NZ Lifelines 2020

Fixing our ageing wastewater networks

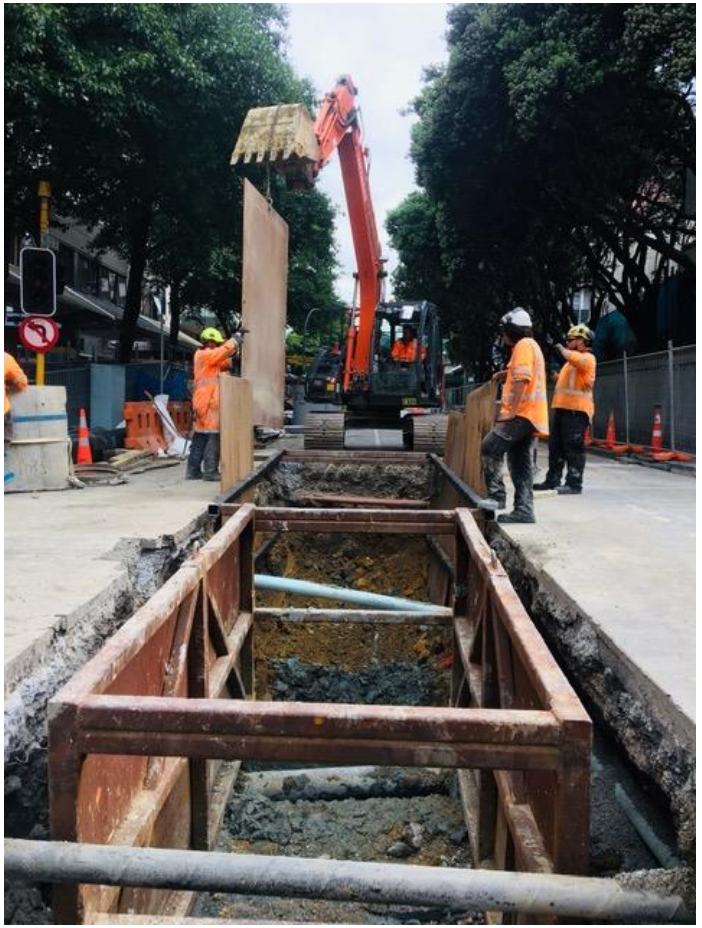
Steve Hutchison – Chief Advisor Wastewater

Wellington Water

Our water, our future.

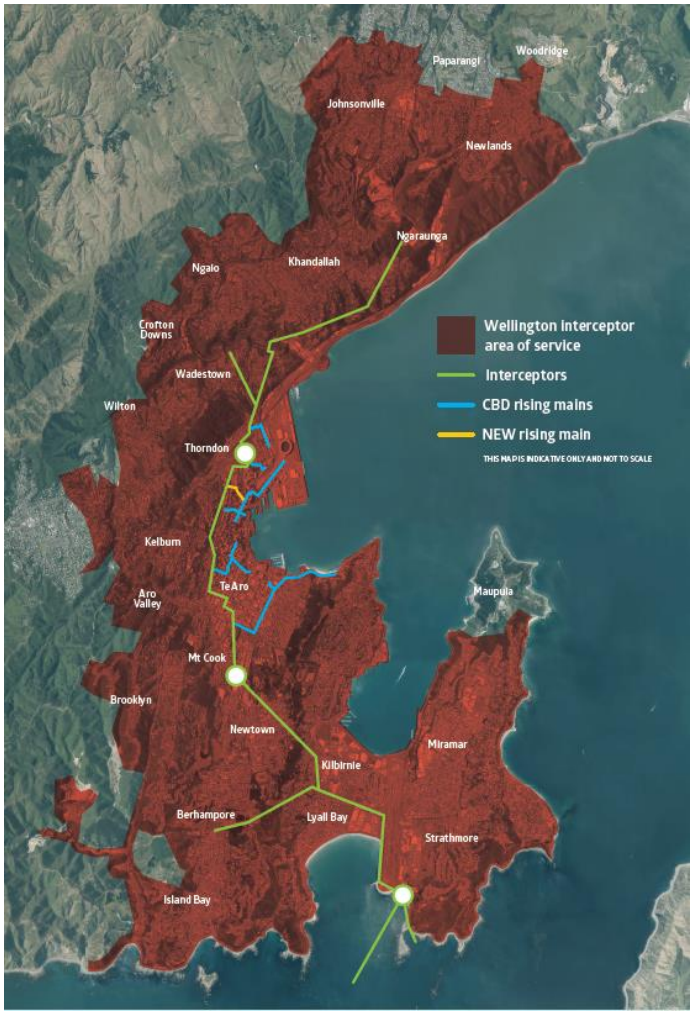
Outline

1. Background
2. Dixon Street failure
3. Mt Albert tunnel sludge pipelines
4. Moa Point Interceptor
5. Proactive replacement of critical mains
6. Conclusions

