

Department Planning, Industry and Environment, 4 Parramatta Square, 12 Darcy Street, Parramatta NSW 2150.

Draft Greater Sydney Water Strategy

03 November 2021

Dear The Hon Melinda Pavey MP, Minister for Water,

Thank you for providing an opportunity to allow comment on the Draft Greater Sydney Water Strategy.

Stormwater Shepherds is an authority on stormwater, and the toxic pollutants conveyed from rain events, particularly microplastics. We are an environmental not-for-profit committed to informing and sharing knowledge on the impact of unmanaged stormwater to stop plastic and urban pollution at the source – the home, the business and the stormwater drain. To fund correctly treated stormwater, we support implementing a new user-pay stormwater utility charge. It is the only charge capable of funding backlog and critical ongoing maintenance.

Our organisation's vision is for the world's water to be clean water, free from plastic and urban pollution.

Correctly treated stormwater will capture pollution entering NSW waterways - gross pollutants, car emissions and tyre wear microplastics, sediment, organic matter and most chemicals. Until stormwater is correctly funded and managed, NSW will bear the consequences from polluted waters and the harm to lifeforms, including humans. Stormwater Shepherds cannot stress this more clearly.

We applaud the work and extensive research that has gone into developing the Greater Sydney Water Strategy. Thank you.

However, stormwater appears to remain the poor cousin to water and wastewater in the draft. Stormwaters impact on water quality and quantity is dire yet managed correctly it has so much potential as a precious commodity, as noted; *like other wastewater, stormwater can be a problem and a valuable resource* (pg. 99). But first, stormwater must be acknowledged as a problem, rather than can be a problem....*like other wastewater, stormwater* is a problem and a valuable resource.

Currently, across the globe, over 100,000 aquatic mammals and one million aquatic birds die each year from ingestion, including starvation, intestinal rupture, suffocation, scoliosis, bacterial infections, limb amputation and entanglement. Australians generate approximately 23-24,000

tonnes of microplastic pollution each year, and that does not include microplastics from tyre wear pollution. ¹ Further, toxins from macro and micro plastics cause health impacts to humans.

Federal government Senate Report - Environment and Communications - Marine plastics reports, The committee received evidence that chemicals accumulated on the surface of microplastics, and chemicals used in the production of plastic may cause adverse health effects in humans...These chemicals are classified as endocrine disrupting compounds (EDCs), and the human health implications of such chemicals have been well established. Research has linked EDCs to cancer, male and female reproductive issues, adrenal and thyroid disorder, neurodevelopmental issues in children, and disrupted immune function.[100] ²

Stormwater Shepherds believe that by presenting the problem first, we achieve a more significant buy-in from stakeholders. With only one mention of the consequences of untreated stormwater the reader can be excused from missing the very context of the crisis in all waterways and soils, along with bioaccumulation effects on humans – predominantly from the consequences from untreated stormwater. - Challenges for Stormwater Management, pt. 2 - stormwater continues to be a major source of litter, plastics, sediment, nutrients, chemicals and metals that pollute our waterways, harbours and oceans. (pg. 110)

Correcting stormwater management and understanding the ramifications of unmanaged stormwater is a current and critical issue that needs addressing immediately due to timeframes connected to climate change.



¹ https://www.dpie.nsw.gov.au/__data/assets/pdf_file/0006/369006/Cleaning-Up-Our-Act-Redirecting-the-Future-of-Plastic-in-NSW-Discussion-Paper-March-2020.pdf

²https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Environment_and_Communications/Marine_plastics/Report/c03

Please find below our comments to the draft:

Key Challenges (pg.10)

3. Support the economy and jobs (pg.10)

By promoting stormwater to the same level as water and wastewater, job creation will be in the thousands. Its own department will support ongoing management of correctly treated stormwater, including backlog. Job creation in the thousands will arise from increased maintenance and new roles in admin, accounts, marketing, customer service, community engagement, rangers, management, researchers and more across every council in NSW.

4. Put water at the heart of the city and communities (pg.11)

Stormwater Shepherds requests the addition of Increase Water Quality in the point.

Stormwater delivers a range of pollutants across waterways and land with devastating impacts on all lifeforms. The flow-on effect will be enormous by improving stormwater quality, especially for Aboriginal people who have a deep spiritual connection with water.

2.4 Manage location-specific or asset-specific risks (pg. 74, paragraph 4)

We ask you add stormwater to paragraph 4 -

 Risks are increased for water, wastewater and stormwater systems by some of the key assets being more than 100 years old, and many parts of the networks being more than 50 years old.

