

CurrenC (CRNC) POC #4

External Privacy Layer on Ethereum

Completed Execution Record

Ethereum Mainnet | CRNC + USDC + ETH + Anon Wallet + Railway / RAILGUN

POC objective

Demonstrate a practical privacy path available today for a CRNC-related liquidity workflow: move downstream USDC from the CRNC Development wallet into RAILGUN private state, then exit that private state to a fresh Ethereum wallet without creating an ordinary direct ERC-20 transfer from the CRNC Development wallet to the destination wallet.

Final result

PASS - Wallet B received both USDC and native ETH after the RAILGUN private step. The successful exits were broadcast through Railway using a public broadcaster, while the CRNC Development wallet did not transfer directly to Wallet B.

Main execution completed: September 15, 2026 ET

1. Purpose and Scope

POC #4 focuses on the privacy layer itself. Earlier CRNC proof-of-concept work already demonstrated the surrounding components, including CRNC participation in permissionless lending and borrowing through Morpho. This record therefore does not repeat market creation, oracle setup, token approvals, collateral setup, or the full Morpho borrower workflow.

The critical path documented here begins with USDC in the CRNC Development wallet. Anon Wallet was used to stage and shield USDC and ETH into RAILGUN private state. Railway Wallet was then used to recover the same RAILGUN private wallet and complete the private-to-public exits to a fresh destination wallet, Wallet B.

Important boundary

POC #4 does not claim that CRNC itself has native private balances or private transfers. CRNC remains a transparent ERC-20 on Ethereum. The POC demonstrates that a CRNC-related downstream liquidity workflow can use an external Ethereum privacy layer without changing, wrapping, bridging, or upgrading the CRNC asset.

2. Relationship to Prior POCs

- POC #3 established the CRNC/USDC lending and borrowing path on Morpho and demonstrated CRNC as collateral infrastructure.
- POC #4 isolates the new capability: privacy for the downstream USDC path using RAILGUN.
- No additional Morpho approvals or collateral setup were required for the final execution documented here.
- Base bridging and MetaMask Card spending remain outside scope because they are not required to prove the privacy boundary.

3. Critical Path

1. CRNC Dev Wallet	2. Anon Public Wallet	3. RAILGUN Private State	4. Railway Exit	5. Fresh Wallet B
10 USDC + 0.0005 ETH funded	Public 0x staging balance	8 USDC + 0.0004 ETH shielded	Private proof + public broadcaster	7.990255 USDC + 0.000121520280625678 ETH

Success condition

Wallet B receives USDC after the RAILGUN private step, no ordinary direct CRNC Development Wallet -> Wallet B ERC-20 transfer exists, and Wallet B also receives native ETH so it is not left operationally stranded without gas.

4. Execution Addresses

Component	Address	Role
CRNC Development wallet	0x634B3b78E5e0B7556A0955Fe998BF7d8cA2e7355	Public source wallet for POC execution
Anon public wallet	0x5665512eb809f100b4c562bfc572c54ee7801282	Public staging wallet before shielding
RAILGUN private wallet	0zk1qyj9...apf7	Private shielded state; same wallet imported into Railway
Wallet B	0xaBBaa44F06d782E76897c3c16107C043c7318723	Fresh Ethereum destination wallet for final privacy-exit proof

5. Execution Record

Step 1 - Fund the Anon Public Wallet

For the main POC #4 execution, 10 USDC was transferred from the CRNC Development wallet to the Anon public wallet on Ethereum Mainnet. This established the public starting balance used for the USDC shield transaction.

Field	Value
Amount transferred	10.000000 USDC
Source	CRNC Development wallet
Destination	Anon public wallet 0x5665512e...01282
Transaction hash	0xa0350d292a07d9abc0c3cb1b5d33e1d43f516d5d6f67321f6b522b9638c0b581

Explorer: [0xa0350d292a07d9abc0c3cb1b5d33e1d43f516d5d6f67321f6b522b9638c0b581](#)

Starting public USDC immediately before the 8 USDC shield was approximately 10.2263 USDC, including the 10 USDC funding transfer plus the small residual public balance already present.

Step 2 - Shield 8 USDC through Anon Wallet v0.9.9

8.000000 USDC was selected for shielding from the Anon public wallet into the existing private RAILGUN wallet. The pre-authorization screen showed an execution-fee estimate of approximately 0.706 USDC, paid in USDC.

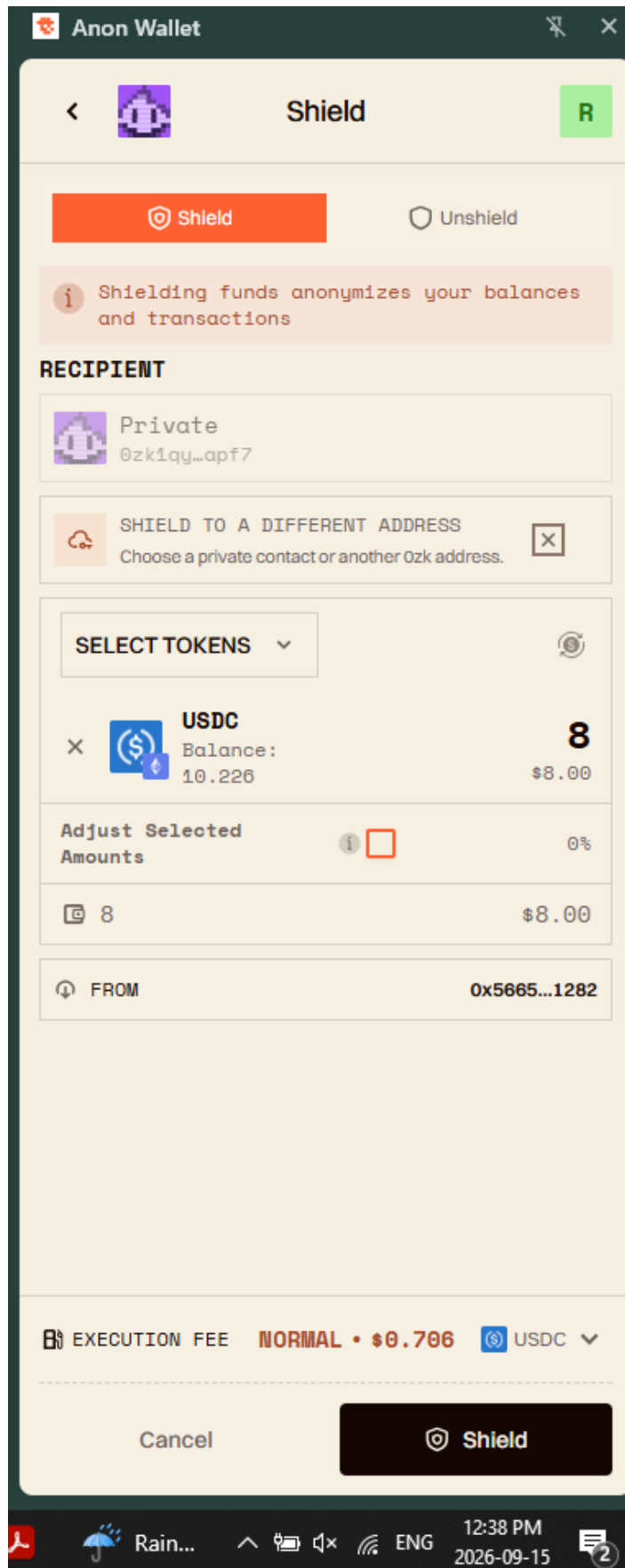


Figure 1 - Anon pre-authorization screen for the 8 USDC shield.

Field	Value
Requested shield amount	8.000000 USDC
Shield transaction	0x6c474d7bd7089f81406fbe3d3a67d2eea86d9fa878a1a31cdf4392736dcfb2ea
Amount entering RAILGUN shield path	8.000000 USDC
RAILGUN Relay/private-side transfer	7.969626 USDC
RAILGUN Treasury transfer	0.019974 USDC
Paymaster/execution transfer	0.844840 USDC
Public USDC balance after shield	~1.3815 USDC

Explorer: [0x6c474d7bd7089f81406fbe3d3a67d2eea86d9fa878a1a31cdf4392736dcfb2ea](https://etherscan.io/tx/0x6c474d7bd7089f81406fbe3d3a67d2eea86d9fa878a1a31cdf4392736dcfb2ea)

The public-wallet accounting reconciled: ~10.2263 USDC starting balance - 8.0000 USDC shield - 0.844840 USDC execution/paymaster transfer = ~1.38146 USDC remaining. Anon displayed ~1.3815 USDC after execution.

