Enviropod
E.T.S.
Management Plan

Hobart Docks and Salamanca Enviropod Trial

November 2002
Issue B

TABLE OF CONTENTS

INTRODUCTION

The Enviropod™ Total Solution (E.T.S) is a managed approach to implementation and management of stormwater pollution source control. It delivers a package of "Best Management Practices" (BMP's), supplying a treatment device and maintenance system, establishing a framework for site assessments, inspections, record keeping, preventive maintenance, external and internal reporting. It is a unique stormwater treatment approach, in that it supplies more than a stand-alone product or design but rather an on-going system for managing contaminants in stormwater.

The following Monitoring and Management Plan details the results of approximately 5 months monitoring by Ingal Environmental Services (formally know as Enviropod NZ Ltd) and 7 months by the Hobart City Council of 20 Enviropod filters installed in Selected gully pits In the Hobart Docks and Salamanca Area, Hobart, Tasmania. (See Fig 1. Location Plan). The Enviropod™ filter is a gully pit insert which comprises a supporting framework, overflow system and a cleanable filter, which is routinely serviced.

The Management Plan is an integral component of the E.T.S system. The plan outlines operation of the system. Installation / removal of filters, maintenance requirements and the frequency of maintenance and inspections required. It ensures that the system continues to perform at its optimal performance and allows remote assessment of the Enviropods performance for the owner and regulatory authority. This is done by way of service receipts (see example included) which lists cleaning procedures and records site specific data and must be completed by the contractor during each service and then sent to the client. When an E.T.S. has been applied to a catchment as a requirement of a regulatory body, the service receipts can be collated and transferred to them annually, or as required.

Maintenance is an essential component of stormwater management. Surveys in the state of Maryland. USA showed that 75.2% of existing dry ponds. 24.4% of wet ponds and 33% of infiltration practices we not functioning as designed because of mismanagement Maintenance will prevent failures such as structural failure (e.g. prevents blocked outlets) or aesthetic failure (e.g. debris accumulation)[1]

Each stormwater treatment device must be inspected and maintained regularly to ensure it is working property throughout the estimated design life. Unlike traditional treatment devices that require contaminant removal and disposal every few years, the Enviropod filters require servicing every 3-6 months depending on site characteristics. Inspections are to be carried out every time the filters are serviced

An essential component of maintaining and inspecting a stormwater treatment device is reporting and record keeping. It is essential that failures are reported to the owner of the treatment device and remedial measures organized and put in place as soon as possible. All maintenance and inspection

[11] J.Kamer, *Urban Stormwater Quality Control*, Project for Masters of Engineering, University of Auckland,1989

activities must be recorded and reported back to the owner of the treatment device to ensure they are being undertaken.

The science of stormwater is not fully understood. Many factors of land use effect contaminant loadings in stormwater. By accurate reporting and recording of these factors, maintenance activities and inspections lead to a greater knowledge of localised stormwater issues and in turn greater efficiency in combating their effects and planning for the future.

Targeting of Education to polluters is greatly improved through accurate reporting and record keeping eg. Illicit discharge of contaminants into the stormwater treatment device can be noted and tracked to the polluter. The polluter can then be educated about their effect on stormwater quality and the consequences, both environmental and financial, that it may have.

It is essential that maintenance (including inspections, recording and reporting) be carried out in a systematic manner and is carried out by qualified and experienced personnel. It is also advisable that the treatment device owner has a nominated person responsible for overseeing the management process.

Ingal Environmental Services is a specialised stormwater consultancy with trained and experienced staff. The company has a comprehensive database with detailed information on every Enviropod filter sold and serviced by Enviropod, collecting site specific data that can be easily accessed and analysed as required.

