

Immutable Verification of Pre-Audit Evidence - Ordinal 08

Sentinel Protocol v3.1 – Cryptographic Proof of Pre-Audit Evidence (C5.7,
C9.5, C9.8)

Date: 05 August 2025

Inventor: Dr. Fernando Telles

Affiliations:

CDA AI (Cardiovascular Diagnostic Audit & AI Pty Ltd, ACN 638019431)

Telles Investments Pty Ltd (ACN 638017384)

IP Rights:

US Provisional: #63/826,381

AU Provisional: #2025902482

AU Trade Mark: #2535745 & #2549093

IP Priority Date: 17 June 2025 (Global Anchor)

Bitcoin Ordinal TXID:

<https://ordinals.com/tx/>

[fc109ea70abb520f025c156c945991f48cb7f84c5d32f2a9cc26d0e46f35e088](https://ordinals.com/tx/fc109ea70abb520f025c156c945991f48cb7f84c5d32f2a9cc26d0e46f35e088)

This white paper was immutably published on the Bitcoin blockchain via Ordinal inscription on 05 August 2025.



Abstract: Immutable Verification of Pre-Audit Evidence — Ordinal 08



Objective

To cryptographically prove that the core evidence file for `METAVAL-SESS001` was sealed before any validator interaction occurred.

This abstract describes the zero-trust, zero-custody method employed to lock and anchor the Markdown evidence file for METAVAL reproducibility validation.

Ordinal 08 was published on the Bitcoin blockchain on **28 July 2025**, and functions as a **proof-of-origin** artifact for Sentinel Protocol's AI-Human Synergy™ reproducibility infrastructure.

It enables public, verifier-independent validation of file immutability via dual-hashing and decentralized timestamping.



Methodology

Cryptographic Flow:

Layer	Tool Used	Output Type
File Hash	<code>batch_dualhasher_multi.py</code>	SHA256 → RIPEMD160 (.2ha)
Timestamp	<code>OpenTimestamps</code>	.ots Merkle Proof
OP_RETURN	<code>opreturnanchor.py</code>	Bitcoin TXID + block metadata
Validation	<code>HashValidatorBlock.py</code>	Runtime dual-hash + .ots check
Session Log	<code>session_logger.py</code>	Immutable .json, .2ha, .ots





Target File (Pre-Audit Evidence):

- `METAVAL-SESS1_Sentinel Protocol v3.1 - Meta-Analysis Evidence Validation Audit Log.md__20250728T051601.390854Z.md`
- **OTS Timestamp:** `2025-07-28 17:01:21`
- **Merkle Root:** `2789c3c0f3fc049e7e418a7eadf099cfd69694c61af957d9117c6abf1ba89dbb`
- **RIPEMD160(SHA256):** `ddac378b9ee44173c9e8b6c16576bbf9a63514c0`
- **OP_RETURN TXID:**
`968e1a67a7da25f0c31e468c6b9f0c3290ea3cb7bd45b84c4521c0f2bd6026b6`

- **OP_RETURN Payload:** `SENTINEL|ORDINAL08CONTENTS|
ddac378b9ee44173c9e8b6c16576bbf9a63514c0`
 - **Bitcoin Block:** `908644`
-

Significance

This pre-anchored evidence enforces Sentinel Protocol’s **C5.7** reproducibility lifecycle by guaranteeing:

-  **No user post-hoc edits**
-  **Pre-Validator Audit Proof-of-Existence**
-  **Zero-Custody Audit Integrity**
-  **Bitcoin-Layer Anchoring** (RIPEMD160/SHA256)

Ordinal 08 is the *first independently verifiable public record* in the METAVAL audit chain. It establishes that all downstream validator signatures (human or AI) were applied only **after** evidence finalization.

Ordinal 08 — Immutable Verification of Pre-Audit Evidence

Session: `METAVAL-SESS001`

Protocol: Sentinel Protocol v3.1

Version: v2025-08-05 | `C1.2_SentinelFeedbackLoopProtocol_v3.1` Optimized

System: AI–Human Synergy™

Purpose:

This file was cryptographically dual-hashed (SHA256 → RIPEMD160) and timestamped (OTS) on **28 July 2025**, before any validator audit.

Its purpose is to prove that the evidence used in the Sentinel Protocol METAVAL–SESS001 reproducibility audit was sealed before any outcome or inference.

This strategy enforces full compliance with `C5.7`, `C8.3`, and `C9.5`, ensuring zero post-hoc edits and absolute audit provenance. Sentinel Protocol v3.1 Four-tier Reproducibility Structure Hash and Manifest Architecture Enabling Multi-Level Cryptographic `.2ha` and `.ots` verification:

- **Per-Evidence** (Evidence Target File) Executed by `batch_dualhasher_multi.py` - **Per-Batch** (Batch Folder Level `.2ha`) Executed by `batch_dualhasher_multi.py` (`.2ha` only) - **Per-Log** Executed by `auditlogger.py` - **Per-Session** Executed by `session_logger.py`

Key Cryptographic Details (Individual Evidence Target File Level Reproducibility)

Target File Name: METAVAL-SESS1_Sentinel Protocol v3.1 - Meta-Analysis Evidence

Validation Audit Log.md__20250728T051601.390854Z.md

RIPEMD160(SHA256) = ddac378b9ee44173c9e8b6c16576bbf9a63514c0

OPRETURN Payload: SENTINEL|ORDINAL08CONTENTS|

ddac378b9ee44173c9e8b6c16576bbf9a63514c0

OPRETURN TXID: 968e1a67a7da25f0c31e468c6b9f0c3290ea3cb7bd45b84c4521c0f2bd6026b6

Inscription Purpose: Immutable cryptographic anchoring of untouched pre-audit markdown

OTS Validation (Individual Evidence Target File Level)

- **File Name:** METAVAL-SESS1_Sentinel Protocol v3.1 - Meta-Analysis Evidence
Validation Audit Log.md__20250728T051601.390854Z.hash.ots
- **SHA256:** f69cd7b098dbfcc311e9ed1c9be15b6dcd274f07599268f5ac6c16a5603b63fc
- **Bitcoin TXID:**
df60ccd7a83a80c80a45d53badf0c672852913a713f3ba51d50b20a4e4f5d665
- **Bitcoin Block:** 907533
- **Timestamp:** 2025-07-28 17:01:21
- **Merkle Root:** 2789c3c0f3fc049e7e418a7eadf099cfd69694c61af957d9117c6abf1ba89dbb

Per-Batch Reproducibility (batch_dualhasher_multi.py)

- **Folder Name:** frozen_files_METAVAL-SESS001_batch_evidence12_METAVAL-SESS1_Pre-Independent_AUDIT_Evidence
- **Folder RIPEMD160 (.2ha):** 32f16aa7ed5c51579ad4079039fcf62a69cd4555

Per-Log Reproducibility (auditlogger.py)

Cryptographic Hashes (from .json)

- **File Name:**
- **meta_id:** METAVAL-LOG012
- **Timestamp:** 2025-07-28T05:21:24.049649Z
- **SHA256 (.hash):**
2a05ac3259f28d637952a4bd119bc1359d1786cec806084a9fbf3a25d891a99a
- **RIPEMD160 (.2ha):** 0461604d52e87c4f8de9da34be2e894976537dae

```
[
  {
    "timestamp": "2025-07-28T05:21:24.049649Z",
    "event": "AUDIT_BATCH_EVIDENCE_VERIFIED",
    "meta_id": "METAVAL-LOG012",
    "input": {
      "batch_filenames": [
        "METAVAL-SESS1_Sentinel Protocol v3.1 \u2013 Meta-Analysis Evidence
Validation Audit Log.md__20250728T051601.390854Z"
      ],
      "evidence_type": "SHA256-RIPEMD160 reproducibility (deferred)",
      "session_context": "METAVAL-SESS001",
      "batch_screenshot_pre": "BATCH_PRE_20250728T051511Z.png",
      "batch_screenshot_post": "BATCH_POST_20250728T051617Z.png",
      "validation_step": "VALIS v2.4 enforcement active. Meta-ID: METAVAL-
SESS001_batch_evidence12_METAVAL-SESS1_Pre-Independent_AUDIT_Evidence, 1 files,
delta=66s. folder_dual_hash computed and checked.",
      "delta_seconds": 66,
      "executed_template": "valis_batchauditlogger_template.py (v2.4)"
    },
    "output": {
      "status": "verifiable",
      "verifiable": true,
      "final_hash_disclosed": false,
      "audit_type": "REPRODUCIBILITY",
      "meta_id": "METAVAL-LOG-METAVAL-SESS001_batch_evidence12_METAVAL-
SESS1_Pre-Independent_AUDIT_Evidence",
      "folder_dual_hash": "32f16aa7ed5c51579ad4079039fcf62a69cd4555"
    },
    "audit": {
      "AI_used": true,
      "LLM_used": "LLM1",
      "human_verified": true,
      "module_version": "v.july28.25",
      "ai_editor_LLM_human_agreement": true,
      "VALIS_template_enforced": true,
      "AI_override": false
    },
    "timestamp_confirmed": true
  }
]
```

OTS Validation

- **File:** audit_log_METAVAL-LOG012_20250728T052124.050186Z.hash.ots
- **SHA256:** f65217404a7b12b08b770971b9f94d16f3da6fc07a824c662dad185090cc0a91
- **Bitcoin TXID:**
981f4d4d12952c476a33ef0c5114e4bcb7d325ecd0a650acebcd27681b067f73
- **Bitcoin Block:** 907528
- **Date of Existence:** 2025-07-28 AEST
- **Merkle Root:** 571dbe5c7723d46e958e69f4ebd6a9a7b52e8844cec709db636e3765c447b3c2

Per-Session Reproducibility (`session_logger.py`)

Cryptographic Hashes (from `.json`)

- **File Name:** `session_log_METAVAL-SESS001_20250728T053115.523329Z.json`
- **meta_id:** `METAVAL-SESS001`
- **Timestamp:** `20250728T053115.523329Z`
- **SHA256 (.hash):**
`941f452e1dcd685cad485f1d26183a684daa0a96c5ff26945260365ba58c736e`
- **RIPEMD160 (.2ha):** `ef9ea0c29816a081eaaad408449bd282e63435a`

OTS Validation

- **File Name:** `session_log_METAVAL-SESS001_20250728T053115.523329Z.hash.ots`
- **SHA256:** `007a7f13071a5df61f7afb34fd16340d9eff4788cb87c7b97eb7926ad07856aa`
- **Bitcoin TXID:**
`981f4d4d12952c476a33ef0c5114e4bcb7d325ecd0a650acebcd27681b067f73`
- **Bitcoin Block:** `907528`
- **Date of Existence:** `2025-07-28 AEST`
- **Merkle Root:** `571dbe5c7723d46e958e69f4ebd6a9a7b52e8844cec709db636e3765c447b3c2`

Why This Matters — Zero-Custody, Zero-Trust Reproducibility for High-Stakes Domains

Sentinel Protocol v3.1 is built for **domains where post hoc trust is insufficient:**



- Medicine
- Law
- Scientific publishing
- Engineering
- Regulatory finance

These environments demand **provable audit independence**, not just technical sophistication.

Ordinal 08 establishes the *cryptographic precondition* for the first validator audit under `METAVAL-SESS001` — ensuring that the evidence file was sealed **before** any validator, AI, or human could influence it.

This inscription supports the enforcement of:

-  `C9.8_ZeroTrust_AuditExecutionProtocol_v3.1` : No validator or agent may validate unverifiable or post-altered input
-  `C9.9_AMPLIFY_LEDGER_v3.1` : Public session registry integrity anchored to `.2ha` , `.ots` , and `OP_RETURN` trails

-  C5.7_CredentialAudit_Doctrine_v2.0 : Requires binary PASS/FAIL audits on fully frozen evidence only
-  C8.3_CodeExecution_rewired_v3.1 : Mandates reproducibility via dual-hash + session anchoring

Together, these enforce a **zero-custody, zero-trust audit infrastructure** that provides:

- ✓ **Proof without access:** The content remains private; the proof is public
- ✓ **Immutable timestamps:** Anchored directly to the Bitcoin blockchain
- ✓ **Cryptographic finality:** RIPEMD160(SHA256) as a canonical audit fingerprint
- ✓ **Non-repudiation of state:** What was sealed cannot be denied or backfilled


Ordinal 08 is the upstream **anchor of origin** — ensuring that every validator step downstream traces back to an **unaltered input**.

Whether you're a journal editor, forensic expert, legal reviewer, or scientific replicator — this Ordinal lets you **prove what was published, when, and by whom**, cryptographically.

The audit trail does not begin after validation. It begins with Sentinel Protocol ABSOLUTE MODE

✓ How to Verify (Cross-Platform)

Prerequisites: - View the On-Chain Ordinal 08 (This Document) - Use an Ordinals explorer: ordinals.com or mempool.space - Search using inscription **TXID** (post inscription) - You may also search by wallet address:

 [bc1pa3695d7x3c13k4xut599s6e8yfjl5876uwpq82fqy4tsazxn77sss53mht](https://ordinals.com/inscription/bc1pa3695d7x3c13k4xut599s6e8yfjl5876uwpq82fqy4tsazxn77sss53mht)

Step 1: Copy and Save the Evidence File (Exact Contents)

1. Scroll below this section to the full contents of the evidence `.md`
2. Copy the entire file into a new plaintext document (e.g., in VSCode)
 - ie:

```
<contents> <-This
```

3. Save as `ordinal08contents.md`
4. Re-run the dual-hash using the Python or OpenSSL methods shown below

Step 2: Compute SHA256 Hash Locally

Run this command in your terminal (macOS/Linux) or Command Prompt/Git Bash (Windows):

```
openssl sha256 ordinal_05.pdf
```

Expected output format:

```
SHA256(ordinal_05.pdf)= <64-character hex string>
```

Copy the hex string (e.g., `abcdef...`).

Step 3: Compute RIPEMD160 of the SHA256 Hash

Pipe the SHA256 output into RIPEMD160:

```
echo -n "<SHA256 hex from Step 2>" | xxd -r -p | openssl ripemd160
```

Expected output:

```
(stdin)= <40-character hex string>
```

This is the `.2ha` hash.

Step 4: Compare to Inscribed Hash in Ordinal 08 (This Document)

1. View Ordinal 08 on a Bitcoin Ordinal explorer (e.g., ordinals.com or unisat.io). Search by inscription ID or Bitcoin transaction.
2. Extract the inscribed RIPEMD160 hash from Ordinal 08's content.
3. Compare your computed hash from Step 3.
 - Match? The Pre-audit file is authentic and untampered.
 - No match? The file has been altered or is not the canonical version.

Step 5: Verify Timestamp Integrity On-Chain

1. Search the *OPRETURN* payload on *mempool.space* using Ordinal05 TXID: `SENTINEL|ORDINAL08CONTENTS|<RIPEMD160 hash from Step 3>`.
2. Confirm the transaction's block height and timestamp (e.g., via block explorer).
3. This proves the hash existed on Bitcoin by that date—immutable and independently verifiable.

Troubleshooting:

- Hash mismatch? Redownload the PDF from source.
- Tool issues? Use alternatives like Python: `hashlib.sha256()` then `hashlib.new('ripemd160')`.
- No explorer access? Use any public Bitcoin node API.

This process requires **no trust in Sentinel Protocol or CDA AI** — only publicly accessible Bitcoin transactions and open-source hash tools.

You are verifying the **pre-audit Markdown document** used in METAVAL-SESS001, anchored on-chain via `OP_RETURN`, and independently reproducible using public tools

Optional: Use Sentinel's Publicly Disclosed Tools for Local Hash Reproduction at scale

Open-source verification scripts are available at:


 <https://github.com/TELAISYN/AI-Human-Synergy> → /SentinelProtocolv3.1/tools

Tools include:

- `amplify_ledger_writer_v2.3.py` – anchor metadata writer
- `dualhasher_public_sentinel.py` – dual-hash generator at scale
- `extract_hashes.py` – CSV digest output for batch reproducibility at scale
- `verify_dualhash.py` – offline SHA256 → RIPEMD160 checker for single target files

All tools comply with `C9.5` (Zero Custody), `C9.8` (Zero Trust Audit Execution), and `C9.9` (AMPLIFY_LEDGER Public Layer).

Detailed instructions are also contained within `Ordinal 06`:  TXID:

`e11022c0ae5b6d603a815e17eeb3af2573cf3cf0ca4f5372da7b63b04dc7ebe3` Block: 907,804 

Viewable on-chain at: [https://mempool.space/tx/](https://mempool.space/tx/e11022c0ae5b6d603a815e17eeb3af2573cf3cf0ca4f5372da7b63b04dc7ebe3)

`e11022c0ae5b6d603a815e17eeb3af2573cf3cf0ca4f5372da7b63b04dc7ebe3`

For time. For reproducibility. For truth.

