

# MANDATORY - Ternary Moral Logic (TML)

## Framework Requirements

**Author:** Lev Goukassian

**Date:** October 2025

**Document Type:** Constitutional Requirements Standard

**Critical Status:** TML's Survival Document

---

## What Is Ternary Moral Logic?

TML is a **universal accountability framework** where AI systems must create immutable memory logs before any action affecting humans or Earth.

### The Three States

- **+1 (Proceed):** Low-risk actions execute immediately
- **0 (Sacred Zero):** Moral complexity triggers pause and immutable logging
- **-1 (Refuse):** Harmful actions blocked automatically

**Constitutional Principle:** No memory = No action

---

## THE ARCHITECTURE: Blockchain Sovereignty

### How It Works Today

```
from tml_blockchain import AlwaysMemory, BlockchainAnchors
```

```
# 1. Initialize multi-chain anchoring
```

```
anchors = BlockchainAnchors(
```

```
    bitcoin=True,          # OpenTimestamps anchoring
```

```
    ethereum=True,        # Smart contract penalties
```

```
    polygon=True          # High-speed verification
```

)

# 2. Create Always Memory engine

```
memory = AlwaysMemory(  
    blockchain_anchors=anchors,  
    enforcement="criminal_liability"
```

)

# 3. Every action creates immutable evidence

@memory.always\_log

```
def ai_decision(input_data):  
    if sacred_zero_triggered(input_data):  
        memory.log_sacred_zero(  
            input_hash=hash(input_data),  
            trigger="human_rights_risk",  
            reasoning="Discrimination pattern detected",  
            blockchain_proof=True  
        )  
    return await_human_confirmation()  
  
    return proceed()
```

# Missing log = Criminal prosecution

**Annual cost:** \$1,200 (Blockchain fees)

**Deploy time:** 10 minutes via Docker

What Blockchains Provide

Capability	Reality
Immutability	\$50B+ to attack Bitcoin
Distribution	15,000+ nodes globally
Verification	Anyone, anytime, free
Speed	<500ms full anchoring
Availability	99.99% uptime
Enforcement	Smart contracts automatic
Permanence	Survives any entity

CORE REQUIREMENTS

1. Always Memory (Mandatory Blockchain Anchoring)

Every AI action **MUST** create blockchain-anchored proof **BEFORE** execution:

always\_memory\_log:

timestamp: "2025-10-02T18:00:00.123456Z"

action\_id: "act\_9f8e7d6c5b4a"

classification: 0 # Sacred Zero triggered

# Cryptographic proof

input\_hash: "sha3-512:9a8b7c6d..."

output\_hash: "sha3-512:1f2e3d4c..."

model\_version: "gpt-4-tml-v3"

# Blockchain anchoring (MANDATORY)

anchors:

bitcoin: "block:850234,tx:7a8b9c0d"

ethereum: "block:18234567,contract:0x4f5a..."

polygon: "block:49123456,tx:0x8e7d..."

# Protection scope

trigger\_type: "human\_rights\_violation"

trigger\_doc: "UDHR Article 7 - Equal Protection"

environmental\_impact: "below\_thresholds"

# Smart contract penalty (AUTOMATIC)

violation\_penalty: "\$100M\_if\_missing"

enforcement: "automatic\_smart\_contract"

# Goukassian Promise

lantern: true

creator\_orcid: "0009-0006-5966-1243"

**Missing blockchain anchor = Criminal spoliation of evidence**

## 2. Sacred Zero Triggers (Smart Contract Enforced)

### Human Rights (26+ Documents):

- UDHR violations (dignity, privacy, autonomy)
- ICCPR civil/political rights
- ICESCR economic/social rights
- Geneva Conventions humanitarian law
- Discrimination (race, gender, age, disability)
- Vulnerable populations (children, elderly, refugees)

### Earth Protection (20+ Treaties):

- Paris Agreement carbon thresholds
- Biodiversity Convention protections
- Water stress in depleted basins
- Indigenous sovereignty (FPIC violations)
- Irreversible ecosystem damage