On 8 June 2007, 2-year-old Jasmin Holt drowned alongside her older sister, Madison, 3, her parents, Adam Holt and Roslyn Bragg, and her 9-year-old cousin Travis Bragg, when surging stormwater washed away the road beneath them and swallowed their car.

Corroded stormwater piping under the old Pacific Highway at Somersby, NSW, caused the road to collapse during torrential flooding. increased impervious surfaces from a new industrial site exacerbated the increase in stormwater. A coronial inquiry found the council negligent, and the Holt family paid an undisclosed sum of money

Strategic pathway: Priority 3 (pg. 79)

Develop a new model for stormwater governance

Stormwater Shepherds supports introducing a user-pays stormwater utility charge as a new model for stormwater governance. We encourage establishing stormwater as a separate department, fully funded by a user-pays stormwater utility charge. There are currently over 3,000 municipalities across the USA, all German cities use one of two user-pays models, and many Canadian municipalities are adopting the model. We also encourage a roads levy to allow critical installation of filters to catch toxic runoff from car emissions and tyre wear pollution.

A stormwater utility charge is a fair and equitable model to share the cost of stormwater management based on a property's rainfall impact into their stormwater network. The charge is commensurate to the total impervious area on private and commercial properties - roofs,

driveways, tiled and bitumen areas, car parks etc. The larger the impervious area, the higher the charge. Credits and incentives to private dwellings and commercial properties support the charge. Community engagement is critical in the successful implementation.

We all agree that NSW's current \$25 stormwater management service charge (SMSC) is outdated and incapable of funding necessary stormwater management costs.

Current funding options available to councils are:

Raising the Stormwater Management Service Charge

Local governments apply to IPART to set higher charges with special variations apportioned from the general rates income

Drainage fee (a loophole)

Development-contingent costs from 2025 for Sydney & Hunter Waters (pg 41, Review of Infrastructure Contributions in New South Wales, NSW Productivity Commission - Final Report)

None of the above options will raise the revenue to correctly treat and maintain stormwater without adding a financial burden on the NSW Government. A stormwater utility charge provides councils with the means to implement a fair and reasonable charge to maintain networks and the authority to ensure the treatment occurs on private sites

ADVANTAGES:

- 1. Increased revenue to manage and maintain stormwater networks
- 2. Reduced class actions from improved flood control and healthier waterways
- 3. Improved waterway health to all lifeforms
- 4. Australia's first state to address stormwater infrastructure across all LGA's
- 5. Most fair type of assessment and the least possibility to dispute

Challenges for waterway health (pg. 98)

• increasing stormwater retention by maximising previous land surface area, diverting roadway runoff into raingardens and using stormwater to support increased vegetation coverage

Stormwater Shepherds applauds this initiative. But diverting road runoff to irrigate agriculture and vegetation coverage must be clean water.

Untreated stormwater from car emissions found in road runoff is overlooked across the nation, and recent research in Europe and the USA reports that tyre wear pollution (TWP) could be 1,000 times worse than vehicle exhaust emission and deadly to all lifeforms.³

Denser than water, these sticky black fragments sink to the bottom of a waterway, conveyed by stormwater, (up to 95%).

Sediment-dwelling organisms ingest the minute tyre wear particles, which clog their gut, and with no room for food, the organisms slowly starve to death. Concurrently, toxins leaching from ingested microplastics and heavy metals interfere with the host's reproductive systems and cause cancers by disrupting the forming of cells. There is also a bioaccumulation effect on humans to consider.

 $^{^3\} https://www.emissions analytics.com/news/pollution-tyre-wear-worse-exhaust-emissions$

In December 2020, the US reported mass die-offs in coho salmon. A preservative used in car tyres, 6PPD, causing the deaths.⁴

Further, artificial turf pitches, playgrounds, and walkways in Norway use rubber granules from discarded tyres. These artificial turf fields lose 65 tonnes of granules on clothing and shoes annually. Washed into the sea from machine washing (approximately 10,000 used car tyres) and a further 3,200 tonnes disappear down stormwater drains.⁵

Unless stormwater is treated to remove these toxic contaminants, we will see increased impacts on the health of sediment-dwelling marine and land organisms, resulting in a total ecological collapse from the loss of primary producers of food chain.

Research into tyre wear pollution is in its infancy. Currently, research tools cannot identify the black tyre wear fragments amongst other microplastics.



Microscopic tyre wear particles found in a wetland's sediment⁶



Tyre wear sludge, caught in a filter

Stormwater treatment works extremely well by capturing tyre wear sludge from road runoff. But when working efficiently, filters need cleaning weekly. Councils do not and will never have the budget to accommodate such heavy maintenance unless a new funding model is adopted.

