

Stormwater Best Practice Guide

Tasman District - Nature's Playground

Aim

This guide is for Audit purposes to show that Council, and more particularly the Engineering Department of Tasman District Council, is carrying out practices that are environmentally sustainable and in accordance with the Resource Management Act. This guide can be used as an educational 'tool kit' to advance the sustainable management of waterways and wetlands.

This Code of Practice is written in accordance with Section 70(2) of the Resource Management Act 1991 'Rules for Discharges' where Council is required to use the 'Best Practicable Option' to prevent or minimise actual or likely adverse effect on the environment through the discharge of a contaminant.

Best Practicable Option is interpreted as follows:

Best Practicable Option: in relation to a discharge of a contaminant or an emission of noise, means the best method for preventing or minimising the adverse effects on the environment having regard, among other things, to:

- a) The nature of the discharge or emission and the sensitivity of the receiving environment to adverse effects; and
- b) The financial implications, and the effects on the environment, of that option when compared with other options; and
- c) The current state of technical knowledge and the likelihood that the option can be successfully applied.

1.1 Council is aware of its responsibilities in regard to the mitigation of adverse effects on the environment - Section 15 RMA

15. Discharge of contaminants into environment -

(1) No person may discharge any

- i. Contaminant or water into water; or
- ii. Contaminant onto or into land in circumstances which may result in that contaminant (or any other contaminant emanating as a result of natural processes from that contaminant) entering water; or
- iii. Contaminant from any industrial or trade premises into air; or
- iv. Contaminant from any industrial or trade premises onto or into land-

Unless the discharge is expressly allowed by a rule of a regional plan, a resource consent, or regulations.

(2) No person may discharge any contaminant into the air, or into or onto land, from -

- i. Any place; or
- ii. Any other source, whether moveable or not, -

In a manner that contravenes a rule in a regional plan or proposed regional plan unless the discharge is expressly allowed by a resource consent or allowed by Section 20 (certain existing lawful activities allowed).

1.2 The United Nation Convention on Biological Diversity 1992, i.e. the Rio Earth Summit, New Zealand (plus 167 other nations) signed and accepted the responsibilities of the objectives of that Convention.

These included:

- Conservation of biological diversity (i.e. diversity within and between species and diversity of ecosystems)
- Sustainable use of ecosystems and components
- Equitable sharing of benefits that arise from the use of genetic resources

1.3 Tasman District would be by far, one of the most diverse regions in New Zealand - from high country snow-capped peaks through to native forest and regenerating bush to golden sands in coastal areas.

Tasman District Council has produced many publications and guides on stormwater quality issues.

The Tasman Resource Management Plan (TRMP) includes several chapters that are relevant to environmental issues and mitigation of adverse effects.

Viz:

Chapter 6 - Urban Environmental Effects

Chapter 7 - Rural Environmental Effects

Chapter 9 - Margins of rivers, lakes, wetlands and the coast

Council's Engineering Standards also stipulate environmentally sensitive designs shall be addressed in all new development applications.

Viz:

Section 3.8 - stormwater management systems

Drawing 324 - waterway concepts

2. Adverse Effects on Aquatic Ecosystems through Urbanisation

- **Loss of wetland and riparian buffers**
A stream ecosystem is dependent on its extensive freshwater wetlands, floodplains, riparian buffers, seeps, springs and flood channels.
- **Changes in substrate quality**
An urban stream can receive a massive pulse of sediment that has eroded from construction sites in the catchment. As a result, the substrate of the stream can change and affect many invertebrate species.
- **Loss of Habitat Diversity**
Channelisation of streams can occur in urban/industrial/rural areas. This includes the straightening and realignment of a natural channel, sometimes with the addition of reinforced streambeds and banks. The resulting habitat offers little diversity or complexity, especially when piping options are considered.
- **Increased Pollution Levels**
Pollutant levels in urban streams are often one or two orders of magnitude greater than a non-developed catchment. This is as a result of increased hard surfaces and stormwater systems/roof runoff that transport contaminated stormwater directly to streams.
- **Increased Hard Surfaces**
Hard (impervious) surfaces and accompanying stormwater systems can contribute to lower base flows, faster runoff of stormwater flows and increased water temperatures. Intensive urbanisation can raise stream water temperatures by 5o to 10oC due to a combination of loss of shoaling (from riparian vegetation removal), lower water levels and addition of warm stormwater (heated during residence time on hard surfaces).
- **Shift in Energy Source**
In a natural headwater stream, the aquatic community is driven by an energy source made up of decomposing vegetation, woody debris and falling insects. This type of ecosystem is lost through urbanisation. In urban streams, reduced tree canopies combined with nutrient accumulation result in an increase in primary producers (aquatic plants and algae).
- **Reduction in Biological Diversity**
Urban streams in intensively developed areas support only a fraction of the fish and aquatic invertebrates that exist in an undeveloped watershed. The reduced diversity is caused by the above factors as well as barriers to fish access, predation and disturbance.