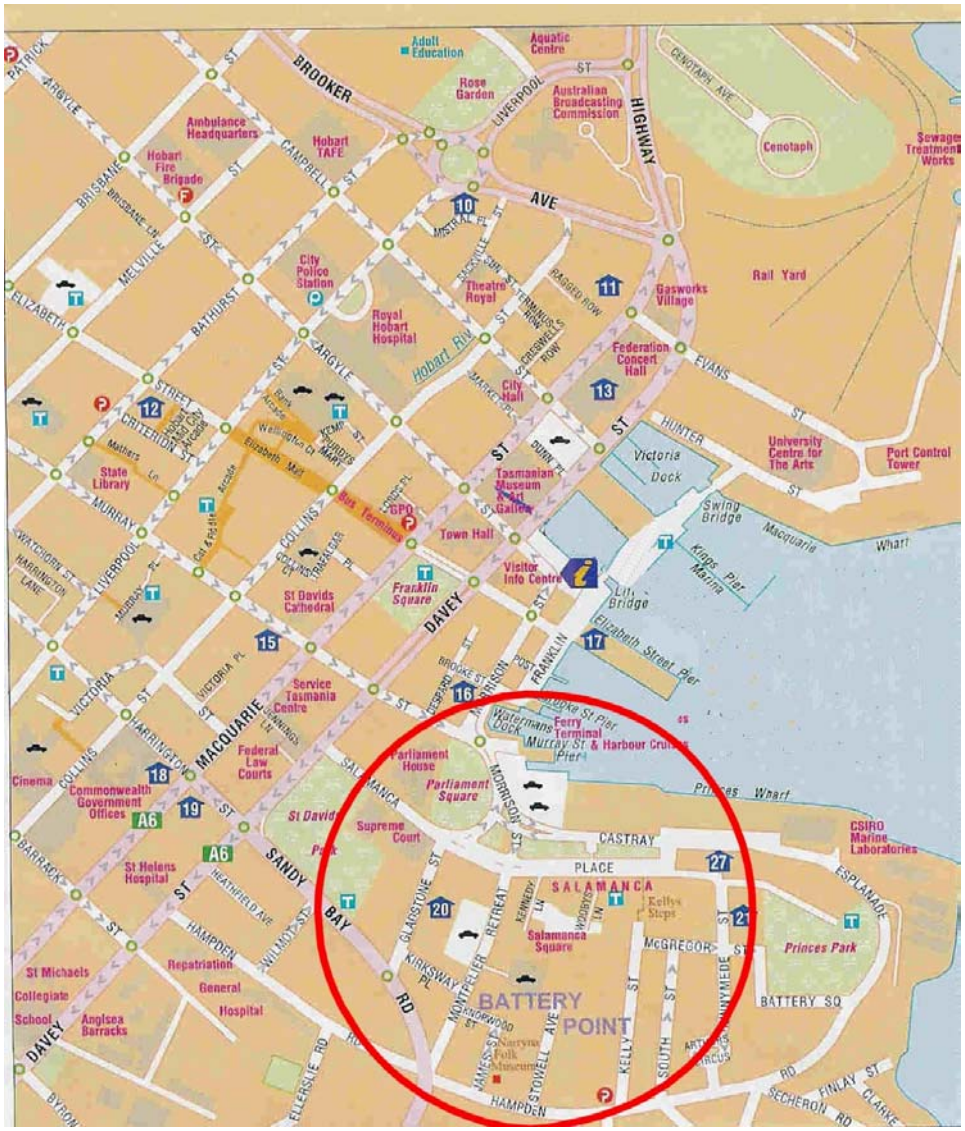

Figure 1: Trial Location Plan

MONITORING METHODOLOGY

An initial site inspection was carried out prior to the installation of the Enviropod Filters in the Hobart Docks Salamanca area. This identified the following:

- Pt dimensions.
- Catchment areas.
- Organic loadings.
- Traffic/Pedestrian loadings.
- Potential pollutant generating activities.
- Surrounding land use.
- Specific design requirements.

Following installation of the Enviropod filters, monthly inspections were carried out on all 20 filters, observing the following:

- Remaining storage capacity for captured sediment.
- Degree of clogging of the filter media.
- Presence of illicit discharge and polluter if identifiable.
- Evidence of overflow.
- General structural performance.
- General hydraulic performance.

Monitoring was carried out in conjunction with Hobart City Council (HCC). Filters were emptied monthly and removed debris was bagged. This material was later weighed and examined by HCC for its contaminant characteristics.

SITE CHARACTERISTICS

Hobart Docks & Salamanca Area

This area of Hobart is old and has gentrified into a major commercial centre of the region with cafes, restaurants, retail outlets, art galleries and markets. The stormwater infrastructure of the area consists of many old gully pits and pipes connected to numerous stormwater branches that all discharge directly into the Derwent River. The topography has required the majority of the reticulation system to be laid on steep grades with the exception the pipes along Salamanca, which are flat. The gullies in the catchment are typically sumpless and self-flushing. This configuration provides no retention time for pollutants to settle out or collect in the sump, thus providing little stormwater quality at benefit at present. The majority of private properties discharge to the kerb.

There are high volumes of pedestrian movements along Salamanca Place and Montpellier Retreat, with Pubs and Cafes being located in this area and a weekly Saturday market at Salamanca Place that attracted over 1,300, 000 people in 2000/2001. In addition January-February sees a higher attendance in the study area with the Hobart Summer Festival attracting 600,000 visitors in 2000/2001 (includes Taste of Tasmania and Salamanca Markets staged during the Festival Period). A high litter loading is expected for Enviropods located in this area, especially during the summer.

Generally there is a high organic loading throughout the trial area with many deciduous trees in the catchment. Frequent windy conditions help to spread this organic loading to most parts of the catchment. There is a very high organic loading on the Enviropods in Sandy Bay Rd and Salamanca Place.

There is high traffic loading on Davey Street and Sandy Bay Road, with average daily totals (ADTs) of +22,000 vehicles on these streets. This may provide a source for the high heavy metal contamination of sediments from these streets. Most of the Streets in the study area have steep grades, which will add to the mobilisation and transportation of sediments.

Rainfall in Hobart is reasonably consistent, with approximately 40 to 60mm of rainfall per month. Historically the wettest months are October, November and December.

20 Enviropod Filters were installed throughout the trial area, treating a total area of approximately 1.9 Hectares of 100% impervious road and footpath runoff. 200 micron filters were installed throughout the site. Enviropods were installed at the end of October of 2001 and monitored by Ingal Environmental Services until the end off March 2002.

MONITORING

Removal Loads

Total Loads

During the monitoring period 1124.5 kg (wet weight) of material was captured in the 20 pits. Removal loads for the 5 monitoring periods are listed in Table 1.

30 Oct - 4 Dec	5 Dec - 15 Jan	16 Jan - 22 Mar	23 Mar - 1 May	2 May - 29 May	Total
T.W. (kg)	T.W. (kg)	T.W. (kg)	T.W. (kg)	T.W. (kg)	T.W. (kg)
284	232	362	97	149.5	1124.5

Table 1: Total Removed Load

Removal Loads varied from location to location. Chart 1 shows the comparative pit loadings. Table 2 lists the pits with the highest average monthly load

