



**GEELONG SITE**

**ANNUAL ENVIRONMENT**

**IMPROVEMENT REPORT FOR 2004/2005**

**LICENCE NO. EW314**

Copy No. 6

**GEELONG COMMUNITY**

## DECLARATION

I hereby state that I have authorised the preparation and issues of this environmental performance report and that it is complete, correct and accurate to the best of my knowledge and belief. I am unaware of any past or current circumstances which would render the report misleading or inaccurate.

Signed: \_\_\_\_\_



Date: \_\_\_\_\_

31/8/05

George Horman  
Managing Director  
Terminals Pty Ltd

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## 1. INTRODUCTION

Construction of the Geelong Terminal in Wharf Road, Corio, began in 1972 and has expanded steadily to its present size and complexity. The Terminal has at present 4 Horton pressure spheres of a total capacity of 17060m<sup>3</sup>. Product currently allocated for storage is Vinyl Chloride Monomer.

Additionally nine (9) conventional tanks were erected of various sizes with a total capacity of 7000 cubic metres. These tanks are for general usage such as, vegetable oils, industrial chemical, petrochemicals and petroleum products. Also one semi pressurised (70 kPa) tank of 2200 cubic metre capacity was built in 1999 to store Mono Iso Propyl Amine (MIPA) and now stores general flammable products. Products are handled into and out of the terminal by:

- a) sea-going parcel tankers from the refinery pier berth used co-jointly with the Shell Company;
- b) Road Tankers;
- c) Drums

The plant generally operates on a 5-day, 3-cycle shift operation.

In July 1996, Geelong site gained ISO 14001 certification for its Environmental Management System. In 2000, EPA reviewed our EPA licence. Consequently, Terminals was directed to develop an Environment Improvement Plan, (EIP), and subsequently an annual report by 30<sup>th</sup> September, consisting of interpretation of existing monitoring data including air, water, land plus EPA reportable incidents and any changes proposed to the Environment Improvement Plan, dated July 2000.

Subsequently Terminals has submitted annual EIPs covering its environmental performance for the financial year. This is the fifth annual report covering 2004-2005 financial year.

In 2005, Terminals started the Geelong Community Consultative Committee (TGCCC) to cover its Geelong site operations at Wharf Road, Corio.

## 2. ENVIRONMENT POLICY

Terminals Pty Ltd has an integrated approach in its Environment Management, Safety Management and Quality Management Systems with the underlying themes of protecting the environment and safety of all people as well as continual improvement.

The Environment Policy is shown below.

# ENVIRONMENT POLICY

**It is the policy of Terminals to operate our facilities in a manner that will protect the environment.**

**This policy is founded on:-**

- ❖ Identifying and managing the environmental risks associated with our business.
- ❖ Providing training and promoting environmental awareness and responsibility amongst all employees.
- ❖ The efficient use of resources and minimisation of waste or loss.
- ❖ Periodic environmental assessments of our facilities, from which ongoing improvement programs will be implemented.
- ❖ Compliance with regulatory requirements is the minimum acceptable level of performance.

In addition, all employees and contractors, working on site, are inducted to the site. This includes signing Terminals Health, Safety and Environment rules. The HSE rules are:

## HEALTH, SAFETY AND ENVIRONMENT RULES

***All Terminals' employees are to abide by the following rules.***

1. Possession and/or consumption of intoxicating liquor, or drugs not prescribed by a medical practitioner are forbidden in Terminals' operating facilities. Attendance at work under the influence of intoxicating liquor or drugs is not permitted.
2. Physical and verbal abuse, harassment, and/or discrimination of any kind is forbidden.
3. Horseplay and practical jokes are prohibited on Terminals' premises.
4. All employees shall comply with safe working/operating procedures as per Operating Procedures (including MSDS) and Safety Management Manual or instructions.
5. Personal protective clothing and equipment provided by Terminals must be worn as per Safety Management Manual, Operating Procedures and Emergency Plan or instructions.
6. All warning and safety signs must be obeyed.
7. No safety device or system (eg. machine guards, fire pumps, critical operating safety interlocks etc) shall be made inoperative nor compromised as per the Safety Management Manual. To remove or tamper with guards, switches, danger tags and lockouts is a statutory offence.
8. All injuries, no matter how slight, must be reported to a person's immediate supervisor.
9. All spills or leaks of solid, liquid or gaseous materials (which are dangerous goods or environmental hazardous) must be immediately reported to supervisor; contained and cleaned up promptly as per Emergency Procedures Manual and management instruction.
10. All work areas and amenities must be kept safe and tidy. Access to fire fighting, emergency equipment and emergency exits must be kept clear at all times.