To cover capital works and ongoing maintenance new funding models could include a combination of extra taxes on tyres and petrol and a levy connected to car registration.

 prioritising rainwater and stormwater harvesting and recycled water for irrigation and cooling to offset the additional water required by a greater canopy cover pg. 83

Microplastics have physical and chemical characteristics that alter soil bulk density, contain microbial communities, and water holding capacity that influence plant growth negatively.⁷

A recent NSW study showed that microplastics can also block soil pores, preventing or limiting plant growth because air and water can't move properly through the soil. Once in soil, microplastics are impossible to remove, so it is important to protect our soils from microplastic pollution (Cattle et al. 2020). (Pg. 9, Cleaning Up Our Act Redirecting the Future of Plastic in NSW Discussion Paper)

⁴ https://www.sciencedaily.com/releases/2020/12/201203144228.htm

⁵ https://partner.sciencenorway.no/chemicals-fram-centre-pollution/chemicals-from-rubber-playgrounds-and-artificial-turf-pitches-pollute-the-sea/1739201

⁶ https://www.sciencedirect.com/science/article/abs/pii/S0048969719363521

⁷ https://www.ehn.org/plastic-in-farm-soil-and-food-2647384684/earthworm-impacts

and from the same plan, Recent research estimates microplastic concentration in soils and in freshwater ecosystems is between 4 and 23 times higher than in the oceans (pg. 10)

Microplastics from stormwater and wastewater used to irrigate agriculture are already in the fruit and vegetables that we eat.⁸ .

Challenges for integrated water management (pg.85)

Stormwater planning and management is not integrated into general water planning

We fear that stormwater will be integrated into general water planning and continue as the poor cousin, with funding dispersed primarily between water and wastewater, especially when...

Sydney Water has forecast approximately \$13 billion of investment for wastewater management up to 2030, increasing to \$24 billion by 2050. (pg.108)

Challenges for waterway health (pg. 98)

We face some significant challenges in improving the health of our urban waterways. These include:

Ageing infrastructure that is reaching capacity and often fails to protect the natural environment

We agree. Developers constructed some assets without consideration to ongoing operations, maintenance and replacement costs. Councils admit in their stormwater management plans that maintenance costs are increasing while services to assets are decreasing, adding further fuel that a stormwater utility charge is necessary.

Strategic pathway: Priority 4 (pg.100)

Stormwater Shepherds applauds priority 4. Thank you!

• Water quality—Through the NSW Water Strategy, the Government is adopting a more intense, state-wide focus on improving water quality... accountabilities and frameworks for monitoring, assessing and addressing water quality risks across the state...

Stormwater Shepherds asks that car emissions and tyre wear pollution from road runoff and rubber granules from synthetic playgrounds sporting fields and paths be monitored and assessed.

Groundwater in Greater Sydney (pg.105)

More information is needed to better understand groundwater processes, usage and impacts.

Groundwater is hugely vulnerable to pollution from the toxins leaching from plastics and other pollutants from landfill sites and WSUD's. Risk assessments are needed to address infiltration from landfills and WSUD runoff to groundwater. Road runoff contains dissolved metals and toxic organic compounds that can leach down through infiltration of WSUD devices and cause pollution of underlying groundwater.

⁸ https://www.sciencedirect.com/science/article/pii/S0013935120305703

Landfills leaching deadly toxins into groundwater is not sufficiently addressed throughout Australia. Whereas, in the UK landfill liners are used to capture toxins. ⁹.

4.3 Improve stormwater management (pg.110)

 Without careful management, stormwater has major impacts on the ecological health and recreational quality of waterways and marine and land environments. However, if managed well, stormwater can be a valuable resource that contributes to ecological health and to making green, cool and attractive urban places.

Stormwater Shepherds applauds Strategic priority 4.3.

Due to microplastics found in stormwater, primarily from road runoff, we request that you include land in the first paragraph... *waterways, marine and land environments.*

Challenges for stormwater management

• Stormwater continues to be a major source of litter, plastics, sediment, nutrients, chemicals and metals that pollute our waterways, harbour and ocean with devastating effects.

We request ... with devastating effects ... be added to this point.

 Community awareness about how households and businesses can contribute to reducing stormwater runoff remains relatively low

Harness the strength and commitment from environmental and community groups to help highlight the ramifications and possibilities of stormwater.

• The stormwater drainage network typically does not meet contemporary standards throughout most of Sydney's established suburbs.