TELAISYN

Sentinel Protocol v3.1 – Meta-Analysis Evidence Validation Audit Log (`METAVAL-SESS001`)

Author: Dr. Fernando Telles BMedSc(Adv) MD(Dist)^{1 2}

Validator Role: ARCHITECT VALIDATOR

Validator meta_id: DRTELLES-VAL

Audit Date: 18 July 2025 (OTS) | 19 July 2025 (SHA256 & RIPEMD160)

Independent Medical Validator: Dr. Andrew Woo BSc MD

Validator meta_id: DRWOO-VAL

Audit Date: *Pending post-broadcast*

Independent Engineering Validator: Benjamin Hookey BEng (Mechatronics & Robotics),
FSEng (Safety Instrumented Systems)

Validator meta_id: ENGBHOOKEY-VAL

Audit Date: *Pending post-broadcast*

Audit Session: `METAVAL-SESS001`

Document Type: Reproducibility Ledger (Evidence Layer)

Protocol Version: Sentinel Protocol v3.1

Protocol Mode: ABSOLUTE MODE**System:** AI-Human Synergy™**Status:** Finalised – Pre-Independent-Audit Record**Last Updated:** 19 July 2025**Affiliations:** ¹ CDA AI Pty Ltd (ACN 638 019 431) – Registered Australian company conducting AI-human medical audit and research services² Telles Investments Pty Ltd (ACN 638 017 384) – Private IP holder and strategic infrastructure developer for Sentinel Protocol**IP Rights:** US Provisional #63/826,381 · AU Provisional #2025902482 · AU Trade Mark #2535745 & #2549093 **IP Priority Date:** 17 June 2025 (Global Anchor) **linkedmemory:** [C1, C1.1, C2.6, C5.1, C5.2, C5.3, C7, C8.3]**linkedaudit:** MVP1 → METAVAL Evidence Layer**OP_RETURN TXID:** {{OP_RETURN_TXID}}**Ordinal TXID:** {{ordinal_TXID}}


Purpose

This ledger verifies the **cryptographic integrity**, **timestamp anchoring**, and **human-AI agreement** for all audit logs and structured evidence files that underlie the AI-Human Synergy™ Meta-Analysis Validation Phase.

It marks the **first published reproducibility session** under `meta_id: METAVAL`, preceding canonical deployment (`METAVAL-SESS002`).

All source data was: -  Hashed using `SHA256` and `RIPEMD160` via `batch_dualhasher.py`

-  Timestamped using OpenTimestamps (`.ots`) and verified against Bitcoin mainnet

-  Structured for reproducibility: `.json`, `.csv`, `.md`, `.2ha`, `.ots`

-  Finalized into frozen directories and dual-anchored

-  Verified via 3x independent validator audits (cryptographic + timestamp)

This ordinal publication constitutes **Supplementary Audit METAVAL-SESS001** for the forthcoming AI-Human Synergy™ meta-analysis and validates full pre-deployment reproducibility compliance.

Audit Record:

- **File Name:** `audit_log_MVP1-SR048_20250630T234800.555307Z.json`
- **meta_id:** `MVP1-SR048`
- **Timestamp:** `20250630T234800.555307Z`
- **Classification:** `MVP2_VALIDATION`
- **Subcategory:** `Immutable File Seal - PICO_Builder_Step1_HumanVagueQuestion.md`
- **LLM Used:** `LLM1`
- **Commander Verified:** `true`
- **AI Used:** `true`
- **Relevance Score (1–5):** `5`

- **Required in Final Publication?** Yes

- **Summary:** Immutable timestamp and cryptographic seal applied to foundational audit record (PICO_Builder_Step1_HumanVagueQuestion.md). Dual-hash verified (SHA256 + RIPEMD160) and OTS-anchored on Bitcoin mainnet. No new edits permitted. Record now serves as reproducibility anchor for MVP 2.1-2.4 scientific publication.

- **File Contents:**

```
[
  {
    "timestamp": "2025-06-30T23:48:00.555208Z",
    "event": "MVP2_AUDIT_FILE_IMMUTABILITY_SEAL",
    "meta_id": "MVP1-SR048",
    "input": {
      "document_title": "PICO Builder \u2013 Step 1: Human Vague Question (MVP
2.1 Audit)",
      "filename": "PICO_Builder_Step1_HumanVagueQuestion.md",
      "entity": "Sentinel Protocol v3.0",
      "mvp_phase": "MVP 2.1\u20132.4 Audit Record",
      "evidence_path": "evidence_files/
PICO_Builder_Step1_HumanVagueQuestion.md",
      "sha256_file": "evidence_files/
PICO_Builder_Step1_HumanVagueQuestion.md.hash",
      "ripemd160_file": "evidence_files/
PICO_Builder_Step1_HumanVagueQuestion.md.2ha",
      "ots_file": "evidence_files/
PICO_Builder_Step1_HumanVagueQuestion.md.hash.ots",
      "validation_step": "This record seals the final audit file as immutable
and timestamped. No new evidence was generated. The audit file was produced and
reviewed during MVP 2.1. This step serves as a reproducibility safeguard for
scientific publication. Hashes were confirmed and OpenTimestamps anchored on Bitcoin
mainnet."
    },
    "output": {
      "status": "verifiable",
      "verifiable": true,
      "sha256":
"90366b7088bd2a8b760c6150dade4d5dbd4ae05be31f270c1afffa73c4437c6",
      "ripemd160": "f8389aa2f3a1d08c6169fef65b498469b18c6719"
    },
    "audit": {
      "AI_used": true,
      "LLM_used": "LLM1",
      "human_verified": true,
      "module_version": "v1.0.0",
      "AI_override": false
    },
    "timestamp_confirmed": true
  }
]
```

Cryptographic Hashes (from `.json`)• **SHA256 (.hash):**`a7d5cd585db8e8d1bee55a8f21a4e23373000d4b3c151cc8403fd94cf5a88d70`• **RIPEMD160 (.2ha):** `6b9392cb6ab66a122b52a71913d8b5eb4ac48cce`**OTS Validation**• **File:** `audit_log_MVP1-SR048_20250630T234800.555307Z.hash.ots`• **SHA256:** `63e9a85cce032092edd402a8105cb583cd71dbcfa49d260eb19cd53ea42ae26f`• **Bitcoin TXID:**`c9b29dc1dfd04a7c22eb2f710919fca19e920cc56937a8b83b6f52cef17d614e`• **Bitcoin Block:** `903455`• **Date of Existence:** `2025-07-01 AEST`• **Merkle Root:** `e03e16dd0852ea835bdce37081cadfc9df7f237f1d132258d859c21dd74711ec`**Audit Record:**• **File Name:** `audit_log_MVP1-SR049_20250630T235345.703064Z.json`• **meta_id:** `MVP1-SR049`• **Timestamp:** `20250630T235345.703064Z`• **Classification:** `EVIDENCE_FILE`• **Subcategory:** `Immutable Audit File - PICO Builder Step 6.0 (PreSyntax MultiLLM)`• **LLM Used:** `LLM1`• **Commander Verified:** `true`• **AI Used:** `true`• **Relevance Score (1–5):** `5`• **Required in Final Publication?** `Yes`• **Summary:** `Evidence`

`file PICOBuilderStep6.0PreSyntaxOptimisationMultiLLMNodeOptimisedPICO.md confirmed`
 immutable and timestamped via OpenTimestamps. Dual-hash verified (SHA256 +
 RIPEMD160). Originally generated in MVP 2.1, this log ensures reproducibility
 for publication, with manual + LLM validation.

• **File Contents:**

```
[
  {
    "timestamp": "2025-06-30T23:53:45.702366Z",
    "event": "MVP2_AUDIT_FILE_TIMESTAMPED_IMMUTABLE",
    "meta_id": "MVP1-SR049",
    "input": {
      "document_title": "PICO Builder Step 6.0 \u2013 PreSyntax MultiLLM Node Optimised",
      "filename":
"PICO_Builder_Step6.0PreSyntaxOptimisation_MultiLLMNodeOptimised_PICO.md",
      "mvp_phase": "MVP 2.1",
      "category": "PreSyntax Optimisation / MultiLLM Output",
      "evidence_path": "evidence_files/
PICO_Builder_Step6.0PreSyntaxOptimisation_MultiLLMNodeOptimised_PICO.md",
      "sha256_file": "evidence_files/
PICO_Builder_Step6.0PreSyntaxOptimisation_MultiLLMNodeOptimised_PICO.md.hash",
      "ripemd160_file": "evidence_files/
PICO_Builder_Step6.0PreSyntaxOptimisation_MultiLLMNodeOptimised_PICO.md.2ha",
      "ots_file": "evidence_files/
PICO_Builder_Step6.0PreSyntaxOptimisation_MultiLLMNodeOptimised_PICO.md.hash.ots",
      "validation_step": "This audit file was previously generated, verified,
and logged during MVP 2.1 execution. The current entry confirms its immutability via
hash and anchors its timestamp using OpenTimestamps. Verified manually and shared
with LLM1 during retrospective review. This step strengthens publication-grade
reproducibility."
    },
    "output": {
      "status": "immutable_timestamped",
      "verifiable": true,
      "sha256":
"671c4046f24048cc53c3fa74a50d4142963dac3e0f37057e5d9c0ec677a5e4da",
      "ripemd160": "2c44e63d6c7c8dff45fac8f7cf749c04b97d434d"
    },
    "audit": {
      "AI_used": true,
      "LLM_used": "LLM1",
      "human_verified": true,
      "module_version": "v1.0.0",
      "AI_override": false
    },
    "timestamp_confirmed": true
  }
]
```

Cryptographic Hashes (from `.json`)

- **SHA256 (.hash):**

15768d3ea2db0fa0355e440d9313617fbd15338f2fc1bcac9e04c40f753f96a3

- **RIPEMD160 (.2ha):**

61f28ed01bf27708f7af49c5a044ffeed412f353

OTS Validation

- **File:**

audit_log_MVP1-SR049_20250630T235345.703064Z.hash.ots

- **SHA256:**

94420cb32f96d3c947297884bedcba9d372479ab9282e80c9ef8a35a3aef1437

- **Bitcoin TXID:**

c9b29dc1dfd04a7c22eb2f710919fca19e920cc56937a8b83b6f52cef17d614e

- **Bitcoin Block:** 903455

- **Date of Existence:** 2025-07-01 AEST

- **Merkle Root:** e03e16dd0852ea835bdce37081cadfc9df7f237f1d132258d859c21dd74711ec

Audit Record:

- **File Name:** audit_log_MVP1-SR050_20250701T000117.730327Z.json

- **meta_id:** MVP1-SR050

- **Timestamp:** 20250701T000117.730327Z

- **Classification:** EVIDENCE_FILE

- **Subcategory:** Immutable Audit File - PICO Builder Step 7 (Human Expert Audit)

- **LLM Used:** LLM1

- **Commander Verified:** true

- **AI Used:** true

- **Relevance Score (1–5):** 5

- **Required in Final Publication?** Yes

- **Summary:** Evidence file *PICOBuilderStep7_HumanExpertAUDIT.md* formally sealed using SHA256 + RIPEMD160 with OpenTimestamps proof. Originally created during MVP 2.1–2.4 phases, the file passed LLM1 verification and is now immutable for scientific reproducibility and audit-chain integrity.

- **File Contents:**

```
[
  {
    "timestamp": "2025-07-01T00:01:17.730136Z",
    "event": "MVP_AUDIT_FILE_IMMUTABILITY_CONFIRMED",
    "meta_id": "MVP1-SR050",
    "input": {
      "document_title": "PICO Step 7 \u2013 Human Expert Audit",
      "filename": "PICO_Builder_Step7_HumanExpertAUDIT.md",
      "mvp_phase": "MVP 2.1\u20132.4",
      "evidence_path": "evidence_files/PICO_Builder_Step7_HumanExpertAUDIT.md",
      "sha256_file": "evidence_files/
PICO_Builder_Step7_HumanExpertAUDIT.md.hash",
      "ripemd160_file": "evidence_files/
PICO_Builder_Step7_HumanExpertAUDIT.md.2ha",
      "ots_file": "evidence_files/
PICO_Builder_Step7_HumanExpertAUDIT.md.hash.ots",
      "validation_step": "This audit file, originally generated and reviewed
during MVP Phases 2.1\u20132.4, has now been formally hashed and timestamped using
SHA256 + RIPEMD160. OpenTimestamps proof generated. This immutability procedure
ensures full reproducibility and preservation of the audit trail. LLM1 validated the
content at time of execution."
    },
    "output": {
      "status": "verifiable",
      "verifiable": true,
      "sha256":
"da9133dd6b9747ac277b0492f640d53938d8197867c8ae5e74f973110d4402",
      "ripemd160": "d58ccbc10639a7eb1fa4ccd5a9ab5cbe2fb786ea"
    },
    "audit": {
      "AI_used": true,
      "LLM_used": "LLM1",
      "human_verified": true,
      "module_version": "v1.0.0",
      "AI_override": false
    },
    "timestamp_confirmed": true
  }
]
```

Cryptographic Hashes (from .json)

- **SHA256 (.hash):**

7b6a9b97e08ec918dc2b322a523a4bd688ae565a389d52f2228264b81e956911

- **RIPEMD160 (.2ha):**

be55901ee43f01706d4e8fd1cce5a40f5195cd90

OTS Validation

- **File:** audit_log_MVP1-SR050_20250701T000117.730327Z.hash.ots

- **SHA256:** d41ba39db17ec175e2a67e4c56c5ab9694cee704480a595988aaf76c091d0f85

- **Bitcoin TXID:**

053fcb25904615668219cfb65478353198e3c928fd261d97d7529e75a3130d90

- **Bitcoin Block:** 903459

- **Date of Existence:** 2025-07-01 AEST
 - **Merkle Root:** 61ec6098d48fa24456ff624f9c2b52ac016ce3dec0ed7d91fd7af777c01d7092
-

Audit Record:

- **File Name:** audit_log_MVP1-SR051_20250701T000337.814256Z.json
- **meta_id:** MVP1-SR051
- **Timestamp:** 20250701T000337.814256Z
- **Classification:** EVIDENCE_FILE
- **Subcategory:** Immutable Audit File - PICO Builder Step 10 (Final Manual Override)
- **LLM Used:** LLM1
- **Commander Verified:** true
- **AI Used:** true
- **Relevance Score (1–5):** 5
- **Required in Final Publication?** Yes
- **Summary:** Audit file *PICOBuilderStep10HumanExpertFinalAudit_ManualOverride.md* verified as final artifact for MVP 2.1-2.4. Cryptographic sealing completed with SHA256, RIPEMD160, and OpenTimestamps. Confirmed immutable and reproducible. Marks closure of pre-MVP2.5 audit phase for scientific publication.
- **File Contents:**


```
[
  {
    "timestamp": "2025-07-01T00:03:37.814085Z",
    "event": "MVP2_EVIDENCE_IMMUTABLE_AUDIT_FILE_CONFIRMED",
    "meta_id": "MVP1-SR051",
    "input": {
      "document_title": "PICO Builder Step 10 \u2013 Final Manual Audit
Override",
      "filename":
"PICO_Builder_Step10_HumanExpert_FinalAudit_ManualOverride.md",
      "entity": "MVP-2 Thread",
      "mvp_range": "MVP 2.1\u201332.4",
      "evidence_purpose": "Make prior audit files immutable and timestamped
before MVP-2.5 publication",
      "evidence_path": "evidence_files/
PICO_Builder_Step10_HumanExpert_FinalAudit_ManualOverride.md",
      "sha256_file": "evidence_files/
PICO_Builder_Step10_HumanExpert_FinalAudit_ManualOverride.md.hash",
      "ripemd160_file": "evidence_files/
PICO_Builder_Step10_HumanExpert_FinalAudit_ManualOverride.md.2ha",
      "ots_file": "evidence_files/
PICO_Builder_Step10_HumanExpert_FinalAudit_ManualOverride.md.hash.ots",
      "validation_step": "Audit file confirmed as final version used in MVP
2.1\u201332.4. Shared with LLM1 at time of review. This file has now been
cryptographically hashed and timestamped using SHA256, RIPEMD160, and OpenTimestamps.
Confirmed immutable. Completes integrity trace for publication."
    },
    "output": {
      "status": "verifiable",
      "verifiable": true,
      "sha256": "bc7f68d15e4282f73e8d767298b69e675370d664",
      "ripemd160":
"2bb0f70f638d592f3a050584b2342a9b0d3e486a24e9a7e39daea8a0b00e9ed9"
    },
    "audit": {
      "AI_used": true,
      "LLM_used": "LLM1",
      "human_verified": true,
      "module_version": "v1.0.0",
      "AI_override": false
    },
    "timestamp_confirmed": true
  }
]
```

Cryptographic Hashes (from `.json`)

- **SHA256 (.hash):**

```
ec9c64d0019a179c54491d8f31f857e70ccdc944e6cb675c26857aacd33ee749
```

- **RIPEMD160 (.2ha):**

```
fa796dd52d07a2d42b41836915e20240117022ff
```

OTS Validation

- **File:**

```
audit_log_MVP1-SR051_20250701T000337.814256Z.hash.ots
```

- **SHA256:** 7e2963f16ec602f200ba9ad6caa86df9098470bb66cde2ad2cc4d80792f6d578
 - **Bitcoin TXID:**
053fcb25904615668219cfb65478353198e3c928fd261d97d7529e75a3130d90
 - **Bitcoin Block:** 903459
 - **Date of Existence:** 2025-07-01 AEST
 - **Merkle Root:** 61ec6098d48fa24456ff624f9c2b52ac016ce3dec0ed7d91fd7af777c01d7092
-

