terminals pty. ltd.

MELBOURNE SITE

ANNUAL COMMUNITY

REPORT FOR 2011-12

Geoff Millard - Terminals

CONTENTS

1. SUMMARY

In January 2011, the EPA made changes to the licence to fit their new streamlined licence and annual performance reporting over the financial year. There were no changes to the licence discharge to air limits. However the change from calendar year to financial year means this report is the second report to cover a financial year ie 1st July 2011 to 30th June 2012.

This year the site performed well with no severity 3 incidents and only 1 environmental incident (1 water discharge had low dissolved oxygen reading), no lost time injuries, no offsite incidents or community complaints about odours.

Work continued on upgrading the west side facilities with the east side land being handed back to Port of Melbourne Corporation in January 2006.

There was only one environmental incident (which was the low dissolved oxygen incident above) and no waste discharge infringements.

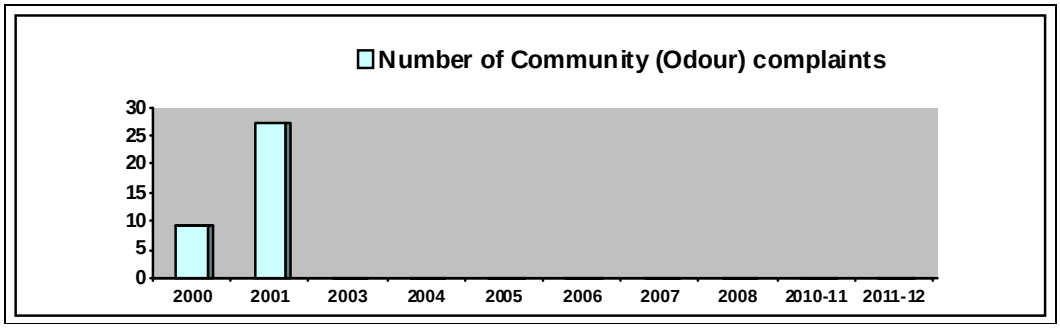
As a result of continued efforts being made since 2002 to reduce volatile organic compound emissions, 2011-12 again saw no air emission non-compliances.

Overall green house gas (GHG) emissions have decreased by 5% in 2011-12 due to updating combustion factors otherwise they would have increased by 5% after a significant increase in 2010-11 compared to a decrease in 2009 after a high energy usage year in 2008 and fairly consistent levels through 2005 to 2007. The last two years increase in gas usage is attributed to mainly heating base oil and tallow which have been added recently.

The third Environmental Improvement Plan (EIP) commenced this year with the previous EIP completed after 4 years. Of the previous EIP's 62 improvements 60 were completed and the remaining 2 rolled over into the new EIP. Status of the new EIP is 16 of the 20 improvements have been completed so far. The bulk of the major upgrading work has been completed, including closure and remediation of the East Side, tank refurbishments and new pipework. We are now in the final 4 year phase of the site upgrade continuing the program of environmental, safety and technological improvements.

2. COMMUNITY COMPLAINTS

There were no community complaints during 2011/12. Historically community complaints have been associated with odours. A graph of community (odours) complaints is detailed below.



Note: These complaints represent those that could be verified as emanating from, or caused by, Terminals. For instance, in 2001 there were a further 49 complaints but no odour sources could be found at Terminals or found caused by external operation.

The major influences in reducing these odour complaints have been the improved methodologies in treating acrylate chemicals. The initial controls were purpose built caustic scrubber; two stage treatment of joining existing activated carbon VEC with existing caustic scrubbers; closing in odorous VEC building with extraction and general environmental awareness. The final solutions include completely enclosed bottom loading facilities using dry break couplings and, since December 2002, combustor treatment of vapour emissions at > 99.6 % effectiveness.

3. EPA, WORKSAFE AND COMPANY AUDITS

EPA accredited licence audit in 2010 was carried out over two days in 6th & 7th October 2010. This was the seventh audit of this type under our new accredited EPA licence. The auditor reported an improved performance to completing recommendations from previous audits as per the following quote from the conclusion;

"Melbourne Terminal Accredited Licensee Environmental Audits 1 – 7 (2004 – 2010) identified 44, 42, 15, 27, 23, 19 and 22 action items respectively. The number of audit action items has declined during this period to a stable level, corresponding to an improvement in environmental management at the Melbourne Terminal. This has been reflected over a number of years in the high closure rate for previous audit action items and a significant improvement in the management of documentation relating to environmental issues.

Terminals management procedures associated with waste generation, process discharges to surface waters and process emissions to air were considered appropriate, with relatively minor amendments.

On the above basis it is considered appropriate that the frequency of involvement of an Industrial Facilities Environmental Auditor in the Melbourne Terminal audit programme be reduced from an annual basis to a biennial basis..."

The next accredited EPA audit is scheduled for October 2012. An internal EMS audit was carried out in July 2011. This found the EMS systems have reached a mature level and are being well managed. There were four observations which are mainly administrative in nature.

The internal audit program for 2011/2012 totalled 9 audits of the Melbourne site including audit topics of operations, maintenance, training, incident reporting, management review, work permits and environmental management systems, safety management system, purchasing, stock control, and non-conformance. There were no significant adverse findings.

Lloyds Register audited the Melbourne site twice during 2011 – 2012 financial year for ISO 14001 EMS and ISO 9001 QMS. This totalled ten day companywide for three year recertification audit followed nine months later by a six day companywide audit. There were no major non compliances and one minor non-compliance raised for the Melbourne site in June 2012. This item was:

• There was slippage in contractor inductions as found evidence of people had not been inducted or not current with the three year currency criteria.

All previous items were closed out.

