

Total Fugitive Emission for Crude/Vac 1 Process Unit (P011)

Max VOC from Fugitive Piping Components

For unmonitored components, emissions estimates are based on EPA average emissions factors (uncontrolled) and then applying appropriate control efficiency (where applicable).
For monitored components, using EPA correlation equation for estimated % leakers and EPA default 0 value for remaining components.

Annual Hours of Service: 8760

Component Type	Process Unit Component Count	EPA Factors (lb/hr/component) ^A	Factor source	For monitored components, EPA factor for Control no detect ^B	Assumed % leakers	Maximum Uncontrolled Emission Rate (lbs/hr)	Percent in VOC Service	Total VOC Emissions ² (Tons/yr)
Valves								
Gas/Vapor	1,691	1.62E-02	Monitored. Using correlation for leakers and EPA default 0 factor for remaining.	1.72E-05	2.0%	0.5752	100%	2.52
Light Liquid								
Heavy Liquid	1,449	5.10E-04	Conservatively assume no monitoring of heavy liquids, so using Refinery Average emission factor		NA	0.7390	100%	3.24
Pumps								
Light Liquid	7	8.15E-02	Monitored. Using correlation for leakers and EPA default 0 factor for remaining.	5.29E-05	10.0%	0.0574	100%	0.25
Heavy Liquid	19	8.29E-03	Monitored. Using API Study Average HL Factors.	5.29E-05	10.0%	0.0167	100%	0.07
Flanges								
Gas/Vapor/ Light Liquid	76	5.51E-04	Conservatively assume no monitoring of flanges, so using Refinery Average emission factor		2.0%	0.0411	100%	0.18
Heavy Liquid								
Connectors	206	5.51E-04	Conservatively assume no monitoring of connectors, so using Refinery Average emission factor		NA	0.1135	100%	0.50
Relief Valves	51	0.35	Connected to flare so assuming 98% control. Using Refinery Average emission factor		NA	0.3598	100%	1.58

Total Current VOC Fugitive Emissions (tons/yr): 8.33

Estimated fugitive Tons VOC/year from new components in the Crude/Vac 1 from TFO Project 1.76

Total estimated maximum fugitive emissions for Crude/Vac 1 Process Unit (P011) in Tons VOC/year 10.09

NOTES:

^A For unmonitored stream, Average Refinery Factors from US EPA protocol Table 2-2 are used for all components. These factors are conservative.

For monitored streams, this column has the EPA correlation factor from Table 2-10 for detected leakers, and uses the default 0 factor in Table 2-14 for non-detect components. Factors are taken from EPA Document EPA-453/R-95-017, Nov. 1995.

^B For monitored components, the Default 0 factors for Table 2-14 are used for components assumed to be non-detect. Factors are estimated from EPA Document EPA-453/R-95-017, Nov. 1995.

Current component count from "component count by unit equip_scv jan09.xls" in Metal-up project file 41917214.