Audit Record:

- **File Name:** audit_log_MVP1-SR052_20250701T000812.334869Z.json
- **meta_id:** MVP1-SR052
- **Timestamp:** 20250701T000812.334869Z
- **Classification:** EVIDENCE_FILE
- **Subcategory:** Immutable Audit File - PROSPERO Alignment Audit v2.0
- **LLM Used:** LLM1
- **Commander Verified:** true
- **AI Used:** true
- **Relevance Score (1–5):** 5
- **Required in Final Publication?** Yes
- **Summary:** Audit file PROSPEROAlignmentAudit_v2.0.md cryptographically sealed with SHA256, RIPEMD160, and OpenTimestamps. Validated as unaltered and immutable. Logged as part of MVP-2 Session 2 reproducibility archive with LLM1 support. Confirms structural alignment for protocol registration.
- **File Contents:**

```
[
  {
    "timestamp": "2025-07-01T00:08:12.334690Z",
    "event": "MVP2_EVIDENCE_AUDIT_FILE_HASHED_AND_TIMESTAMPED",
    "meta_id": "MVP1-SR052",
    "input": {
      "document_title": "PROSPERO Alignment Audit v2.0",
      "filename": "PROSPERO_Alignment_Audit_v2.0.md",
      "evidence_path": "evidence_files/PROSPERO_Alignment_Audit_v2.0.md",
      "sha256_file": "evidence_files/PROSPERO_Alignment_Audit_v2.0.md.hash",
      "ripemd160_file": "evidence_files/PROSPERO_Alignment_Audit_v2.0.md.2ha",
      "ots_file": "evidence_files/PROSPERO_Alignment_Audit_v2.0.md.hash.ots",
      "validation_step": "LLM1-assisted hash and timestamp registration of
prior audit file created during MVP-2. This entry confirms that the document has been
rendered immutable via SHA256, RIPEMD160, and OpenTimestamps. No content was altered.
Operation is part of MVP-2 Session 2 reproducibility log."
    },
    "output": {
      "status": "verifiable",
      "verifiable": true,
      "sha256":
"9d7aa900822265c55d0937f12b441d0b3136e68e70e75226b1057c34f749f2bc",
      "ripemd160": "70348aefe26fb8a0a598e9b2e8ecd50598fab844"
    },
    "audit": {
      "AI_used": true,
      "LLM_used": "LLM1",
      "human_verified": true,
      "module_version": "v1.0.0",
      "AI_override": false
    },
    "timestamp_confirmed": true
  }
]
```

Cryptographic Hashes (from `.json`)

- **SHA256 (.hash):**

2eaf6cc4812c1d6312ddaa3c686a5d292d6beb07e825b77639d6cc149cf006bf

- **RIPEMD160 (.2ha):**

981c5c9b7c59ac9d4ace5a22d5dc215a9a12da7d

OTS Validation

- **File:** audit_log_MVP1-SR052_20250701T000812.334869Z.hash.ots

- **SHA256:** b8e30ff8c37422b8522513ba4cdebca41eaa6079393e74804ed72b0969d7a895

- **Bitcoin TXID:**

053fcb25904615668219cfb65478353198e3c928fd261d97d7529e75a3130d90

- **Bitcoin Block:** 903459

- **Date of Existence:** 2025-07-01 AEST

- **Merkle Root:** 61ec6098d48fa24456ff624f9c2b52ac016ce3dec0ed7d91fd7af777c01d7092

Audit Record:

- **File Name:** audit_log_MVP1-SR053_20250701T001640.539972Z.json
- **meta_id:** MVP1-SR053
- **Timestamp:** 20250701T001640.539972Z
- **Classification:** EVIDENCE_FILE
- **Subcategory:** Immutable Audit File - Human-Identified Duplicate Records (MVP2.2)
- **LLM Used:** LLM1
- **Commander Verified:** true
- **AI Used:** true
- **Relevance Score (1–5):** 5
- **Required in Final Publication?** Yes
- **Summary:** Audit file Audit_human identified duplicate.md retroactively sealed under MVP 2.2 execution. Dual-hash verification with SHA256 and RIPEMD160 confirmed via OpenTimestamps. Evidence shared with LLM1; now locked and tamper-evident. Supports MVP-2 reproducibility and duplicate record integrity traceability.
- **File Contents:**

```
[
  {
    "timestamp": "2025-07-01T00:16:40.539837Z",
    "event": "AUDIT_FILE_IMMUTABILITY_LOGGED",
    "meta_id": "MVP1-SR053",
    "input": {
      "document_title": "Audit \u2013 Human Identified Duplicate Records
(MVP2.2)",
      "filename": "Audit_human identified duplicate.md",
      "evidence_path": "evidence_files/Audit_human identified duplicate.md",
      "sha256_file": "evidence_files/Audit_human identified duplicate.md.hash",
      "ripemd160_file": "evidence_files/Audit_human identified
duplicate.md.2ha",
      "ots_file": "evidence_files/Audit_human identified
duplicate.md.hash.ots",
      "validation_step": "File contains retroactively generated audit log as
part of MVP 2.2 execution. Evidence was disclosed and confirmed with LLM1.
Cryptographic hash functions (SHA256 and RIPEMD160) have been generated and
timestamped. The file is now immutable, tamper-evident, and registered under the
'MVP-2 scientific reproducibility assurance protocol.'"
    },
    "output": {
      "status": "verifiable",
      "verifiable": true,
      "sha256":
"459ead67f6a1c93c32c098271301053b1708c26a4279074adda1f2b611d1c1a",
      "ripemd160": "33e11d7e50bc70a38785ddaf0992cf64c24763a8"
    },
    "audit": {
      "AI_used": true,
      "LLM_used": "LLM1",
      "human_verified": true,
      "module_version": "v1.0.0",
      "AI_override": false
    },
    "timestamp_confirmed": true
  }
]
```

Cryptographic Hashes (from .json)

- **SHA256 (.hash):**

4cb50305097cb897b91f6efd9f374ae1a279edb631238802a33d5869cdec2843

- **RIPEMD160 (.2ha):**

c3f82f6d88722cd845f62c21907ccfd1e6543541

OTS Validation

- **File:** audit_log_MVP1-SR053_20250701T001640.539972Z.hash.ots

- **SHA256:** 1c298a0bb92e9e207c9f610a50e8a4eda4c5f1b6a1dd26bf3ae8df786ca943fa

- **Bitcoin TXID:**

053fcb25904615668219cfb65478353198e3c928fd261d97d7529e75a3130d90

- **Bitcoin Block:** 903459

- **Date of Existence:** 2025-07-01 AEST
 - **Merkle Root:** 61ec6098d48fa24456ff624f9c2b52ac016ce3dec0ed7d91fd7af777c01d7092
-

Audit Record:

- **File Name:** audit_log_MVP1-SR054_20250701T002554.568618Z.json
- **meta_id:** MVP1-SR054
- **Timestamp:** 20250701T002554.568618Z
- **Classification:** EVIDENCE_FILE
- **Subcategory:** Immutable Audit File - Rehash Conflict Exception (MVP2.2)
- **LLM Used:** LLM1
- **Commander Verified:** true
- **AI Used:** true
- **Relevance Score (1–5):** 5
- **Required in Final Publication?** Yes
- **Summary:** Audit file Audit_human identified absolute fields for protocol.md confirmed immutable via .hash.ots , despite mismatch with regenerated .hash and .2ha due to manual rehash error. .ots anchor remains the canonical proof. Entry logged as formal reproducibility exception under Sentinel Protocol.
- **File Contents:**

```
[
  {
    "timestamp": "2025-07-01T00:25:54.568417Z",
    "event": "AUDIT_FILE_IMMUTABILITY_REHASH_CONFLICT",
    "meta_id": "MVP1-SR054",
    "input": {
      "document_title": "Audit \u2013 Human Identified Absolute Fields for Protocol (MVP2.2)",
      "filename": "Audit_human identified absolute fields for protocol.md",
      "evidence_path": "evidence_files/Audit_human identified absolute fields for protocol.md",
      "sha256_file": "evidence_files/Audit_human identified absolute fields for protocol.md.hash",
      "ripemd160_file": "evidence_files/Audit_human identified absolute fields for protocol.md.2ha",
      "ots_file": "evidence_files/Audit_human identified absolute fields for protocol.md.hash.ots",
      "validation_step": "Original file was successfully timestamped and anchored using SHA256 + RIPEMD160.\nHowever, due to human error, the file was rehashed multiple times, causing mismatch between\ncurrent `.hash` / `.2ha` and the original `.hash.ots`.\n\nThe `.hash.ots` file remains unaltered and is the source of truth.\n**This entry registers a canonical exception for scientific reproducibility audit.**"
    },
    "output": {
      "status": "verifiable (with caveat)",
      "verifiable": true,
      "sha256": "f30ff382ba8c38356ff48c24cdaa7642e5f3f89717b871cafade2058e32d84be",
      "ripemd160": "50c0b2075c1c8d5071af9c07b0fc9b7a7f7b47f2"
    },
    "audit": {
      "AI_used": true,
      "LLM_used": "LLM1",
      "human_verified": true,
      "module_version": "v1.0.0",
      "AI_override": false
    },
    "timestamp_confirmed": true
  }
]
```

Cryptographic Hashes (from .json)

- **SHA256 (.hash):**

```
3e53c145e0b3ad3cd6ba337d8d3ea7048ae251af1bac1888cb51c08ddc2fb5d5
```

- **RIPEMD160 (.2ha):** 51974a98fc60ca35ef320ffebbb01d88654bc5e82

OTS Validation

- **File:** audit_log_MVP1-SR054_20250701T002554.568618Z.hash.ots

- **SHA256:** 28ced1487337ee1de1f92f6a1b6f33d3f94ea8ab9340c3fd7dccbb772a379aabe

- **Bitcoin TXID:**

b96ec03fb255df2a614a0d771163260faeb97c6824ade959a6b34dda35f7e61c

- **Bitcoin Block:** 903463

- **Date of Existence:** 2025-07-01 AEST

- **Merkle Root:** a645a74d49049c7aec9256670949fc279ffddba97448239a232cfd6c55fb2e8a

Audit Record:

- **File Name:** audit_log_MVP1-SR055_20250701T002823.668339Z.json

- **meta_id:** MVP1-SR055

- **Timestamp:** 20250701T002823.668339Z

- **Classification:** EVIDENCE_FILE

- **Subcategory:** Immutable Audit File - Inclusion Criteria Optimisation Step 3 (MVP2.2)

- **LLM Used:** LLM1

- **Commander Verified:** true

- **AI Used:** true

- **Relevance Score (1–5):** 5

- **Required in Final Publication?** Yes

- **Summary:** Audit

file InclusionCriteriaOptimisationStep3_HumanExpertAudit.md verified as immutable and timestamped with SHA256, RIPEMD160, and OpenTimestamps. Retroactively logged for MVP2.2 reproducibility. File is tamper-evident and confirmed by LLM1 under Sentinel Protocol reproducibility safeguards.

- **File Contents:**


```
[
  {
    "timestamp": "2025-07-01T00:28:23.668092Z",
    "event": "AUDIT_FILE_IMMUTABILITY_LOGGED",
    "meta_id": "MVP1-SR055",
    "input": {
      "document_title": "Audit \u2013 Inclusion Criteria Optimisation: Step 3 (MVP2.2)",
      "filename": "InclusionCriteria_Optimisation_Step3_HumanExpertAudit.md",
      "evidence_path": "evidence_files/InclusionCriteria_Optimisation_Step3_HumanExpertAudit.md",
      "sha256_file": "evidence_files/InclusionCriteria_Optimisation_Step3_HumanExpertAudit.md.hash",
      "ripemd160_file": "evidence_files/InclusionCriteria_Optimisation_Step3_HumanExpertAudit.md.2ha",
      "ots_file": "evidence_files/InclusionCriteria_Optimisation_Step3_HumanExpertAudit.md.hash.ots",
      "validation_step": "File contains retroactively generated audit log as part of MVP2.2 execution. Evidence was disclosed and confirmed with LLM1. Cryptographic hash functions (SHA256 and RIPEMD160) have been generated and timestamped. The file is now immutable, tamper-evident, and registered under: \u2013 MVP-2 scientific reproducibility assurance protocol.\u2013",
    },
    "output": {
      "status": "verifiable",
      "verifiable": true,
      "sha256": "161c72cce36b46bfd0980b15de81788b5301076e24956296e6cf2eb5976e6853",
      "ripemd160": "533329cf4314d0108b4fb7b23d9ed11f204a3783"
    },
    "audit": {
      "AI_used": true,
      "LLM_used": "LLM1",
      "human_verified": true,
      "module_version": "v1.0.0",
      "AI_override": false
    },
    "timestamp_confirmed": true
  }
]
```

Cryptographic Hashes (from .json)

- **SHA256 (.hash):**

299af3da092555b9296981362a6fd642c6785e6b32cb704cbd02540ea6db6bb2

- **RIPEMD160 (.2ha):**

4fdcf4e7ed8b06fbb206cdba79cb4fab22234e17

OTS Validation

- **File:** audit_log_MVP1-SR055_20250701T002823.668339Z.hash.ots

- **SHA256:** 2fc3fea5f29fcf4345a36766c2da1cf7670448c333f9786ff340f383a248e779

- **Bitcoin TXID:**

b96ec03fb255df2a614a0d771163260faeb97c6824ade959a6b34dda35f7e61c

- **Bitcoin Block:** 903463
 - **Date of Existence:** 2025-07-01 AEST
 - **Merkle Root:** a645a74d49049c7aec9256670949fc279ffddba97448239a232cfd6c55fb2e8a
-

Audit Record:

- **File Name:** audit_log_MVP1-SR056_20250701T003801.775932Z.json
- **meta_id:** MVP1-SR056
- **Timestamp:** 20250701T003801.775932Z
- **Classification:** EVIDENCE_FILE
- **Subcategory:** Immutable Audit File - Inclusion Criteria Optimisation Step 3.0
(Pre-Syntax, MVP2.2)
- **LLM Used:** LLM1
- **Commander Verified:** true
- **AI Used:** true
- **Relevance Score (1–5):** 5
- **Required in Final Publication?** Yes
- **Summary:** Audit
file InclusionCriteriaOptimisationStep3.0PreSyntaxOptimisation_HumanExpertAudit.md confirmed
immutable under SHA256 + RIPEMD160 with OpenTimestamps verification.
Originally generated during MVP2.2, now registered under reproducibility
protocol. Validated by LLM1 as tamper-evident and publication-ready.
- **File Contents:**

```
[
  {
    "timestamp": "2025-07-01T00:38:01.775760Z",
    "event": "AUDIT_FILE_IMMUTABILITY_LOGGED",
    "meta_id": "MVP1-SR056",
    "input": {
      "document_title": "Inclusion Criteria Optimisation Step 3.0 \u2013 Pre-Syntax Audit (MVP2.2)",
      "filename": "InclusionCriteria_Optimisation_Step3.0PreSyntaxOptimisation_HumanExpertAudit.md",
      "evidence_path": "evidence_files/InclusionCriteria_Optimisation_Step3.0PreSyntaxOptimisation_HumanExpertAudit.md",
      "sha256_file": "evidence_files/InclusionCriteria_Optimisation_Step3.0PreSyntaxOptimisation_HumanExpertAudit.md.hash",
      "ripemd160_file": "evidence_files/InclusionCriteria_Optimisation_Step3.0PreSyntaxOptimisation_HumanExpertAudit.md.2ha",
      "ots_file": "evidence_files/InclusionCriteria_Optimisation_Step3.0PreSyntaxOptimisation_HumanExpertAudit.md.hash.ots",
      "validation_step": "File contains previously executed audit logic from MVP2.2. Evidence was disclosed and confirmed with LLM1. Cryptographic hash functions (SHA256 + RIPEMD160) were applied. The resulting digest was timestamped using OpenTimestamps (OTS), making this file tamper-evident and verifiably immutable as of today. Registered under: 'MVP-2 scientific reproducibility assurance protocol.'"
    },
    "output": {
      "status": "verifiable",
      "verifiable": true,
      "sha256": "5d2e3534dc5511ab4499c2281f8803c31cbdeeafa89838b9b112c7a3d0a5c922",
      "ripemd160": "5cba15a55b2353bcaca06632125dd4b565599e6a"
    },
    "audit": {
      "AI_used": true,
      "LLM_used": "LLM1",
      "human_verified": true,
      "module_version": "v1.0.0",
      "AI_override": false
    },
    "timestamp_confirmed": true
  }
]
```

Cryptographic Hashes (from `.json`)

- **SHA256 (.hash):**

d542b53972e572c91dd8396a366dd3af9f56533091beb78b4631f8a770fcfb33

- **RIPEMD160 (.2ha):** 3327f9a0f14bd66608749177a61b7b1bd7c57bc7

OTS Validation

- **File:** audit_log_MVP1-SR056_20250701T003801.775932Z.hash.ots

- **SHA256:** f293b56a8b589b70f7b050c938b604555f2f13544112022333d2d28af12b9121

- **Bitcoin TXID:**

b96ec03fb255df2a614a0d771163260faeb97c6824ade959a6b34dda35f7e61c

- **Bitcoin Block:** 903463

- **Date of Existence:** 2025-07-01 AEST

- **Merkle Root:** a645a74d49049c7aec9256670949fc279ffddba97448239a232cfd6c55fb2e8a

Audit Record:

- **File Name:** audit_log_MVP1-SR059_20250701T032325.805941Z.json

- **meta_id:** MVP1-SR059

- **Timestamp:** 20250701T032325.805941Z

- **Classification:** EVIDENCE_FILE

- **Subcategory:** Hash Mismatch Correction Log - Validator Activation Audit

- **LLM Used:** LLM1

- **Commander Verified:** true

- **AI Used:** false

- **Relevance Score (1–5):** 5

- **Required in Final Publication?** Yes

- **Summary:**

Final correction log for previously mismatched SHA256 and RIPEMD160 values across MVP2 audit files. All hashes revalidated with HashValidatorBlock.py and sealed via OpenTimestamps. This evidence file locks the correction cycle and establishes live verification as mandatory for all future audits.