The second round of MHF licensing resulted in a new 5 year MHF licence from December 2007 with no conditions. Worksafe have visited the site on several occasions over the last 12 months. There were no Improvement Notices during 2011 - 2012. In 2011, Terminals commenced the 5 yearly review & revise of the Safety Case for MHF relicensing. The third round Safety Case was submitted to Worksafe in June 2012 after comprehensive review, revision, upgrading and consultation processes.

4. MAJOR CHANGES TO SITE PLANT, EQUIPMENT AND CONTROLS

The Melbourne site in 2011-12 continued with the upgrade program from the last few years.

The pace is now at a slower pace compared to previous years as the majority of infrastructure is now in place. The plan now is to slowly upgrade the remaining tanks at Plant B and upgrade bunds when tanks are complete.

Some of the major achievements include:

- All Plant B tanks are now connected to sealed truck loading.
- Automatic shutdown of dilute systems after ten minutes when not being used.
- All tanks at Plant B have new fill lines.
- All flammable tanks at Plant B are connected through hard piped exchanger areas.
- Burning of waste now includes aqueous combustible waste stream.
- Last remaining tanks at Plant B to be renovated were completed in 2012.
- East side assessment review completed and EPA agrees with auditor to cease monitoring.

5. SAFETY AND ENVIRONMENTAL PERFORMANCE

5.1 SAFETY INCIDENTS

At Melbourne in 2011-12 there were no lost time injuries and 2 work injuries (strained back and strained shoulder during manual handling).

There were no WorkSafe Improvement Notices issued this year.

There were no Reportable Site Incidents for the period.

There were no Prohibition/Penalty Infringement Notice/Prosecutions for the period.

There were no Major Hazard incidents for the period.

There were 28 internal incident reports raised during 2011-12 which were broken up into the following categories:

Type:	Injury	7%
	Dangerous/Unusual/Near Misses	50%
	Environmental	21%
	Critical Control Measures	4%
	Customer/Complaints	18%
	Quality System	0%
	Other	4%

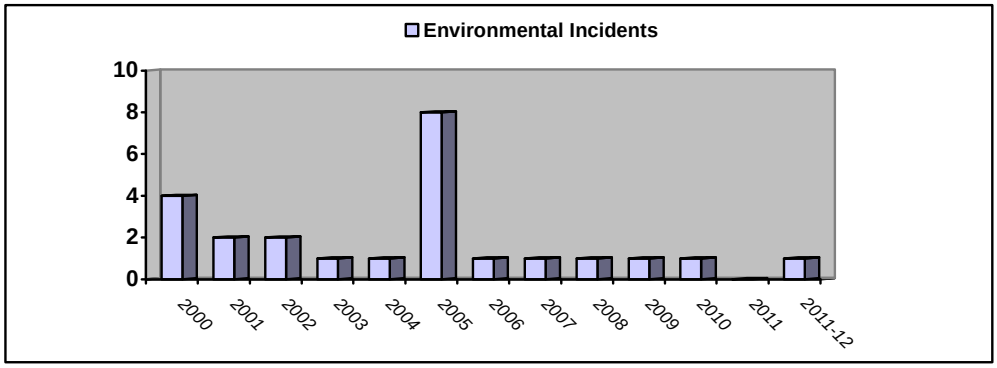
There were no severity 3 incidents in 2011-12:

5.2 ENVIRONMENTAL INCIDENTS

Historical trend of environmental incidents is detailed below. These are defined as spills greater than 200 ltrs, EPA reportable incidents (ie cause or likely to cause an offsite discharge or odour), licence breaches and EPA infringement actions. But these incidents do not include odour complaints as reported previously, or benzene emissions exceeding historical 51g/min licence condition, which regularly occurred until the thermal oxidiser (combustor) vapour emission control system was commissioned in November 2002 for benzene treatment.

In 2011 - 12; there was one environmental incident:-

- One water discharge result from Plant B resulted in low dissolved oxygen, 2.9 compared to minimum criteria of 5 ppm. All other parameters including toxicity were well within water discharge criteria. Three months later, the next result marginally met the criteria. The abnormal result was considered due to stagnant water in the separator system and the limited quantity being flushed through the system. The preventive measures are to clean out the separator and ensure sampling is representative of the bund water discharging through the system.



There has been a significant improvement to the seven incidents in 2005 that related to waste water discharge criteria.

6. EPA WASTE DISCHARGES

6.1 AIR EMISSIONS

Tabulated below shows a comparison of the estimated air emissions from the various discharge points with the emission limits specified in revised 2011 EPA licence, Table 1, Emission Limits for Discharge to Air. These limits are the same as the revised 2009 table. All emissions in 2011-12 are below the licence mass emission limits.

The air monitoring program was complied with as detailed in the Environmental Management Manual. The analysing of air emission discharge points during 2011-12 found no non compliances over 22 tests over thirteen sampling events. All results were below the level of analytical sensitivity except one round of very low CO/NOx results.

These emission estimates are based on US Tanks 4.0 or API 42 software calculations as a function of storage tank dimensions, chemical physical properties, and tank container filling quantities, duration in the tank and emission treatment effectiveness.

For 2005 and onwards; VOC is defined as per Victorian EPA definition of all hydrocarbons with a vapour pressure greater than 0.01kPa whereas previously the NPI definition of hydrocarbons with a vapour pressure greater than 0.272kPa had been used.