Past Designs

- little in stream values
- good hydraulics
- high water temperatures
- no cover from predators
- high water velocity
- unsafe
- no spawning areas
- algae growth

Sustainable Urban Drainage Designs

- riparian habitate
- pools
- shading
- falling debris
- refuge and nesting areas

3. Description of Stormwater Systems

Tasman District:

- covers an area of 9,786,000 ha
- has 11 towns or settlements where urban drainage areas are present
- has five main river systems
- has 725 km of coastline
- has three National Parks
- has 853 km sealed roads and 807 km unsealed roads
- has 450 bridges
- has 7 wastewater treatment plants discharging to ground

Council has many hundreds of stormwater pipe discharges, with many being private. Many of these are over 300 mm diameter and can range from plain pipe outlets to major headwall structures.

4. TRMP Requirements:

Stormwater discharge consents are required generally on all subdivision applications with the following objectives:

- maintaining existing water quality
- enhancing water quality where existing quality is degraded for natural and human uses or values
- mitigate adverse effects downstream

The objectives and policies are covered under Sections 33 and 36 of the TRMP and meet the requirements of Section 15 of the Resource Management Act.

TRMP Section 36.2.7 states:

- discharge of water into water is permitted, if:
- the discharge does not cause erosion of the bed of any river or stream;
- the discharge does not contain more than 0.5 grams per cubic metre of free or residual chlorine;
- discharge does not contain contaminants;
- the natural water temperature being less than 20o is not raised above 20o or increased by 3o;
- the discharge does not exceed 5 litres per second
- does not obstruct fish passage
- does not cause the production of conspicuous oil, grease films, scums, foam, floatable or suspended materials
- does not cause or contribute to the destruction of any habitat plant or animal in any water body or coastal water;
- does not cause or contribute to erosion of land including the bed of any stream or drain

5. Best Practical Options for Development

Design Guidelines

Council's Engineering Standards Section 3 outline issues that designers need to consider in new subdivision/developments. Waterway concepts are also outlined in the attached drawing 324 of the above standard.

Generally these guidelines encapsulate:

- a)** Allow for 2% annual exceedance probability AEP or a Q50 (50 year return period rainfall discharge) year event in main channels but include allowance for planting of berm areas and side slopes;
i.e. allow a low flow channel to be formed together with a conservative design to allow some planting in channel. These plantings, flaxes, grasses, can 'lay flat' in storm events.
- b)** Alignments to mimic natural meanders and encourage low flow channels and rest areas for fish species;
i.e. natural channels have pools which collect organic material as food source, refuge areas for fish and in low flows ripples, create turbulence and enhance the transfer of organic matter, dissolved gases and nutrients.
- c)** Native plantings to enhance shoaling and lower water temperature
i.e. Plantings at edges of streams create shading and lower water temperatures. They create a refuge area and food source from insects.
- d)** Reduce contaminants entering system
i.e. plantings and grasses trap sediments in the riparian margins of a stream. Sufficient pre-treatment may also be incorporated into vegetated swales and constructed wetlands.
- e)** Reduce peak flows by retention upstream and water reuse
i.e. by reducing the capacity of the peak storms by retention upstream will enhance waterways and mitigate invertebrates and fish being 'flushed' out of the system. By holding back stormwater at source, i.e. roof/dwelling, by way of onsite tanks, stormwater disposal to planted gardens and water re-use within the dwelling will assist to reduce flows downstream.
- f)** Minimise impervious areas
i.e. the use of paving blocks where rainwater can move into the underlying soils should be encouraged. Planning rules to limit site coverage of buildings and hard surfaced areas should be adopted. Swales beside roads in some situations. Public car parks can be broken up with grassed berms and specimen trees which in a small way lower subsequent stormwater discharge temperatures.
- g)** Encourage open channels rather than piped systems
i.e. piping systems are more expensive to maintain in the long term and the table below shows far more values are realised by using natural waterways.