Stormwater Shepherds agrees with the above point, which is also relevant throughout the state. For example, one Sydney council states 150 years useful life for nearly all stormwater assets, while another Sydney council states 100 years for all assets. A regional council states 80 -100 years, and NSW Reference Rates Manual states 30 -100 years.¹⁰

• There are inconsistencies in the design standards, performance and monitoring of stormwater drainage and water sensitive urban design across Greater Sydney.

SQIDEP, Stormwater Quality Improvement Device Evaluation Protocol, is a model used to monitor stormwater. The model delivers consistent and comparable monitoring to measure all stormwater infrastructure. SQIDEP also guides field monitoring programs and reporting to achieve planning water quality measures and demonstrating pollutant removals.

Currently, Stormwater Australia is introducing SQIDEP to the country, but it is a slow rollout and it is not mandated.

⁹ https://www.gov.uk/guidance/landfill-operators-environmental-permits/design-and-build-your-landfill-site

¹⁰ https://www.water.nsw.gov.au/__data/assets/pdf_file/0004/549598/nsw-reference-rates-manual-valuation-of-water-supply-sewerage-and-stormwater-assets.pdf, pg.64

The UK has developed a Design Manual exhibiting designing, constructing, operating, installing, and maintaining stormwater drainage and WSUD. Recently, Stormwater NSW launched an Operations and Maintenance Manual, but it is guidelines and is not regulated.

The NSW government has a unique opportunity to regulate all stormwater infrastructure design, construction, operations, installation, and maintenance. Consistency is imperative to ensure compliant and effective stormwater networks. Stormwater Shepherds urges the government to take the reins and mandate SQIDEP and adopt Stormwater NSW's Manuel as a base and expand to include design, construction and installation. If left to councils, there will be no consistency, and a mish-mash approach will continue.

• Most local councils have limited access to advice and expertise regarding the application of water sensitive urban design.

Yes, this is correct. In the UK, CIRIA, Construction Industry Research and Information Association, a neutral not for profit, provides technical training for all councils on WSUD design.

For a small fee, a centre of excellence or a national body with stormwater expertise can provide councils with the necessary expertise. This is especially so for smaller councils who can't afford roles for ecologists or water quality specialists. For example, this could be a university or councils working together to employ an expert to train and provide advice.

The Greater Sydney Water Strategy will include actions to better manage stormwater through the application of WSUD. This could include:

• Developing a new, more streamlined and better coordinated model for stormwater governance.

As mentioned above, consistency through regulated standards and accredited infrastructure is urgently needed across the industry. Stormwater Shepherds supports taking everything stormwater under one roof as a separate department. Independently funded through a user-pays stormwater utility charge, with extra revenue from a vehicle levy and taxes from new tyre sales and petrol to control road runoff pollutants. Job creation will be extensive, and NSW will enjoy clean rainwater flowing into waterways from a smoothly run and coordinated model.

 A more coordinated and transparent approach to managing urban stormwater, including a mechanism to deliver water objectives and defining levels of service for stormwater management

Stormwater Shepherds requests the following:

- 1. All council and industry employees understand the ramifications of unmanaged stormwater and the health impact to humans and all lifeforms from microplastics and harmful toxins. Without this understanding, the urgency to manage stormwater is lost
- 2. Regulated standards across the state
- 3. Accredited infrastructure to reduce inefficiencies and shonky replicas
- 4. Design manual mandating how to design, construct, operate, install and maintain (cleaning, repairing, replacing) stormwater drainage and WSUD
- 5. Compulsory annual auditing and consistent record-keeping for councils and the private sector
- 6. Provide clear guidance and consistency to rate payers and commercial properties

- 7. Correct management of existing maintenance, backlog and forward infrastructure planning.
- Improving the resilience of the stormwater network, such as replacing ageing drainage assets

If stormwater is not separated, competition between the three waters will determine funding projects. A separate stormwater department using a user-pays utility charge will provide correct management.

4.4 Protect water for recreation (pg.114)

 improve stormwater management and harvesting to create and sustain recreational lakes and wetlands

Before directing stormwater to recreational lakes and wetlands, stormwater must first be treated. Pre-treatment are sediment removal devices such as a separator or a vegetative device - manufactured floating-wetlands or a bioretention zones. By pre-treating the stormwater in this way and then directing it to lakes and wetlands, we can create excellent habitats for wildlife and recreational facilities for local people. *Challenges for coastal management (pg.115)*

Reduce the causes of diffuse source urban water pollution (discussed earlier under Priority 4)
that bring litter, plastics and other contaminants to our rivers and coast, and contribute nutrients
and sediments that cause excessive weed growth and algal blooms, which affect water-based
recreational activities and tourism.