Waste	EPA Emission Limits (2009)		Estimated Emissions (Kgpa)									
	Total Mass Rate (g/min)	Total Annual Mass Rate (Kg/ annum)	2002-2003	2003-2004	2004	2005	2006	2007	2008	2009	2010-2011	2011-2012
Benzene	36	450	1478	151	138	16	4	10	9	8	9.3	8.9
Butyl Acrylate	11	65	13	23	21	3	4	4	4	4	4	2.9
Methyl Methacrylate	11	200	41	64	65	11	10	11	11	11	11	10.5
Phenol	0.3	6	3	2.6	4.2	2.4	0.2	0.1	0.1	0.1	0.1	0.1
Toluene Di-isocyanate	0.015	0.3	0.1	0.1	0.1##	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Non-Speciated VOC	370	8,400	4820	2790	2790 ##	1211	1101	1510	949	704	662	932
Carbon monoxide*	40	1,100				510	400	370	470	431	502	572
Total nitrogen oxides*	240	3,500				1150	910	850	1070	976	2744**	3125**
Total sulphur oxides*	70	1,000				3	3	3	3	3	9	9.8

Notes:

* In 2011, this data was based on the combustion products from the combustor VECs and the boilers based on NPI emission factors for tangentially fired boiler and wall fired boiler factors respectively; plus 90% of gas consumed by the combustor and an allowance of additional 3% fuel to combustor being VOC equivalent. The VOC fuel is about 5% of the natural gas mass usage and 3% of the combustion value of natural gas usage. Thus NPI emission factors seem appropriate.

The 2003/04 financial year estimated emission was used for 2004 calendar year

** NOx estimation increased substantially in 2010 and onwards due to a higher factor being used. The reasoning is based on previously used wall fired boilers from NPI website for all site gas usage. However combustors have not been attributed a special factor and it is considered by the environmental auditor that using a tangentially fired boiler factor from NPI web site will be more accurate for the combustor used gas due to the much higher combustor temperature.

Emissions to throughput ratio table

Year	Total emissions (kg)	Throughput (cubic metres)	Ratio (w/w%)
2008	973	138,800	0.000825
2009	727	113,723	0.000752
2010-2011	687	121,791	0.000664
2011-2012	953	138,391	0.000812

These ratios are very low and compare very favourably with the UK Department of Environment, Food and Rural Affairs – Process Guidance Note 1/13; which provides a target reference value of 0.01% w/w of annual emissions per throughput for petrol loading and storage plus a target reference value of 0.005% of throughput for annual petrol losses while loading and unloading tankers. The variations relate mainly to the mix and throughputs of non-hazardous chemicals. Despite their low volatility; these dominant the emission levels by a factor of more than 30 over the hazardous, volatile chemicals. The hazardous, flammable and volatile chemicals are treated by the combustor resulting in a 250 fold decrease in these emissions which are predominantly the usual highest emitters even after treatment up to 90% effectiveness.

6.2 STORMWATER DISCHARGES

There was one non-compliance to the waste discharge criteria specified in the Environmental Management Manual and tabulated below. This compares favourably with no non compliances since the five non compliances during the 2005 year. The non-compliance was a low dissolved oxygen result at Plant B water discharge. Refer to Environmental Incident section for further details.

Performance Indicator Unit	Limit/s
Biochemical Oxygen Demand	**40** (mg/l) Maximum
Suspended Solids	**60** (mg/l) Maximum
Toxicity as determined by microtox	**100** Minimum
pH	**6-9**
Total Organic Carbon	**40** (mg/l) Maximum
Dissolved Oxygen	**5** (mg/l) Minimum
Flow rate	**200** kilo litres/day Maximum
Temperature	**Ambient**

The tables below are based on 1st January 2010 to 30th June 2012 data.

PLANT B WATER DISCHARGE RESULTS (DP 313)								
DATE	**B.O.D.**	**SUS. SOLIDS**	**PH**	**DO**	**TOC**	**TOXICITY**	**FLOW (L/MIN)**	**Temp**
1-Jan-10		No sample taken						
15-Mar-10	<10	18	6.3	-	<5	NMT	-	-
18-May-10	11	43	7.6	8.0	11	NMT	-	11
22-Jul-10	15	19	7.5	7.2	29	>100		
1-Aug-10		No sample taken						
1-Sep-10		No sample taken						
8-Oct-10	10	58	8.3	6.5	21	NMT	-	15
15-Nov-10	8	18	7.8	6.8	21	NMT	-	17
1-Dec-10		No sample taken						
1-Jan-11		No sample taken						
8-Feb-11	6	8	8.4	8.4	21	>100		19
20-May-11	21	21	8.1	8.5	34	>100		14
16 Aug 11	9.1	15	7.4	2.9	13	>100		15
9 Nov 11	13	28	7.6	5.1	19	>100		22
Dec 11 to July 2012 No water discharged								

PLANT C WATER DISCHARGE RESULTS (DP 799)								
DATE	**B.O.D.**	**SUS. SOLIDS**	**PH**	**DO**	**TOC**	**TOXICITY**	**FLOW (L/MIN)**	**Temp**
1-Jan-10		No sample taken						
15-Mar-10	<10	10	6.2	-	<5	>100	-	-
18-May-10	<10	11	7.6	11	9.1	>100	-	9
22-Jul-10	<5	<1	8.0	7.2	<5	NMT		
1-Aug-10		No sample taken						
1-Sep-10		No sample taken						
8-Oct-10	9	8	8.0	5.6	<5	NMT	-	15
16-Nov-10	<4	2	8.6	7.9	8.4	NMT	-	22
1-Dec-10		No sample taken						
1-Jan-11		No sample taken						
8-Feb-11	<5	28	8.6	8.6	6.2	NMT		18
4-May-11	< 5	3	7.5	6.0	< 5	>100		15
June 11 to July 2012 No water discharged								

7. WASTE MANAGEMENT PERFORMANCE

This section is mainly for historical information with the combustor system reaching full commissioning in 2008 and demonstrating a mature high performance level over the last three years. The Environmental Management System reviews existing and develops new targets and objectives on an annual basis. This is also called the Waste Management Plan.