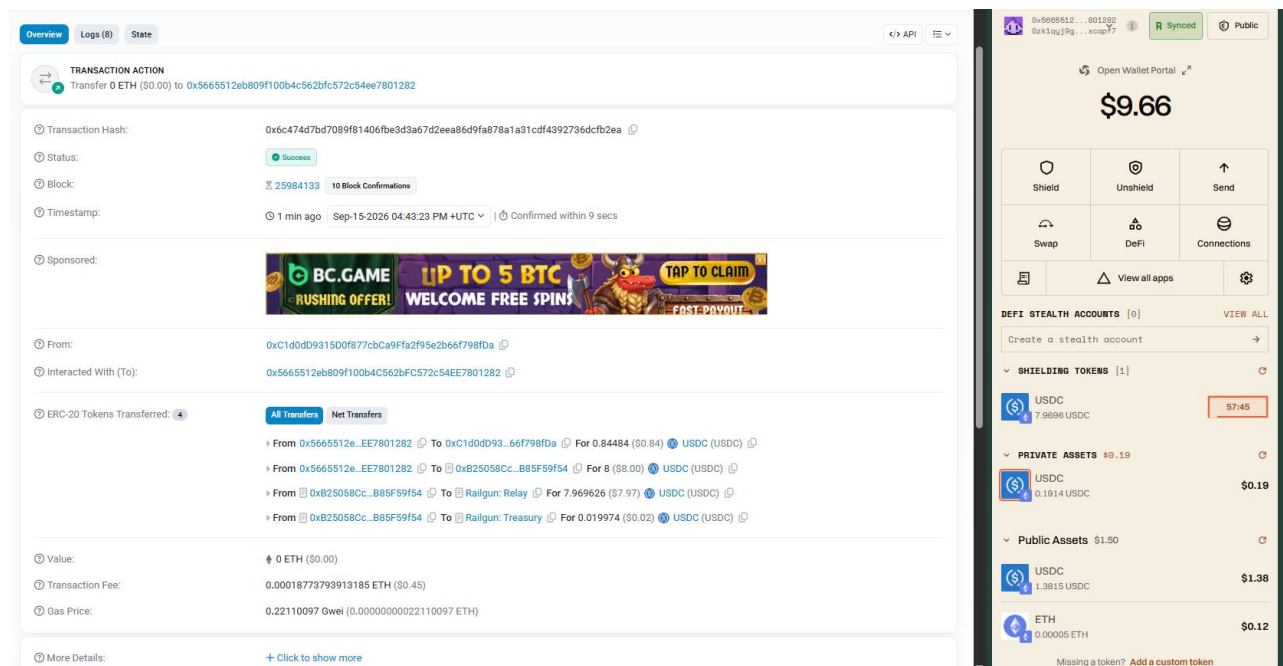


Figure 2 - Etherscan and Anon immediately after the 8 USDC shield. The private amount entered the PPOI waiting period.

Step 3 - Add Native ETH to the Privacy Path

To avoid leaving Wallet B with an ERC-20 balance but no native gas, 0.0005 ETH was transferred from the CRNC Development wallet to the Anon public wallet. Of that amount, 0.0004 ETH was then shielded. RAILGUN represented the private balance as WETH while inside private state.

Field	Value
ETH transferred to Anon public wallet	0.0005 ETH
ETH funding transaction	0x80b85553b25d57bdbe12d91416e2f410e7f33e7744347b4d15c0979a8f3e5def
ETH selected for shielding	0.0004 ETH
ETH shield transaction	0x6a6504dc2c79cbf895dea5bca5788f88bda2fc1f8ec243fbc0c804d9a7814af1
Private-side WETH after shield	~0.000398481 WETH

Field	Value
RAILGUN Treasury transfer	0.000000999 WETH

ETH funding explorer: [0x80b85553b25d57bdbe12d91416e2f410e7f33e7744347b4d15c0979a8f3e5def](https://etherscan.io/tx/0x80b85553b25d57bdbe12d91416e2f410e7f33e7744347b4d15c0979a8f3e5def)

ETH shield explorer: [0x6a6504dc2c79cbf895dea5bca5788f88bda2fc1f8ec243fbc0c804d9a7814af1](https://etherscan.io/tx/0x6a6504dc2c79cbf895dea5bca5788f88bda2fc1f8ec243fbc0c804d9a7814af1)

ETH Price: \$2,407.94 (-4.61%) Gas: 0.045 Gwei

Search by Address / Txn Hash / Block / Token / Domain Name

TRANSACTION ACTION
Call Multicall Function by 0x5665512e...EE7801282 on 0x5665512e...EE7801282

Transaction Hash: 0x6a6504dc2c79cbf895dea5bca5788f88bda2fc1f8ec243fbc0c804d9a7814af1

Status: Success

Block: 25986156 2 Block Confirmations

Timestamp: 23 secs ago Sep-15-2026 11:29:59 PM +UTC

Sponsored:

NEW EXCLUSIVE STRIKER

From: 0x5665512eb09f100b4C562bFC572c54EE7801282

Interacted With (To): 0x5665512eb09f100b4C562bFC572c54EE7801282

Internal Transactions:

All Transfers Net Transfers

Transfer 0.0004 ETH (\$0.96) From 0x5665512e...EE7801282 To 0xB25058Cc...B85F59f54

Transfer 0.0004 ETH (\$0.96) From 0xB25058Cc...B85F59f54 To Wrapped Ether

ERC-20 Tokens Transferred: 2

All Transfers Net Transfers

From 0xB25058Cc...B85F59f54 To Railgun: Relay For 0.000398481 (\$0.96) Wrapped Ether (WETH)

From 0xB25058Cc...B85F59f54 To Railgun: Treasury For 0.000000999 (\$0.002405) Wrapped Ether (WETH)

Value: 0 ETH (\$0.00)

Transaction Fee: 0.00003978208629612 ETH (\$0.10)

Gas Price: 0.047877732 Gwei (0.000000000047877732 ETH)

More Details: Click to show more

Anon Wallet

SHIELD COMPLETED

Shielded 0.0004 ETH

0x6a6504dc...a7814af1

View on Explorer

Done

Figure 3 - Native ETH shield completed; Etherscan shows the WETH private-side accounting.

Step 4 - Recover the Same RAILGUN Private Wallet in Railway

The same RAILGUN wallet was imported into Railway Wallet. Railway reconstructed the private state and displayed the private USDC and WETH balances created through Anon. This demonstrated that the private balance is protocol-level RAILGUN state rather than a balance confined to one frontend.

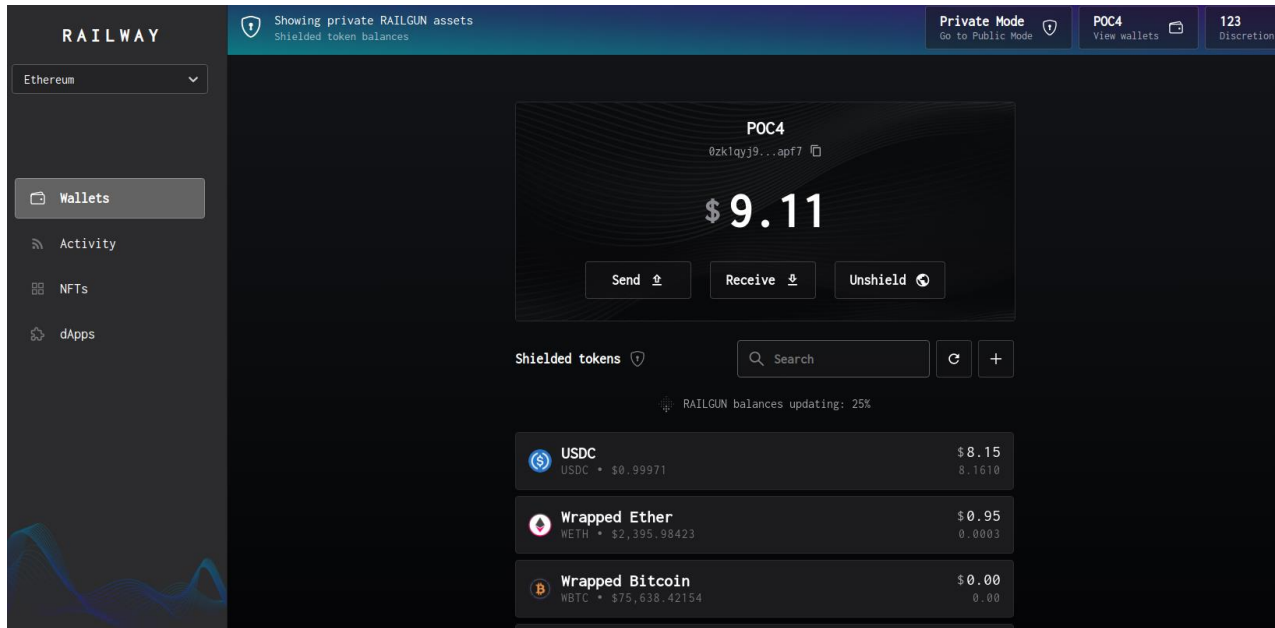


Figure 4 - Railway showing the recovered RAILGUN private wallet with USDC and WETH balances.

Frontend execution note

Anon successfully performed the shield stage under v0.9.9, but the attempted unshield workflow was not completed in Anon because fee-route controls (Public vs Private, Paymaster vs Gas Account, and gas-account setup) were not sufficiently clear or actionable. The RAILGUN private assets remained intact. Railway was therefore used for the exit stage. This was a frontend usability issue, not a RAILGUN protocol failure.