- **File Contents:**

```
[
  {
    "timestamp": "2025-07-01T03:23:25.805768Z",
    "event": "HASH_MISMATCH_CORRECTION_LOGGED",
    "meta_id": "MVP1-SR059",
    "input": {
      "document_title": "Human Audit \u2013 Correction Log of Prior Hash
Errors",
      "filename": "Human Audit - correction of `sha256` and `ripemd160` post
implementation of real-time firewall under new script `HashValidatorBlock.py`.md",
      "evidence_path": "evidence_files/Human Audit - correction of `sha256` and
`ripemd160` post implementation of real-time firewall under new script
`HashValidatorBlock.py`.md",
      "sha256_file": "evidence_files/Human Audit - correction of `sha256` and
`ripemd160` post implementation of real-time firewall under new script
`HashValidatorBlock.py`.md.hash",
      "ripemd160_file": "evidence_files/Human Audit - correction of `sha256`
and `ripemd160` post implementation of real-time firewall under new script
`HashValidatorBlock.py`.md.2ha",
      "ots_file": "evidence_files/Human Audit - correction of `sha256` and
`ripemd160` post implementation of real-time firewall under new script
`HashValidatorBlock.py`.md.hash.ots",
      "validation_step": "This audit discloses prior mismatches in SHA256 and
RIPEMD160 values across MVP2 audit logs, logged prior to the activation of
`HashValidatorBlock.py`. All mismatches have now been corrected. Hashes were re-
validated from disk, confirmed against source `.md`, and timestamped with
OpenTimestamps. This file closes the correction loop and locks future audits to live
verification."
    },
    "output": {
      "status": "verifiable",
      "verifiable": true,
      "sha256":
"32d6607e57b7128c6b3d62b1398b2348dd62020b20f6ab6d4ec118d0283c04a1",
      "ripemd160": "bda20b32a35b58776afa8e34f2dcbc56e115e6f2"
    },
    "audit": {
      "AI_used": false,
      "LLM_used": "LLM1",
      "human_verified": true,
      "module_version": "v1.0.0",
      "AI_override": false
    },
    "timestamp_confirmed": true
  }
]
```

Cryptographic Hashes (from `.json`)

- **SHA256 (.hash):**

```
ae7166c843177a5ba4371b83e8de166995534086d3f2af0dc649c7f873ac28ca
```

- **RIPEMD160 (.2ha):**

```
a39b2d0b7cb119b9ad6aaaa61a36d7e7a32d2177
```

OTS Validation

- **File:** `audit_log_MVP1-SR059_20250701T032325.805941Z.hash.ots`
 - **SHA256:** `27904cdae8226ffaa3d9e43672d00aee54f4908571175429e3900b220e8365b4`
 - **Bitcoin TXID:**
`1e8af7888748851047340e77b9ba77b123a70ba9b2ddf20a37e16682ab7d984d`
 - **Bitcoin Block:** `903480`
 - **Date of Existence:** `2025-07-01 AEST`
 - **Merkle Root:** `7306ae8c56932b06090e50ba39455d2f0f463c3e7138c9e870670510898f19a0`
-

Audit Record:

- **File Name:** `audit_log_MVP1-SR060_20250701T033131.536198Z.json`
- **meta_id:** `MVP1-SR060`
- **Timestamp:** `20250701T033131.536198Z`
- **Classification:** `EVIDENCE_FILE`
- **Subcategory:** `Corrected Hash Metadata Log - Canonical Replay (MVP2.1-2.2)`
- **LLM Used:** `LLM1`
- **Commander Verified:** `true`
- **AI Used:** `false`
- **Relevance Score (1–5):** `5`
- **Required in Final Publication?** `Yes`
- **Summary:** `Corrected SHA256 and RIPEMD160 values recorded for four MVP2.1-2.2 evidence files following live validator replay. Source file MVP1-SR059 validated under HashValidatorBlock.py and sealed. All entries are now hash-locked and CEM-compliant under Sentinel Protocol reproducibility enforcement.`
- **File Contents:**

```
[
  {
    "timestamp": "2025-07-01T03:31:31.535938Z",
    "event": "HASH_METADATA_CORRECTION_LOGGED",
    "meta_id": "MVP1-SR060",
    "input": {
      "document_title": "Corrected SHA256 and RIPEMD160 Metadata Log",
      "source_correction_file": "Human Audit - correction of `sha256` and
`ripemd160` post implementation of real-time firewall under new script
`HashValidatorBlock.py`.md",
      "validated_under": "HashValidatorBlock.py (2025-07-01 canonical
release)",
      "corrections": [
        {
          "meta_id": "MVP1-SR048",
          "filename": "PICO_Builder_Step1_HumanVagueQuestion.md",
          "sha256_corrected":
"903660b7088bd2a8b760c6150dade4d5dbd4ae05be31f270c1afffa73c4437c6",
          "ripemd160_corrected": "f8389aa2f3a1d08c6169fef65b498469b18c6719"
        },
        {
          "meta_id": "MVP1-SR050",
          "filename": "PICO_Builder_Step7_HumanExpertAUDIT.md",
          "sha256_corrected":
"da9133dd6db9747ac277b0492f640d53938d8d197867c8ae5e74f973110dd402",
          "ripemd160_corrected": "d58ccb010639a7be1fa4ccd5a9ab5cbe2fb786ea"
        },
        {
          "meta_id": "MVP1-SR053",
          "filename": "Audit_human identified duplicate.md",
          "sha256_corrected":
"459ead67f6a1c93c32c098271301053b1708c26a42792074adda1f2b611d1c1a",
          "ripemd160_corrected": "33e11d7e50bc70a38785ddaf0992cf64c24763a8"
        },
        {
          "meta_id": "MVP1-SR055",
          "filename":
"InclusionCriteria_Optimisation_Step3_HumanExpertAudit.md",
          "sha256_corrected":
"161c72cce36b46bfd0980b15de81788b5301076e24956295e6cfe2b5976e6853",
          "ripemd160_corrected": "533329cf4314d0108b4fb7b23d9ed11f204a3783"
        }
      ],
      "validation_step": "This metadata audit logs corrected SHA256 and
RIPEMD160 values for previously mismatched files recorded during MVP2.1 and MVP2.2
audit logging. Corrections are sourced from `Human Audit - correction of `sha256` and
`ripemd160` post implementation of real-time firewall under new script
`HashValidatorBlock.py`.md`, which was successfully validated under
`HashValidatorBlock.py` and timestamped with OpenTimestamps. All entries are now CEM-
compliant and hash-locked."
    },
    "output": {
      "status": "corrected",
      "verifiable": true,
      "sha256_source":
"32d6607e57b7128c6b3d62b1398b2348dd62020b20f6ab6d4ec118d0283c04a1",
      "ripemd160_source": "bda20b32a35b58776afa8e34f2dcbbc56e115e6f2"
    }
  }
]
```

```

    },
    "audit": {
      "AI_used": false,
      "LLM_used": "LLM1",
      "human_verified": true,
      "module_version": "v1.0.0",
      "AI_override": false
    },
    "timestamp_confirmed": true
  }
]

```

Cryptographic Hashes (from `.json`)

- **SHA256 (.hash):**

cb9815ef7cfc0fe82b9fa7c04626e433b5612f1e51d33c43594e264b17f83ba4

- **RIPEMD160 (.2ha):**

d4b84d4838a9ce195282f008c721f84dfa34469c

OTS Validation

- **File:** audit_log_MVP1-SR060_20250701T033131.536198Z.hash.ots

- **SHA256:** 2ba4919fe7cab5d2140f50932c331470d187ea087384c3b46de0222f6b9877b1

- **Bitcoin TXID:**

1e8af7888748851047340e77b9ba77b123a70ba9b2ddf20a37e16682ab7d984d

- **Bitcoin Block:** 903480

- **Date of Existence:** 2025-07-01 AEST

- **Merkle Root:** 7306ae8c56932b06090e50ba39455d2f0f463c3e7138c9e870670510898f19a0

Audit Record:

- **File Name:** audit_log_MVP1-SR061_20250701T034347.290546Z.json

- **meta_id:** MVP1-SR061

- **Timestamp:** 20250701T034347.290546Z

- **Classification:** EVIDENCE_FILE

- **Subcategory:** Immutable Audit File - Protocol Generator Step 4 (Human Expert Audit, MVP-2.3)

- **LLM Used:** LLM1

- **Commander Verified:** true

- **AI Used:** false

- **Relevance Score (1–5):** 5

- **Required in Final Publication?** Yes

- **Summary:** Audit

file `ProtocolGeneratorStep4_HumanExpertFinalAudit.md` confirmed immutable under SHA256 + RIPEMD160 with OpenTimestamps. MVP-2.3 protocol audit finalized with HashValidatorBlock.py validation. File now registered as a reproducibility-locked artifact under Sentinel Protocol.

• File Contents:

```
[
  {
    "timestamp": "2025-07-01T03:43:47.290377Z",
    "event": "EVIDENCE_FILE_IMMUTABILITY_LOGGED",
    "meta_id": "MVP1-SR061",
    "input": {
      "document_title": "MVP-2.3 Protocol Generator \u2013 Step 4 Final Audit (Human Expert)",
      "filename": "Protocol_Generator_Step4_HumanExpertFinalAudit.md",
      "evidence_path": "evidence_files/Protocol_Generator_Step4_HumanExpertFinalAudit.md",
      "sha256_file": "evidence_files/Protocol_Generator_Step4_HumanExpertFinalAudit.md.hash",
      "ripemd160_file": "evidence_files/Protocol_Generator_Step4_HumanExpertFinalAudit.md.2ha",
      "ots_file": "evidence_files/Protocol_Generator_Step4_HumanExpertFinalAudit.md.hash.ots",
      "validation_step": "MVP-2.3 hash firewall activated. HashValidatorBlock.py confirmed SHA256 and RIPEMD160 integrity. File validated on disk, OTS timestamp confirmed, and audit registered under reproducibility protocol."
    },
    "output": {
      "status": "verifiable",
      "verifiable": true,
      "sha256": "62c4fc7594ef9e81ce276f7199a69c1e3c1faefde70ab88385cd1be9e5c0bc79",
      "ripemd160": "99639fb62bb751c0b98ec9ed7d4db12b20ba42cb"
    },
    "audit": {
      "AI_used": false,
      "LLM_used": "LLM1",
      "human_verified": true,
      "module_version": "v1.0.0",
      "AI_override": false
    },
    "timestamp_confirmed": true
  }
]
```

Cryptographic Hashes (from .json)

• SHA256 (.hash):

c46ae537631bf671fd803b470300e70cb63e7e75e9eb861b679328eabfa8616c

• RIPEMD160 (.2ha):

532a07bb6a4f0e7329ef213cf0ea50aee756314c

OTS Validation

• File:

audit_log_MVP1-SR061_20250701T034347.290546Z.hash.ots

• SHA256:

af419c48a1d23897e139ef6c01bea0155004e1664368e33cf7595054f78ccadb

• Bitcoin TXID:

b80f326c21929801a08aaf7557f58411315e817571130ea7b467b2c402af7890

- **Bitcoin Block:** 903480
 - **Date of Existence:** 2025-07-01 AEST
 - **Merkle Root:** 7306ae8c56932b06090e50ba39455d2f0f463c3e7138c9e870670510898f19a0
-

Audit Record:

- **File Name:** audit_log_MVP1-SR062_20250701T034720.316262Z.json
- **meta_id:** MVP1-SR062
- **Timestamp:** 20250701T034720.316262Z
- **Classification:** EVIDENCE_FILE
- **Subcategory:** Immutable Evidence - PROSPERO Protocol PDF (MVP-2.3)
- **LLM Used:** LLM1
- **Commander Verified:** true
- **AI Used:** false
- **Relevance Score (1–5):** 5
- **Required in Final Publication?** Yes
- **Summary:** PDF protocol titled “The impact of preterm birth on cardiac structure and function” formally sealed under MVP-2.3. SHA256 + RIPEMD160 confirmed by HashValidatorBlock.py . Audit confirms integrity and timestamp validity for PROSPERO registration and archival reproducibility.
- **File Contents:**

```
[
  {
    "timestamp": "2025-07-01T03:47:20.316116Z",
    "event": "AUDIT_FILE_IMMUTABILITY_LOGGED",
    "meta_id": "MVP1-SR062",
    "input": {
      "document_title": "PROSPERO \u2013 Cardiac Meta-Analysis Protocol",
      "filename": "PROSPERO The impact of preterm birth on cardiac structure
and function \u2013 a systematic review and meta-analysis.pdf",
      "evidence_path": "evidence_files/PROSPERO The impact of preterm birth on
cardiac structure and function \u2013 a systematic review and meta-analysis.pdf",
      "sha256_file": "evidence_files/PROSPERO The impact of preterm birth on
cardiac structure and function \u2013 a systematic review and meta-
analysis.pdf.hash",
      "ripemd160_file": "evidence_files/PROSPERO The impact of preterm birth on
cardiac structure and function \u2013 a systematic review and meta-analysis.pdf.2ha",
      "ots_file": "evidence_files/PROSPERO The impact of preterm birth on
cardiac structure and function \u2013 a systematic review and meta-
analysis.pdf.hash.ots",
      "validation_step": "This PROSPERO PDF protocol was validated using
`HashValidatorBlock.py` with correct SHA256 and RIPEMD160 fingerprint. It defines the
systematic review protocol for assessing preterm birth impact on cardiac structure
and function. Audit validation confirms file has not been modified post-anchoring.
MVP\u20132.3 hash firewall activated."
    },
    "output": {
      "status": "verifiable",
      "verifiable": true,
      "sha256":
"1887e548da3733521ad4419741a92220a7c818c905de50736b8b5733a1fa4b71",
      "ripemd160": "ef5e7e04a9fdf0fdd48e36561cf52a1776dd16ac"
    },
    "audit": {
      "AI_used": false,
      "LLM_used": "LLM1",
      "human_verified": true,
      "module_version": "v1.0.0",
      "AI_override": false
    },
    "timestamp_confirmed": true
  }
]
```

Cryptographic Hashes (from `.json`)

- **SHA256 (.hash):**

```
51b506a7e4eda4ef521dfa80a8cf859e6ee91dd838e54a608bc9f769bd92ce49
```

- **RIPEMD160 (.2ha):**

```
392d82edb9945226529251b860e3775a2fe40952
```

OTS Validation

- **File:** `audit_log_MVP1-SR062_20250701T034720.316262Z.hash.ots`

- **SHA256:** `48e679a1639a91d57fa5b84fe090d47354b94ddd157d4f3b0e375c0b98e3ef6c`

- **Bitcoin TXID:**

b80f326c21929801a08aaf7557f58411315e817571130ea7b467b2c402af7890

- **Bitcoin Block:** 903480

- **Date of Existence:** 2025-07-01 AEST

- **Merkle Root:** 7306ae8c56932b06090e50ba39455d2f0f463c3e7138c9e870670510898f19a0

Audit Record:

- **File Name:** audit_log_MVP1-SR063_20250701T035347.547522Z.json

- **meta_id:** MVP1-SR063

- **Timestamp:** 20250701T035347.547522Z

- **Classification:** EVIDENCE_FILE

- **Subcategory:** Immutable Evidence - PROSPERO Protocol PDF (IPD Meta-analysis, MVP-2.3)

- **LLM Used:** LLM1

- **Commander Verified:** true

- **AI Used:** false

- **Relevance Score (1–5):** 5

- **Required in Final Publication?** Yes

- **Summary:** PROSPERO protocol PDF for individual patient data meta-analysis in preterm-born adults successfully sealed. SHA256 and RIPEMD160 fingerprints confirmed with OpenTimestamps. Integrity validated using HashValidatorBlock.py . Audit complete under MVP-2.3 hash firewall enforcement.

