

AI is dying of thirst. *Canada isn't.*

A concept for hydro-powered, water-rich AI data centres — designed for the age of AI scarcity, on Canadian land, under Canadian law.

Concept stage, pre-seed. Canadian Vault has no facilities, customers, or revenue. Every figure below is either a *design target* or a *cited public benchmark* — never an operating result. We are seeking \$50K to validate the concept.

1 · THE THESIS

Compute is becoming a siting decision — and water is the constraint

Desert-sited data centres were chosen for cheap land and power. Evaporative cooling now makes each kilowatt-hour cost one to two litres of water on site, and the industry is being forced to count — in courtrooms, audits, and municipal records.

PROJECTED GLOBAL AI WATER WITHDRAWAL, 2027

4.2–6.6 billion m³

4–6× the annual withdrawal of Denmark

Published projection — Li et al., CACM

WATER EVAPORATED TRAINING GPT-3 (US DATA CENTRES)

700,000 L

Published projection — Li et al., CACM

US DATA CENTRES' DIRECT WATER USE, 2023

~17 billion gal

hyperscale alone: 16–33 B gal/yr by 2028

Published benchmark — LBNL 2024 (DOE)

VIRGINIA DATA-CENTRE WATER, 2023

2.1 billion gal

+86% since 2019

Published benchmark — JLARC audit, Dec 2024

Our design answer is structural, not technological: put compute where hydro power and continental freshwater coexist, and let cold air do most of the cooling. Our water design target is **0.2 L/kWh** (closed loop) against a verified US average of **1.8 L/kWh** — with real facilities spanning 1–9 L/kWh depending on climate and technology.

0.2 L/kWh is an engineering goal — no facility exists. The claim we stand behind today is the geography, not the number.

2 · THE ADVANTAGE, IN VERIFIED NUMBERS

Québec's grid vs the Virginia corridor

Every comparator below is a published figure with a named source; every Canadian Vault figure is a labelled design target. Corrections from our 2025 materials are dated on the methodology page of the website.

GRID CARBON INTENSITY

Québec grid (Canada Energy Regulator, 2022) 1.2 gCO₂e/kWh



Virginia data-centre corridor (EPA eGRID 2023) ~270 gCO₂/kWh



94% hydro + ~5% wind vs SRVC/RFCE subregions; US national average ≈ 348 gCO₂/kWh.

POWER USAGE EFFECTIVENESS

Canadian Vault design target 1.20



US fleet average 2024 (LBNL 2024 report) 1.55



AI-dedicated halls already average ≈1.15; our target is conservative against purpose-built AI and robust against the fleet — and designed for a water-scarce world.

FREE-AIR COOLING

Baie-Comeau, warmest month (July) daily mean 16.0 °C



Outside-air cooling threshold ≈18 °C



ECCC 1991–2020 normals: all twelve months average below 18 °C. 280+ free-air days/yr is our deliberately conservative target.

Thirteen proposed sites, nine on named river systems

Every site is conceptual — no land, permits, power agreements, or funding. We publish them because the siting logic is the thesis and it deserves scrutiny now, not after money is spent.

SITE	POWER	MW INITIAL→TARGET	ADJACENT WATER
Baie-Comeau, QC	Grid (Hydro-Québec)	3 → 25	St. Lawrence Estuary
Sept-Îles, QC	Grid (Hydro-Québec)	3 → 25	St. Lawrence Estuary
Churchill, MB	Grid (Manitoba Hydro)	3 → 20	Churchill River estuary
Inuvik, NWT	Remote (wind + BESS)	3 → 10	Mackenzie River
Tuktoyaktuk, NWT	Remote (wind + BESS)	2 → 8	Beaufort Sea coast
Norman Wells, NWT	Remote (in-stream hydro)	2 → 7	Mackenzie River
Dawson City / Dempster, YT	Remote (run-of-river)	2 → 6	Yukon River
Rankin Inlet, NU	Remote (wind + BESS)	1 → 6	Hudson Bay coast
Baker Lake, NU	Remote (wind + BESS)	1 → 5	Baker Lake / Thelon
Kangiqsujaq, QC	Remote (tidal)	1 → 6	Hudson Strait (hypertidal)
Salluit, QC	Remote (tidal)	1 → 5	Hudson Strait fjord
Kuujuuaq, QC	Remote (in-stream/tidal)	2 → 8	Koksoak estuary
Labrador City / Wabush, NL	Grid (Churchill Falls)	2 → 15	Smallwood Reservoir nearby

Infrastructure for AI that must stay in Canada

Compute & colocation

Private cages and halls in low-profile facilities on Canadian soil; liquid-ready high-density GPU halls; storage and disaster recovery inside Canadian jurisdiction.