Step 5 - Unshield USDC to Wallet B using Railway

Railway was configured to unshield the private USDC balance to Wallet B using a Public Broadcaster. Railway separately disclosed the RAILGUN unshield fee and broadcaster gas fee before proof generation.

Field	Value
Private USDC balance available	~8.1611 USDC
Amount consumed by unshield	8.010280 USDC
RAILGUN unshield fee	0.020025 USDC
Broadcaster gas fee	0.150800 USDC
Wallet B expected receipt	7.990255 USDC
Signer	Public Broadcaster - encrypted & anonymous

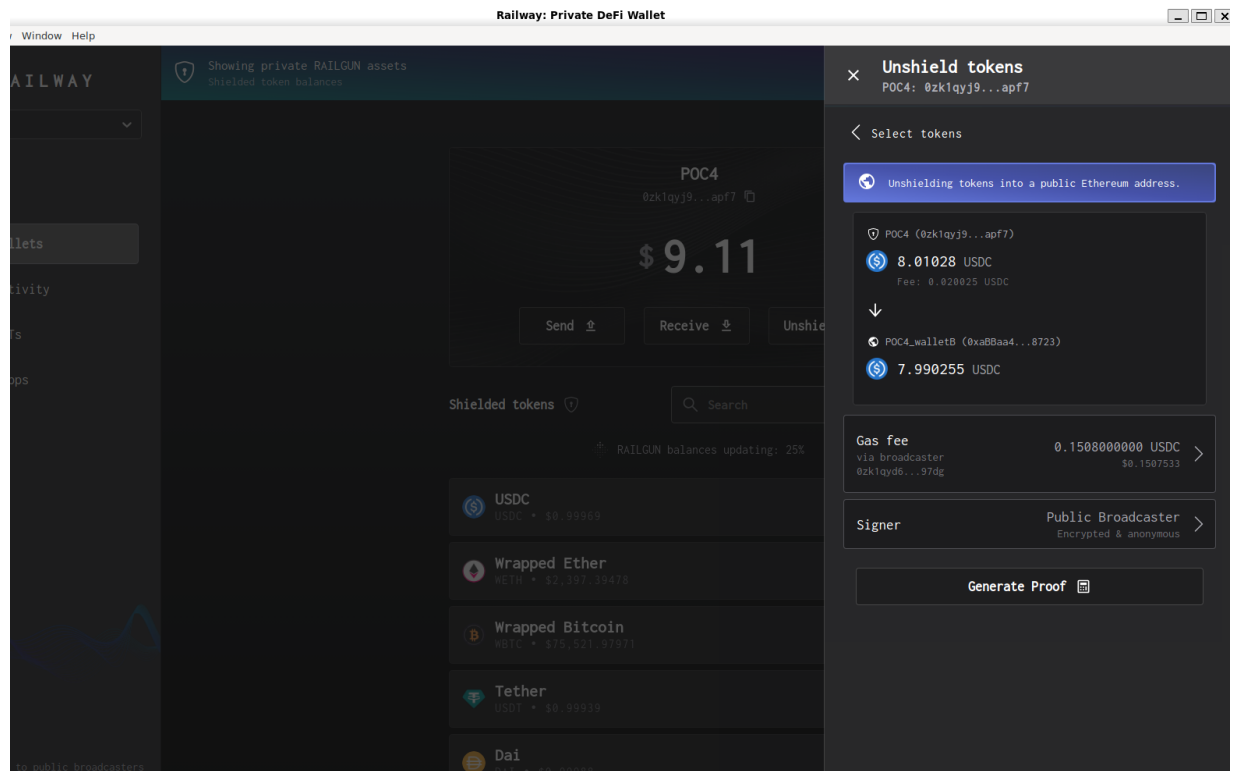


Figure 5 - Railway review screen before USDC proof generation and unshield.

The private spend proof was generated locally, the broadcaster submitted the exit, and Railway reported “Success: Unshield through Broadcaster.” Wallet B then showed approximately 7.99 USDC.

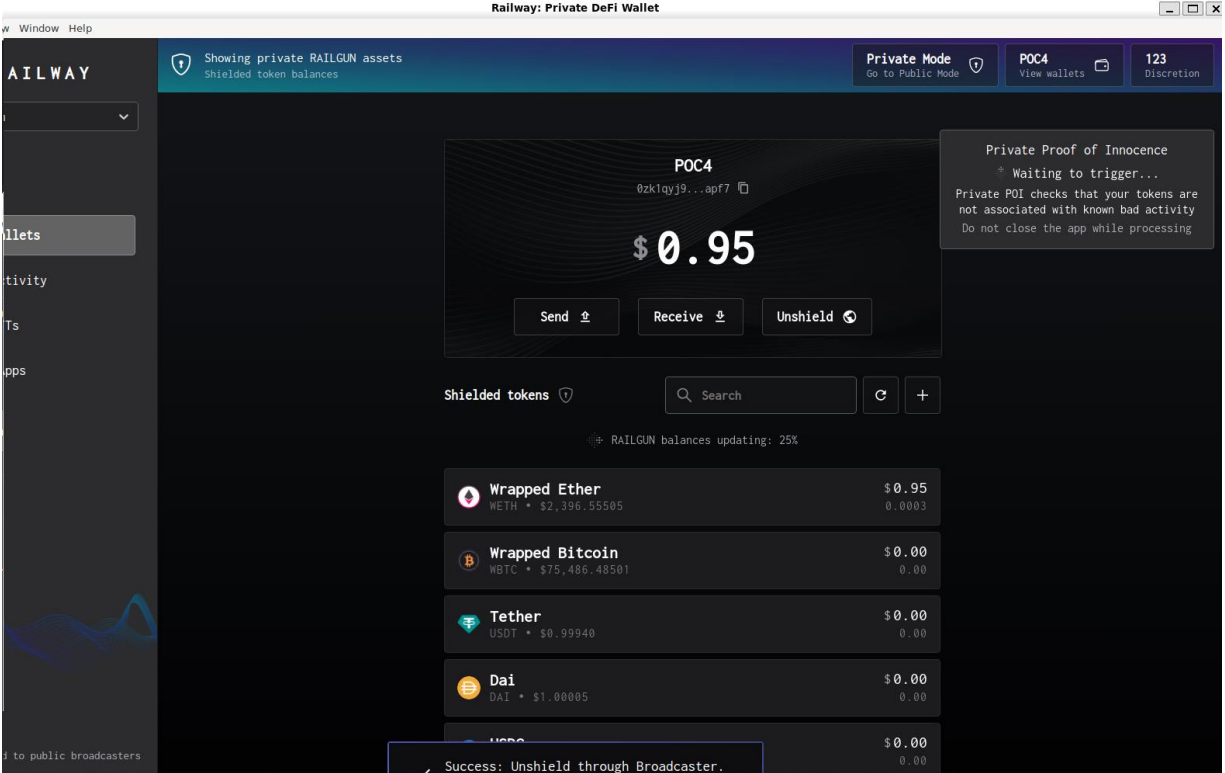


Figure 6 - Railway after the successful USDC unshield through a broadcaster.

Field	Value
USDC unshield transaction	0x093f01c0e68aae7e7711ce14960f02991724f591250f252070e93e68bd0bb4f7
USDC received by Wallet B	7.990255 USDC
Destination	0xaBBaa44F06d782E76897c3c16107C043c7318723

USDC exit explorer: [0x093f01c0e68aae7e7711ce14960f02991724f591250f252070e93e68bd0bb4f7](https://debank.com/profile/0xabbaa44f06d782e76897c3c16107c043c7318723/history)

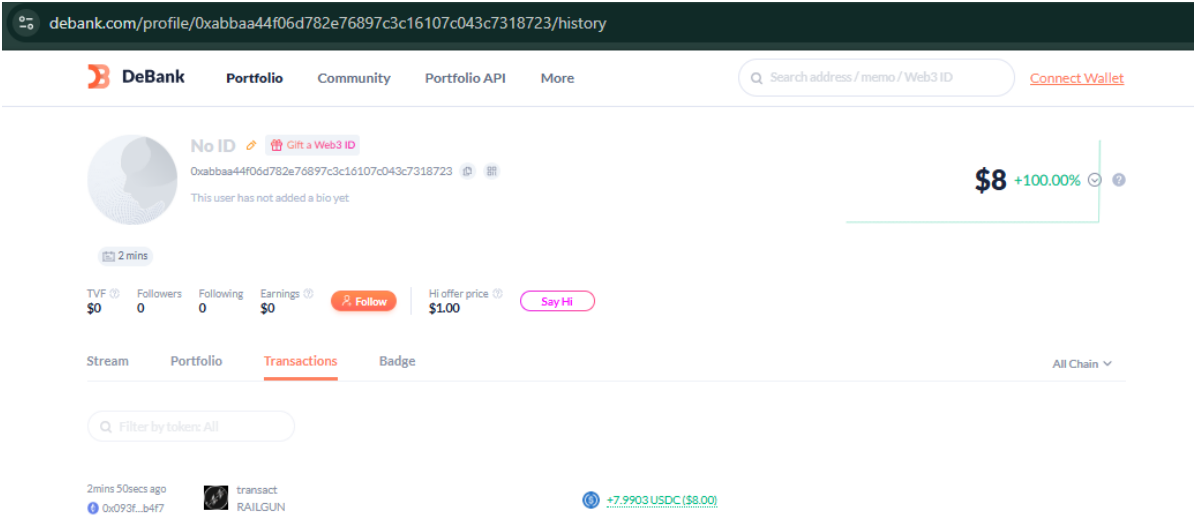


Figure 7 - DeBank history for Wallet B showing the incoming RAILGUN USDC transfer.