**In addition, specific HS&E rules for highlighting are:**

11. Cross ties between potable (drinking) water and any other system, without back flow protection, are prohibited.
12. All road tankers, drums and transfer equipment shall be earthed when flammable chemicals are handled.
13. Pigs, when contaminated with natural oil, must be immediately placed in drums full of water with closed lid.
14. Smoking is not permitted on site.

### **3. ANNUAL AUDIT PROGRAM**

The internal audit program for 2004 calendar year totalled 17 audits of the Geelong site including audit topics of operations, maintenance, training, incident reporting, management review, work permits and environmental management systems. A further seven audits have been conducted in the first half of 2005. Internal EMS Audit Summary, incorporating action plan, is attached as Appendix A.

Lloyds Register audited the Geelong site in November 2004. There were no holding points or improvement notices.

The oversight program for Major Hazards Facility was conducted by Worksafe. This included three visits and an annual licence inspection over two days. The outcome was the overall results supported reducing the visit frequency from three to four months.

In March 2005, an Improvement Notice was issued by Worksafe relating to an overflow incident of approximately 200-500 ltrs of isopropyl alcohol. The incident is detailed in Section 4. This incident was fully investigated and the Improvement Notice was complied with and closed out.

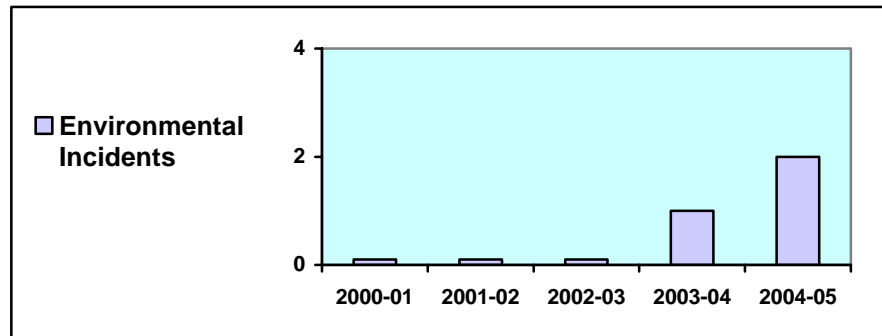
## 4. ENVIRONMENTAL INCIDENTS

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, stormwater criteria exceedances and EPA infringement actions. There were no community complaints during 2004/2005. Historically this is consistent with the performance of no community complaints.

In December 2004, a sample from the EPA discharge point resulted in a pH of 9.3 compared to a pH criteria of 6.0 to 8.2. The slightly alkaline material was considered the consequence of a small amount of residual material left from the washing of the dockline to a road tanker after a caustic ship discharge. Actions to prevent a recurrence are to monitor residual material from caustic washing exercises for pH and recycle or transport off site for waste treatment, if necessary.

In March 2005; there was a spill of approximately 200-500 ltrs of isopropyl alcohol (IPA), class 3 flammable liquid, into a contained area. The cause was overflowing Tank 2.7 during a ship discharge due to incorrect instructions on a ship discharge plan and inadequate level (ullage) monitoring. The site emergency plan was invoked. The spill was blanketed with foam and cleaned up within 4 hours. Emergency services, CFA, attended the site. Worksafe and EPA were notified of the incident. Preventive action has been to upgrade the instruction methodology, the monitoring systems and longer term to install high level alarms on these tanks.

