



SYDNEY COASTAL COUNCILS GROUP INC.

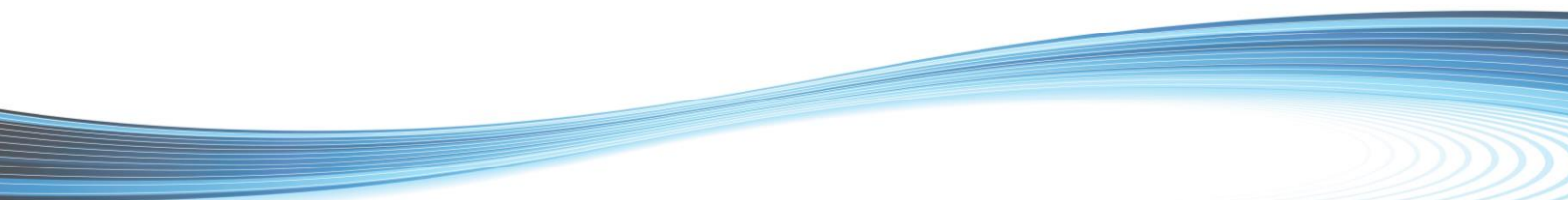
councils **caring** for the coastal environment

SUBMISSION

Review of Sydney Water Corporation's Sewage Treatment Environment Protection Licences

May 2015

044-15EN
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Introduction

We are a voluntary Regional Organisation of Councils (ROC) representing 15 Sydney coastal councils (www.sydneycostalouncils.com.au). We are the peak NSW ROC representing coastal councils and the third largest based upon population.¹ We have 25 years' experience leading sustainable coastal management.

We harness the individual and collective knowledge of our Member Councils, a suite of technical and academic experts as well as other stakeholders. Engagement is undertaken through a range of communications including meetings, workshops, information sessions and publications. Accordingly, we are able to provide unique insights drawing upon the technical, experiential and local knowledge of our Members.

We have a long history in sewage-related issues. We were established in 1989 when we spearheaded a campaign to address shoreline sewage outfalls off Sydney's iconic beaches. We worked with the then Water Board and the NSW Government to resolve the severe pollution problems, resulting in the installation of deep ocean outfalls.

Over the last 25 years our scope of interest has expanded significantly. We have worked in partnership with Sydney Water and other State agencies to promote an integrated management approach across stormwater, assets and infrastructure, water recycling and climate change adaptation.

We welcome the opportunity to contribute to this Review and will continue to identify and harness opportunities for collaborative action to continuously improve Sydney's sewage system.

Scope and structure of this submission

This submission focuses on the area in which we have specific knowledge and expertise, namely the urban coastal and estuarine environment. General comments are provided, followed by specific comments under the following key areas:

- Limits on pollutant discharges
- Operation and maintenance of the system
- Treatment processes
- Sewage overflows
- Monitoring requirements
- Pollution Reduction Programs (PRPs)

¹ Gooding, A 2012, *A Comparative Analysis of Regional Organisations of Councils in NSW and Western Australia*, Australian Centre of Excellence for Local Government, University of Technology Sydney.

1 General Comments

As a matter of principle, we would like to see the licensing system used to drive a proactive approach to continuous improvement of sewage treatment and management in Sydney, in line with international best practice. Currently the licences are framed in the context of legacy infrastructure and system constraints, thus continuing a business-as-usual approach with limited improvements. By contrast, we would like to see ambitious performance targets and a whole-of-government commitment to invest in and maintain a sewage system that will accommodate increased population pressures and a changing climate with minimal environmental impact.

We appreciate that Sydney Water is limited by funding and resource constraints, which is why we are calling for a whole-of-government commitment to strategic investment in infrastructure renewal, augmentation, adaptation and innovation. Income streams and payment dividends to the State Government need to be reviewed in this context. The EPA can play a role by reframing the licensing system to incentivise continuous improvement and strategic investment.

In framing the new licences we recommend the EPA use the 'waste minimisation hierarchy' as a guiding framework (Figure 1). The current licensing framework is heavily focused at the bottom of the waste hierarchy on the transport, treatment and disposal of sewage. Licence conditions should be expanded up the waste hierarchy to promote investment and innovation in waste reduction, reuse, recycling and energy recovery. We believe there are significant improvements to be made across the spectrum:

- **Avoid and reduce:** improve demand management strategies to promote source reduction and water conservation.
- **Reuse, recycle and recover energy:** invest in technologies to reuse, recycle and recover energy from effluent. This requires a fundamental change in thinking that recognises effluent as a 'resource' rather than a 'waste'.
- **Treat:** improve treatment processes to at least secondary treatment and promote point-source treatment and reuse.
- **Dispose:** Increase capture of solids, investigate decentralised systems and work towards the phasing out of Deep Ocean Outfalls by mid-century.