Step 6 - Unshield WETH as Native ETH to Wallet B

The remaining private WETH was then exited separately as native ETH so Wallet B would have gas for subsequent Ethereum transactions. Railway again used a public broadcaster and generated a new private spend proof.

Field	Value
WETH allocated to base-token unshield	0.000121824842732509 WETH
RAILGUN unshield fee	0.000000304562106831 WETH
Broadcaster gas fee	0.0002766565 WETH
Native ETH received by Wallet B	0.000121520280625678 ETH
Signer	Public Broadcaster - encrypted & anonymous

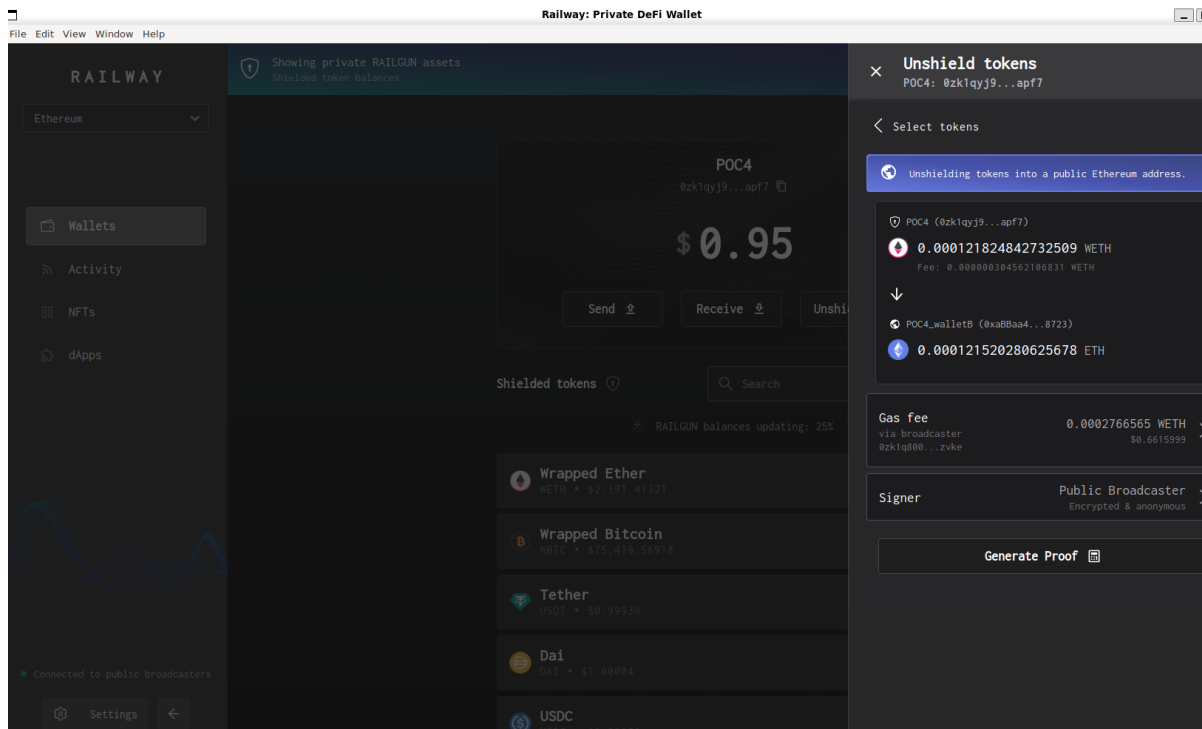


Figure 8 - Railway WETH-to-native-ETH unshield review for Wallet B.

The ETH exit transaction completed successfully. Etherscan shows the RAILGUN Relay Adapt delivering native ETH to Wallet B, while MetaMask shows Wallet B holding both the previously received USDC and native ETH.

Field	Value
ETH unshield transaction	0xbc3d16792462d0b10e8f544daf7c4384a6d2e7488b69a5c2b891823070d26b5d
Native ETH received by Wallet B	0.000121520280625678 ETH
Wallet B final demonstrated assets	~7.99 USDC + ~0.000120 ETH

ETH exit explorer: [0xbc3d16792462d0b10e8f544daf7c4384a6d2e7488b69a5c2b891823070d26b5d](https://etherscan.io/tx/0xbc3d16792462d0b10e8f544daf7c4384a6d2e7488b69a5c2b891823070d26b5d)

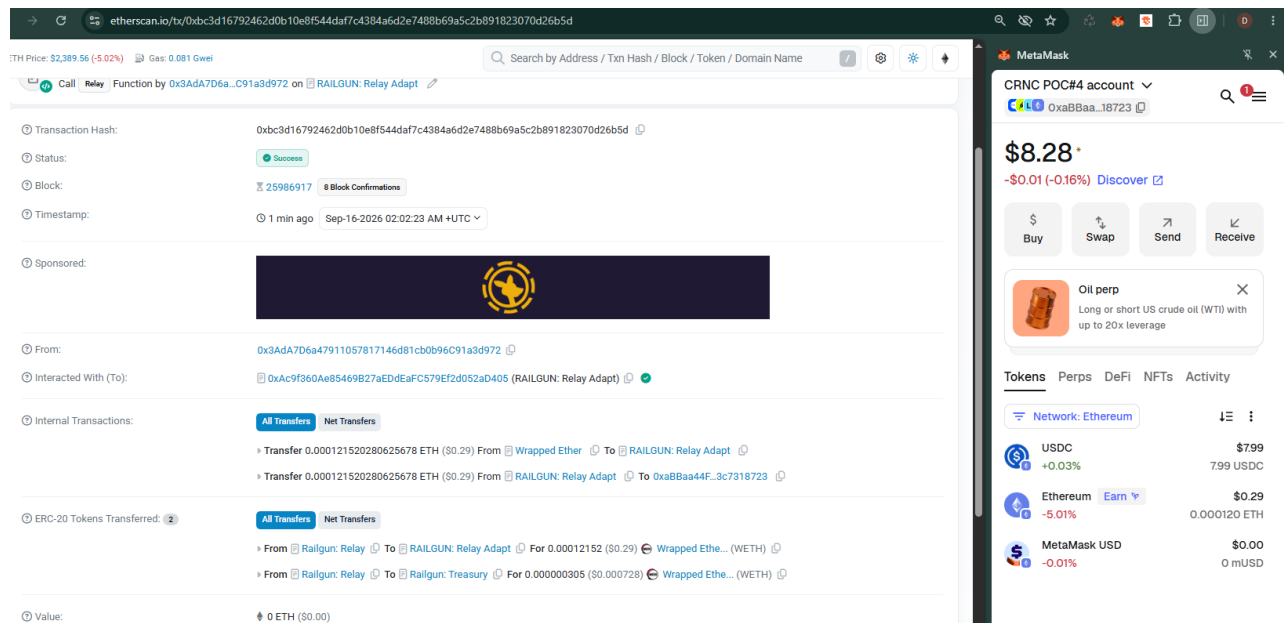


Figure 9 - ETH exit on Etherscan and final Wallet B balances in MetaMask.

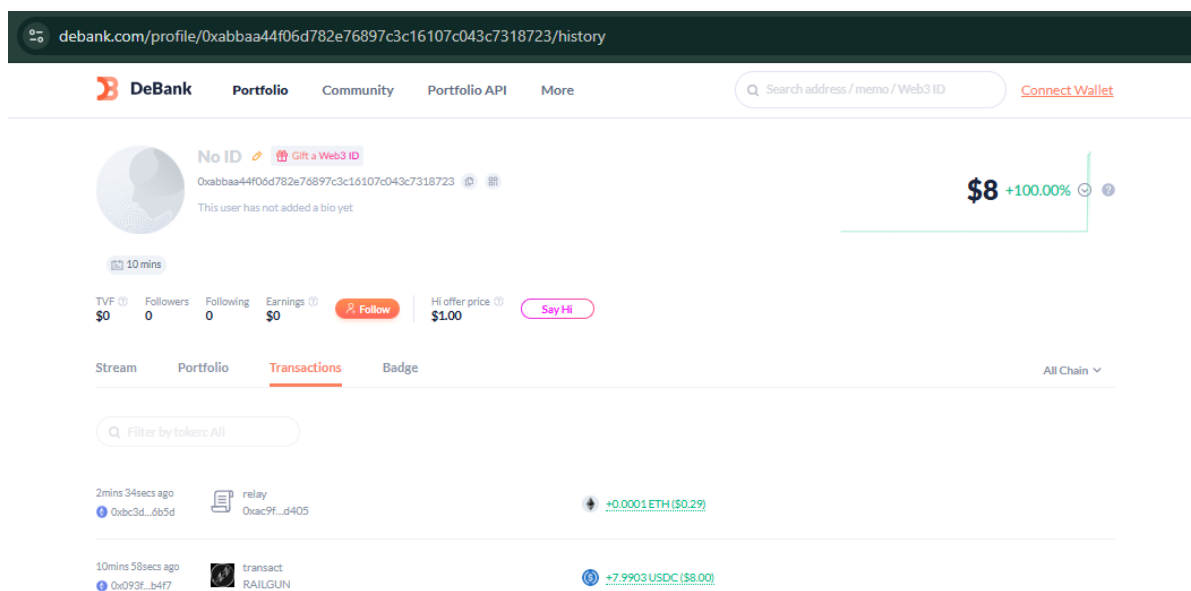


Figure 10 - DeBank history for Wallet B showing both the RAILGUN USDC receipt and native ETH receipt.