Chart 1



## 5. AIR MONITORING

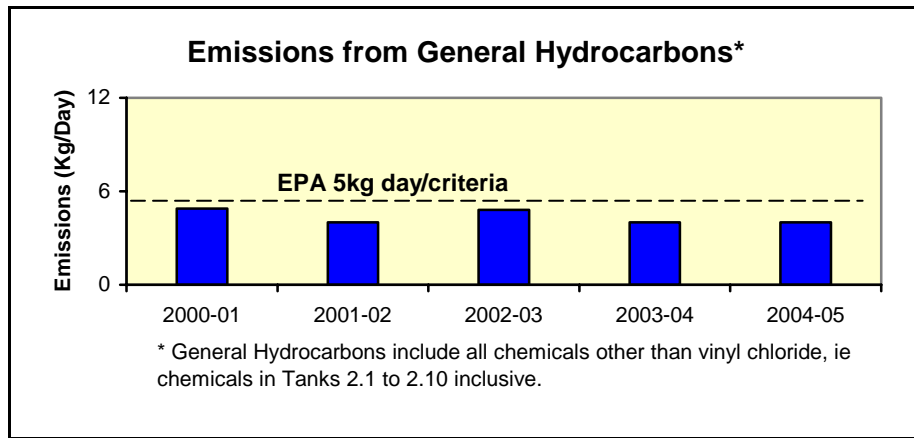
Terminals meets our EPA Waste Discharge Licence No. EW214, conditions 1.1, 1.2 and 1.3.

### 5.1 Air Emissions

Hydrocarbon emissions (other than vinyl chloride) to air were estimated at less than 5kg/day/tank; using the US tanks 4.0 or AP42 tank emission computer calculation program. This is consistent with the results over the last five years.

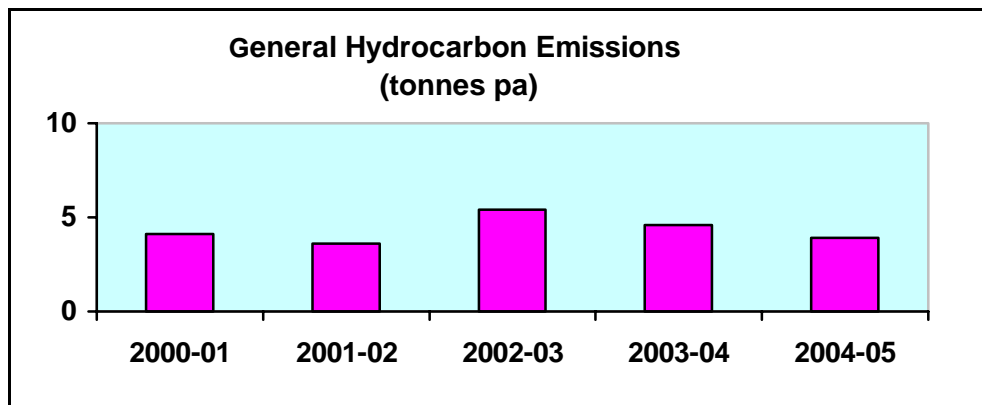
#### Chart 2

Graphs the maximum cases of average tank emissions per day for each year.



A table showing peak emissions results during tank filling is detailed in Appendix B.

