

Permit Reference Number: KP3734SH

Operator: Navigator Terminals Windmill Limited

Installation: Barry Silicon Based Manufacturing Installation

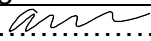
Form Number: R1

Reporting of Waste Disposal and Recovery for the year 2020

Waste Description	Disposal		Trends in Waste Disposal		
	Route	Tonnes (t)	Year	Parameter	
				Total Hazardous Wastes (t)	Total Non-Hazardous Wastes (t)
1) Hazardous Waste:			2007	203	10.3
WEEE		0.0	2008	202	14.4
Other Hazardous waste	Incineration /energy recovery	22.26	2009	167	15.6
			2010	170	15.0
2) Non-Hazardous Wastes:			2011	33.72	217.25
Site Cess Pit	Treatment	206.317	2012	0	219.88
General/Construction/Metal etc	Recycling	10.492	2013	0	180.76
Non haz washings	Treatment	7.58	2014	0.5	170.32
Siloxane waste (sample waste)	Treatment	24.74	2015	0.05	142.84
			2016	0	161.79
			2017	0	153.52
Hazardous		22.26	2018	1.42	174.82
Non- Hazardous		249.129	2019	4.68	215.022
			2020	22.26	249.129

Operator's comments: 2 x methanol tank outages in 2020 accounts for majority of hazardous waste. New tank cleaning method uses water to dilute methanol prior to tank entry (diluted approx. 90% water /10%methanol). Still handled as hazardous waste however.

1 x D5 tank was washed resulting in 7.58 Tns non haz washings. Terminal is still handling sample waste and linears water drains waste generating around 2 tns per month

Signed.....A Jackson
(Authorised to sign as representative of the Operator)

Date.....25/1/2021

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Form Number: E1

Reporting of Energy Usage for the year 2020

Energy Source	Energy Usage		CO ₂ Produced (t)
	Quantity	Primary Energy (MWh)	
Electricity * (MWh)	774.404	774.404	129.926
Natural Gas (MWh)	235.110	235.110	39.311
Diesel / Distillate Fuel Oil (t)	0.26	2.808	0.473
TOTAL	1009.774	1012.322	170.183

Trends in Energy Usage		
Year	Parameter	
	Primary Energy Usage (MWh)	CO ₂ Produced (t)
2007	1557	262.232
2008	1521	256
2009	1532	261
2010	1466	249
2011	1392	237
2012	1476	249
2013	1389	234
2014	1280	216
2015	1310	220.6
2016	1059	179
2017	956	161
2018	1011	169
2019	1060.825	178.103
2020	1012.322	170.183

Operator's comments: Energy consumption is comparable with previous year.

Signed.....A Jackson

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Form Number: MR1

Reporting of Mass Release for the year 2020

Mass Release		
Parameter	Medium	kg
Methanol ¹	Fugitive to air	72
Octamethylcyclotetrasiloxane (D4 Cyclics) ¹	Fugitive to air	1930.51
Decamethylcyclotetrasiloxane (D5 Cyclics) ¹	Fugitive to air	11.92

Trends in Mass Release (kg)			
Year	Parameter		
	Methanol	Octamethylcyclotetrasiloxane (D4 Cyclics)	Decamethylcyclotetrasiloxane (D5 Cyclics)
2008	43	1699	10.76
2009	100	1431	11.4
2010	55	1678	11
2011	98	1812	10
2012	70	2170	10
2013	125	2445	11
2014	121	2530	13.7
2015	85	3298	12.96
2016	100	2559	14.71
2017	34.4	2165.25	14.12
2018	92.4	2351.83	8.59
2019	42	1813.18	12.93
2020	72	1930.51	11.92

Operator's Comments:

The Methanol mass (air emission) release was calculated by averaging the results obtained from the fugitive emission surveys carried out by LDAR Envolve Ltd.

D4 and D5 Cyclic products mass emissions are calculated from ideal gas laws in conjunction with Raoult's law using vapour pressure, the final calculated figure is directly related to the tank throughputs.

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Date.....25/1/2021.....

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Navigator Terminals Windmill Ltd

Annual Review (2020) of Fugitive Emission Testing.

Date: 25/1/2021

Objective

To review the fugitive emission testing at the Windmill Site regarding the application of Best Available Techniques. Permit Condition 4.1.4

Scope

All equipment utilised in the storage and handling of methanol on the Navigator Site, including tank vents, pipelines, pumps, filters, flanges, seals and glands.

Exceptions

The ship unloading system is only full during ship off loading operations (less than 15% of year) and as such does not form part of every 6 monthly fugitive emissions test. Visual checks on the shipping pipelines and fitments are carried out at the commencement of every shipping operation and logged. The pipeline is fully welded from the site to the berths.

Test Methods Adopted

US EPA "Method 21" using a flame ionisation detector (Foxboro TVA 1000B)

Monitoring

- LDAR Envelope retained for 2020 to carry out the monitoring. Monitoring performed 6 monthly.
- All valves, pumps, filters and flanges (398 points) tested each visit.
- The four methanol tanks tested at 16 circumferential vent positions to monitor the performance of the internal floating roof seals.
- Monitoring results used to pinpoint any deterioration of seals, flange joints and glands etc, and prioritising of maintenance activities. (Action level >500ppm)
- Results obtained used to estimate the methanol fugitive emissions for the annual reporting.

Conclusions

Due to COVID LDAR were not able to travel during the first half of the year so 2 x visits were performed in August and November.

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During a previous LDAR inspection V0022 was found to be leaking above the threshold of 500ppm. Due to the location of the valve, remedial action was delayed until T103 planned tank outage in January 2020.

During the January tank outage, the V0022 was removed, and gaskets replaced. At next inspection, (August 2021), the release rate had unfortunately increased to 4370ppm (still no visible leakage observed), this reduced to 2850ppm in November 2020. Work is now planned to replace the valve and inspect flange faces on pipework.

Another valve V1120 was also observed leaking at a rate of 5510ppm. On review of results with the engineering team, we intend to adjust our inspection process to ensure any releases are inspected by terminal staff whilst inspector remains onsite. This will hopefully allow for corrective action to be taken and reported values reduced. (e.g., adjust gland packing, re-torque flanges then re-test)

The small number of fugitive releases above the 500ppm threshold, looks to confirm previous assumption that elevated emissions are more likely after invasive maintenance tasks (making and breaking flanges and opening and closing infrequently used isolation valves.) The second LDAR visit for 2021 is thus scheduled after the planned outage of T102 to identify any releases, caused by this maintenance activity.

Over the past 3 years, we have progressed with a program to replace the methanol tanks internal floating roof seals as they have reached end of life. T101, T103 and T104 have been replaced. T102 is planned for September 2021.

The total calculated methanol emissions for 2020 was recorded as 72 kgs based on the LDAR monitoring results.

The LDAR programme still is regarded as an effective means of monitoring for potential methanol leakage.

Best Regards



Andy Jackson