There is also a need to extend planning horizons beyond the five-year intervals currently in place. Components of the licensing system could be extended to facilitate long-term planning (20-50 years ahead), with short- to mid-term reviews. In particular, Sydney Water should be required to report on the adaptive capacity of the sewage network to cope with climate impacts including sea level rise, population growth and changes in industry over a 50 year planning horizon. Clear and transparent performance metrics are needed to drive continuous improvement, system maintenance and potential augmentation.

Finally, there are opportunities for enhanced coordination and information-sharing between councils and Sydney



FIGURE 1: WASTE HIERARCHY (SOURCE: NSW ENVIRONMENT PROTECTION AUTHORITY)

Water, to improve incident response, asset management and planning, monitoring and community engagement.

Recommendations:

- 1.1 Expand licence conditions up the waste hierarchy to promote investment and innovation in waste reduction, reuse, recycling and energy recovery.
 - 1.2 Extend components of the licensing system to facilitate long-term planning (20-50 years ahead), with short- to mid-term reviews.
 - 1.3 Require Sydney Water to report on the adaptive capacity of the network to cope with climate impacts including sea level rise, population growth and changes in industry over a 50 year planning horizon.
 - 1.4 Facilitate coordination and information-sharing between councils and Sydney Water, to improve incident response, asset management and planning, monitoring and community engagement.
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2 Limits on pollutant discharges

Sydney Water should be incentivised to achieve overall reductions in waste disposal (particularly trade waste), through improved operations, decentralised treatment, targeted demand management initiatives and public and private infrastructure improvements. Both Sydney Water and the numerous industries disposing of trade waste into the sewage system under licence have responsibilities for continuous improvement to operations and a resultant overall reduction in pollutant disposal to the environment. The EPA should assist Sydney Water to work with industry on these issues.

Load limits should reflect potential harm to the environment, not the processing capacity of the plant. Current limits are designed to “restrict the discharged mass of pollution to levels which either cause minimal harm to the environment or to levels that reflect approved processing capacity of the plant”² (emphasis added). This implies environmental considerations can be overridden by infrastructural constraints and precludes a proactive approach to improvements across all sewage treatment networks. It is also unclear why load limits for heavy metal pollutants only apply to larger treatment plants. If small plants are receiving these pollutants they should be subject to load limits too.

The inadequacy of the current limits is clearly demonstrated at North Head STP. The latest National Pollutant Inventory reported significant increases in heavy metal (mercury) levels from North Head STP with 30kg released in 2013/14, up from 8 kg the previous two years. Surprisingly, this was still within the loads limits of the licence, which allow for 60kg to be released. The enormous gap between the load limits and actual pollution demonstrates that the licences provide no incentive to improve environmental outcomes. Pollutant load limits should be significantly reduced across all licences. This would provide an incentive for industry to find alternative ways to dispose of, reuse or recycle their liquid waste and to use less toxic materials in their operations. Sydney Water has an incentive not to reduce these pollutant loads because of the levies they receive for the removal of trade waste. Therefore it should be the EPA that determines these limits.

² EPA (2015) *Fact Sheet: Overview of Sydney Water Corporation's Sewage Treatment System Environment Protection Licences issues by the EPA*

Furthermore, the load limits should be progressively tightened over the duration of the licence, rather than static. This could be achieved through an end-of-licence target and related 'sunset clauses' that require incremental reductions in pollution over the five-year period. These reductions could be achieved through water sensitive urban design (WSUD), alternative uses such as reuse of solid and liquid waste, full scale potable reuse and on-site disposal. For example, specific target dates and associated implementation strategies could be developed in partnership with Local and State Governments for 100% diversion of grey water for appropriate treatment and reuse, and maximum reuse of biosolids. These activities would significantly augment system capacity and allow for progressive reduction in pollutant discharges.