6. Final Result and Verification

Success criterion	Result
USDC moved from CRNC Development wallet to Anon public wallet	PASS
8 USDC successfully entered RAILGUN private state	PASS
Native ETH added to private state for destination gas provisioning	PASS
Same private wallet recovered in Railway	PASS
Private USDC delivered to fresh Wallet B	PASS - 7.990255 USDC
Private WETH exited as native ETH to Wallet B	PASS - 0.000121520280625678 ETH
Ordinary direct CRNC Dev Wallet -> Wallet B ERC-20 transfer	NONE observed / not used
CRNC token contract changed, wrapped, bridged, or upgraded	NO

POC #4 conclusion

POC #4 is complete. A CRNC-related downstream liquidity path was moved from a known public source wallet into RAILGUN private state and then exited to a fresh Ethereum wallet through a public broadcaster. Wallet B received both USDC and native ETH without an ordinary direct transfer from the CRNC Development wallet to Wallet B. CRNC itself remained unchanged and transparent on Ethereum throughout the workflow.

7. What the POC Demonstrates

- Privacy capability is available today on Ethereum without changing the CRNC token contract.
- The private balance is portable across RAILGUN-compatible frontends: Anon was used for shielding and Railway was used for unshielding.
- The recipient address and exit amounts become public when assets are unshielded, but the ordinary direct public-wallet-to-public-wallet trail is broken by the private state in between.
- Providing native ETH to the fresh destination wallet is operationally important so the wallet can perform subsequent Ethereum transactions.
- The current workflow remains more complex than a conventional wallet transfer and should be viewed as a practical workaround, not yet a fully abstracted retail experience.

8. Current UX and Cost Observations

Observation	Implication
PPOI waiting period after shielding	Adds approximately one hour of latency before newly shielded assets become spendable privately.
Anon fee-route controls were difficult to interpret for unshielding	Frontend UX can materially affect usability even when the underlying private assets are intact.
Railway private-balance sync can take time	Initial or repeated private-state reconstruction is slower than ordinary public-wallet balance loading.
Railway separated protocol fee and broadcaster fee clearly	Made the private exit economics and proof-generation flow easier to audit.
Native ETH exit required a separate base-token unshield	The destination can be made operational, but doing so adds another private transaction and broadcaster fee.

9. Evidence and Transaction Index

10 USDC funding to Anon public wallet:

[0xa0350d292a07d9abc0c3cb1b5d33e1d43f516d5d6f67321f6b522b9638c0b581](#)

8 USDC shield: [0x6c474d7bd7089f81406fbe3d3a67d2eea86d9fa878a1a31cdf4392736dcfb2ea](#)

0.0005 ETH funding to Anon public wallet:

[0x80b85553b25d57bdbe12d91416e2f410e7f33e7744347b4d15c0979a8f3e5def](#)

0.0004 ETH shield: [0x6a6504dc2c79cbf895dea5bca5788f88bda2fc1f8ec243fbc0c804d9a7814af1](#)

USDC unshield to Wallet B: [0x093f01c0e68aae7e7711ce14960f02991724f591250f252070e93e68bd0bb4f7](#)

Native ETH unshield to Wallet B: [0xabc3d16792462d0b10e8f544daf7c4384a6d2e7488b69a5c2b891823070d26b5d](#)

POC #3 reference: https://currenc.co/CRNC_POC3_steps.pdf

Appendix A - Interface Execution Notes

The main execution record above follows the successful critical path. The following notes preserve the material frontend issues encountered during development without making troubleshooting the focus of the POC.

Stage	Outcome
Earlier Anon shield test	A small-value shield exposed a sequencing/accounting bug that reduced the executed shield amount. The issue was reported to Anon and subsequently addressed in v0.9.7-v0.9.9.
Final Anon shield stage	Successful under v0.9.9. The full 8 USDC and 0.0005 ETH selected entered the shield path and the success screen reported the executed amount correctly.
Anon unshield attempt	Not completed. The UI presented confusing fee-route dependencies across Public/Private mode, Paymaster, and Gas Account paths, including disabled controls and unclear gas-account setup. Private funds remained intact.
Railway unshield stage	Successful. The same RAILGUN wallet was recovered, fees were disclosed separately, proofs were generated, and both USDC and native ETH were delivered to Wallet B through public broadcasters.

Interpretation

The switch from Anon to Railway at the exit stage does not change the underlying privacy protocol. It demonstrates that RAILGUN private state is accessible across compatible frontends and that a frontend usability failure can be separated from protocol-level asset custody and privacy state.

CRNC Proof of Concept #4A

Direct CRNC Shielding and Unshielding Through RAILGUN

Extension to POC #4 | Execution record | September 17, 2026

Purpose	Test whether the original CRNC ERC-20 asset can enter RAILGUN private state and later be unshielded to a different public Ethereum address.
Test amount	1 CRNC
Result	PASS for direct CRNC shielding and unshielding compatibility
Important limitation	A private CRNC transfer between two private RAILGUN addresses was not executed in this extension and is therefore not claimed as demonstrated.

This document records a small-value technical validation. It is not a claim of native CRNC privacy, guaranteed anonymity, or future protocol availability.

1. Executive Summary

POC #4A extends the completed POC #4 privacy-layer work by testing the CRNC asset itself rather than only USDC and ETH used in the surrounding liquidity workflow. One CRNC was transferred to the public wallet used for the RAILGUN test, shielded into RAILGUN private state through Anon Wallet, recognized as a private CRNC balance in Railway, and then unshielded through Railway to a different public Ethereum address.

The test demonstrates that CRNC can traverse the public-to-private-to-public RAILGUN cycle while remaining the original CRNC ERC-20 asset. The CRNC token contract was not modified, upgraded, wrapped, or redeployed as part of the test.

The extension does not demonstrate a private CRNC transfer from one private RAILGUN address to another. The asset was held in private state and then unshielded to a separate public address. Accordingly, this document treats private-address-to-private-address CRNC transfer as outside the tested scope.

Observed Flow

CRNC development wallet → public Anon/RAILGUN wallet → RAILGUN private CRNC balance → Railway unshield → Wallet B

Stage	Observed amount	Notes
Public test amount	1 CRNC	Small-value compatibility test
Private spendable balance shown by Railway	0.99620325 CRNC	Observed after shielding and private-state synchronization
Railway unshield fee	0.002490508125 CRNC	Displayed before unshield
CRNC sent to Wallet B	0.993712741875 CRNC	Displayed by Railway before execution
Estimated Railway gas fee	0.0000317788 ETH	Displayed before unshield

2. Setup and Route Selection

The test began with a 1 CRNC transfer from the CRNC development wallet to the public wallet used for the privacy-layer testing. The transfer confirmation showed Ethereum as the network and CRNC as the asset being transferred.

