

The logo for Central Coast Council, featuring the text "Central Coast Council" in a white, sans-serif font, centered within a white circle.

Central  
Coast  
Council

# Water Quality Investigations

## Catchment Audits

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# Terrigal swim safety category changed from Poor to Good

- Yearly grading uses the last 100 samples - 3 years of data
- It is widely accepted that changes in rainfall patterns are reflected in beach water quality over time
- Rainfall during 2014-17 years was much higher which may reduce the influence of stormwater pollution and lagoon opening on Terrigal Beach
- The audit is continuing regardless of the category change



# Issues investigated that are not pollution sources



Major topics raised by the community include:

- Dry weather flows, where are they from?
  - Sump pumps
  - Garden watering/car washing
  - Large washout and sometimes trapped by sand
  - Not a source of contamination

Is the stormwater harvester a source of contamination?

- Stormwater harvester is a water conservation facility (not stormwater reduction)
- Stormwater harvester not causing pollution (not a part of the Terrigal Catchment Audit)



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# It's brown smelly water – is it sewage?

- No.
- Sewage is comprised of 98% water.
- Incorrect association between brown and smelly water with sewage
- There are natural explanations - they have been investigated



# It's brown smelly water – is it sewage?

## Turbidity

(A measure of water clarity or cloudiness)

- Dirt from the suburb builds up in stormwater networks from gradual catchment build up (gardens and erosion and development sites) and this gets washed out all at once causing visual plumes.
- Wet weather sampling assessing this in Terrigal
- Community can report sediment and erosion issues to Council

Dirt from catchment in stormwater pipes.



Dirt washed out in rainfall.



Causes cloudy water outside drains.



Prominent plumes.



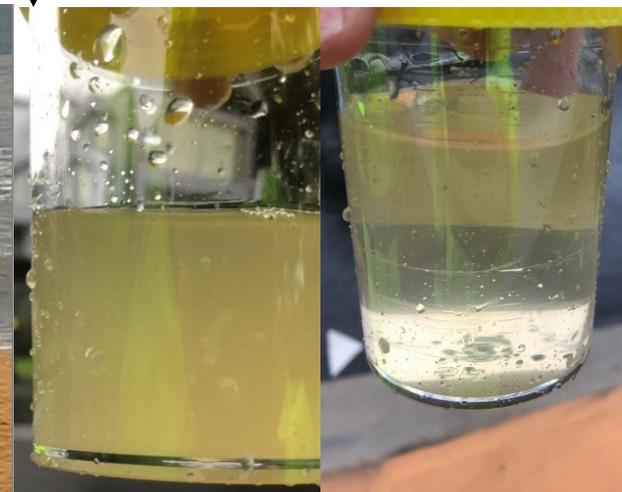
Dirt plume



Sampling in wet weather



Wet weather sampling testing turbidity to track sources.



# It's brown smelly water – is it sewage?

## Decaying seaweed or seagrass

- Brown/green/cream/froth
- Decomposition releases rotten egg gas (hydrogen sulphide)
- Sometimes becomes trapped in Northern or Southern areas of beaches
- Seaweed is protected by legislation (*Fisheries Management Act 1994*) and under Councils beach maintenance permit seaweed cannot be removed from below the mean high tide mark
- Dry weather tested

Seaweed gets dislodged from substrate (e.g. rocks) washes to shore.



Seaweed begins to decay.



Can turn water brown and create froth.



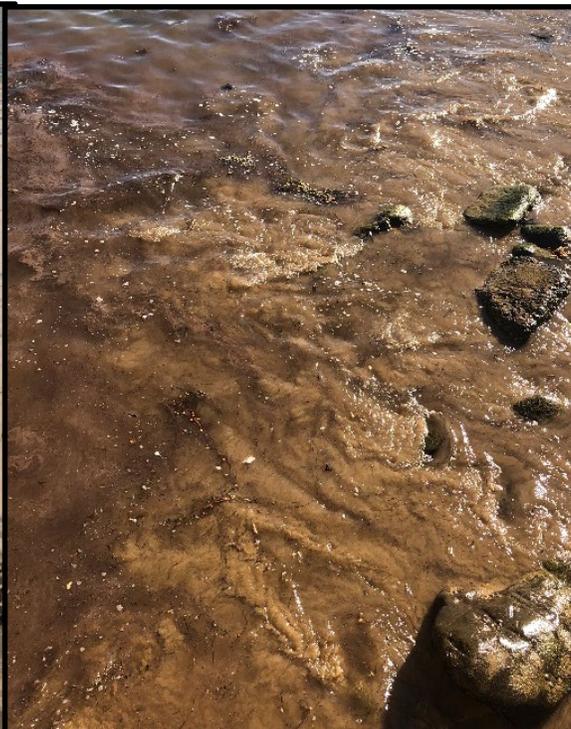
Decaying seaweed looks unappealing and smells.