Recommendations:

- 2.1 Incentivise Sydney Water to achieve overall reductions in waste disposal (particularly trade waste), through improved operations, decentralised treatment, targeted demand management initiatives and public and private infrastructure improvements.
 - 2.2 Set pollution load limits according to environmental impacts and continuous improvement, not plant capacity and system constraints.
 - 2.3 Investigate why load limits for heavy metal pollutants only apply to larger treatment plants. If small plants are receiving these pollutants they should be subject to load limits too.
 - 2.4 Introduce end-of-licence targets and sunset clauses that require incremental reductions in pollution over the duration of the licence.
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3 Operation and maintenance of the system

Coastal processes, hazards and climate change

The impacts of coastal processes, hazards and climate change urgently need to be incorporated into the licence conditions for Sydney Water's sewage treatment systems. Regulating adaptation options and implementation pathways will ensure long-term system integrity. It is well known that critical parts of Sydney water's assets are exposed to current and future hazards from coastal processes, including inundation and erosion. Long term planning and investment commitments are critical to ensure that current and future impacts of climate change are addressed.

Specifically, the design and location of Sydney Water sewage infrastructure needs to be incorporated into the operating conditions of the licence. These should be adjustable to ensure continuous improvement and adaption of the system as natural hazard profiles, recurrence intervals and hazards change with climate change. For example, time-bound and strategic investment plans should be developed to ensure all critical infrastructure is relocated outside 1:100 year flood plains and above 1:100 year coastal inundation levels. Accommodation of lower recurrence intervals (e.g. 1:10 to 1:50 year events) also needs to be considered in the design of the system (e.g. vulnerable infrastructure could be retrofitted to prevent ingress and enhance structural stability).

In addition, stronger partnerships with coastal managers (particularly Local Government) are needed to ensure that there is a collective determination and ongoing commitment to developing and implementing preferred climate change adaptation options across the spectrum of accommodation, protection and retreat. Our project [Demonstrating Climate Change Adaptation of Interconnected Water Infrastructure](#) provides a guiding framework. In

partnership with Sydney Water, the Water Research Laboratory (UNSW) and the NSW Office of Environment and Heritage (OEH), the project developed information, guidance and capacity building activities to ensure that organisations responsible for managing water infrastructure are able to implement appropriate asset management systems in a changing climate.

Seawater ingress

There is evidence of seawater ingress across the sewage network. Sutherland Council has observed saltwater in treated effluent from the ocean outfall line from the Cronulla STP, suggesting the problem is not isolated to a few problem areas, but is pervasive across the network. This observation is quite significant given that the majority of the network is not subject to tidal influences.

Presumably this will be impacting on the overall capacity of the treatment system, causing it to enter into bypass conditions more quickly than it otherwise would. Historically (5 or more years ago) the network would only go to bypass during major rainfall events, whereas today it can during relatively minor rainfall events. Other potential causes such as illegal connections are unlikely as most new development should be removing historic illegal connections.

It is unclear whether Sydney Water has a proactive program to minimise the ingress of seawater, or if they are aware of problem locations. To the contrary, at the Cronulla STP it appears that the level of ingress has become normalised and incorporated into the standard operating procedures. As such, it is recommended that monitoring and mitigation of seawater ingress become one of the licence conditions for the operation of all STPs.

Site management

In operating and maintaining the sewage treatment system, consideration should be given to impacts on the surrounding environment. For example, the North Head STP has on its site nationally endangered Eastern Suburbs Banksia Scrub and is part of the habitat for the state-listed endangered population of Long-nosed Bandicoots. Generally, there should be greater recognition of site-specific factors in the operating conditions of the licences. For environmentally sensitive sites such as North Head, a site management plan should be required.

Network maintenance

A methodology should be developed in partnership with Local Government for determining maintenance works. This would allow for better coordination of activities, less disruption to the community and potential cost-savings. An environmental and human health risk management approach to determine investment priority is required and should be publicly reported. Investment decisions should also take account of catchment loads and trade waste licence fees should help fund network upgrades.

Information relating to network maintenance and system audits should be shared with councils to help guide asset management. Councils may also have spatial data that they can share with Sydney Water to improve information management.

Recommendations

- 3.1 Mandate consideration and mitigation of the impacts of coastal processes, hazards and climate change in the operating conditions of the licences.
- 3.2 Establish timeframes for relocating and/or retrofitting Sydney Water infrastructure to reduce vulnerability to climate change impacts.

