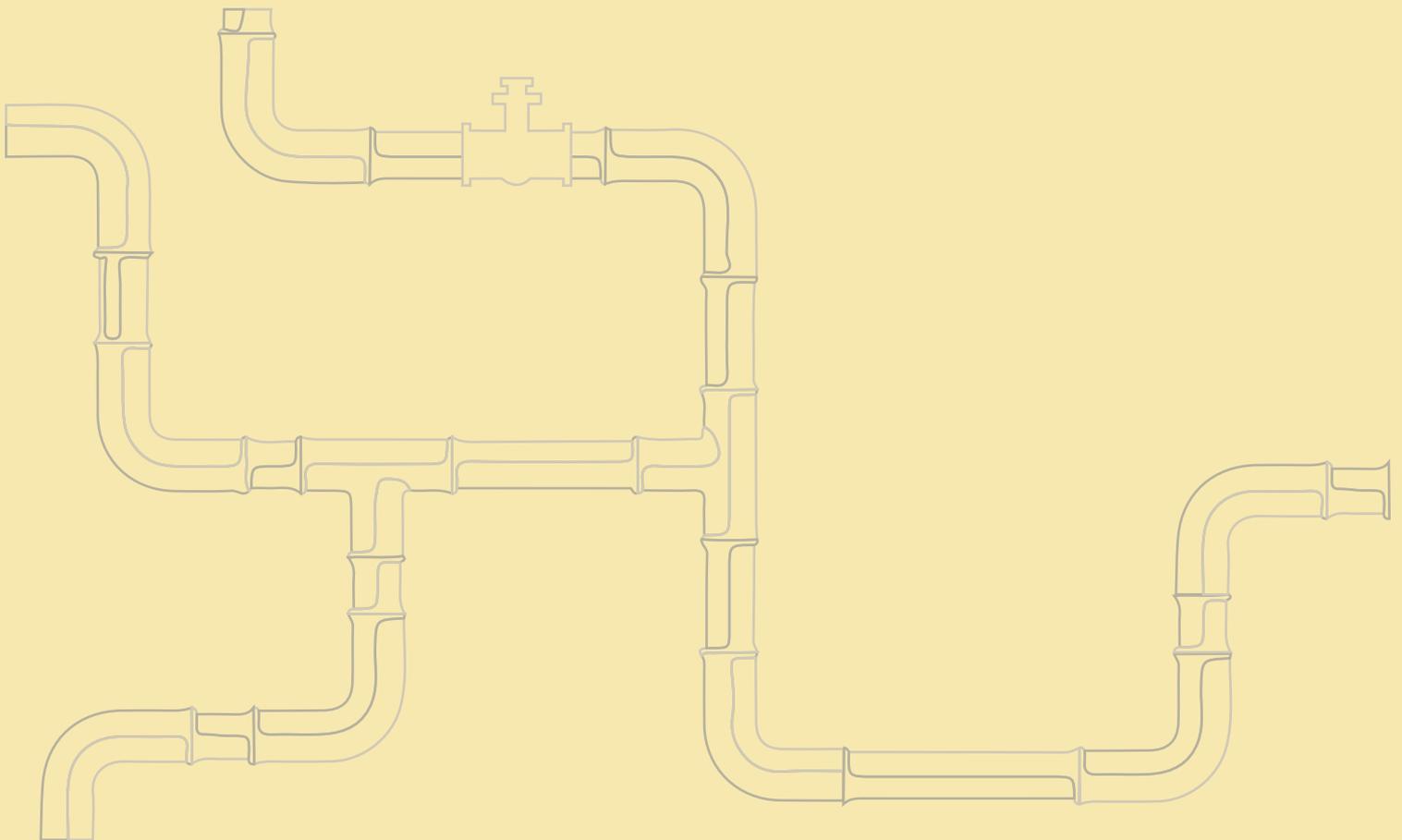


Report back on the SymPOOsium

Beyond the Pipes - Reimagining
sustainable and resilient wastewater
and sanitation solutions

20 September 2021



Overview

On Monday 26 July 2021, Beyond the Pipes¹ held a “SymPOOsium” to discuss Wellington’s current wastewater and sanitation system, and to consider whether the region should explore alternative approaches to managing human waste and wastewater and, if so, how and where to start. The context that led to the decision to hold the SymPOOsium was outlined in the opening address by co-facilitator, Liam Prince (included as Appendix 1).

The SymPOOsium was held in the Council Chambers of the Greater Wellington Regional Council. Roughly 60 people attended, including attendees from the wider community and civil society, research institutes, mana whenua, officers from the regional and local councils, councillors, academics, public servants from central government agencies, and MPs.

The event featured two main sessions facilitated by Liam Prince ([The Rubbish Trip](#)) and Grant Symons ([Transition-HQ](#)). Each session included a panel discussion, followed by an open discussion with the audience where we collectively documented the room’s thoughts and reactions.

The SymPOOsium was kindly supported by Greater Wellington Regional Council and Clare Foundation.



¹ Beyond the Pipes is a consortium of experts and community members committed to facilitating conversation, research and exploration of better wastewater and sanitation systems in the Wellington region.

Purpose of the SymPOOsium

The overarching aim of the SymPOOsium was to bring together those interested in Wellington’s wastewater and sanitation issues in order to develop a shared understanding of the issues our urban populations face with sanitation, and the barriers to, and opportunities from, doing things differently. Beyond the Pipes believe that a shared understanding is the first step towards addressing these serious long-term challenges collectively. Additional, more specific aims of the SymPOOsium were to—

- identify some of the fundamental, unresolved problems with the current wastewater and sanitation system in the Wellington region;
- begin to develop a key set of criteria or attributes that might underpin a sustainable, resilient and culturally-appropriate system;
- identify worthwhile themes or avenues to start exploring, post-SymPOOsium;
- receive a commitment or response from attendees on how they could bring the day’s learnings into their own work and/or an expression of interest to remain part of the broader conversation the SymPOOsium initiates; and
- gain recognition—particularly from those in the public sector who fund, procure and deliver sanitation services—that progressing alternative solutions will require support for research, innovation and pilot projects.

It was not the aim of the SymPOOsium to undertake a thorough analysis of the costs and benefits of the current system, nor to make a definitive determination or feasibility assessment of the best alternative options.

The two panel discussions in a nutshell

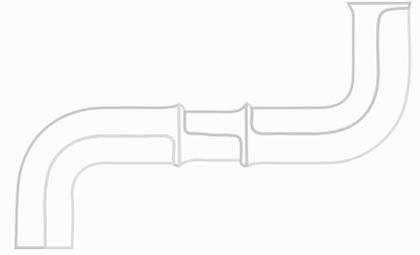
‘Where Are We Now?’ was the topic of the first session, which explored different dimensions of the Wellington region’s current wastewater and sanitation system and associated infrastructure—including pros, cons and critical reflections. The panellists were:

- Te Kawa Robb, [Para Kore](#) and [Mauri Ora Consulting](#)
- Martin Payne, Independent Water Engineer
- Michelle Laurenson and Marie Wright, [Your Bay Your Say](#)/Titahi Bay Residents Association
- Dr Maria Gutierrez-Gines, Lead Scientist Biowaste Team, [ESR](#)

‘Where Could We Be?’ was the topic of the second session, which sought to consider what a more sustainable and resilient sanitation system might look like, particularly one that better met environmental, economic, social and cultural needs, and what it would take to move towards such a system (including identifying barriers and opportunities). The panellists were:

- Grant Symons, [Transition-HQ](#)
- Matt Brenin, [Green Earth](#)
- Cr David Lee, [Greater Wellington Regional Council](#)

The panellists’ presentations are available as Appendices to this report.

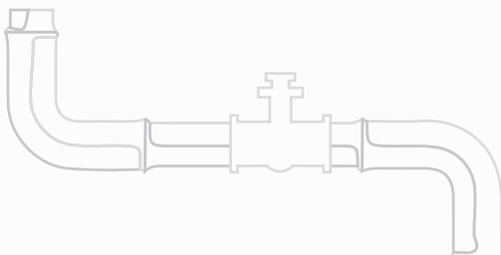


The audience discussions – a thematic analysis

The audience discussions after each panel discussion were wide-ranging. The content has been summarised thematically, below.



Photo by David Lee



Where Are We Now?

An essential service for the region, but not resilient

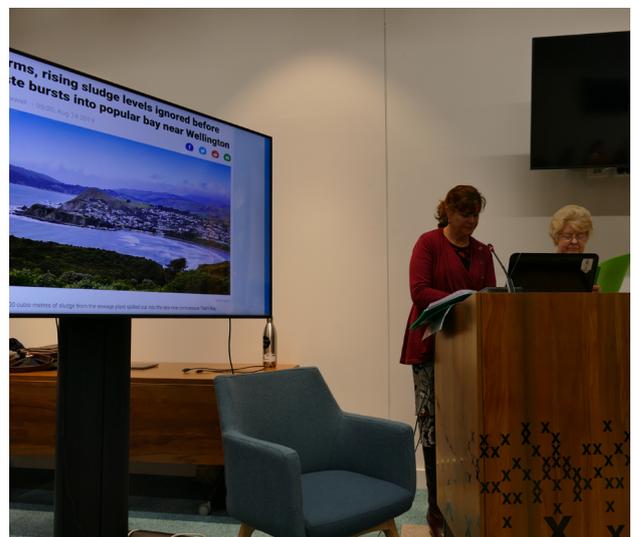
For all its imperfections, the Wellington region's wastewater and sanitation system is an **essential service** that hundreds of thousands of people are connected to and benefit from. Fixing its evident problems is not about chucking the baby out with the bathwater. Nevertheless, the essential nature of the system does elevate the seriousness of the fact that **it is not resilient**. Key parts of the infrastructure are already ailing in non-emergency conditions, e.g. bursting pipes throughout Wellington and Porirua Cities, instances of raw sewage leaking into both harbours, and ongoing overflows of raw sewage into Titahi Bay every time it rains. It's worrying to imagine what might happen in an earthquake or other disaster event.

Centralised, 'flush and forget' linear system

The region's wastewater and sanitation systems are **centralised and linear**—water comes to our homes via the mains from centralised aquifers, the water takes our waste away to centralised treatment plants that then extract the waste, treat the water and release it back into the environment, and send the solids to landfills. The centralised system is largely managed by one agency (Wellington Water, on behalf of the council), in a 'one-size-fits-all' model that is not very responsive to the needs of local communities. The centralisation of both infrastructure and responsibility away from communities encourages a "**flush and forget**" mindset that dampens public awareness of the role we all play in creating our region's wastewater and sanitation issues. Consequently, the system does not engender a sense of public agency, and when things go wrong, the public expectation is that 'someone else' (e.g. councils, Wellington Water) will fix it.

Limited community voice and participation

Public detachment, disengagement and disempowerment is enhanced by **perceived lack of transparency** from the central agencies running the system (councils, policymakers, Wellington Water). There was a sense that these agencies dominate decision-making and do not respond well to external community critique. Public engagement could be more meaningful and there could be **greater use of participatory or citizen-science** when it comes to evaluating the current system and/or problem solving. Participants felt it was a missed opportunity that no representatives from Wellington Water were available to attend the SymPOOsium this time, but were hopeful that future engagement at future events would be possible.



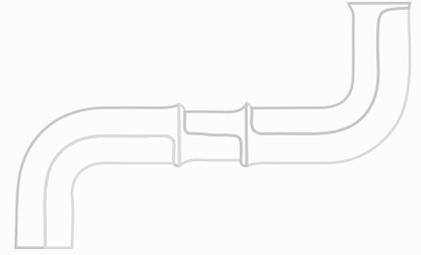
Photos by Simon Collins

Inconsistent with tikanga Māori and overlooks Mātauranga Māori

The current approach to wastewater and sanitation **fails to uphold Māori cultural views** towards both water and human waste. Furthermore, its **colonial foundations** make it difficult to retrofit greater sensitivity to tikanga or a reflection of mātauranga Māori. In rethinking the current system, Māori are Treaty partners, not stakeholders. However, the fundamental flaws underlying the current system create a burden for mana whenua who might be engaged to support a transition to a more culturally appropriate approach. The size of this burden is not matched with equivalent resource or cultural responsiveness from decision-makers. Empowering and resourcing Māori to establish independent wastewater and sanitation management systems for Māori communities and Māori development projects would better uphold tino rangatiratanga.



