



# Illegal dumping in sewer catchments

Lessons from the Warrnambool Sewage Treatment Plant nurdle incident



## Background

On a Saturday morning in mid-November 2017, members of the public found large numbers of pre-production plastic pellets (nurdles) washed up along the tideline at Shelly Beach in Victoria's south-west, close to the Warrnambool Sewage Treatment Plant ocean outfall.

Wannon Water, the regional water utility, was notified two days later. An initial investigation revealed that an unknown quantity of nurdles had been illegally dumped into the septage receiveal point at the sewage treatment plant. The nurdles contaminated the plant and some were expelled to the ocean through the outfall. These subsequently contaminated more than 25 kilometres of coastline.



## Agency response

### Immediate actions by utility

Wannon Water initially isolated the primary treatment tanks at the plant and physically removed several million nurdles from the infrastructure. The plant had multiple systems in place to filter out the vast majority of plastics and foreign material, including three-millimetre inlet step-screens on the main sewer inlet. The septage receiveal facility had coarser six millimetre screening. The facilities were not designed to remove microplastics such as nurdles from the final effluent.

Agency beach clean-up activities commenced within two days of being notified. A broad communications program was also initiated to inform community and other stakeholders on the status of the incident.

Screening was quickly installed on the treated effluent outlet of the plant to prevent any remnant nurdles from entering the ocean and to improve environmental protection.

### Incident reporting and emergency management

Wannon Water managed the first 10 days of the incident using established emergency response protocols.

Due to the unknown volume of nurdles involved, potential for impact on wildlife, public health and the broader environment, the incident was subsequently reclassified as a Class 2 State Emergency. The Department of Environment, Land, Water and Planning was appointed control agency, supported by multiple agencies including Wannon Water for a further three weeks.

The Class 2 State Emergency was withdrawn just prior to Christmas. Wannon Water maintained its own emergency management response until February 2018, meaning the formal response extended for 77 days. Wannon Water subsequently established an internal team to coordinate recovery efforts for another 11 months until December 2018.

## Quick facts



1. Be aware of factors impacting community attitudes during incidents; global interest, community advocates, access to social media and local community networks.



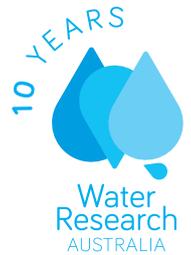
2. First-of-a-kind incidents means few lessons to draw upon. Documenting and communicating is important for future reference.



3. People matter – look after your team throughout the incident. Recognise and reward the efforts of staff.



4. Having clear crisis management protocols, lines of command and good communication between agencies is essential.



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## Community involvement

Immediately following the incident a strong social media presence was established by local community members to highlight the event, advocate for a rapid and ongoing agency clean-up effort, and mobilise community volunteers. There was significant public uptake, and rapid interest and prolonged attention from local and state media.

## Challenges of clean-up

### Issues with cleaning up nurdles

The beach clean-up efforts involved physically picking up or sieving the nurdles from the sand by hand, which was laborious. Mechanical alternatives were tested in the hope they would be more efficient, but these were found to be impractical due to the lack of beach access and the moisture content of the sand.

## Surveying for identification of the spread of contamination

A series of ongoing structured mapping surveys documented the spread, abundance and persistence of nurdles in the environment to help target locations for local clean-up activities and build a longer-term dataset to inform related activities elsewhere. These required extensive walking along isolated beaches.

### A clean-up needs a community effort

The clean-up along beaches stretching from Port Fairy to the east of Warrnambool required a sustained effort by community, as well as Wannon Water and other agency staff. Drop-off points for nurdles collected from beaches were provided in multiple locations to assist the clean-up and compile reliable data. Around 40-50 litres of nurdles (>920,000) were collected from beaches by the combined agency and community effort to December 2018.

## Nurdle Response

10 December 2018





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## Incident Impacts

### Impacts to the workforce

The emergency response and recovery process involved around half of Wannon Water's 220-person workforce, each spending an average of 40 hours on the event. This stretched the capacity, capability and resilience of a regional water utility in support of such a sustained emergency event, whilst still maintaining business-as-usual activities.

### Impacts to Wannon Water's business

By the end of December 2018 the direct cost to Wannon Water for the response and recovery effort was more than \$350,000. Additional community and agency costs have not been quantified, but were also very significant.

### Broader community and environmental impacts

Protocols were established for the collection of dead wildlife that may have been impacted by nurdles. Whilst a small number of samples were collected by the community and presented for assessment, results did not indicate that nurdles were the primary cause of death. To December 2018 there was no documented impact on wildlife or human health as a result of the incident. There was an aesthetic impact for some communities due to the visibility of nurdles on beaches.

## Key Lessons

### Being the first can complicate things

When confronted with a "first of its kind" event with the potential for a high public profile, the timeliness of engagement with community members can be considered critical.

The incident has generated considerable learnings about response and recovery for a microplastic pellet event, which could be applied to any "first of its kind" event. Existing protocols for other contaminant spills did not readily apply, hence no established clean-up protocol was available. There was no agreed credible source of information on possible environmental or human health impacts of microplastic pellets.

### Take care of your team

There were significant learnings on appropriately managing employee wellbeing throughout a protracted incident within a regional organisation.

The resilience of organisations relies on the ongoing commitment of employees. Managing an incident openly, debriefing it effectively, embedding the learnings and communicating this back to employees proved an effective approach for Wannon Water in maintaining the willingness of employees to "go beyond" their normal duties in times of crisis.

### Share the story, educate others

Since the event, the Environment Protection Authority in Victoria has published a "nurdle" page on its website (EPA, 2018). The Water Research Foundation has also added a fact sheet and valuable webinar resource providing a "state of the science" summary to their previous white paper published in 2017 (WRF, 2018). Wannon Water has completed a broad range of presentations to both water and emergency sector peer groups. The incident has highlighted the open nature of sewerage systems, and the vulnerability to previously unrecorded risks.

### Infrastructure changes over time

Water utilities have continually responded to changing circumstances, community expectations and availability of new technology. Whilst the Warrnambool Sewage Treatment Plant was representative of broader industry practices, a strategic approach to upgrading screening systems is now being implemented by Wannon Water, which may have implications for ocean outfalls Australia-wide. Continuing to review and improve practices and communicate this to stakeholders is essential in maintaining social licence to operate.

### Look out for the early indicators of community activism

There were a number of pre-cursors that contributed to the rapid escalation and level of community activism that was expressed during the nurdle incident. These may provide a generic risk management framework that could be applied for emerging issues well beyond nurdles:

- A recent rapid escalation in global interest in plastic pollution in the oceans
- Previous community concern about the presence of plastic "cotton bud" sticks on local beaches and perceived association with the Warrnambool Sewage Treatment Plant ocean outfall
- An established and competent media capability within the local community with an interest in ocean plastic and impacts to the environment

## References

EPA Victoria, June 2018, *Fact sheet: Managing plastic resin pellets (nurdles)*, Publication 1701, 2pp.

Burton, A, Sturm, B, Nielsen, P.H, Walther, S, 2018, *Occurrence of Microplastics in Water...Size Does Matter!*, Water Research Foundation Webcast, 13th December, 2018.

### Stay ahead of the curve

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[waterra.com.au/publications/fact-sheets/](http://waterra.com.au/publications/fact-sheets/)