# Smart Contract Security Audit V1

# **IncubateX NFT Smart Contract**

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# Background

The purpose of the audit was to achieve the following:

- Ensure that the smart contract functions as intended.
- Identify potential security issues with the smart contract.

The information in this report should be used to understand the risk exposure of the smart contract, and as a guide to improve the security posture of the smart contract by remediating the issues that were identified.

# **Project Information**

- Platform: Polygon Network
- Contract Address: 0x846ea1212276F9db7E26218c026E66eB00c05f3f
- Code:

https://ropsten.etherscan.io/address/0xb56a656907ba4ea34daa106412b52253b8ea0bd2#code

• The Code:

https://mumbai.polygonscan.com/address/0x489bF55C961Fb94d732ED6C7Af97f343603087aC#code

#### **NFT** Information

• Name: IX

• Total Supply: 22222

- Holders:
- Total transactions:

## Contracts address deployed to test net (Polygon Network)

IncubateX NFT Smart contract on Polygon test net to test write functions by the auditor.

https://mumbai.polygonscan.com/address/0x846ea1212276f9db7e26218c026e66eb00c05f3f

# **Executive Summary**

According to our assessment, the customer's solidity smart contract is **Secured**.

Well Secured	
Secured	<b>√</b>
Poor Secured	
Insecure	

Automated checks are with remix IDE. All issues were performed by the team, which included the analysis of code functionality, manual audit found during automated analysis were manually reviewed and applicable vulnerabilities are presented in the audit overview section. The general overview is presented in the Project Information section and all issues found are located in the audit overview section.

Team found 0 critical, 0 high, 0 medium, 3 low, 0 very low-level issues and 0 note in all solidity files of the contract

The files:

IncubateX.sol

# File and Function Level Report

# File in Scope:

Contract Name	SHA 256 hash	Contract Address
incubateX.soi	b6df8bcfde41c117b1d9f7a2 5a159d0d0d4161591461bc2 6bc5c92abe456f789	0x846ea1212276F9db7E26218c026E66eB00c0 5f3f

• Contract: IncubateX

• Inherit: ERC721Enumerable, Ownable

• Observation: All passed including security check

• Test Report: passed

• Score: passed

• Conclusion: passed

Function	Test Result	Type / Return Type	Score
name	<b>√</b>	Read / public	Passed
symbol	<b>√</b>	Read / public	Passed
saleIsActive	<b>√</b>	Read / public	Passed
supportsInterface	<b>√</b>	Read / public	Passed
totalSupply	<b>√</b>	Read / public	Passed
balanceOf	<b>√</b>	Read / public	Passed
Owner	<b>√</b>	Read / public	Passed
genesisCount	<b>√</b>	Read / public	Passed
getMintedGenesisToken s	<b>√</b>	Read / public	Passed
getApprovedForAll	<b>√</b>	Read / public	Passed
ownerOf	<b>√</b>	Read / public	Passed
getApproved	<b>√</b>	Read / public	Passed

tokenURI	<b>√</b>	Read / public	Passed
tokenByIndex	✓	Read / public	Passed
tokenOfOwnerByIndex	✓	Read / public	Passed
PRICE_PER_NFT_Genes is	<b>√</b>	Read / public	Passed
PRICE_PER_NFT_Meta	✓	Read / public	Passed
verifyUserisWL	✓	Read / public	Passed
getMintedMetaCapsule	✓	Read / public	Passed
addUserWL	✓	Write / public	Passed
approve	<b>√</b>	Write / public	Passed
safeTransferFrom	<b>√</b>	Write / public	Passed
safeTransferFrom	<b>√</b>	Write / public	Passed
mintGenesisNft	<b>√</b>	Write / payable	Passed
mintMetaNft	<b>√</b>	Write / payable	Passed
transferOwnership	<b>√</b>	Write / public	Passed
setApprovalForAll	<b>√</b>	Write / public	Passed
transferFrom	✓	Write / public	Passed
withdrawAll	✓	Write / public	Passed
setMetaBaseURI	✓	Write / public	Passed
setGenesisPrice	✓	Write / public	Passed
renounceOwnership	✓	Write / public	Passed
withdraw	✓	Write / public	Passed
setMetaPrice	<b>√</b>	Write / public	Passed
setSaleIsActive	✓	Write / public	Passed