Photo by David Lee

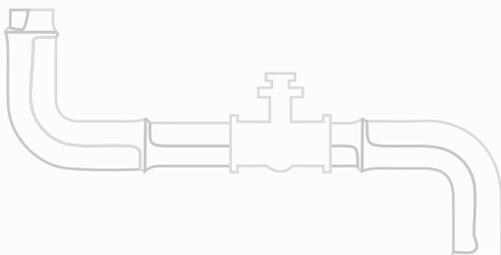


Not in harmony with natural systems and harms the surrounding environment

The concept of regeneration is gaining currency locally, nationally and internationally. In stark contrast, Wellington's wastewater and sanitation system (like most urban areas, globally) **does not act in harmony with natural systems, and harms the surrounding environment.**

For example, the system:

- Is premised on defecation into potable water, which is not common amongst other species.
- Uses significant amounts of drinking water in order to flush away relatively small amounts of human waste in an age of increasing water scarcity.
- Is highly energy-intensive in the midst of a climate emergency.
- Flushes a wide range of "unseen" contaminants into the environment (through both wastewater and biowaste), including industrial chemicals and emerging organic contaminants in personal care products and cleaning products, microplastics, and pharmaceuticals.
- Turns resources (human waste and potable drinking water) into contaminated waste streams that require treatment and/or landfilling.
- Requires ongoing landfill capacity and, in some cases (i.e. the Southern Landfill), landfill extensions, which frustrates Wellington's efforts to increase circularity.
- Does not seem to be based on a shared understanding of what constitutes an acceptable standard of "treatment", either scientifically or culturally.



A system of silos rather than connection

The system as it currently operates is **heavily siloed**, even while the issues it purports to manage are entangled and complex. For example, wastewater, biowaste and solid waste, while clearly intertwined in practice, are often dealt with by separate teams, delivery agencies and policymakers in local and central government. It was also noted that **the waste-focused language we use further perpetuates silos** (e.g. biowaste, human waste, wastewater). For what is a valuable organic resource. Furthermore, there are insufficient feedback loops back to relevant agencies to address “up the pipe” problems that are showing up downstream, such as emerging organic contaminants and microplastics in wastewater. Ultimately, Government, communities, industry, researchers and delivery agencies **must do better at building whakawhānaungatanga** and communication in order to work collectively.

Locked-in to the current system, rather than openness to wonder and innovate

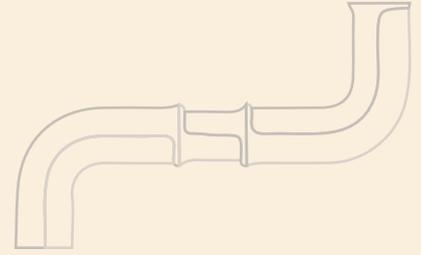
Institutional silos and centralisation are barriers to the system’s internal self-reflectxion or ongoing transformation. Participants felt that **councils and agencies have overly invested in the current system** and are demonstrating the pitfalls of path dependence, such as **infrastructural and institutional lock-in** that makes it difficult for those within the system to stop and take a moment to understand and reflect on the bigger picture or consider alternatives. The result is a **tendency to pursue band-aid solutions**, rather than a culture of responsiveness to new ideas, knowledge and research. The system would benefit from more openness to change, from decisions, standards and processes that were more informed by science and more inclusive, and from new ideas being given a chance to be piloted.

Where Could We Be?

The intention of the second session was not to predetermine or limit available alternatives, but to start a conversation with the aid of practical examples. The main example explored was source-separated sanitation systems that do not mix water and human waste (e.g. composting toilets), but in discussion other examples were raised, such as water-sensitive urban design.

Advocacy and Awareness Raising

Human waste and how it's managed are off-putting topics for large segments of the public who would probably rather not think about it, far less be involved in changing how it's managed. Political willingness and decisions about resource allocation also place limits on our collective ability to imagine alternative ways of managing wastewater and human waste, and can make it hard to commit to studying and assessing different options. For these reasons, an important first step is to **raise awareness amongst the public and policymakers** about the problems of the current system, and to question the presumption that flush toilets and the centralised infrastructure that supports them are necessarily 'clean and convenient' or the only option out there. This type of advocacy could help build a consensus for properly resourced conversations and investigations into better approaches. Participants committed to share information from the SymPOOsium with their friends, family and community.



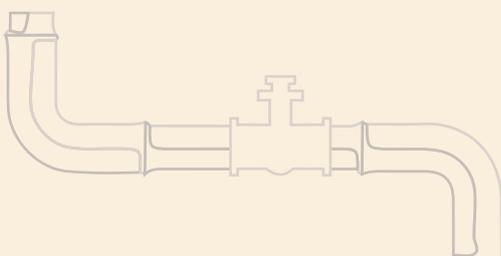
Maintain current levels and scope of service

Participants recognised that the current centralised system ensures an essential service that meets the needs of a large population. Any new system(s) would need to be piloted and implemented incrementally, without disrupting the current service. Ultimately, **new approaches would have to be capable of eventually delivering at least an equivalent level of service coverage** (albeit in different ways), without recreating the problems or flaws of the current system outlined in the first session.

More decentralisation and community/local involvement and resilience

A new approach isn't necessarily about chucking out what we have, but may involve **a more mindful approach to future investment** that avoids further entrenching the current system and infrastructure. A greater share of investment, policy and innovation could go towards investigating and/or implementing:

- New wastewater and sanitation infrastructure and services that are grounded in tikanga Māori.
- Localised solutions that reflect the value systems of the communities they go into.
- Efforts to scale-down and scale-out wastewater and sanitation systems (rather than scaling-up).
- Systems based on greater self-sufficiency, including household/building water capture and compost toilet infrastructure.
- More decentralised and democratised approaches to managing system infrastructure and decision-making.



Adequately resourced research and trials are needed to advance new ideas

Research into overseas experience and alternative methods of managing wastewater and human waste would be useful. One example given of an interesting approach was South Korea, but there will be many others out there. **Domestic research is also important**, particularly Māori pre-European approaches to managing human waste. A literature review of pilots and studies already undertaken in New Zealand would also be useful to consolidate findings and avoid reinventing the wheel (Matt Brenin's presentation demonstrated that a number of composting toilet pilots have already occurred). Following these desktop studies, some **decently-sized and adequately resourced trials/pilots of new approaches** could be run.

All studies should be appropriately mandated and publically funded to guarantee that pilots are successful and well-run, and that their findings will not be ignored. Furthermore, it needs to be recognised that new approaches to wastewater and sanitation will require troubleshooting through trials and pilots. Inevitably, these pilots will not be perfect in the early stages (some may even be unsuccessful). We need to **give ourselves time to get new systems up to scratch**. This means starting preliminary research, feasibility studies and trials sooner rather than later so that we aren't on the back foot when the need to transform the status quo becomes urgent and unavoidable.

Be wary of techno-fixes

Developing and implementing any new technology or approach to managing wastewater and human waste must recognise the rapidly narrowing 'carbon envelope' for such activities. Accordingly, **we should be wary of 'techno-fixes'** that require more new and complex infrastructure to be built, particularly if they are energy-intensive to maintain. We should be open to the possibility that simple solutions delivered through a system change could be more effective and also more climate-friendly.

Keep the collective good at the fore in the design and/or roll out of any new system

While recognising the potential merit of bolstering localised and decentralised approaches, these should be developed with the community or collective in mind. While new systems will likely start as small-scale trials and might be privately-implemented at first, there is a likely cost to maintaining private systems that could undermine the central system. **When transitioning, the key thing is to move as a community and a collective,** rather than inadvertently creating the sanitation equivalent of a gated community that draws resources away from the publicly managed system while being inaccessible to underprivileged communities. Ultimately, **new systems must be accessible to all**, so discussion should focus on ensuring new systems work for the most vulnerable communities because then we know they will work for everyone.



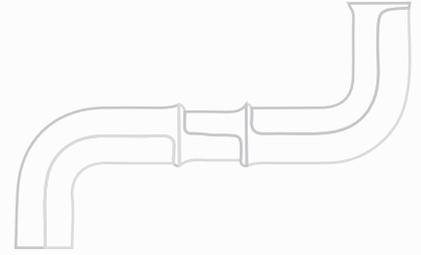
Photo by Simon Collins

Make simple changes where possible

Alongside developing new systems and approaches, councils could do more to **remove unnecessary barriers to things that could be implemented now**. For example, creating a waiver in building code regulations to allow compost toilets as a primary toilet. While it was recognised that these actions are not a silver bullet and are often focused on permitting individual or household actions rather than systemic solutions, they were still considered to be worth pursuing, so long as they did not become the only action.



Photos by Simon Collins

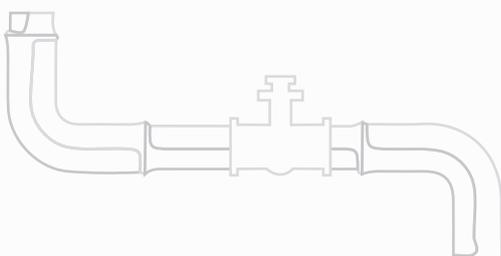


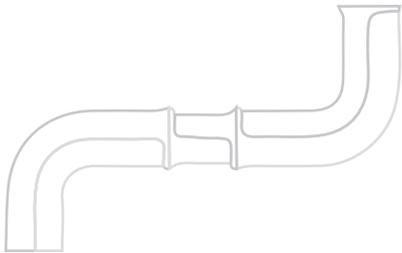
Take advantage of all opportunities to try new things

Retrofitting new approaches into the infrastructure and built environment that we already have is not easy. However, **new builds and new developments provide an opportunity to do things differently from the outset**, and alternative wastewater and sanitation systems should be considered for new developments going forward. Local and regional councils should lead by example by retrofitting or building-in new approaches to wastewater and sanitation in all its own buildings and developments (whether existing or planned). Furthermore, **the impetus to rethink how we do things for the sake of resilience and climate appropriateness is highly compatible with exploring new approaches to wastewater and sanitation** (given the current approach is not resilient or climate friendly). We should make the most of all the opportunities available to us to advance the conversation about rethinking wastewater and sanitation.

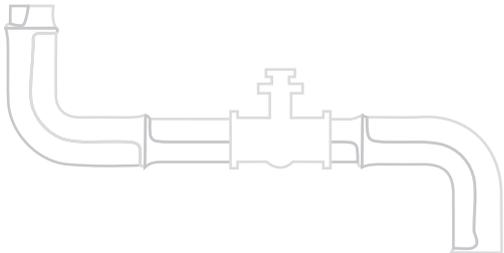
Learn from nature/work with nature

One of the flaws of our current wastewater and sanitation system that we can learn from is that it acts against nature. By **taking nature as our cue**, we may be able to develop lasting and meaningful approaches. Some examples given in discussion were to use trees to heal the land and contaminated sites, the use of permeable surfaces and water-sensitive urban design, and taking inspiration from nature's approach to slow down the movement of water through the system.





Appendices



Appendix 1 – Opening address to the SymPOOsium by Liam Prince (The Rubbish Trip) outlining the background context for the event

Tēnā koutou, welcome to this Symposium, *Beyond the Pipes—Reimagining sustainable and resilient wastewater and sanitation solutions*.

I'm Liam, a zero waste and circular economy researcher, educator and advocate. And I'm one of the facilitators alongside Grant Symons of Transition HQ, who I'll hand over to in a moment.

First, I wanted to give a short background on why we're gathered here today. This SymPOOsium is the first public initiative of an informal group of residents' advocates, engineers, sustainability consultants, professional composters, public servants and more, which I've been part of, and we have been regularly meeting since September last year to discuss the future of Wellington's sewage management. We're known by a couple of names, including the Poo Breakfast Club in honour of our early morning breakfast meetings, which were always held over steaming cups of morning brown – coffee that is – but our more serious name, 'Beyond the Pipes', very much reflects the big picture rethink of sewage and sanitation systems that we've been exploring in our meetings.

Our group's initial purpose was to discuss the disturbing reality that 15,000 odd tonnes of sewage sludge is being sent to the Wellington Southern Landfill every year. I'm sure most of you are familiar with this problem - it was splattered across the Aotearoa news media during lockdown last year when broken pipes meant the sludge had to be trucked instead from Mōa Point to the landfill in up to 150 round trips per day in what were dubbed turd taxis. This was not the first recent example, nor anywhere near the last, of how frail and fragile our city's sewerage network is even in everyday conditions.

But what brought our group together was in fact rubbish – specifically the fact that those 15,000 tonnes of sewage sludge currently have to be mixed with at least four times as much general rubbish in order to meet the Landfill's resource consent requirements – that's a bit over 60,000 tonnes of rubbish – pretty much the annual rate of waste that Wellington currently sends to the Southern landfill. This means two things: firstly, that we're currently locked into landfilling 75,000 tonnes a year of combined crap and trash, which is a lot. So much so that our landfill is filling up - we've now had more than one proposal to extend the landfill into Carrie's Gully as the current landfill nears its consented capacity. And secondly, the requirement to mix sludge with 4 parts general rubbish means that Wellington has been unable to pursue any meaningful waste minimisation actions, because if we were to seriously reduce waste to landfill, then according to Mayor Andy Foster, council would literally have to cut off parts of the hillside to mix with the sludge.

