Risks and impacts of poor soil erosion and sediment control practices during urban development

Bronwyn Scallan, Environmental Officer/Sediment Task Force Coordinator
Department of Biodiversity, Conservation and Attractions

Government and community concern

- Increasing evidence of significant environmental, economic and social impacts when water, soil, sand drift, silt, mud and dust (sediment) is not effectively managed on urban development sites

Sediment plume following heavy rainfall event, attributed to inadequate sediment control on one building site.
Elizabeth Quay, August 2023
Photo Credit: CBRE Retail Property Management

What's happening on-the-ground?

- Frequent evidence of legislative non-compliance due to poor on-site drainage, soil erosion and sediment control
    - Large volumes of sand drifting off site during strong winds
    - Large volumes of sediment mobilised during heavy rainfall
- Monitoring for compliance mostly a reactive response triggered primarily by complaints
- Irregular inspection and maintenance of on-site controls

Quantifying typical sediment loss (Perth)

UWA/ CRCWSC Sediment Research Project 2017- 2019

~ **17 tonnes of exposed soil and sand can escape** into the environment, stormwater drains, rivers and waterways **for every hectare** of subdivision and building development **every year**

"Uncontrolled sedimentation, pollution and hydrological changes resulting from construction sites are one of the largest contributors to land and water quality degradation in Australia"
(International Erosion Control Association Australasia, 2024)

Environmental risks and impacts

- Degraded water quality and physical habitat
- 'Filling up' of river pools
- Reduced (water) carrying capacity of wetlands
- Increased weed encroachment, diversity and growth
- Impacts on biota and macrophyte populations
- Algal growth and algal blooms

Environmental risks and impacts

- Nutrients, toxic chemicals (including heavy metals, hydrocarbons, PFAS, herbicides, fungicides, insecticides, termicides) pathogens and bacteria often adhere to sediment
- The toxicity of sediments from land development sites is caused by:
  - Remobilisation of agricultural and other chemicals already in the soil
  - Application of new chemicals during construction and construction site litter

Economic risks and impacts (WA examples)

City of Cockburn 2024/ 2025 budget estimates

- $1.8M street sweeping internal roads and paths
- $265k for educting program
- $111k for waste disposal post sweeping and educting

City of Swan 2019/ 2020 budget estimates

- $267k - street sweeping new subdivision stages after residential building
- $375k cleaning drainage pits and lines full of sand in new subdivisions

City of Subiaco 2017

- $36k manual “cleaning” Mabel Talbot wetland – removal of 7t of sediments ($5142/t)

Private sector 2025

- $1,106 street sweeping 4 streets 6hrs

Social risks and impacts

Public Health

- Increased mosquito and midge breeding habitat and populations
- Presence of pathogens, bacteria and toxic sediments from land development processes in surface and ground water
- Reduced safety of drinking water for stock, swimming, food collection
- Increased risk of flooding and hazards

Recreation

  - Reduced function and amenity of natural assets
  - Fishing - loss of drought refuges and juvenile breeding habitat

Reduced aesthetics (visual amenity and streetscapes)

Declining cultural and heritage values

Solutions

- Regular and sustained monitoring for compliance is critical:
  - protect the environment
  - to achieve behavior change
  - to ensure compliance with legislation and commitments made in management plans
- Self-auditing by industry resulting in immediate corrective action

Solutions

- Sediment control measures considered during the planning and design phase and in place before any soil is disturbed
- Incorporation of Water Sensitive Urban Design assets and effective ESC controls across the entire site
- Regular inspections and maintenance of controls
- Being prepared for unexpected weather events
- Restrictions on timing and staging of earthworks (bare soil) at times of known high risk

Looking forward

- Responding to the current housing crisis and pressure to reduce red tape and cost to industry and consumers is compounding these risks and impacts

Reducing risks and impacts requires:

- Wide-spread industry adoption of best practice soil erosion and sediment control
- A collaborative approach by governments and industry to improve sediment management outcomes and meet community expectations