

How Deep is Your Love? Spurting, surging, leaking and hissing in Calgary's pressurised drinking water infrastructure.

SHAW, Becky <<http://orcid.org/0000-0001-6835-6044>>

Available from Sheffield Hallam University Research Archive (SHURA) at:

<https://shura.shu.ac.uk/29536/>

This document is the Accepted Version [AM]

Citation:

SHAW, Becky (2022). How Deep is Your Love? Spurting, surging, leaking and hissing in Calgary's pressurised drinking water infrastructure. In: BATES, Charlotte and MOLES, Kate, (eds.) Living with Water. Everyday encounters and liquid connections. UK, Manchester University Press. [Book Section]

Copyright and re-use policy

See <http://shura.shu.ac.uk/information.html>

How Deep is Your Love? Spurting, surging, leaking and hissing in Calgary's pressurised drinking water infrastructure.

In 2016-2019 I worked as a commissioned artist exploring Calgarian's emotional attachment to their water system¹. I (with other artists) was taken to many of the key sites of water management including for drinking water, sewage and storm water, and spent time with engineers and managers. Everywhere we went we saw electronic imaging systems monitoring the network of flows and volumes being moved up and down gradients and to the outer edges of Calgary's rapidly expanding 825.3 km² footfall (bigger than New York, just over half the size of London, over seven times the size of Paris).

Calgary, Alberta, has a dynamic and unstable climate- it can snow in almost any month but is also semi-arid. Calgary is notorious for its chinook. This is a sudden hot wind that can raise the temperature by up to 20 degrees in an hour and can make snow sublime. Calgary's water source begins as rainwater in the Canadian Rockies and Bow glacier. It is transported downhill into the city via the huge Bow River. The Bow and the Elbow River meet in Calgary, and then continue an 800km journey across from West to East, into the Hudson Bay. The Bow and Elbow are a significant part of Calgarian identity, being profoundly important to first nation and indigenous communities and a site of water sports and 'hanging out' for urbane neighbourhoods. The river is also the site of a devastating flood surge in 2013, and the source of Calgary's pristine drinking water.

In a city Water Services office an old, hand-drawn poster documents the pressure differentials needed to ensure a good supply for all in the city. Beneath the poster is a 'cut-through' model water valve, to train staff. The slice-through reveals the space where water pushes with enormous pressure against the valve top. Not surprisingly, drinking water is produced under the strictest of sanitary conditions, where the social pressure to maintain a healthy supply interlocks with the pressure to maintain the natural environment and the physical pressure to move water to neighbourhoods. The intertwining of social and technical pressure never lets up: at Christmas, Thanksgiving and Stampede (Calgary's world-famous Rodeo) the supply water pressure must be elevated to cope with increased demand.

¹ The period of exploration and resulting work, *How Deep is your Love?* was commissioned by the City of Calgary Utilities and Environmental Protection, as part of the Dynamic Environment Lab, led by Watershed+, with Sans façon as lead artists. <http://www.watershedplus.com/news/how-deep-is-your-love-by-becky-shaw-dynamic-environment-exhibition/>

As part of my research, I spent time in the meter-shed, where staff show me rows of water meters brought in for testing. Water meters belong to the City of Calgary, even when installed in homes and businesses. A political and media storm has recently surged and abated, as customers complained that faulty meters were inflating water bills. The engineer shows me the cavity where the pressurised water forces through the meters and explains that faulty meters under-estimate rather than over-calculate. However, political pressure, ~~and~~ Calgary's responsibility as public body, and their need to maintain public trust, means they must respect the complaints and run checks. The meters then, are a single emblematic part of a system of conflicting pressures. The physical and social infrastructure ~~negotiates~~avigates supply and demand, and ~~the~~ balances competing demands of individual household and collective system. The water and its infrastructure is both public service and a product. This is a resource that flows past doors, into every living cell, but also has a cost and produces a 'customer' at the same time as a citizen. It seems that drinking water is a substance where the very nature of publicness is being constructed and contested.

I spent several weeks with Kelly Pyke, a leak locator. The leak location service is a small team of men who travel around the city following reported surface water, loss of service, unexpected meter readings, and routinely inspecting ~~or~~ ageing services where leaks are common. Kelly is quiet and professional, and initially shy. While the locators sometimes work in teams, leak location is often a solitary job. Kelly tells me the job suits thoughtful people who enjoy the quiet and sense of freedom while driving miles around the entire city. The city van is comfortable and fit for purpose, and as we travel we see many other city vehicles on the road, with their distinctive civic livery.

We gradually become comfortable with each other, talking about family, health, renovation, history and our two cultures. I was given permission to travel with Kelly on four or five leak location trips. We picked up his jobs from a central office at the city Water Centre at 5am. We travelled to glassy wealthy crescents with wide roads, manicured lawns and no evident people; uniform developments right at the city limit, often occupied by 'new Canadians'; and industrial parks. More often, we attend leaks closer to the city; in suburbs mosaiced with Calgary's oldest 'century houses', served by the oldest of water infrastructure. The patched road surfaces in these areas attest to the frequency of mends.