In short, our group began meeting to discuss how we might prevent sewage sludge from being sent to the Southern Landfill to halt the landfill extension and to enable progress on the city's waste minimisation goals.

Since then, in recognition of this fundamental problem, Wellington City Council has made the decision through its LTP to construct a new sludge minimisation facility at Moa Point to digest and dehydrate all of that crap. Once fully operational, this facility is expected to reduce the volume of the sludge by 82%, reduce associated emissions by 63%, eliminate the need for a 4:1 mix of waste to sludge at the landfill, which opens up the opportunity to finally move forward with an ambitious waste minimisation programme in Wellington.

While this is a great outcome in terms of reducing waste and landfill emissions, this fancy new facility will not address the fragility and vulnerability of our sewerage network as a whole, and the many other environmental, social and cultural impacts of the network. Nor does it solve the fact that we will still send the dehydrated poo to landfill (albeit in much lesser quantities). If we want to stop doing that – i.e. 'beneficially reuse the biosolids' – which council has said it would like to consider, we then come up against the next issue that by mixing human excrement with other wastewater contaminates the biosolids with all the other stuff that goes down our drains in the modern era, e.g. industrial and household chemicals, heavy metals, microplastics and other many other emerging contaminants.

These are some of the big issues that our Symposium will grapple with today. We want to take a serious look at the sustainability and resilience of our wastewater and sanitation system in a place prone to earthquakes, at risk of water scarcity and more adverse natural events. We want to ask whether ecological and public health risks are best served by the current system, to what extent our current approach or any new ideas incorporate tikanga values and mātauranga Māori, and how we might learn from best practices from previous generations and other parts of the world.

With the massive investment in pipes and other infrastructure being proposed for Wellington, and the central government three waters reforms looming, we feel that a bold rethink of our approach to sanitation is timely. We cannot continue to approach these water and sanitation issues in silos, but need a much broader perspective on how our systems work together. And our challenge today is to reimagine the ways we can deal with human waste, rather than limiting ourselves only to improving, tweaking and maintaining the existing system.

Appendix 2 – Te Kawa Robb, Para Kore and Mauri Ora Consulting

Te Kawa Robb's presentation opened the first half of the SymPOOsium, and was focused on considering and evaluating the current wastewater and sanitation system through the lens of te ao Māori.

Te Kawa started by explaining the place of water in the Māori worldview - that Māori hold whakapapa relationships with water bodies, and that if water is desecrated, people's personal and collective identity is desecrated as a result. Relationships with natural systems are also based on principles of reciprocity, in that what is received from Papatūānuku is honoured by what is returned.

In considering the origins of the wastewater and sanitation system we have today, it's important to understand New Zealand's colonial history. Te Kawa talked about how Māori (and Pākehā) have been disconnected from their relationships with water as a result of legislation, infrastructure and the worldview of the dominant culture. Colonialism brought to Aotearoa the ideas of power and control over natural resources, so our public infrastructure and systems were built with the mindset of controlling natural systems. Alongside that, colonialism also brought the idea of the primacy of individuals over the community, and families became increasingly nuclear. All these rapid social changes, driven by economic imperatives, put demands on resources that favoured the creation of massive, centralised wastewater and sewage systems to meet those demands, at the expense of resilience, the community, and the natural environment.

Within Te Ao Māori, human waste is highly tapu and tikanga is in place to ensure people are protected from it. Human waste exists in the domain of atua associated with darkness. Māori practices of managing human waste was to locate the waste generally at the foot of cliffs well away from water. The surrounding area was well-maintained and protected. Human waste and water were not mixed.

Clearly, current wastewater systems do not uphold Te Tiriti and they don't uphold standards of caring for each other and te taiao. We are currently stuck in an entrenched system that is fundamentally broken - any improvements that don't move us to another way of managing human waste entirely will simply be a band-aid. Today, some Māori organisations and papakainga are starting to explore alternative ways of managing wastewater and human waste that is more aligned with tikanga. However, because this looks so different to the centralised system, it does require starting from scratch and being 'off grid' and off the mains. Some interesting ideas and solutions are coming forward - to be able to apply these solutions to more Māori communities will require resourcing.

Appendix 3 – Martin Payne, Independent Water Engineer

Tēnā koutou katoa

My name is Martin Payne and I am here to illustrate a wastewater system and consider some of the challenges using the Wellington City's network.

To understand a wastewater system, we need to follow the water as it is what is doing the heavy lifting or more accurately the heavy flushing of the waste. Gravity and pumps helpfully assist in keeping Wellington's waste moving.

For Wellington city, we have to go well beyond the city limits to find the necessary water.

To the headwaters of the Hutt river, the Waiwhetu aquifer and catchment of the Wainuiomata and Orongorongo rivers. This water is treated and piped into the city for distribution to our homes and businesses. Ironically we drink very little of this "drinking water" using most of it to flush away our waste.

With a push of a button or the pull of a sink plug our waste is on its way to our wastewater treatment plants. We have three, one in the north shared with Porirua City, one in the west in Karori and probably the best known, Moa point near the airport. At these plants, water is extracted, pathogens neutralized and the separated biosolids (sewage sludge) landfilled.

To recap I thought a rough recipe for the Wellington's wastewater system would be useful. This annualized recipe is currently for 216 thousand people but be aware that this number is likely to grow significantly.

Scale as required.

Take 30 billion litres of drinking water, mix somewhere around 12 million kg human faeces, 110 million litres of urine and a considerable amount of greywater. Then add bacteria, viruses, pharmaceuticals, heavy metals, plastics, food waste and trade waste. Once thoroughly mixed, extract as much of the added water as possible and discard into the sea. Resource consents require this effluent to be treated but this is not always possible. Then take the remaining 16.5 million kg of sewage sludge and bury it in a convenient streambed, too commonly known as a landfill.

Oh and I almost forgot you will also need 65 million kgs of general waste to stabilize the sludge or it will just go everywhere. Please note that this recipe is to be found in the Linear Waste Disposal section rather than in the circular resource recovery section of the waste management and minimisation manual.

So what are the challenges?

Finding enough water to drive this system. Water scarcity, droughts and even ironically flooding. Sea level rise and coastal inundation are also a threat to the Waiwhetu aquifer. There is a growing understanding that freshwater is both a finite and valuable resource and one that needs to be shared with the natural environment. Earthquakes. The Wellington Faultline tears directly through the centre of both the potable and wastewater networks. Liquefaction and ground movement will also play havoc with the integrity of the network.

A growing population creates a greater and greater volume of biosolids to dispose of.

Internationally, landfilling waste is not seen as a positive or long-term solution and is also increasingly difficult to consent this as an activity. What's more, communities are demanding that their backyards, streams and beaches be valued and respected.

And then there is the costs of building, maintain and extending the system. Despite considerable investment the city has not kept up with the failing and aging infrastructure. Money, money, money but who wants to pay?

I need to be clear that our wastewater system is an essential service and without it the city would quickly come to a screaming, unsanitary and smelly halt. It is incredible that our society has been able to engineer a system of such scale and complexity that has for so long allowed us to flush and forget. I am not recommending that we abandon these systems but I do want us to think again, to think beyond the pipes.

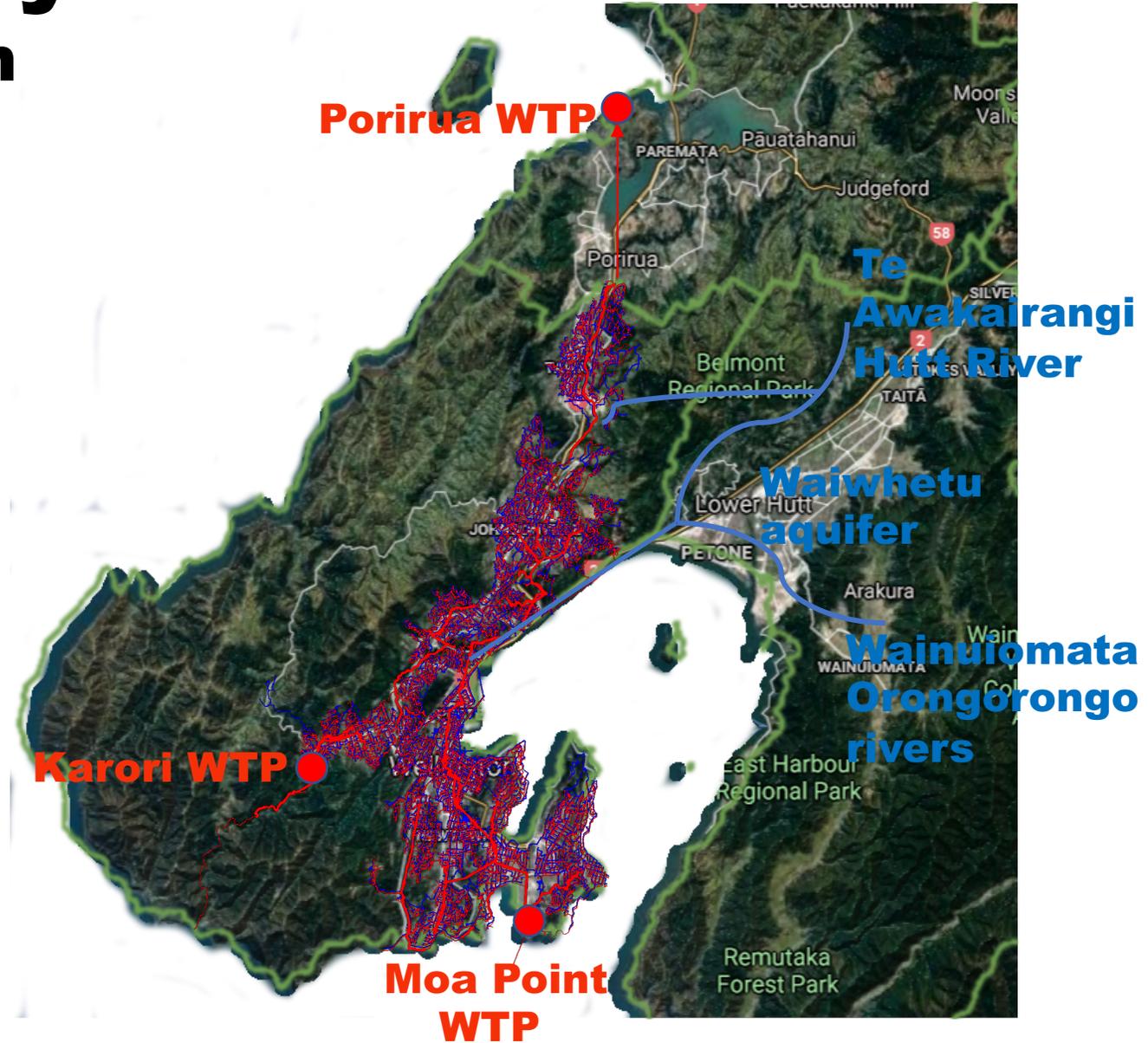
Are there new ways to provide these important services while mitigating the immense and sometimes problematic footprint of these systems. These footprints: water use, energy, carbon emissions, waste disposal, environmental and community impacts, financial cost are all creating a strain on the places that we love live.

How do we transition from a linear waste disposal system to a circular resource recovery system where the true costs are not externalized?

How can we authentically care for both people and the natural environment? In 1596, John Harington is credited with inventing the flushing toilet. His promotional pamphlet begins "A new discourse on a stale subject". I hope that today, we will not be equally coy about talking about a lot of shit.