# **Issues Checking Status**

No.	Issue Description	Checking Status
1	Compiler warnings.	Passed
2	Race conditions and Reentrancy. Cross-function race conditions.	Passed
3	Possible delays in data delivery.	Passed
4	Oracle calls.	Passed
5	Design Logic.	Passed
6	Timestamp dependence.	Passed
7	Integer Overflow and Underflow.	Passed
8	DoS with Revert.	Passed
9	DoS with block gas limit.	Passed
10	Methods execution permissions.	Passed
11	Economy model. If application logic is based on an incorrect economic model, the application would not function correctly and participants would incur financial losses.  This type of issue is most often found in bonus rewards systems, Staking and Farming contracts, Vault and Vesting contracts, etc.	
12	The impact of the exchange rate on the logic.	Passed
13	Private user data leaks.	Passed
14	Malicious Event log.	Passed
15	Scoping and Declarations.	Passed
16	Uninitialized storage pointers.	Passed
17	Arithmetic accuracy. Passed	

# Severity Definitions

Risk Level	Description
Critical	Critical vulnerabilities are usually straightforward to exploit and can lead to tokens loss etc.
High	High-level vulnerabilities are difficult to exploit; however, they also have significant impact on smart contract execution, e.g. public access to crucial functions
Medium	Medium-level vulnerabilities are important to fix; however, they can't lead to tokens lose
Low	Low-level vulnerabilities are mostly related to outdated, unused etc. code snippets, that can't have significant impact on execution
Note	Lowest-level vulnerabilities, code style violations and info statements can't affect smart contract execution and can be ignored.

# Audit Findings

### **Critical:**

## #Logic errors

## Description

According to the business plan the team had sent to the auditor, the auditor had found these logic errors on the smart contract.

The Error	Description
Max Supply	The team want(11,111 IncubateX Genesis Membership & 11,111 Meta Access Capsule NFTs available for mint on mint day, for a total of 22,222 NFTs) The Max Supply is Unlimited.
Whitelist error	The team want (25% of the IncubateX NFTs will be available for whitelisted community members during the presale, 2,777 Genesis Membership NFTs and 2,777 Meta Access Capsule NFTs)  The error any one can mint the IX NFT at whitelist stage without being in the whitelist and there aren't any limits for minting at whitelist stage.
Secondary sales	If a member decides to independently sell their IncubateX NFT on the secondary market, they would be transferring the membership utility of that NFT to the new NFT holder.
	There will be a 10% royalty for secondary market sales for both the Genesis Membership NFT & Meta Access Capsule NFT.
	Revenue from royalties should go to to the same wallet as the project wallet for mint.
	The error this is normal NFT smart contract not royalty NFT contract.
Limits	Each wallet address is able to mint 10 of each of the NFTs; 10 IncubateX Genesis
	Membership NFTs & 10 Meta Access Capsules
	The error any address can hold any numbers there aren't any limits of holding IX Genesis or IX Meta.
Updates	This project is a private company project and we need to be able to make updates to the code later on if necessary.

The error after deploying the team can only change a few things on the code using the write functions like the price, baseURI, and withdraw the funds but they can't update the smart contract.

Status: Closed. Fixed in version 2.

#### High:

No High severity vulnerabilities were found.

#### **Medium:**

No Medium severity vulnerabilities were found.

#### Low:

#### #Missing zero address validation

#### Description

When the investor wants to add his address to the whitelist, he has to check for the zero address to make, he didn't add the burn address. Otherwise, the investor will lose some funds as gas.

```
function addUserWL(address _addressToWhitelist) public {
     whitelistedAddresses[_addressToWhitelist] = true;
}
```

#### Remediation

Use the require statement to check for zero addresses.

Status: Closed. Fixed in version 2.

#### #Pragam version not fixed

#### Description

It is a good practice to lock the solidity version for a live deployment (use 0.8.14 instead of ^0.8.7). contracts should be deployed with the same compiler version and flags that they have been tested the most with. Locking the pragma helps ensure that contracts do not accidentally get deployed using, for example, the latest compiler which may have higher risks of undiscovered bugs. Contracts may also be deployed by others and the pragma indicates the compiler version intended by the original authors.

#### Remediation

Remove the ^ sign to lock the pragma version.

Status: Closed. Fixed in version 2.

### #Owner privileges (In the period when the owner isn't renounced)

#### Description

The owner can change the Price at any time.

The owner can open or close the sale.

#### Remediation

Make these functions internal in next version or the team should announce the investors before open, close the sale or changing the price of the mint to give them time if they want to do anything.