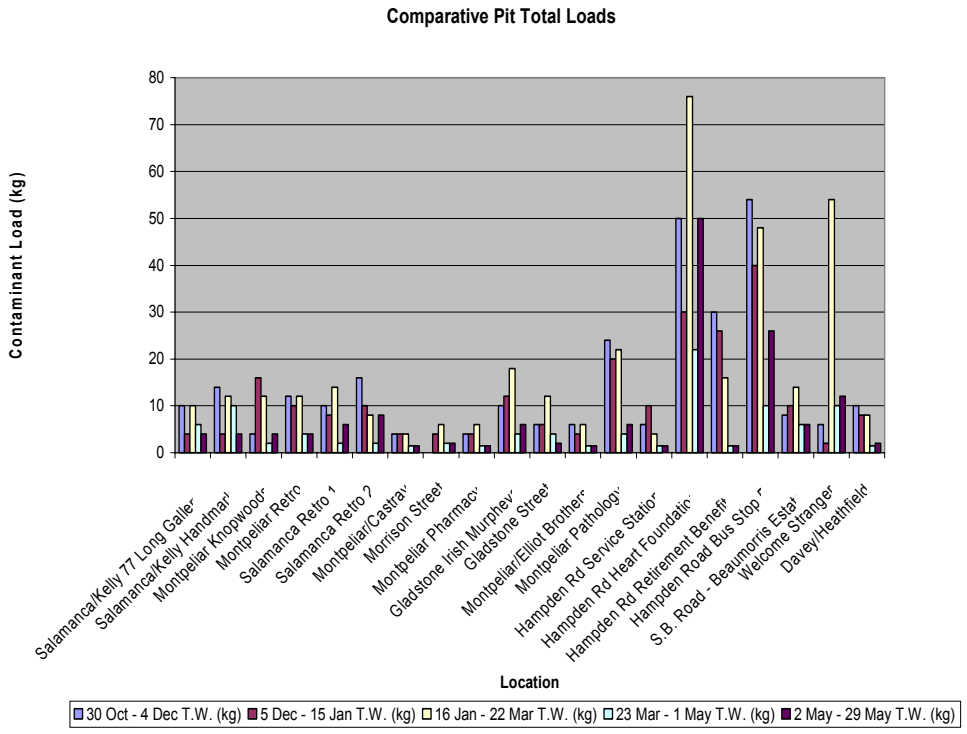

Chart 1: Comparative Pit Loading

Month Location	Enviropod ID	Averages T.W. (kg)
Hampden Road Bus Stop 5	**17**	35.6
Hampden Rd Retirement Benefits	**16**	24.0
Welcome Stranger	**19**	16.8
Montpelier Pathology	**13**	15.2

Table 2:

High Level of Organic Material

A high level of organic matter was retained in all of the Enviropods. Of 1124.5 kg (wet mass) collected in the 20 Enviropods, 96.6% or 1074.6 kg was organic material and sediment. If organic matter and sediments are allowed in watercourses, they settle out as deposits in riverbeds and estuarine areas. Organic matter is known to reduce dissolved oxygen (DO) levels in receiving water bodies. The rate of DO reduction is dependent on many factors i.e. type of organic material, time of exposure and existence of anaerobic conditions. Organic matter tends to increase the Biological Oxygen Demand (BOD), which in turn reduces DO reducing the pH level of the settled sediment. The acidic condition of the sediment, in turn promotes the release of attached heavy metals. It is advisable to minimise organic loading on the receiving water bodies by installing at-source pollutant traps.

Litter Loads

Litter only made up approximately 4.4% of the total exported load. This value is much lower than other Australian trials eg South Sydney CC Trial 27.8% litter, Marrickville trial 34.5% and Woollahra MC Trial 30%. For further info on these trials please contact Ingal Environmental Services. It is presumed low litter loading is because of the lower pedestrian densities, This is evident in examination of Chart 2 where much high litter loads were encountered during December, January-and February because of Christmas shopping and the Hobart Summer Festival. Approximately 600,000 visitors were in the study area during the Hobart Summer Festival.

Chart 3 clearly shows the higher volumes (maroon bars) of litter trapped over the Christmas New Years Period. The highest loading was encountered in the Enviropods located on the kerbside outside Pubs and Cafes on Salamanca Place and Montpelier Retreat. Enviropods located in the middle of the road along Salamanca did not have as high loading as expected. The likely cause of this is because of the absence of side entry inlets on these gullies. Another area of high litter loading was Hampden Road. This road is a pedestrian route for commuters travelling to and from work in the CBD.

Enviropods located near cafes, pubs and public buildings had a high loading of discarded cigarette butts. The amount of cigarette butts retained in the Enviropods was high in comparison with Enviropod Trials in other Australian Cities. Cigarette butts represented 42% 5297 items) of all litter items collected from the 20 Enviropods during end of October 2001 until the end of March 2002. Between the end of October 2001 and the end of May 2002 cigarette butts represented 44% (6686 items) of all litter items

collected from the 20 Enviropods. Research has shown that cigarette butts increase phosphorous, suspended sediment, conductivity and COD levels.[2]