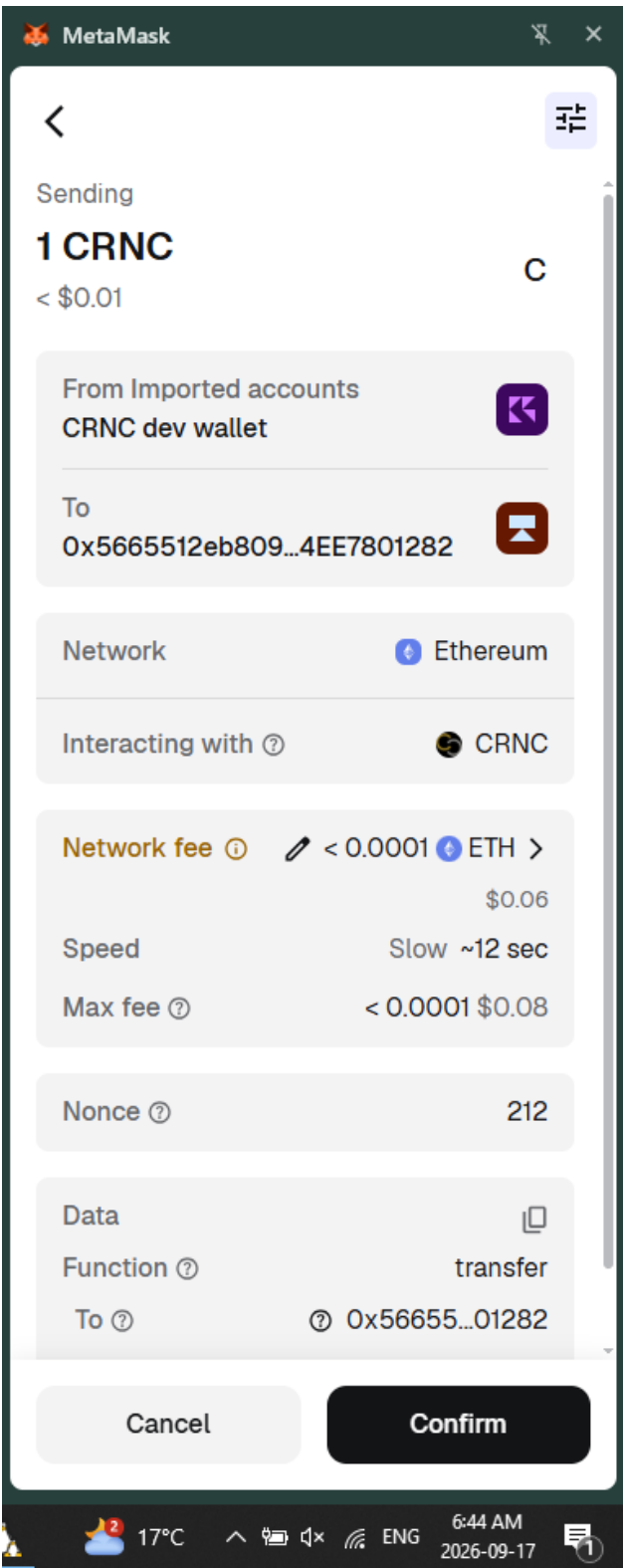


Figure 1. MetaMask confirmation for the 1 CRNC test transfer.

Railway was initially evaluated for the shielding step. In the observed Railway interface, CRNC had no detected price and the shielding flow required the shielding fee to be paid in CRNC. For this very small test amount, that route was not practical, so the shielding step was moved to Anon Wallet.

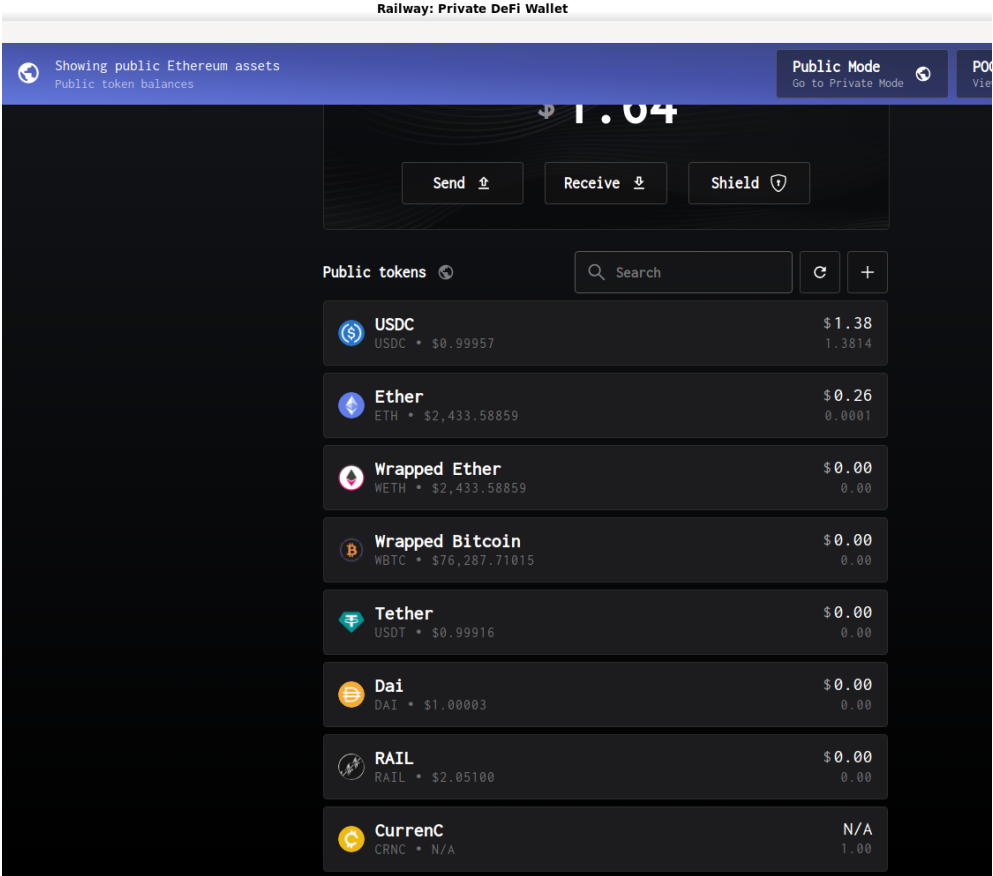


Figure 2. Railway displayed CRNC without a detected price, leading the test to use Anon for shielding.

The public wallet was also topped up with ETH for execution costs. Anon then recognized CRNC as an Ethereum token available for selection in the shield interface.

3. Shielding CRNC Through Anon

Anon Wallet was used to shield the full 1 CRNC test amount to the existing RAILGUN private address. Before execution, the interface showed 1 CRNC selected and an estimated execution fee of approximately \$0.57 paid in ETH.

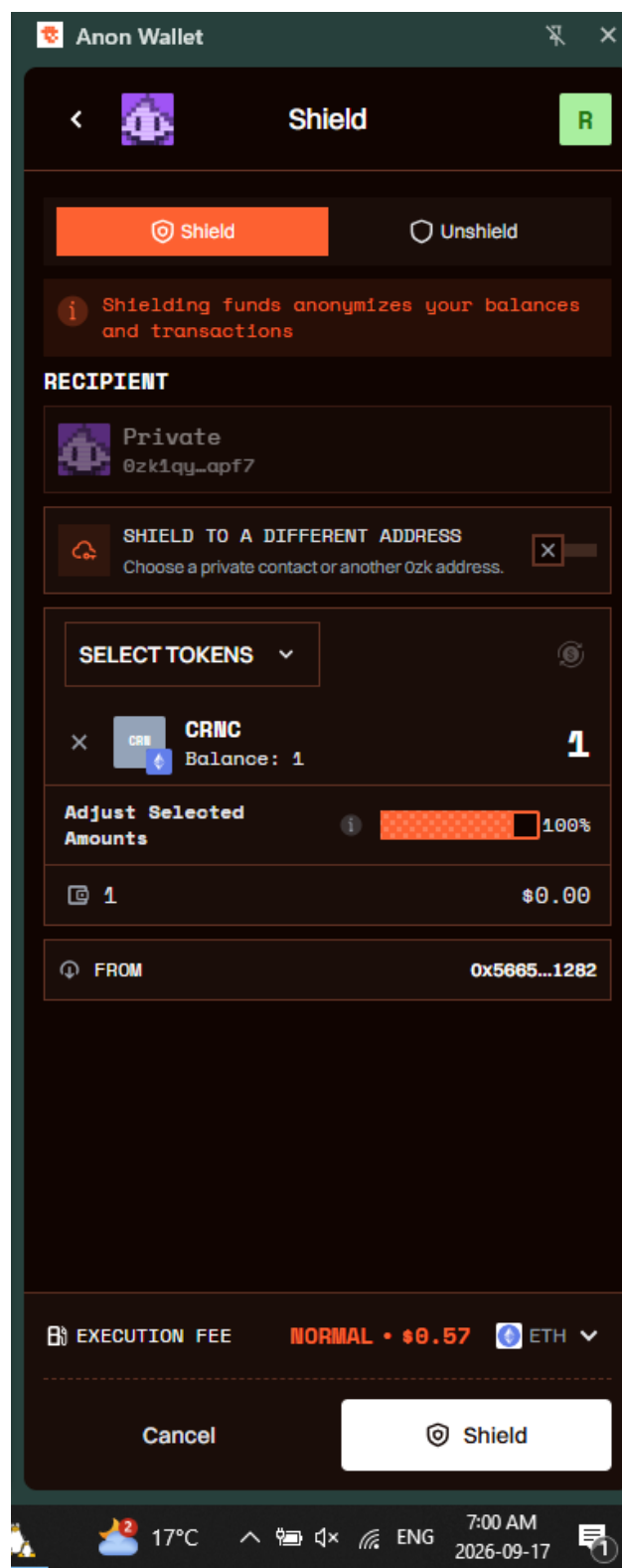


Figure 3. Anon shield screen showing 1 CRNC selected and the execution fee denominated in ETH.