6. Rural Farming

Farmers are being encouraged through education to develop and implement environmentally sustainable stormwater solutions. A number of farm practices which have been curtailed in recent years are:

- Reduction in stock access to waterways by fencing and withdrawing riparian areas from farming uses, as promoted by councils, Federated Farmers, Fish and Game and Ministry of Agriculture and Forestry.
- Bridging of stock water crossings through streams, i.e. for dairy farming;
- Stream cleaning (reference Te Tau Ihu Mahituna eel management plan)
- The unnecessary removal of weeds from streams
- Gravel extraction in dry areas of river only

- **Farm Practices that are being promoted:**
- Making fish passage over dams and weirs
- Alternative cleaning one bank side each year
- Restricting drainage of wetlands

- Culverts to be imbedded into the channel
- Reduced water abstraction and water augmentation
- Reduction in agrichemicals

Council's Environmental and Planning Department can provide advice on the above practice.

7. Trade Waste

Tasman District Council along with Nelson City Council is working on trade waste issues common to both councils via a trade waste bylaw which monitors processes in commercial and industrial activities that can create contaminants.

The majority of discharges are audited before being discharged to the wastewater reticulation system.

Oil interceptors are also installed in areas where vehicle contaminants, i.e. oils and greases, may find their way into stormwater drainage systems. These oil interceptors contain the first flush off yard areas to the sewer and subsequent clean flows directed to the stormwater systems.

Council holds a database of all trade waste and oil interceptors and has an audit role to verify that these systems are cleaned/maintained on a regular basis.

Council employs a Compliance Monitoring Team which actively investigates illegal discharges and can impose requirements and abatement notices should an adverse effect be confirmed.

Any enquiries regarding the Trade Waste Bylaw 2005 should be directed to Council's Engineering Services Department. Alternatively you can download a copy of the Trade Waste Bylaw from the Tasman District Council website.

8. Oil Spill Response and Contingent Planning

Emergency Services

Initial oil spills or contaminants from vehicle accidents are immediately controlled/ contained by the Fire Service.

Council Response Unit

In the event of a major spill, the 'Oil Response Team' is mobilised with specialised equipment to contain and clean up the area.

Tasman District Council and Nelson City Council work together on this and combine resources to form the Oil Response Team. The specialised equipment is stored at Port Nelson.

The Councils' Environmental Health Officers, David Lewis on behalf of Tasman District Council and Stephen Lawrence on behalf of Nelson City Council are designated the 'on scene Commanders' and are called upon to perform this administration role.

Private Response

Most service stations maintain 'spill kits' held on site and available for minor spill incidents.

9. Stormwater Discharge from Tasman District Council's Road Network

To restrict the amount of contaminants entering the environment, the following standard practices are carried out in the Tasman District.

Street Sweeping/Cleaning

- Roads inside the CBD (central business district) areas of main urban centres are swept almost daily and all visible litter is collected at all times.
- Other major urban streets are swept on average once per month with stormwater sumps cleaned out at the same time. Most other urban streets are swept 4 times per year.
- CBD cleaning of brick pavers where hot water only is used (no detergents).
- SW sumps are cleaned out and sludge is discharged to landfill.

Vegetation Maintenance and Control

- Road berms are sprayed as required to control growth and to ensure public safety. Sprays are used which are no threat to the environment.
- On newly cut roadside batters, hydroseeding to enhance growth and reduce silt erosion is carried out as soon as possible after works are complete.
- Culverts/bridges are kept clear to enhance fish and wildlife passage and to provide adequate flood discharge capacity

Frost Mitigation

- Grit is used in all cases to alleviate frost on road surfaces, however Council has a consent to use calcium magnesium acetate (CMA) but under strict monitoring conditions. Tasman District Council has not used this product as yet.

Dust/Silt Reduction from Roads

- A programme of approximately 10 km of unsealed roads are sealed each year.
- The use of oil to suppress dust on roads and yards is being used sparingly because of past long term contamination from the toxic heavy metals and other chemicals in the oil. New oils are being developed that do not contain these contaminants, however, there are a great many unsealed roads in the district and dust can cause significant problems by depositing on crops and causing health and nuisance effects for people living along these roads. Discretionary status for this activity reflects the balance between effective dust suppression and the need to avoid creating adverse environmental effects. Council has a consent to use oil for dust suppression on public roads but under stringent conditions and monitoring due to the potential for contaminants to enter waterways and streams.

10. Education

Tasman District Council is proactive in educational programmes and has produced many pamphlets over the last few years and are available at the Customer Services counter. Tasman District Council has also been represented at road shows and promotions.

Careless disposal of contaminants has been highlighted by the yellow 'fish' symbol painted on the kerb and channel beside roadside sumps. This symbol helps remind people that the point of discharge is directly connected to an environmentally sensitive waterway system and an important habitat for many species.

For more information on Stormwater and Education refer to the Tasman District Council Stormwater WebPages listed under Environment and Services.