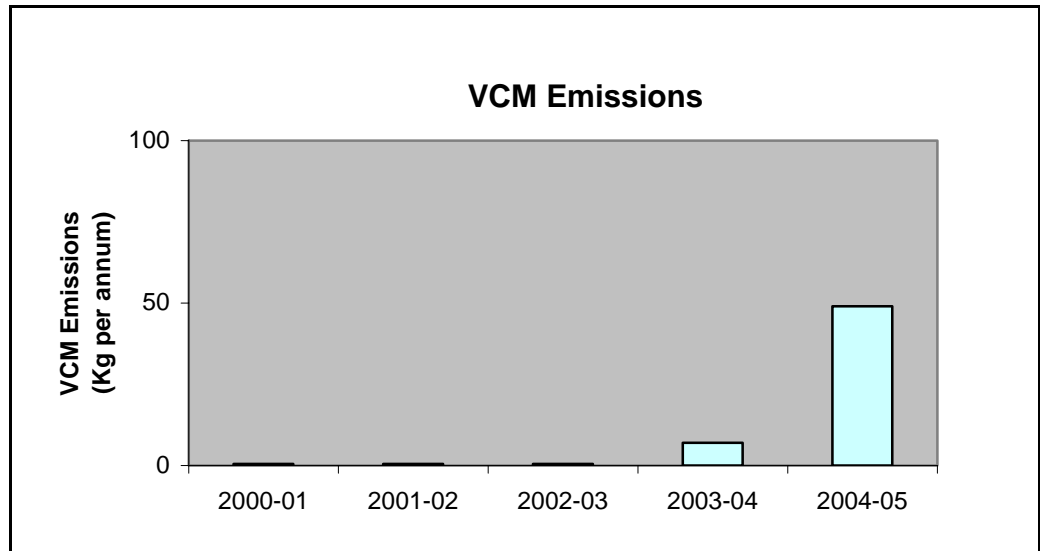
#### Chart 3



TERMINALS' GEELONG EMISSIONS TABLE FOR 2004-05						
Chemical	Throughput	Tank Emission	Tank Emission	Truck Emission	Total Emission	Tank Number
	(cubic metres)	(Kg)	(Kg/day)	(Kg)	(Kg)	
Gasoline	437	937.1	2.6	269.8	1,206.9	8
Isopropyl Alcohol	978	306.9	0.8	17.3	324.2	6
Isopropyl Alcohol	2,367	428.3	1.2	41.9	470.2	7
Methyl Ethyl Ketone	2,128	1,451.7	4.0	251.6	1,703.4	3
Mono Ethylene Glycol	16,712	4.1	0.0	1.5	5.6	9
Solvent A 150	3,639	120.2	0.3	13.8	134.0	2
Solvent T	1,017	42.4	0.1	2.2	44.7	5
Vinyl Chloride Monomer	120,274	0	0	0	49.0	2100, 2200 2300, 2400
Gas Condensate	4,507	0	0	0	0	10
<b>Totals</b>	<b>152,059</b>	<b>3,291</b>	<b>9</b>	<b>598</b>	<b>3,938</b>	

There are no vinyl chloride emissions to air from the storage and handling operations. The exception is any emissions due to planned ten year internal inspections of the four spheres or any leaks. This is detailed below.

**Chart 4**

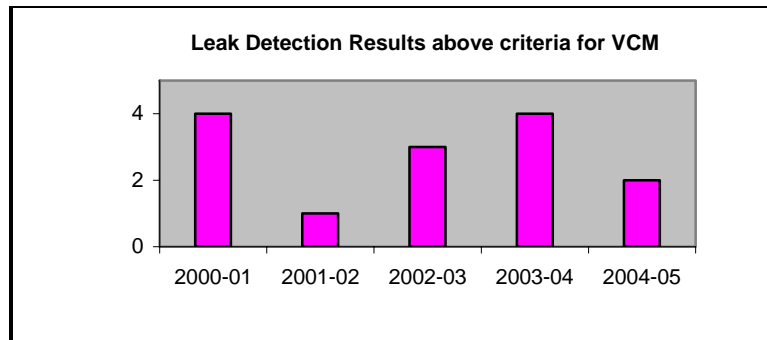


These VCM emissions represent planned sphere internal inspections which occurred in February 2005 (sphere 2200), August 2004 (sphere 2300) and the 7kg leak ex GRS vessel in March 2004. They do not include fugitive emissions which are detailed in section 5.2, called Leak Detection Program.

## 5.2 Leak Detection Program

Terminals has a comprehensive leak detection program for Vinyl Chloride Monomer and Tank 2.10 material. This involves checking every flange, gland and fitting over an 8 week cycle.

