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WAKA KOTAHI

NZWWA 6th South Pacific Stormwater Conference

Stormwater Treatment from State Highway Infrastructure

why, how and when

Carl Reller, Environment Manager

WHY: sustainable management

RMA & LTMA



NZTA

- Strategic Plan
- Environmental Plan



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WHY: adverse effects

tyre life cycle

40,000km, 30% tread loss
urban rate several times
higher than average

	<u>kg/year</u>
UK	57,000,000
Germany	60,000,000
Sweden	10,000,000
Italy	50,000,000
USA	500,000,000

Environmental Pollution 157 (2009) 1-11



WHY: tyre composition

<u>%</u>	<u>Ingredient</u>
40-60	synthetic and natural polymers
20-35	carbon black and silica filling agents
15-20	high PAH oils
1-1.5	vulcanisation agents and activators (S, Zn)
1	protective agents, antioxidants/ozonants
<1	plasticisers, softeners

Tyre leachates are very complex mixtures with most toxic components remaining unknown.

WHY: adverse effects

Road dust and soil

>80% within 30m (complex shaped porous particles)

Sediments and surface water

EU found Zn on occasions exceeds acceptable limits

Air

5% airborne, majority of particles < 1 μ m

Bioavailabilty

Absorbed by filter feeders, benthic organisms and plants

WHY: adverse effects (cont)

Aquatic toxicity

tyre leachate acutely toxic in most studies

Terrestrial toxicity

Use of 2% as soil conditions damaged plant growth

Human health

Evidence of teratogenic, mutagenic and estrogenic activity in higher concentrations. Suggested links to human latex allergy and asthma in air borne particles.

Tyres account for 75% global latex consumption.

WHY: lessons learnt



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WHY: lessons learnt (cont)

unnecessary “innovation” on standard method/design and repetitive “innovation” on minor works

storm water treatment devices which are hard to maintain

lack of whole life cycle assessment increased future maintenance cost

WHY: lessons learnt (cont)

limited training on consent conditions and requirements for compliance

inability to access consents and supporting documentation

lack of detail in current contractual arrangements on the scope of environmental management and compliance

ad-hoc relationship management with regulatory and territorial authorities

HOW: NZTA role in driving best environmental practice

continuous improvement by means of clear

specifications and standards

training programmes

HOW

What this means is that the NZTA Stormwater Treatment Standard for State Highway Infrastructure is a **minimum standard** to be applied throughout New Zealand.