# It's brown smelly water – is it sewage?

## Algal blooms

- Brown, yellow, red, pink, white or grey/green water
- Trichodesmium "Sea sawdust" first documented by Joseph Banks in 1770
- Sometimes becomes trapped in Northern or Southern parts of beaches
- Rises up in daylight, sinks at night
- Signs installed when reports come in – often across NSW



# Investigation summary

## Phase 1 – Develop our understanding

- Ocean sampling (beach and offshore)
- Pipe outlets
- Controls (neighbouring beaches Forresters and Avoca/North Avoca)

## Phase 2 – Detailed catchment investigations

- Catchment sampling in stormwater pipes
- CCTV, smoke and dye testing

## Phase 3 – Works program

- Infrastructure works



# Phase 1 complete

## Established swim safety trends for beach samples

- Dry weather generally "Good"
- Wet weather sewage contamination
- Precaution:

*"This area can be affected by stormwater pollution for up to three days following heavy rain. Swimming during this period is not recommended."*

## DNA report (DPIE)

- Not dogs
- Background birds
- Confirmed sewage contamination assessed in the context of other potential sources (other animals)



# Phase 2 underway

Sampling sub-catchments in wet weather

- 16 small sampling days (May-September)
- 1 full suite in wet weather (October)

CCTV, smoke and dye testing



Smoke testing photo removed due to confidentiality



Staff photograph removed

# Sampling sub-catchments in wet weather

- 40 sample locations
- Wet weather sampling also happening in the lagoons, see [yourvoiceourcoast.com/tcla](https://yourvoiceourcoast.com/tcla)



# What is causing the problem?

- Cracked/disjointed/collapsed sewer pipes - common for aging infrastructure
- Groundwater infiltration, cracked manholes and illegal stormwater to sewer connections (lagoons)

## Results:

- **15.7 km of inspections** identified **3.61 km** of sewer pipes in need of upgrade, of which **1.15 km has been relined**
- One pipe identified as a direct source of contamination
- Example of a lagoon sub catchment: **5 broken** manholes, **7 illegal** connections and a number of broken pipes (numbers being finalised)





# Phase 3: What are the solutions?

Councils ongoing sewer network programs (sewer and stormwater relining, manhole fixes, rectifications on private land)

So far, **\$390,000 Council funding** has gone toward

- Investigations
- Improvement works
- More expenditure undertaken (invoices coming in) and more expected as the audit progresses

Council and the NSW Government are continuing to assess if other sources of microbial contamination are present in the catchment and scheduling infrastructure improvements as the program progresses



# Diverting stormwater? Treating stormwater?

- The solution to water quality issues is fixing the sewer network on private and public land - preventing contamination at the source is the best socially, environmentally and economically responsible method
- The sewer network needs to be fixed regardless of suggestions to divert or treat stormwater – therefore diversion and treatment is likely unnecessary expenditure and is a Band-Aid solution





# Expected timeframes

Location	Last FY 2018-19	This FY 2019-20	Next FY 2020-21	2021-22 FY	2022-23 FY	2023-24 FY
Terrigal Beach and Haven	P1	P1, 2 and 3	P2 and 3	Monitoring***		
Terrigal Lagoon	P1*	P1, 2 and 3	P2 and 3	P2 and 3**	P3**	Monitoring***

**Phase 1 – Develop understanding**

**Phase 2 – Detailed catchment investigations**

**Phase 3 – Works program**

\*Initial sampling only

\*\*Lagoon catchments are considerably larger than the Terrigal Beach and Haven catchment, and will take longer to complete.

\*\*\*Monitoring periods may provide recommendations to revisit phases 2 and 3 depending on audit results.

The Terrigal Catchment Audit is an adaptively managed program, and re





## Conclusions

- Progress is being made
- Audit program fully funded – infrastructure issues will be fixed by Council
- Working closely with NSW Government - partnership investigation with an additional budget managed by the NSW Government
- Stormwater investigations are complex and take time to undertake
- Website: [www.yourvoiceourcoast.com/tcla](http://www.yourvoiceourcoast.com/tcla)