Chart 5



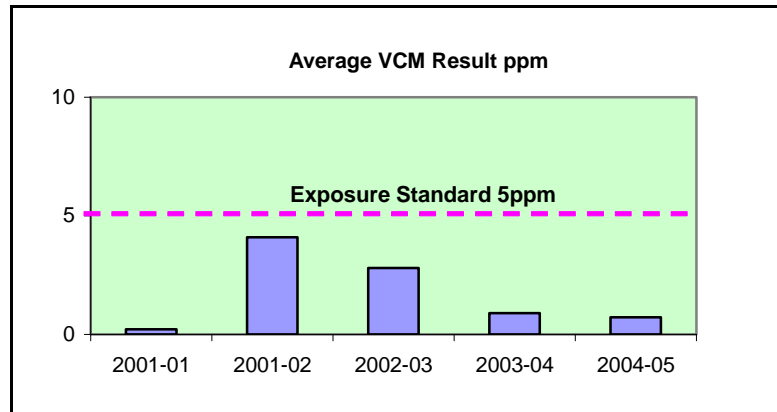
The criteria is 10ppm reading at 15cm from the source using a Photo Ionisation Detector (PID). Generally leak sources are valve packings around valve items or flanges that are rectified by tightening the gland packing or flange. For 2004-05; two events above the criteria were flange and valve stem leaks of 20ppm and these were rectified.

Summary Table of Leak Detection Results						
		2000-01	2001-02	2002-03	2003-04	2004-05
VCM	No of results	3,515	3,679	3,822	4,020	4,088
	No. of results above 10 ppm	12	5	4	3	2
	No. of results above criteria level	4	1	3	4	2
Tank 2.10 Material	No of results	732	1,529	2,146	680	3,100
	No. of results above 10 ppm	1	0	8	0	0
	No. of results above criteria level	1	0	2	0	0

### 5.3 Onsite Air Monitoring

Ambient air monitoring for VCM showed no emissions of concern based on Worksafe exposure standards of 5ppm over 8 hours and the Short Term Exposure Limit of 15ppm over 30 minutes.

Chart 6



A detailed analysis of VCM results is tabulated below.

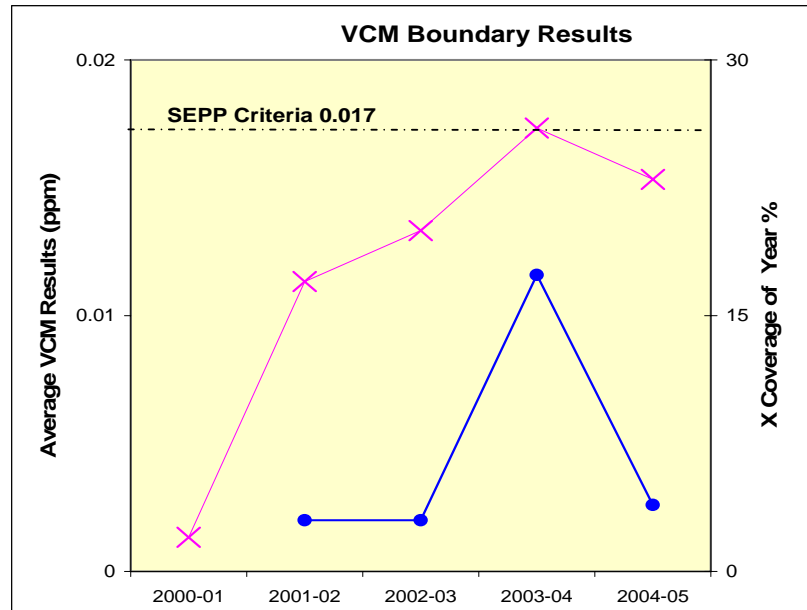
	Year				
	2000-01	2001-02	2002-03	2003-04	2004-05
Average (ppm)	0.21	4.1	2.8	0.9	0.7
Standard deviation (ppm)	0.95	23.4	10.9	2.7	2.0
Number of samples	43	83	72	78	52

Many of the results were below the level of detection; which ranged from 0.4 to 0.01 ppm. The score of detection level rather than zero was conservatively used for estimating above results. The sampling covered fixed point monitoring at worse case locations (eg ship hose disconnection over short term) to personal monitoring involving ship unloading, road tanker loading and general duties over eight hours and short durations of 15-30 minutes. Charcoal passive badge monitors were used.

## 5.4 Boundary Air Monitoring

Plant boundaries in all directions are monitored for VCM usually for a period of 4-5 days every month. These samples are taken using the charcoal passive badge monitors. These results are assessed against the SEPP (Air Quality Management) value for VCM which was changed in 2003 from 0.033 ppm to 0.017ppm for estimated ground level concentration outside plant boundary from dispersion modelling. These results are generally an order of magnitude below the criteria.