- 3.3 Establish partnerships with coastal managers, particularly Local Government, to advance preferred climate change adaptation options.
 - 3.4 Add a licence condition requiring monitoring and mitigation of seawater ingress across the network.
 - 3.5 Expand the operating conditions to require greater recognition of site-specific environmental factors and mandate site management plans where infrastructure is located in environmentally sensitive areas.
 - 3.6 Establish a methodology in partnership with Local Government for determining maintenance works, taking account of human health and environmental risks, and catchment loads.
 - 3.7 Ensure fees collected from trade waste licences are used to fund infrastructure upgrades.
 - 3.8 Establish information-sharing agreements with Local Government.
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4 Treatment processes

The current (advanced) primary treatment levels at the three major ocean STPs (Malabar, Bondi, Manly) are environmentally and socially unacceptable in 2015. Currently, "treatment processes are based on the capacity and efficiency of the treatment plant and the nature of sewage being received".³ This implies a poor plant will deliver poor treatment and provides no impetus for Sydney Water to progressively improve the system. Physical and technological restrictions can no longer be used as an excuse to maintain the worst level of sewage treatment in the country, particularly as these plants manage 75 per cent of all of Sydney sewage.

All other major plants in our nation's capitals, other than Darwin, have secondary or tertiary treatment before discharge. In 1991 the European Union agreed to a mandate that major plants across 27 European countries have at least secondary and preferably tertiary treatment. The USA has a requirement for major plants to discharge at least secondary treated sewage and there are similar examples in New Zealand, Singapore and Japan.

The EPA, NSW Government and Sydney Water must work collaboratively to determine a target date to implement tertiary treatment through the system. This should be regulated through the licence conditions. The State Government should review the Sydney Water dividend payment with a view to increasing financial investment and incentives for Sydney Water to achieve this target.

Alternative treatment options should also be considered, including reuse and decentralised treatment and disposal. In particular, the EPA and Sydney Water should establish industry partnerships to promote greater source treatment of trade waste.

Recommendations

- 4.1 Develop a target date and implementation plan for tertiary treatment through the system.

³ EPA (2015) *Fact Sheet: Overview of Sydney Water Corporation's Sewage Treatment System*
Environment Protection Licences issues by the EPA

- 4.2 Review the Sydney Water dividend payment to State Government with a view to increasing financial investment and incentives to improve treatment processes.
 - 4.3 Mandate implementation of alternative treatment options, including reuse and decentralised treatment and disposal.
 - 4.4 Establish industry partnerships to promote greater source treatment of trade waste.
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5 Sewage overflows

Wet weather overflows

Licence conditions should require progressive reduction of bypasses that occur during wet weather at sewage treatment plants. These bypasses are caused by ingress of water to the reticulated sewage system and licence conditions should reflect the ongoing need to eliminate this ingress. Furthermore, targets and limits on the number of sewage overflows that are permitted to reach waterways should be constantly reviewed and reduced over time. These should be based on volumes and effluent concentration, not simply frequency.

The stormwater system is the primary conduit of sewage overflows to the receiving environment. As such, the stormwater system (not just stormwater assets) owned and managed by Sydney Water needs to be considered as part of the licence design and performance provisions. Sydney Water should also be required to invest in other parts of the stormwater system that function as conveyances of sewer.

There are opportunities for stormwater capture, treatment and reuse to reduce volumes and pollutant loads entering the sewage system. The licence conditions should promote partnerships with Local and State Governments to drive greater investment in these areas.

Dry weather overflows

Sydney Water, in partnership with Local and State Governments, should work towards the minimisation of dry weather overflow events. This could be achieved through a long-term (5-10 year) licence objective for no further dry weather overflows. Specific timing and activities required to achieve that objective should be determined in consultation with Sydney Water.

We would also like to see a formal process where Local Government and Sydney Water work cooperatively to identify and repair dry weather overflows. While councils do not have the resources to trace overflows to their source, they can assist Sydney Water to detect them. Currently, councils do not have clear guidelines as to what to monitor, who to report to, and what response they can expect. Sydney Water and councils also need to work more cooperatively together to maintain the integrity of private sewage systems, focusing particularly on private sewers outside property boundaries.

Pollution notifications

There needs to be greater clarity around the roles and responsibilities of Sydney Water and the EPA relating to pollution notifications. Under condition R4 of the EPLs, Sydney Water is required to notify the EPA and other relevant authorities where a dry weather overflow or untreated sewage or effluent has been, or is reasonably expected to be, discharged to waterways. While s148 of the *Protection of the Environment Operations Act 1997* stipulates that 'relevant

authorities' includes the local council, this should be explicitly stated in the licence conditions to promote transparency and accountability.

