Version Number	Purpose/Change	Name	Date
0.1	First Draft for Revision	Fergus Hamilton	7/4
0.2	draft	Joshua Magor	8/4/15
0.3	Added to cost & recommendation sections	Fergus Hamilton	8/4/15
0.4	Issue for review	Fergus Hamilton	8/4/15
0.5	Review	C Somerville	8/04/15

Gross Pollutant Traps

According to the Water Sensitive Urban Design technical manual (Department of Planning and Local Government, 2010) a Gross Pollutant Trap (GPT) is a "device for the removal of solids conveyed by runoff that are typically greater than 5 millimetres." There are a number of different variations of GPTs that may be suitable for use in urban environments, these include:

- Gully baskets
- In-ground gross pollutant traps
- Trash racks
- Pipe nets
- Direct screening devices

The main function of a gross pollutant trap is to help improve water quality by the the removal of gross pollutants. Gross pollutants are defined as "debris items larger than 5mm" (Allison, 1997) and can pose a threat to the local wildlife, local water environments and aesthetics relative to the environment. They can also create unwanted smells and attract vermin.

Relevant Legislation

Before any design of a GPT can begin it is important to check with the appropriate legislation and regulations to see if there are any requirements that apply to GPTs in the project area. The legislations which are most applicable to the design and installation of GPTs in the Adelaide region are:

- Development Act 1993
- Development Regulations 2008
- Environmental Protection Act 1993

Advantages

The addition of a GPT to the existing stormwater system would be an effective way to improvement stormwater quality. Advantages of GPT include:

- Effective way of removing gross pollutants
- Some traps can be hidden from view
- They take up a relatively small area

Disadvantages

Limitations of GPTs include:

- Limited in the removal of fine sediments, dissolved pollutants and other materials that are less than 5mm in size
- Needs to be maintained and regularly cleaned
- High initial installation cost
- Some designs are complex to install
- May be aesthetically unpleasant in public areas

Cost

The cost of the GPT is largely dependent on its size and its application. To help with the decision on the appropriate GPT design to use, the life cycle cost of the trap should be considered. The life cycle cost is the combination of both maintenance and installation costs. This provides a true long term cost estimate of the infrastructure. This is done by taking into account an assumed life cycle of the project. Using simple hand calculations or the computer software MUSIC, a good estimate on the overall life cycle cost for a GPT can be calculated. The cost factors that should be considered when selecting the appropriate GPT are:

- Installation costs
- Maintenance costs
- Waste disposal costs

Installation prices of GPTs can vary anywhere between $300 and $12,000 (approximate figures based on Department of Planning and Local Government, 2010). Maintenance and disposal costs on the other hand are dependent on a number of different factors. Factors affecting maintenance costs include:

- GPT size, based on the total area of stormwater in which the GPT is receiving
- Techniques used for maintenance, based on the unknown nature of present gross pollutants
- Time required for maintenance, i.e. hours, days needed

Factors affecting waste disposal costs include:

- Special disposal requirements for hazardous wastes
- Total volume of waste

- Implications of materials that are in a wet or dry condition

These factors should be taken into consideration as there is potential for them to have a significant effect on the lifecycle cost.

Recommendation

The decision on the most suitable GPT will be made with consideration of the following key areas:

- Accessibility
- Maintenance
- Aesthetics
- Lifecycle cost

Of the many GPT options available, the Environmental Team believes that a direct screening device would be best suited for the stormwater system in place at North Terrace, Kent Town. It is believed that it will be a more feasible option in comparison to other traps such as drainage entrance treatments, floating traps, sediment traps, etc. If drainage entrance treatments are installed along North Terrace, any required maintenance will disturb traffic in this area. The use of a screening device at the end of the stormwater system, will relocate the required maintenance work away from North Terrace.

In comparison to other types of GPTs, a direct screening option will be much more cost effective in the long term. The simple design will mean there is a lower installation cost, it will be easier to maintain and will have a smaller disposal of waste costs, when compared to the other types of GPTs available. In order to provide a cost effective solution, the Environmental Team believe that spending the extra money on a more efficient GPT wouldn't be feasible and a simple direct screening trap would be sufficient for this project.

The Environmental Management Team suggests the use of one of the following direct screening devices:

Option 1 – Litter Collection Basket at the end of the stormwater pipe

The first option is to install a littler collection basket at the end of the stormwater pipe exiting at First Creek. Any gross pollutants will be removed directly into the collection basket before they enter First Creek. For this reason, the litter collection basket would be the preferred solutions to choose. However, due to the stormwater pipe location installation and future maintenance this may be difficult. An example of a litter collection basket can be seen in Figure *1* below.

Figure 1 - Litter Collection Basket Collingwood, VIC *Source: (IEAust, 2006)*

Option 2 – Channel Nets in First Creek

The second option involves the screening device being submerged in First Creek, in a location that is easily accessible. Like the litter collection basket it will be an effective tool to remove gross pollutants but may be visible to the public creating aesthetic and odour problems. On the contrary, as the net will be in a visible position it will be easily accessible for installation and maintenance. An example of channel net can be seen in Figure *2* below.

Figure 2 - Channel Nets West Torrens, SA *Source: (IEAust, 2006)*

References

Allison, R., Chiew, F. and McMahon, T. 1997, Stormwater Gross Pollutants, Industry Report 97/11, Cooperative Research Centre for Catchment Hydrology, Monash University, Victoria

Department of Planning and Local Government, 2010, Water Sensitive Urban Design Technical Manual for the Greater Adelaide Region, Government of South Australia, Adelaide

IEAust (2006). Australian Runoff Quality: A Guide to Water Sensitive Urban Design. New South Wales.