The leak locators aren't always a welcome sight. While residents assume the ~~garden~~ garden ~~line~~ marks the beginning of their property, some City of Calgary water infrastructure sits underneath may run under these, with the join between individual and state falling under lovingly-maintained grass. ~~LE~~qually, leaks can also turn out to be the responsibility of residents and not the cCity. The

Formatted: Indent: First line: 0 cm

locators need good communication skills to manage difficult conversations and negotiate the interests of residents and the state. City interests.

The services in Calgary are buried three metres beneath the depth of the frost-line, to avoid freezing and damage. The leak locators use a variety of instruments to diagnose or pinpoint a leak. The instruments all use sound. They seek that listen for the sound of leaks: a change in sonic frequency of sound due to the pressurised spurt of water, or the agitated clicks noises of pebbles being swirled round in turbulent flow. On site, Kelly ~~They~~ starts off with instruments called 'correlators' and a the digital aquascope. These digital instruments generate a digital trace and a numerical reading and identify the 'ballpark' area where more detailed locating should then happen.

Kelly then moves on to use the ~~but usually end with the~~ analogue geophone. This is an extraordinary steam-punk-looking instrument with two heavy brass disks that are sit positioned on the ground around the possible leak site. The disks transmit the pressure of sound waves through the earth, through two delicate vibrating brass and copper plates, and then amplifies it through stethoscopes into the ears of the leak locator staff. The listener must, then, perform an extraordinary act of translation. The leak locator must bring: ~~they their must~~ understanding of soil types, the wider landscape, the age and material of services, atmospheric noise, household noise, hydraulic forces and pressure, to bear on their interpretation of the sound from the two 'touch points' on the ground. The and act of translation compresses all this understanding, but also has to perform a fascinating act of spatial translation, translate this from the space between the two 'touch points' on the ground, between two points into a mental conception of this space underground, then back- to the surface where they diagnose the site of a leak into a point on the ground.

Kelly tries to train me to listen- he describes the need to 'sink under' ambient noise to 'reach' any leak noise. A leak noise is hard to recognise for an untrained ear although Kelly (and other leak locators) make a range of verbal hissing noises to try to describe it. The analogue system means there is no sharable record, only trust in the crew's listening skills. From this diagnosis the repair road crews are authorized, with mistakes leading to potentially thousands of dollars of cost for the tax payer and occasionally for householders. This gentle act of listening then, is also high pressure for the locators.

Leak location has its own lore- there are places in Calgary where rogue 'leak' sounds are heard but with no source: these are common places to bring trainee locators- and Kelly also takes me there. There are also stories of leaks flowing backwards, uphill, and of householder's pet birds making leak-like noises that confused all locators. Listening with the geophones is an extraordinary experience:

part meditation, part spy-movie, and part time-traveller. Listening feels intimate and subjective, and generates a peculiar oscillation between feeling alone with the earth and being wired into the vast social infrastructure. It seems to me that the most important thing I could do with my artwork, would be to give other people this experience.

A leak is 'matter out of place' (Douglas, 1984) - a spurting, expensive, specific, disobedient, lively opposition to the orderly, industrial, extensive social infrastructure². I am fascinated by it and decided to make it the 'site' of my public artwork, revelling in the possibility of making a small and intimate work in a giant system. I started by asking the City of Calgary fabricators if they can copy a geophone. This is a unit of engineers within the City who seek to make savings for the public by self-building equipment. I ask them if they could ~~copy the geophones, or~~ make a smaller geophone pair, thinking that a reduction in size might amplify the intimacy of listening and reverse our expectation that public art is 'bigger'. Lengthy inspection by a group of engineers indicated that the central 'spine' of the geophone, that holds the oscillating plates at a perfect distance from each other, would be extremely difficult ~~is hard~~ to manufacture. ~~so~~ Brent L'Heureux, a skilled engineer, takes the original geophone ~~#~~ apart and painstakingly mills a geophone suitable for the hand size of my ~~my~~ eight-year-old son, out of the adult one. ~~The~~ fabricators and the leak locators try out the 'mini-geo': it can't reach sound so far as the 'adult' one ~~deep~~ and its pitch, like a child's voice, is higher. This is a strange new tool that makes the listener work harder and bend lower to the ground to listen.

At the same time, I fantasised about being able to pass sound through the sterile drinking water system. What if a leak in our own neighbourhood spurted with our 'emotional outburst' - those favourite pieces of music that we listen to, to 'let go' or 'keep going'? How would these individual choices conflict with the need to provide a civic 'public service'? How would the City of Calgary manage the conflict between those who wanted explicit rap, mass-produced elegiac dance music, or relaxing whale music, all 'dirtying up' the sterile social drinking water system? While attempts to literally pass sound through connecting valves failed, I started asking staff I met what music they would want to burst through a leak in their neighbourhood. Kelly imagined k.d.lang's 'Miss Chatelain' and Neneh Cherry's 'Buffalo Stance', Another leak locator, Chris Steffen, imagined hearing AC/DC or Nine Inch Nails. Denise, a manager who lived in the desirable Signal Ridge neighbourhood wanted Jeff Beck's gritty, screeching furious guitar.

