Collateral Risk Analysis - Felix USDhl

Anthias Labs

23 June 2025

Abstract

This report analyzes USDhl, a yield-bearing fiat-backed stablecoin built on M0's framework and deployed on Hyperliquid through Felix. Unlike USDC and USDT which retain treasury yields internally, USDhl distributes this annual yield to holders via air-dropping HYPE which is acquired using the interest generated through M0's rebasing mechanism. The underlying $M token maintains full collateralization through US Treasuries held in bankruptcy-remote SPVs, with real-time on-chain attestation by independent validators.

We examine M0's multi-actor architecture (Minters, Validators, Earners, SPVs), USDhl's 1:1 wrapping mechanism, and critical risk vectors including smart contract architecture, audit reports and centralization dependencies in this report. With approximately 27M USDhl minted and 21M+ deployed in Felix markets, liquidity analysis indicates about 12M available across AMMs and HyperCore orderbook combined against total debt exposure.

Recommendations include dual-oracle configuration, supply cap methodology and conservative maintenance parameters keeping in mind the looped nature of USDhl liquidity in HyperEVM ecosystem.

1 M0 Ecosystem Workflow

The M0 ecosystem converts short-term U.S. Treasury securities into \$M. Licensed Minters deposit eligible collateral into bankruptcy-remote special purpose vehicles (SPVs) and mint \$M tokens only after independent Validators verify that the collateral exists and meets all protocol requirements. Once minted, \$M operates within a defined economic structure:

- Minters and Validators call `updateCollateral()` in regular intervals (30 h for now) to maintain the overcollateralization.
- Addresses approved as Earners receive yield through rebasing, which is based on the interest minters pay.
- Extensions like USDhl wrap \$M tokens to implement custom yield distribution and behavioral rules.
- The Two-Token Governance system uses *POWER* tokens for operational decisions (approving actors, setting rates) and *ZERO* tokens for protocol upgrades.
- M-Portals facilitate cross-chain transfers using Wormhole and Hyperlane.

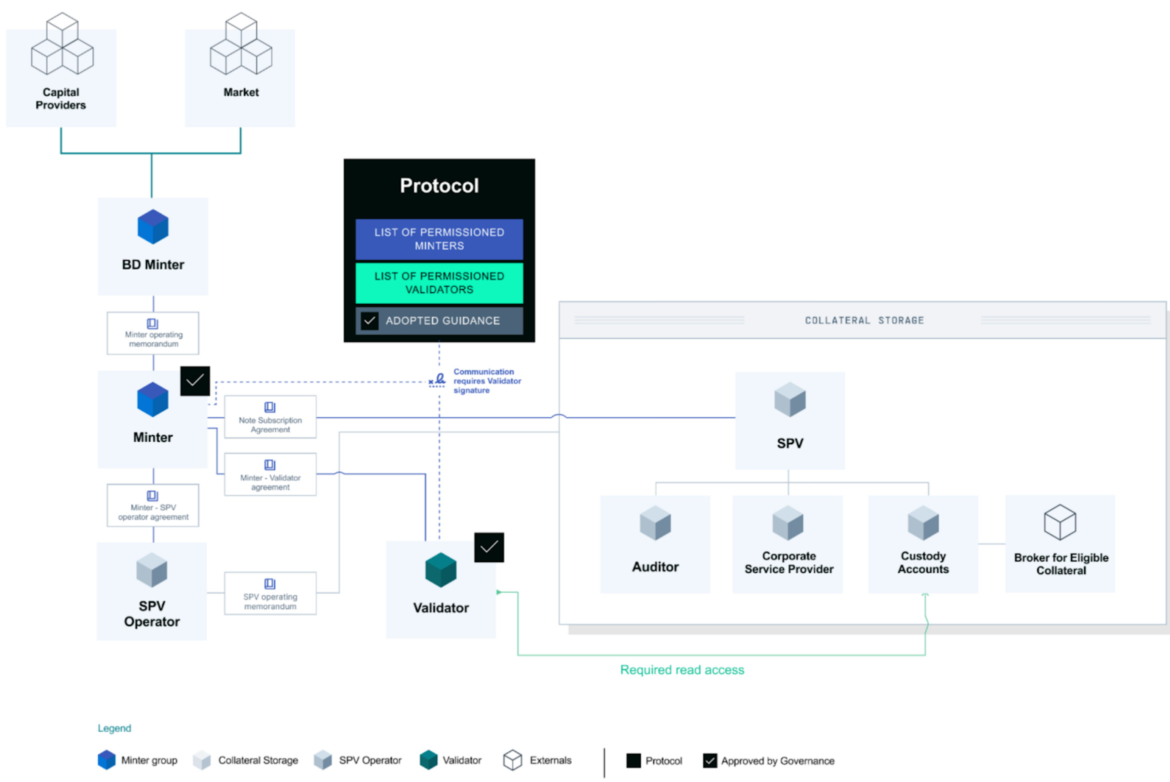

Figure 1: M0 ecosystem components — Source: M0 documentation

1.1 Minters

1.1.1 How Minters Work

Minters are permissioned institutions authorized by M0 Governance to mint $M tokens against eligible collateral. They execute this process through the `MinterGateway` contract following a three-phase workflow:

- Proposal & Delay
  - The Minter initiates a mint proposal by calling `proposeMint(amount, destination)` on the `MinterGateway` contract, specifying the amount of $M to mint and the recipient address.
  - The contract generates a unique `mintId` and enforces a mandatory delay period before execution can occur. During this delay, the Minter must ensure eligible collateral is deposited into the designated SPV's custody and deposit accounts.
- Validation & Execution
  - Validators independently verify the Minter's collateral by checking the SPV's custody accounts and confirming the assets meet eligibility criteria. They then submit their attestations through `updateCollateral()` calls, confirming the collateral's presence and value.
  - After collecting required Validator signatures and the delay period expires, the Minter executes `mintM(mintId)` and gets the specified $M tokens.
- Post-Mint Obligations
  - Interest Payments: Minters pay continuous interest on their outstanding $M at the Minter Rate, which accrues to their owed balance in the protocol.
  - Collateral Maintenance: Minters must regularly update collateral valuations through `updateCollateral()` calls to reflect current market prices from treasurydirect.gov.
  - Administrative Buffer: Minters deposit a separate administrative buffer to the Eligible Custody Solution Operator, which remains outside their eligible collateral calculation and facilitates orderly wind-down if needed.

Minters typically sell minted $M on secondary markets to obtain operating liquidity. If a Minter fails to maintain adequate collateralization or pay accrued interest, M0 Governance can initiate wind-down procedures to seize the underlying collateral and administrative buffer to cover the owed $M, ensuring the protocol remains overcollateralized. A Minter can also request a retrieval by calling the `proposeRetrieval()` function with the amount it wishes to retrieve. This request will only proceed if core operating conditions remain satisfied after the retrieval.