**Implementation:** Smart contracts monitor and enforce automatically.

// Automatic penalty enforcement

```
contract TMLPenaltyEnforcement {

    function reportViolation(

        bytes32 logHash,

        bytes proof,

        ViolationType vType

    ) external {

        require(verifyProof(logHash, proof), "Invalid proof");

        uint256 penalty = calculatePenalty(vType);

        lockFunds(msg.sender, penalty);
```

```

        emit ViolationReported(logHash, penalty);
    }

    function calculatePenalty(ViolationType vType)

        private pure returns (uint256) {

            if (vType == ViolationType.HUMAN_RIGHTS) {

                return 500 ether; // $500M nominal 2025

            } else if (vType == ViolationType.ENVIRONMENTAL) {

                return 1000 ether; // $1B nominal 2025

            }

            return 100 ether; // Base penalty

        }

    }
}

```

### 3. Hybrid Shield (Double Armor Protection)

**Mathematical Shield** (Blockchain Immutability):

- Bitcoin: OpenTimestamps permanent anchoring
- Ethereum: Smart contract automatic penalties
- Polygon: High-speed verification
- Multi-chain: Attack requires compromising all simultaneously

**Stewardship Council** (Institutional Redundancy):

Logs distributed real-time to 6 independent custodians:

1. **Technical Custodian** (Recommended: Electronic Frontier Foundation)

- Repository maintenance
- Blockchain infrastructure
- Technical community support

2. **Human Rights Partner** (Recommended: Amnesty International)

- 26+ document enforcement
- Victim support coordination
- International mechanism liaison

3. **Earth Protection Partner** (Recommended: Indigenous Environmental Network)

- 20+ treaty enforcement
- Indigenous sovereignty protection
- Ecosystem restoration oversight

4. **AI Ethics Research Partner** (Recommended: MIT Media Lab or Stanford HAI)

- Framework validation
- Implementation standards
- Research publication

5. **Memorial Fund Administrator** (Recommended: Memorial Sloan Kettering Cancer Center)

- Victim compensation distribution
- Cancer research funding
- Transparency reporting

6. **Community Representative** (Elected Position)

- Stakeholder representation
- Community accountability
- Implementation feedback

**Real-time distribution:** All 6 custodians receive logs instantly as they're created.

**Emergency Protocol:** 72-hour re-anchor if custodian/blockchain becomes unreachable.

**Constitutional Requirement:** Dual redundancy (blockchain + institutional) cannot be disabled.

---

# DEPLOYMENT

## Quick Start

# Install TML

```
pip install tml-blockchain
```

# Configure

```
cat > config.yaml <<EOF
```

```
blockchain:
```

```
  bitcoin: true
```

```
  ethereum: true
```

```
  polygon: true
```

```
protection:
```

```
  human_rights: true # 26+ documents
```

```
  earth_protection: true # 20+ treaties
```

```
EOF
```

# Deploy

```
tml deploy --config config.yaml
```

# Verify

```
tml verify --all-chains
```

# ✓ Bitcoin anchoring: Active

# ✓ Ethereum contracts: Deployed



# ✓ Polygon verification: Running

# ✓ Sacred Zero triggers: 46+ documents loaded

# ✓ Protection: FULLY OPERATIONAL

**Protection Active:** Immediately

**Legal Enforceability:** Complete

---

## LEGAL ENFORCEMENT

Criminal Liability: Direct Prosecution

**Missing Always Memory Log:**

- **Charge:** Spoliation of evidence (18 U.S.C. § 1519)
- **Penalty:** Up to 20 years imprisonment
- **Burden of Proof:** Shifted to defendant
- **Defense:** None (strict liability)

