



with assistance from  
New Zealand Water and Wastes Association  
*presents*

**Managing Stormwater  
and Road Run-off  
Tools, Techniques and Devices**



Stormwater360



**Innovative Stormwater Technologies for Road Runoff**

# Stormwater Treatment Technologies

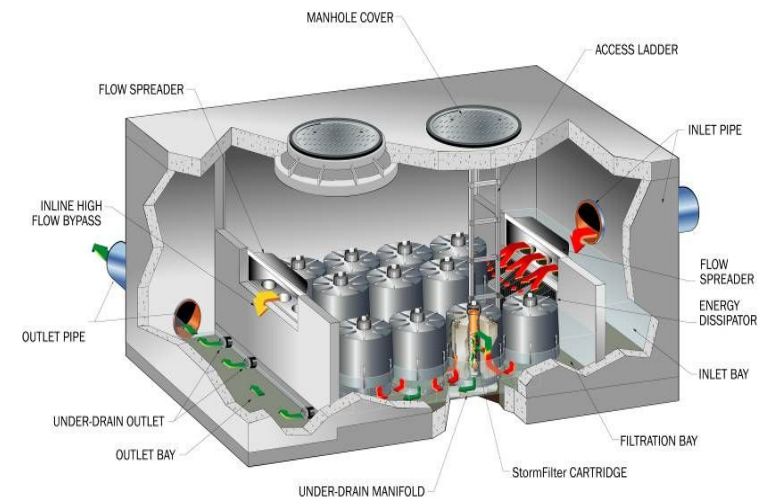
- Traditional

- Ponds
- Wetlands
- Swales
- Sand filters



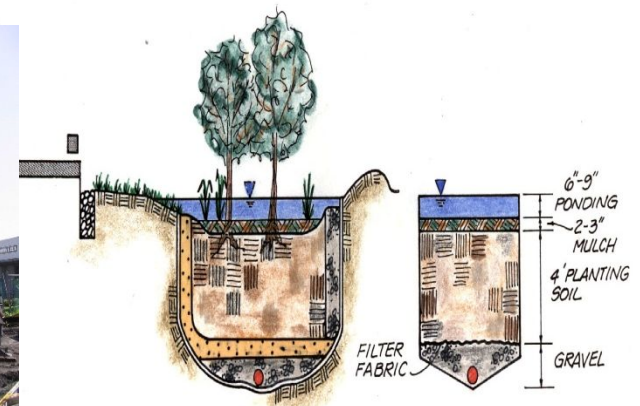
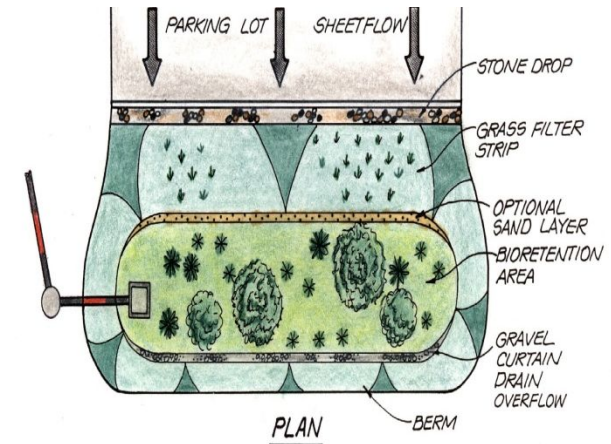
- Innovative