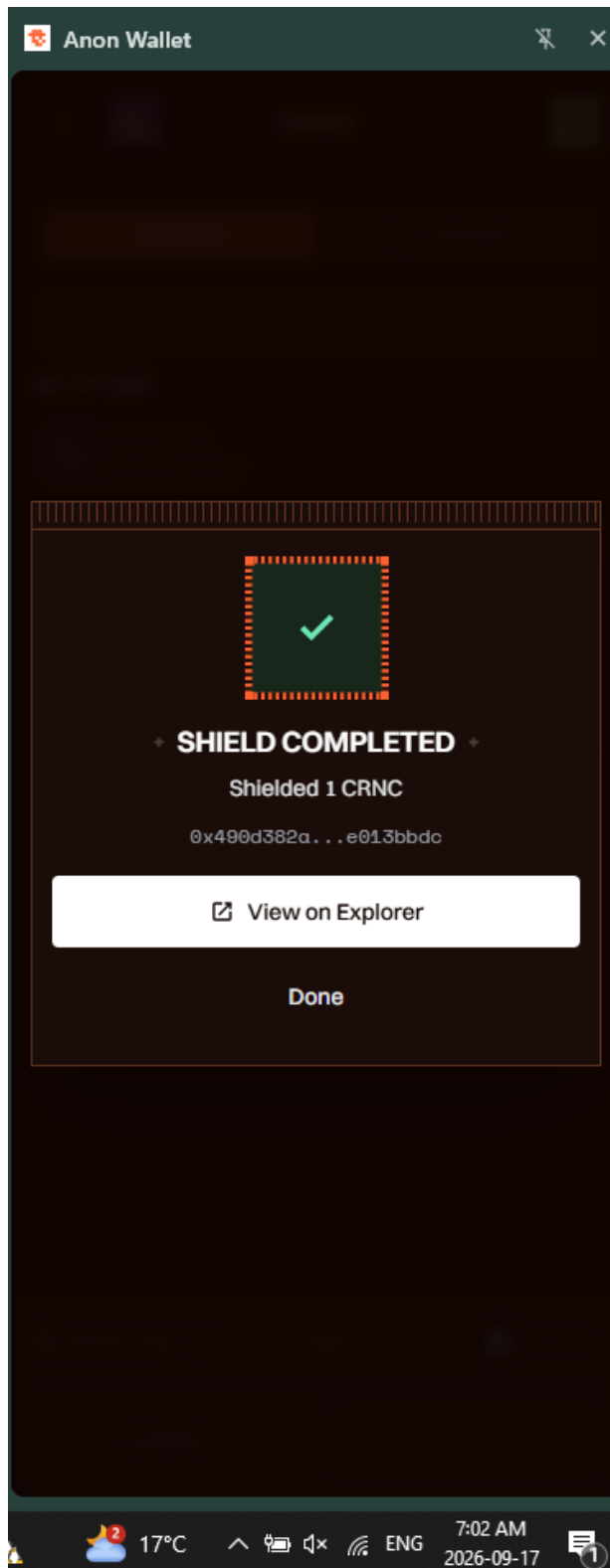


Figure 4. Anon reported “Shield Completed” for 1 CRNC.

Shield transaction

[0x490d382abab84c436d88d6e0fc1208e3dcfdbbddd485da47a461a2b2be013bbdc](https://explorer.curren.cash/tx/0x490d382abab84c436d88d6e0fc1208e3dcfdbbddd485da47a461a2b2be013bbdc)

After the shield transaction and synchronization, Railway recognized CRNC inside the same private RAILGUN state. The private spendable balance shown during the later unshield flow was 0.99620325 CRNC.

4. Unshielding CRNC Through Railway

Railway was then used for the exit from private state. A different public Ethereum address, Wallet B, was entered as the recipient. Railway displayed the spendable private CRNC balance of 0.99620325 CRNC.

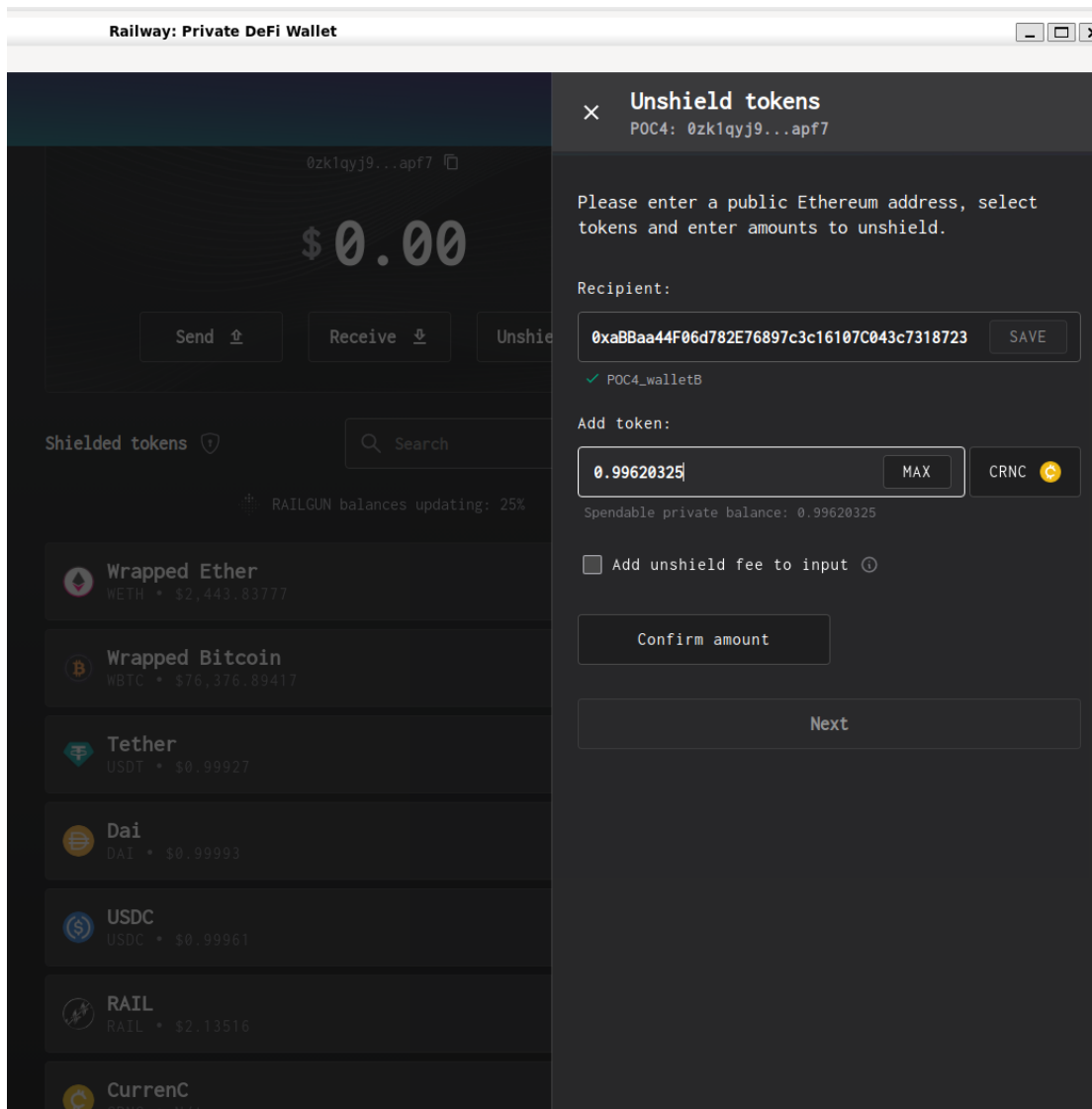


Figure 5. Railway unshield interface showing Wallet B as the recipient and 0.99620325 CRNC as the spendable private balance.

Before proof generation, Railway displayed the CRNC unshield fee and the resulting public amount. The interface showed a 0.002490508125 CRNC fee and 0.993712741875 CRNC to be delivered to Wallet B. The estimated Ethereum gas fee shown at this stage was 0.0000317788 ETH.