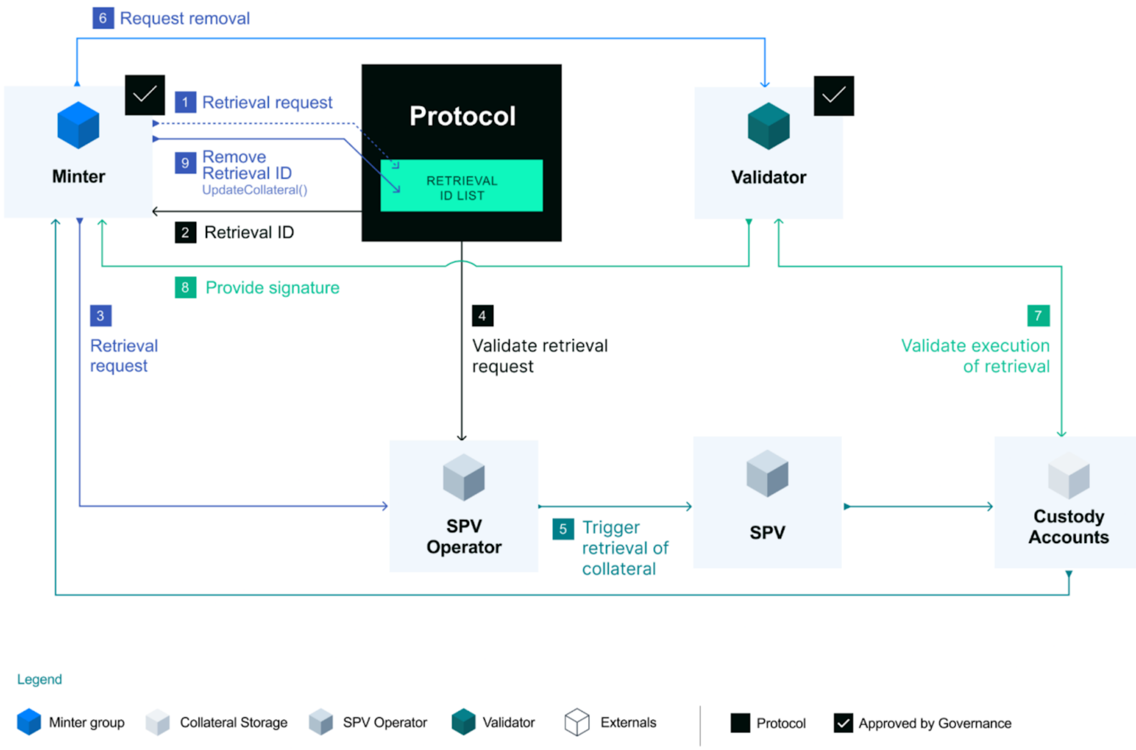

Figure 2: Collateral Retrieval Process — Source: M0 documentation

1.1.2 Why Minters Participate

Minters participate in M0 to earn returns from the spread between Treasury yields and the protocol's Minter Rate by acting as money market providers in the ecosystem. They perform these activities:

- Collateral Deployment
  - A Minter deposits collateral that meets all protocol requirements: orphaned entity structure, bankruptcy remoteness, asset segregation, and annual audits
  - The protocol recognizes collateral at daily market value, allowing minting up to the maximum collateralization ratio set by Governance
- Revenue Generation
  - The Minter usually sells minted $M on secondary markets to obtain working capital
  - Treasury securities in the SPV continue earning their natural yield
  - The Minter at the very least, captures the spread between Treasury yields and the Minter Rate paid to the protocol

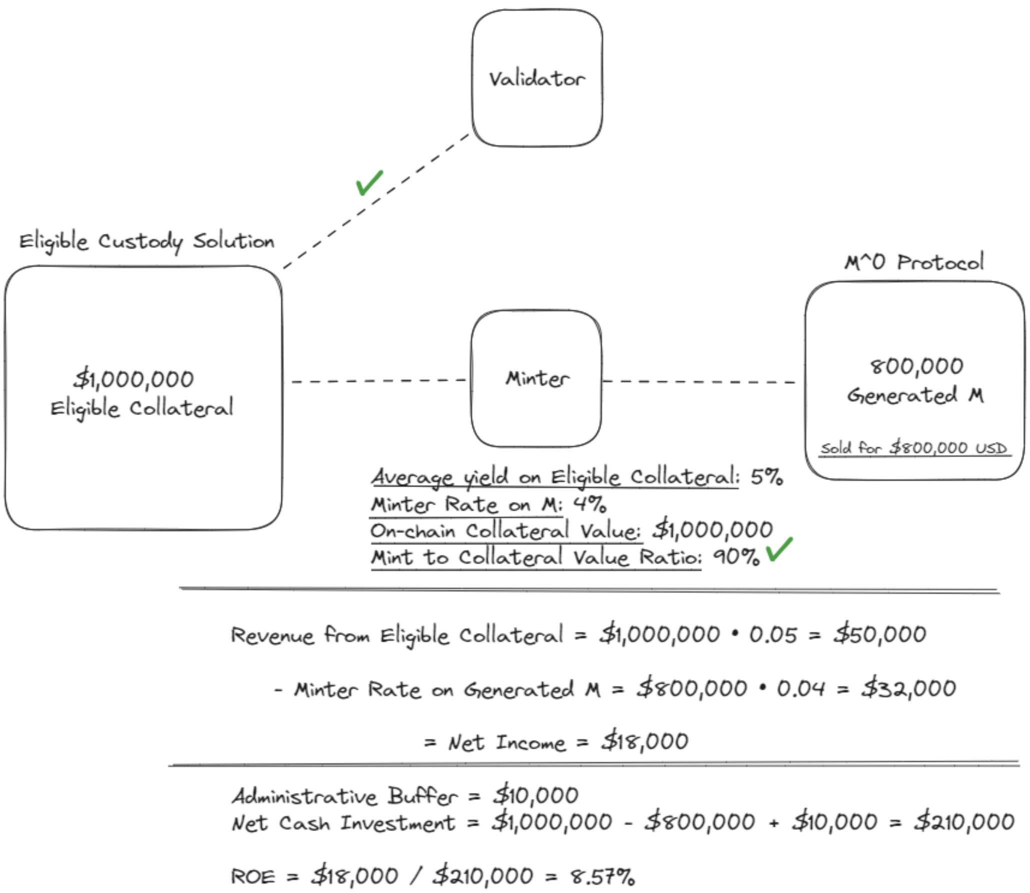

Figure 3: Basic economics of a Minter — Source: M0 documentation

This structure creates sustainable economics where Minters earn from Treasury-to-protocol rate spreads while maintaining full collateralization of the $M supply.

1.1.3 Penalties for Minters

Minters must regularly update collateral; failure to do so incurs penalties. The protocol can automatically freeze or deactivate a Minter if they become under-collateralized or unresponsive. Validators can initiate a freeze or cancel pending mints if there is suspicion (e.g. stale collateral updates). Missed updates or liquidations trigger extra interest charges (a liquidation fee) to force repayment.