We acknowledge that Sydney Water has identified local councils for notification in their [Pollution Incident Response Management Plan](#), however Member Councils have reported that notifications are not forthcoming and there is confusion around standard protocols. It has been reported that notifications are being made by fax, which is an unreliable and untimely method of communication for our times. Sydney Water used to publish notifications of overflows over a 7-day period on their website, however this no longer occurs. At a minimum, Sydney Water should be required to resume overflow notifications on their website. In addition, they should be required to develop a communication plan for overflow sites, including stakeholder identification and notification requirements, communication channels and clarification of roles and responsibilities relating to response and repair. The plan should be communicated and agreed with all stakeholders and approved by the EPA.

Clarity is also needed on notifying the general public about pollution events. During and after wet weather there is general community awareness about the potential risks of swimming, however this is not the case for dry weather overflows. Particularly where a dry weather overflow is likely to reach the coast or a swimming / primary contact area, there should be a systematic process for notifying the community of potential risks, including:

- Erecting temporary signage at primary contact locations to warn the general public of pollution
- Providing electronic alerts to interested stakeholders and user groups via SMSs or similar in relation to overflows, bypasses, beach and waterway closures and re-openings.

Recommendations

- 5.1 Amend licence conditions to require progressive reduction of bypasses that occur during wet weather at sewage treatment plants.
 - 5.2 Progressively reduce the number of permissible wet weather overflow events based on volumes and effluent concentration, not simply frequency.
 - 5.3 Integrate the stormwater system into licence design and performance provisions, acknowledging its conveyance of sewer especially during wet weather conditions.
 - 5.4 Expand the licence conditions to promote partnerships with Local and State Governments to drive greater investment in stormwater capture, treatment and reuse.
 - 5.5 Facilitate a partnership approach with Local Government to monitor and mitigate overflows.
 - 5.6 Require public reporting of overflow events on the Sydney Water website.
 - 5.7 Require Sydney Water to develop a communication plan for overflow sites, including stakeholder identification and notification requirements, communication channels and clarification of roles and responsibilities relating to response and repair. The plan should be communicated and agreed with all stakeholders and approved by the EPA.
 - 5.8 Establish a systematic process for notifying the community of potential risks following overflow events, including temporary signage and electronic alerts.
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6 Monitoring requirements

Scope of monitoring requirements

Monitoring requirements should be expanded across the following areas to inform performance benchmarks and promote continuous improvement:

- Monitoring and public reporting of overflow points should be required so that the frequency and severity of overflow events can be quantified and progressively reduced.
- Monitoring requirements should be expanded to cover cumulative impacts on recreational water quality and ambient environmental conditions in:
 - areas where stormwater outlets / receiving waters have historically shown high levels of faecal contamination
 - areas identified by Sydney Water, local councils, the EPA, Fisheries or RMS as problem areas due to known network factors or water quality data.
- Monitoring and reporting on groundwater and seawater ingress into the sewage system should be required.
- Monitoring and investigation of airborne emissions, and in particular odours (beyond hydrogen sulphide), should be expanded.

Availability of information

All monitoring activities should be publicly reported in a simple and accessible manner. We acknowledge and support Sydney Water's public reporting of monitoring outcomes, however reporting on compliance with licence conditions can be challenging to find and understand. It would be beneficial if this information could be consolidated across multiple sites and networks, to allow for an assessment of performance at local and regional scales. This information should also be consolidated over time, so that improvements or deterioration in performance can be easily identified. This will enhance transparency and provide an incentive for Sydney Water to improve its performance and for the NSW Government to invest appropriately in the network.

Recommendations

6.1 Expand the scope of monitoring and reporting requirements to cover:

- a) overflow points
- b) cumulative impacts on recreational water quality and ambient environmental conditions in sensitive areas
- c) groundwater and seawater ingress
- d) airborne emissions (beyond hydrogen sulphide).

6.2 Consolidate information on compliance with licence conditions:

- a) across multiple sites
 - b) across the entire network
 - c) over time.
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7 Pollution Reduction Programs (PRPs)

It is currently unclear how PRPs are initiated. There should be a clear and transparent process for engaging the community and Local Government in the design and implementation of PRPs. Sydney Water should also be required to report publicly on the progress of implementation of PRPs.