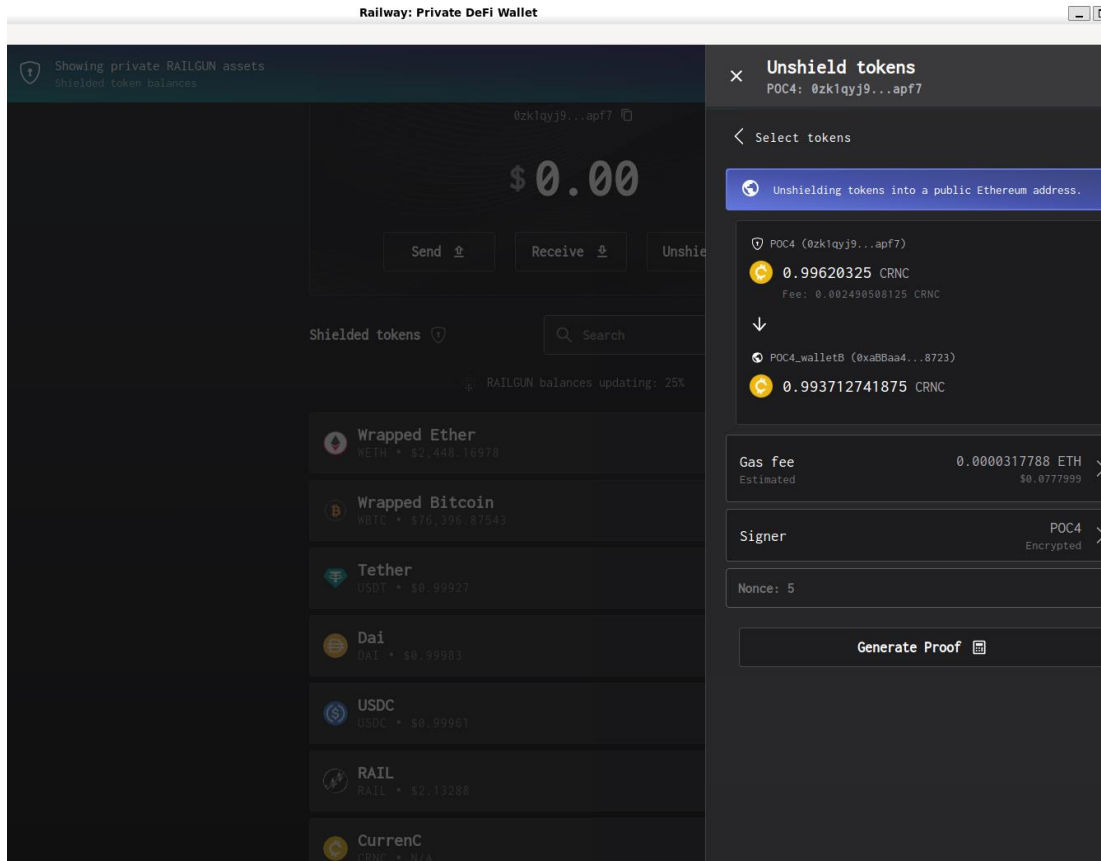


Figure 6. Railway pre-execution summary showing the CRNC unshield fee, output amount, and estimated ETH gas fee.

Railway generated the transaction proof and completed the unshield process. The destination wallet subsequently displayed CRNC alongside its existing assets.

5. Public Verification and Result

The unshield transaction was recorded on Ethereum and the destination wallet showed the resulting CRNC balance. The evidence confirms that CRNC exited RAILGUN private state to the separate public recipient used for this test.

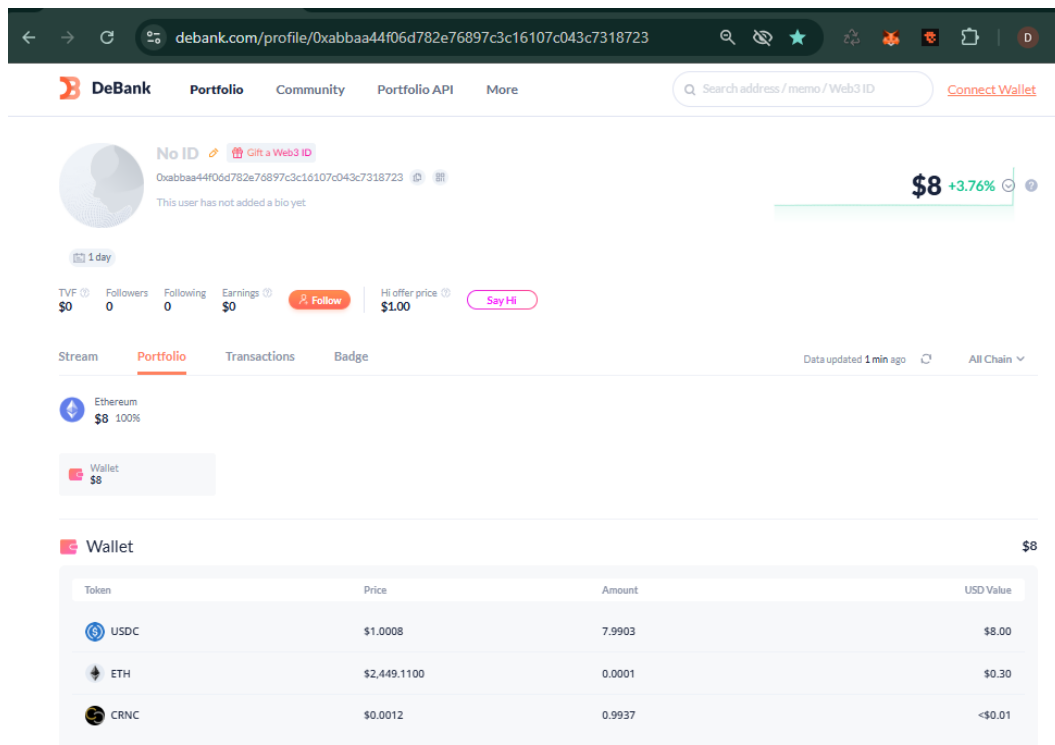


Figure 7. Destination portfolio view after the test, showing CRNC at Wallet B.

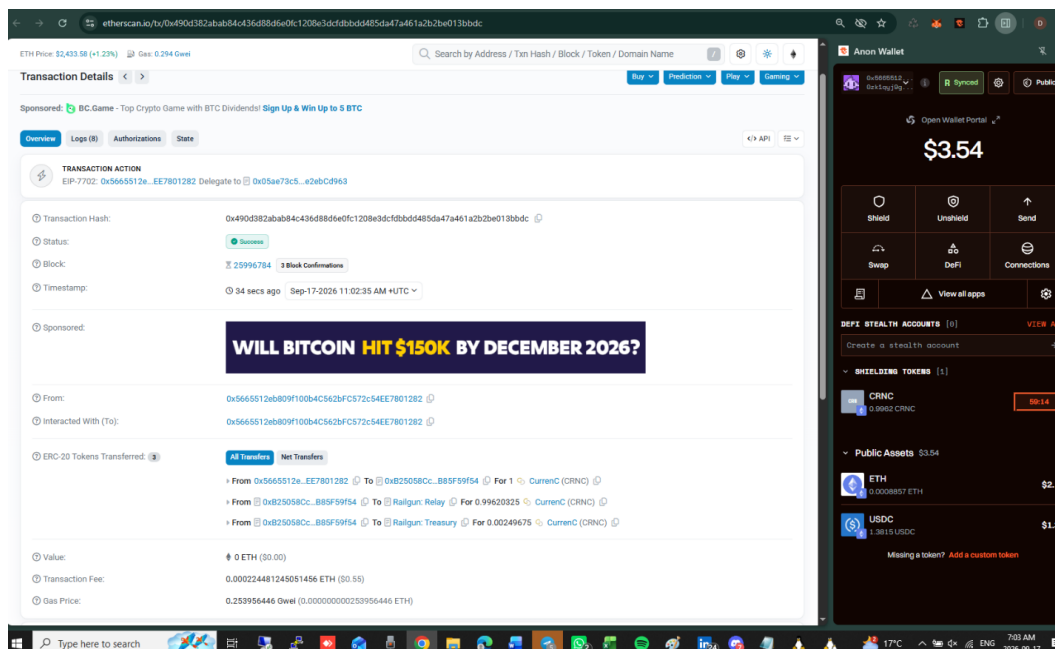


Figure 8. Etherscan and wallet view associated with the CRNC unshield transaction.

Unshield transaction

[0xb9fa8579d0b011d6fb853fbc262ec4a50a13ccd9f97d3d416912451fd65137d1](#)

Result

PASS. The test directly demonstrated that CRNC can be shielded into RAILGUN private state and later unshielded to a different public Ethereum address using the tested Anon/Railway workflow.

6. What POC #4A Demonstrates

- The original CRNC ERC-20 asset was accepted by the tested RAILGUN-facing tooling for shielding.
- CRNC was represented as a spendable private balance after shielding and synchronization.
- CRNC could be unshielded from private state to a different public Ethereum address.
- The process did not require changing the CRNC token contract or creating a replacement CRNC asset.
- Execution and gas costs can be paid through surrounding Ethereum infrastructure rather than altering CRNC itself.

7. What POC #4A Does Not Demonstrate

- It does not make CRNC a natively private token. RAILGUN is an external privacy layer.
- It does not establish guaranteed anonymity or unlinkability. Public shield and unshield endpoints remain observable on Ethereum.
- It does not demonstrate a private transfer of CRNC between two different private RAILGUN addresses. That action was not executed in this test.
- It does not establish that every wallet or RAILGUN frontend will support CRNC identically. Railway and Anon behaved differently during the shielding setup.
- It does not guarantee future availability, fees, user experience, or compatibility of Anon, Railway, RAILGUN, or other external infrastructure.

8. Relationship to POC #4

POC #4 demonstrated a privacy-layer pathway for USDC and ETH used within a CRNC-related liquidity/spending workflow. POC #4A adds a narrower but important validation: the CRNC asset itself can enter and exit RAILGUN private state in the tested environment.

Together, the two tests support a more precise conclusion: external Ethereum privacy infrastructure can be applied both to assets used around a CRNC spending workflow and, as demonstrated in POC #4A, to CRNC itself. The privacy functionality remains external to CRNC.

9. Suggested Public Summary

“POC #4A extended the privacy-layer test to CRNC itself. A small amount of CRNC was shielded into RAILGUN private state and later unshielded to a different Ethereum address. CRNC remained the original ERC-20 asset throughout. This demonstrates compatibility with an external privacy layer, not native CRNC privacy.”