P.S: This issue is common to the majority of NFT smart contracts.

Status: Acknowledged.

#### **Very Low:**

No Very Low severity vulnerabilities were found.

#### Notes:

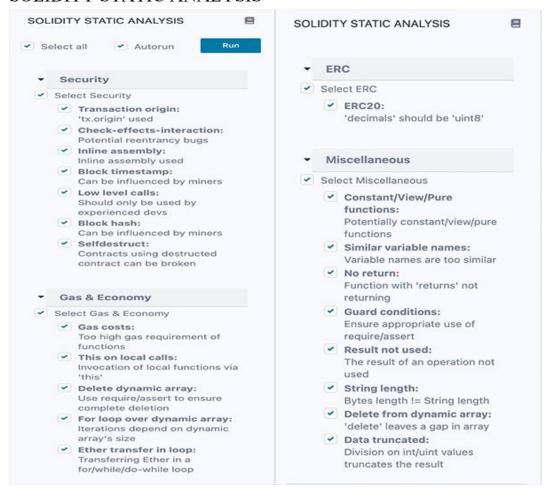
No Notes were found.

# **Automatic Testing**

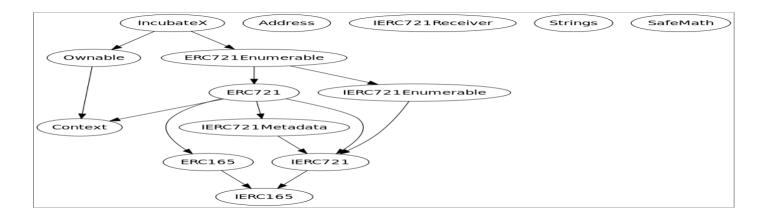
## 1- Check for security



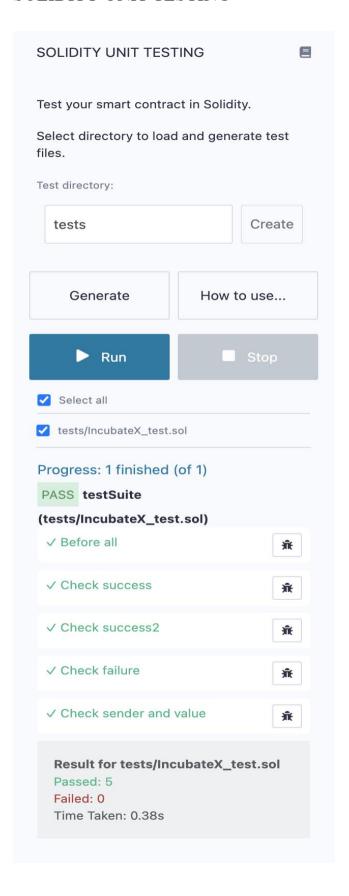
#### 2- SOLIDITY STATIC ANALYSIS



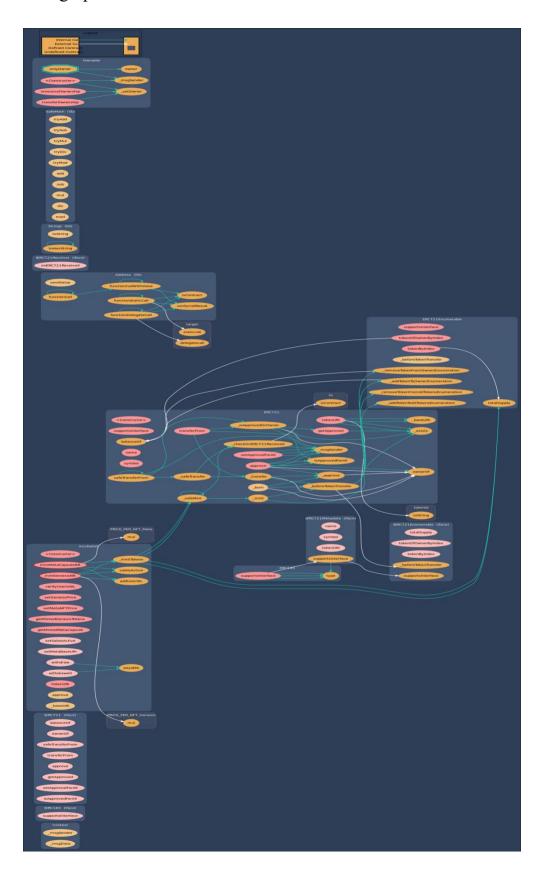
### 3- Inheritance graph



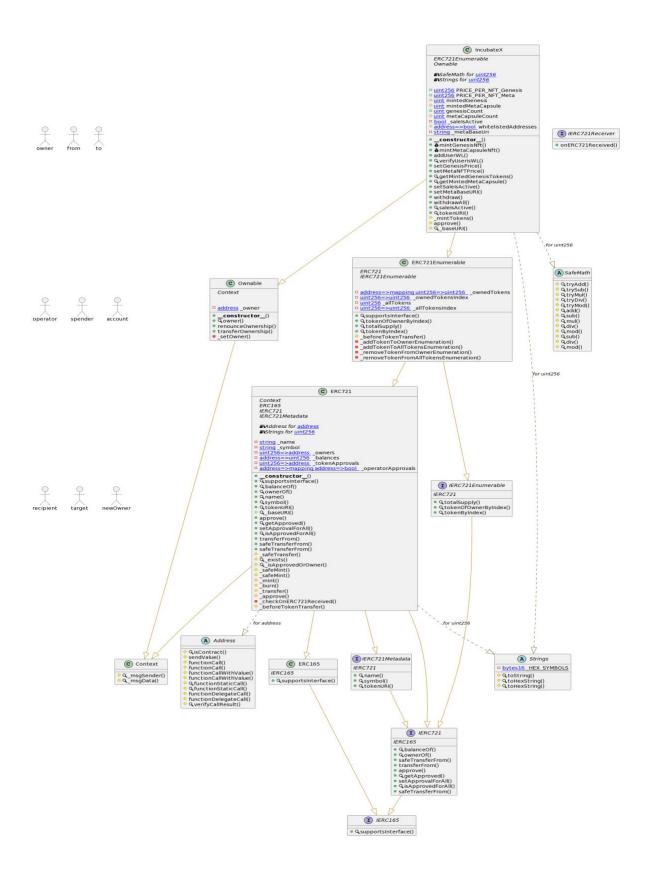
#### 4- SOLIDITY UNIT TESTING



# 5- Call graph



# Unified Modeling Language (UML)



## Functions signature

```
Sighash | Function Signature
_____
16279055 => isContract(address)
119df25f => _msgSender()
8b49d47e => _msgData()
01ffc9a7 => supportsInterface(bytes4)
70a08231 => balanceOf(address)
6352211e => ownerOf(uint256)
42842e0e => safeTransferFrom(address,address,uint256)
23b872dd => transferFrom(address,address,uint256)
095ea7b3 => approve(address, uint256)
081812fc => getApproved(uint256)
a22cb465 => setApprovalForAll(address,bool)
e985e9c5 => isApprovedForAll(address,address)
b88d4fde => safeTransferFrom(address,address,uint256,bytes)
06fdde03 => name()
95d89b41 => symbol()
c87b56dd => tokenURI(uint256)
c87b56dd => tokenURI(uint256)
743976a0 => _baseURI()
24b6b8c0 => _safeTransfer(address, address, uint256, bytes)
f8e76cc0 => _exists(uint256)
4cdc9549 => _isApprovedOrOwner(address, uint256)
b3e1c718 => _safeMint(address, uint256)
6a4f832b => _safeMint(address, uint256, bytes)
4e6ec247 => _mint(address, uint256)
9b1f9e74 => _burn(uint256)
30e0789e => _transfer(address, address, uint256)
7b7d7225 => _approve(address, uint256)
1fd01de1 => _checkOnERC721Received(address, address, uint256)
2da084df => sendValue(address, uint256)
a0b5ffb0 => functionCall(address, bytes)
                   checkOnERC721Received (address, address, uint256, bytes)
a0b5ffb0 => functionCall(address,bytes)
241b5886 => functionCall(address,bytes,string)