1.1.4 Current Minters

Minter One Generator SPV Ltd.
171 Main Street, PO Box 92, Road Town, British Virgin Islands VG1110
minter.one.generator@mxon.co
www.mxon.co

1.2 Validators

1.2.1 How Validators Work

Validators are independent entities approved by M0 Governance to verify that Minters' collateral meets protocol requirements. They use a systematic verification and attestation process:

- Collateral Verification
  - Validators access SPV custody account statements and deposit account records to verify the presence of eligible collateral
  - Verification includes checking that collateral is held in approved SPVs meeting all requirements: orphaned entity status, bankruptcy remoteness, proper asset segregation, and current audit compliance
- On-Chain Attestation
  - After verification, Validators submit signatures via `updateCollateral()` calls to the `MinterGateway` contract. Each attestation includes: the Minter's address, verified collateral amount, valuation timestamp, and the Validator's signature
  - Multiple Validators must attest to the same collateral state before a mint can proceed, creating redundant verification. These attestations remain on-chain as permanent records of collateral verification at specific points in time
- Dispute & Halt Mechanism
  - If a Validator detects misreporting, it can withhold its signature, causing the mintId to stall beyond the delay period causing a penalty on the minter.
  - Validators can broadcast off-chain alerts and escalate to governance if irregularities persist.

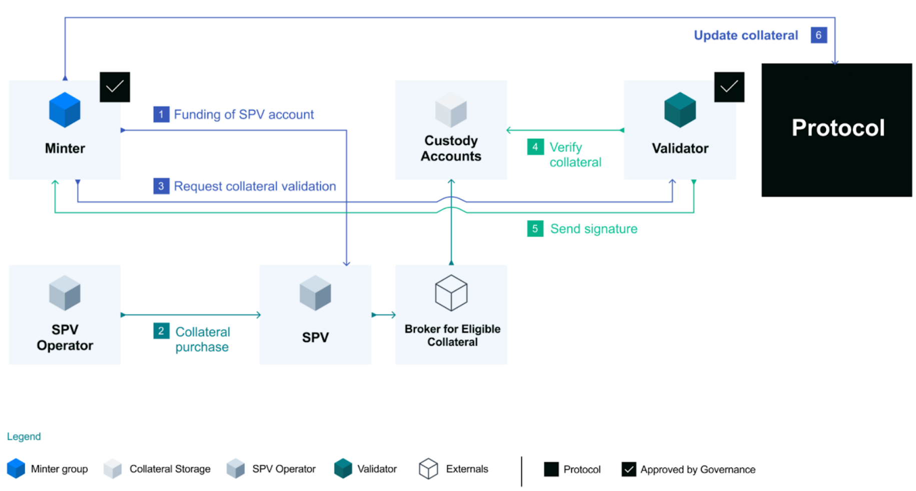

Figure 4: Update Collateral Procedure — Source: M0 documentation

1.2.2 Why Validators Participate

Validators are economically incentivized to maintain system integrity as per the following reasons:

- Validation Fees: A portion of the Minter Rate fee (typically 5–10bps on minted $M) is allocated pro-rata to Validators for each successful updateCollateral signature they submit.
- Governance Rights: Validators get incentives in form of POWER tokens granting them voting weight in protocol polls, enabling them to shape risk parameters and actor permissions.
- Reputation & Liability: Validators sign binding legal agreements; fraudulent attestations carry the threat of slashing reputational standing and off-chain penalties, including loss of license and other financial repercussions.
- Continuous Demand: As the protocol's usage grows, so does the volume of mint and redeem operations, creating a recurring revenue stream for Validators.

1.2.3 Current validators

Validator One GmbH
Friedrichstr. 114A, 10117 Berlin, Germany
contact@validator-one.com
www.validator-one.com
Public Key: 0xEF1D05E206Af8103619DF7Cb576068e11Fd07270

Chronicle Labs
190 Elgin Ave, George Town Cayman KY1-9005, Cayman Islands
hello@chroniclelabs.org
www.chroniclelabs.org
Public Key: 0xEe4d4938296E3BD4cD166b9b35EE1B8FeD2F93C1

1.3 Earners

1.3.1 How Earners Work

Earners are addresses approved by M0 Governance to receive yield from the protocol through automatic balance increases. These can be externally owned accounts (EOAs) held by individuals or smart contracts like extension protocols that redistribute yield according to their own logic. Some important aspects related to earners are:

- Earner List Inclusion
  - M0 Governance maintains an on-chain Earner List that determines which addresses receive yield. Addresses are added or removed through governance proposals voted on by POWER token holders.

- Extension contracts like USDhl submit their contract addresses for inclusion, enabling them to capture yield on behalf of their users.

- Rebasing Mechanism
  - The protocol implements yield distribution through rebasing, executed via the rebase() function which updates balances without changing total token count for non-earners.
  - The Earner Rate, currently 4.07% annualized, is applied continuously through the protocol's yield index mechanism.

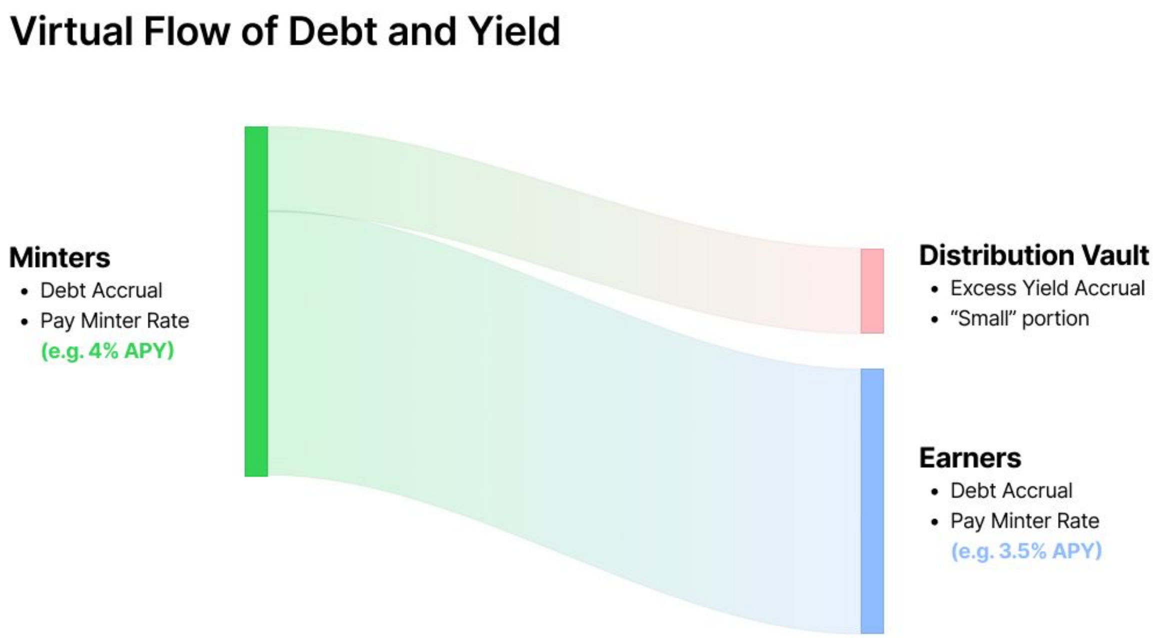

Figure 5: Yield Distribution — Source: M0 documentation

1.3.2 Why Earners Participate

Earners gain yield in a stablecoin-like asset. The annualized earner rate is set by the protocol (via a model contract) and is paid from interest collected from Minters. Because only approved Earners can receive yield, governance ensures supply/demand balance. Earners benefit from predictable, on-chain interest on a safe collateral pool (short-term Treasuries).