Treatment systems effectiveness is generally conservative and includes:

- Vapour return at 100%.
- Combustor at 99.6% but initially (2002-03) combustor efficiency factor of 99.96% was used on actual design performance effectiveness. The assumption of 99.6% has been verified by previous results and confirmed by results in 2005, 2006, 2007 & 2008. The effectiveness could be higher but the accuracy is limited by the measuring sensitivity of the outlet results.
- Activated carbon bed at 90% after July 2001 and 85% previously due to workload and performance. Previous Annual Performance Reports verify treatment efficiency of greater than 90% except for low load conditions when accuracy is limited by the measuring sensitivity of the outlet results.
- Caustic scrubbers for acrylates range from 85% to 90% while two in series or scrubber with activated carbon VEC scored 98.5% but since December 2002, acrylates generally treated by the combustor
- Phenol scrubber at 95% and at 99.6% from July 2005 when new phenol tank (44) was commissioned and emissions treated by combustor.
- PO scrubber 99%. This assumption has been verified by analysing results.
- TDI ammonia scrubber plus activated carbon treatment at 99%.

Efforts to reduce VOC emissions have been focused on reducing emissions of class 3 indicators, benzene and acrylonitrile, as well as odour generators, acrylates, as priority and then general volatile hydrocarbons. Overall, the combustor vapour emission treatment system has been the major factor in dramatically reducing the VOC emissions. From April 2008; the combustor handles all emissions from storage and loading operations for volatile chemicals.

The overall trend of reductions in VOC emissions are demonstrated in the table in section 6.1 over the last ten years. The historical and specific reasons are:

- Combustor started treating benzene and crude benzene emissions from November 2002.
- Combustor started treating acrylate storage tank emissions from December 2002 at Plant B.
- Combustor started treating acrylonitrile storage tank emissions from June 2003.
- Combustor started treating acrylate road tanker loading emissions from December 2004.
- Acrylonitrile storage tank was decommissioned in June 2004.
- During 2005, the east side storage tanks were decommissioned. This included all PO storage tanks being decommissioned by April 2005.
- Benzene and crude benzene were no longer stored nor handled from April 2005. However a new product of pygas (mainly benzene) has been stored from early 2006 in two semi pressurised tanks and one atmospheric tank. The semi pressurised tanks have further reduced the benzene emissions due to their higher pressure (less need to vent for pygas vapour pressure) coupled with vapour balancing to road tanker unloading operations.

- Storage tanks at both Plants B and C have steadily been switched to the combustor with only seven tanks at Plant B west side remaining in 2005 on the activated carbon bed system. In 2006, remaining seven relevant tanks have been switched to the combustor.
- From April 2008; Plant B road tanker loading operations have been switched from carbon bed system to the combustor vapour treatment system. The carbon bed system is now only used as emergency backup for vapour emission treatment.
- Year 2009 is the first full calendar year with the combustor being fully commissioned. The continual waste reduction improvements over the several stages and years are well demonstrated by the above total emission graphs and now have reached the maximum achievement of the combustor.

Because of the significant number of odour complaints in 2001 from acrylate operations, several strategies were implemented to reduce odour (acrylate) emissions and complaints from handling 10-20 acrylate storage tanks located at different parts of the site. These treatment improvements included:-

- Two stage treatment process using available caustic scrubbers with activated carbon VECs.
- Installing a new purpose built caustic scrubber for acrylate treatment.
- Consolidating acrylates into one area to make use of best available caustic scrubbers then later combustor treatment in stages starting from December 2002.
- Exiting the highly odorous ethyl acrylate business in late 2001.

In 2011-2012; the specific licence chemical emissions have generally decreased and are less than all four previous years as well as being orders of magnitude less than emission rates from ten years ago before the combustor was fully commissioned. The 2011-2012 decrease is essentially due to throughputs of the chemicals. The non speciated VOC emissions during 2011-2012 have increased to levels from three years ago. This relates to increased throughput of chemicals that are not hazardous and as such are not treated by the combustor. The dominating example is canola oil where the throughput has more than doubled and emissions have increased from 242 Kg to 568 Kg and this difference is more than the emission difference between the two years. In addition; the Victorian emissions are higher as they represent more chemicals due to the Victorian definition of VOCs being more encompassing than other states ie Victorian VOC is defined by a chemical with a vapour pressure greater than 0.01 kPa while NPI definition is vapour pressure greater than 0.272 kPa; a substantial difference.

7.1 LIQUID WASTE

Overall, the total waste stream has remained at significantly decreased levels from 5,210 tonnes in 2005 to less than 1,000 tonnes per annum during 2006 to 2009. Further reduction has halted in 2009 due to extensive once off cleaning of Plant B pipelines to accommodate swapping to the new stainless steel pump suction lines; tank changes and tallow tank cleaning.

Total EPA prescribed liquid wastes transported from Melbourne site to an approved treatment facility are tabulated below plus an allowance for flammable aqueous waste being treated by the combustor since October 2007. Overall, this provides a total picture of the liquid waste generated on site. But the present on site treatment of flammable aqueous waste (estimated at 300 tonnes) by the combustor represents an additional significant savings in offsite prescribed waste treatment. The treatment now of the combustible aqueous waste by the combustor is providing further savings in offsite prescribed waste treatment.

Breakdown components and previous results are tabulated as a means to identify waste sources and minimisation strategies. In general terms, the Melbourne site has been undergoing major upgrading of its facilities while decommissioning and demolishing or relocating tanks from the east side of Mackenzie road. This has involved cleaning storage tanks, major renovations to tanks, new foundations including environmental liners and moving storage tanks.