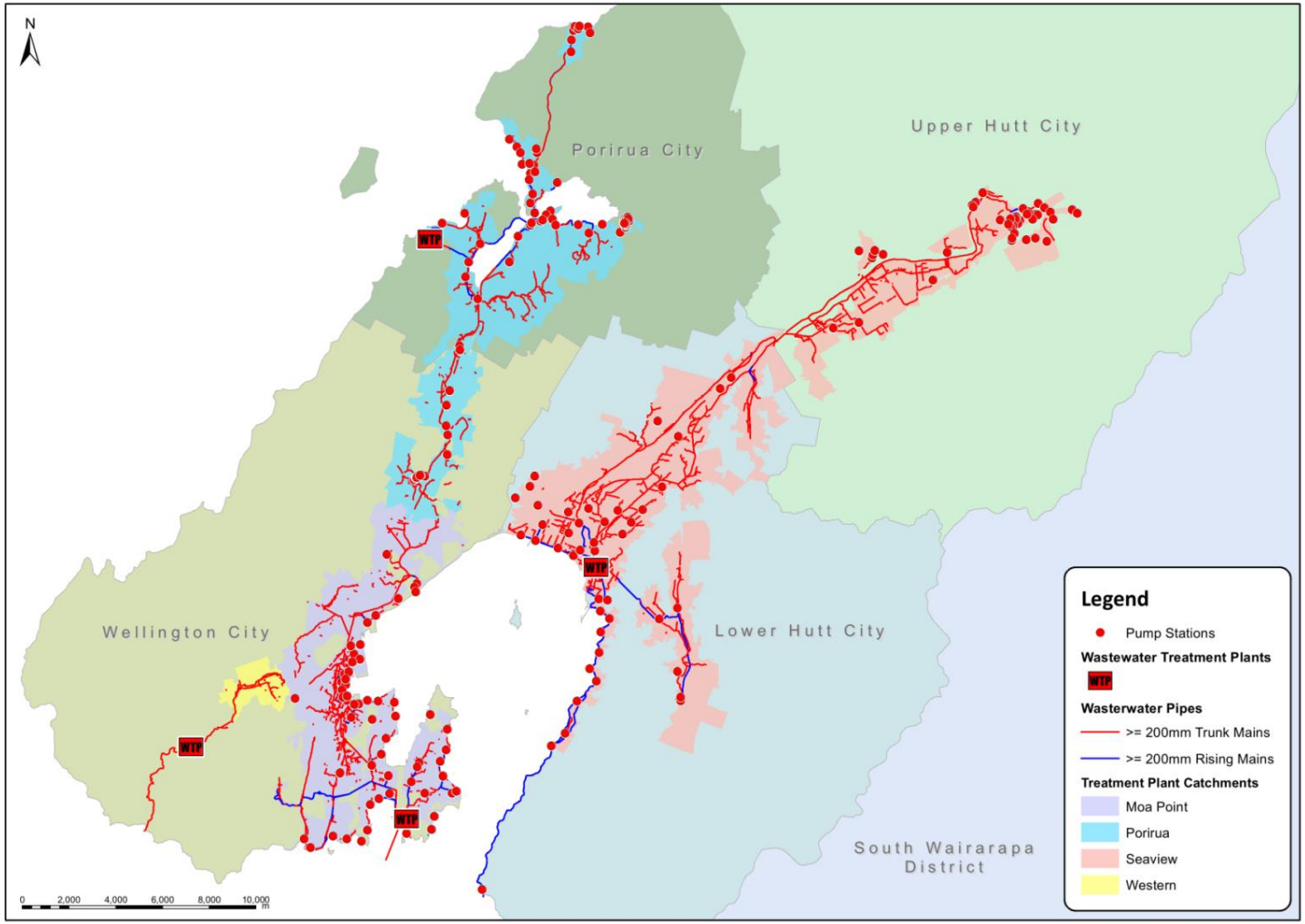


Background

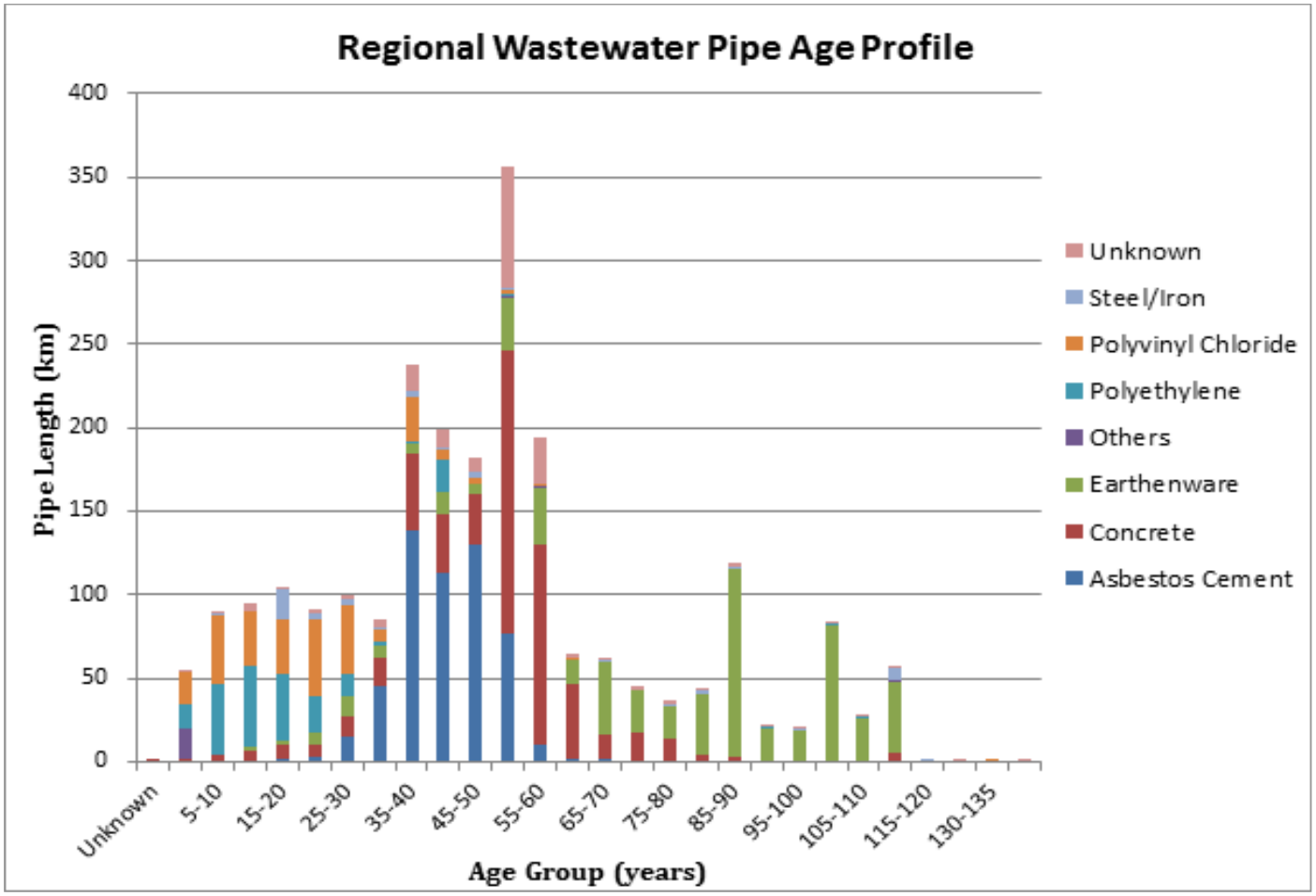
- Public health focus
- Interceptor first stage 1890’s
- Extended in stages
- CBD is pumped up



