SAFETIN

AUDIT

MultiFunctional Environmental Token

- Stake.sol

September 22th, 2022

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AUDIT SUMMARY

This report was written for MultiFunctional Environmental Token in order to find flaws and vulnerabilities in the MultiFunctional Environmental Token project's source code, as well as any contract dependencies that weren't part of an officially recognized library given they were provided.

A comprehensive examination has been performed, utilizing Static Analysis, Manual Review, and MultiFunctional Environmental Token Deployment techniques. The auditing process pays special attention to the following considerations:

- Testing the smart contracts against both common and uncommon attack vectors
- Assessing the codebase to ensure compliance with current best practices and industry standards
- Ensuring contract logic meets the specifications and intentions of the client
- Cross referencing contract structure and implementation against similar smart contracts produced by industry leaders
- Through line-by-line manual review of the entire codebase by industry expert

AUDIT OVERVIEW

PROJECT SUMMARY

Project name	MultiFunctional Environmental Token
Description	MFET is an ecosystem that provides consultancy to companies in their environmental works as an environmentally friendly token supporting sustainable projects.
Platform	BNB Smart-chain
Language	Solidity
Codebase	Main.sol https://bscscan.com/address/0x6d23970ce32Cb0F1929bECE7C56D71319e1b4F01 Stake.sol https://bscscan.com/address/0xe0cd1e9820001faff0c98935dae500471f92c6e1 Lock.sol https://bscscan.com/address/0x3b7f0d2BaB984c9dbc70F53Ef0B5C65a8E86c463

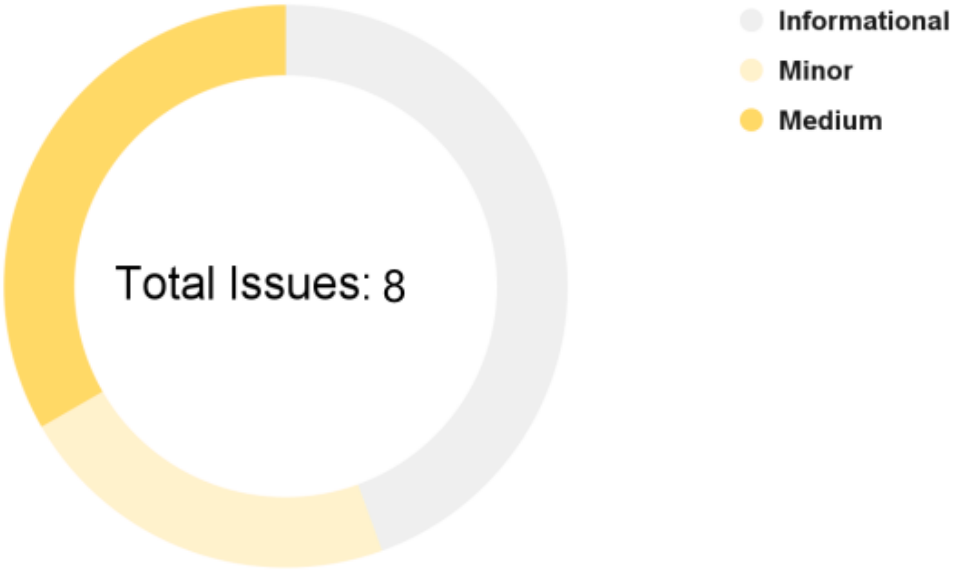
FINDINGS SUMMARY

Vulnerability	Total	Resolved
Critical	0	0
Major	0	0
Medium	3	0
Minor	1	0
Informational	4	0

EXECUTIVE SUMMARY

There have been no critical issues related to the codebase and all findings listed here range from informational to medium. The medium security problems are the following: Centralization of major privileges, Divide before multiply, and Missing threshold checks.

AUDIT FINDINGS



Code	Title	Severity
CENT-1	Centralization of major privileges	Medium
MATH-1	Divide before multiply	Medium
THRE-3	Missing threshold checks	Medium
COMP-1	Unlocked compiler versions	Minor
FUNC-1	Unused functions	Informational
GAS-2	Overly long error messages	Informational
MSG-1	Missing event emits	Informational

MSG-2	Limited NatSpec comments	Informational

CENT-1 | Centralization of major privileges

Description

The onlyOwner modifier of the smart contract(s) gives major privileges over it (modify transfer fees)*. This can be a problem, in the case of a hack, an attacker who has taken possession of this privileged account could damage the project and the investors.
*This list is not exhaustive but presents the most sensitive points

Recommendation

We recommend at least to use a multi-sig wallet as the owner address, and at best to establish a community governance protocol to avoid such centralization. For more information, see https://solidity-by-example.org/app/multi-sig-wallet/

MATH-1 | Divide before multiply

Description

Certain operations in MultiFunctional Environmental Token's contract perform both multiplication and division operations on a variable, some instances of which perform division before multiplication. This is not best practice and should be avoided where possible, as it could lead to rounding errors. Where these division first operations have been identified are listed below.