Chart 7



In 2000-01 there were no results detected above the instrument sensitivity which was generally 0.1ppm and trialed at 0.001ppm for one set of longer duration samples. These high sensitivity results were not meaningful compared to the SEPP criteria so this led to the trials on sensitivity and consequently improved to 0.001ppm. The 2000-01 VCM result was not graphed due to the sensitivity level being generally above the SEPP criteria.

The current year's results had an average of 0.003 from 35 samples with a standard deviation of 0.004 and analysis of sensitivity of 0.001ppm.

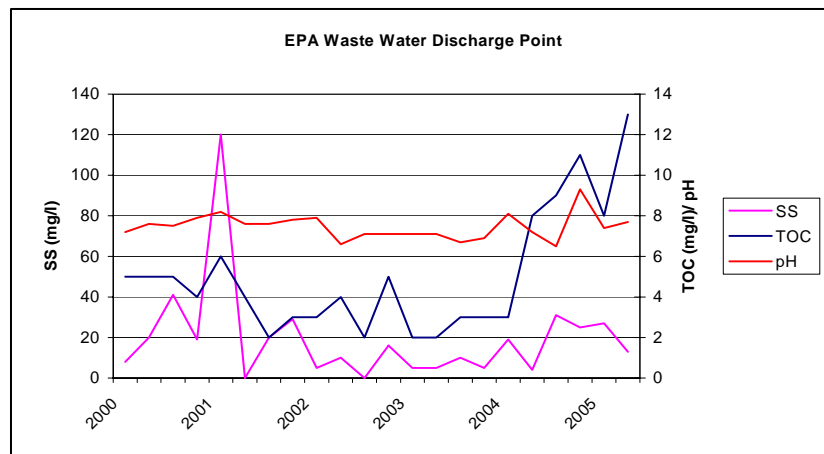
## 6. STORMWATER MONITORING RESULTS

There was one non compliance over the last 12 months to the waste discharge criteria specified in the Environmental Management Manual. The non compliance was a pH result of 9.3, compared to upper limit of 8.2, during December 2004. An incident report was raised and this is detailed in the environmental incidents section 4. Historically, there has been only one other non compliance over the last five years; in 2001.

Date	SS (mg/l)	Toxicity (%)	Visible Oil/Grease	pH	TOC (mg/l)
2000	9			7.2	5
	20			7.6	5
	41			7.5	5
	19			7.9	4
2001	120			8.2	6
	<5			7.6	4
	20			7.6	2
	29			7.8	3
2002	5	100	Nil	7.9	3
	10	100	Nil	6.6	4
	<5	100	Nil	7.1	2
	16	100	Nil	7.1	5
2003	5	100	Nil	7.1	2
	5	100	Nil	7.1	2
	10	100	Nil	6.7	3
	5	80	Nil	6.9	3
2004	19	100	Nil	8.1	3
	4	100	Nil	7.2	8
	31	100	Nil	6.5	9
	25	100	Nil	9.3	11
2005	27	100	Nil	7.4	8
	13	100	Nil	7.7	13
<b>LICENCE LIMIT:</b>	<b>80</b>		<b>Nil</b>	<b>6-8.2</b>	<b>40</b>

The stormwater discharged from the premises to Corio Bay was sampled every quarter. Any exceedances to these limits requires an Incident Report to be raised so follow up action can be determined. Results are detailed in the graph below.

Chart 8



## 7. GROUNDWATER MONITORING

Terminals Pty Ltd and Shell Refining (Aust.) Pty Ltd have been working jointly to implement the Management Plan for identified hydrocarbon impact at the Terminals' site on Wharf Road, North Shore (refer letter dated 26<sup>th</sup> August 1998). This section is to provide an annual update (as per letters dated 9/4/99 and 12/5/2000 and EIPs in 2001, 2002, 2003 and 2004) regarding the status of the Terminals' Site Impact Management Plan as well as meet the EIP monitoring condition (3.2) of our new EPA licence, dated 19 October 2000.