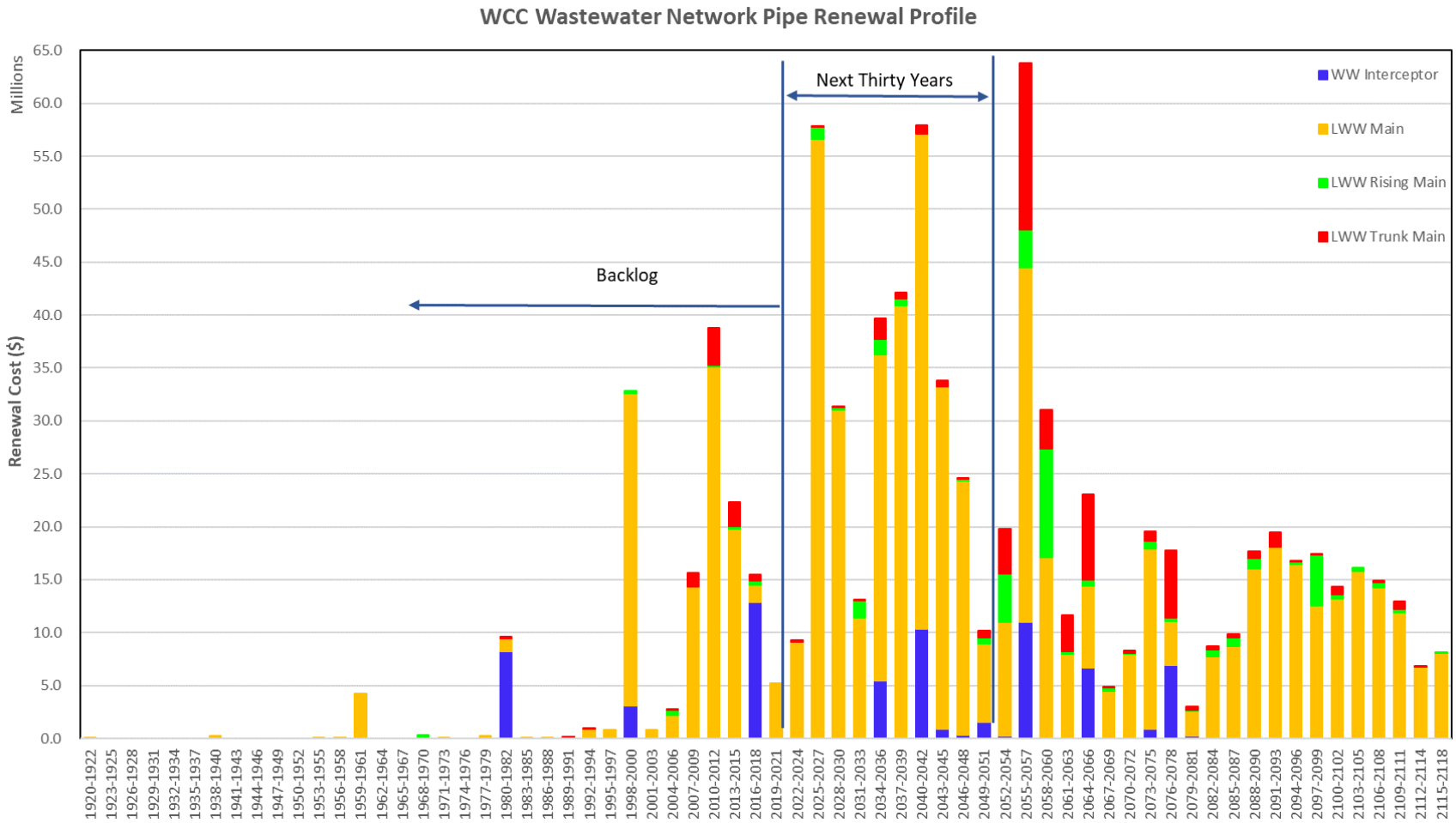
Current network layout



The wastewater pipe network



Age based renewal profile