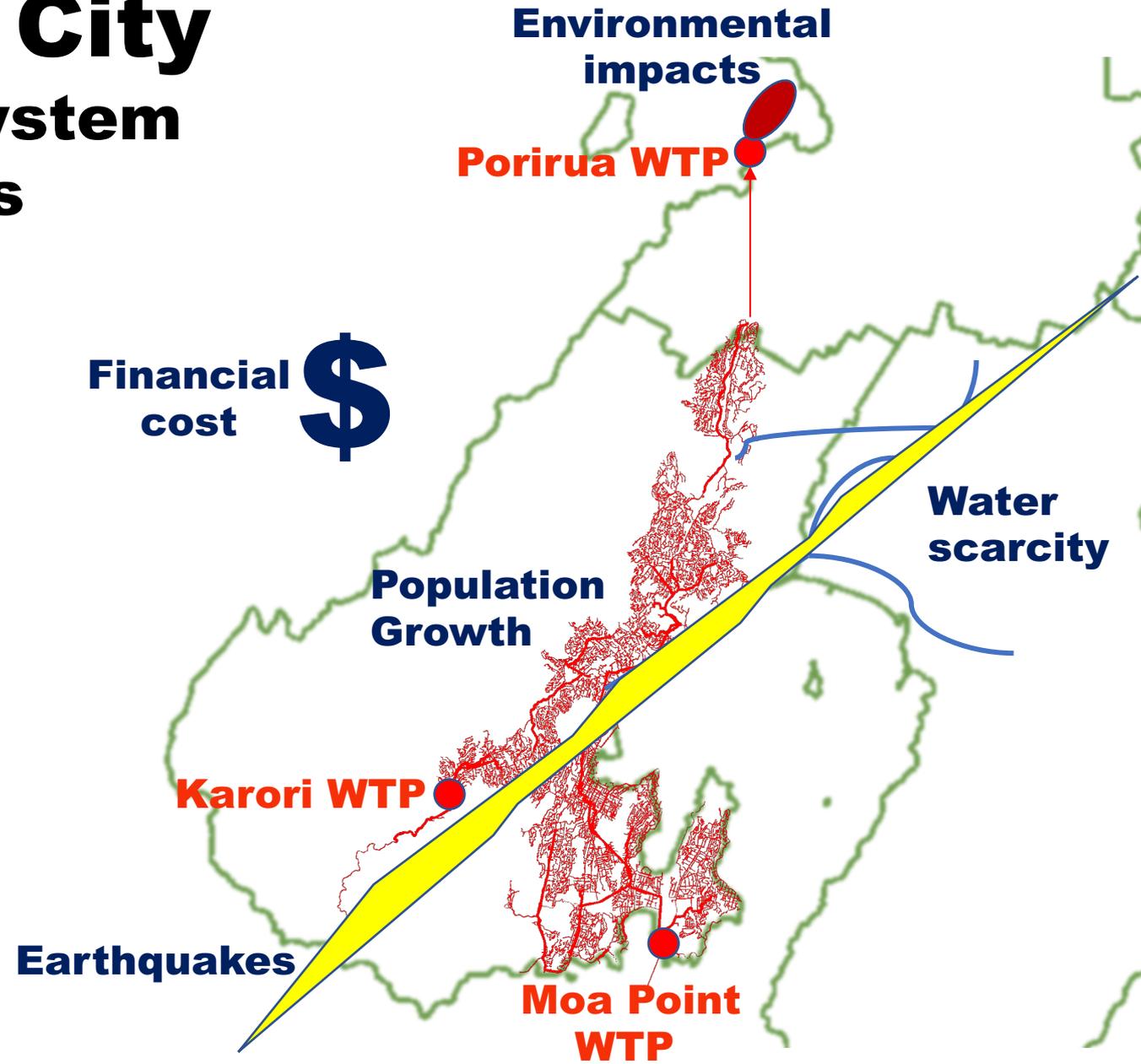
Thank you.

Wellington City Wastewater System



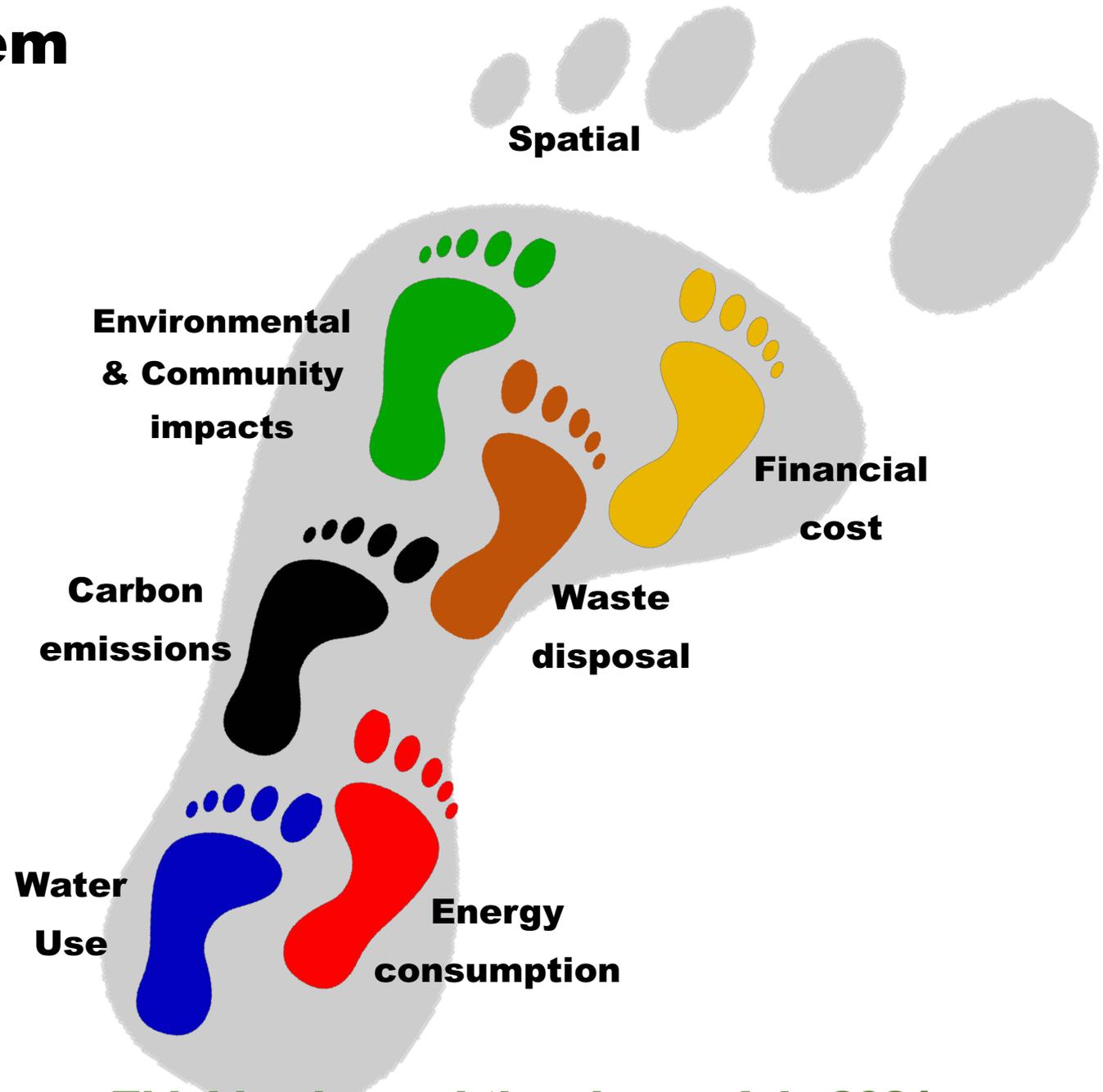
Thinking beyond the pipes – July 2021

Wellington City Wastewater System challenges



Thinking beyond the pipes – July 2021

Wastewater System footprints



Thinking beyond the pipes – July 2021



Ka ora te wai, ka ora te whenua

Ka ora te whenua, ka ora te tangata

If the water is healthy, then the land is healthy

If the land is healthy, then the people are healthy

POO TOWN

PORIRUA CITY

ACUTE HEALTH HAZARD

YOUR SAY YOUR BAY

Alarms, rising sludge levels ignored before waste bursts into popular bay near Wellington

Joel Maxwell · 05:00, Aug 14 2019



ROSS GIBLIN

More than 1000 cubic metres of sludge from the sewage plant spilled out into the sea near picturesque Titahi Bay.

Wellington Water fined \$67,500 for illegal discharge into sea near Titahi Bay

Nicholas Boyack · 16:06, Sep 13 2019



ROSS GIBLIN

A sewage treatment plant near Titahi Bay is now being run by an international firm. Its previous operator, Wellington Water, was fined \$67,500 for allowing an illegal discharged into the sea.



**Plant is
900m
from the
bay, but
discharge
pipe is
500m**



Concerned Community: Your Bay Your Say



JOEL MAXWELL

Titahi Bay beach residents who want improvements to the nearby wastewater treatment plant, from left, Lynn MacGregor, Margaret Dietrich, Michelle Laurenson, Lucy Neal and Marie Wright.

Acute public health issue – every time there is heavy rain

1. Manholes overflowing with toilet paper and faeces
2. Raw sewage sludge overflowing from an ageing Treatment Plant
3. Overloaded and under-funded stormwater and wastewater network

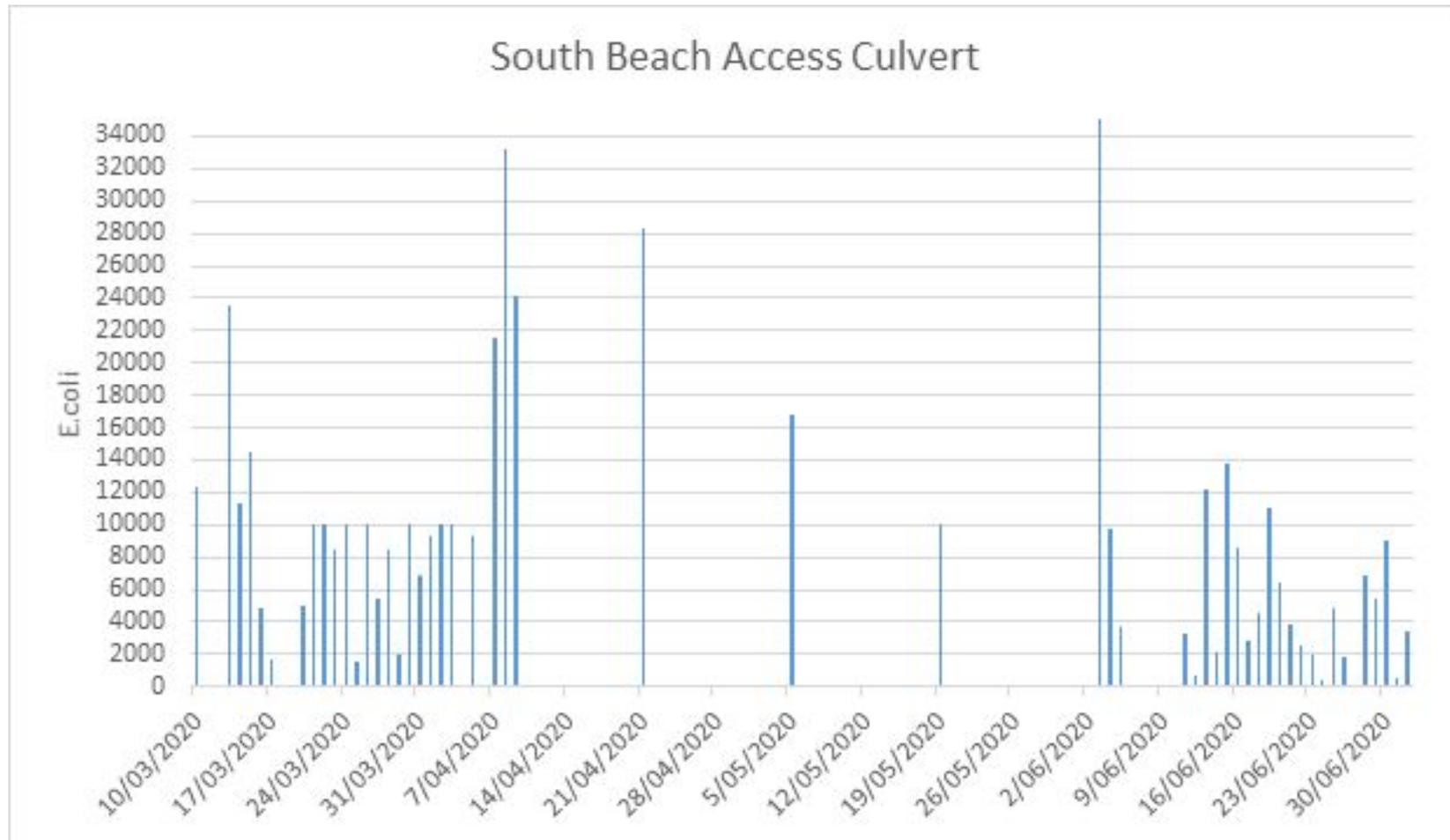
Faecal levels up to 171,000cfu/100ml, when acceptable levels are 61-151cfu/100ml - which is over 300 times the recommended acceptable levels .



Stormwater and Wastewater network flood with frequent rain. Manholes spew faeces and toilet paper into streets and homes.

Over 20 in 2020, with 10 between September & December 2020

Acceptable levels of *E. coli* for a *single sample* are **61-151cfu/100ml.**



Acceptable levels of E. coli for a *single sample* are 61-151cfu/100ml.