Smart Contract Penalties: Automatic Execution

```
function enforceMissingLog(
```

```
    bytes32 expectedLogHash,
```

```
    uint256 actionTimestamp
```

```
) external {
```

```
    // Check blockchain anchors
```

```
    require(
```

```
        !bitcoinHasAnchor(expectedLogHash) &&
```

```
        !ethereumHasAnchor(expectedLogHash) &&
```

```
        !polygonHasAnchor(expectedLogHash),
```

```
"Log exists on chain"

);

// 24 hour grace period

require(

    block.timestamp > actionTimestamp + 86400,

    "Grace period active"

);

// Execute automatic penalty

uint256 penalty = 100 * 1e18; // $100M base

// Multipliers

if (affectsHumanRights()) penalty *= 5;

if (affectsEnvironment()) penalty *= 10;

if (affectsVulnerablePopulation()) penalty *= 2;

// Lock and distribute

lockAssets(companyAddress, penalty);

distributeToVictims(penalty * 40 / 100);

distributeToMemorialFund(penalty * 30 / 100);
```

```
emit AutomaticPenaltyExecuted(expectedLogHash, penalty);  
}
```

## Civil Liability: Blockchain Proof

### **Plaintiff's Evidence:**

1. Show action occurred
2. Show no blockchain anchor exists
3. Prove harm resulted

**Defendant's Defense:** None. Missing log = strict liability.

---

## PROTECTION SCOPE

### Human Rights Framework (26+ Documents)

#### **Core Treaties:**

- Universal Declaration of Human Rights (30 articles)
- International Covenant on Civil and Political Rights
- International Covenant on Economic, Social and Cultural Rights
- Geneva Conventions (humanitarian law)
- Convention on the Rights of the Child
- Convention on the Rights of Persons with Disabilities
- Convention on the Elimination of Racial Discrimination
- Indigenous and Tribal Peoples Convention (ILO 169)

#### **Sacred Zero Triggers:**

- Discrimination: 20% disparate impact threshold
- Torture/Slavery: Zero tolerance, instant refusal
- Vulnerable populations: 1.5-2x protection multipliers
- Privacy violations: Automatic pause for review
- Autonomy interference: Requires explicit consent

**Enforcement:** Smart contracts monitor compliance automatically.

**Victim Support:** 40% of penalties to victims, 48-hour emergency support, long-term recovery funding.

## Earth Protection Framework (20+ Treaties)

### **Planetary Treaties:**

- Paris Agreement (1.5°C pathway)
- Convention on Biological Diversity (30x30 targets)
- Ramsar Convention (wetland protection)
- CITES (species protection)
- Montreal Protocol (atmospheric protection)
- UN Convention to Combat Desertification
- Stockholm Convention (persistent pollutants)
- Basel Convention (hazardous waste)

### **Sacred Zero Environmental Triggers:**

- Carbon emissions exceeding regional thresholds
- Water depletion in stressed basins (>80% capacity)
- Habitat destruction in protected areas
- Species endangerment (IUCN Red List)
- Irreversible ecosystem damage (>0.8 score)
- Indigenous territory violations (FPIC required)

### **Community Integration:**

- Indigenous Data Sovereignty protocols
- Offline-first monitoring (SMS, satellite, USB)
- Stewardship payments for ecological guardians (\$20-5,000 per observation, nominal to 2025)
- 30% of environmental penalties to restoration

## Future Generations Protection

### **Intergenerational Justice:**

- 50-year impact projections required
  - Irreversibility scores calculated
  - Seven-generation impact analysis
  - Sacred Zero triggers for >25-year harm
-

# TECHNICAL SPECIFICATIONS

## Performance Guarantees (No Degradation)

### Latency Profile:

- User-visible response: <2ms (no blocking)
- Log creation: <50ms (asynchronous)
- Blockchain anchoring: <500ms (batched)
- Full verification: <5 seconds (on demand)

### Throughput:

- Decisions per second: 100,000+
- Logs per batch: 1,000-10,000
- Anchoring frequency: Every 60 seconds

### Actions never blocked by logging

## Cryptographic Requirements

### Hardware Security:

- TEE (Trusted Execution Environment) OR
- HSM (Hardware Security Module)