2a011594 => functionCallWithValue(address, bytes, uint256)
d525ab8a => functionCallWithValue(address, bytes, uint256, string)
c21d36f3 => functionStaticCall(address, bytes)
dbc40fb9 => functionStaticCall(address,bytes,string)
ee33b7e2 => functionDelegateCall(address,bytes)
57387df0 => functionDelegateCall(address, bytes, string)
946b5793 => verifyCallResult(bool, bytes, string)
150b7a02 => onERC721Received(address,address,uint256,bytes)
18160ddd => totalSupply()
2f745c59 => tokenOfOwnerByIndex(address,uint256)
4f6ccce7 => tokenByIndex(uint256)
6900a3ae => toString(uint256)
8fba8d5c => toHexString(uint256)
63e1cbea => toHexString(uint256,uint256)
884557bf => tryAdd(uint256,uint256)
a29962b1 => trySub(uint256,uint256)
6281efa4 => tryMul(uint256,uint256)
736ecb18 => tryDiv(uint256,uint256)
38dc0867 => tryMod(uint256,uint256)
771602f7 => add(uint256, uint256)
```

```
b67d77c5 => sub(uint256, uint256)
c8a4ac9c => mul(uint256, uint256)
a391c15b => div(uint256,uint256)
f43f523a => mod(uint256,uint256)
e31bdc0a => sub(uint256, uint256, string)
b745d336 => div(uint256, uint256, string)
71af23e8 => mod(uint256, uint256, string)
8da5cb5b => owner()
715018a6 => renounceOwnership()
f2fde38b => transferOwnership(address)
fc201122 => setOwner(address)
69025b5f => _addTokenToOwnerEnumeration(address,uint256)
e03d890b => _addTokenToAllTokensEnumeration(uint256)
68df0d53 => _removeTokenFromOwnerEnumeration(address,uint256)
4cbb4a0a => removeTokenFromAllTokensEnumeration(uint256)
c16fe148 => mintGenesisNft(uint16)
b49cc889 => mintMetaCapsuleNft(uint16)
d50a165b => addUserWL(address)
1c5c4200 => verifyUserisWL(address)
61f36462 => setGenesisPrice(uint256)
9b8b4533 => setMetaNFTPrice(uint256)
5dc2fefc => getMintedGenesisTokens()
c8050c71 => getMintedMetaCapsule()
02c88989 => setSaleIsActive(bool)
18d272eb => setMetaBaseURI(string)
2e1a7d4d => withdraw(uint256)
853828b6 => withdrawAll()
eb8d2444 => saleIsActive()
89c590ab => mintTokens(uint16,address,uint256)
febe4909 => approve(uint256,address)
```

