

M C P S E R V E R

N O C O D E

C L O U D H O S T E D

Aquifer Influx Model MCP

Simulate reservoir water influx and pressure support.

Aquifer Influx Model MCP provides specialized hydraulic modeling tools for reservoir engineering. Your AI client can calculate instantaneous flow rates, total cumulative volume, and pressure maintenance using established mathematical models like Fetkovich and van Everdingen-Hurst for both edge-water and bottom-water drive mechanisms.

A+ Quality Score 100/100

reservoir-engineering

aquifer

hydraulics

petroleum

fluid-dynamics



The connectivity layer between AI and the world's software.

Vinkius sits between AI and every application. All communication passes through Vinkius Cloud via the Model Context Protocol (MCP) — with governance, observability, and security at every layer.

Your AI Connections Run Through Vinkius Cloud

The world's largest
managed MCP catalog

Vinkius is the connectivity layer where AI connects to the software your business already runs. We handle the hosting, the security, the credentials, the uptime — you get agents that actually do things.

We operate the world's largest managed MCP catalog. Major SaaS platforms, CRMs, databases, and cloud providers — running, monitored, production-ready. This MCP server is hosted and maintained by the Vinkius Cloud for AI Agents.

The agent doesn't manage credentials, doesn't manage uptime, doesn't manage security. Vinkius does.

— Architecture principle

Four Pillars of the Vinkius Runtime

01 — Security by design

Credentials stay encrypted at rest via AES-256. The AI agent never touches raw keys — they're injected into a sandboxed V8 isolate at runtime. Actions are logged, and connections have an emergency kill switch.

03 — Deterministic observability

Eight immutable metrics per endpoint: request volume, p95 latency, error rate, active connections, cost attribution. A live payload feed logs every tool call with mutation detection.

02 — Built on MCP Fusion

This MCP server was built with **MCP Fusion**, the open-source framework (Apache 2.0) that powers the entire Vinkius catalog. Schema-as-firewall strips undeclared fields, compiled PII redaction runs at zero overhead, and cryptographic lockfiles produce git-diffable audit trails.

04 — Autonomous operations

Servers are deployed, monitored, and patched autonomously. New capabilities and security patches ship weekly. Zero-downtime deployments ensure continuous availability across all managed MCP servers.

AES-256

Encryption at rest

Ed25519

PKI vault signatures

24h TTL

Ephemeral session keys

V8 Isolate

Sandboxed execution

One Token. Instant Access.

Every MCP server on Vinkius is accessed through a **Connection Token**. Tokens are generated in the cloud dashboard and produce a unique MCP endpoint URL. Paste this URL into any MCP-compatible client — no SDK required.

A single token can serve **multiple AI clients simultaneously**, or you can issue separate tokens per client for granular access control. Each token tracks its own request count, last activity timestamp, and can be individually enabled or revoked.

MCP ENDPOINT`https://edge.vinkius.com/{token}/mcp`

Claude



Cursor



VS Code



Windsurf



Grok



Gemini

Security Is the Architecture

Security in Vinkius is not a feature — it's the foundation of the runtime. The gateway enforces multiple independent protection layers between AI agents and third-party APIs.

01 — Ed25519 PKI Vault

Every workspace has an Ed25519 Master Key. Session keys are generated ephemerally (24h TTL) and signed by the Master Key. Credentials never leave the vault boundary.

02 — V8 Isolate Sandboxing

Tool code runs inside isolated-vm V8 isolates with 64 MB memory caps and per-request timeouts. No filesystem access, no network access except through the SSRF-guarded fetch bridge.

03 — SSRF Guard

All outbound HTTP requests are DNS-resolved and validated before execution. Private IP ranges (10.x, 172.16-31.x, 192.168.x, AWS metadata 169.254.x) are blocked at the network layer.

05 — Cryptographic Audit Trail

Every request is signed into a SHA-256 hash chain with Ed25519 signatures. Events form a tamper-proof, SIEM-exportable forensic record.

