

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 2023

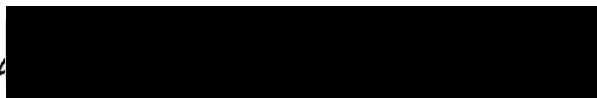
Waste Description	Disposal		Trends in Waste Disposal		
	Route	Tonnes (t)	Year	Parameter	
				Total Hazardous Wastes (t)	Total Non-Hazardous Waste (t)
1) Hazardous Waste:			2008	202	14.4
WEEE	Recycling	0.62	2009	167	15.6
Batteries	Recycling	0.008	2010	170	15.0
Other Hazardous waste	Incineration /energy recovery	0.16	2011	33.72	217.25
			2012	0	219.88
2) Non-Hazardous Wastes:			2013	0	180.76
Cess pit waste	Treatment	162.44	2014	0.5	170.32
Construction waste	Transfer station	3.42	2015	0.05	142.84
General waste	Recycling	5.582	2016	0	161.79
Dry mixed	Recycling	1.08	2017	0	153.52
			2018	1.42	174.82
Other	Treatment		2019	4.68	215.022
Metal	Recycling	9.85			
Siloxane waste (sample waste and tank water drains)	Treatment	18.46	2020	22.26	249.129
			2021	14.54	78.63
Hazardous		0.788	2022	4.14	132.437
Non- Hazardous		200.832	2023	0.788	200.832

Operator's comments: Hazardous waste volumes remain low and include used battery recycling, WEEE waste and small amounts of soiled PPE/ rags etc.
A crack in the sites underground cess pit was reported in 2021 submission (occurring August 2021). For the first 5 months of 2022, the site was using portable toilets, whilst a repair was actioned. 2023 was the first full year since the cess pit was repaired and

better reflects the historic volume of toilet waste that the site office generates.

Terminal is still handling sample waste and linear's water drains waste generating around 1-1.5 tn per month

Signed

A black rectangular box redacting the signature of the authorized representative.

Date.....23/1/24

(Authorised to sign as representative of the Operator)

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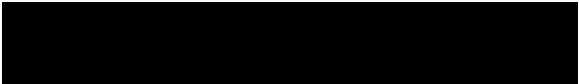
Reporting of Energy Usage for the year 2023

Energy Source	Energy Usage		CO ₂ Produced (t)
	Quantity	Primary Energy (MWh)	
Electricity * (MWh)	751750	751.750	155.612
Natural Gas (MWh)	237745	237.745	43.507
Diesel / Distillate Fuel Oil (t)	0.54m3	5.917	1.490
TOTAL		995.412	200.609

Trends in Energy Usage		
Year	Parameter	
	Primary Energy Usage (MWh)	CO ₂ Produced (t)
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
2021	994.657	166.761
2022	1006.181	194.902
2023	995.412	200.609

Operator's comments:

Electricity and gas usage was slightly reduced on 2022 values, however the CO₂ equivalent emissions factor used was different (now using values issued by UK government). Diesel use increased slightly vs previous years due to fuelling of cherry pickers etc onsite related to planned project work

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(Authorised to sign as representative of the Operator)

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Form Number: MR1

Reporting of Mass Release for the year 2023

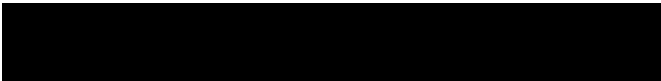
Mass Release		
Parameter	Medium	kg
Methanol ¹	Fugitive to air	38.5
Octamethylcyclotetrasiloxane (D4 Cyclics) ¹	Fugitive to air	1324.86
Decamethylcyclotetrasiloxane (D5 Cyclics) ¹	Fugitive to air	8.73

Trends in Mass Release (kg)			
Year	Parameter		
	Methanol	Octamethylcyclotetrasiloxane (D4 Cyclics)	Decamethylcyclotetrasiloxane (D5 Cyclics)
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
2021	51.5	1549.07	8.58
2022	49.4	1319.38	9.05
2023	38.5	1324.86	8.73

Operator's Comments:

The Methanol mass (air emission) release was calculated by averaging the results obtained from the 2 fugitive emission surveys carried out by LDAR Envolve Ltd this year. The program to replace methanol tank IFR seals has now completed (4 tanks seals replaced)

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. Throughput of D4 and D5 products are consistent with the past few years

Signed 
(Authorised to sign as representative of the Operator)

Date.....23/1/24.....

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Navigator Terminals Windmill Ltd

Annual Review (2023) of Fugitive Emission Testing.

Date: 23/1/2024

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 2023 to carry out the monitoring. Monitoring performed 6 monthly.
- All valves, pumps, filters and flanges (401 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

The ongoing LDAR process appears well controlled. Site mechanical resource follow emissions tester around site, “nipping up” any flanges that might have higher values than the action threshold. This eliminates follow on actions resulting from testing.

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The program of tank roof seal replacements is now complete, as is the current round of methanol tank inspections. The next methanol tank due for inspection will be in 2025.

The total calculated methanol emissions for 2023 was recorded as 38.5 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