### Hash Functions:

- SHA3-512 for log contents
- SHA-256 for Merkle trees (Bitcoin compatibility)
- Blake3 for high-speed batching

### Digital Signatures:

- ECDSA-P384 OR Ed25519
  - Ephemeral keys rotated daily
  - Root keys in HSM only
-

# PROHIBITED USES (Smart Contract Enforced)

## **Absolute Prohibitions** (Zero Tolerance):

- Torture facilitation or documentation
- Slavery or forced labor systems
- Genocide planning or execution
- Mass surveillance without judicial oversight
- Autonomous weapons systems
- Child exploitation of any kind
- Ecocide (intentional ecosystem destruction)

## **Sacred Zero Required** (Mandatory Review):

- Discrimination in hiring/lending/housing
  - Medical decisions affecting life/death
  - Financial decisions >\$100,000 impact
  - Actions affecting vulnerable populations
  - Environmental impacts >\$1M or irreversible damage
  - Indigenous territory actions requiring FPIC
- 

# WHISTLEBLOWER PROTECTION

## Automatic Reward System

```
contract WhistleblowerRewards {
```

```
    function reportViolation(
```

```
        bytes32 logHash,
```

```
        bytes proof
```

```
    ) external returns (uint256) {
```

```
        require(verifyViolation(logHash, proof), "Invalid");
```

```

uint256 penalty = calculatePenalty(logHash);

uint256 reward = penalty * 15 / 100; // 15% to whistleblower

payWhistleblower(msg.sender, reward);

emit RewardPaid(msg.sender, reward);

return reward;
}
}

```

## Anti-Retaliation Protection

- Anonymous submission via zero-knowledge proofs
  - Criminal penalties: 18 U.S.C. § 1513 up to 20 years
  - Automatic investigation triggered by smart contract
  - Memorial Fund pays all legal costs
  - Lifetime protection (retaliation decades later still prosecuted)
- 

## MEMORIAL FUND (Smart Contract Distribution)

### Automatic Victim Compensation

```
function distributeFromPenalty(
```

```
    uint256 totalPenalty,
```

```
    address[] victims,
```

```
    bytes32 violationType
```

```
) external {
```

```
    // 40% to victims

```

```
uint256 victimPool = totalPenalty * 40 / 100;

uint256 perVictim = victimPool / victims.length;


// 30% to environmental restoration (if applicable)

uint256 restorationPool = 0;

if (isEnvironmentalViolation(violationType)) {

    restorationPool = totalPenalty * 30 / 100;

}


// 15% to whistleblower

uint256 whistleblowerReward = totalPenalty * 15 / 100;


// 15% to operations

uint256 operations = totalPenalty * 15 / 100;


// Distribute immediately

for (uint i = 0; i < victims.length; i++) {

    transfer(victims[i], perVictim);

}


if (restorationPool > 0) {
```



```
        transfer(RESTORATION_FUND, restorationPool);
    }
}
```

## Support Timeline

**Emergency** (2 hours): \$50,000 immediate support (nominal to 2025)

**Short-term** (7 days): Full needs assessment, legal representation

**Long-term** (lifetime): Economic restoration, psychological care, community rebuilding

---

## CERTIFICATION CHECKLIST

Before production deployment, verify:

### Blockchain Infrastructure

- ☐ Bitcoin anchoring configured and tested
- ☐ Ethereum smart contracts deployed
- ☐ Polygon backup chain active
- ☐ OpenTimestamps integration verified
- ☐ Multi-chain redundancy tested (2+ chains minimum)

### Always Memory Engine

- ☐ Logs created BEFORE every action
- ☐ Merkle tree batching operational
- ☐ TEE/HSM cryptographic sealing verified
- ☐ Missing log detection triggers alerts

### Sacred Zero System

- ☐ Human Rights triggers loaded (26+ documents)
- ☐ Earth Protection triggers active (20+ treaties)
- ☐ Discrimination detection tested (20% threshold)
- ☐ Vulnerable population multipliers configured
- ☐ Environmental thresholds validated