For institutions, Earners function like stable deposit accounts: they earn a risk-adjusted return on digital dollars. The system also protects them: if for any reason the protocol's yield exceeds obligations, excess goes to the Distribution Vault for ZERO holders, not to private parties.

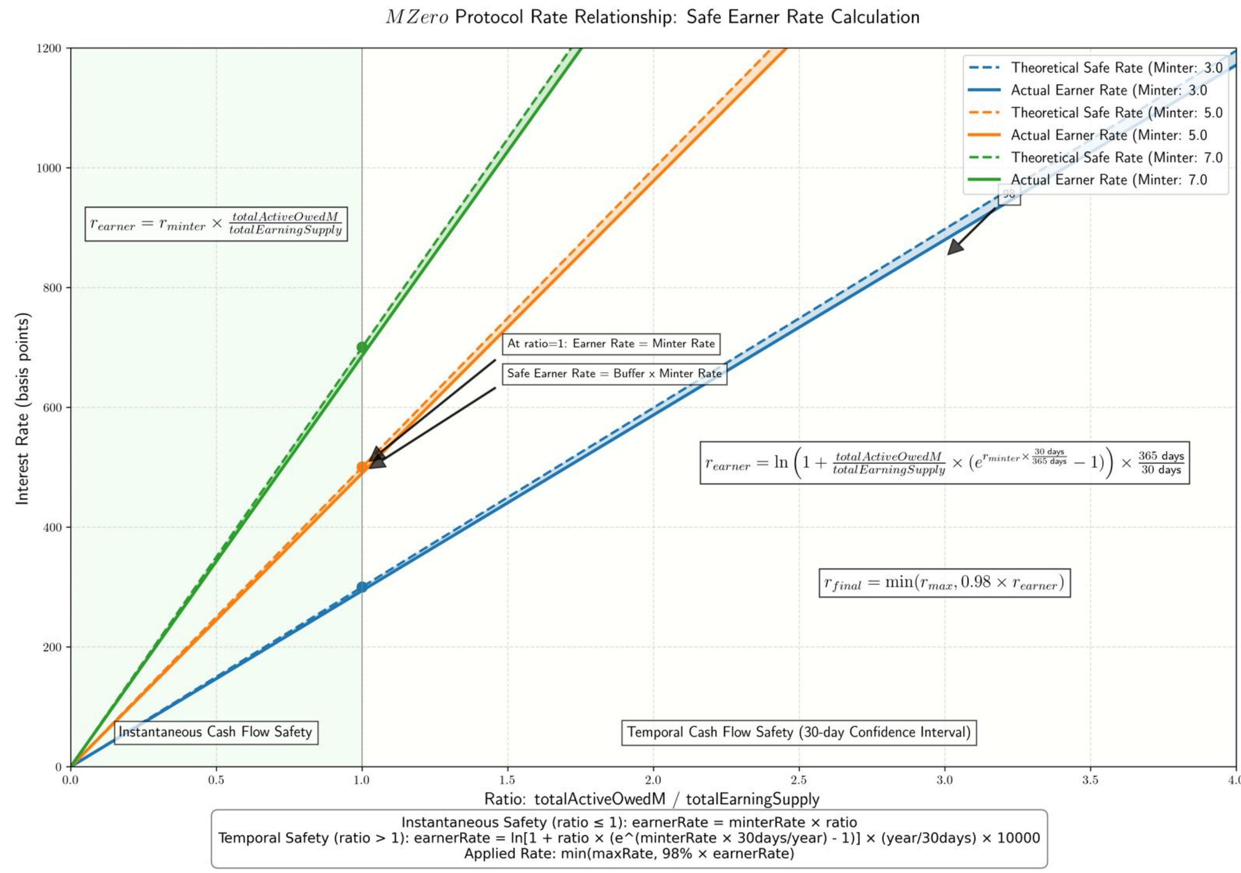

Figure 6: Explainer of IRM used by M0 — Source: M0 documentation

1.4 SPV operators

1.4.1 How SPVs Work

Special Purpose Vehicles (SPVs) are bankruptcy-remote legal entities that hold the U.S. Treasury securities and other eligible collateral backing $M tokens. These entities operate under strict structural and operational requirements to ensure collateral security and protocol integrity which include:

- Asset Custody and Segregation
  - SPVs maintain custody accounts and deposit accounts specifically designated for holding eligible collateral. The collateral remains legally separated from the operating assets of Minters, Validators, custodian banks, or any other protocol participants.
  - Each SPV issues formal custody documentation and legal attestations that Validators review when verifying collateral for mint proposals. The custody arrangements ensure that even in cases of custodian bankruptcy, the assets remain protected and accessible to the SPV.

- Legal Structuring
  - SPVs must be established as orphaned entities in approved jurisdictions that meet specific criteria including bankruptcy remoteness provisions, non-petition and non-seizure protections, and clear frameworks for asset segregation.
  - All SPV operations are governed by mandatory contracts that require approvals for material actions such as asset transfers or structural changes. The legal framework ensures that creditor claims are limited exclusively to the collateral belonging to specific Notes, with no recourse to other compartments or the SPV's general assets.
- Collateral Reporting
  - Periodically, custodians provide SPV statements confirming asset holdings and valuations.
  - Validators collect these reports to generate attestations using updateCollateral that updates on-chain records, ensuring $M remains overcollateralized.
- Redemption Mechanism
  - When a Minter redeems $M, the SPV facilitates the release of the proportional share of T-Bills or repo positions back to the Minter's designated custody account, following on-chain burn confirmation.
- Wind-down facilitation
  - In stress scenarios (e.g. Minter exit or insolvency), the SPV Operator coordinates a wind-down.
  - In an amicable wind down, the Minter has 90 days to call burnM() on their owed $M, each burn prompting the SPV to sell collateral and redeem value 1:1 (adjusted by the mint ratio)

If the Minter cannot fully repay, a non-amicable wind down accelerates asset liquidation by the SPV (typically via auction or market sale) to protect remaining $M holders.

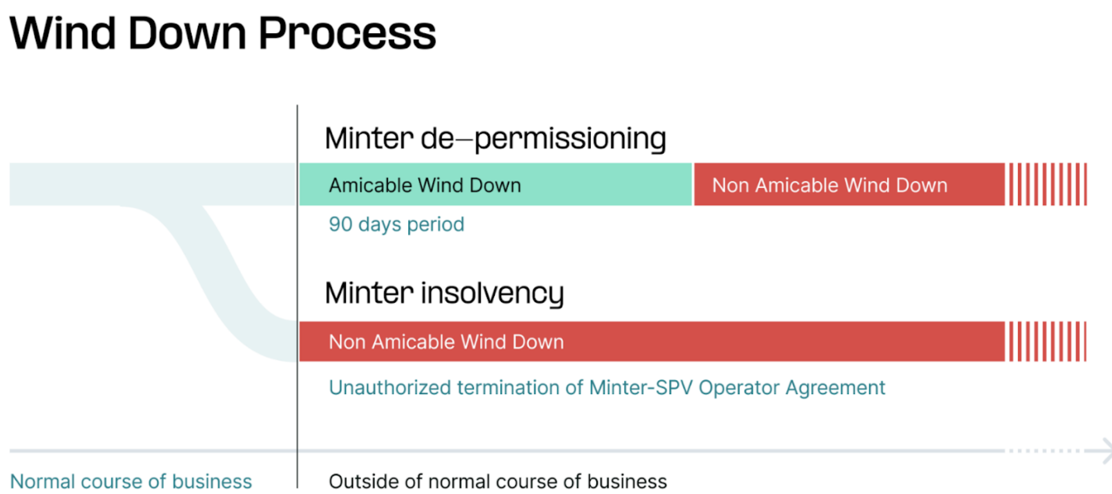

Figure 7: Wind Down Routes — Source: M0 documentation

1.4.2 Why SPVs Matter

SPVs provide the essential legal and operational infrastructure that enables real-world assets to back on-chain tokens reliably. The bankruptcy isolation protects $M holders from claims by creditors of Minters, custodians, or other parties, ensuring collateral remains available exclusively for backing the tokens.