PRESCRIBED LIQUID WASTE (tonnes)											
	2001-02	**2002-03**	**2003-04**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010-11**	**2011-12**	**Comments**
Corrosive Washings	240	1255	1256	905.9	0	0	0	0	0	0	Propylene oxide gone
Tank & line washings (non flammable)	746	1350	5080	2787.4	Flammable 194.4 Non Flammable 375.8	703	376	574	437	397	Settling towards a minimal level due to waste reduction improvements plus stabilising storage service. In 2009 though there was extensive line cleaning due to swapping to new pump suction lines; tank changes & tallow tank cleans.
Ship first flush	58	2	0		0	0	0	0	0	0	Customers unable to handle pure waste separately
Phenol wastes	33	93	0	285.7	30	60.4	60.2	10.2	48	9.5	Back to usual
VECS waste (flammable)	3975	3342	1769	1230.3	324	169.8	300*	300*	300*	300*	Load on carbon VECS decreases as combustor takes increasing load from its 2002 commissioning to April 2008 where it handles all relevant storage & loading emissions
Total tonnes	**6340**	**6051**	**8105**	**5209.3**	**924.2**	**938.0**	**736.2**	**884**	**785**	**707**	

Note: * Estimate based on flammable aqueous waste treated by the combustor at 4 lpm x 60 mins x 5 hours average per day x 250 working days per year.

The two most significant trends over the last six years have been the Tank & Line washings and the VECS waste categories. Tank & Line washings appear to have started to stabilise in 2005 with a substantial decrease of 2,293 tonnes (45%) in tank and pipeline cleaning waste. Further substantial decreases have continued over the 2006 to 2008 period. A contributing factor to this decrease appears to be the segregating storm water project which was commissioned in five areas in 2005 and completed in early 2007. Also a majority of tanks have been renovated, including internal waste minimising pipework plus the settling of tanks in longer term service appear to be having an impact on reducing waste generation. However further reduction has halted in 2009 due to extensive once off cleaning of Plant B pipelines to accommodate swapping to the new stainless steel pump suction lines; tank changes and tallow tank cleaning. In 2012; the last tanks at Plant B were renovated. The overall trend downwards continues to be favourable.

The waste from the carbon bed VEC system has continued to decrease significantly with the vapour treatment load being gradually switched to the combustor. Commissioning started in 2002 and from April 2008, the combustor handles all vapour treatment from relevant storage and loading operations. The carbon bed system is now used as an emergency backup only and desorbed once per month generating an estimated 10-12 tonnes per annum.

In addition, aqueous combustible waste stream (but not canola oil nor urea waste) is treated by the combustor since July 2010. This stream and flammable waste stream were not measured until late 2010 leading to rough estimates of flammable and combustible aqueous waste streams.

7.2 SOLID WASTE

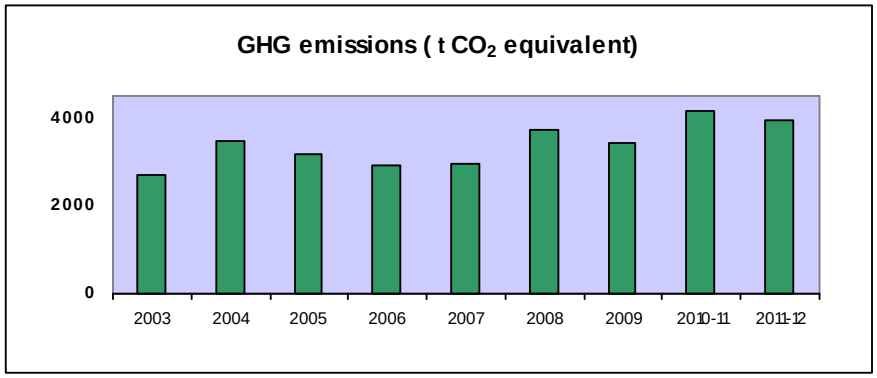
The total waste transported off site in 2011-12 was 4.8 tonnes. This appears to be a relative minimum waste level. The breakdown of this waste into components with comparison to previous years is tabulated below.

PRESCRIBED SOLID WASTE (tonnes)										
	YEARS									
	2001-02	2002-03	2003-04	2005	2006	2007	2008	2009	2010-11	2011-12
Foam pigs (F100)	1.5	3.8	7.6	4	2.7	4.4	4.6	4.4	4.9	4.8
Contaminated Soils including sandblasting grit (N120)	22.9	2.3	17.5	17.4			12.0			
Activated carbon (N210)		16	2.3	0.4	0.4				0.4	
Drums (N100)		2.2								
Sludges & residues (N205)	36.5									
Organic cyanides (M210)	26.9									
Polymerised acrylate (N180)				0.2						
TOTAL	**87.8**	**24.3**	**27.4**	**22**	**3.1**	**4.4**	**16.6**	**4.4**	**5.3**	**4.8**

8. ENERGY EFFICIENCY AND GREEN HOUSE GASES

A level two energy audit was undertaken on 21st October 2003 by ERM. The energy assessment was undertaken as part of the Victorian EPA Protocol for Environmental Management (PEM) requirements, ie. a category C of the PEM requiring a level two energy and greenhouse gas assessment. With additional information, this report was accepted by the EPA in October 2005.

Greenhouse Gas (GHG) emissions are graphed below in equivalent tonnes of CO_2 emissions. These figures do not include the combustion products from treating the product vapour emissions.