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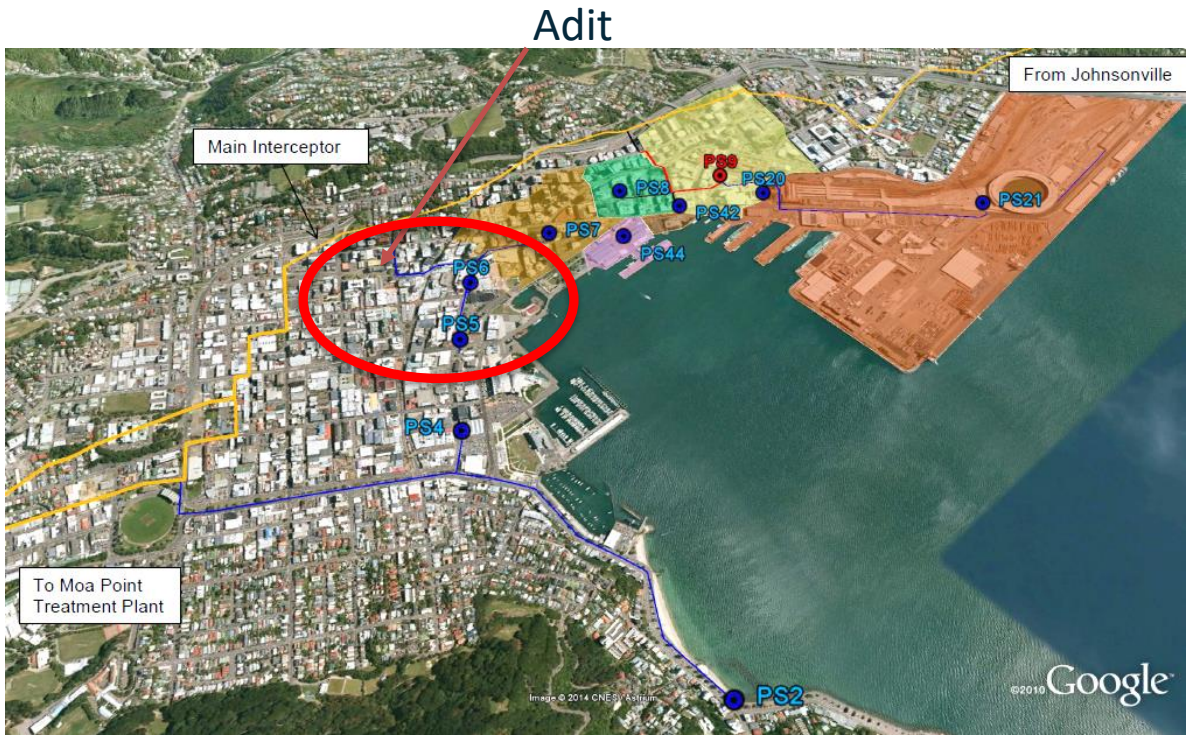
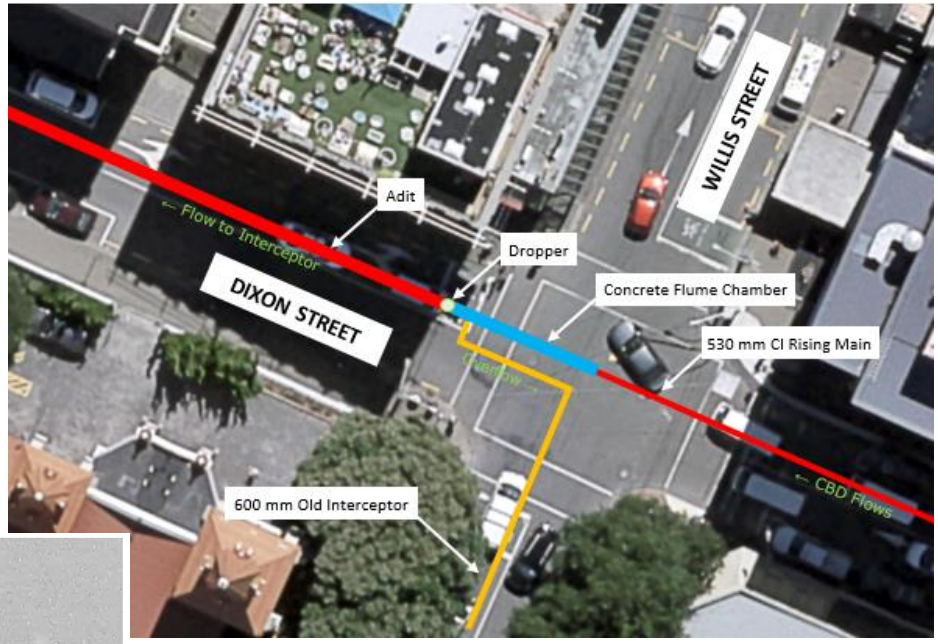
Dixon Street collapse