In addition, in October 2004, Shell was issued with a Section 62A Clean Up Notice by the EPA to prevent further migration and further spread of contaminated groundwater and separate phase hydrocarbons beyond the Shell premise's boundary. Specifically, clause 25, 26, and 59-65 cover the further migration and spread into Terminals' Wharf road premises as well as undertaking risk assessment and an assessment of the feasibility of remediation caused by contamination from the premises at Terminals Pty Ltd.

In summary, the Shell gauging data and groundwater monitoring report by ERM continues to support the theory that the plume is stable, not increasing. During the year, Shell has installed over 120 additional monitoring wells of which 5 new wells were located on Terminals' site. Aquifer (pump) tests and remediation plot trials were undertaken in February at the area opposite VCM loading gantries. The findings of these remedial trials indicate that multi-phase vacuum extraction (MPVE) may be a viable technology for hydrocarbon removal at the site.

The following outlines progress over the last 12 months plus actions for the next twelve months similar to the previous Site Impact Management Plan.

### **PSH Recovery**

Monitoring wells B2, MW6 and M7 were regularly gauged for PSH. Vacuum extraction of wells ceased in September 2004 in line with Shell 62A Clean Up Notice as considered vacuum extraction would assist smearing of the soil in the groundwater zone.

Overall, apparent thickness of PSH shows a stable situation as detailed in Shell's report, dated 20 July 2004, in Appendix C. ERM report dated July 2005, Appendix D found no PSH in any monitoring wells. One exception is B2 showing 0.5 to 0.6m of PSH over the March to May period. This is consistent with historical trend of lower groundwater levels showing increased PSH levels, as expected.

### **Annual Groundwater Monitoring Program**

Monitoring of six hydraulically down gradient monitoring wells for TPH and BTEX occurred in June 2005. Results found all analytes were below the ANZECC Guidelines for Protection of Aquatic Eco systems – Marine Water (1992) and Fresh and Marine Water Quality (2000). Low levels of TPH, predominately in the C<sub>10</sub> to C<sub>28</sub> fraction, were found. These levels were consistent with previous year's results except for MW 11 which increased. Results are detailed in the attached report by ERM Australia Pty Ltd in Appendix D.

### **Proposed Action Plan for July 2005 to June 2006.**

- Continue quarterly groundwater monitoring as part of Shell program.
- Undertake annual groundwater monitoring report including analysing for TPH and BTEX at key down gradient monitoring wells.
- Continue to comply with the various requirements under the Shell Section 62A Clean Up Notice.

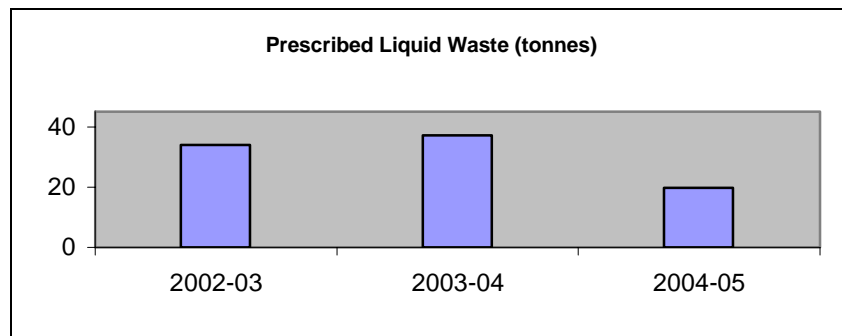
## 8. PRESCRIBED WASTE

### 8.1 Liquid Waste

Prescribed liquid waste is generally line and tank washings and contaminated stormwater. Where possible, liquid waste is minimised, reused (eg. MEG pipeline flushings) and recycled (eg. flushings of Shell solvents).

Total prescribed liquid waste being treated off site over the last three years, is shown below.

Chart 9



### 8.2 Sewage

As there is no connection to the sewer mains, domestic sewage is collected and stored on site in a septic tank.

The sewage is removed twice per week and transported to Barwon Water for treatment.

The average weekly sewage quantity is around 7,000 ltrs/week, resulting in an annual quantity of 360 k litres.