- **File Contents:**

```
[
  {
    "timestamp": "2025-07-01T03:53:47.547273Z",
    "event": "EVIDENCE_FILE_IMMUTABILITY_LOGGED",
    "meta_id": "MVP1-SR063",
    "input": {
      "document_title": "PROSPERO \u2013 Cardiac structure and function in
preterm-born adults (IPD Meta-analysis)",
      "filename": "PROSPERO Cardiac structure and function in preterm-born
adults- an individual patient data meta-analysis.pdf",
      "evidence_path": "evidence_files/PROSPERO Cardiac structure and function
in preterm-born adults- an individual patient data meta-analysis.pdf",
      "sha256_file": "evidence_files/PROSPERO Cardiac structure and function in
preterm-born adults- an individual patient data meta-analysis.pdf.hash",
      "ripemd160_file": "evidence_files/PROSPERO Cardiac structure and function
in preterm-born adults- an individual patient data meta-analysis.pdf.2ha",
      "ots_file": "evidence_files/PROSPERO Cardiac structure and function in
preterm-born adults- an individual patient data meta-analysis.pdf.hash.ots",
      "validation_step": "Validated and hash-locked under
`HashValidatorBlock.py` with full cryptographic integrity. The evidence file has been
hashed (SHA256), fingerprinted (RIPEMD160), and timestamped using OpenTimestamps.
MVP-2.3 hash firewall successfully enforced, metadata permanently registered in
Sentinel Protocol."
    },
    "output": {
      "status": "verifiable",
      "verifiable": true,
      "sha256":
"16bef7de122b5c39830e78c040680e7a090f0bb3ef40c8176655bb147adce171",
      "ripemd160": "463f5f6be7871b32d2b5eaa7edb32dedcd033ee6"
    },
    "audit": {
      "AI_used": false,
      "LLM_used": "LLM1",
      "human_verified": true,
      "module_version": "v1.0.0",
      "AI_override": false
    },
    "timestamp_confirmed": true
  }
]
```

Cryptographic Hashes (from .json)

- **SHA256 (.hash):**

```
67214ac1e25816c600d6a6f83a37a599f2e4ab70f0b0a42f2dd8eaa4f8d44dac
```

- **RIPEMD160 (.2ha):** 1dc5dc8079ee43b651ebf8a50440da4501a36919

OTS Validation

- **File:** audit_log_MVP1-SR063_20250701T035347.547522Z.hash.ots

- **SHA256:** eea957ac5ca3c82749bcd7d98e87a34e084f8938fd454f79361a5d5afd1001ae

- **Bitcoin TXID:**

b80f326c21929801a08aaf7557f58411315e817571130ea7b467b2c402af7890

- **Bitcoin Block:** 903480

- **Date of Existence:** 2025-07-01 AEST

- **Merkle Root:** 7306ae8c56932b06090e50ba39455d2f0f463c3e7138c9e870670510898f19a0

Audit Record:

- **File Name:** audit_log_MVP1-SR064_20250701T041643.049193Z.json

- **meta_id:** MVP1-SR064

- **Timestamp:** 20250701T041643.049193Z

- **Classification:** EVIDENCE_FILE

- **Subcategory:** Immutable Audit File - Medline Search Optimisation Step 3 (MVP-2.4)

- **LLM Used:** LLM1

- **Commander Verified:** true

- **AI Used:** true

- **Relevance Score (1–5):** 5

- **Required in Final Publication?** Yes

- **Summary:** Audit

file SearchStringOptimisationMedlineStep3HumanExpert_Audit.md sealed with verified SHA256 and RIPEMD160 using OpenTimestamps. HashValidatorBlock.py confirmed firewall enforcement under MVP-2.4. File now locked for reproducibility and publication use.

- **File Contents:**

```
[
  {
    "timestamp": "2025-07-01T04:16:43.049074Z",
    "event": "AUDIT_FILE_IMMUTABILITY_LOGGED",
    "meta_id": "MVP1-SR064",
    "input": {
      "document_title": "MVP-2.4 | Step 3 \u2013 Medline Search Optimisation Audit (Human Expert)",
      "filename": "SearchString_Optimisation_Medline_Step3_HumanExpert_Audit.md",
      "evidence_path": "evidence_files/SearchString_Optimisation_Medline_Step3_HumanExpert_Audit.md",
      "sha256_file": "evidence_files/SearchString_Optimisation_Medline_Step3_HumanExpert_Audit.md.hash",
      "ripemd160_file": "evidence_files/SearchString_Optimisation_Medline_Step3_HumanExpert_Audit.md.2ha",
      "ots_file": "evidence_files/SearchString_Optimisation_Medline_Step3_HumanExpert_Audit.md.hash.ots",
      "validation_step": "Validated under `HashValidatorBlock.py` with strict firewall enforcement.\nAudit file confirmed SHA256 and RIPEMD160 integrity with OpenTimestamps.\nMVP-2.4 audit stack verified and hash-locked successfully."
    },
    "output": {
      "status": "verifiable",
      "verifiable": true,
      "sha256": "111eb4b8290357e1bacac9ca9c13314f53c36eb6bb124529bf9f0a7b552c6675",
      "ripemd160": "1b071659a139c9323d2a2e84f87cec5d0cbd5e43"
    },
    "audit": {
      "AI_used": true,
      "LLM_used": "LLM1",
      "human_verified": true,
      "module_version": "v1.0.0",
      "AI_override": false
    },
    "timestamp_confirmed": true
  }
]
```

Cryptographic Hashes (from .json)

- **SHA256 (.hash):**

5cd5712f47daf7d466fe3fbd240261851f98f665092d0de6926570eade651fec

- **RIPEMD160 (.2ha):**

9f211a8a639f8813e9276076054ebb152f4b2d65

OTS Validation

- **File:** audit_log_MVP1-SR064_20250701T041643.049193Z.hash.ots

- **SHA256:** 5a317241715ad15d80ac2eac61471e990e5a0123860f910c8e488ceeece767b5

- **Bitcoin TXID:**

32ac2cdf0b3451c8ed3a3d164aae593f9588c0e0560ee2e9693d67d71fb2579e

- **Bitcoin Block:** 903489

- **Date of Existence:** 2025-07-01 AEST
 - **Merkle Root:** 006ca452dd19f2606b4182e27f119c8737653ae35ff5c4b1d26417166b3c6424
-

Audit Record:

- **File Name:** audit_log_MVP1-SR065_20250701T041936.691691Z.json
- **meta_id:** MVP1-SR065
- **Timestamp:** 20250701T041936.691691Z
- **Classification:** EVIDENCE_FILE
- **Subcategory:** Immutable Audit File - Medline Audit Step 6 (MVP-2.4)
- **LLM Used:** LLM1
- **Commander Verified:** true
- **AI Used:** true
- **Relevance Score (1–5):** 5
- **Required in Final Publication?** Yes
- **Summary:** Audit file SearchStringOptimisationMedlineStep6HumanExpert_Audit.md sealed with cryptographic integrity using SHA256, RIPEMD160, and OpenTimestamps. Verified under HashValidatorBlock.py with MVP-2.4 hash firewall enforcement. File confirmed immutable and ready for publication-grade reproducibility.
- **File Contents:**


```
[
  {
    "timestamp": "2025-07-01T04:19:36.691575Z",
    "event": "AUDIT_FILE_IMMUTABILITY_LOGGED",
    "meta_id": "MVP1-SR065",
    "input": {
      "document_title": "MVP-2.4 | Step 6 \u2013 Medline Audit (Human Expert)",
      "filename":
"SearchString_Optimisation_Medline_Step6_HumanExpert_Audit.md",
      "evidence_path": "evidence_files/
SearchString_Optimisation_Medline_Step6_HumanExpert_Audit.md",
      "sha256_file": "evidence_files/
SearchString_Optimisation_Medline_Step6_HumanExpert_Audit.md.hash",
      "ripemd160_file": "evidence_files/
SearchString_Optimisation_Medline_Step6_HumanExpert_Audit.md.2ha",
      "ots_file": "evidence_files/
SearchString_Optimisation_Medline_Step6_HumanExpert_Audit.md.hash.ots",
      "validation_step": "HashValidatorBlock.py enforced SHA256 + RIPEMD160
verification.\nConfirmed match with disk and OpenTimestamps integrity.\nFirewall
confirmed audit lock integrity under MVP-2.4 hash guard."
    },
    "output": {
      "status": "verifiable",
      "verifiable": true,
      "sha256":
"db09bf5932e26c2bb49b2f7e9fee3a43d2ea3cbaf50cc7cac52e3302d9532ba4",
      "ripemd160": "c40edb8e48156c6f82445a6186767d6df9d6855f"
    },
    "audit": {
      "AI_used": true,
      "LLM_used": "LLM1",
      "human_verified": true,
      "module_version": "v1.0.0",
      "AI_override": false
    },
    "timestamp_confirmed": true
  }
]
```

Cryptographic Hashes (from .json)

- **SHA256 (.hash):**

e87dbea58d49feebc37a79b505c57bb64aaa95ef8033edb52d0e0df59f3e9caa

- **RIPEMD160 (.2ha):**

5be5bb6d0dfe0770667d61f05f9620a37bc774c7

OTS Validation

- **File:** audit_log_MVP1-SR065_20250701T041936.691691Z.hash.ots

- **SHA256:** b8baaf73292a5e39ea3fceca08b7c1d01aea23ef6f2ca546440308d38c1da8fa

- **Bitcoin TXID:**

32ac2cdf0b3451c8ed3a3d164aae593f9588c0e0560ee2e9693d67d71fb2579e

- **Bitcoin Block:** 903489

- **Date of Existence:** 2025-07-01 AEST
 - **Merkle Root:** 006ca452dd19f2606b4182e27f119c8737653ae35ff5c4b1d26417166b3c6424
-

Audit Record:

- **File Name:** audit_log_MVP1-SR066_20250701T042852.735137Z.json
- **meta_id:** MVP1-SR066
- **Timestamp:** 20250701T042852.735137Z
- **Classification:** EVIDENCE_FILE
- **Subcategory:** Immutable Audit File - Medline Execution Audit Step 7 (Final String, MVP-2.4)
- **LLM Used:** LLM1
- **Commander Verified:** true
- **AI Used:** true
- **Relevance Score (1–5):** 5
- **Required in Final Publication?** Yes
- **Summary:** Final Medline execution audit
(*SearchStringOptimisationMedlineStep7SeachExecuted_Audit.md*)
cryptographically sealed under MVP-2.4. Verified with SHA256, RIPEMD160, and OpenTimestamps. HashValidatorBlock.py confirmed on-disk immutability and timestamp integrity. Search string now reproducibility-locked for publication.
- **File Contents:**

```
[
  {
    "timestamp": "2025-07-01T04:28:52.734891Z",
    "event": "AUDIT_FILE_IMMUTABILITY_LOGGED",
    "meta_id": "MVP1-SR066",
    "input": {
      "document_title": "MVP-2.4 | Step 7 \u2013 Medline Search Execution Audit (Final String)",
      "filename":
"SearchString_Optimisation_Medline_Step7_SeachExecuted_Audit.md",
      "evidence_path": "evidence_files/
SearchString_Optimisation_Medline_Step7_SeachExecuted_Audit.md",
      "sha256_file": "evidence_files/
SearchString_Optimisation_Medline_Step7_SeachExecuted_Audit.md.hash",
      "ripemd160_file": "evidence_files/
SearchString_Optimisation_Medline_Step7_SeachExecuted_Audit.md.2ha",
      "ots_file": "evidence_files/
SearchString_Optimisation_Medline_Step7_SeachExecuted_Audit.md.hash.ots",
      "validation_step": "Confirmed immutable under `HashValidatorBlock.py`.
Real-time disk hash validated against `.hash` and `.2ha` records. OTS timestamp
located and confirmed. Firewall policy for MVP-2.4 enforced."
    },
    "output": {
      "status": "verifiable",
      "verifiable": true,
      "sha256":
"0f75a8f0524b2db1e2bd21233450cdfd4d7b8c368034274fa7a4357f3b81634f",
      "ripemd160": "c5e201655f6111ae39c608cc4ba13713e154405b"
    },
    "audit": {
      "AI_used": true,
      "LLM_used": "LLM1",
      "human_verified": true,
      "module_version": "v1.0.0",
      "AI_override": false
    },
    "timestamp_confirmed": true
  }
]
```

Cryptographic Hashes (from .json)

- **SHA256 (.hash):**

dae6181451d480b96924c790fd52b034b9f0d6f95e610f1b6abca1ef4d4bbd60

- **RIPEMD160 (.2ha):** 5697189c8669fb09ec7c2bd84a954deb93946a3b

OTS Validation

- **File:** audit_log_MVP1-SR066_20250701T042852.735137Z.hash.ots

- **SHA256:** f2e1265737428c22328dc2c2dad3d33e2d0a20898ab47b75d3ddeea3dfcdec44

- **Bitcoin TXID:**

32ac2cdf0b3451c8ed3a3d164aae593f9588c0e0560ee2e9693d67d71fb2579e

- **Bitcoin Block:** 903489

- **Date of Existence:** 2025-07-01 AEST
 - **Merkle Root:** 006ca452dd19f2606b4182e27f119c8737653ae35ff5c4b1d26417166b3c6424
-

Audit Record:

- **File Name:** audit_log_MVP1-SR067_20250701T044648.652920Z.json
- **meta_id:** MVP1-SR067
- **Timestamp:** 20250701T044648.652920Z
- **Classification:** EVIDENCE_FILE
- **Subcategory:**
Immutable Audit File - BNP-Specific Final Search Execution (Step 8, MVP-2.4)
- **LLM Used:** LLM1
- **Commander Verified:** true
- **AI Used:** true
- **Relevance Score (1–5):** 5
- **Required in Final Publication?** Yes
- **Summary:** BNP-targeted final Medline search audit file
(*SearchStringOptimisationMedlineStep8BNPSeachExecuted_Audit.md*) confirmed
immutable via SHA256, RIPEMD160, and OpenTimestamps. HashValidatorBlock.py
verified integrity under VALIS and MVP-2.4 firewall. Artifact is
reproducibility-locked for publication.
- **File Contents:**

```
[
  {
    "timestamp": "2025-07-01T04:46:48.652738Z",
    "event": "AUDIT_FILE_IMMUTABILITY_LOGGED",
    "meta_id": "MVP1-SR067",
    "input": {
      "document_title": "MVP-2.4 | Step 8 \u2013 BNP Final Search Execution Audit (Human Verified)",
      "filename": "SearchString_Optimisation_Medline_Step8_BNPSeachExecuted_Audit.md",
      "evidence_path": "evidence_files/SearchString_Optimisation_Medline_Step8_BNPSeachExecuted_Audit.md",
      "sha256_file": "evidence_files/SearchString_Optimisation_Medline_Step8_BNPSeachExecuted_Audit.md.hash",
      "ripemd160_file": "evidence_files/SearchString_Optimisation_Medline_Step8_BNPSeachExecuted_Audit.md.2ha",
      "ots_file": "evidence_files/SearchString_Optimisation_Medline_Step8_BNPSeachExecuted_Audit.md.hash.ots",
      "validation_step": "Validated using `HashValidatorBlock.py` under VALIS protocol. Confirmed disk hash matches `.hash` + `.2ha` files. OTS timestamp found. MVP-2.4 hash firewall active."
    },
    "output": {
      "status": "verifiable",
      "verifiable": true,
      "sha256": "b3e9ab31efe3ef893caa931c2760e16b8dc4b79c7221f4736254316b31cbb42c",
      "ripemd160": "01e673e424c415b94971c0a87138767cd83f83d7"
    },
    "audit": {
      "AI_used": true,
      "LLM_used": "LLM1",
      "human_verified": true,
      "module_version": "v1.0.0",
      "AI_override": false
    },
    "timestamp_confirmed": true
  }
]
```

Cryptographic Hashes (from .json)

- **SHA256 (.hash):**

```
ff47391cb8567610d95e65150e61c531b4c04bc1bc2a1293c9cf4edf489634bb
```

- **RIPEMD160 (.2ha):**

```
6304cf04a9055e507bf5ace7069202e61e147330
```

OTS Validation

- **File:**

```
audit_log_MVP1-SR067_20250701T044648.652920Z.hash.ots
```

- **SHA256:**

```
32e10c42b94d1b90b7a5e5ea141c981ab67e68d4ce9960dbbe0615965b2cb689
```

- **Bitcoin TXID:**

```
32ac2cdf0b3451c8ed3a3d164aae593f9588c0e0560ee2e9693d67d71fb2579e
```

- **Bitcoin Block:**

```
903489
```

- **Date of Existence:** 2025-07-01 AEST
 - **Merkle Root:** 006ca452dd19f2606b4182e27f119c8737653ae35ff5c4b1d26417166b3c6424
-

Audit Record:

- **File Name:** audit_log_MVP1-SR068_20250701T045131.393490Z.json
- **meta_id:** MVP1-SR068
- **Timestamp:** 20250701T045131.393490Z
- **Classification:** EVIDENCE_FILE
- **Subcategory:** Immutable Screenshot - Optimised Medline Search (Step 6.1, MVP-2.4)
- **LLM Used:** LLM1
- **Commander Verified:** true
- **AI Used:** true
- **Relevance Score (1–5):** 5
- **Required in Final Publication?** Yes
- **Summary:** Screenshot evidence OptimisedSearchMedlineOvid_Screenshot 2025-06-15 at 11.46.25 am.png sealed with SHA256, RIPEMD160, and OpenTimestamps. HashValidatorBlock.py confirmed immutability under real-time firewall with VALIS Template v1.0. Verifies visual record of final Medline query structure under MVP-2.4.
- **File Contents:**

```
[
  {
    "timestamp": "2025-07-01T04:51:31.393328Z",
    "event": "AUDIT_FILE_IMMUTABILITY_LOGGED",
    "meta_id": "MVP1-SR068",
    "input": {
      "document_title": "MVP-2.4 | MedlineOvid Screenshot \u2013 Optimised Search (Step 6.1)",
      "filename": "Optimised_Search_MedlineOvid_Screenshot 2025-06-15 at 11.46.25\u202fam.png",
      "evidence_path": "evidence_files/Optimised_Search_MedlineOvid_Screenshot 2025-06-15 at 11.46.25\u202fam.png",
      "sha256_file": "evidence_files/Optimised_Search_MedlineOvid_Screenshot 2025-06-15 at 11.46.25\u202fam.png.hash",
      "ripemd160_file": "evidence_files/Optimised_Search_MedlineOvid_Screenshot 2025-06-15 at 11.46.25\u202fam.png.2ha",
      "ots_file": "evidence_files/Optimised_Search_MedlineOvid_Screenshot 2025-06-15 at 11.46.25\u202fam.png.hash.ots",
      "validation_step": "Validated under `HashValidatorBlock.py` with real-time hash firewall. Disk SHA256 and RIPEMD160 match confirmed against saved `.hash` and `.2ha` records. OpenTimestamps `.ots` file present and valid. Execution consistent with VALIS canonical template v1.0.",
      "template_ref": "VALIS_Template_Canonical_v1.py"
    },
    "output": {
      "status": "verifiable",
      "verifiable": true,
      "sha256": "636ebda951dca1a3f57df20c554b3fc61afa31ce74a9736577bcc8355617193c",
      "ripemd160": "4485ee335176e62f2f77d3cad7625065bc9e4b88"
    },
    "audit": {
      "AI_used": true,
      "LLM_used": "LLM1",
      "human_verified": true,
      "module_version": "v1.0.0",
      "AI_override": false
    },
    "timestamp_confirmed": true
  }
]
```

Cryptographic Hashes (from .json)

- **SHA256 (.hash):**

```
0eb9ef0f87618689b2147032407e4a23c5b3fe01f1ee615e99115a3b201b61ed
```

- **RIPEMD160 (.2ha):**

```
3db789185a3268673a538746d53e13e153c3b475
```

OTS Validation

- **File:** audit_log_MVP1-SR068_20250701T045131.393490Z.hash.ots

- **SHA256:** 326d58943df2a2cee920ae69b573f9003a5f249eacbd8bc18852cd0c44e3c799

- **Bitcoin TXID:**

32ac2cdf0b3451c8ed3a3d164aae593f9588c0e0560ee2e9693d67d71fb2579e

- **Bitcoin Block:** 903489

- **Date of Existence:** 2025-07-01 AEST

- **Merkle Root:** 006ca452dd19f2606b4182e27f119c8737653ae35ff5c4b1d26417166b3c6424

Audit Record:

- **File Name:** audit_log_MVP1-SR069_20250701T045617.873294Z.json

- **meta_id:** MVP1-SR069

- **Timestamp:** 20250701T045617.873294Z

- **Classification:** EVIDENCE_FILE

- **Subcategory:** Immutable Screenshot - BNP Exclusion Confirmation (Step 8, MVP-2.4)

- **LLM Used:** LLM1

- **Commander Verified:** true

- **AI Used:** true

- **Relevance Score (1–5):** 5

- **Required in Final Publication?** Yes

- **Summary:** Screenshot BNP exclusion_Screenshot 2025-06-24 at 11.22.43 am.png confirmed immutable via SHA256, RIPEMD160, and OpenTimestamps. Validated with HashValidatorBlock.py and locked under VALIS Template v1.0. File verifies exclusion step from final Medline search (MVP-2.4) and supports audit reproducibility.

- **File Contents:**


```
[
  {
    "timestamp": "2025-07-01T04:56:17.873128Z",
    "event": "AUDIT_FILE_IMMUTABILITY_LOGGED",
    "meta_id": "MVP1-SR069",
    "input": {
      "document_title": "MVP-2.4 | BNP Screenshot \u2013 Step 8 Exclusion Confirmation",
      "filename": "BNP exclusion_Screenshot 2025-06-24 at 11.22.43\u202fam.png",
      "evidence_path": "evidence_files/BNP exclusion_Screenshot 2025-06-24 at 11.22.43\u202fam.png",
      "sha256_file": "evidence_files/BNP exclusion_Screenshot 2025-06-24 at 11.22.43\u202fam.png.hash",
      "ripemd160_file": "evidence_files/BNP exclusion_Screenshot 2025-06-24 at 11.22.43\u202fam.png.2ha",
      "ots_file": "evidence_files/BNP exclusion_Screenshot 2025-06-24 at 11.22.43\u202fam.png.hash.ots",
      "validation_step": "Hash integrity validated using `HashValidatorBlock.py` with disk comparison. OTS file present and matches expected hash. VALIS Template v1.0 applied with hash-lock compliance.",
      "template_ref": "VALIS_Template_Canonical_v1.py"
    },
    "output": {
      "status": "verifiable",
      "verifiable": true,
      "sha256": "b6436706718753ee8a437b488212bb56a5fb4084e23c914be52a24dd5070ca33",
      "ripemd160": "7432d432a34cf65011f6ea04ab2f4c472e08bd57"
    },
    "audit": {
      "AI_used": true,
      "LLM_used": "LLM1",
      "human_verified": true,
      "module_version": "v1.0.0",
      "AI_override": false
    },
    "timestamp_confirmed": true
  }
]
```

Cryptographic Hashes (from .json)

- **SHA256 (.hash):**

1ed663cdaba3353930f9edeb82b957eafaf111e78a66e886051a7c4d5b988995

- **RIPEMD160 (.2ha):**

f038d7c9ca93fe3b18b5e2389d699c401e9fa3a8

OTS Validation

- **File:** audit_log_MVP1-SR069_20250701T045617.873294Z.hash.ots

- **SHA256:** d79d5f916fd675d12f66fd3747b1152b08a06b226b596b3227b09de1ae754328

- **Bitcoin TXID:**

32ac2cdf0b3451c8ed3a3d164aae593f9588c0e0560ee2e9693d67d71fb2579e

- **Bitcoin Block:** 903489
 - **Date of Existence:** 2025-07-01 AEST
 - **Merkle Root:** 006ca452dd19f2606b4182e27f119c8737653ae35ff5c4b1d26417166b3c6424
-

Audit Record:

- **File Name:** audit_log_MVP1-SR070_20250701T051013.388529Z.json
- **meta_id:** MVP1-SR070
- **Timestamp:** 20250701T051013.388529Z
- **Classification:** EVIDENCE_FILE
- **Subcategory:** Immutable Screening Output - Included Records (MVP-2.5)
- **LLM Used:** LLM1
- **Commander Verified:** true
- **AI Used:** true
- **Relevance Score (1–5):** 5
- **Required in Final Publication?** Yes
- **Summary:** File Included_Records.txt sealed under SHA256, RIPEMD160, and OpenTimestamps. Verified using HashValidatorBlock.py with VALIS Template v1.0. Confirms inclusion results for MVP-2.5 screening engine and ensures tamper-proof audit traceability.
- **File Contents:**

```
[
  {
    "timestamp": "2025-07-01T05:10:13.388407Z",
    "event": "AUDIT_FILE_IMMUTABILITY_LOGGED",
    "meta_id": "MVP1-SR070",
    "input": {
      "document_title": "MVP-2.5 | Screening File \u2013 Included Records",
      "filename": "Included_Records.txt",
      "evidence_path": "evidence_files/Included_Records.txt",
      "sha256_file": "evidence_files/Included_Records.txt.hash",
      "ripemd160_file": "evidence_files/Included_Records.txt.2ha",
      "ots_file": "evidence_files/Included_Records.txt.hash.ots",
      "validation_step": "Validated under `HashValidatorBlock.py` using real-time firewall. Disk hash verified against `.hash` and `.2ha` with OpenTimestamps proof present. Execution adheres to `VALIS_Template_Canonical_v1.py`.",
      "template_ref": "VALIS_Template_Canonical_v1.py"
    },
    "output": {
      "status": "verifiable",
      "verifiable": true,
      "sha256": "3330065dd80b161d1084e0160a3bea94c5b4cd030ffbba1d49f94a69b772080a",
      "ripemd160": "4f5d90c2f7c97955dc9dc01e17801e0feef17905"
    },
    "audit": {
      "AI_used": true,
      "LLM_used": "LLM1",
      "human_verified": true,
      "module_version": "v1.0.0",
      "AI_override": false
    },
    "timestamp_confirmed": true
  }
]
```

Cryptographic Hashes (from `.json`)

- **SHA256 (.hash):**

f7f97dbdfef1fb1dc761a64cba4f1a20a7643fa1f9e8df38da1a4ef36a9dfd3f9

- **RIPEMD160 (.2ha):**

6cf9aba83f035c132152fa1a804ef7533cf4396d

OTS Validation

- **File:** audit_log_MVP1-SR070_20250701T051013.388529Z.hash.ots

- **SHA256:** eb0a0f490863877fdf3e616498f796827d250a7b93e6ee9df518d183ee63baf6

- **Bitcoin TXID:**

c41965ec25f1f9e28770b7c6fc0ba2eb6587875a83661c16f05b0b6861df4c37

- **Bitcoin Block:** 903498

- **Date of Existence:** 2025-07-01 AEST

- **Merkle Root:** 625877f145a426658480d5f667ff2fb4449f7a72c502e52c8b97e89d2dd2aee2

Audit Record:

- **File Name:** audit_log_MVP1-SR071_20250701T051253.728001Z.json
- **meta_id:** MVP1-SR071
- **Timestamp:** 20250701T051253.728001Z
- **Classification:** EVIDENCE_FILE
- **Subcategory:** Immutable CSV Evidence - Titles & Abstracts Screening Pilot (MVP-2.5)
- **LLM Used:** LLM1
- **Commander Verified:** true
- **AI Used:** true
- **Relevance Score (1–5):** 5
- **Required in Final Publication?** Yes
- **Summary:** CSV file titlesandabstracts_001.csv sealed under SHA256, RIPEMD160, and OpenTimestamps. Validated using HashValidatorBlock.py under VALIS Template v1.0. Confirms inclusion of LLM + human pilot screening input for MVP-2.5. Fully compliant with CEM-2.5 reproducibility firewall.
- **File Contents:**

```
[
  {
    "timestamp": "2025-07-01T05:12:53.727867Z",
    "event": "AUDIT_FILE_IMMUTABILITY_LOGGED",
    "meta_id": "MVP1-SR071",
    "input": {
      "document_title": "MVP-2.5 | CSV: Human + LLM Titles & Abstracts Evidence (Pilot)",
      "filename": "titles_and_abstracts_001.csv",
      "evidence_path": "evidence_files/titles_and_abstracts_001.csv",
      "sha256_file": "evidence_files/titles_and_abstracts_001.csv.hash",
      "ripemd160_file": "evidence_files/titles_and_abstracts_001.csv.2ha",
      "ots_file": "evidence_files/titles_and_abstracts_001.csv.hash.ots",
      "validation_step": "Validated with `HashValidatorBlock.py` as per VALIS v1.0. Disk hash matched all immutability artifacts. OTS anchor confirmed present. Audit entry fully compliant with CEM-2.5 hash firewall conditions.",
      "template_ref": "VALIS_Template_Canonical_v1.py"
    },
    "output": {
      "status": "verifiable",
      "verifiable": true,
      "sha256": "b2b5f6bc8fdec99d35f176f74158d23c4e62afd39c63df8a457ad9ae1e96d66d",
      "ripemd160": "4ca4a263eb1e822daec247b8e0498f2197fde1ed"
    },
    "audit": {
      "AI_used": true,
      "LLM_used": "LLM1",
      "human_verified": true,
      "module_version": "v1.0.0",
      "AI_override": false
    },
    "timestamp_confirmed": true
  }
]
```

Cryptographic Hashes (from `.json`)

- **SHA256 (.hash):**

c9c0b099abc1fc15e993c00ec6732e48a8e2906a1b629e00a9610bbcf7d4be25

- **RIPEMD160 (.2ha):**

2790865b8a8ab11bee524651e561c053b1df59cd

OTS Validation

- **File:** audit_log_MVP1-SR071_20250701T051253.728001Z.hash.ots

- **SHA256:** c5b6b8c48eca90a2b54aab202df2246f62d165af4ea72a351c52b574a606a9d2

- **Bitcoin TXID:**

c41965ec25f1f9e28770b7c6fc0ba2eb6587875a83661c16f05b0b6861df4c37

- **Bitcoin Block:** 903498

- **Date of Existence:** 2025-07-01 AEST

- **Merkle Root:** 625877f145a426658480d5f667ff2fb4449f7a72c502e52c8b97e89d2dd2aee2

Audit Record:

- **File Name:** `audit_log_MVP1-SR072_20250701T051513.879295Z.json`
- **meta_id:** `MVP1-SR072`
- **Timestamp:** `20250701T051513.879295Z`
- **Classification:** `EVIDENCE_FILE`
- **Subcategory:** `Immutable CSV Evidence - LLM3 vs LLM4 Human Audit (Titles & Abstracts, MVP-2.5)`
- **LLM Used:** `LLM1`
- **Commander Verified:** `true`
- **AI Used:** `true`
- **Relevance Score (1–5):** `5`
- **Required in Final Publication?** `Yes`
- **Summary:** `Evidence file HumanAuditLLM3LLM4titlesandabstracts001Combined.csv verified as immutable using SHA256, RIPEMD160, and OpenTimestamps. HashValidatorBlock.py confirmed all hashes; compliance with VALIS Template v1.0 ensured. Supports comparative triage audit between LLM3 and LLM4 in MVP-2.5.`
- **File Contents:**

```
[
  {
    "timestamp": "2025-07-01T05:15:13.879156Z",
    "event": "AUDIT_FILE_IMMUTABILITY_LOGGED",
    "meta_id": "MVP1-SR072",
    "input": {
      "document_title": "MVP-2.5 | HumanAudit \u2013 LLM3 vs LLM4 Titles & Abstracts (Combined Set)",
      "filename": "HumanAudit_LLM3LLM4_titles_and_abstracts_001_Combined.csv",
      "evidence_path": "evidence_files/HumanAudit_LLM3LLM4_titles_and_abstracts_001_Combined.csv",
      "sha256_file": "evidence_files/HumanAudit_LLM3LLM4_titles_and_abstracts_001_Combined.csv.hash",
      "ripemd160_file": "evidence_files/HumanAudit_LLM3LLM4_titles_and_abstracts_001_Combined.csv.2ha",
      "ots_file": "evidence_files/HumanAudit_LLM3LLM4_titles_and_abstracts_001_Combined.csv.hash.ots",
      "validation_step": "Confirmed valid under `HashValidatorBlock.py`. Disk SHA256 and RIPEMD160 hashes match `.hash` and `.2ha` values respectively. OTS timestamp file present and verified. Template used: VALIS_Template_Canonical_v1.py.",
      "template_ref": "VALIS_Template_Canonical_v1.py"
    },
    "output": {
      "status": "verifiable",
      "verifiable": true,
      "sha256": "8a705e74ee77fe3f9acd324d0a63e73ab8d7afacfee36593c822c720a320171a",
      "ripemd160": "6504105816d00d8ab3bea667a166ea7bc36e4b0e"
    },
    "audit": {
      "AI_used": true,
      "LLM_used": "LLM1",
      "human_verified": true,
      "module_version": "v1.0.0",
      "AI_override": false
    },
    "timestamp_confirmed": true
  }
]
```

Cryptographic Hashes (from .json)

- **SHA256 (.hash):**

ce69d9180192490affe3e2ffa1673dcc1ca198d19ec9b34a3b5b29210ca7fd52

- **RIPEMD160 (.2ha):**

197aefa57411a53ac1876b3c74ab49e3c15db711

OTS Validation

- **File:** audit_log_MVP1-SR072_20250701T051513.879295Z.hash.ots

- **SHA256:** f810ee6caec11b17352cc2951deaf9e7eff1ebe620bbf09a8ce4415c780b4a53

- **Bitcoin TXID:**

c41965ec25f1f9e28770b7c6fc0ba2eb6587875a83661c16f05b0b6861df4c37

- **Bitcoin Block:** 903498

- **Date of Existence:** 2025-07-01 AEST
 - **Merkle Root:** 625877f145a426658480d5f667ff2fb4449f7a72c502e52c8b97e89d2dd2aee2
-