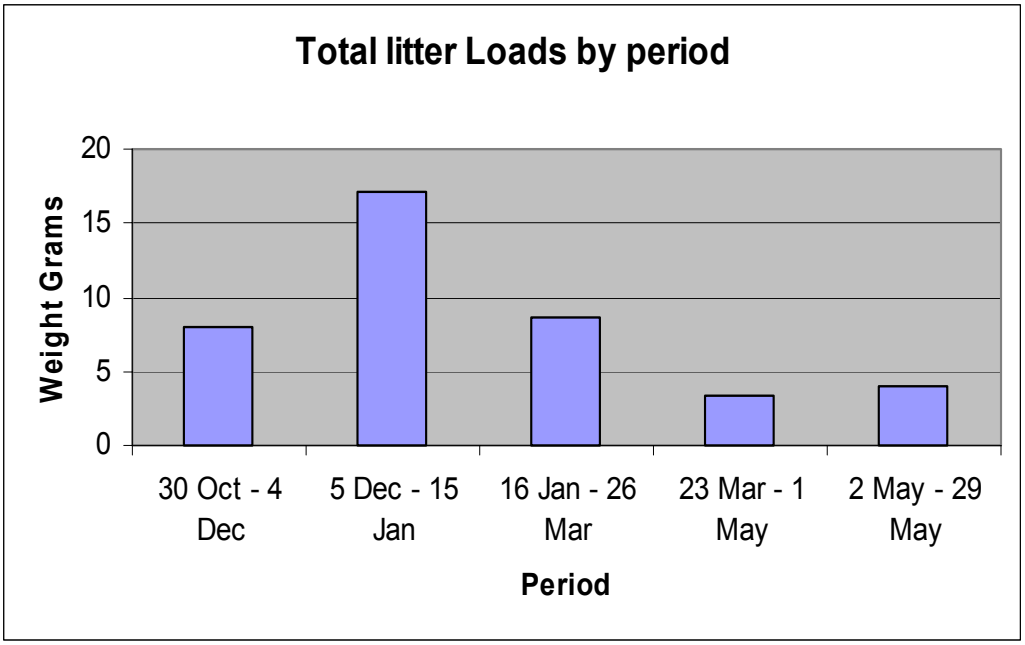

Chart 1: Comparative Pit Litter Loading

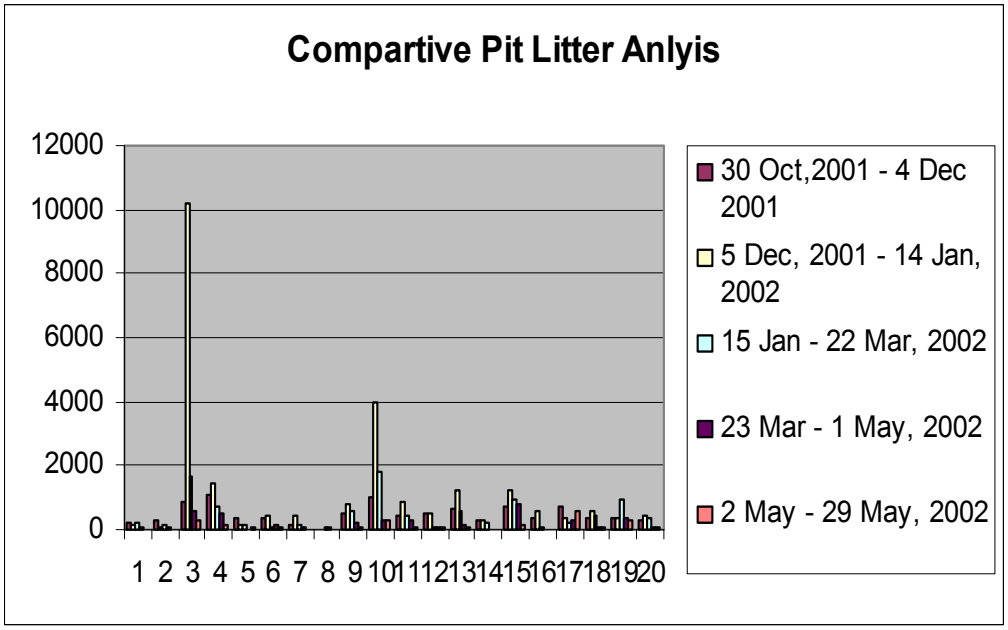

Chart 2: Litter Loads by Period

[2] Aboom M. And Riely S.J. (1997) " Impact on water Quality of Gross Pollutants" Research Report No 121 Urban water Reaserach Association of Australia. June 1997.

Loading Rates

Total Exported Contaminants

To determine areas and times with high stormwater contamination, loading rates need to be calculated to take into account different rainfall and catchment areas. Loading rates are typically expressed as Kg/ha/mm of rainfall Chart 3 below shows the comparative pit loading rates for Hobart Trial. Chart 4 shows the variation of loading rates across the monitoring period.

Higher loading rates per mm of rainfall were encountered in the last period. It is presumed that this is a result of the early onset of autumn and associated higher organic loading. Table 3 below lists the 5 locations with the highest average loading rate. Hampden Road, Sandy Bay Road and Montpellier Retreat have high loading rates. This can be expected because of the high organic loading and high traffic loading as well as the fact that catchment draining to the Enviropods was on a steep grade.

Location	ID	Average Kg/ha/mm
Montpelier Retro	**4**	4.24
Montpelier Pathology	**13**	4.66
Hampden Rd Heart Foundation	**15**	5.79
Salamanca Retro 1	**5**	6.43
Hampden Road Bus Stop 5	**17**	8.39

Table 3: Pits with highest average loading Rates.

Table 4 shows the comparison of Hobart's loading rates with other Australian cities.

Comparison Loadings	Kg/ha/yr
Hobart Docks and Salamanca	**702**
Brisbane CDB, OLD	**639**
Woollahra , NSW	**2173**