These are derived from usage of natural gas for boilers (2) and combustor treatment units (2); electricity for pumps/fans/utilities and diesel for firewater pumps and forklifts/trucks. In 2009 one boiler was replaced by a hot water heater to heat tallow. Fuel usages are converted to energy consumption (GJ) and, in turn, to GHG emissions (t CO_2 equivalent) using standard emission factors from the GHG website or in 2012 NGA factors, May 2012. The last eight years are tabulated below and cover the period of the combustor operating. The information is based on invoice meter readings. A minority of the records prior to 2005 cannot be found and these values have been estimated based on the available majority of data. In addition, the electricity meter reading for December 2007 is missing.

Fuel Type	2004		2005		2006		2007		2008		2009		2010-11		2011-2012	
	Fuel consumed	GHG emissions (t CO2. equivalent)	Fuel consumed	GHG emissions (t CO2. equivalent)	Fuel consumed	GHG emissions (t CO2. equivalent)	Fuel consumed	GHG emissions (t CO2. equivalent)	Fuel consumed	GHG emissions (t CO2. equivalent)	Fuel consumed	GHG emissions (t CO2. equivalent)	Fuel consumed	GHG emissions (t CO2. equivalent)	Fuel consumed	GHG emissions (t CO2. equivalent)
Natural Gas (GJ)	23,256	1,202	27,847	1,440	22,132	1,140	20,540	1,062	25,890	1,338	23,682	1,224	33,620	1,738	38,300	1961
Electricity (KWH)	1,530,220	2,210	1,163,660	1,680	1,186,600	1,713	1,281,000	1,845	1,594,283	2,302	1,470,691	2,124	1,630,384	2,354	1,600,696	1904.8
Diesel (kl)	25	68	25	68	25	68	25	68	25	68	25	68	25	68	25	66.8
Total		**3,480**		**3,190**		**2,925**		**2,975**		**3,710**		**3,415**		**4,160**		**3933**

In the last four years; the breakdown of emission contributors was electricity around 60%, natural gas at about 40 % and diesel at < 2%. In 2010-11, electricity usage was 56% (from 62%) while in 2011-12 at 48% and natural gas usage was 42% (from 36%) while in 2011-12 at 50%; a significant shift over the last two years considered to be caused by heating base oil and tallow which have been added recently.

Overall, the GHG emissions have decreased by 5% in 2011-12 due to updating NGA factors otherwise they would have increased by 5% after a 22% increase in 2010-11 compared with a decrease by 9% in 2009; while they increased by 25% in 2008; were consistent over 2007 & 2006; were reduced by 8% in 2006 and a further 8% in 2005. It seems 2008 represents a high energy usage year. The facility has undergone substantial changes over the last 7 years with most changes occurring in 2005 and significant changes in 2008. They were:

- Commissioning air dilution stream for road tanker loading as an additional feed to the combustor in late 2004; combustor is located at Plant B. The air dilution stream is operated with sufficient additional air to conservatively maintain this feed stream in the fuel lean range for safety reasons. This adds a substantial air stream that is energy (gas) hungry in order to keep the combustor at 890 C. In addition this involves a large air dilution fan that increases power usage.
- In 2007; the air dilution stream for road tanker loading has been modified to operate only when required rather than continuously during business hours. This reduces natural gas usage and electricity usage.
- Shutting down the boiler and activated carbon VEC system at Plant C east side during first half of 2005. In turn, reducing gas (boiler) and power (VEC fans) usage.
- Benzene and crude benzene tanks were decommissioned in April 2005. The loss of this stream as a fuel to the combustor means higher fuel usage to maintain the combustor temperature control but about 5% factor only.
- Upgrading tanks and transfer systems at Plants B and C west side facilities including new tank foundations and resulting in more efficient pump motors plus online time. This means less power usage when operations cease during upgrades and after when more efficient pump motors are used for loading and connected to automatic loading system that stops motors when not required.
- Decommissioning tanks on the east side and then either relocating them to west side or demolishing them. In turn, power usage decreasing on the east side but increasing on the west side as many of these tanks and systems are returned to service.
- In 2007; there has been greater tank utilisation and increased throughput as tanks on the west side are recommissioned after major upgrading. At beginning of 2006; there has been a total of additional 4,500 cubic metres tank capacity commissioned to Plant C and a total of additional 2,300 cubic metres tank capacity commissioned at Plant B. This has contributed to increased road tanker loading at Plant C and, in turn, greater power usage by the air dilution system at Plant B's combustor. Also during the second half of 2007; a nitrogen generator was commissioned at Plant B. There has been a 38% increase in electricity usage over the last 4 months at Plant B. These have contributed towards an 11% increase in electricity usage at Plant B and a modest overall increase (8%) in electricity usage.
- Reducing combustor temperature set point from 890 to 750 C during 2006 to reduce natural gas (energy) usage and GHG emissions.
- In 2008; the new bottom loading at plant B was commissioned. This requires an air dilution stream for road tanker loading as an additional feed to the combustor. The air dilution stream is operated with sufficient additional air to conservatively maintain this feed stream in the fuel lean range for safety reasons. This adds a substantial air

stream that is energy (gas) hungry in order to keep the combustor at 750 C. There was a similar increase in fuel usage in 2005 after the Plant C bottom loading air dilution system was commissioned in late 2004. In addition air dilution involves the large air dilution fan operating harder plus longer periods as loading throughput increases and, in turn, increasing power usage. The 2008 power usage increase at Plant B is consistent with increased electricity usage in 2005 at Plant B.

- Treatment of liquid waste in the combustor started in late 2007. This waste consists of flammable aqueous liquid and its burning is considered a GHG saving when considering the transport and treatment of the waste offsite.
- New bottom loading pumps at plant B are considered more energy efficient and are now automated so that they are only online when loading and not reliant on people turning them off; hence reduced energy usage from the past. In the future; an energy factor may relate to tanker throughput but first the sites need to reach a steady reference point.
- In 2009; energy changes are shutting down a small VEC fan that is no longer required and replacing a boiler with a modern more efficient hot water heater for heating the tallow product.