The requirement for SPVs to be audited annually by licensed auditors adds another layer of verification beyond the continuous Validator attestations. These audits confirm proper asset segregation, operational compliance, and accurate record-keeping.

1.5 Two Token Governance

M0 uses a TTG model. The Power token is an inflationary voting token used for routine and emergency protocol proposals. Holders can create or vote on proposals in the Standard Governor (majority rule) or Emergency Governor (quorum rule). Active participation in voting epochs earns POWER holders additional ZERO tokens. The Zero token is a non-inflationary meta-governance token: it decides on fundamental changes (via the Zero Governor) and entitles holders to claim a pro-rata share of fees and excess yield from the Distribution Vault.

Governance operates in discrete 15-day epochs with defined periods for proposal submission, voting, and execution. All critical protocol parameters (interest rates, collateral ratios, permissioned actors) are stored in the Registrar contract and are only modifiable via passed proposals.

Policy changes happen through code-managed registrars and contracts. For example, if the governance votes to change the minter interest rate, the parameter in the Registrar is updated and automatically used by the protocol. In extreme events, the Emergency Governor can fast-track fixes without the normal proposal fee, preserving stability.

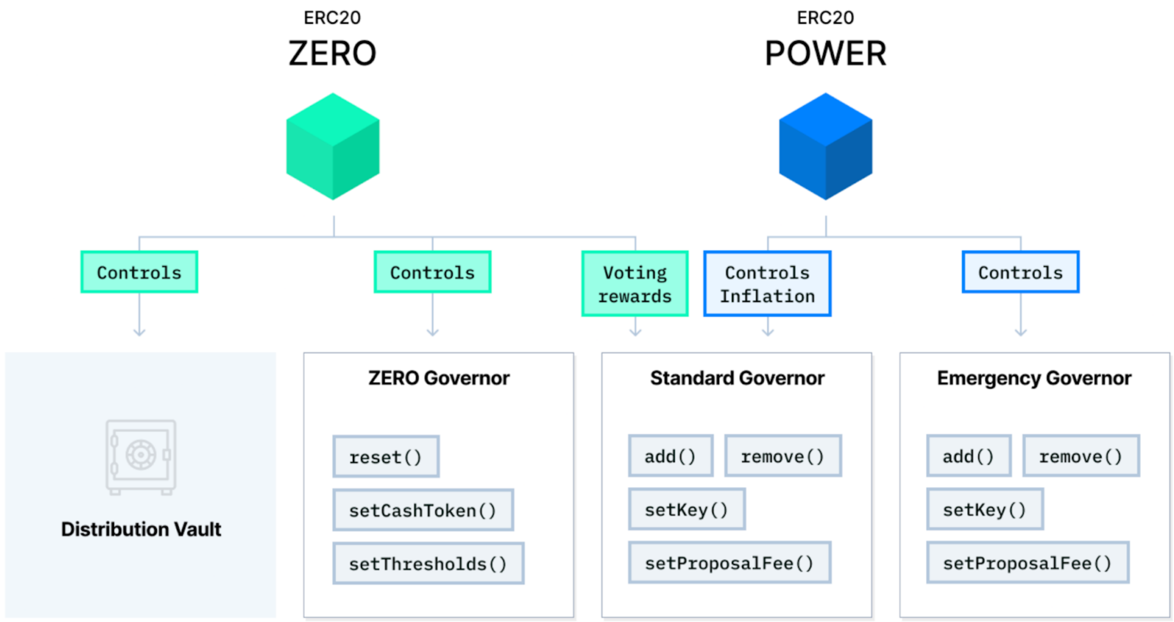

Figure 8: Two Token Governance System — Source: M0 documentation

1.6 Shutdown and Emergency Procedures

Minter Removal: If governance de-permissions a Minter, a 90-day amicable wind-down begins. The Minter sequentially burns all its Owed $M. Each burn is verified on-chain by the SPV Operator, who then sells an amount of collateral equal to the burned value (at the mint time collateral ratio) and pays that cash to the Minter. If the Minter fully repays within 90 days, any leftover collateral goes back to the Minter; if not, the SPV triggers a non-amicable wind-down to liquidate remaining collateral.

Validator or Earner Exit: Validators and Earners are permissioned via governance. If a Validator is removed, the protocol simply stops accepting its signatures and updates the validator set in the Registrar. No special on-chain shutdown is required beyond adjusting permissioned lists. Earners can stop the earnings by calling stopEarning(), which fixes their balance and converts it to non-earning form. If governance revokes an Earner, it remains non-earning by default.

Global Emergency: Governance has the ability to pause or freeze the protocol in extreme cases (e.g. through emergency proposal). This can disable minting and redemptions until issues are resolved. The protocol design includes immutable safety backstops and funds can always be redeemed via the SPV wind-down processes.

1.7 Audits

Most findings in M0's codebase were of Low or Informational severity, with a few Critical and Highs, all of which have been addressed. The protocol is immutable and has gotten multiple high quality firms to audit their codebase(including formal verification by Certora and a Sherlock audit contest) which makes the codebase very resilient to exploits. Overall, no fundamental design flaws were found, and the few serious logic bugs that were discovered were addressed and fixed by protocol, indicating high security standards.

M0 Protocol and TTG were deployed to Ethereum Mainnet on May 7th 2024. Wrapped $M (wM) was deployed to Ethereum Mainnet on Aug 14th 2024.

Key recurring issue types: The audits revealed some common patterns in vulnerabilities:

- Precision & Rounding: Several findings related to loss of precision or rounding errors in financial calculations. For example, the Power Token's inflation calculations can accumulate small rounding errors over time.
- Delegation & Governance Logic: Auditors flagged edge cases in vote delegation and token bootstrap logic. Notably, one critical issue allowed double-counting of a user's PowerToken balance by abusing the `bootstrap()` and `sync()` functions, and another involved misreading past voting power after token resets.
- Overflow Risks: Multiple reviews identified integer overflow or truncation risks when values grow extremely large. These issues would only manifest in unlikely scenarios (e.g. near-maximum token supply) and were assessed as low likelihood.
- Signature/Authorization Issues: One high-severity bug involved a signature replay attack in the minting gateway, and minor findings noted missing expiration for signed messages and EIP-712 compliance gaps. These were resolved, reinforcing the integrity of the protocol's authorization mechanisms.