Table 4: Loading Rate Comparison

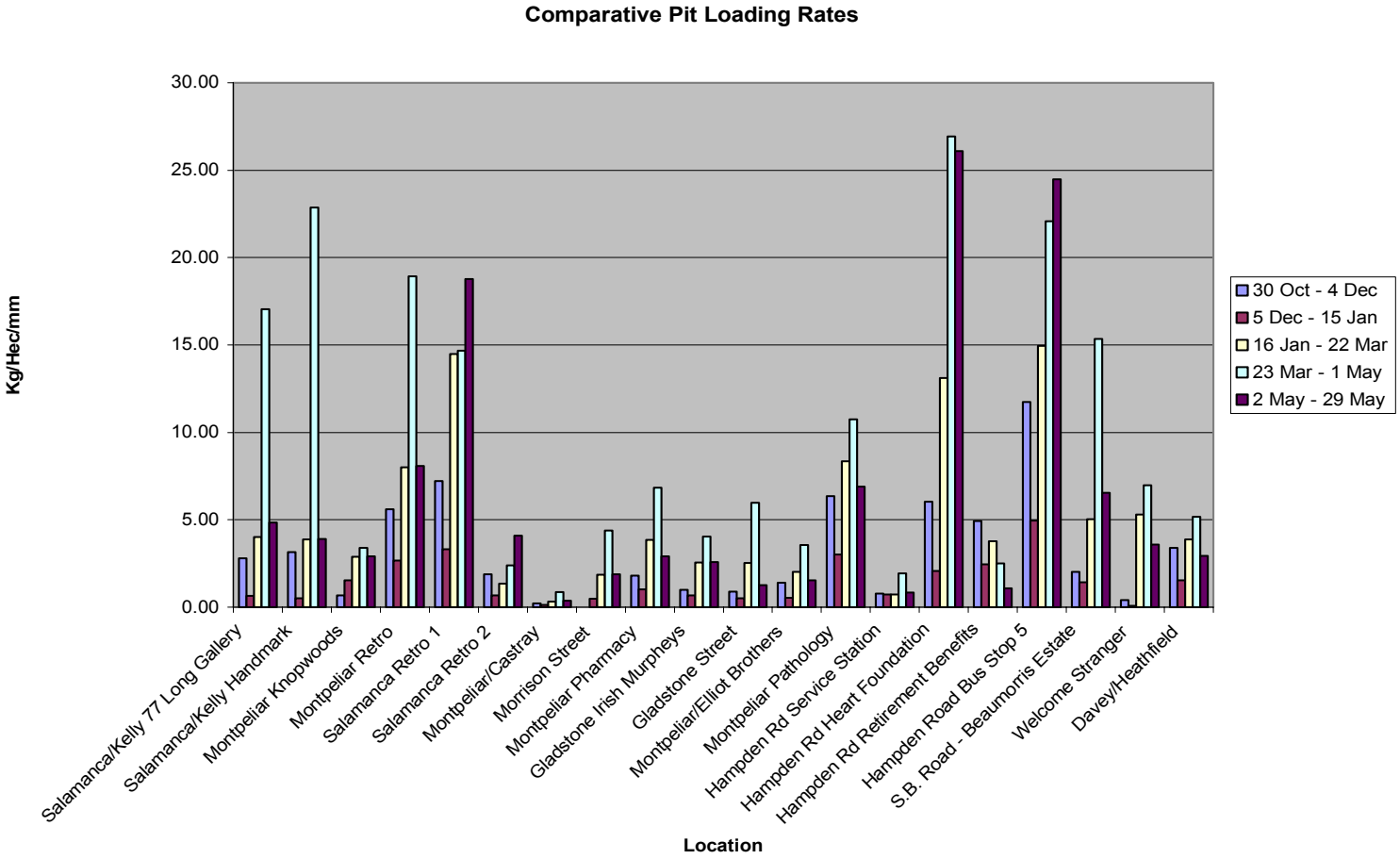

Chart 3: Comparative Pit Loading Rates

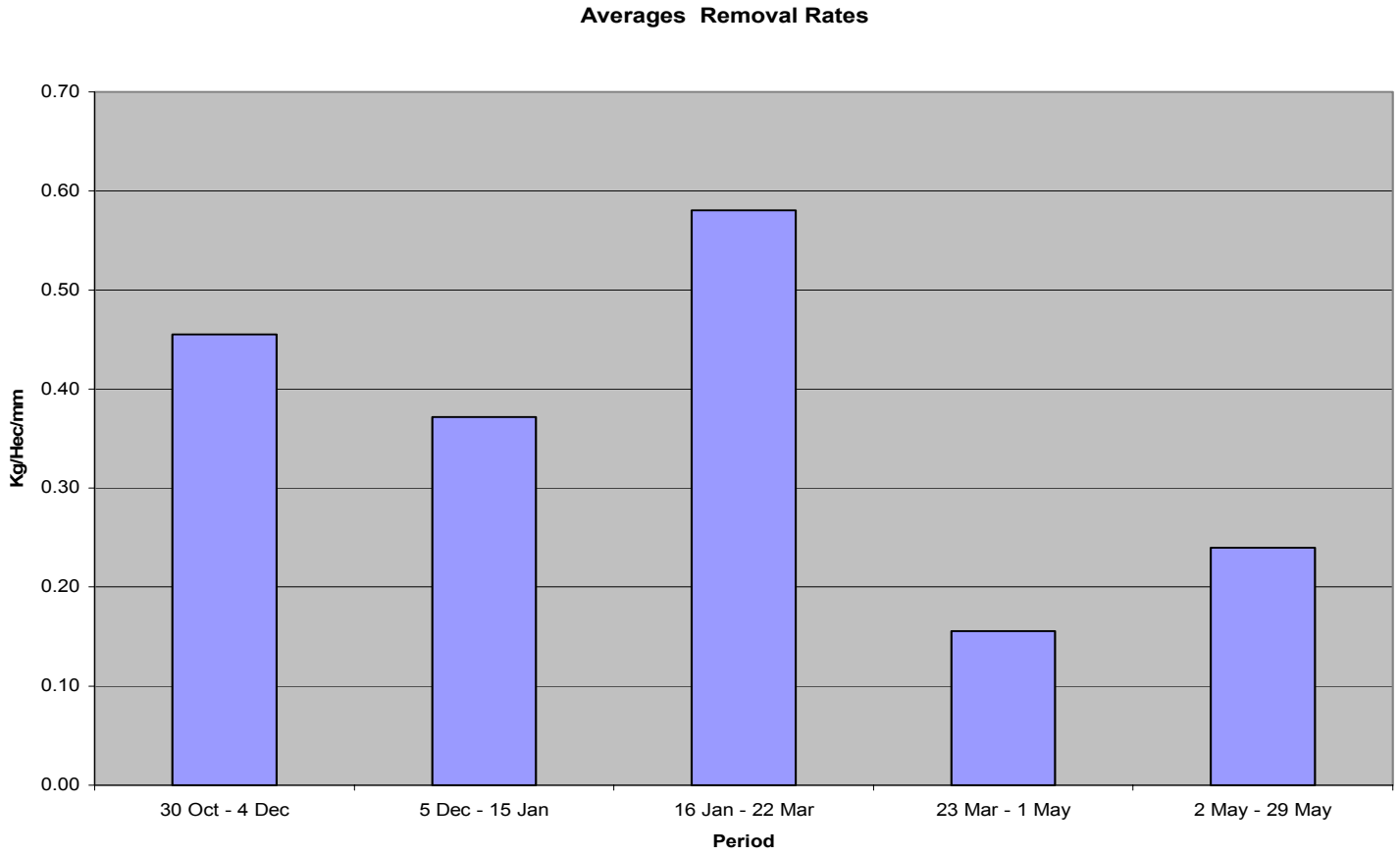

Chart 4: Average Total Removal Rates.