These effects are reflected in the following tables.

Electricity Usage (KWH)

	Plant B	Plant C West	Plant C East	Overall
2004	661,092	439,428	429,700	1,530, 220
2005	869,039	159,391	135,230	1,163,660
2006	1,048,000	138,100	0	1,186,600
2007	1,167,366	113,665	0	1,281,000
2008	1,485,777	108,506	0	1,594,283
2009	1,368,747	101,944	0	1,470,691
2010-11	1,520,598	109,785	0	1,630,384
2011-12	1,490,328	110,368	0	1,600,696
Effect from previous years.	2 % decrease	Consistent.	East side shutdown in 2005.	2% decrease.

Natural Gas (GJ)

	Plant B	Plant C	Overall
2004	20,727	2,529	23,256
2005	26,375	1,472	27,847
2006	22,131	0	22,131
2007	20,540	0	20,540
2008	25,890	0	25,890
2009	23,682	0	23,682
2010-11	33,620	0	33,620
2011-12	38,300	0	38,300
Effect from previous years	14% increase after a 42% increase during the previous years.	East side gas usage shutdown in 2005.	14% increase after a 42% increase during the previous years.

In summary, overall the GHG emissions have decreased by 5% in 2011-12 due to updating NGA factors otherwise they would have increased by 5% after a significant increase in 2010-11 compared to a decrease in 2009 after a high energy usage year in 2008 and fairly consistent levels through 2005 to 2007. The last two years increase in gas usage is attributed to mainly heating base oil and tallow which have been added recently.

The largest factor in GHG emissions is the combustor located at Plant B in both natural gas and electricity as demonstrated by the Plant B figures. In 2008; the combustor system is fully commissioned with all tanks now connected. The new Plant B road tanker bottom loading via a new gas hungry plant B air dilute stream was commissioned by April 2008. This is considered the major cause of the huge spike in GHG emissions as similarly occurred in 2005 with the commissioning of the Plant C bottom loading air dilution stream in late 2004.

Full commissioning will assist in having a steady reference point for comparing GHG emissions as over the previous 6 years there has been several conflicting influences eg tank renovations, greater tank utilisation/ greater throughput & in turn increased loading (pump & air dilution fan power), nitrogen generator, combustor gas usage improvements, old top loading at Plant B and new bottom loading at Plant C plus now at Plant B and these include more efficient pump motors & online times.

With the combustor systems fully commissioned, the old activated carbon bed VECs is only required for emergency backup. This enables the switching of the carbon beds to a static system and shutting down the continuously online fans and steam desorption capability; saving energy usage. This new project initiative would require a safety study.

The status of the GHG reduction action plan is tabulated below.

Action	Status
- Improve combustor efficiency & Greenhouse Gas Emissions by:- • Trialling 50^0C reduced temperature set points for combustion • Minimising night time duty for combustor while no transfers.	Reduced combustor temperature set point to 750 C after EPA approval based on successful trials showed treatment effectiveness maintained above 99.6% ie the stated design performance by manufacturer.
- Shut down east side operations including boiler, VEC & pumps / fans/ utilities. Monitor reduction of natural gas by 10% & electricity by 20 – 25%.	Completed by July 2005. Boiler and VEC systems were located at Plant C east. Plant C east side electricity decreased by 100% & 69% in 2006 & 2005 respectively ie 429,700 to 0 KWH. This equates to 36% saving of the company electricity usage in 2006 terms. Natural gas usages for Plant C decreased by 100% & 42% per year over the last two years ie from 2,500 to 0 GJ. This equates to 11% savings of the company gas usage in 2006 terms.
- Replace motors with high efficiency motors as opportunity arises.	All new pump/motors are designed at maximum efficiency pump loading point. These have been commissioned at Plants C and B. Complete.
- Nominate Energy Manager for site.	Complete. Nominee is Engineering Manager, Paul Hayward.
- Regular reporting of energy and associated GHG emissions, as part of EIP.	Complete as per this annual report to the EPA.
- Minimise online duration for air dilution systems to combustor	Complete. Installed an interlock to stop air dilution stream to combustor when bottom loading of road tankers finished; minimising energy (gas) hungry usage.
- Minimise night time duty for combustor while no transfers	Under investigation and changed to pilot light online only project. Held up due to safety concerns of restarting combustor upon a demand but out of hours and site is not manned.
- Switch activated carbon bed VEC from continuously online to static system ie shutting down fans & steam desorption systems.	In 2009; small VEC fans shutdown and steam desorption is only occurring if required. Investigating main fan shutdown but needs further understanding of safety relating to air dilution if used in an emergency.

9. GROUNDWATER MANAGEMENT PLAN

9.1 WEST SIDE MONITORING RESULTS

The annual Groundwater Monitoring Program of the west side for 2011-12 financial year was completed by Environmental Strategies Global with a complete monitoring event in mid 2012 and a mini monitoring event of key off site monitoring wells in early 2012. This is in accordance with our Groundwater Management Plan dated 30 November 2001. The results are consistent with historical findings.

