

The Water Lines You Cannot Cut Open

What if you could measure a 1970s water line through its original coating — in service, in its vault, without cutting, draining, or dismantling anything?

Vaults, tunnels, hatcheries, and treatment plants across Canada still run on piping commissioned in the 1950s–1970s. Much of it cannot be taken out of service, and record drawings rarely tell the whole story. HELIX Sensors screens these lines from the outside — through their coatings — and puts every reading on a 3D model of the real asset.

THE CHALLENGE

Old lines, live service, no drawings you can trust.

Water and wastewater lines in vaults, tunnels, and hatchery galleries are among the hardest assets in any portfolio to assess: confined, sometimes flooded spaces; live process or drinking water that cannot be interrupted; and fifty years of repairs the as-built drawings no longer match.

- **No shutdown available.** A live chlorinated-water line at a working facility cannot simply be drained for inspection.
- **No cutting or coupons.** Destructive verification is off the table on lines that must return to service.
- **Unknown material boundaries.** Decades of replacements mean one “pipe” can be several different pipes — and readings must not be compared across an unconfirmed boundary.
- **Coatings that stay on.** Older lines may carry blistered, possibly lead-containing coatings that should not be disturbed for spot readings.



Coating disbondment and external corrosion — visible at the surface, but the wall behind it is the real question.

OUR SOLUTION

Four screening methods, one site visit, one model.**Pulsed eddy current (PEC) wall-response screening**

The HELIX PEC scanner measures relative wall response through coatings and insulation — no surface prep, no bare metal, no couplant. Referenced to the ISO 20669 framework for PEC of ferromagnetic components.

Eddy current array (ECA) surface screening

A 32-element array screens welds and accessible surfaces for surface-breaking and near-surface discontinuities, and flags indications for follow-up examination.

LiDAR + photogrammetry 3D capture

The piping and the space around it are captured as a registered 3D model — the vault, the supports, the penetrations, exactly as they stand.

Registration in HELIX Horizon

Every screening sample is placed where it was taken. A reading stops being a spreadsheet row and becomes a coloured patch on the actual pipe, in the actual room.

HOW IT WORKS

1 Walk-down and zoning

The line is divided into numbered inspection zones so every result has an address future surveys can return to.

2 Screen in place, in service

PEC and ECA scanning proceed from the outside, through the original coating, while the line keeps operating.

3 Capture and register

LiDAR and photogrammetry capture the asset in 3D; all results are registered to their physical locations in HELIX Horizon.

4 Report and hand over

Deliverables: inspection report, processed PEC and ECA datasets, a point-of-interest register, the registered 3D model, and Horizon access.



The HELIX PEC scanner on an in-service line — screening proceeds from the outside, through the coating.

PROVEN IN THE FIELD

Fisheries and Oceans Canada — Capilano River Hatchery

July 2026, North Vancouver, BC: a working federal fish hatchery needed a condition picture of two 1970s piping runs in an underground room — a 24-inch out-of-service wastewater line and a live 4-inch chlorinated drinking-water line. Neither could be cut open; the 4-inch line could not be taken out of service at all. (HELIX case study, ref. HLX-2026-001.)

~100 m

OF PIPING SCREENED IN PLACE

378,407

SCREENING SAMPLES ACQUIRED

4 days

ON SITE, START TO FINISH

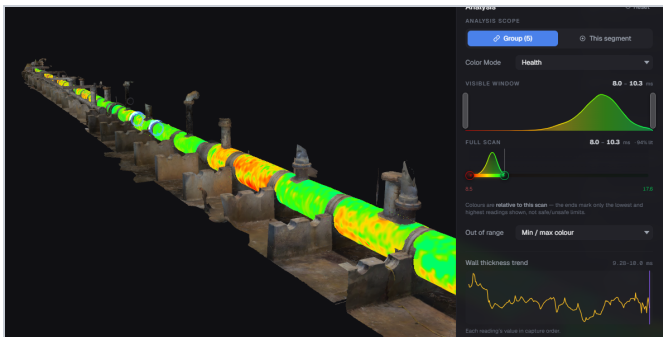
Zero

CUTTING, DRAINING OR DISMANTLING

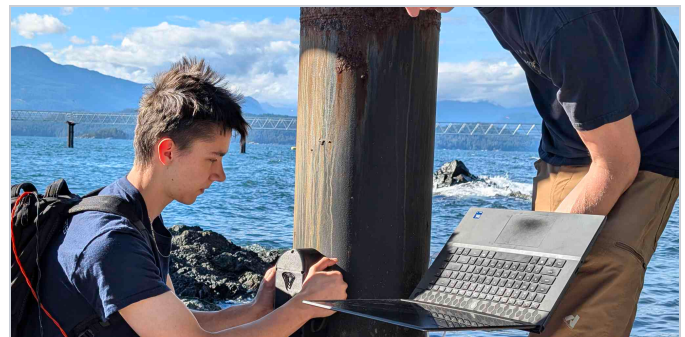
WHAT THE SURVEY DELIVERED

- 34 numbered inspection zones and 46 point-of-interest entries, each registered to the 3D model.
- Located thinning signatures on the wastewater line — about 2.8 m reading roughly 5–6% less apparent wall than the adjacent section.
- An unrecorded material boundary found mid-run — a question the client did not know to ask before the survey.

Findings are relative comparisons within each line; PEC reports apparent wall response, not absolute thickness. Full basis and limitations in the released case study.



Screening results as a colour map on the captured geometry, from HELIX Horizon. Colours are relative to this scan — they mark the lowest and highest readings shown, not safe/unsafe limits.



The same methods extend to marine and coastal structures — pilings, intakes, and outfalls.

BENEFITS

Keep the water running

Screening proceeds while lines stay in service — no outage, no bypass, no interruption.

Spend follow-up where it counts

Located points of interest tell your engineers exactly where to take ultrasonic readings first.

A record that outlives the survey

The registered 3D model is a durable baseline: the next survey lays directly over this one.

Answers about what you actually own

Material boundaries and replaced sections surface from the data, correcting decades-old drawings.

What screening does not do: HELIX screening locates and prioritizes — it does not certify. Fitness-for-service remains a regulated engineering assessment that stays with your engineers, and PEC results are relative comparisons, not absolute thickness measurements, unless a material reference exists.

Book a screening survey

Tell us about the line you cannot cut open. We will scope a screening survey — typically a matter of days on site — and show you your asset in HELIX Horizon.

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