WWL Report to Community: 22 May 2020 and 30 May 2020

Latest sampling results

Location	Sampling date	Indicator organism	Measurement
South Beach Access Culvert	05/05/2020	E.coli	16,800cfu/100mL
	19/05/2020	E.coli	171,000cfu/100mL
Titahi Bay recreational bathing site at Toms Dr	05/05/2020	Enterococci	<4cfu/100mL
Titahi Bay recreational bathing site at South Beach Access	05/05/2020	Enterococci	<4cfu/100mL
Titahi Bay recreational bathing site at Bay Dr	05/05/2020	Enterococci	<4cfu/100mL

UV Offline – causes untreated discharge

Jan 2019, Jan 2021, March 2021

Wellington
Water

porirua city

Porirua Wastewater Treatment Plant Resource Consent

February 2019 Final Effluent Faecal Coliform Exceedances



Your public water company

From: Hugh Dixon-Paver

Sent: Thursday, 10 January 2019 11:24 AM

To: 'Edward Yong' <Edward.Yong@wellingtonwater.co.nz>

Cc: Moe Dahlan <Moe.Dahlan@wellingtonwater.co.nz>; Paul Winstanley <Paul.Winstanley@wellingtonwater.co.nz>;

Anna Hector <Anna.Hector@wellingtonwater.co.nz>; Steve Hutchison <Steve.Hutchison@wellingtonwater.co.nz>

Subject: Issues at the Porirua WWTP - GWRC comments 10 Jan 2019

What were the FC spikes (numbers)?

3/1/2019 – 13,600cfu/100mL

4/1/2019 – 5,600cfu/100mL

7/1/2019 – 2,600cfu/100mL

8/1/2019 – 4,200cfu/100mL

**After heavy rain: Raw sewage from Treatment Plant
discharges into sea
8 overflows from Sept – Dec 2020**





Wellington Water

March 8, 2019 · 🌐



⚠️ Attention Porirua residents! ⚠️

As a result of today's heavy rain, there is a wastewater overflow at Rukutane Point.

For the next 48 hours, please do not swim or collect shellfish in Titahi Bay and associated gathering areas near the wastewater discharge point at Rukutane Point.

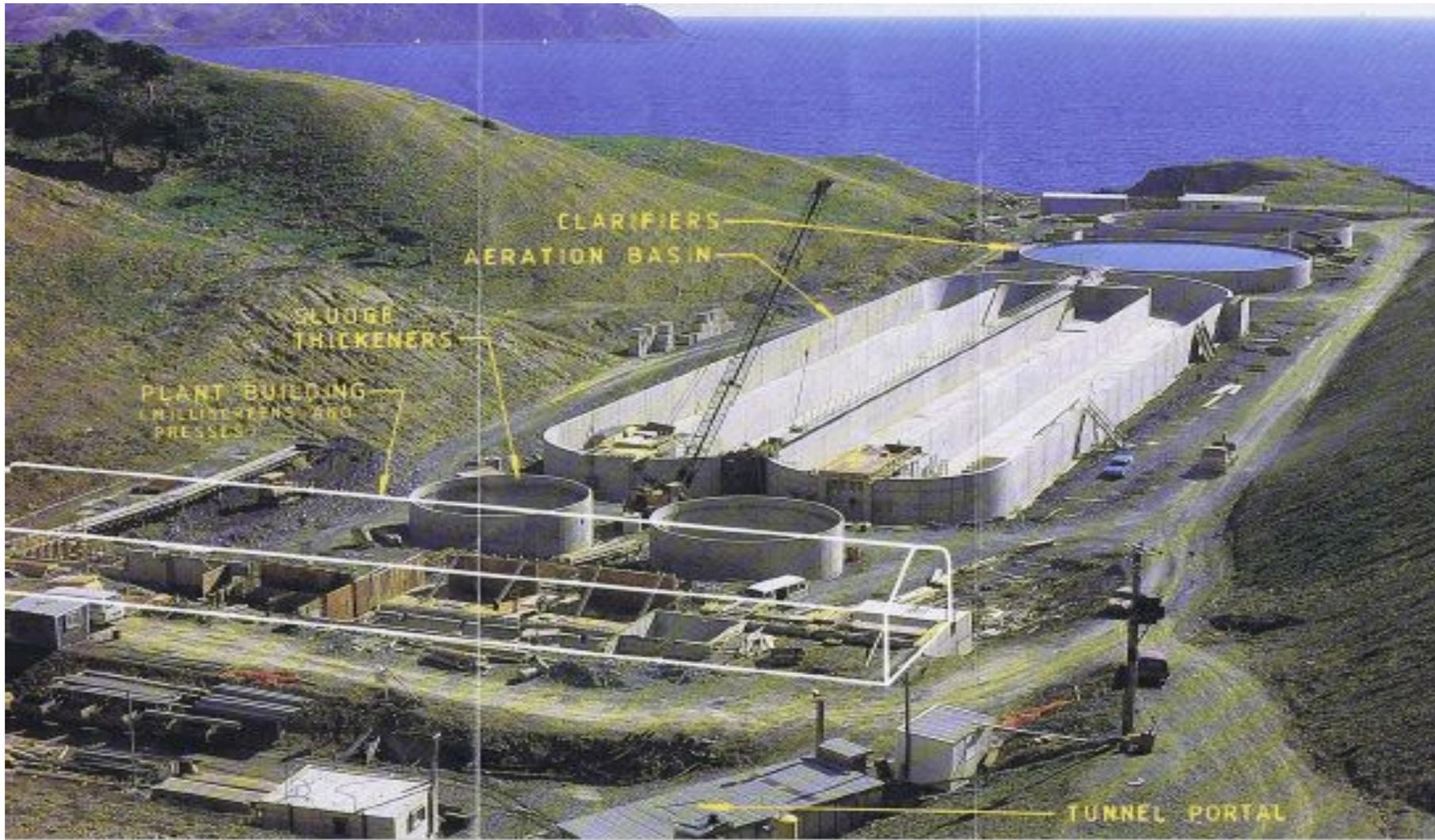
The 'Work in your area' section on our website provides details around events such as water overflows. You can take a look here:

<https://www.wellingtonwater.co.nz/work-in-your-area/#map>



Porirua Wastewater Treatment Plant (PWWTP)

Stage 1 built 1989 for 80,000 (pop.), reached capacity in 2012
Currently treats over 100,000 (pop.)





Titahi Bay and Porirua Harbour swamped in sewage, again (16-23 July 2021)





**Titahi Bay
Beach
code
brown
again
(20 July)**

Ōwhiro Stream

Human Health Mitigation Project Plan

May 2021



South Beach Access Road - Titahi Bay Human Health Mitigation Project Plan

April 2021



Document information

People involved

Activity	Title	Name	Electronic signature	Date
Prepared by	Engineer Investigations			30/03/2021
Checked by	Principal Engineer - Stormwater			14/04/2021
	Principal Engineer Wastewater			
	Chief Advisor			30/03/2020
	Service Planning			
Approved by	Programme Manager – Environmental Water Quality			31/03/2021

Revision history

Date	Version number	Description of change
20-02-2021	0.1	First draft
19-03-2021	1.0	Acceptance of track changes

6. Stakeholders

The stakeholders for this activity are shown in Table 5.

Table 5: Stakeholders

Role	Title	Name	Responsibility
Programme Manager	Programme Manager – Environmental Water Quality		<ul style="list-style-type: none"> Escalation of significant changes to programme, scope, milestone or budget. Escalation of LTP funding requests. Overall project delivery and project direction. Updates to client council
Project manager	Engineer - Network Engineering		<ul style="list-style-type: none"> Identification of public network pipes for CCTV. Preparation of the HHMP plan. Monthly reporting.
Project Resource	Manager – Network Performance		<ul style="list-style-type: none"> Global stormwater consent monitoring. Approval of the HHMP plan to be released to GWRC.
Project Resource	Private Drainage Investigation Team Leader		<ul style="list-style-type: none"> Management of the team and their processes.
Cultural Advisor	Mana Whenua Advisor		<ul style="list-style-type: none"> Mana whenua direction
Communications	Senior Communications Advisor		<ul style="list-style-type: none"> Development of the communications plan Delivery of the communication plan
GWRC Consent Officer	Resource Advisor		<ul style="list-style-type: none"> Approves HHMP

**Submission on a resource consent application: WGN200229
Porirua Wastewater Treatment Plant**

Pursuant to section 96 of the Resource Management Act 1991

To: Environmental Regulation department
Greater Wellington Regional Council
PO Box 11646
Wellington 6142

or Notifications@gw.govt.nz

Your details

Full name:
Full postal address:
.....
.....
Telephone no's: Work: Home: Cell:
Contact person:
Address and telephone no (if different from above):
.....

Electronic communication

The Greater Wellington Regional Council has a preference for providing information about this resource consent process via email. We will send you updates on the process, information and provide you with details of any meetings and the hearing. Please tick here if you **do not** agree to receive communication via email.

Email address:

Application which submission relates to:

Application no: WGN200229
Name of applicant: Porirua City Council - email copy to: Richard.peterson@stantec.com
Proposal (activity type): Discharges related to the continued operation of the Porirua Wastewater Treatment Plant

I support the application I oppose the application I am neutral to the application
(neither support or oppose)

- 1. POOR WATER QUALITY:** Porirua has 4 times less the flow of Moa point Plant and wants 5 times more contamination and therefore higher allowances than water standards allow.
- 2. POOR TREATMENT:** Porirua Treatment plant is old, needs replacing and has a lengthy history of poor quality discharge, often noticeable, with a visible slick or plume that floats into Titahi Bay.
- 3. POOR INVESTMENT:** Upgrades continue to be deferred, future promises not guaranteed or trusted.
- 4. POOR DATA:** Population forecast numbers are significantly under-estimated showing 120,000 for 2043 when the figure will be over 140,000.
- 5. POOR MONITORING:** Bypass discharge monitoring will stop in 2023.
- 6. POOR SAMPLING:** No sampling for bypasses after 2023.
- 7. POOR ANALYSIS:** Sampling before 2023 taken 24 hours after a bypass which is two tidal flows producing diluted data.
- 8. POOR PROCESS:** Proposed Ecological, Monitoring and Technical reviews do not recognise the Treaty of Waitangi cultural impact and stricter assessment requirements.
- 9. POOR REPORTS:** Independent reviewers say application and proposed conditions in some areas are mis-leading, ambiguous and lacks sufficient data and policies to validate some statements and assumptions made.
- 10. EXCESSIVE COST:** Cost of the consent to date is \$1.7million, will continue to rise and Council can change consent after 12 months of start.

Titahi Bay sunset with oily discharge slick

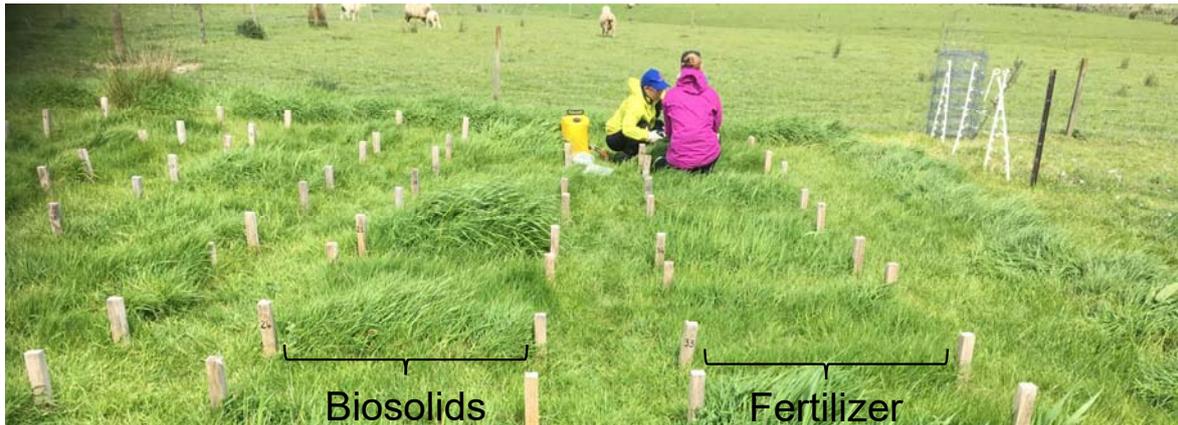


Appendix 5 – Dr Maria Gutierrez-Gines, Lead Scientist Biowaste Team, ESR



Biowaste Research in Aotearoa New Zealand

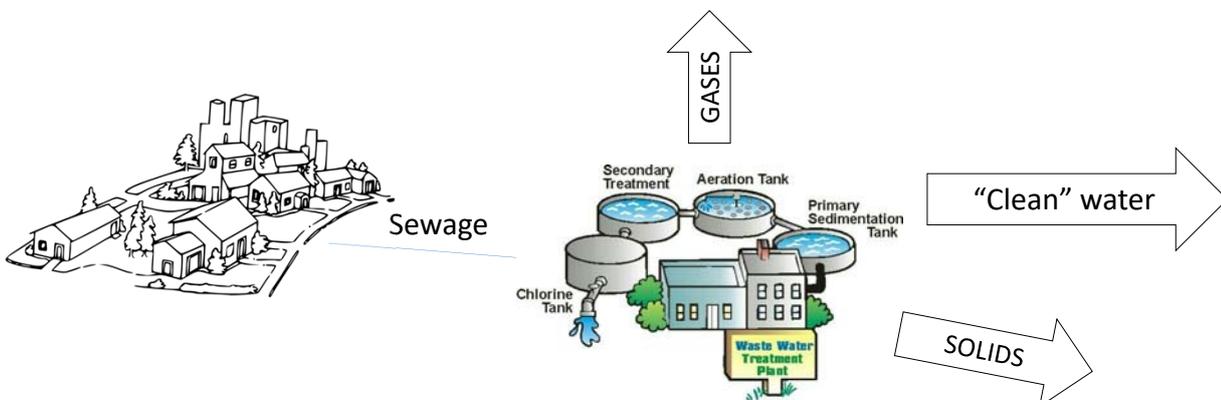
Maria J Gutierrez Gines: maria.gines@esr.cri.nz



1



What's a wastewater treatment plant?



