

# Managing the end of the pipe:

## Coastal stormwater outfalls

Coastal Management Fact Sheet 2.5

***As stormwater infrastructure ages, Councils and land managers have the opportunity to update these systems to improve environmental outcomes around coastal stormwater outfalls***

Rainfall runoff in the natural environment is directed to the ocean via creeks, rivers and groundwater infiltration. In urban environments, built infrastructure replaces these natural systems and directs stormwater to the ocean via beaches or rocky headlands.

Efficient stormwater drainage is essential in periods of high rainfall to quickly divert water and reduce the risk of urban flooding. However, rapid discharge can have detrimental effects on the coastal environment.

As infrastructure ages, stormwater outfalls should be replaced with systems that reduce impact on the environmental and coastal processes. This will ensure that the public space around coastal outfalls can be safely enjoyed by both foreshore and water users.



### Stormwater outfalls in the coastal landscape

Beaches are dynamic coastal systems that experience erosion and deposition of sand depending on wave conditions. Outfall pipes discharging onto the beach may be clogged with sand or damaged if supporting sand is eroded away. They may be fully exposed or buried with sand at various times of the year. Direct wave damage and corrosion from salt can reduce the lifespan of the structure.



Beach erosion often coincides with storm events that bring heavy rainfall and high stormwater discharge. The flow of outfall water across the beach can exacerbate beach scour and, after repeated events, cause the wider beach profile to be lowered. Untreated stormwater can result in rubbish on the beach or place swimmers at risk of illness.

Outfalls built on rocky coastlines do not experience the same erosion issues, and can be sited in natural rock clefts to reduce visual impact. However, the opportunity to build on rock shelves is often limited by the distance from the stormwater source, and water quality in the immediate area can be adversely affected.

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## Alternative stormwater design principles

Many stormwater systems are the result of historic networks that did not consider coastal and other landscape processes in their design. However, the impacts of erosion and stormwater pollution can be dramatically reduced by adopting water sensitive urban design practices from the stormwater source to the outfall.

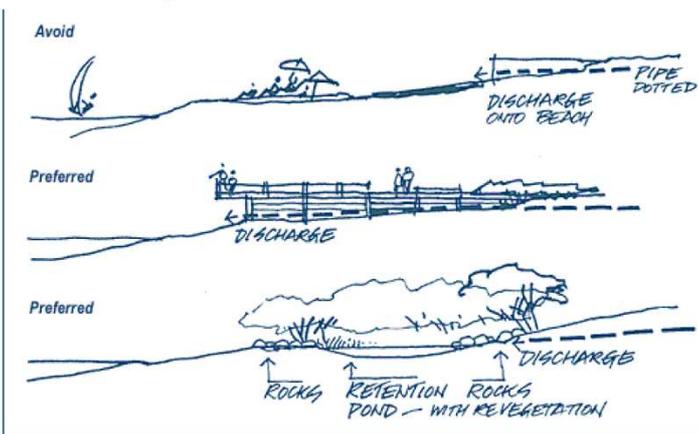
Systems are now being designed that slow down or intercept stormwater before it reaches the coast. This reduces the physical impacts on beach systems and may be achieved by:

- Diverting water into an alternative receiving body such as a wetland, river, estuary or retention pond
- Promoting infiltration of stormwater in vegetated areas
- Combining outfalls with soak pits that have overflow capacity for high rainfall events

There are many examples of successful sensitive stormwater design reducing detrimental impacts on the coastal environment. Solutions must be carefully chosen, appropriate to the site conditions and supported by technical and engineering advice.

All stormwater systems require regular monitoring and maintenance to ensure they are meeting their performance and environmental objectives. The Environment Protection Authority (EPA) Victoria's Best Practice Environmental Management Guidelines address this.

### Stormwater Discharge



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## Land use planning and visual amenity

Councils and land managers need to strategically plan to improve stormwater outfalls to reduce visual intrusion and minimise impact on the coast. Where possible, alternate solutions to direct ocean outfalls should be considered.

Where coastal stormwater outfalls cannot be removed or relocated, the location of outfalls in the wider landscape should consider the type and intensity of public use, visual amenity and public safety.

Drains should be designed to be incorporated into the coastal landscape and should not stand alone as foreign objects (Siting and Design Guidelines for Structures on the Victorian Coast 1998). For example, they can be incorporated into other infrastructure such as viewing platforms or groynes.

It is important that all local managers and stakeholders work together to ensure these important assets are functional, safe, have minimal impact and are properly integrated in the wider coastal landscape.

## Cooperative foreshore asset management

Local councils are responsible for stormwater management. However, their infrastructure may be on land managed by a coastal Committee of Management.

With proper planning between local councils, land managers and the community, new systems are being introduced to replace or consolidate aging infrastructure that results in changes to our beaches. Backflow technology is also introduced to stop pipes being blocked with sand and causing greater erosion during heavy rainfall.

Most Councils have stormwater management plans. These plans need to ensure that the impacts on the beach and ocean have been considered and incorporated into the plan. Education of the of the broader community on stormwater management is critical to this success.

For a copy of the EPA Best Practice Guidelines visit the EPA website ([www.epa.vic.gov.au](http://www.epa.vic.gov.au)).

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