### 8.3 Solid Waste

Prescribed solid waste consists of contaminated sponges, pigs and rags estimated at 0.4 tonnes per annum. These are generated from mostly cleaning wharf lines. This solid waste is collected and transported off site by Energy Recovery Pty Ltd, who steam the waste to recover the organic solvent. The foam sponges (pigs) are then incinerated. Any chemically contaminated material is contained and disposed of separately under EPA approval.

Otherwise solid waste generated on site is predominately domestic/industrial rubbish. This is collected in waste bins. Approximately 1.5 cubic metres of waste is disposed to landfill per week. Therefore 117m<sup>3</sup> (93.6 tonnes) of non-prescribed domestic and industrial waste is disposed to landfill annually.

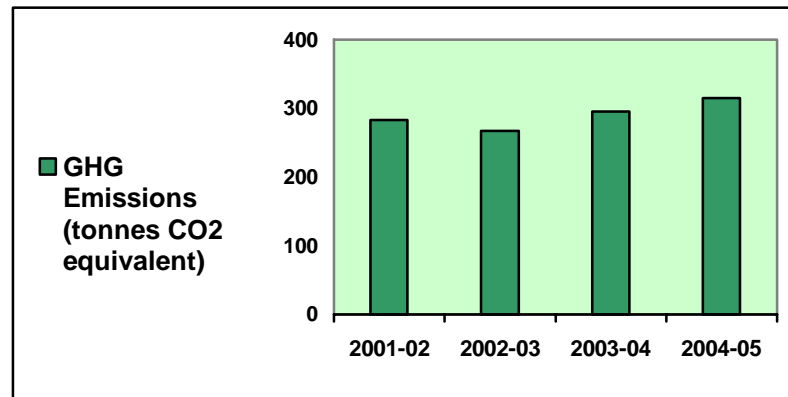
Administrative paper products are collected on a routine basis. Approximately 1 m<sup>3</sup> of paper products is collected and recycled quarterly. Therefore, a total of 4 m<sup>3</sup> (0.6 tonnes) of paper product is generated annually.

## 9. ENERGY EFFICIENCY AND GREEN HOUSE GASES

A level one energy audit was undertaken in September 2003 by ERM and submitted to the EPA in 2003. The energy assessment was undertaken as part of the Victorian EPA Protocol for Environmental Management (PEM) requirements, ie. a category B of the PEM requiring a level one energy and greenhouse gas assessment.

Greenhouse Gas (GHG) emissions are graphed below in equivalent tonnes of CO<sub>2</sub> emissions.

**Chart 10**



These are derived from electricity for pumps/fans/utilities and diesel for firewater pumps and forklifts/trucks. Electricity and diesel usage is converted to GHG emissions (tonnes CO<sub>2</sub>) using standard emission factors from the Australian Greenhouse Office (AGO) website. For 2004/05, electrical usage was 213,270 kw hours, equating to 308 tonnes of CO<sub>2</sub> emissions. Electricity usage is based on invoice meter readings. A minority of the records cannot be found and these values have been estimated based on the available majority of data, whereas the diesel usage is fairly consistent at 2,400 ltrs per annum.

**GHG emissions (t CO<sub>2</sub> equivalent)**

Fuel Type	2001/02	2002/03	2003/04	2004/05
Electricity	276	260	288	308
Diesel	6.5	6.5	6.5	6.5
<b>Total</b>	<b>283</b>	<b>267</b>	<b>295</b>	<b>315</b>

The breakdown of emission contributors are electricity around 98%, and diesel at 2%.

The GHG reduction action plan was limited to administrative measures with no actions of potential savings of 3 year payback. The main reason is the energy usage and overall greenhouse gases are minimal. However, GHG actions are included in the Environmental Targets Plan, detailed in Appendix E.

## 10. ENVIRONMENT IMPROVEMENT PLAN (EIP)

The current 2004-2005 environment targets and actions plan for environmental improvement is attached in Appendix E.

The 2003-04 environmental performance report on the previous year's environmental targets and action plan is attached in Appendix F. Overall, the performance is summarised below.

Year	Targets	Completed	Recycled
2003 to 2004	8	7	4