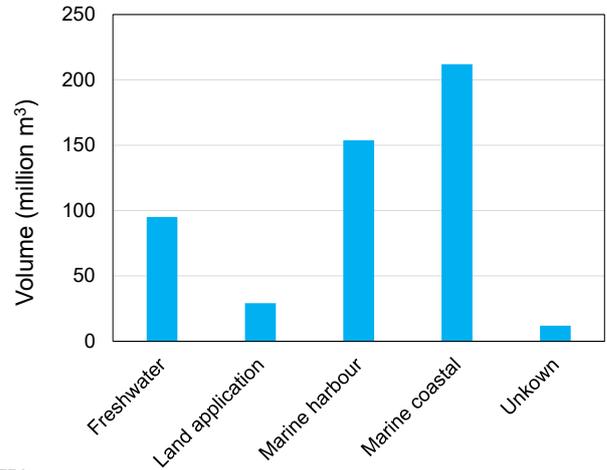
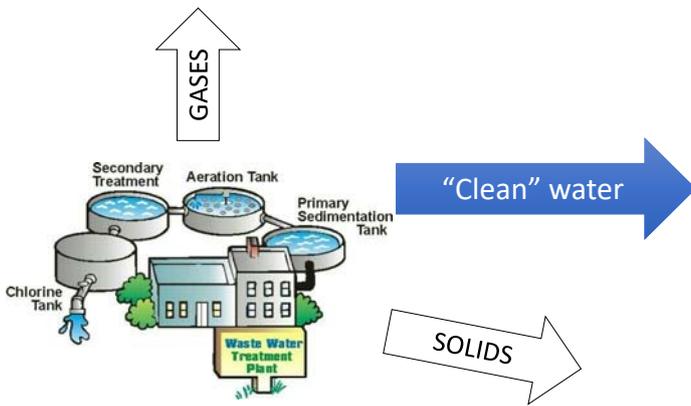
2



Centre for Integrated Biowaste Research



What's a wastewater treatment plant?



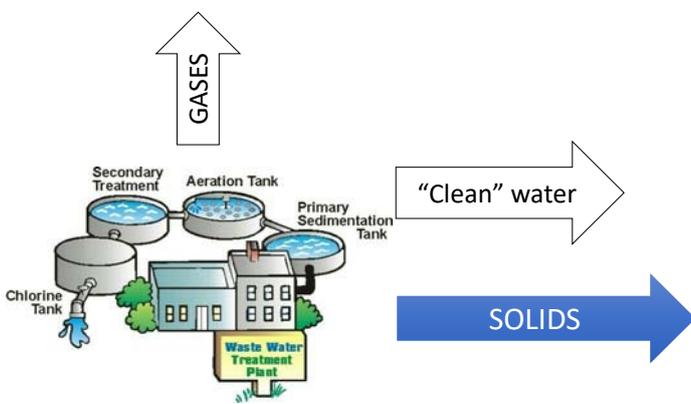
Data from WaterNZ 2021. WWTP Inventory: <https://www.waternz.org.nz/WWTPInventory>



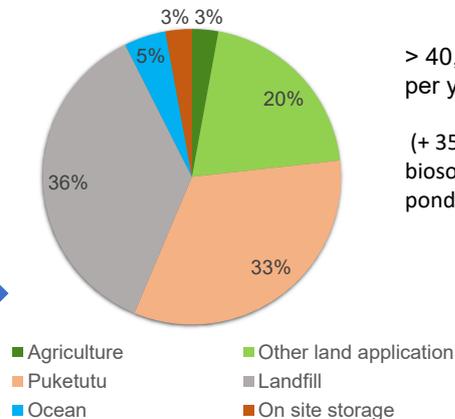
Centre for Integrated Biowaste Research



What's a wastewater treatment plant?



Biosolids Enduse 2019

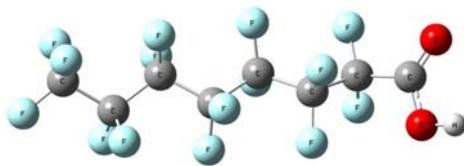
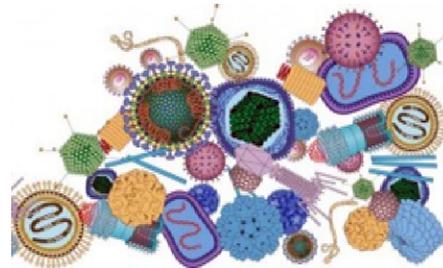


> 40,000 dry tonnes per year

(+ 35,000 dry tonnes biosolids sitting in ox ponds)

Calculated from ANZBP2019: <https://www.biosolids.com.au/> and WWTP inventory Water NZ 2019

Some challenges

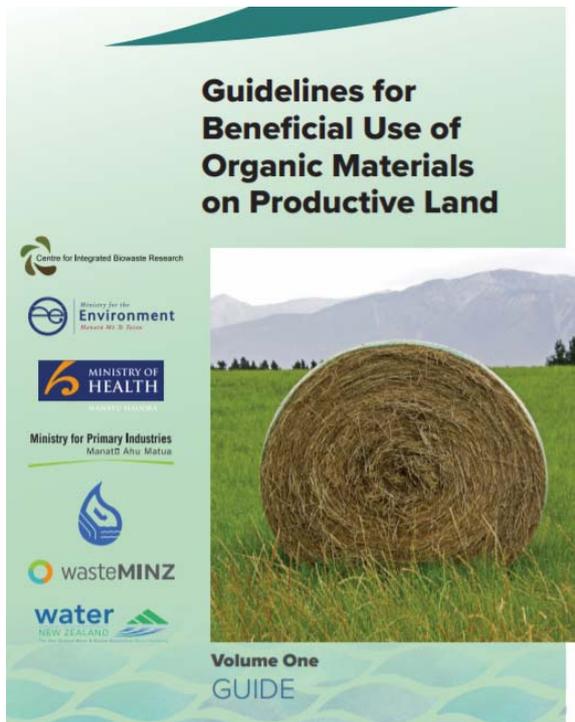


Izzie.Alderton@esr.cri.nz



5

Guidelines for Beneficial Use of Organic Materials on Productive Land



Some challenges



Good management

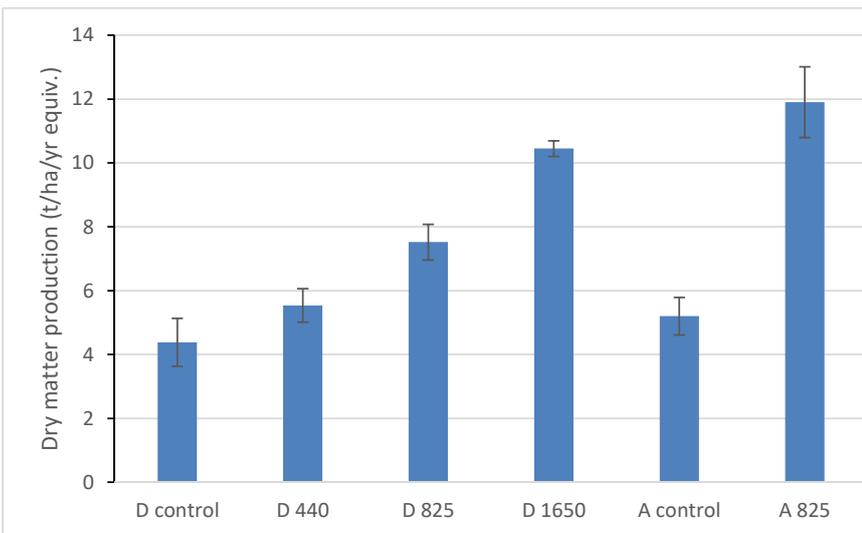
6

Reuse of treated municipal wastewater



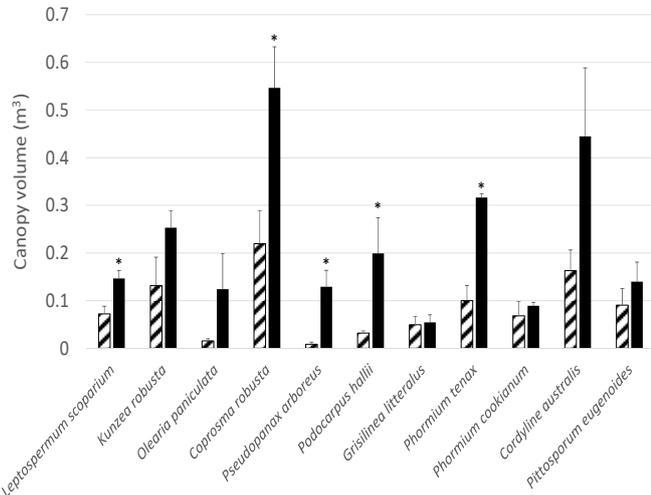
7

More pasture production



8

Irrigation on native trees



<http://www.kiwiscience.com/duvauchelle.html>

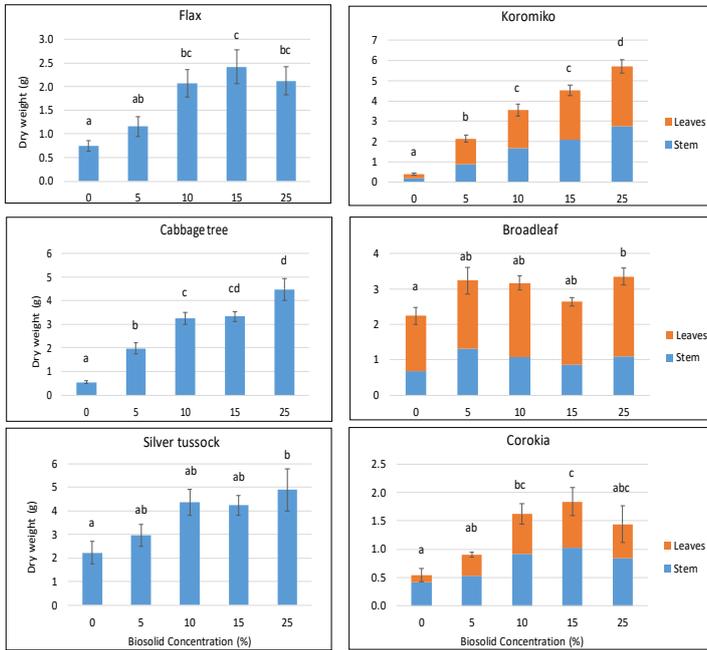
Canopy volume of the plants in the field plot as of May 2017