² Mary Douglas (1984), *Purity and Danger: An Analysis of the Concepts of Pollution and Taboo*. Kegan Paul, p.36.

These elements were pulled together into a final, multi-form artwork. An exhibition was held in Calgary's extraordinary futuristic-meets-brutalist ex planetarium³. A ~~redundant hard-copy~~ paper ~~City of Calgary~~ repair manual (~~used in all city vans until a full digital version was developed~~) was pieced back together into a 12m x 8m floor ~~map~~, making the ~~vast~~ ~~large~~ City scale present alongside ~~the intimate encounter with a~~ full-size and mini-geophone (~~positioned so the visitor could listen to the heating and water system in the building~~). Then, for two days this ~~site~~ was the convening point for a guided tour, where we collected the ~~participants~~, geophones, ~~hi-vis vests~~ ~~and some artist-~~ ~~made a set of publications that maps (that also~~ functioned as scripts, tour guides, ~~artworks~~ ~~artists~~ ~~publications~~ and souvenirs. ~~Participants were taken onto a City of Calgary liveried mini-bus and led~~ ~~and went~~ on a guided listening tour, supported by Chris Steffen. We visited ~~two~~ ~~free~~ roadsides in ~~neighbourhoods that staff lived in (and had added to the map)~~ and we also visited the place with the 'rogue' leak sound. ~~On the way to the~~ ~~staff~~ ~~neighbourhoods~~ we played the leak music selected for this ~~neighbourhood, connecting the place above ground with the space of the infrastructure imagined belows and played chosen leak music on the way.~~

~~On each site we used both standard and mini-geophone to listen for leaks. The tour group made new friendships as they passed instruments back and forth and suggested new spots to listen. The~~ ~~The~~ day of the tour ~~coincided with~~ ~~generated~~ Calgary's first ~~day of~~ autumn snow. As we listened, we could hear a strange, gentle, repetitive, drumming noise- ~~before we realised it was~~ the feathers of snow landing on the sensitive geophones.

How Deep is your Love? sought to give the public the experience of listening for leaks, and through this to melt definitions of what might be considered a negative phenomenon. Nikhil Anand (2020) describes material failure as an ordinary and inevitable part of the assemblages and decompositions of everyday life⁴. Indeed, he writes that failure can generate the conditions from which newly visible infrastructures emerge through the work of maintenance and repair. The leak here generated the possibility for a public artwork that could animate the construction of public and private, dissolve artificial boundaries between man-made and natural, and to make large scale institutional structures animate and lively.

³ <https://www.contemporarycalgary.com/whats-on/2019/9/26/dynamic-environment>

⁴ Nikhil Anand (2020) After Breakdown: Invisibility and the Labour of Infrastructure Maintenance. *Economic and Political Weekly*, 2020-12.26. <https://www-proquest-com.hallam.idm.oclc.org/docview/2473359027?accountid=13827&pq-origsite=primo> (accessed 10/9/2021).



Figure 1: Model of water valve in City of Calgary Water Centre Offices, and water meters in City of Calgary Meter Shed.

Image credit Becky Shaw



Figure 2: Full size geophone head on right, mini-geophone trial 'hack' on left.
Image credit Becky Shaw

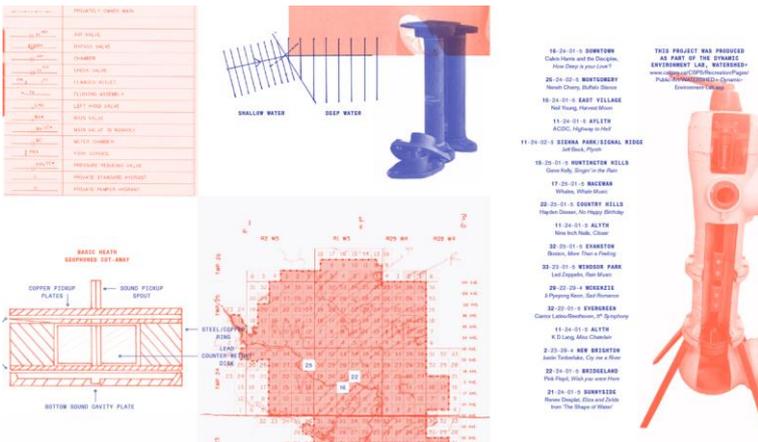


Figure 3: detail from *How Deep is your Love?* map showing list of leak music choices.
Designed by Ashleigh Armitage @dust Sheffield.



Figure 4: *How Deep is your Love?* Guided tour.

Photo credit Jeffrey Heyden-Kane