Heavy Metals

The average concentrations for lead coper and zinc are listed in the table 5 below. These values are consistent with material retained in Enviropod Units in other Australian Cities. This is surprising considering the small number of vehicles registered in Hobart. There could be a link between the age of vehicles and the high level of heavy metal contaminants. Of the 44,082 vehicles registered in the Hobart Municipality, the average age is 10 years old. Of the 13,267 cars registered in the Hobart CBD, the average registered age of vehicles is 6.75 years while with the 1,352 vehicles registered in Battery Point (which includes Salamanca Place and Hampden Road), the average registered age is 10.325 years.

Vehicles generate fine particulates loaded with heavy metals through engine, brake, clutch and tyre wear. One of the principal sources of copper in stormwater sediments is wear of vehicle brake pads. Older vehicles would generate higher volumes of heavy metals through wear compared with newer vehicles.

Another possible reason is the high organic loading encountered in the Hobart Trial. Research [3] has indicated that tree leaves have the ability to remove dissolved metals and hydrocarbons from stormwater passing through them. These contaminants are retained with the organic matter and are removed from the runoff by cation exchange with organic material in plant matter.

Enviropod Site	ID	Copper (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)
Salamanca Kelly 77 Long Gallery	1	33.0	121.0	642.7
Salamanca Kelly Handmark	2	41.7	159.0	688.3
Montpelier Knopwoods	3	53.3	402.7	1343.3
Montpelier Retro	4	35.7	61.8	523.5
Salamanca Retro 1	5	45.0	157.8	630.8
Salamanca Retro 2	6	44.0	222.3	953.5
Montpelier Castray	7	39.3	68.3	434.7
Morrison Street	8	32.0	55.0	319.7
Montpelier Pharmacy	9	44.0	291.3	2478.3
Gladstone Irish Murphey's	10	145.0	287.3	1805.0
Gladstone Street	11	44.7	185.3	657.0
Montpelier Elliot Brothers	12	40.0	220.0	895.8
Montpelier Pathology	13	38.0	308.8	1033.3
Hampden Road Service Station	14	36.3	465.3	920.0
Hampden Road Heart Foundation	15	33.7	119.0	552.0
Hampden Road Retirement Benefits	16	28.7	17.7	167.7
Hampden Road Bus Stop 5	17	33.0	96.3	918.7
Sandy Bay Beaumorris Estate	18	33.7	101.0	408.0
Welcome Stranger	19	43.3	357.3	1472.7
Davey Heathfield	20	52.7	261.7	669.7

Table 5: Copper lead Zinc Concentrations

[3] S Clark, P Brown & R Pitt, Wastewater Treatment Using Low-Cost Absorbents and Waste Materials, University of Alabama, Birmingham, Alabama, USA,

Chart 5 shows the concentrations for copper and zinc were found in to be in excess of ANCECC [4]guidelines for environmental investigation for most locations. Pits with high heavy metal concentrations should have further investigation into possible source of this heavy metal contamination, especially if the location is not on major arterial roads.

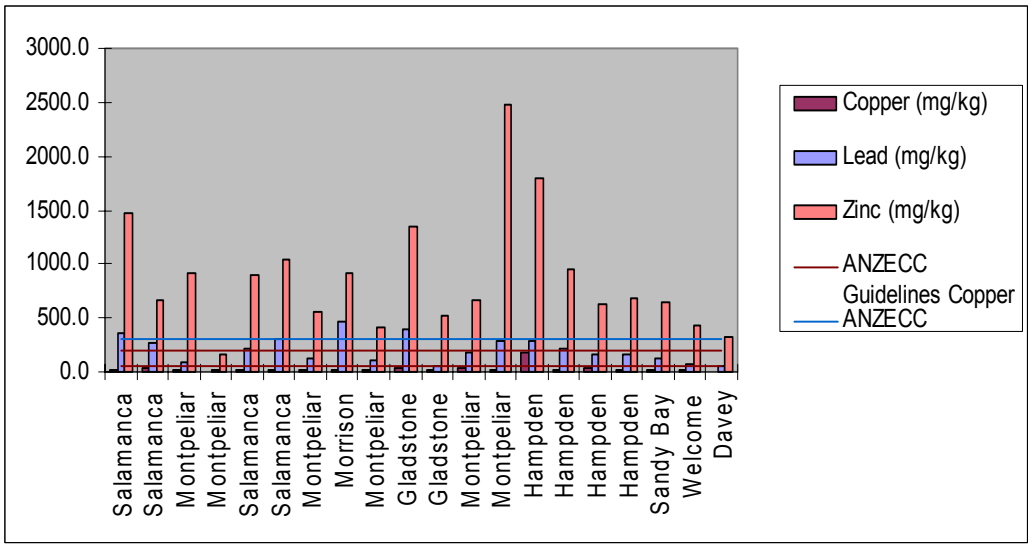

Chart 5: Heavy Metal Concentrations of retained Sediment

Comparison with Other Locations

Loading rates for metals and suspended solids were calculated to allow comparison with other overseas studies. These are stated in the table 6 below. Table 7 shows other studies from overseas studies.