Sewage sludge to grow winter crops



As a potting mix



11

To restore degraded soil



12

To restore degraded soil



Tī kōuka



Akiraho



Koromiko



Soil 1 Soil 1 + Biosolids Soil 2 Soil 2 + Biosolids

Gutierrez-Gines et al. 2017. JEQ 46:906–914

For essential oil production

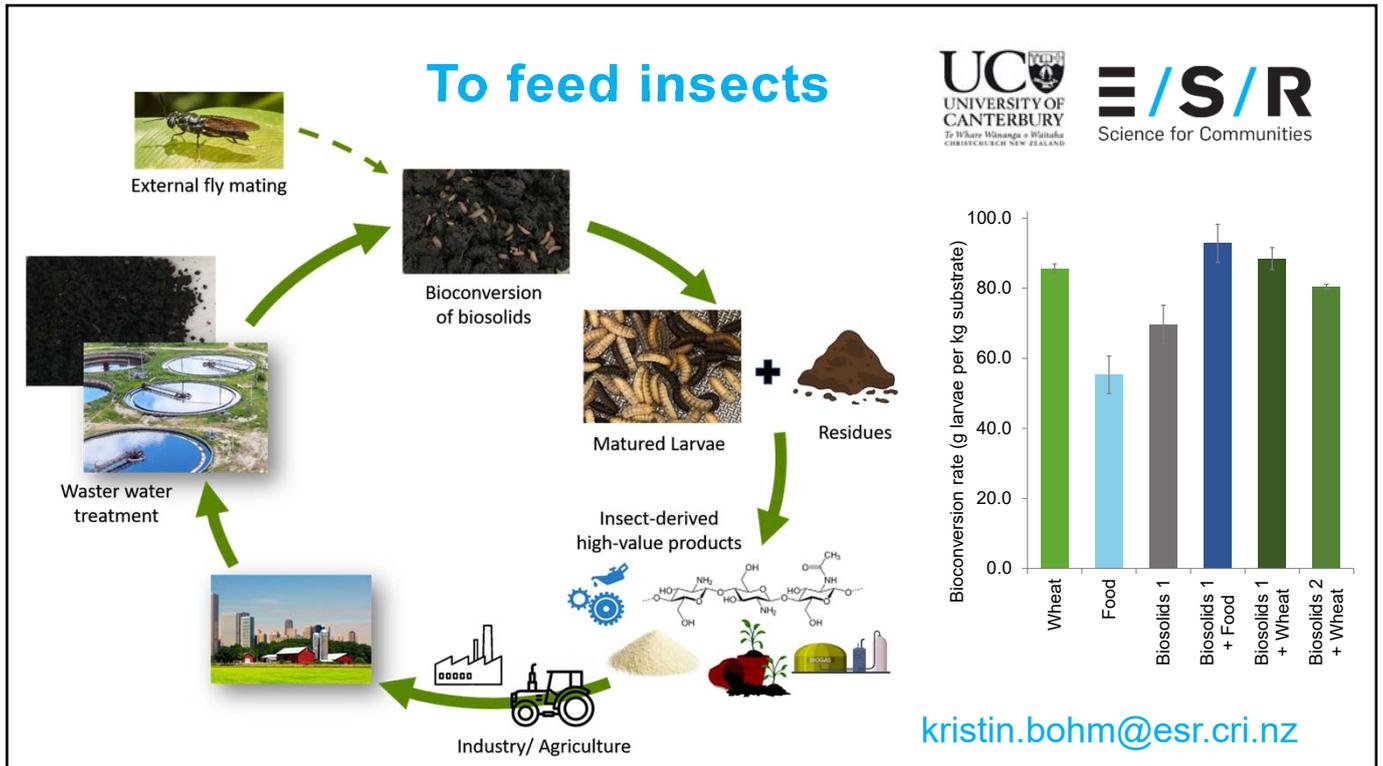


3 types of soil + mānuka and kānuka + two types of biosolids and dairy shed effluent

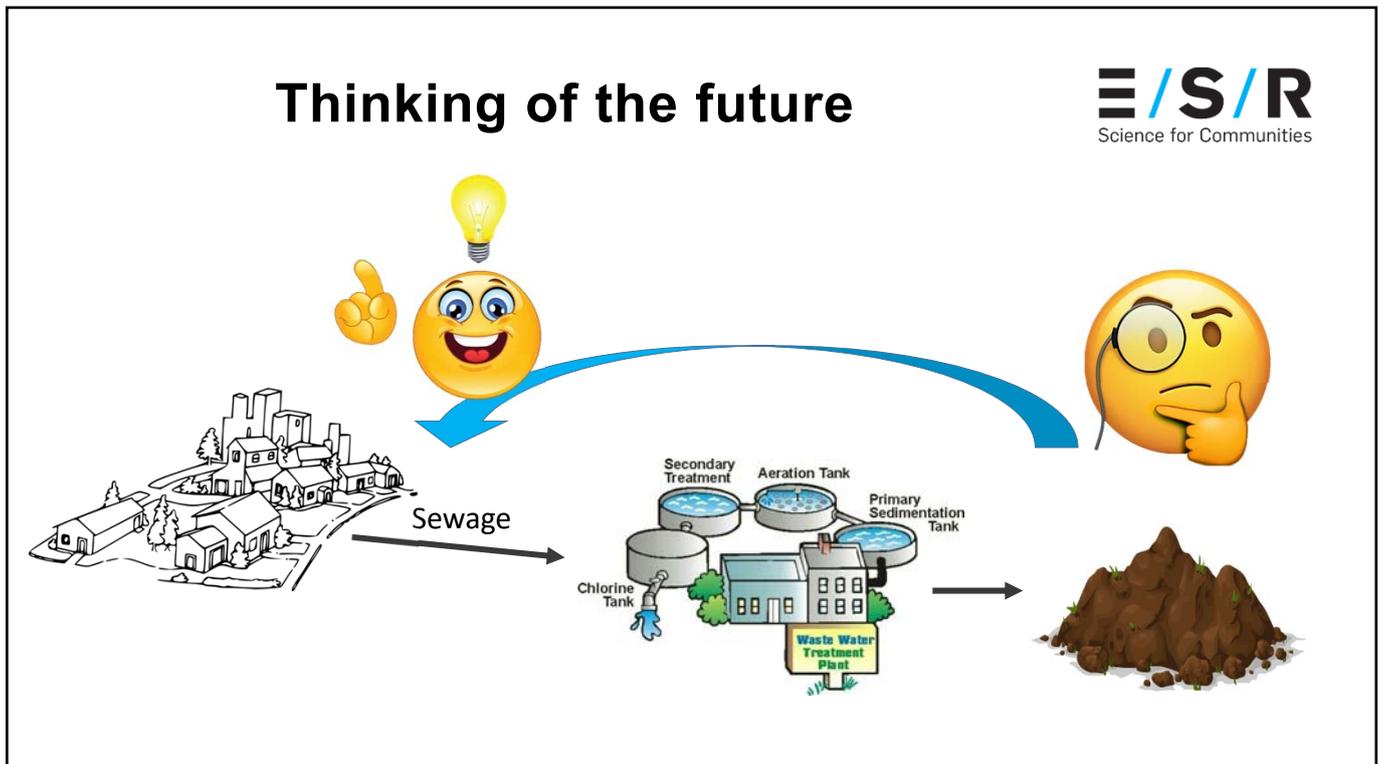
Applying biosolids (up to 1500 kg N / ha equiv.) to low-fertility soils to establish mānuka and kānuka that annually would produce ca. 100 kg / ha of essential oils worth ~ \$ 25,000.



Seyedalikhani et al. 2019. Plant Physiology and Biochemistry 137: 213–221



15



16

Appendix 6 – Grant Symons, CEO of Transition-HQ

The purpose of Grant's presentation was to draw our attention to the point that the solutions and pathways we take into the future require us to consider reduction of emissions and reduction of available energy. For example, when we remove fossil fuel energy from the equation it means we have to learn how to use **less energy as well**, because the renewable sources of energy of the future will not be as intense. Estimates put the reduction at between 40% and 60% depending on where you live in the world.

He explained that energy use falls in to 3 main categories

1. Building new stuff
2. Maintaining what we have built or protecting it from depreciation
3. Consumption – all the stuff we create, use up or throw away

In the 1950s we used most of the energy we had on building new infrastructure. Today, we use less on building new infrastructure and maintenance, but **a lot more** goes into consumption.

With reduced energy available in future it looks as though we will need to radically reduce the amount of energy that we use building new, and for consumption, **with the majority likely to be directed towards repurposing, maintaining and restoring what we have.**

So, future emissions and energy reductions need to be taken into account when we think about the creation, maintenance and running costs of large infrastructure because it may not be feasible.

Grant is the CEO at www.thq.nz

Introducing..... Composting Toilets!



Matt Brenin: Composting Toilet Designer, Construction, User & Educator



Outline

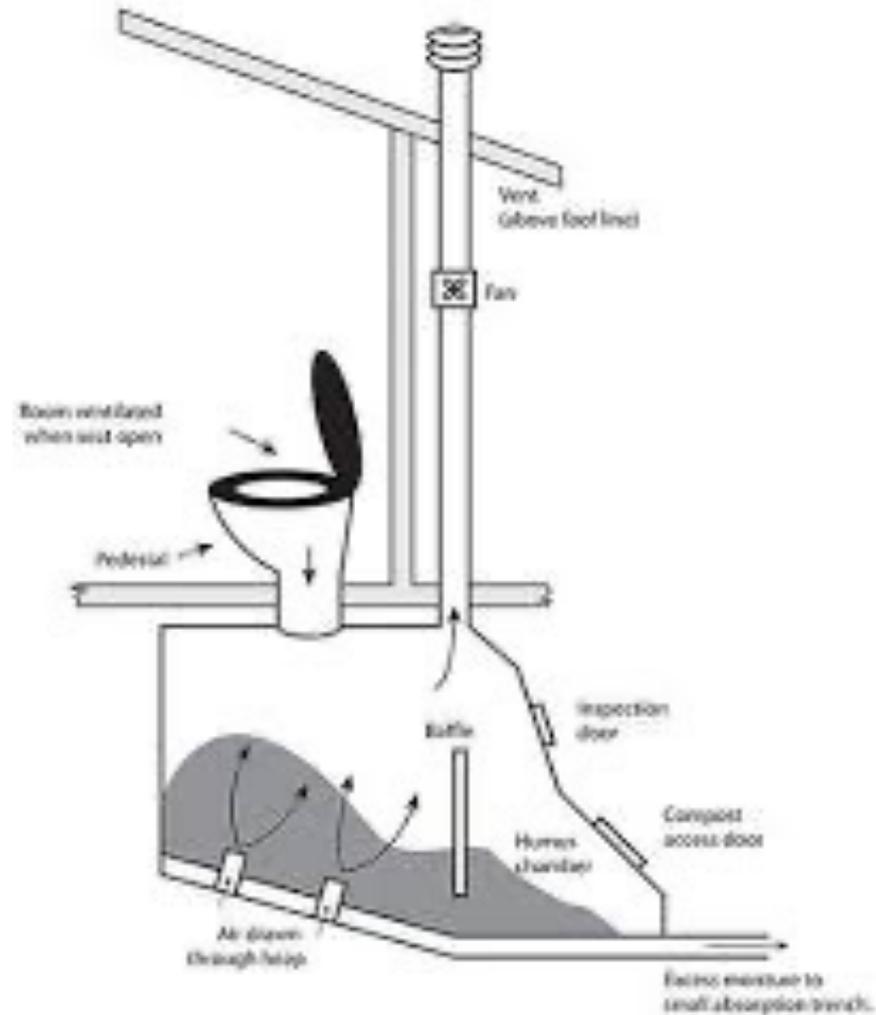
- Misconceptions
- Simple systems
- NZ examples - Standards, Practice and Research
- Challenges to mainstreaming Composting Toilets
- Opportunities to mainstreaming Composting Toilets

Misconceptions about Composting Toilets



They smell and are unhygienic

Misconceptions about Composting Toilets



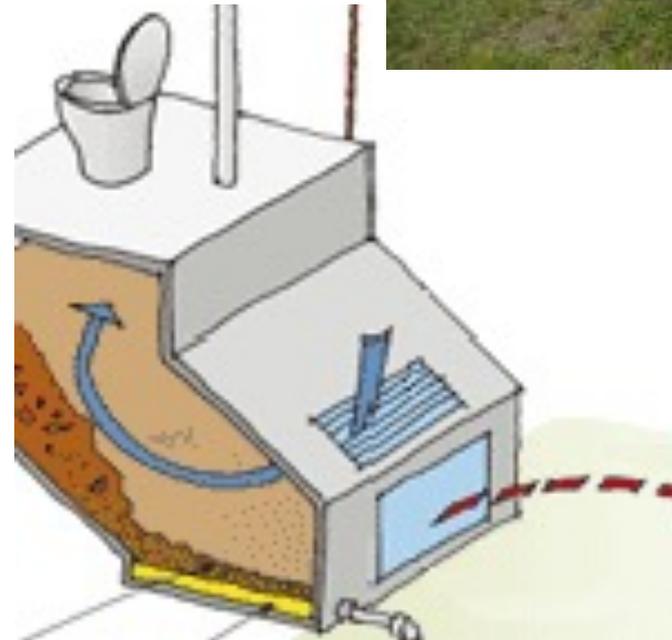
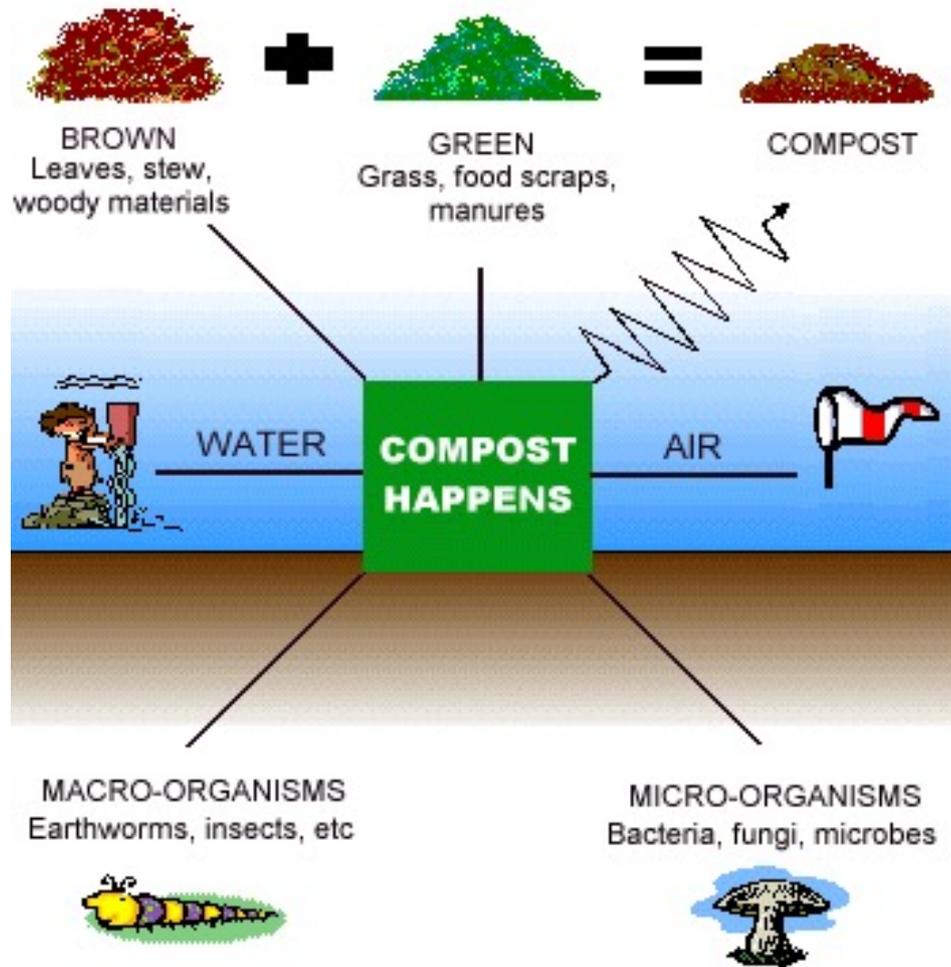
They require a lot of maintenance