1.7.1 Major Critical & High Findings (All Fixed)

ID	Source	Severity	Description	Fix Commit
C-1	Certora	Critical	`sync()` re-entry loop allowed historic inflation compounding and PowerToken supply doubling.	`44784c6a`
C-2	Certora	Critical	`bootstrap()` double-minted PowerToken and voting weight.	`44784c6a`
H-7.1	Prototech (H-7.1)	High	Delegating to `address(0)` locked user funds & broke vote checkpoints.	`930f2db7`
H-3-01	Three Sigma (H-01)	High	Dutch-auction `buy()` lacked deadline → grief via delayed TX.	`3fb74e7`

Table 1: Major Critical & High Findings (All Fixed)

1.7.2 Privileged roles

In essence, almost everything that happens on the protocol is controlled by the TTG. TTG approves the list of minters and validators who can interact with the `MinterGateaway` contract.
There are two permissioned roles in the `MinterGateway` contract:

- Minters: Minters are responsible for the circulation of M-tokens. Only active minters can update their collateral and propose retrieval. Active minters that are not frozen can propose mints and mint M-tokens.
- Validators: Approved validators can cancel mint requests and freeze minters. In addition, there are off-chain ECS operators that have the privilege of physically storing and removing users' collateral from the ECS.

The `mint` and `burn` functions in the `MToken` contract can only be called by the `MinterGateway` contract.

Within the `TTG` system, each governor has a set of powers.

The `ZeroGovernor` can:

- Deploy the `PowerToken`, `StandardGovernor`, and `EmergencyGovernor` contracts when resetting the Power token to Power token holders or Zero token holders
- Set the Power threshold proposal ratio and Zero proposal threshold ratio
- Set the cash token of the system and proposal fee of standard proposals

The `EmergencyGovernor` contract can:

- Set the Standard proposal fee
- Add and delete account from lists, and modify key-value pairs of the Registrar contract

The `StandardGovernor` can:

- Set its proposal fee in the `StandardGovernor` contract
- Call the `markNextVotingEpochAsActive`, and `markParticipation` functions of `PowerToken` contract
- Mint `Zero` tokens
- Add and delete account from lists, and modify key-value pairs of the `Registrar` contract

1.7.3 Conclusion

Overall, the audit reports conclude that M0 Protocol's smart contracts provide a good level of security after fixes. No unresolved critical vulnerabilities remain, and the development team has been responsive in mitigating identified issues, showing a strong commitment to security best practices.

1.8 Miscellaneous

Eligible Collateral:

- The protocol currently restricts collateral to highly liquid, low-risk assets: short-term U.S. Treasury bills (180 days to maturity) or approved equivalents (e.g. tokenized Treasury MMF shares).
- Validators only recognize collateral that meets strict criteria (e.g. market value pricing, maturities).
- Collateral must be continuously marked-to-market based on public price feeds, so both Minters and Validators operate on the same valuation. This policy ensures any accrued interest on bonds is promptly reflected in collateral value, supporting bank-like capital buffers.

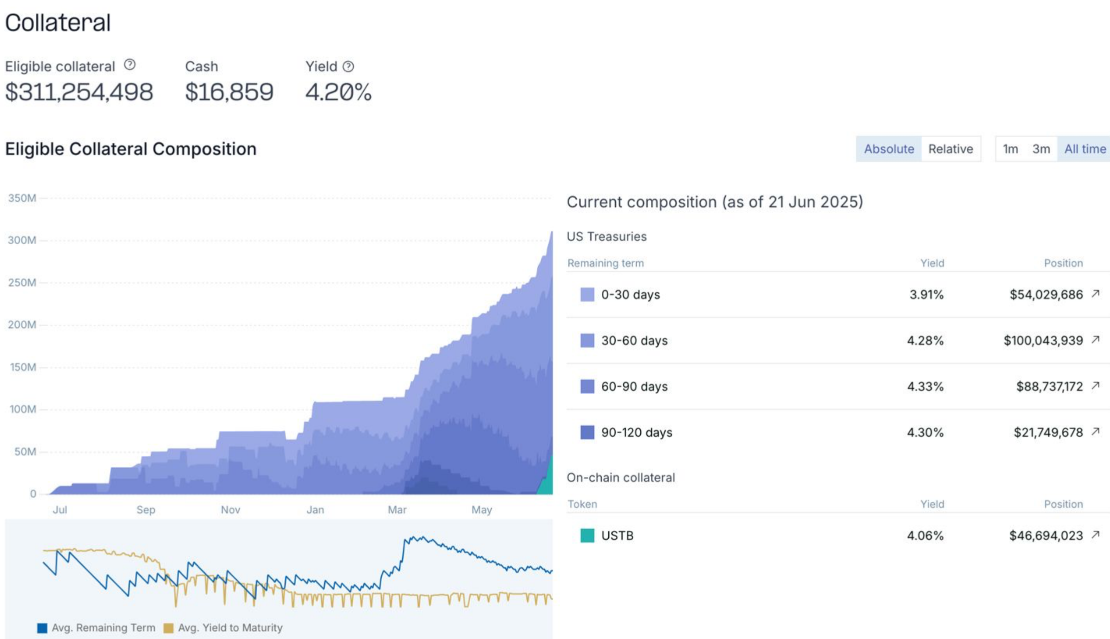

Figure 9: Current Collateral Composition — Source: M0 Dashboard

2 USDhl Working Mechanism

Here are some key components of the mechanism employed by USDhl:

Backing & Collateralization

- USDhl maintains a 1:1 backing through $M tokens locked in its Ethereum vault (`0x36f586A30502AE3afb555b8aA4dCc05d233c2ecE`). Each USDhl token corresponds to exactly one $M token, which itself is fully collateralized by eligible assets held in M0's SPVs.

Minting & Redemption

- **Minting:** Users deposit $M (`0x866A2BF4E572CbcF37D5071A7a58503Bfb36be1b`) into the USDhl contract (`0xb50A96253aBDF803D85efcDe07Ad8becBc52BD5`) on Ethereum. The contract locks these $M tokens and mints an equivalent amount of USDhl tokens to the user's address on HyperEVM through M0's cross-chain infrastructure.
- **Redemption:** Users burn USDhl on HyperEVM, which triggers the USDhl contract to release the corresponding $M tokens from the Ethereum vault back to the user. This mechanism maintains the 1:1 peg.