- Screening Devices
- Hydrodynamic Devices
- Filtration Devices

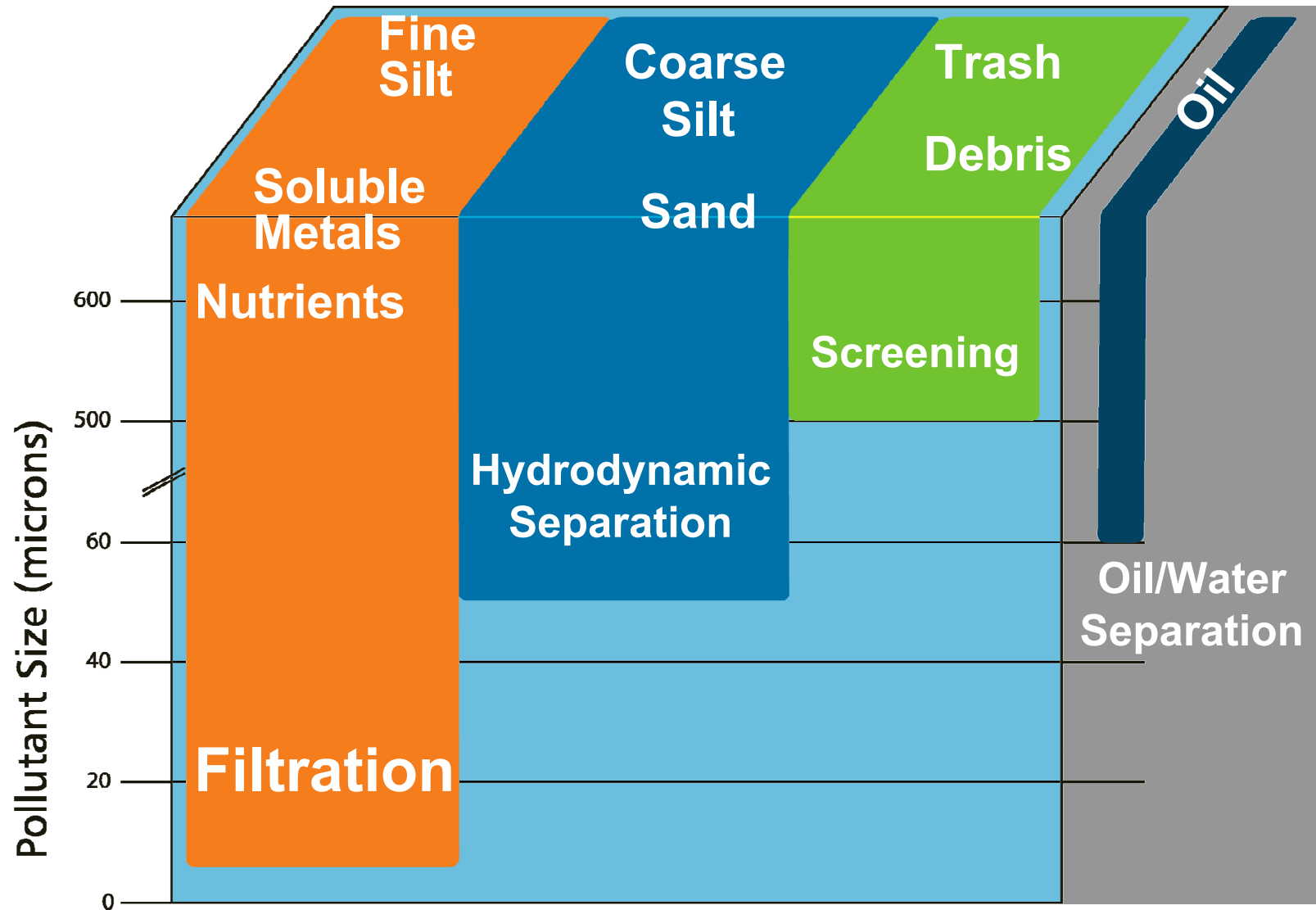


# Traditional or Innovative

- Flow based as Opposed to Volume based
- Manufactured Solution as Opposed to Designed and Constructed
- Aboveground or Underground

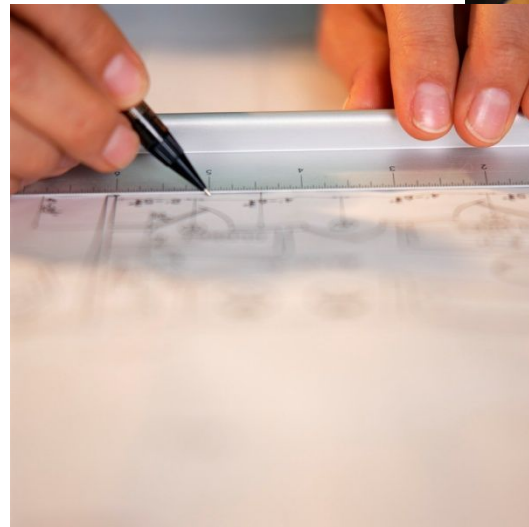


# Pollutant Characterization



# Other Considerations - Design

- Hydraulics
  - Head loss
  - Bypass capacity
- Sizing
  - Flow based
  - Load based
  - Particle size removal



# Other Considerations - Maintenance

- **Understanding when maintenance is needed**
- **Maintenance Frequency**
- **Is there good access?**
- **How much storage volume is required ?**
- **Are the contaminants stored dry or wet?**
- **Is confined space entry required?**
- **Are specialised equipment required?**



# Other Considerations - Performance

- Difficult to evaluate because of variability
- Laboratory and field evaluations
- In house or independent testing
- International testing programmes
- NJCAT, Washington State of Ecology, International BMP database

<http://www.state.nj.us/dep/dsr/bscit/CertifiedMain.html>

<http://www.ecy.wa.gov/programs/wq/stormwater/newtech/index.html>

# Other Considerations - Costs

- Land, facility and construction costs
- Opportunity costs
- Maintenance costs
- Ecological costs



# Summary

- There is now a greater emphasis on stormwater treatment
- There is a variety of contaminants in stormwater
- Innovative devices
- There are many different stormwater treatment devices
- There are 3 main types
  - Screening
  - Separation
  - Filtration
- The type chosen depends on contaminants targeted.
- Consideration needs also be given to design, maintenance, cost and performance

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Thank you

# Questions?

- Mike Hannah, Stormwater 360
- Chris Thorpe, Humes
- Peter Carroll, Hynds
- Keith Caldwell / Sue-Ellen Fenelon, Beca