Location	Enviropod ID	Copper (mg/hec/mm)	Lead (mg/hec/mm)	Zinc (mg/hec/mm)
Salamanca/Kelly 77 Long Gallery	**1**	0.05	0.69	2.85
Salamanca/Kelly Handmark	**2**	0.08	0.54	1.37
Montpelier Knopwoods	**3**	0.01	0.13	1.25
Montpelier Retro	**4**	0.01	0.07	0.71
Salamanca Retro 1	**5**	0.13	1.42	5.76
Salamanca Retro 2	**6**	0.02	0.36	1.21
Montpelier/Castray	**7**	0.00	0.03	0.14
Morrison Street	**8**	0.01	0.44	0.87
Montpelier Pharmacy	**9**	0.02	0.23	0.94
Gladstone Irish Murphy's	**10**	0.05	0.48	1.59
Gladstone Street	**11**	0.02	0.07	0.63
Montpelier/Elliot Brothers	**12**	0.04	0.27	0.94
Montpelier Pathology	**13**	0.12	1.36	11.56
Hampden Rd Service Station	**14**	0.17	0.27	1.69
Hampden Rd Heart Foundation	**15**	0.15	1.29	5.53
Hampden Rd Retirement Benefits	**16**	0.08	0.47	1.87
Hampden Road Bus Stop 5	**17**	0.19	1.33	5.77
S.B. Road - Beaumorris Estate	**18**	0.03	0.37	1.99
Welcome Stranger	**19**	0.03	0.10	0.61
Davey/Heathfield	**20**	0.03	0.18	1.06
	Averages	0.06	0.50	2.42

Table 6: Hobart Copper, lead, Zinc Loading Rates

[4]ANZECC Guidelines 1992 (B) required for Environmental Investigation.

Site[5]	M1	N1	Hwy -794	Harrisburg	Street
Country	England	Switzerland	USA	USA	England
Vehicals Per Day	32000	26500	53000	24000	500
Pb (g/ha/mm)	5.9	3.5	16	16.5	0.25
Zn (g/ha/mm)	11.5	2.7	3.8	1.4	0.19
Cu (g/ha/mm)			0.84	0.7	0.04

Table 7: Comparisons for Copper, lead, Zinc Loading Rates

The Locations where Enviropod Filters are installed have the following average daily totals (ADTs) of traffic movements:

- Davey Street and Sandy Bay Road $^{+}$22,000 vehicles.
- Salamanca Place between Montpellier Retreat & Runnymede Street 4,280 vehicles.
- Gladstone Street, between Sandy Bay Road & Salamanca Place 5,081 vehicles.
- Montpellier Retreat, between Kirksway Place and Salamanca Place 3,395 vehicles.
- Castray Esplanade, between Montpellier Retreat & Runnymede Street 6,279 vehicles.
- Morrison Street, between Murray Street & Montpellier Retreat 16,029 vehicles.

These traffic loadings suggest that at certain locations Hobart stormwater is highly contaminated. In addition, attention should be drawn to other locations not on highly trafficked roads - in particular Salamanca and the pit outside Montpellier Pathology.

Monitoring Observations

Rainfall

Rainfall over the monitoring period was higher than usual. Rainfall in November, December and January was nearly double historical figures while the rainfall in February and March was approximately half of what would be expected, and only a quarter of what would be expected in April and May.

Illegal Discharges

The following Enviropods were affected by illegal discharge during the monitoring period.

Enviropod ID	Location	Reason
4	Cnr Montpelier and Salamanca	Vegetable oils from Cafes
14	Cnr Hampden and Sandy Bay Rd	Oil from Petrol Station
17	Sandy Bay Road	Gravel Burn unsealed driveway
11	Cnr Gladstone and Salamanca	Food oils possibly from Pub
15	Hampden Rd	Construction runoff from 82 Hampden Rd
6	Salamanca outside Retro	Food oils possibly from Cafes

Table 8: Illegal Discharges

[5] Williamson, BW. *Urban Runoff Data Book*, Water quality Centre publication No 20, Hamilton, NZ, 1991

Contaminant Hotspots

The following roads are considered sediment and organic hotspots because of the high loading rates encountered in Enviropods located on them.

- Hampden Road, between Davey Street and Sandy Bay Road
- Sandy Bay Road, between St Georges Terrace and Hampton Road
- Montpellier Retreat, between Sandy Bay Road and Salamanca Place
- Salamanca Place, between Davey Street and Runnymede Street

The following areas are considered Litter Hotspots:

- Salamanca Place, between Gladstone Street and Runnymede Street
- Hampden Road, between Davey Street and Sandy Bay Road

Monitoring Recommendations

Maintenance Cycle

The effect of seasonal organic loading is the major influence on the maintenance cycle. Unfortunately monitoring was overtaken until mid March providing limited data on seasonal influences (possibly include the data supplied by the HCC). Considering the above, table 8 below has the suggested maintenance frequencies. It suggests that during maintenance, records be kept on the level of retained material in the Enviropods so the maintenance frequencies can be refined.

Pits (Enviropod ID)	Cleaning Months
1,2,3,5,7, 9,10,11.12.14,18, 17,18, 20	January, April, June, August. November
4, 8,15,19	February May, August. November
5,13	February, July

Table 8: Suggested maintenance cycles

Education and other Source Control Opportunities.

1. Enforcement or education in litter hotspot areas such as Salamanca Place.
2. Enforcement or education to identified illegal discharges.
3. On site control of stormwater runoff from the service station on the Cnr of Sandy Bay Rd and Hampden Rd.
4. Examination of street cleaning practices - in particular increases in organic loading in autumn.
5. Further heavy metal and oil and grease investigation
6. Continued monitoring of the seasonal nature of contaminant loadings is carried out in order to allow efficient maintenance programs.

7. Further monitoring and record keeping of installed Enviropod Filters.
8. Installation of additional Enviropod Filters in Streets identified as contaminant hot spots (see above).
9. Enviropod Filters in the Hotspot locations are maintained at 2.5 monthly intervals.
10. Education programs are put in place at pubs, cafes and public buildings to promote disposal of cigarette butts into rubbish bins.
11. Ensure the provision and relevant placement of rubbish bins and cigarette disposal bins.
12. Installing Enviropods in streets where regular flushing occurs will prevent discharge of contaminants into the River Derwent. Street flushing is the most cost effective way to clean the streets. Installation of Enviropods will mitigate against some of the adverse effects associated with it.