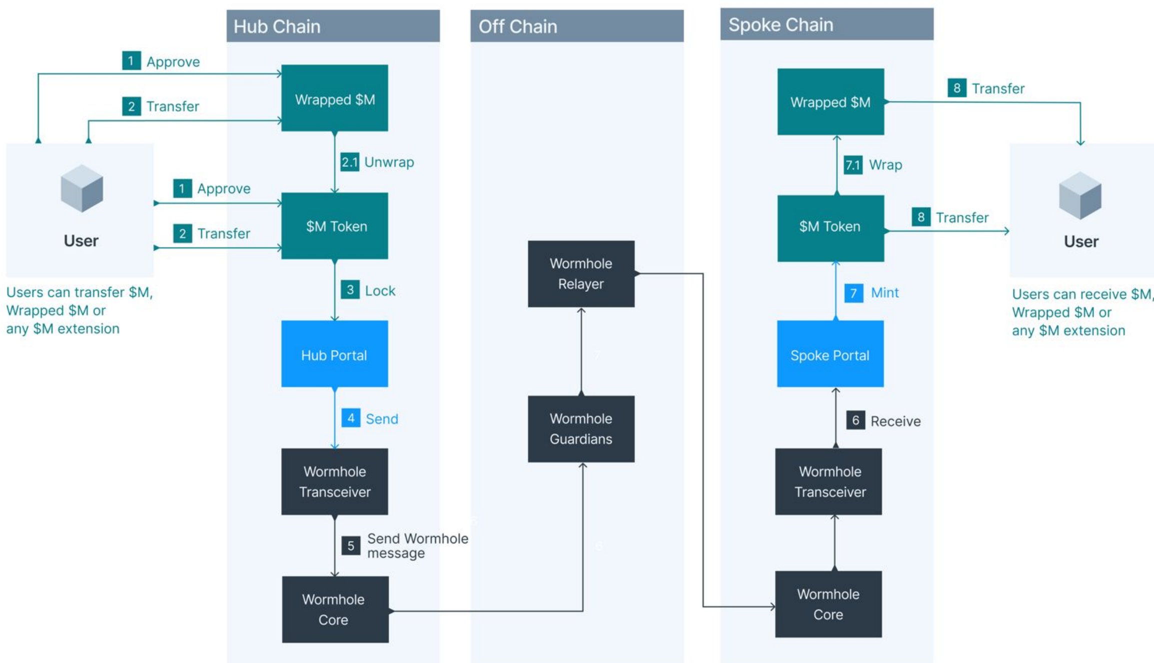

Figure 10: M0 Portal Architecture — Source: M0 documentation

Yield accrual

- The USDhl contract address is approved as an M0 Earner, enabling all $M tokens held within the contract to earn yield at the protocol's Earner Rate. This rate is determined by M0's Rate Models and sourced from the interest that Minters pay on their outstanding $M obligations. The yield accrues through automatic rebasing, where the $M balance in the USDhl vault increases to reflect earned interest from the underlying Treasury collateral returns.
- This yield is then redistributed to the holders by giving incentives on Lending, Trading USDhl/USDC pair on spot Orderbook and LP deposits. These incentives are paid by airdropping HYPE bought using the interest generated.

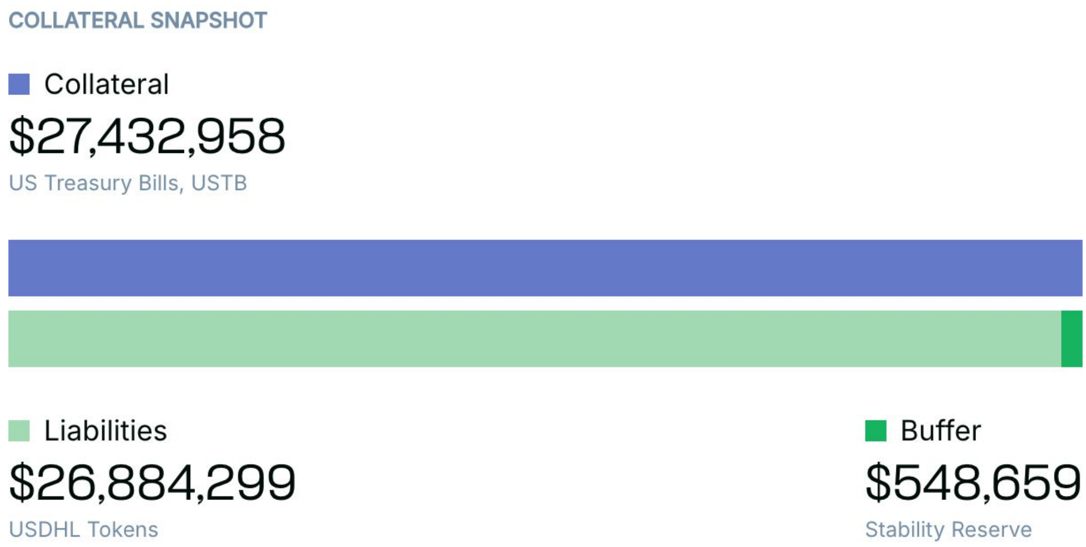

Figure 11: USDhl's Collateral Health — Source: M0 Dashboard

Figure 12: Historical Collateral Health for M0 — Source: M0 Dashboard

3 USDhl v/s USDC/USDT

Here we do a comparison between USDhl and two most widely used stables; USDC and USDT.

Feature	USDhl / $M (M0)	USDC (Circle)	USDT (Tether)
Collateral Composition	100% short-term U.S. Treasuries & reverse repos, held in bankruptcy-remote SPVs	$\sim$ 77% short-term U.S. Treasuries, remainder cash at regulated banks (per Circle Q1 2025 attestation)	$\sim$ 83% Treasuries & repos, plus $\sim$ 2% BTC & "other investments" (per Tether Q1 2025 report)
Collateral Transparency	Real-time on-chain attestation by independent Validators	Monthly reserve reports audited by Deloitte; lag of 4–5 weeks	Quarterly assurance reports by BDO; lag of $\sim$ 6 weeks
Yield Distribution	Rebasing Earner Rate ($\sim$ 4.5%) flows to users via `claim()`	$1.7 B reserve income in 2024 went almost entirely to Circle & distribution partners (Coinbase)	$1 B operating profit in Q1 2025 alone accrued to Tether Ltd.; holders earn 0%
Minter Model	Multiple licensed Minters (approved by governance)	Single issuer (Circle Internet Financial)	Single issuer (Tether Holdings)
Governance	Two-Token Governor (POWER/ZERO) with dilution for inactive voters and veto tier	Off-chain corporate governance; no token-holder voting	Off-chain corporate governance; opaque share structure
Blacklisting Power	Extensions can opt-in to sanctions lists; core $M contract is immutable and cannot unilaterally freeze balances	Circle can unilaterally freeze addresses; over 1,000 USDC addresses frozen since 2020	Tether can also freeze addresses; over $650 M USDT frozen per law-enforcement requests

Table 2: Comparison of USDhl / $M, USDC, and USDT across key features.

3.1 Key differences

1. **Yield Sharing vs. Yield Capture:** USDC and USDT generated $\sim$ $1.7 B (2024) and > $1 B (Q1 2025) respectively in reserve yield, but none of that accrues directly to token-holders. In contrast, USDhl directs 100% of the earner interest to Hyperliquid community initiatives and holders. This makes it a very attractive option for users in Hyperliquid ecosystem.
2. **Real-Time Attestation:** M0's Validator signatures publish collateral updates regularly, whereas USDC and USDT disclose collateral reports after weeks.
3. **Dispersed Issuance:** An open Minter registry spreads counter-party risk across multiple institutions, unlike the single-issuer models of Circle and Tether.
4. **Flexibility by Design:** m-Extensions like USDhl can embed custom compliance or yield logic without fragmenting liquidity, preserving 1:1 convertibility with $M.