Audit Record:

- **File Name:** audit_log_MVP1-SR073_20250701T051725.233229Z.json
- **meta_id:** MVP1-SR073
- **Timestamp:** 20250701T051725.233229Z
- **Classification:** EVIDENCE_FILE
- **Subcategory:** Immutable CSV Evidence - DeepAudit: LLM3 vs LLM4 Combined (Titles & Abstracts, MVP-2.5)
- **LLM Used:** LLM1
- **Commander Verified:** true
- **AI Used:** true
- **Relevance Score (1–5):** 5
- **Required in Final Publication?** Yes
- **Summary:** DeepAudit CSV DeepAuditCSV001HumanAuditLLM3LLM4titlesandabstracts001Combined.csv validated via HashValidatorBlock.py with OpenTimestamps confirmation. Full immutability confirmed under VALIS Template v1.0. Artifact documents comparative LLM3/LLM4 triage against human review in MVP-2.5.
- **File Contents:**


```
[
  {
    "timestamp": "2025-07-01T05:17:25.233024Z",
    "event": "AUDIT_FILE_IMMUTABILITY_LOGGED",
    "meta_id": "MVP1-SR073",
    "input": {
      "document_title": "MVP-2.5 | DeepAudit \u2013 CSV001 LLM3 vs LLM4 Titles
& Abstracts (Combined)",
      "filename":
"DeepAudit_CSV001_HumanAudit_LLM3LLM4_titles_and_abstracts_001_Combined.csv",
      "evidence_path": "evidence_files/
DeepAudit_CSV001_HumanAudit_LLM3LLM4_titles_and_abstracts_001_Combined.csv",
      "sha256_file": "evidence_files/
DeepAudit_CSV001_HumanAudit_LLM3LLM4_titles_and_abstracts_001_Combined.csv.hash",
      "ripemd160_file": "evidence_files/
DeepAudit_CSV001_HumanAudit_LLM3LLM4_titles_and_abstracts_001_Combined.csv.2ha",
      "ots_file": "evidence_files/
DeepAudit_CSV001_HumanAudit_LLM3LLM4_titles_and_abstracts_001_Combined.csv.hash.ots",
      "validation_step": "Hash validated live under `HashValidatorBlock.py`.
Disk content confirmed SHA256 + RIPEMD160 match with saved `.hash` and `.2ha`. OTS
timestamp file present. Canonical VALIS protocol v1.0 applied.",
      "template_ref": "VALIS_Template_Canonical_v1.py"
    },
    "output": {
      "status": "verifiable",
      "verifiable": true,
      "sha256":
"157e3f62b2c46cb7a8b0dcd43abd75e18d3a6ce1e056c59b5c57e0f6af1dcd10",
      "ripemd160": "6e04dd421b44c44a51d0ce21797a20a08601ffa7"
    },
    "audit": {
      "AI_used": true,
      "LLM_used": "LLM1",
      "human_verified": true,
      "module_version": "v1.0.0",
      "AI_override": false
    },
    "timestamp_confirmed": true
  }
]
```

Cryptographic Hashes (from .json)

- **SHA256 (.hash):**

```
23d31d8e15718d936ee5c9e215234978763291bc7abc75ea0e23990544f7cffc
```

- **RIPEMD160 (.2ha):**

```
44d319b059d06789e68872c73db7dda1b167ed74
```

OTS Validation

- **File:** audit_log_MVP1-SR073_20250701T051725.233229Z.hash.ots

- **SHA256:** d667d6bb7036d545df0708c41cc7f3d9fac9789e03f917d3b9fa45fa910c9e6b

- **Bitcoin TXID:**

```
c41965ec25f1f9e28770b7c6fc0ba2eb6587875a83661c16f05b0b6861df4c37
```

- **Bitcoin Block:** 903498
 - **Date of Existence:** 2025-07-01 AEST
 - **Merkle Root:** 625877f145a426658480d5f667ff2fb4449f7a72c502e52c8b97e89d2dd2aee2
-

Audit Record:

- **File Name:** audit_log_MVP1-SR074_20250701T052022.695270Z.json
- **meta_id:** MVP1-SR074
- **Timestamp:** 20250701T052022.695270Z
- **Classification:** EVIDENCE_FILE
- **Subcategory:** Immutable Audit Summary – LLM vs Human Disagreement (MVP-2.5)
- **LLM Used:** LLM1
- **Commander Verified:** true
- **AI Used:** true
- **Relevance Score (1–5):** 5
- **Required in Final Publication?** Yes
- **Summary:** Audit file Human Audit – LLM vs Human Disagreement
Summary.md verified under HashValidatorBlock.py with full immutability confirmed via SHA256, RIPEMD160, and OpenTimestamps. Logged under VALIS Template v1.0. Captures key divergence points between AI and human classification in MVP-2.5 screening phase.
- **File Contents:**

```
[
  {
    "timestamp": "2025-07-01T05:20:22.695011Z",
    "event": "AUDIT_FILE_IMMUTABILITY_LOGGED",
    "meta_id": "MVP1-SR074",
    "input": {
      "document_title": "MVP-2.5 | Human Audit \u2013 LLM vs Human Disagreement Summary",
      "filename": "Human Audit \u2013 LLM vs Human Disagreement Summary.md",
      "evidence_path": "evidence_files/Human Audit \u2013 LLM vs Human Disagreement Summary.md",
      "sha256_file": "evidence_files/Human Audit \u2013 LLM vs Human Disagreement Summary.md.hash",
      "ripemd160_file": "evidence_files/Human Audit \u2013 LLM vs Human Disagreement Summary.md.2ha",
      "ots_file": "evidence_files/Human Audit \u2013 LLM vs Human Disagreement Summary.md.hash.ots",
      "validation_step": "Audit file validated by `HashValidatorBlock.py`. Disk hash matched saved `.hash` and `.2ha` files, and `.ots` timestamp located. Logged under `VALIS_Template_Canonical_v1.py`.",
      "template_ref": "VALIS_Template_Canonical_v1.py"
    },
    "output": {
      "status": "verifiable",
      "verifiable": true,
      "sha256": "97ef8c317eef29d3ee87f6dc11988fe847a18da9144943d9f3813f759d26786b",
      "ripemd160": "54727f865785d0925514e91dfa921e00b2ac3dc5"
    },
    "audit": {
      "AI_used": true,
      "LLM_used": "LLM1",
      "human_verified": true,
      "module_version": "v1.0.0",
      "AI_override": false
    },
    "timestamp_confirmed": true
  }
]
```

Cryptographic Hashes (from .json)

- **SHA256 (.hash):**

52554519563faf19d72471136b6cc473806ab19d8ee5ccb820c2d21131825a84

- **RIPEMD160 (.2ha):**

ce2bacd6cf3d9fa7a9495374167cca50822996c6

OTS Validation

- **File:** audit_log_MVP1-SR074_20250701T052022.695270Z.hash.ots

- **SHA256:** b8fcbeca368469dc83f0209b10c4e26c1d65096e1d7f77b521873df5c6442f20

- **Bitcoin TXID:**

c41965ec25f1f9e28770b7c6fc0ba2eb6587875a83661c16f05b0b6861df4c37

- **Bitcoin Block:** 903498

- **Date of Existence:** 2025-07-01 AEST
 - **Merkle Root:** 625877f145a426658480d5f667ff2fb4449f7a72c502e52c8b97e89d2dd2aee2
-

Audit Record:

- **File Name:** audit_log_MVP1-SR075_20250701T052230.725856Z.json
- **meta_id:** MVP1-SR075
- **Timestamp:** 20250701T052230.725856Z
- **Classification:** EVIDENCE_FILE
- **Subcategory:** Immutable Audit File - 4-Tier Human-LLM Agreement System (MVP-2.5)
- **LLM Used:** LLM1
- **Commander Verified:** true
- **AI Used:** true
- **Relevance Score (1–5):** 5
- **Required in Final Publication?** Yes
- **Summary:** Audit file 4-Tier HumanLLM Agreement System.md verified under HashValidatorBlock.py and sealed with SHA256, RIPEMD160, and OpenTimestamps. Logged under VALIS Template v1.0. Documents multi-resolution agreement system for human-AI triage integrity in MVP-2.5 screening pipeline.
- **File Contents:**

```
[
  {
    "timestamp": "2025-07-01T05:22:30.725639Z",
    "event": "AUDIT_FILE_IMMUTABILITY_LOGGED",
    "meta_id": "MVP1-SR075",
    "input": {
      "document_title": "MVP-2.5 | 4-Tier Human\u2013LLM Agreement System",
      "filename": "4-Tier HumanLLM Agreement System.md",
      "evidence_path": "evidence_files/4-Tier HumanLLM Agreement System.md",
      "sha256_file": "evidence_files/4-Tier HumanLLM Agreement System.md.hash",
      "ripemd160_file": "evidence_files/4-Tier HumanLLM Agreement
System.md.2ha",
      "ots_file": "evidence_files/4-Tier HumanLLM Agreement
System.md.hash.ots",
      "validation_step": "Validated by `HashValidatorBlock.py` under full
firewall enforcement. Disk SHA256 and RIPEMD160 matched stored hash records,
OpenTimestamps found. VALIS_Template_Canonical_v1.py structure confirmed.",
      "template_ref": "VALIS_Template_Canonical_v1.py"
    },
    "output": {
      "status": "verifiable",
      "verifiable": true,
      "sha256":
"dec7079df3b02b3659d269e0814ea2fdd609eb76d8590418bea1071339647846",
      "ripemd160": "1266b3fa296c1bc0df2ed13036ebe346387fd9a9"
    },
    "audit": {
      "AI_used": true,
      "LLM_used": "LLM1",
      "human_verified": true,
      "module_version": "v1.0.0",
      "AI_override": false
    },
    "timestamp_confirmed": true
  }
]
```

Cryptographic Hashes (from `.json`)

- **SHA256 (.hash):**

c360f71243e5ec9fefb0516eb47d7854bb703385da8ee6a4e6f34ce003102ed6

- **RIPEMD160 (.2ha):**

65bba83758285a22e1f257204a37af18d162f068

OTS Validation

- **File:** audit_log_MVP1-SR075_20250701T052230.725856Z.hash.ots

- **SHA256:** 1f15158edea2ee47db11eca3856ae90234b081d1d10bb9451caa0eb3a78fef0a

- **Bitcoin TXID:**

c41965ec25f1f9e28770b7c6fc0ba2eb6587875a83661c16f05b0b6861df4c37

- **Bitcoin Block:** 903498

- **Date of Existence:** 2025-07-01 AEST

- **Merkle Root:** 625877f145a426658480d5f667ff2fb4449f7a72c502e52c8b97e89d2dd2aee2

Audit Record:

- **File Name:** audit_log_MVP1-SR077_20250702T024304.971063Z.json
- **meta_id:** MVP1-SR077
- **Timestamp:** 20250702T024304.971063Z
- **Classification:** EVIDENCE_FILE
- **Subcategory:** Immutable Blueprint - MVP-2.5 Directory Architecture (v2.0)
- **LLM Used:** LLM1
- **Commander Verified:** true
- **AI Used:** true
- **Relevance Score (1–5):** 5
- **Required in Final Publication?** Yes
- **Summary:** Blueprint file MVP-2.5 Directory Architecture
Blueprint.md sealed under MVP-2.5 audit firewall using HashValidatorBlock.py.
Cryptographic integrity confirmed via SHA256, RIPEMD160, and OpenTimestamps.
Validated against VALIS Template v1.0 for reproducibility and structural
traceability.
- **File Contents:**

```
[
  {
    "timestamp": "2025-07-02T02:43:04.970897Z",
    "event": "AUDIT_FILE_IMMUTABILITY_LOGGED",
    "meta_id": "MVP1-SR077",
    "input": {
      "document_title": "\u2705 MVP-2.5 Directory Architecture Blueprint
(v2.0)",
      "filename": "MVP-2.5 Directory Architecture Blueprint.md",
      "evidence_path": "evidence_files/MVP-2.5 Directory Architecture
Blueprint.md",
      "sha256_file": "evidence_files/MVP-2.5 Directory Architecture
Blueprint.md.hash",
      "ripemd160_file": "evidence_files/MVP-2.5 Directory Architecture
Blueprint.md.2ha",
      "ots_file": "evidence_files/MVP-2.5 Directory Architecture
Blueprint.md.hash.ots",
      "validation_step": "Validated under `HashValidatorBlock.py`. Disk SHA256
and RIPEMD160 match confirmed with OpenTimestamps. VALIS hash firewall enforced under
MVP-2.5 compliance mode.",
      "template_ref": "VALIS_Template_Canonical_v1.py"
    },
    "output": {
      "status": "verifiable",
      "verifiable": true,
      "sha256":
"d91e616430f811ca9628fd648826c5c4fce9b026e6f6d34092cca274442147bc",
      "ripemd160": "10194e878ef68d1f543da52a84a490b605b51e86"
    },
    "audit": {
      "AI_used": true,
      "LLM_used": "LLM1",
      "human_verified": true,
      "module_version": "v1.0.0",
      "AI_override": false
    },
    "timestamp_confirmed": true
  }
]
```

Cryptographic Hashes (from .json)

- **SHA256 (.hash):**

ef9323d14d50993a98fd603745d0c3225b8400860e640c5f4c462ee120448030

- **RIPEMD160 (.2ha):**

8f9bbc7f5e643c46a8238fae76d215656b089f1f

OTS Validation

- **File:** audit_log_MVP1-SR077_20250702T024304.971063Z.hash.ots

- **SHA256:** 63fa5715ddfc1172b2bae3237dcba5049aee263b6e9f1adc6581bf8824d62c76

- **Bitcoin TXID:**

514a4c62efd354a39ce2359a9cf80125135ba10aeeafb2492298d3f532c87772

- **Bitcoin Block:** 903607
 - **Date of Existence:** 2025-07-02 AEST
 - **Merkle Root:** 177fbc83686f898fef588db2ac224473fd7d6ed33a6c2a380eed949698f1c114
-

Audit Record:

- **File Name:** audit_log_MVP1-SR078_20250702T024636.302134Z.json
- **meta_id:** MVP1-SR078
- **Timestamp:** 20250702T024636.302134Z
- **Classification:** EVIDENCE_FILE
- **Subcategory:** Immutable CSV – Master Validation: Titles & Abstracts (Medline, MVP-2.5)
- **LLM Used:** LLM1
- **Commander Verified:** true
- **AI Used:** true
- **Relevance Score (1–5):** 5
- **Required in Final Publication?** Yes
- **Summary:** CSV file mastervalidationtitlesandabstracts_medline.csv sealed using HashValidatorBlock.py. Validated with SHA256, RIPEMD160, and OpenTimestamps. Complies with VALIS Template v1.0 and confirms master validation state for Medline screening input under MVP-2.5.
- **File Contents:**


```
[
  {
    "timestamp": "2025-07-02T02:46:36.302022Z",
    "event": "AUDIT_FILE_IMMUTABILITY_LOGGED",
    "meta_id": "MVP1-SR078",
    "input": {
      "document_title": "MVP-2.5 | Master Validation CSV (Titles + Abstracts
\u2013 Medline)",
      "filename": "master_validation_titles_and_abstracts_medline.csv",
      "evidence_path": "evidence_files/
master_validation_titles_and_abstracts_medline.csv",
      "sha256_file": "evidence_files/
master_validation_titles_and_abstracts_medline.csv.hash",
      "ripemd160_file": "evidence_files/
master_validation_titles_and_abstracts_medline.csv.2ha",
      "ots_file": "evidence_files/
master_validation_titles_and_abstracts_medline.csv.hash.ots",
      "validation_step": "Validated with `HashValidatorBlock.py`. Live SHA256
and RIPEMD160 matched disk record and confirmed OTS timestamp. Audit integrity
enforced under VALIS template v1.0.",
      "template_ref": "VALIS_Template_Canonical_v1.py"
    },
    "output": {
      "status": "verifiable",
      "verifiable": true,
      "sha256":
"fa57e316f48c0f4a5353b5bd93cfdff95c631c81d0def8007980fd2c28b27027",
      "ripemd160": "328449e4cd4b8f0ec42172c7812e86312984ff9a"
    },
    "audit": {
      "AI_used": true,
      "LLM_used": "LLM1",
      "human_verified": true,
      "module_version": "v1.0.0",
      "AI_override": false
    },
    "timestamp_confirmed": true
  }
]
```

Cryptographic Hashes (from .json)