04 — DLP & PII Redaction

A ResponseGuard pipeline intercepts every tool response. Configurable redaction patterns strip sensitive fields (emails, SSNs, card numbers) before data reaches the AI agent.

06 — Honeypot Trap System

Phantom credentials are injected into isolated environments. If a honeypot is used outside Vinkius infrastructure, the server is quarantined instantly.

Emergency Kill Switch

EU AI Act Art. 14(1)
Compliant

The kill switch is an **emergency halt** mechanism — not a simple toggle. When triggered, it executes three actions atomically:

01 — Server deactivated

The MCP server is immediately taken offline across the entire cluster.

02 — All tokens revoked

Every connection token is invalidated. Total lockout — reconnection blocked until new tokens are issued.

03 — WebSocket connections killed

Active connections terminated via Redis pubsub broadcast. Propagates to every runtime node in the cluster.

Full Visibility. Zero Guesswork.

The Vinkius cloud dashboard includes a full MCP Governance suite — real-time analytics and security controls for production AI operations.

Control Plane

KPI dashboard with request volume, latency, success rate, token consumption, and AI-generated operational briefings.

FinOps

Cost tracking per tool, payload compression savings, budget optimization signals, and consumption trends.

Firewall & DLP

PII redaction activity, sensitive data protection counters, and security event timeline.

Agent Activity

Which AI clients are connecting, how often, and what they're doing — real-time session tracking.

Tool Health

Slowest and most error-prone tools, with actionable root-cause insights and performance baselines.

Incident Log

Error trends, failure rates, status-code breakdowns, and forensic audit trail access.

Get started at cloud.vinkius.com — connect your AI agent in under 60 seconds.

Aquifer Influx Model MCP

4 tools available

Cloud-hosted on Vinkius

You can now run complex hydraulic simulations directly through your AI client. This MCP gives your agent the ability to model how water moves from an adjacent aquifer into a reservoir. Instead of manually calculating flow rates or volumes, you can ask your agent to run the math using specific drive mechanisms. It supports edge-water and bottom-water configurations through the van Everdingen-Hurst and Fetkovich models. You can use it to check how much water has entered a reservoir over time or to see if the current aquifer setup provides enough pressure to keep production steady. It turns your AI into a specialized reservoir engineering assistant that handles the heavy lifting of influx modeling.

Core Capabilities

01 — Drive Mechanism Comparison

Your agent compares edge-water and bottom-water performance.

02 — Instantaneous Flow Calculation

The AI calculates the exact rate of water entering the reservoir at a specific moment.

03 — Cumulative Volume Tracking

Your agent determines the total volume of water influx over a set timeframe.

04 — Pressure Support Evaluation

The AI analyzes how well the aquifer maintains reservoir pressure.

05 — Mathematical Modeling

The agent applies Fetkovich and van Everdingen-Hurst models to your reservoir data.

One Click on Vinkius — From Prompt to Execution

Available at vinkius.com/en/ai-agent-connect/aquifer-influx-model — connect your AI agent in three steps.

- 01
- Connect your MCP-compatible client like Claude or Cursor to Vinkius.
- 02
- Provide your reservoir parameters to your AI client.
- 03
- The agent calls the specific influx or pressure tool from the MCP.
- 04
- The MCP executes the mathematical model and returns the result to your agent.
- 05
- Your agent presents the calculated rate, volume, or analysis to you.

Connect your client to Vinkius to start running reservoir simulations immediately.

Built For

This MCP is built for petroleum engineers and reservoir specialists who need to run quick hydraulic simulations.

Reservoir Engineer

Hands off mathematical modeling and influx calculations to the agent.

Petroleum Engineer

Uses the agent to evaluate pressure support and drive mechanisms.

Hydraulic Modeler

Leverages the Fetkovich and van Everdingen-Hurst models via the AI client.

What Changes When You Connect

- 01
- Calculates instantaneous and cumulative influx without manual math.
- 02
- Compares different aquifer drive configurations quickly.

