

Permit Number : EPR/YP3930EX

Reporting year : 2019

A review of the results of the monitoring and assessment carried out in accordance with the permit [Condition 4.2.2(a)]

**Releases to Air**

Substance	CAS No.	Reporting Threshold	Values (kg)		Comment
			2018	2019	
Butadiene	106-99-0	100 kg	2,320	3,495	Mass fraction derived from fenceline monitoring increased from previous year. Mass fraction used to calculate proportion from Total VOC emission.
Butene - All isomers	25167-67-3	1,000 kg	138,617	46,832	Mass fraction derived from fenceline monitoring decreased from previous year. Mass fraction used to calculate proportion from Total VOC emission. Total VOC emission decreased from previous year due to improved monitoring.
Ethylbenzene	100-41-4	100 kg	17,422	8,388	Mass fraction derived from fenceline monitoring similar to previous year. Mass fraction used to calculate proportion from Total VOC emission. Total VOC emission decreased from previous year due to improved monitoring.
Ethylene (Ethene)	74-85-1	1,000 kg	7,575	1,048	Mass fraction derived from fenceline monitoring decreased from previous year. Mass fraction used to calculate proportion from Total VOC emission. Total VOC emission decreased from previous year due to improved monitoring.
Hexane	110-54-3	10 kg	562,798	169,854	Mass fraction derived from fenceline monitoring decreased from previous year. Mass fraction used to calculate proportion from Total VOC emission. Total VOC emission decreased from previous year due to improved monitoring.
1-Hexene	592-41-6	10 kg	52,265	44,386	Mass fraction derived from fenceline monitoring increased from previous year. Mass fraction used to calculate proportion from Total VOC emission. Total VOC emission decreased from previous year due to improved monitoring.
Pentane	109-66-0	100 kg	695,355	253,034	Mass fraction derived from fenceline monitoring decreased from previous year. Mass fraction used to calculate proportion from Total VOC emission. Total VOC emission decreased from previous year due to improved monitoring.
Pentene - All isomers	25377-72-4	1,000 kg	68,172	6,990	Mass fraction derived from fenceline monitoring decreased from previous year. Mass fraction used to calculate proportion from Total VOC emission. Total VOC emission decreased from previous year due to improved monitoring.
Propylene	115-07-1	10,000 kg	14,392	7,339	Mass fraction derived from fenceline monitoring similar to previous year. Mass fraction used to calculate proportion from Total VOC emission. Total VOC emission decreased from previous year due to improved monitoring.
Toluene	108-88-3	100 kg	87,109	55,919	Mass fraction derived from fenceline monitoring increased from previous year. Mass fraction used to calculate proportion from Total VOC emission. Total VOC emission decreased from previous year due to improved monitoring.
Xylene - All isomers	1330-20-7	1,000 kg	65,900	44,735	Mass fraction derived from fenceline monitoring decreased from previous year. Mass fraction used to calculate proportion from Total VOC emission. Total VOC emission decreased from previous year due to improved monitoring.
Nickel	7440-02-0	10 kg	336	241	Mass fraction derived from FCCU catalyst monitoring decreased from previous year. Mass fraction used to calculate proportion from FCCU particulate emission. FCCU particulate emission decreased from previous year due to unit throughput.
Vanadium	7440-62-2	10 kg	312	222	Mass fraction derived from FCCU catalyst monitoring decreased from previous year. Mass fraction used to calculate proportion from FCCU particulate emission. FCCU particulate emission decreased from previous year due to unit throughput.
NMVOCS		10,000 kg	3,093,869	1,397,976	Decreased contribution from process plant fugitive emissions due to adoption of Tier 2 monitoring methodology.
Particulate matter - PM <sub>10</sub>		1,000 kg	127,752	108,182	FCCU particulate emission decreased from previous year due to unit throughput.
Particulate matter - total		10,000 kg	166,219	141,340	FCCU particulate emission decreased from previous year due to unit throughput.
Sulphur oxides		100,000 kg	2,445,934	2,784,023	Sour water stripper overheads flaring increased from previous year due to variations in sour water feed quality.

**Releases to Controlled Waters**

Substance	CAS No.	Reporting Threshold	Values (kg)		Comment
			2018	2019	
Ammonia	7664-41-7	10 kg	19,102	23,186	Flow weighted average increased from previous year.
Benzene	71-43-2	10 kg	24	4	Adoption of new test method with improved limit of detection. All monitoring results below limit of detection.
Arsenic	7440-38-2	5 kg	55	39	Adoption of new test method. Flow weighted average decreased from previous year.
Cadmium	7440-43-9	1 kg	2	2.3	Adoption of new test method. Flow weighted average increased from previous year.
Iron	7439-89-6	1,000 kg	4,921	5,761	Adoption of new test method. Flow weighted average increased from previous year.
Lead	7439-92-1	20 kg	37	12	Adoption of new test method. Flow weighted average decreased from previous year.
Mercury	7439-97-6	0.1 kg	20	1	Adoption of new test method with improved limit of detection. Flow weighted average decreased from previous year.
Zinc	7440-66-6	100 kg	197	261	Flow weighted average increased from previous year.
Fluorides - Total as F		2,000 kg	5,013	7,588	Flow weighted average increased from previous year.
Total organic carbon		50,000 kg	313,011	344,416	Flow weighted average increased from previous year.

**Waste Releases**

Waste	EWC code	WFD code	Values (tonne)		Comment
			2018	2019	
Non-hazardous waste transferred for disposal	20 03 01	D5	136	204	General waste increased from previous year due to house keeping campaign.
Non-hazardous waste for recovery	16 08 04	R5	5,488	4,818	Spent FCCU catalyst reduced from previous year due to unit throughput.