0.001-0.01 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure 100-1000 Pa Water solubility 0.001-0.01 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	1.0%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.000002%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m^3/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017).	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.		
	sub-SPERC identifier:	ESVOC 1.1.s.v3 VP 100-1000 Pa; WS 0.01-0.1 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure 100-1000 Pa Water solubility 0.01-0.1 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	1.0%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.00002%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m^3/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.		
	sub-SPERC identifier:	ESVOC 1.1.I.t3 VP 100-1000 Pa; WS 0.1-1.0 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure 100-1000 Pa Water solubility 0.1-1.0 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	1.0%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.0002%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m³/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m³/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 1.1.u.v3 VP 100-1000 Pa; WS 1-10 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure 100-1000 Pa Water solubility 1-10 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	1.0%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.002%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m^3/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 1.1.v.v3 VP 100-1000 Pa; WS 10-100 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure 100-1000 Pa Water solubility 10-100 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	1.0%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.02%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m^3/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC.	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.		
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 1.1.w.v3 VP 100-1000 Pa; WS 100-1000 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure 100-1000 Pa Water solubility 100-1000 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	1.0%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.2%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m^3/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		leakage volume 0.16 m³/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.		
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 1.1.x.v3 VP 100-1000 Pa; WS >1000 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure 100-1000 Pa Water solubility >1000 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	1.0%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.5%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m³/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y

FS Section	Content field	Explanation of content	CSR	eSDS
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m³/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 1.1.y.v3 VP 10-100 Pa; WS <0.001 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure 10-100 Pa Water solubility <0.001 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.1%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.0000005%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m³/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m³/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 1.1.z.v3 VP 10-100 Pa; WS 0.001-0.01 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure 10-100 Pa Water solubility 0.001-0.01 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.1%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.000002%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m³/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor.	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.		
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 1.1.aa.v3 VP 10-100 Pa; WS 0.01-0.1 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure 10-100 Pa Water solubility 0.01-0.1 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.1%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.00002%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product.	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		The average volume of effluent wastewater from up to 98 European refineries was 1.0 m^3/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.		
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 1.1.bb.v3 VP 10-100 Pa; WS 0.1-1.0 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure 10-100 Pa Water solubility 0.1-1.0 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.1%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			

FS Section	Content field	Explanation of content	CSR	eSDS
	Numeric value / percent of input amount (Water):	0.0002%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m³/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m³/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 1.1.cc.v3 VP 10-100 Pa; WS 1-10 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure 10-100 Pa Water solubility 1-10 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.1%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2,	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)		
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.002%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m³/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m³/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 1.1.dd.v3 VP 10-100 Pa; WS 10-100 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure 10-100 Pa Water solubility 10-100 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.1%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)		
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.02%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m³/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m³/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 1.1.ee.v3 VP 10-100 Pa; WS 100-1000 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure 10-100 Pa Water solubility 100-1000 mg/l	Y	N
	5.3.1 Release Factor – air			

FS Section	Content field	Explanation of content	CSR	eSDS
	Numeric value / percent of input amount (Air)	0.1%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.2%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m^3/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 1.1.ff.v3 VP 10-100 Pa; WS >1000 mg/l	Y	N
	ERC	ERC 1		

FS Section	Content field	Explanation of content	CSR	eSDS
	sub-SPERC applicability:	Vapour pressure 10-100 Pa Water solubility >1000 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.1%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.5%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m³/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m³/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
	sub-SPERC identifier:	ESVOC 1.1.gg.v3 VP 1-10 Pa; WS <0.001 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure 1-10 Pa Water solubility <0.001 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.01%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.0000005%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m^3/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017).	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.		
	sub-SPERC identifier:	ESVOC 1.1.hh.v3 VP 1-10 Pa; WS 0.001-0.01 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure 1-10 Pa Water solubility 0.001-0.01 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.01%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.000002%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m^3/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.		
	sub-SPERC identifier:	ESVOC 1.1.ii.v3 VP 1-10 Pa; WS 0.01-0.1 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure 1-10 Pa Water solubility 0.01-0.1 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.01%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.00002%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m³/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m³/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 1.1.jj.t3 VP 1-10 Pa; WS 0.1-1.0 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure 1-10 Pa Water solubility 0.1-1.0 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.01%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.0002%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m^3/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 1.1.kk.v3 VP 1-10 Pa; WS 1-10 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure 1-10 Pa Water solubility 1-10 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.01%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.002%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m^3/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC.	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.		
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 1.1.II.v3 VP 1-10 Pa; WS 10-100 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure 1-10 Pa Water solubility 10-100 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.01%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.02%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m^3/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		leakage volume 0.16 m³/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.		
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 1.1.mm.v3 VP 1-10 Pa; WS 100-1000 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure 1-10 Pa Water solubility 100-1000 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.01%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.2%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m³/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y

FS Section	Content field	Explanation of content	CSR	eSDS
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m³/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 1.1.nn.v3 VP 1-10 Pa; WS >1000 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure 1-10 Pa Water solubility >1000 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.01%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.5%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m³/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 1.1.oo.v3 VP <1 Pa; WS <0.001 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure <1 Pa Water solubility <0.001 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.001%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.0000005%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m^3/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor.	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.		
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 1.1.pp.v3 VP <1 Pa; WS 0.001-0.01 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure <1 Pa Water solubility 0.001-0.01 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.001%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.000002%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product.	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		The average volume of effluent wastewater from up to 98 European refineries was 1.0 m³/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.		
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m³/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 1.1.qq.v3 VP <1 Pa; WS 0.01-0.1 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure <1 Pa Water solubility 0.01-0.1 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.001%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			