OPERATIONS

Cleaning of Enviropod Filters is a specialist activity. Material collected can be harmful if not handled correctly. Sediments can contain heavy metals and carcinogenic substances as well as harmful objects such as broken glass. It is essential that Occupational Safety and Health guidelines are followed at all times, and that the following steps are carried out to ensure safe and successful maintenance operations.

The following method of maintenance should be used for the servicing of these Enviropod Filters.

1) **Cleaning using Inductor Truck**

Cleaning using Inductor Truck

Maintenance utilising a vacuum Inductor truck is the preferred option for cleaning Enviropod Filers. Hand maintenance is discouraged as it can lead to damage of the lifters and has Health and Safety implications with sediments often being highly contaminated. Filters are also capable of storing a large weight of material.

Traffic Control

Traffic control must be well planned when maintaining Enviropod Filters. All standard rules and regulations governing Traffic Control and Safety while working on the Road must be rigidly followed at all times. All potential hazards must be identified and control methods put in place prior to maintaining filters.

Health and Safety

All contractors should comply with all current Health and Safety Legislation and take at practicable steps to:

1. Comply with all applicable Laws, Regulations and Standards.
2. Ensure that all Employees. Contractors and Visitors are Informed of and understand their obligations in respect of current Health and Safety Legislation
3. Ensure that employees understand and accept their responsibility to practice and promote a safe and healthy work environment.

All relevant precautions must be taken to prevent contact with sediment and litter when maintaining filters. The following safety equipment should be worn:

1. Puncture resistant gloves
2. Steel capped safety boots
3. Fluorescent safety vest.
4. Safety apron (optional)
5. Overalls or similar skin protection
6. Eye protection if necessary

Where there is a need to proceed in a confined space, the space shall be inspected for gas/fumes. Safety equipment must be worn where deemed necessary and where gas or oxygen hazard occurs. Staff trained in its use will only use BA gear. Non-trained staff must not go into confined spaces.

Operation

Sediment is to be extracted from the filter bag by the sucker truck. Sediment retained in the gully pit grate is to be removed. Back opening channels are to be cleared of any debris to ensure flow is not hindered. Care is to be taken by the operator not to damage the filter. **All gully pit waste is to be removed from the pit. Gully pit sediments under no circumstances are to be backwashed into the gully pit.**

A visual examination of the Filter structure and filter media is to be carried out. Structure is to be visually checked for failure or movement and that filter boxes are sealing sufficiently. If any structural failure has occurred it is to be remedied, or reported to the filter owner for remedial works. Filter media is to be examined for permeability. If the pores in the filter fabric are clean, the filter bag is placed back into the frame and the service is complete. If the filter media has become blocked or hindered in performance, the filter bag must be rejuvenated. This is achieved by either by lifting the bag and ring out of the pit, placing over a frame and water blasting at a waste disposal point, or alternately by having the filter bags washed at an industrial washing plan.

All gully pit wastes from the site are to be taken off site and disposed of at a transfer station or similar approved disposal site. Stormwater Sediments can contain Lead, Copper, Zinc, Mercury and PCBs, which are harmful to both humans and the receiving environment

Maintenance and inspection frequency

The suggested maintenance frequency of the 20 Enviropod Filters is detailed in Table 6. Inspections as per Service receipt should be carried out at this time. Additional inspection may be warranted alter intense rainfall.

Attached in Appendix A is an example of an Enviropod Service Receipt to be completed by the Cleaning Contractor when servicing any Filters. Relevant information is recorded and forwarded to the client following each maintenance clean.

It is recommended that this Management Plan be reviewed after the first 12 months to account for any new usage or seasonal variations that may not have occurred during the initial monitoring period.

Emergency Procedures

Spill Procedure

In the event of a spill discharging into any gully pit all sediment is to be extracted and the filter bags are to be removed and replaced with rejuvenated Filter bags. Normal operation procedures apply to additional cleaning as a result of spills.

Blockages

The Enviropod filter has been designed with an overflow mechanism built into the filter box. If Surface flooding existing check the overflow slots underneath the rubber seal. If debris is lodged in the overflow slots these can be easily cleared by hand or steel rod.

If overflow is clear and surface flooding still exists, remove Enviropod and check outlet pipe for blockages.

Removal of the Enviropod may be difficult if the filter is clogged and the Enviropod is holding water. If the filter is clogged, brush the source of the filter with a yard broom or similar. This will dislodge particles trapped at the interface allowing contained water to flow through the filter.

If the outlet pipe is blocked, it is likely that a gully sucker truck will be required to unblock it. Debris should be removed from the Enviropod with the gully sucker truck before removal of the Enviropod filter.

If a gully sucker truck is not available and the Enviropod needs to be removed by hand, follow the steps below;

1. Remove excess debris by hand or brush the side of the filter.
2. Lift and place filter ring through the filter box and into cage.
3. Remove Filter box,
4. Lift cage containing filter bag and ring out of the pit.
5. Unblock outlet pipe.

Audit Procedures

The maintenance contractor is to provide documentation that all maintenance requirements are being carried out. Attached is an example of documentation to be provided by the cleaning contractor.

This management plan and records of maintenance operations for the property are to be kept on site and are to be available for Hobart City Council compliance inspections.

Reporting to the HCC is required annually to meet the requirements of the Enviropod E.T.S. Management Plan for Hobart Docks and Salamanca and to ensure optimum performance from the Enviropod filters installed. Details of all maintenance operations are to be forwarded to the Environmental Co-coordinator, Hydraulic and Waste, Hobart City Council every year in the month dated on this report.

Appendix A Service Receipt

Enviropod Service Receipt

Site:
Contractor:
Location:

Job Number:
Receipt Number:
Week Serviced:
Year:

Service Frequency:
Enviropods on Site:

Enviropods Cleaned:
Bags Checked:
Frames and Seals Checked:
Tonnage:

Comments

This service has been performed in accordance with Enviropod Management Plan (EMP) for above site. Please file this receipt with EMP and keep on site compliance inspections.

Signature:
Position:

Appendix B Location Plans