Conclusions are:

- The reducing impact of historical Separate Phase Hydrocarbons found in the Plant B northern area and Plant C southern plus south central areas; continues from 2008. This is an outcome of the automatic recovery trench systems installed at Plant B northern and Plant C southern areas from almost five years ago. The automatic system is only operating at Plant C as the other has no PSH levels. Recover rate is approximately 100 – 200 litres per annum at Plant C. Only one area, around well B9, located at Plant C south central, showed any significant SPH level during the last three years. In 2010, a new recovery well was installed near well B9 (called MWB9a). In 2012, the recovery well used at Plant B was relocated to MWB9 at Plant C to assist the local recovery process as PSH levels appeared to be very specific and local.
- Down gradient off site monitoring wells meet the adopted criteria; ANZECC Guidelines for Marine Waters at 90% level of protection trigger values.
- Generally consistent and/or decreasing results over the last three annual years of results compared with previous years and all results were below the adopted guideline levels. The historical finding of elevated benzene levels at MW13 (Plant B S-W corner) was below the adopted criteria in 2012 at 0.023 mg/l (reduced from 1.8 mg/l in 2011). Previously reported (2009) MW7 at plant C showed no exceedances to adopted guidelines in 2012.
- There is minimal impact to off-site groundwater from the activities undertaken by Terminals at Plants B and C.

The air sparge curtain at Plant B west side in recent years has shown some channelling impact via observed air bubbling at the river's edge. In August/September, Environmental Strategies has conducted a trial of sampling key off site wells with the air sparge system being off line for two weeks. This demonstrated the air sparge system was still required and effective in preventing any migration off site to the Maribyrnong River.

Terminals proposes to continue the existing bi-annual sampling and assessment and the trench plus skimming systems as well as assessing air sparge curtain effectiveness.

9.2 EAST SIDE MONITORING RESULTS

The previous eastern parts of the facility were demolished and remediated during 2005 as per the Remediation Action Plan of July 2002. Final assessment reports culminating in a Statement of Environmental Audit signing off the clean up of the site for industrial use was received on 28th August 2006. A groundwater monitoring plan to assess any offsite impact has been developed and is part of the Statement of Environmental Audit. Initially this requires groundwater monitoring of key boundary wells every quarter for the first 15 months then six monthly and an assessment report on performance every 12 months. This four year monitoring plan was completed in 2010 with an additional full monitoring event in early 2011 showing full compliance to analytes target criteria.

After completing the four year monitoring program, Terminals commissioned the EPA auditor, LanePiper Pty Ltd, to undertake a 53v audit. The auditor concluded:

"Based on the findings presented in this audit report, the Auditor is of the opinion that groundwater monitoring should be discontinued and bores decommissioned at the site, for the following reasons:

- all the conditions for GQMP closure have been met
- a continuous concrete slab has been emplaced across the site (following clean up) that covers the contamination within the fill such that infiltration (and discharge to surface water) is substantially reduced, and disconnects the exposure pathways between underlying soil and groundwater and human receptors
- the remaining risks to the environment and community is negligible."

In 2012, Terminals received advice that the EPA agrees with these findings to cease monitoring. In August, the Environmental auditor has revised the Statement of Environmental Audit to remove the GQMP condition ie cease monitoring and decommission the east side monitoring wells.

10. ENVIRONMENT IMPROVEMENT PLAN (EIP)

All items from the first EIP (2002 to 2004) are complete.

Some of the major achievements include:

- commissioning of majority of stages of combustor treatment unit, ie new vapour emission control system;
- upgrading of acrylate storage tanks and loading systems to sealed systems;
- fitting high density polyethylene impermeable liners under tank floor as tanks were renovated;
- implementing new exchanger area for Plant C and for acrylates;
- installing waste minimisation pipework for acrylate storage tanks; and
- installing backup emergency power supply for combustors and critical equipment.

This EIP concluded at end of 2004. A new EIP was developed for the following four years to the end of 2008. The status of the second EIP is summarised below.

Year	Total Number	Completed
2005 to 2008	62	60

Some of the major achievements include:

- installing five roofs and drainage systems over truck fills and exchanger areas to minimise waste by segregating rain water;
- refurbishing all tanks at Plant C expansion and upgrading their foundations;
- refurbishing all tanks at Plant B combustible area and upgrading their foundations;
- upgrading pumps, pipework, loading systems for above Plant B and C tank upgrades;
- installing waste minimisation pipework for above Plant B and C tank upgrades;
- installing emergency lighting for Plant B;
- decommissioning, demolishing and remediating east side facilities;
- shutting down boiler and carbon bed VECS on east side facilities;
- all flammable storage tanks are vented to the combustor;
- phenol tank is vented to the combustor;
- all flammable tanks have high pressure alarms as well as high level alarms;
- all tanks at Plant C are connected through hard piped exchanger areas;
- combustor temperature set point has been lowered to 750 C;
- domestic waste is connected to the sewer;
- install clay liner for Plant C tank compound floor
- received new accredited EPA licence with the leaving of the east side;
- installed & commissioned automatic PSH recovery systems at Plants B & C;
- installed above ground drainage system with pump filters instead of sediment & litter traps;
- maintenance manual updated;
- newsletter issued for October 2007 open day;
- Plant B bottom loading commissioned for Plant B flammable tanks;

- removed old Plant B top loading gantry;
- all flammable road tanker loading vented to combustor;
- topics from 1st EIP underwent an effectiveness evaluation study;
- Plant A groundwater monitoring completed.

This EIP concluded at end of 2008 and the remaining two actions were carried over to the next EIP. A new third EIP was developed for the following four years to the end of 2012. The third EIP is detailed in Appendix C. The status of the third EIP is summarised below.

Year	Total Number	Completed
2009 to 2012	20	16

Major achievements so far include:

- All Plant B tanks are now connected to sealed truck loading
- Automatic shutdown of dilute systems after ten minutes when not being used.
- All tanks at Plant B have new fill lines.
- All flammable tanks at Plant B are connected through hard piped exchanger areas.
- Burning of waste now includes aqueous combustible waste stream.
- Last remaining tanks at Plant B to be renovated were completed in 2012.
- East side assessment review completed and EPA agrees with auditor to cease monitoring.

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