FS Section	Content field	Explanation of content	CSR	eSDS
	Numeric value / percent of input amount (Water):	0.00002%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m^3/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 1.1.rr.t3 VP <1 Pa; WS 0.1-1.0 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure <1 Pa Water solubility 0.1-1.0 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.001%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2,	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)		
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.0002%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m³/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m³/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 1.1.ss.v3 VP <1 Pa; WS 1-10 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure <1 Pa Water solubility 1-10 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.001%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)		
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.002%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m³/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m³/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 1.1.tt.v3 VP <1 Pa; WS 10-100 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure <1 Pa Water solubility 10-100 mg/l	Y	N
	5.3.1 Release Factor – air			

FS Section	Content field	Explanation of content	CSR	eSDS
	Numeric value / percent of input amount (Air)	0.001%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.02%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m^3/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N
	sub-SPERC identifier:	ESVOC 1.1.uu.v3 VP <1 Pa; WS 100-1000 mg/l	Y	N
	ERC	ERC 1		

FS Section	Content field	Explanation of content	CSR	eSDS
	sub-SPERC applicability:	Vapour pressure <1 Pa Water solubility 100-1000 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.001%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.2%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m^3/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m^3/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017). CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
	sub-SPERC identifier:	ESVOC 1.1.vv.v3 VP <1 Pa; WS >1000 mg/l	Y	N
	ERC	ERC 1		
	sub-SPERC applicability:	Vapour pressure <1 Pa Water solubility >1000 mg/l	Y	N
	5.3.1 Release Factor – air			
	Numeric value / percent of input amount (Air)	0.001%	Y	Y
	Justification of RFs (Air):	This value has been adopted from a published source that documents the worst-case estimates of air emissions based on the expert judgement of environmental scientists from the Dutch National Institute for Public Health and the Environment (RIVM). European Commission (2003). European Commission Technical Guidance Document on Risk Assessment (EUTGD), Report EUR 20418 EN/2, Appendix 1, Table A1.1, Brussels, Belgium. (https://echa.europa.eu/documents/10162/16960216/tgdpart2_2ed_en.pdf)	Y	N
	5.3.2 Release Factor – water			
	Numeric value / percent of input amount (Water):	0.5%	Y	Y
	Justification of RFs (Water):	The factor was established after identifying the geometric mean for eight water solubility categories and combining this result with survey data describing the wastewater generation per tonne of manufactured product. The average volume of effluent wastewater from up to 98 European refineries was 1.0 m³/tonne over a three-year period. This value was conservatively increased by a factor of 5 to derive a recommended water release factor. CONCAWE, 2020. 2016 Survey of Effluent Quality and Water Use at European Refineries. Report No. 10/20, Conservation of Clean Air and Water in Europe. Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/Rpt_20-10.pdf.	Y	N
	5.3.3 Release Factor – soil			
	Numeric value / percent of input amount (Soil):	0.001%	Y	Y
	Justification of RFs (Soil):	The soil release for manufacturing operations considers the potential for pin hole leaks from the containment liners used as barriers within adjoined tank farms. Studies have shown that liners installed under strict quality control conditions will still have multiple small holes per acre capable of leaking measurable amounts of liquid (Hadj-Hamou et al., 2002). A leakage volume 0.16 m³/day/acre was used along with tank farm size and turnover data to determine a soil release factor (Laine, 1991). Hadj-Hamou T., Myers P., Sanglerat T. (2002). Alternatives to secondary containment lining. Proceedings of the Freshwater Spills Symposium. U.S. Environmental Protection Agency, Washington, DC. Laine D. L. (1991). Analysis of pinhole seam leaks located in geomembrane liners using the electrical leak location method: Case histories. Geosynthetics' 91Industrial Fabrics Association North American Geosynthetics Society, Atlanta, GA.	Y	N
	5.3.4 Release Factor – waste			
	Percent of input amount disposed as waste:	0.2%	Y	N
	Justification of RFs:	The value is consistent with well documented efficiencies and economies that take place in highly automated petrochemical production facilities. The operational conditions are outlined in greater detail in Factsheet Section 3.2 and are consistent with ECHA guidelines for establishing the irrelevance of a waste stage analysis for this this type of facility. The assigned value is in agreement with a survey of European petroleum refiners that did not show an appreciable generation of residual hazardous solvent waste (CONCAWE, 2017).	Y	N

FS Section	Content field	Explanation of content	CSR	eSDS
		CONCAWE, 2017. 2013 survey of waste production and management at European refiners, Conservation of Clean Air and Water in Europe, Brussels, Belgium. https://www.concawe.eu/wp-content/uploads/2017/11/rpt12-17.pdf.		
References to SPERC Background Document				
	Reference to Background Document	ESIG/ESVOC (2023). SpERC Background Document. Specific Environmental Release Categories (SpERCs) for the industrial manufacture, formulation, and intermediate use of petrochemicals and petrochemical-borne substances. European Solvents Industry Group. Brussels, Belgium.	Y	N