- Stake.sol
  - line -> 642-643, 650-652
  - line -> 650-652, 656

Recommendation

We recommend these found operations be modified to perform multiplication first and then division, in most cases simply swapping the division and multiplication operations should be sufficient however any changes made should be tested.

THRE-3 | Missing threshold checks

Description

Functions which can change sensitive variables within MultiFunctional Environmental Token's contract do not contain threshold checks to ensure these variables are not changed to unreasonable values. This includes fees. As such it is important to add a threshold to prevent an attacker from setting fees as 100% easily. Key examples of Identified functions with this issue have been listed below:

- Stake.sol
  - setStakeFee -> Line 472
  - setEmergencyWithdrawFee -> Line 463
  - setStakePlus -> Line 443

Recommendation

We recommend adding threshold checks using require statements for each of the identified functions above and other functions with this issue.

COMP-1 | Unlocked compiler version

Description

MultiFunctional Environmental Token's contract does not have locked compiler versions, meaning a range of compiler versions can be used. This can lead to differing bytecodes being produced depending on the compiler version, which can create confusion when debugging, as bugs may be specific to a specific compiler version(s).

Recommendation

To rectify this, we recommend setting the compiler to a single version, the version tested the most to be compatible with the code, an example of this change can be seen below.

```
pragma solidity 0.8.0;
```

FUNC-1 | Unused functions

Description

Multiple functions within MultiFunctional Environmental Token's contract are defined as private or internal but are never called within the contract. This wastes contract space as there is a maximum size a contract can have. Functions found with this issue have been listed below:

- Stake.sol
  - safeIncreaseAllowance -> Line 314
  - safeDecreaseAllowance -> Line 330
  - safeApprove -> Line 299
  - _msgData -> Line 60
  - sendValue -> Line 146
  - functionStaticCall -> Line 219
  - functionStaticCall -> Line 206
  - functionDelegateCall -> Line 242
  - functionDelegateCall -> Line 230
  - functionCallWithValue -> Line 174
  - functionCall -> Line 159

Recommendation

We recommend safely removing these functions from the contract.

GAS-2 | Overly long error messages

Description

The smart contract has some error messages that are too long. The industry standards specify error messages must have a maximum length of 32 bytes. We recommend having the short error messages within 32 bytes to optimize gas costs. Require statements with this issue have been listed below:

- Stake.sol
  - line -> 82
  - line -> 224
  - line -> 247
  - line -> 552
  - line -> 598
  - line -> 617
  - line -> 654
  - line -> 777
  - line -> 837

Recommendation

We recommend shortening these error messages to be 32 characters or less in length.

MSG-1 | Missing event emits

Description

Some functions within MultiFunctional Environmental Token's contracts modify sensitive variables without emitting an event. Functions with this issue are listed below:

- Stake.sol
  - setStakeFee -> Line 472
  - setEmergencyWithdrawFee -> Line 463
  - setStakePlus -> Line 443

Recommendation

We recommend amending these functions to include event emits to ensure transparency with users.

MSG-2 | Limited NatSpec comments

Description

Throughout MultiFunctional Environmental Token's contracts many functions remain uncommented. This can make understanding the code's functionality difficult for developers and users (if the code is open source) thus reducing maintainability.

Recommendation

We recommend using NetSpec standard comments throughout all of MultiFunctional Environmental Token's contracts.

See: https://docs.soliditylang.org/en/v0.5.17/style-guide.html?highlight=natspec%23natspec

Global security warnings

These are safety issues for the whole project. They are not necessarily critical problems but they are inherent in the structure of the project itself. Potential attack vectors for these security problems should be monitored.

CENT-1 | Global SPOF (Single Point Of Failure)

The project's smart contracts often have a problem of centralized privileges. The owner system in particular can be subject to attack. To address this security issue we recommend using a multi-sig wallet, establishing secure project administration protocols and strengthening the security of project administrators.

Compliance with industry standards

The way the contract is developed and its compliance with industry standards are part of the project. In order to increase the optimization of the latter, we recommend refining the code to best fit industry best practices, in particular the use of error messages and library utilization.

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