RedBeaver (proposed platform)

A sovereign-AI stack: Canadian-hosted models, retrieval over tenant documents, French/English parity from day one — shaped by six specialist modules for public-sector mandates.

Compliance-ready tiers (proposed)

TIER	INDICATIVE PREMIUM	TARGET AVAILABILITY
Standard	+25%	99.9%
Premium	+45%	99.95%
Enterprise	Custom	99.99%

Evidence collection and control frameworks built into the infrastructure: PIPEDA, Québec Law 25, OSFI B-13, Bill C-27, SOC 2 / ISO 27001 acceleration, bilingual documentation.

All tiers are proposals for services that do not exist. Availability figures are design targets — no SLA can be offered until facilities operate.

Architecture in one paragraph

Low-profile buildings near existing hydro infrastructure; free-air and closed-loop liquid cooling targeting 0.2 L/kWh; battery buffering against grid events; dark-fibre backhaul with carrier diversity; Canadian-only control planes so no management path ever leaves the jurisdiction.

\$50K pre-seed to take one site from geography to feasibility

Use of funds

- **~60% feasibility** — hydrology, interconnection study, land, environmental screening for one lead site.
- **~25% community** — structured conversations with the Indigenous communities and municipalities nearest it.
- **~15% disclosure** — audited engineering baseline; every finding published, favourable or not.

What exists today

- A siting thesis with verified public comparators.
- Thirteen published candidate locations.
- Engineering design targets, labelled as such.
- This document, and a website that cites everything.

What does not exist

- Facilities, land, permits, or power agreements.
- Customers, revenue, or signed partnerships.
- Any SLA, price, or operating result.

The biggest risk

That the economics do not survive contact with reality: interconnection costs, backhaul, or community timelines could make the first site uneconomic. That is precisely what the feasibility round is designed to find out cheaply.

Contact

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Every figure in this brief is cited at canadianvault.online/methodology

This document is not an offer of securities. Any eventual investment proceeds under exempt-market documentation with accredited investors, subject to review.

Every figure, and where it came from

FIGURE	SOURCE	ACCESSED
AI water withdrawal 4.2–6.6 Bn m³ (2027); GPT-3 ≈700,000 L; US average on-site WUE 1.8 L/kWh (facilities 1–9)	Li, Yang, Islam & Ren (UC Riverside), "Making AI Less 'Thirsty'", Communications of the ACM / arXiv:2304.03271	2026-09-10
US data-centre direct water ~17 B gal (2023); hyperscale 16–33 B gal/yr by 2028	2024 United States Data Center Energy Usage Report, Lawrence Berkeley National Laboratory for US DOE (DOI 10.71468/P1RP4F)	2026-09-10
US fleet-average PUE 1.55 (2024) → ≈1.45 (2028) → ≈1.36 (2030); AI-serving facilities ≈1.15	Same LBNL 2024 report	2026-09-10
Virginia corridor grid ≈270 gCO₂/kWh (SRVC ≈269, RFCE ≈271); US average ≈348	EPA eGRID 2023 (rev. 2, June 2025)	2026-09-10
Québec grid 1.2 gCO₂e/kWh (2022); 94% hydro; national average 100	Canada Energy Regulator — Québec energy profile	2026-09-11
Baie-Comeau July daily mean 16.0 °C (1991–2020 normals)	Environment and Climate Change Canada climate normals	2026-09-11
Virginia water 2.1 B gal (2023), +86% since 2019	JLARC data-center audit, Dec 2024	2026-09-10
~1 in 5 US withdrawals from stressed watersheds; The Dalles 2022 settlement; \$64B blocked/delayed 2024–25	Environmental Research Letters; The Oregonian; Data Center Watch — as surveyed in Wikipedia, "Environmental impact of data centers"	2026-09-10

Corrections log: our 2025 materials cited a Virginia grid figure of ~420 gCO₂/kWh (eGRID 2023: ≈270) and a fleet PUE of 1.45 (LBNL 2024: 1.55 today; 1.45 is the 2028 projection). Both were corrected 2026-09-10 across the website and this brief.