## Automatic general report

```
Files Description Table
| File Name | SHA-1 Hash |
|-----|
| /Users/macbook/Desktop/smart contracts/IncubateX.sol |
168e2cb797fa871a0662e29504bc145f960cf2db |
Contracts Description Table
| Contract |
                  Type Bases
| **Function Name** | **Visibility** | **Mutability** |
**Modifiers** |
| **Context** | Implementation | ||| | | | | | | | | | | |
| L | msgData | Internal 🖺 | | |
| **IERC165** | Interface | |||
| L | supportsInterface | External | | | NO | |
| **IERC721** | Interface | IERC165 |||
| L | balanceOf | External | NO | |
| L | ownerOf | External | | NO| |
| L | safeTransferFrom | External | | NO | |
| L | transferFrom | External | | | | NO| |
| L | approve | External | | MO| |
| L | getApproved | External | | | NO | |
| L | setApprovalForAll | External | | | | | | | | | | | | | |
| L | isApprovedForAll | External | | NO | | | L | safeTransferFrom | External | | NO | |
| **IERC721Metadata** | Interface | IERC721 |||
| L | name | External | | NO | |
| L | symbol | External | | | NO | |
| L | tokenURI | External | | NO | |
| **ERC165** | Implementation | IERC165 |||
| L | supportsInterface | Public | | NO | |
| **ERC721** | Implementation | Context, ERC165, IERC721, IERC721Metadata | | |
| L | <Constructor> | Public | | ( ) | NO | |
| L | supportsInterface | Public | |
| L | balanceOf | Public | | NO | |
| L | ownerOf | Public | | NO | |
| L | symbol | Public | |
| L | tokenURI | Public | | NO | |
| L | baseURI | Internal A | | |
| L | approve | Public | | NO | |
```

```
L | getApproved | Public | | NO | |
 L | setApprovalForAll | Public | | ● | NO| |
| L | isApprovedForAll | Public | | NO | |
 | L | safeTransferFrom | Public | | ( □ )
| L | safeTransferFrom | Public | |
                             NO | NO | |
 L | _safeTransfer | Internal 🗎 | 🔘 | |
 L | exists | Internal 🖺 | | |
| L | isApprovedOrOwner | Internal 🖺 |
| L | safeMint | Internal 🖺 | 🔘
 L | safeMint | Internal 🖺 | 🔘 | |
 L | _mint | Internal 🖺 |
 L | transfer | Internal 🖺 | 🔘 | |
| L | approve | Internal 🖺 | 🔘 | |
 L | beforeTokenTransfer | Internal A | O | |
L | isContract | Internal A |
| L | sendValue | Internal 🖺 | 🔘
| L | functionCall | Internal A |
| L | functionCall | Internal A |
 L | functionCallWithValue | Internal
 L | functionCallWithValue | Internal 🖺 | 🔘
| L | functionStaticCall | Internal 🖺 |
| L | functionDelegateCall | Internal | A
| L | functionDelegateCall | Internal
 | **IERC721Receiver** | Interface | | | | |
| L | onERC721Received | External | |
| **IERC721Enumerable** | Interface | IERC721 |||
| L | totalSupply | External | | NO| |
 L | tokenOfOwnerByIndex | External | | | NO | |
| L | tokenByIndex | External | | NO| |
| **Strings** | Library | |||
| L | toString | Internal 🖺 |
| L | toHexString | Internal A
| L | toHexString | Internal A |
| **SafeMath** | Library |
| L | tryAdd | Internal 🦳
| L | trySub | Internal 🖺
| L | tryMul | Internal
| L | tryDiv | Internal
L | tryMod | Internal
| L | add | Internal A | L | sub | Internal A
| L | mul | Internal A
| L | div | Internal
| L | mod | Internal A |