Recommendations

- 7.1 Establish a clear and transparent process for engaging the community and Local Government in the design and implementation of PRPs.
 - 7.2 Require Sydney Water to report publicly on the progress of implementation of PRPs.
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SUMMARY OF RECOMMENDATIONS

1 General comments

- 1.1 Expand licence conditions up the waste hierarchy to promote investment and innovation in waste reduction, reuse, recycling and energy recovery.
- 1.2 Extend components of the licensing system to facilitate long-term planning (20-50 years ahead), with short- to mid-term reviews.
- 1.3 Require Sydney Water to report on the adaptive capacity of the network to cope with climate impacts including sea level rise, population growth and changes in industry over a 50 year planning horizon.
- 1.4 Facilitate coordination and information-sharing between councils and Sydney Water, to improve incident response, asset management and planning, monitoring and community engagement.

2 Limits on pollutant discharges

- 2.1 Incentivise Sydney Water to achieve overall reductions in waste disposal (particularly trade waste), through improved operations, decentralised treatment, targeted demand management initiatives and public and private infrastructure improvements.
- 2.2 Set pollution load limits according to environmental impacts and continuous improvement, not plant capacity and system constraints.
- 2.3 Investigate why load limits for heavy metal pollutants only apply to larger treatment plants. If small plants are receiving these pollutants they should be subject to load limits too.
- 2.4 Introduce end-of-licence targets and sunset clauses that require incremental reductions in pollution over the duration of the licence.

3 Operation and maintenance of the system

- 3.1 Mandate consideration and mitigation of the impacts of coastal processes, hazards and climate change in the operating conditions of the licences.
- 3.2 Establish timeframes for relocating and/or retrofitting Sydney Water infrastructure to reduce vulnerability to climate change impacts.
- 3.3 Establish partnerships with coastal managers, particularly Local Government, to advance preferred climate change adaptation options.
- 3.4 Add a licence condition requiring monitoring and mitigation of seawater ingress across the network.
- 3.5 Expand the operating conditions to require greater recognition of site-specific environmental factors and mandate site management plans where infrastructure is located in environmentally sensitive areas.
- 3.6 Establish a methodology in partnership with Local Government for determining maintenance works, taking account of human health and environmental risks, and catchment loads.
- 3.7 Ensure fees collected from trade waste licences are used to fund infrastructure upgrades.
- 3.8 Establish information-sharing agreements with Local Government.

4 Treatment processes

- 4.1 Develop a target date and implementation plan for tertiary treatment through the system.
- 4.2 Review the Sydney Water dividend payment to State Government with a view to increasing financial investment and incentives to improve treatment processes.
- 4.3 Mandate implementation of alternative treatment options, including reuse and decentralised treatment and disposal.
- 4.4 Establish industry partnerships to promote greater source treatment of trade waste.

5 Sewage overflows

- 5.1 Amend licence conditions to require progressive reduction of bypasses that occur during wet weather at sewage treatment plants.
- 5.2 Progressively reduce the number of permissible wet weather overflow events based on volumes and effluent concentration, not simply frequency.
- 5.3 Integrate the stormwater system into licence design and performance provisions, acknowledging its conveyance of sewer especially during wet weather conditions.
- 5.4 Expand the licence conditions to promote partnerships with Local and State Governments to drive greater investment in stormwater capture, treatment and reuse.

- 5.5 Facilitate a partnership approach with Local Government to monitor and mitigate overflows.
- 5.6 Require public reporting of overflow events on the Sydney Water website.
- 5.7 Require Sydney Water to develop a communication plan for overflow sites, including stakeholder identification and notification requirements, communication channels and clarification of roles and responsibilities relating to response and repair. The plan should be communicated and agreed with all stakeholders and approved by the EPA.
- 5.8 Establish a systematic process for notifying the community of potential risks following overflow events, including temporary signage and electronic alerts.

6 Monitoring requirements

- 6.1 Expand the scope of monitoring and reporting requirements to cover:
 - a) overflow points
 - b) cumulative impacts on recreational water quality and ambient environmental conditions in sensitive areas
 - c) groundwater and seawater ingress
 - d) airborne emissions.
- 6.2 Consolidate information on compliance with licence conditions:
 - a) across multiple sites
 - b) across the entire network
 - c) over time.

7 Pollution Reduction Programs

- 7.1 Establish a clear and transparent process for engaging the community and Local Government in the design and implementation of PRPs.
 - 7.2 Require Sydney Water to report publicly on the progress of implementation of PRPs.
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