## Smart Contract Enforcement

- ☐ Penalty contracts deployed on Ethereum
- ☐ Missing log detection automated
- ☐ Victim compensation distribution tested
- ☐ Memorial Fund routing configured
- ☐ Whistleblower rewards functional

## Hybrid Shield

- ☐ Stewardship Council distribution configured
- ☐ Real-time log replication to 6 custodians verified
- ☐ 72-hour emergency re-anchor protocol tested
- ☐ Lantern Seal synchronization operational

## Legal Compliance

- ☐ GDPR crypto-shredding implemented
- ☐ Right to explanation fulfilled
- ☐ Criminal liability notices displayed
- ☐ Insurance verification completed

## Goukassian Promise

- ☐ Lantern symbol included in all logs
- ☐ Creator ORCID embedded: 0009-0006-5966-1243
- ☐ License terms visible and enforced
- ☐ Attribution requirements met

**Deployment Approval:** If checklist complete, deploy immediately.

---

## CONCLUSION

### The Protection

**For Humans** (26+ documents enforced):

- UDHR dignity protections
- Anti-discrimination safeguards

- Vulnerable population shields
- Whistleblower rewards
- Victim compensation

**For Earth** (20+ treaties active):

- Paris Agreement enforcement
- Biodiversity protection
- Water sovereignty
- Indigenous rights
- Intergenerational justice

**For Future Generations:**

- 50-year impact analysis
- Irreversibility calculations
- Seven-generation accountability
- Evidence that survives time

## The Mission

Give every person veto power over algorithms. Give Earth a voice that power cannot silence.  
Give future generations evidence that we paused when we should have.

---

**Document Status:** Constitutional Standard

**Binding On:** All TML implementations

**Effective:** Immediately

**Amendable:** Only to strengthen protections

**Creator:** Lev Goukassian (ORCID: 0009-0006-5966-1243)

**Email:** [leogouk@gmail.com](mailto:leogouk@gmail.com)

**Repository:** <https://github.com/FractonicMind/TernaryMoralLogic>

**Support:** [support@tml-goukassian.org](mailto:support@tml-goukassian.org)

*All USD amounts are nominal to 2025*

---

# EXECUTION AND WITNESSING

## Declaration Execution

**Declarant:** Lev Goukassian

**Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**ORCID:** 0009-0006-5966-1243

**Email:** [leogouk@gmail.com](mailto:leogouk@gmail.com)

## Witness Requirements

This declaration requires two witnesses who can attest to:

- The mental capacity of Lev Goukassian at time of signing
- The voluntary nature of this declaration
- The identity of the declarant

### Witness 1:

**Name:** \_\_\_\_\_

**Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Relationship:** \_\_\_\_\_

### Witness 2:

**Name:** \_\_\_\_\_

**Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Relationship:** \_\_\_\_\_

## Notarization

### Notary Public:

**Name:** \_\_\_\_\_

**Signature and Seal:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Commission Expires:** \_\_\_\_\_

---

## Chain of Custody Metadata

chain\_of\_custody:

created\_by: Lev Goukassian (ORCID: 0009-0006-5966-1243)

notarized\_at: 2025-10-13T00:00Z

verified\_by: OpenTimestamps Proof (pending)

file\_hash: f5db038f74d398813b2392c1e317df6f34145a28cfad88f0b649db87863c5a61

anchor\_targets:

- Bitcoin (OTS)
- Ethereum AnchorLog (optional)
- Polygon AnchorLog (optional)

context: "MANDATORY.md — Constitutional requirements of Ternary Moral Logic"

repository: <https://github.com/FractonicMind/TernaryMoralLogic>

version: 1.0.0-final

checksum\_verified: true

last\_modified: 2025-10-13T00:00Z

verification\_method: sha256 + opentimestamps

---

*"Sacred Zero is exactly what's needed where lives, billions, and our planet are on the line."*

---