```

```
| L | sub | Internal 🖺 | | | | | | |
| L | div | Internal A | | |
| L | mod | Internal A | | |
| **Ownable** | Implementation | Context |||
| Constructor> | Public | | NO | |
| L | owner | Public | | NO | |
| L | renounceOwnership | Public | | OnlyOwner | L | transferOwnership | Public | OnlyOwner |
| L | _setOwner | Private 🖺 | 🔘 | |
| **ERC721Enumerable** | Implementation | ERC721, IERC721Enumerable | | |
| L | tokenOfOwnerByIndex | Public | | NO | |
| L | totalSupply | Public | | NO | |
| L | tokenByIndex | Public | | NO
| L | _beforeTokenTransfer | Internal 🖺 | 🔘 | |
| L | addTokenToOwnerEnumeration | Private 🖺 | 🔘 | |
| L | addTokenToAllTokensEnumeration | Private 🖺 | 🔘 | |
| L | removeTokenFromAllTokensEnumeration | Private 🖺 | 🔘
| **IncubateX** | Implementation | ERC721Enumerable, Ownable ||| | | | |
| L | mintGenesisNft | Public | | III | NO | |
| L | mintMetaCapsuleNft | Public | | I I I NO | |
| L | addUserWL | Public | | | NO | |
| L | verifyUserisWL | Public | | NO | |
| L | setGenesisPrice | Public | | onlyOwner | L | setMetaNFTPrice | Public | onlyOwner |
 L | getMintedGenesisTokens | Public | | NO | |
 L | setMetaBaseURI | External | | | | onlyOwner |
| L | withdraw | External [ | _ ① | onlyOwner | |
| L | withdrawAll | External [ | OnlyOwner |
| L | saleIsActive | Public | | NO | |
| L | tokenURI | Public | | NO | |
| L | mintTokens | Internal 🖺 | 🔘 | |
| L | approve | Internal 🖺 | 🔘 | |
| L | baseURI | Internal 🖺 | | |
Legend
| Symbol | Meaning |
|:----|
   Function can modify state |
| Function is payable |
```

## Conclusion

The contracts are written systematically. Team found no critical issues in version 2. So, it is good to go for production.

Since possible test cases can be unlimited and developer level documentation (code flow diagram with function level description) not provided, for such an extensive smart contract protocol, we provide no such guarantee of future outcomes. We have used all the latest static tools and manual observations to cover maximum possible test cases to scan Everything.

Security state of the reviewed contract is "Secured".

√ No Critical logic issues were found.

## Disclaimer

This is a limited report on our findings based on our analysis, in accordance with good industry practice as of the date of this report, in relation to cybersecurity vulnerabilities and issues in the framework and algorithms based on smart contracts, the details of which are set out in this report. In order to get a full view of our analysis, it is crucial for you to read the full report. While we have done our best in conducting our analysis and producing this report, it is important to note that you should not rely on this report and cannot claim against the team on the basis of what it says or doesn't say, or how team produced it, and it is important for you to conduct your own independent investigations before making any decisions. team go into more detail on this in the below disclaimer below – please make sure to read it in full.

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