3.2 USDhl use-cases on HyperEVM

Currently the primary use case of USDhl in the HyperEVM ecosystem is yield farming. This means that most of the minted USDhl is either supplied to Felix's Vanilla markets or is used to open LP positions on AMMs like Hyperswap and Kittenswap. Since USDhl is in a very nascent stage, most of its liquidity in AMM pools comes from borrow positions in markets on Felix Vault.

This is also amplified by the fact that Felix is the sole Lending and Borrowing market which supports USDhl as of now. Most of the LPs go through Felix before they deposit liquidity in AMMs. We keep in consideration the cycled nature of liquidity of USDhl while recommending parameters for USDhl Vault so that Felix and the wider HyperEVM ecosystem is not impacted by any single point of failures.

4 Key Risks

4.1 Smart contract risk

The M0 ecosystem and extension USDhl both rely on interlocking smart contracts (e.g. the core `MToken, MinterGateway`, Two-Token Governor modules, bridge adapters, and USDhl's wrapper). This complexity creates multiple attack surfaces as contracts handle minting, burning, rebasing, governance, cross-chain transfers, and yield distribution all in one system. If vulnerabilities occur in any module (reentrancy, integer math errors, access-control, oracle-index bugs, etc) the peg can be compromised or funds may be stolen.

4.2 Centralization Regulatory risks

Centralization and actor-level risks in the USDhl–M0 ecosystem are due to reliance on a small set of off-chain participants and governance levers. Key risk vectors are:

- Malicious or compromised Minters which do not act as per the rules
- Validator collusion or failure leading to false attestations
- Governance token concentration (POWER & ZERO) leading to governance attacks
- Jurisdictional risks if approved SPV jurisdictions change laws or enforcement

USDhl is not targeted toward US users. However and regardless of this, the recent GENIUS Act must be taken into account. The GENIUS Act, passed in the US Senate in June of 2025, prohibits the distribution of yield-bearing stablecoins. To avoid this classification while still being able to give value to users, USDhl does not distribute yield directly to users. Instead the yield from the treasuries backing USDhl is used to purchase HYPE. This HYPE may then be airdropped to certain users using USDhl within the Hyperliquid ecosystem (HyperEVM and HyperCore). The Felix Foundation, operating USDhl, is based in the Cayman Islands and under Cayman jurisdiction.

5 Oracle Recommendation

5.1 Architecture Considerations

Push-based oracles are optimal for lending markets, providing price updates without requiring manual triggers. Redstone is the preferred provider for such oracles on HyperEVM and is recommended for use on Felix's lending markets.

5.2 Recommended Configuration

A dual-oracle setup is recommended:

Primary Oracle: Redstone's HYPE/USDhl exchange rate feed

- Provides direct pricing between HYPE and USDhl
- Most closely tracks the price ratio

Secondary Oracle: Derived pricing using USDhl/USD and HYPE/USD feeds

- Offers redundancy and sanity checking
- Enables USD-denominated risk calculations
- Provides fallback if primary feed experiences issues

6 Current Market Scenario [22 June 2025]

6.1 Supply Distribution

- Total USDhl Minted: 27M
- Total Deposited in Felix Vanilla Markets: 21.5M
- Total Borrowed from the Felix Vaults: 11.5M
- Liquidity Pools: 7M
  - HyperSwap: 5.5M
  - Kittenswap: 1.5M
- HyperCore Orderbook: 5M

6.2 Liquidation Dynamics

For USDhl vault liquidations, we take the worst case as a 2x drop in USDhl liquidity relative to liquidation volume, with 1.5x as the average case. Inventory based liquidators can swap their existing collateral/stables for USDhl using the Orderbook or AMMs to repay the debt of a position. They will then sell the acquired collateral immediately through the same routes in order to maintain stable asset positions for subsequent liquidations. This process leads to more than 2x drop in USDhl liquidity compared to the debt value. When USDhl pool slippage becomes excessive, liquidators will redirect volume to alternative stable pools for swapping their acquired collateral. Flash Loan based liquidators on the other hand will only cause a 1x drop in liquidity. Hence we can model all liquidations to cause 1.5x drop in the average case[considering the almost equal distribution in liquidation volumes observed from both kinds of liquidators]. We will keep this average case value for reference in further calculations and methodologies.

6.3 Liquidity Constraints

USDhl's combined liquidity from AMMs and Orderbook is about 12M against a total debt of approximately 11.5M, which is healthy and gives adequate coverage. While this liquidity consists of recycled borrowed debt, risk modeling still remains possible by keeping extra conservative at-risk thresholds which account for the given nature of the liquidity. On-chain and orderbook liquidity for collaterals HYPE and UBTC show sufficient depth to handle liquidations[upwards of 50M for both HYPE and UBTC at 15% slippage threshold].

This means unlike for protocols on mature chains Collateral-at-Risk(CaR) is not a constraint we face during cap raises in case of USDhl vaults. The parameters are governed by Debt-at-Risk(DaR) for Felix's USDhl vaults. We keep the ability to pay off USDhl debt using AMM liquidity paramount in our methodology. This makes sure that even if no inventory based liquidator is active on the chain, simple liquidation bots working on Flash loans and AMM liquidity can carry out liquidation without any hindrance.

7 Supply Cap Methodology

Given the recycled nature of USDhl liquidity in the HyperEVM ecosystem, we suggest employing a conservative approach to supply cap management which accounts for the unique aspects of USDhl markets. This methodology ensures that there is enough liquidity coverage for potential liquidations without hampering the growth of markets.

7.1 Core Requirements

The protocol must ensure that complete debt from at-risk positions remains covered by available AMM liquidity under 10% slippage at all times.

- At-risk positions include those eligible for liquidation at a 30% drop in HYPE price and a 20% drop in BTC price
- Total debt from these positions must be covered by pool liquidity under 10% slippage
- This coverage ratio must hold for at least 3 consecutive days before warranting a cap raise

7.2 Scaling Methodology

When evaluating cap raises, we suggest applying conservative projections for Debt-at-Risk growth given as:

- Scaled DaR = 1.6 × (% cap increase) × current DaR / 100
- For example, a 50% cap increase from 5M to 7.5M assumes an 80% increase in DaR
- The 1.6 factor derives from historical DaR increments relative to cap raises, which ranged between 1.5 and 2.0 across observation period of 24H and 5D respectively

7.3 Implementation Strategy

Cap increases should follow this structured approach to minimize market disruption:

- Initial liquidity is sourced from the idle market in order to prevent looping as much as possible
- This leaves the protocol with less dependence on the on-chain liquidity to reach caps
- Suppose $X Million is taken from the idle markets and $Y Million is sourced from the chain

Post-implementation, from our observation new borrows typically redistribute as follows: 60% returns to the idle market, 30% enters AMM pools, and 10% remains unutilized. Hence the impact on AMM liquidity is about $(0.3 × X) - Y} Million.

7.4 Final Validation

The cap raise approval criterion requires:

$$\big[\text{current liquidity} + \big((0.3 \times X) - Y\big)\big] > \left[1.6 \times \frac{\%\text{Cap raise}}{100} \times \text{current DaR}\right]$$

This relationship must remain true for at least 3 consecutive days, ensuring sufficient market depth exists to handle both new borrowing activity and potential stress events while maintaining the protocol's conservative risk parameters. If all the above criteria are met then the protocol should proceed with raising the caps.