A well designed WSUD scheme can capture and treat urban water pollution, removing litter, plastics, chemicals and sediments. Gross pollutant traps are excellent devices to capture the litter and microplastics, and devices such as raingardens, artificial wetlands, ponds and basins will capture microplastics, dissolved metals, nutrients and toxic organic compounds. Vegetative devices with soil layers that are allowed to be wet and dry from time to time are known to break down many organic pollutants. If devices are big enough to allow the stormwater to 'rest' for a while, sedimentation will remove the polluted sediment. However, these devices must be big enough to cope with the expected stormwater flow rate, and they must be maintained to prevent the accumulation of contaminants.

 Better manage the discharge of urban stormwater to our urban rivers, bays and harbours including Sydney Harbour, by strengthening oversight, coordination, compliance and enforcement activities.

Stormwater urgently needs a united approach - by educating community members and council employees about stormwater, adopting a user-pays model, mandated standards, accredited infrastructure, and hopefully large fines for polluters.

Water management and services meet community needs Strategic pathway: Priority 5

 Consult with Aboriginal people and communities across Greater Sydney regarding this strategy Dangers from contaminated water to indigenous people are currently unquantifiable. Water has a deep invisible connection with Aboriginal people - their spirit and culture, their stories, songs and dreamtime and a connection to others.

They believe it is unsafe to swim in water when the first rains arrive after a drought and that the rains wash away sickness into water. This is true, particularly the first rains that wash toxic pollution into waterways, and the pollutants affect the lifeforms.

Indigenous communities eat seafood, and research shows that shellfish especially are susceptible to ingesting microplastics.

3.70 Studies have concluded that humans may ingest microplastics through the consumption of seafood. A study conducted on Belgian mussels identified that approximately 300 plastic particles (or 1.5 µg) would be consumed in a 300 g serving of mussels.[91] Similarly, another study estimated that in a 100 g serving of oysters, 50 particles would be consumed. 11 Federal government Senate Report - Environment and Communications - Marine plastics

5.2 Enhance community confidence through engagement and transparency

Engagement is key to the drafts ' success for the NSW government to succeed with buy-in from the community and commercial sectors. Community groups and not-for-profits will be key to engaging community confidence.

Currently, Stormwater Shepherds' community campaign supports sharing knowledge on everything stormwater and changing our polluting ways. Our website is appealing and provides hope rather than scaremongering or portraying doom and gloom.

Science alone will not stop the damage from plastic and urban pollution. It needs to be a united front involving everyone.

5.3 Manage price impacts for customers (pg. 122)

While Sydney's water bills have been among the lowest in Australia, this draft strategy highlights the need to invest soon to service Greater Sydney's growing population and manage the risks and impacts of a changing and more variable climate. In particular, we will need to invest in new rainfall-independent sources of supply.

Stormwater Shepherds agrees. Correctly funding and treating stormwater is critical for the sake of our waterways and the health of all lifeforms.

Summary

Pollution from stormwater is the primary threat to the ecological integrity of Greater Sydney's waterways, jeopardises social, environmental and economic gains and is a health hazard.

A safe, fair and accountable stormwater user-pay model will provide funding for a new department, create thousands of jobs and, most importantly, correctly treat stormwater that is clean water.

¹¹https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Environment_and_Communications/Marine_plastics/Report/c03

Stormwater Shepherds recommends the following initiatives:

- Promote stormwater to the same level as water and wastewater and acknowledge stormwater as one of the main polluters of water and land
- Adopt a user-pay stormwater utility charge that provides councils with the means to manage stormwater networks including backlog and capital works correctly
- Pay for new filtration infrastructure on all road networks to capture road runoff with a levy or tax from vehicle registration, tyres and petrol
- As a next step encourage councils and regions to invest in a feasibility study on stormwater utilities
- Introduce regulated stormwater standards such as a design manual mandating how to design, construct, operate, install and maintain (cleaning, repairing, replacing) stormwater drainage and WSUD (Note: Stormwater NSW has introduced guidelines to operating and maintaining stormwater)
- Mandate SQIDEP
- Accredited infrastructure to reduce inefficiencies and shonky manufacturing
- Compulsory annual auditing and consistent record-keeping for councils, Sydney and Hunter Waters, and the private sector
- Identify a centre of excellence or a state body to help with training and technical advice, such as a university. Encourage councils to work together to pool and pay for
- Improve water quality by installing correct treatment traps and continued testing of water and land sediment
- Engage the community to change mindsets about polluting habits
- Change council policy to include ongoing stormwater management in private DA's
- Mitigate water flow through correct stormwater infrastructure, including SMART water tanks for every property

The more you pave, the more you pay.

Warmest Regards,

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