-
- 03** Provides direct pressure support analysis for reservoir stability.
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- 04** Uses industry standard Fetkovich and van Everdingen-Hurst models.
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Real-World Applications

Pressure Maintenance Checks

You ask the agent to evaluate if an aquifer provides enough pressure support for current production levels.

Drive Mechanism Selection

You use the agent to compare edge-water versus bottom-water performance for a specific reservoir.

Volume Forecasting

You calculate the total cumulative water influx expected over a specific time period.

Real-time Flow Analysis

You determine the instantaneous rate of water entering the reservoir during active production.

4 Tools Available

#	TOOL	DESCRIPTION
01	compare_drive_mechanisms	This tool compares how edge-water and bottom-water configurations perform regarding influx.
02	get_cumulative_influx	Use this to find the total volume of water that has moved into the reservoir over a specific period.
03	get_influx_rate	This tool calculates the instantaneous rate of water entering the reservoir at any given time.
04	get_pressure_support_analysis	This tool evaluates how effectively the aquifer is maintaining reservoir pressure.

See It in Action

Real prompts you can use once this MCP is connected to your AI agent through Vinkius Cloud.

U What is the instantaneous water influx rate for an aquifer with size 500, permeability 150, pressure differential 200, time 10, using edge-water drive and the fetkovich model?



The instantaneous water influx rate is 45.2 cubic meters per day with a pressure support ratio of 0.12.

U Calculate the total volume of water that has entered the reservoir after 50 units of time using the van-everdingen-hurst model with an aquifer size of 1000, permeability 200, pressure differential 300, and bottom-water drive.



The total cumulative influx is 1250.5 cubic meters, with an average rate of 25.01 cubic meters per unit of time.

U How effective is the pressure support for an aquifer with size 800, permeability 100, pressure differential 150, time 20, using edge-water drive and the fetkovich model?



The pressure support effectiveness is 0.65, with an estimated pressure drop of 12.4 units.

Frequently Asked Questions

01 What mathematical models does this MCP use?

The MCP uses the Fetkovich and van Everdingen-Hurst models for calculating water influx.

02 Can I model bottom-water drive?

Yes, the MCP supports both edge-water and bottom-water drive mechanisms.

03 Which AI clients can I use with this MCP?

You can use any MCP-compatible client, including Claude, Cursor, and Windsurf.

04 Does this MCP calculate pressure support?

Yes, it includes a specific tool to evaluate how effectively an aquifer maintains reservoir pressure.

05 How do I get the total water volume?

You can use the `get_cumulative_influx` tool to find the total volume of water that has moved into the reservoir.

Go Live in 60 Seconds

Get your connection token from cloud.vinkius.com, then paste the endpoint URL into any MCP-compatible client.

YOUR MCP ENDPOINT

`https://edge.vinkius.com/[TOKEN]/mcp`

CLIENT	WHERE TO CONFIGURE
 Claude AI	Profile → Customize → Connectors → "+" → Add custom connector → Paste endpoint
 Cursor	Settings → Features → MCP Servers → "+" Add New MCP Server → Type: SSE → Paste endpoint
 VS Code	Ctrl/Cmd+Shift+P → "MCP: Add Server" → add <code>"aquifer-influx-model": { "url": "..." }</code>
 Windsurf	MCP Settings → <code>mcp_settings.json</code> → Add endpoint URL
 ChatGPT	Settings → Tools & plugins → Add MCP server → Paste endpoint
 Gemini	Extensions → Add MCP Server → Paste endpoint URL

ASK AN AI ABOUT THIS

Let your preferred AI explain this MCP server

-  Ask ChatGPT 
-  Ask Claude 
-  Ask Perplexity 
-  Ask Gemini 
-  Ask Grok 

READY TO CONNECT

Aquifer Influx Model is live on Vinkius Cloud.

Get your connection token, paste it into your AI agent, and
start building. No SDK. No deployment. Just results.

Start at cloud.vinkius.com →

vinkius.com · support@vinkius.com

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DOCUMENT INFORMATION

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Platform	Vinkius Cloud for AI Agents
Endpoint	<code>https://edge.vinkius.com/{token}/mcp</code>

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