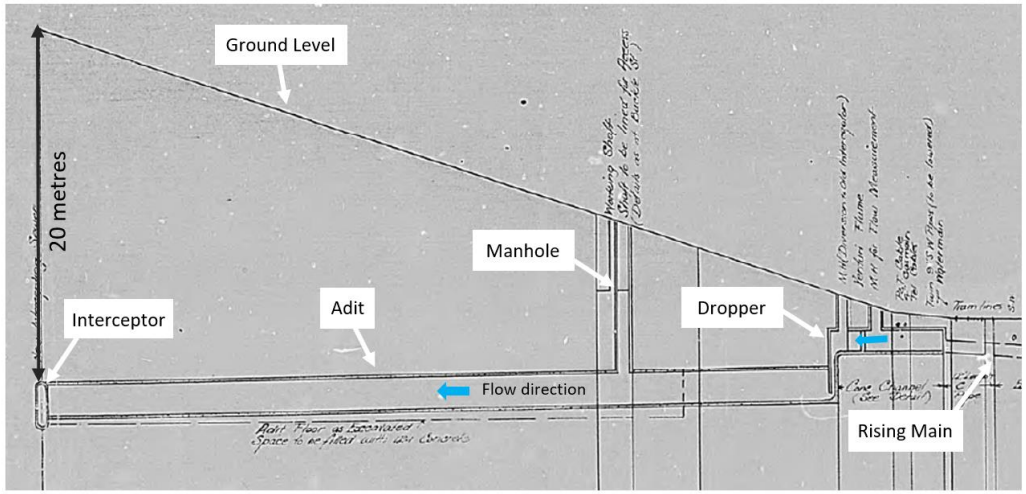
- Dixon Street serves key CBD area
- 5 million litres/day



Started as odour investigation

- Odour investigation located leak under Dixon/Willis St
- Rising main connected to “New” 1937 Interceptor
- Original interceptor abandoned in 1980’s



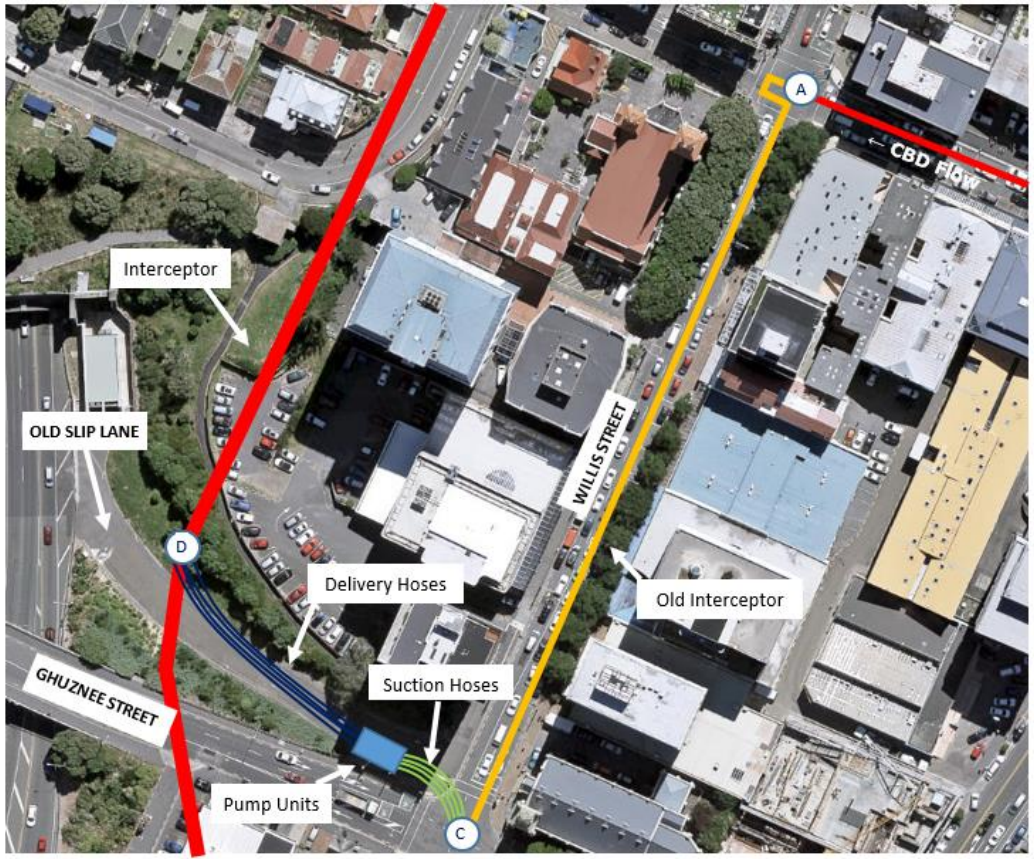


Void lead to collapse

- Potholing nearby revealed void
- Efforts to stabilise void were unsuccessful
- Turned off pumps to stop sluicing and undermining buildings