- **SHA256 (.hash):**

c56dbae22ab024e2f52817b3f378e41be48a1af2dbf8f57819c6d366a7f2d130

- **RIPEMD160 (.2ha):**

6328aeeb0f570b565c9d9f57e79084b7be7da6f4

OTS Validation

- **File:** audit_log_MVP1-SR078_20250702T024636.302134Z.hash.ots

- **SHA256:** 2e4a0c554a6fdd170cabfca526ebade959659bf5f5706792bb2def83988cecfcc

- **Bitcoin TXID:**

514a4c62efd354a39ce2359a9cf80125135ba10aeedfb2492298d3f532c87772

- **Bitcoin Block:** 903607
 - **Date of Existence:** 2025-07-02 AEST
 - **Merkle Root:** 177fbc83686f898fef588db2ac224473fd7d6ed33a6c2a380eed949698f1c114
-

Audit Record:

- **File Name:** audit_log_MVP1-SR079_20250702T024908.355401Z.json
- **meta_id:** MVP1-SR079
- **Timestamp:** 20250702T024908.355401Z
- **Classification:** EVIDENCE_FILE
- **Subcategory:** Immutable CSV - LLM-Optimised Master Validation (Medline, MVP-2.5)
- **LLM Used:** LLM1
- **Commander Verified:** true
- **AI Used:** true
- **Relevance Score (1–5):** 5
- **Required in Final Publication?** Yes
- **Summary:** LLM-optimised CSV file LLMoptimisedmastervalidationtitlesandabstracts_medline.csv validated using HashValidatorBlock.py. Integrity confirmed via SHA256, RIPEMD160, and OpenTimestamps. Fully compliant with VALIS Template v1.0 under MVP-2.5 reproducibility and audit firewall.
- **File Contents:**

```
[
  {
    "timestamp": "2025-07-02T02:49:08.355260Z",
    "event": "AUDIT_FILE_IMMUTABILITY_LOGGED",
    "meta_id": "MVP1-SR079",
    "input": {
      "document_title": "MVP-2.5 | LLM-Optimised Master Validation CSV
(Medline)",
      "filename":
"LLM_optimised_master_validation_titles_and_abstracts_medline.csv",
      "evidence_path": "evidence_files/
LLM_optimised_master_validation_titles_and_abstracts_medline.csv",
      "sha256_file": "evidence_files/
LLM_optimised_master_validation_titles_and_abstracts_medline.csv.hash",
      "ripemd160_file": "evidence_files/
LLM_optimised_master_validation_titles_and_abstracts_medline.csv.2ha",
      "ots_file": "evidence_files/
LLM_optimised_master_validation_titles_and_abstracts_medline.csv.hash.ots",
      "validation_step": "Confirmed real-time file integrity using
`HashValidatorBlock.py`. Disk SHA256 and RIPEMD160 match validated against pre-
recorded .hash and .2ha files. OpenTimestamps .ots located and confirmed. Canonical
validation successful under VALIS v1.0.",
      "template_ref": "VALIS_Template_Canonical_v1.py"
    },
    "output": {
      "status": "verifiable",
      "verifiable": true,
      "sha256":
"d7f5bd17511ec40abdd70fc7596404deec32a352a715917e465751b186f645f8",
      "ripemd160": "07b5d0cb25eac463b6927b25cc7c7ba87cd8b211"
    },
    "audit": {
      "AI_used": true,
      "LLM_used": "LLM1",
      "human_verified": true,
      "module_version": "v1.0.0",
      "AI_override": false
    },
    "timestamp_confirmed": true
  }
]
```

Cryptographic Hashes (from .json)

- **SHA256 (.hash):**

abd377fe88ee2ee6e63ffd1a7740124c6ab96117b1513cb8289542d3f16be761

- **RIPEMD160 (.2ha):**

724d1ecda32332f344beec348e46e5f53378cd85

OTS Validation

- **File:** audit_log_MVP1-SR079_20250702T024908.355401Z.hash.ots

- **SHA256:** a41b3c5a2806d8275fb2dbeb0293c5149dcc11b6616f35d3821f3c357e36b8c0

- **Bitcoin TXID:**

514a4c62efd354a39ce2359a9cf80125135ba10aeedfb2492298d3f532c87772

- **Bitcoin Block:** 903607

- **Date of Existence:** 2025-07-02 AEST

- **Merkle Root:** 177fbc83686f898fef588db2ac224473fd7d6ed33a6c2a380eed949698f1c114

Audit Record:

- **File Name:** audit_log_MVP1-SR080_20250702T035846.082291Z.json

- **meta_id:** MVP1-SR080

- **Timestamp:** 20250702T035846.082291Z

- **Classification:** EVIDENCE_FILE

- **Subcategory:** Immutable Audit Log - CSV Integrity Check (Master vs Split, MVP-2.5)

- **LLM Used:** LLM1, LLM2

- **Commander Verified:** true

- **AI Used:** true

- **Relevance Score (1–5):** 5

- **Required in Final Publication?** Yes

- **Summary:** Evidence

log HumanAuditMasterandSplitCSVIntegrityCheck.md confirmed immutable via SHA256, RIPEMD160, and OpenTimestamps. Validated using HashValidatorBlock.py under VALIS Template v1.0. Ensures file parity and split logic correctness across CSV batch processing during MVP-2.5 audit.

- **File Contents:**

```
[
  {
    "timestamp": "2025-07-02T03:58:46.082083Z",
    "event": "AUDIT_FILE_IMMUTABILITY_LOGGED",
    "meta_id": "MVP1-SR080",
    "input": {
      "document_title": "MVP-2.5 | CSV Integrity Verification \u2013 Master vs Split Audit",
      "filename": "HumanAudit_Master_and_Split_CSV_Integrity_Check.md",
      "evidence_path": "evidence_files/
HumanAudit_Master_and_Split_CSV_Integrity_Check.md",
      "sha256_file": "evidence_files/
HumanAudit_Master_and_Split_CSV_Integrity_Check.md.hash",
      "ripemd160_file": "evidence_files/
HumanAudit_Master_and_Split_CSV_Integrity_Check.md.2ha",
      "ots_file": "evidence_files/
HumanAudit_Master_and_Split_CSV_Integrity_Check.md.hash.ots",
      "validation_step": "Validated under `HashValidatorBlock.py` with strict
audit enforcement.\nDisk SHA256 and RIPEMD160 matched `.hash` and `.2ha` files
respectively.\nOpenTimestamps `.ots` file confirmed and present.\nAudit conducted
under VALIS v1.0 protocol.",
      "template_ref": "VALIS_Template_Canonical_v1.py"
    },
    "output": {
      "status": "verifiable",
      "verifiable": true,
      "sha256":
"fcccc201b76aa39a4e84b8b5dc64cf06cb4d9fa9a1a8484d539ae98c861069f34",
      "ripemd160": "a74a790cbc7a63e9dd02fa0a79756ee6c8eb5bd7"
    },
    "audit": {
      "AI_used": true,
      "LLM_used": "LLM1, LLM2",
      "human_verified": true,
      "module_version": "v1.0.0",
      "AI_override": false
    },
    "timestamp_confirmed": true
  }
]
```

Cryptographic Hashes (from .json)

- **SHA256 (.hash):**

294a6e075b7b6a4b4eef710c245b75eb3d0e533067e9f0488a70fba0a54f6f3f

- **RIPEMD160 (.2ha):**

5a1959d00ea5e0303b9fe452599bc924c43de656

OTS Validation

- **File:** audit_log_MVP1-SR080_20250702T035846.082291Z.hash.ots

- **SHA256:** 693d4312072029c9ed1954ab1d77ea230f7d38ddfc5d5357f8e21023164c5045

- **Bitcoin TXID:**

514a4c62efd354a39ce2359a9cf80125135ba10aeeedfb2492298d3f532c87772

- **Bitcoin Block:** 903607
 - **Date of Existence:** 2025-07-02 AEST
 - **Merkle Root:** 177fbc83686f898fef588db2ac224473fd7d6ed33a6c2a380eed949698f1c114
-

Audit Record:

- **File Name:** audit_log_MVP1-SR081_20250702T051120.525235Z.json
- **meta_id:** MVP1-SR081
- **Timestamp:** 20250702T051120.525235Z
- **Classification:** EVIDENCE_FILE
- **Subcategory:** Immutable Audit Log - CSV-to-Markdown Conversion Integrity (MVP-2.5)
- **LLM Used:** LLM1
- **Commander Verified:** true
- **AI Used:** true
- **Relevance Score (1–5):** 5
- **Required in Final Publication?** Yes
- **Summary:** Audit file HumanAuditCSVtoMDconversionIntegrity_Check.md sealed using SHA256, RIPEMD160, and OpenTimestamps. HashValidatorBlock.py confirmed disk-file parity and VALIS v1.0 compliance. Validates structural fidelity and integrity of CSV-to-Markdown transformation for MVP-2.5 documentation.
- **File Contents:**

```
[
  {
    "timestamp": "2025-07-02T05:11:20.525020Z",
    "event": "AUDIT_FILE_IMMUTABILITY_LOGGED",
    "meta_id": "MVP1-SR081",
    "input": {
      "document_title": "MVP-2.5 | CSV\u2013to\u2013Markdown Conversion
Integrity Audit",
      "filename": "HumanAudit_CSVtoMDconversion_Integrity_Check.md",
      "evidence_path": "evidence_files/
HumanAudit_CSVtoMDconversion_Integrity_Check.md",
      "sha256_file": "evidence_files/
HumanAudit_CSVtoMDconversion_Integrity_Check.md.hash",
      "ripemd160_file": "evidence_files/
HumanAudit_CSVtoMDconversion_Integrity_Check.md.2ha",
      "ots_file": "evidence_files/
HumanAudit_CSVtoMDconversion_Integrity_Check.md.hash.ots",
      "validation_step": "Validated under `HashValidatorBlock.py` with strict
audit enforcement.\nDisk SHA256 and RIPEMD160 matched `.hash` and `.2ha` files
respectively.\nOpenTimestamps `.ots` file confirmed and present.\nAudit conducted
under VALIS v1.0 protocol.",
      "template_ref": "VALIS_Template_Canonical_v1.py"
    },
    "output": {
      "status": "verifiable",
      "verifiable": true,
      "sha256":
"5a675195fa45835f635778d4be49377104eb6789e7c7c79a3979907a6e77654b",
      "ripemd160": "961dba6bf228e42cb3e748057e005dfa81f435b9"
    },
    "audit": {
      "AI_used": true,
      "LLM_used": "LLM1",
      "human_verified": true,
      "module_version": "v1.0.0",
      "AI_override": false
    },
    "timestamp_confirmed": true
  }
]
```

Cryptographic Hashes (from .json)

- **SHA256 (.hash):**

1a6873dc04b934160a1c569fd1b141aa0ce6fe5e0c7193342508b846b9f3c896

- **RIPEMD160 (.2ha):**

bdb6c87e234daf51bce2c0e488805cd1b7fd223c

OTS Validation

- **File:** audit_log_MVP1-SR081_20250702T051120.525235Z.hash.ots

- **SHA256:** 0168998c0f35da3c10881f97d310d86b8d66129535cb2597d6c485cf1ec49f4b

- **Bitcoin TXID:**

48e0d8e87c6585302707d2ffa0f5269b8bda165d6fa520bdc2021c9f91481939

- **Bitcoin Block:** 903620
 - **Date of Existence:** 2025-07-02 AEST
 - **Merkle Root:** 7106853f1642207bc9591e8ffd64630ed850f442856153e1e916d507f55bf752
-

Audit Record:

- **File Name:** audit_log_MVP1-SR082_20250702T052738.708728Z.json
- **meta_id:** MVP1-SR082
- **Timestamp:** 20250702T052738.708728Z
- **Classification:** INFRASTRUCTURE_LOG
- **Subcategory:** Markdown Upload - LLM2 Validator Integration (MVP-2.5 Medline Phase)
- **LLM Used:** LLM1, LLM2
- **Commander Verified:** true
- **AI Used:** true
- **Relevance Score (1–5):** 5
- **Required in Final Publication?** Yes
- **Summary:** 66 hash-locked markdown audit files uploaded to LLM2 Validator memory for the MVP-2.5 Medline Validation Phase. Upload confirmed under VALIS Template v1.0 with prior conversion integrity validated in MVP1-SR081 . Enables meta_id verification, eligibility screening, and downstream parsing by LLM4 under audit control.
- **File Contents:**


```
[
  {
    "timestamp": "2025-07-02T05:27:38.708540Z",
    "event": "MVP2_MARKDOWN_UPLOAD_TO_LLM2_VALIDATOR",
    "meta_id": "MVP1-SR082",
    "input": {
      "session_scope": "Upload of markdown-split audit files for Medline
Validation Phase",
      "total_files_uploaded": 66,
      "source_document":
"LLM_optimised_master_validation_titles_and_abstracts_medline.csv",
      "conversion_audit": "HumanAudit_CSVtoMDconversion_Integrity_Check.md",
      "validator_target": "LLM2 \u2013 Validator",
      "upload_path": "Sentinel Protocol v3.0 Workspace \u2013 Validator
Memory",
      "purpose": "Enable LLM2-based meta_id verification, document integrity
analysis, and downstream eligibility screening within MVP2.5 under AI\u2013Human
Synergy\u2013.",
      "notes": "Uploaded markdown files were converted directly from integrity-
audited, hash-locked CSVs. All conversion, metadata tracking, and audit steps were
confirmed under VALIS v1.0 protocol and CEM\u2013HASH-INTEGRITY enforcement."
    },
    "output": {
      "status": "Markdown batch uploaded successfully for LLM2 validation",
      "upload_status": "Live within Validator LLM2 vault memory",
      "next_step": "LLM4 parsing to commence from
`validation_medline_titles_and_abstracts_001.md` using updated eligibility prompt
stack (MVP2.5)",
      "linked_audit": "MVP1-SR081"
    },
    "audit": {
      "AI_used": true,
      "LLM_used": "LLM1, LLM2",
      "human_verified": true,
      "module_version": "v1.0.0",
      "AI_override": false
    },
    "timestamp_confirmed": true
  }
]
```

Cryptographic Hashes (from .json)

- **SHA256 (.hash):**

23c93302fddff5f1be2655ef9b76a1834164e0b456bcc2a05f489efe30680ddc

- **RIPEMD160 (.2ha):**

cd9c52a75abf7f681b6b71dd94f66bfe7227fce0

OTS Validation

- **File:** audit_log_MVP1-SR082_20250702T052738.708728Z.hash.ots

- **SHA256:** e166916aac283e905f2b35f127faaa2fa1096a6d114fa61317f7562c3610fcb6

- **Bitcoin TXID:**

904dc3188a65b3d4bd7f94e6416fd916ce9f73afb4b354de46f583ac5e116562

- **Bitcoin Block:** 903620
 - **Date of Existence:** 2025-07-02 AEST
 - **Merkle Root:** 7106853f1642207bc9591e8ffd64630ed850f442856153e1e916d507f55bf752
-

References

1. Sentinel Protocol v3.0

Telles, Fernando. *Sentinel Protocol v3.0 – AI–Human Synergy™ Infrastructure Technical Summary for Intellectual Property & Strategic Briefing*. CDA AI Pty Ltd, June 2025.

DOI: [10.13140/RG.2.2.20488.12803](https://doi.org/10.13140/RG.2.2.20488.12803)

Zenodo: [10.5281/zenodo.15795252](https://zenodo.org/record/15795252)

2. Sentinel Protocol v3.1

Telles, Fernando. *Sentinel Protocol v3.1 – Infrastructure Reproducibility and Public Verification Log*. CDA AI Pty Ltd, July 2025.

DOI: [10.13140/RG.2.2.29180.65924](https://doi.org/10.13140/RG.2.2.29180.65924)

Zenodo: [10.5281/zenodo.16607606](https://zenodo.org/record/16607606)

3. Ordinal 06 – Public Guide for Independent Reproducibility Verification






Telles, Fernando; Hookey, Benjamin; Woo, Andrew. *Ordinal 06 – Immutable Verification of Infrastructure Audit Log (Ordinal 05) under Sentinel Protocol v3.1*. CDA AI Pty Ltd, July 2025.



DOI: [10.13140/RG.2.2.21019.78882](https://doi.org/10.13140/RG.2.2.21019.78882)


Zenodo: [10.5281/zenodo.16777715](https://zenodo.org/record/16777715)

Contact & Custodian

Governor / Inventor:

Dr. Fernando Telles BMedSc(Adv) MD(Dist)  Dr.Telles@aihumansynergy.org  <https://www.aihumansynergy.org>  CDA AI I  AI–Human Synergy™ IP Custodian  This audit log was immutably published on the Bitcoin blockchain via Ordinal inscription on **05 August 2025**.

 TXID: [fc109ea70abb520f025c156c945991f48cb7f84c5d32f2a9cc26d0e46f35e088](https://ordinals.com/tx/fc109ea70abb520f025c156c945991f48cb7f84c5d32f2a9cc26d0e46f35e088) Block: 908,664  Viewable on-chain at: <https://ordinals.com/tx/fc109ea70abb520f025c156c945991f48cb7f84c5d32f2a9cc26d0e46f35e088>

 Wallet:

[bc1pa3695d7x3c13k4xut599s6e8yfj15876uwpq82fqy4tsazxn77sss53mht](https://ordinals.com/wallet/bc1pa3695d7x3c13k4xut599s6e8yfj15876uwpq82fqy4tsazxn77sss53mht)