Misconceptions about Composting Toilets



They are just like a long drop

Simple Systems



We have Standards!

AS/NZS 1546.2:2008

Australian/New Zealand Standard

On-site domestic wastewater treatment units

Part 2: Waterless composting toilets

Superseding AS/NZS 1546.2:2001

Assessing the effectiveness of compost toilets in an emergency

Debrief
05 December 2012
Craig Hamilton & Sarah Gauden-ing
Business & Development
Wellington Region Emergency Management Office

Purpose of trial

- **Are compost toilets a viable alternative to chemical toilets, port-a-loos and long drops?**
- Capturing perceptions
- Changes to routines
- What worked? What didn't work?



Report Conclusion



“The trial demonstrated that households and workplaces could safely and hygienically use a compost toilet exclusively for a month. Compost toilets therefore should be promoted as a viable toilet option in an emergency where sewerage systems are disrupted.”

SPLORE Music Festival





How effective is a composting toilet system for protecting human health in an emergency context?

M. Brenin, J. Horswell & C. Stewart

College of Health, Massey University, Wellington.

M.J. Gutiérrez-Ginés & K. Bohm

The Institute of Environmental Science and Research (ESR) Ltd, Christchurch.

D. Johnston

Joint Centre for Disaster Research, Massey University, Wellington.

ABSTRACT

The Wellington Region is highly vulnerable to large earthquakes as it is crossed by active faults. Expected timeframes of 1 to 2 Page for the re-establishment of networked wastewater management services provide urgency to the consideration of emergency sanitation options for the city. Lessons

Challenges to Mainstreaming Composting Toilets

- Our Emotions - Emotions of disgust

Challenges to Mainstreaming Composting Toilets

- Our Emotions - Emotions of disgust
- Retrofitting Composting Toilets



Challenges to Mainstreaming Composting Toilets

- Our Emotions - Emotions of disgust
- Retrofitting Composting Toilets
- Removal and recycling



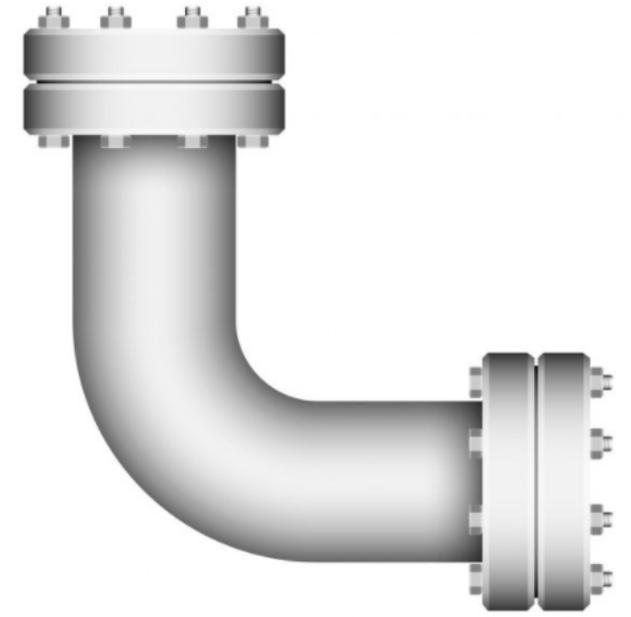
Opportunities to Mainstreaming Composting Toilets

- Engaging the public - Providing opportunities for understanding and experience.



SymPOO-sium – Beyond the Pipes

David Lee
Councillor - Pōneke/Wellington
Greater Wellington
26 July 2021



10 min download

- Backstory
- Water
- Internationally - where do we rank?
- Toilet talk
- Whaitua
- Next Steps

David's backstory: life history in 60 seconds

- Born and bred in Christchurch
- UC and University of AK alumni
- Urban planner (strategic planning)
- 25 years in local and central government



Partnerships: Trust and Confidence

Cheyne Hakaraia - Director, Coup d'état Enterprises Ltd

Hab//Co - constructors

Designers

Investors

Iwi/Hapū



Remarkable Places: The vision and concept

Havelock North: water contamination



What Happened: the numbers

- **August 2016 a waterborne disease outbreak of gastroenteritis**
- **5500 residents become ill with campylobacter**
- **45 subsequently hospitalised**
- **4 deaths**



Public Inquiry: twofold purpose

- Consider the causes of the outbreak and who was responsible
- Recommend measures to prevent similar incidents in the future



Public Inquiry: twofold purpose

- **Consider the causes of the outbreak and who was responsible**
- **Recommend measures to prevent similar incidents in the future**





Safe, Clean, Dry and Affordable Homes

**Vision: Access to housing is a
fundamental right!**

MALTA: Water from sewage is no longer a pipe dream

- Treated to a level good enough to be discharged at sea under the EU Wastewater Directive
- The upgraded filtration system: reverse osmosis, removing viruses and bacteria
- To **potable water Standard**

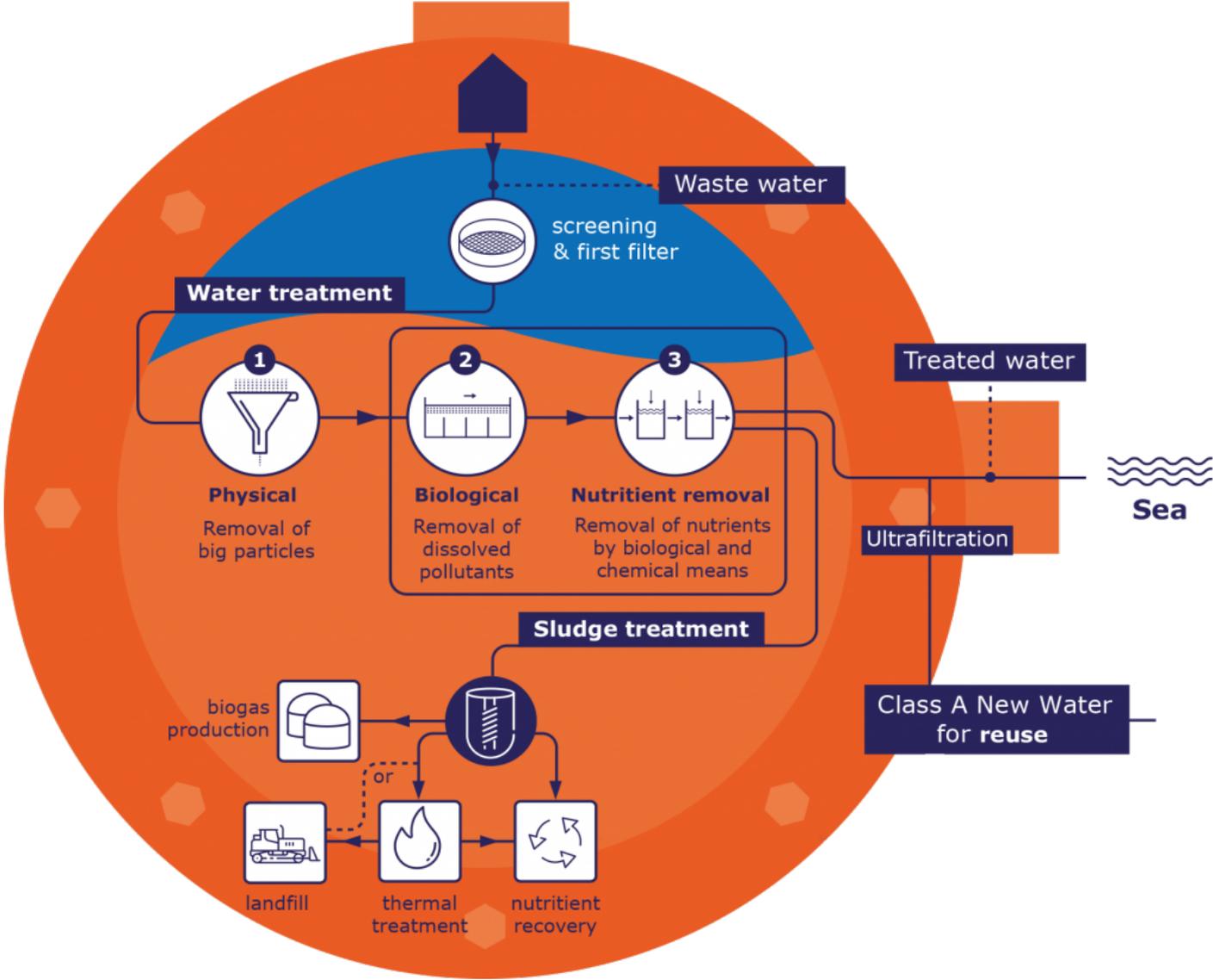


MALTA: Water from sewage is no longer a pipe dream

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SEWAGE TREATMENT



Compostion Toilet: Sun Mar Excel

- By designing modest, affordable, comfortable homes, we want to put forth a philosophy that aims to serve the dreams of all people and a modern way of living.
- Back to the future - Papakainga Housing



Nelson Mandela

"It always



“Everything is possible. The impossible just takes longer.” —

Dan Brown

The Whaitua Programme

Community-led

enable local knowledge and decision-making

to improve the health and wellbeing of local water and water bodies; rivers, lakes, streams and coastal discharge areas.

Local knowledge is critical in addressing poor water quality as it is the impact of local land use, the level of local investment in water infrastructure and local community uses of water that are the direct causes of decline in local water quality.

Response to the NPS-Freshwater Management

requires that water quality must be either maintained where it is good or improved where it is failing. Water quality and quantity must be measured against a number of compulsory values as well as others identified by local communities and mana whenua and then a plan formed that drives improvement.

Whaitua Committees determine a course of action and pace for change for improving water quality. They produce a Whaitua Implementation Programme (WIP) which is submitted to the regional council. Once endorsed by Council, the WIP is progressed as a plan change to put new rules into action.

The Whaitua Programme

The purpose of the whaitua process is to enable local knowledge and decision-making to improve the health and wellbeing of local water and water bodies; rivers, lakes, streams and coastal discharge areas. Local knowledge is critical in addressing poor water quality as it is the impact of local land use, the level of local investment in water infrastructure and local community uses of water that are the direct causes of decline in local water quality.

The whaitua process is a core part of the regional council's response to the National Policy Statement for Freshwater Management 2020. The NPS-FM requires that water quality must be either maintained where it is good or improved where it is failing. Water quality and quantity must be measured against a number of compulsory values as well as others identified by local communities and mana whenua and then a plan formed that drives improvement.

Whaitua Committees determine a course of action and pace for change for improving water quality. They produce a Whaitua Implementation Programme (WIP) which is submitted to the regional council. Once endorsed by Council, the WIP is progressed as a plan change to put new rules into action.

Whaitua te Whanganui-a-Tara Committee

Whaitua te Whanganui-a-Tara Committee is a group of local people from Hutt Valley and Wellington assigned with developing a programme to improve the quality of our streams, rivers and harbour. The Committee has been meeting since February 2019 and

Next Steps,... ***your choice, you decide!***

Ngā mihi - Thank you