Emergency response

- Emergency response initiated 8am 21 Dec
- Public warnings on harbour pollution
- Road closures in place
- Old interceptor cleared
- Temporary pumping within 48 hours



Above ground bypass installed

- 230m overland pipeline completed on day 4
- Rāhui on inner harbour
- Beaches open day 7

Mount Albert tunnel sludge pipeline

- Sludge pumped 8km to landfill
- Duty/standby 150mm pipelines
- 220m operating pressure
- Both failed late January 2020

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Extremely challenging environment

- Leak located to Mt Albert tunnel
- Mt Albert Tunnel also conveys wastewater
- No alternative flow path
- Sludge pipes encased in concrete
- 1780m long tunnel
- Locating the breaks was difficult
- Fixing them was even harder

Keeping the sludge moving

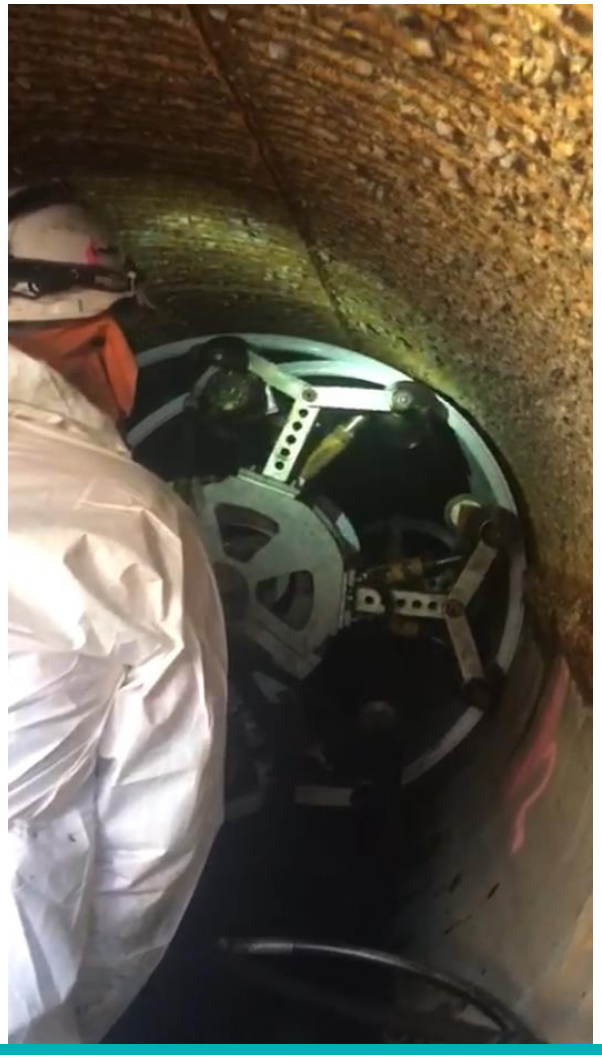
- 1,110 million litres sludge per day
- 10 km road trip
- 120 tanker loads a day
- 24 hour operation
- Urgency to fix or replace pipes

Repairing the tunnel pipes

- High pressure liner used
- German technical crew
- COVID-19 complications

Moa Point Inlet pipe deterioration

- Condition inspection found deterioration in 2013
- Re-inspected in 2018, had got worse
- Required urgent structural rehabilitation
- Internal PVC lining wound in place



Proactive replacement critical mains

- Northern CBD rising main failures 2010
- No redundancy for planned renewal
- Laying a new rising main on different alignment
- Underground services congestion
- Traffic management challenges

Conclusion

- Age profile of assets has many approaching end of life
- Condition knowledge is critical
- Focus on high criticality assets
- Step change in renewals likely

Questions

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