HACKEN

SMART CONTRACT CODE REVIEW AND SECURITY ANALYSIS REPORT

Customer: Disciplina
Date: July 14th, 2021

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Document

Name	Smart Contract Code Review and Security Analysis Report for Disciplina - Second Review
Approved by	Andrew Matiukhin | CTO Hacken OU
Type	ERC20 Token, Farm
Platform	Ethereum / Solidity
Methods	Architecture Review, Functional Testing, Computer-Aided Verification, Manual Review
Git	https://github.com/DisciplinaOU/farming-smart/commit/7e06db6fba3eaed4af3945eedb70ec43af86f668
Timeline	5 JULY 2021 - 14 JULY 2021
Changelog	5 JULY 2021 - INITIAL AUDIT 14 JULY 2021 - SECOND REVIEW

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Introduction

Hacken OÜ (Consultant) was contracted by Disciplina (Customer) to conduct a Smart Contract Code Review and Security Analysis. This report presents the findings of the security assessment of Customer's smart contract and its code review conducted on July 17th, 2021.

Scope

The scope of the project is the smart contracts in zip archive:

https://github.com/DisciplinaOU/farming-smart/commit/7e06db6fba3eaed4af3945eedb70ec43af86f668

Scope:
DisciplinaFarm.sol md5: 9b0c57339c9f8d9fe1403f2fc1f07852
ERC20Token.sol md5: e575b052dd349b708d3222075197df15
Migrations.sol md5: a2b92088294b0704e4297eb6c7c7437b

We have scanned these smart contracts for commonly known and more specific vulnerabilities. Here are some of the commonly known vulnerabilities that are considered:

Category	Check Item
Code review	▪ Reentrancy ▪ Ownership Takeover ▪ Timestamp Dependence ▪ Gas Limit and Loops ▪ DoS with (Unexpected) Throw ▪ DoS with Block Gas Limit ▪ Transaction-Ordering Dependence ▪ Style guide violation ▪ Costly Loop ▪ ERC20 API violation ▪ Unchecked external call ▪ Unchecked math ▪ Unsafe type inference ▪ Implicit visibility level ▪ Deployment Consistency ▪ Repository Consistency ▪ Data Consistency

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Functional review	▪ Business Logics Review ▪ Functionality Checks ▪ Access Control & Authorization ▪ Escrow manipulation ▪ Token Supply manipulation ▪ Asset’s integrity ▪ User Balances manipulation ▪ Kill-Switch Mechanism ▪ Operation Trails & Event Generation

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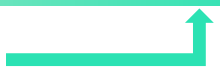
Executive Summary

According to the assessment, the Customer's smart contracts are well-secured.

Insecure	Poor secured	Secured	Well-secured

You are here 

Our team performed an analysis of code functionality, manual audit, and automated checks with Mythril and Slither. All issues found during automated analysis were manually reviewed, and important vulnerabilities are presented in the Audit overview section. All found issues can be found in the Audit overview section.

Security engineers found 2 medium and 1 informational issue during the first review.

Security engineers found no issues during the second review.

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Severity Definitions

Risk Level	Description
Critical	Critical vulnerabilities are usually straightforward to exploit and can lead to assets loss or data manipulations.
High	High-level vulnerabilities are difficult to exploit; however, they also have a 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 assets loss or data manipulations.
Low	Low-level vulnerabilities are mostly related to outdated, unused, etc. code snippets that can't have a significant impact on execution
Lowest / Code Style / Best Practice	Lowest-level vulnerabilities, code style violations, and info statements can't affect smart contract execution and can be ignored.

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Audit overview

Critical

No Critical severity issues were found.

High

No High severity issues were found.

Medium

1. Vulnerability: No way to withdraw partly

   The provided documentation describes ability to withdraw LP partly, but the smart contract doesn't contain such ability.

   Recommendation: Please consider providing ability for partial withdrawal or make changes in the documentation

   Addressed in 7e06db6fba3eaed4af3945eedb70ec43af86f668 commit.

2. Vulnerability: Very expensive loops

   Using loops with unpredictable number of iterations, especially nested loops, is too expensive in gas meaning.

   Recommendation: Please switch to using math instead of doing calculations in loops.

   Addressed in 7e06db6fba3eaed4af3945eedb70ec43af86f668 commit.

Low

No Low severity issues were found.

Lowest / Code style / Best Practice

1. Vulnerability: No License header

   Each solidity source file must consist SPDX-License-Identifier header

   Addressed in 7e06db6fba3eaed4af3945eedb70ec43af86f668 commit.

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Conclusion

Smart contracts within the scope were manually reviewed and analyzed with static analysis tools.

Audit report contains all found security vulnerabilities and other issues in the reviewed code.

Security engineers found 2 medium and 1 informational issues during the first review.

Security engineers found no issues during the second review.

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Disclaimers

Hacken Disclaimer

The smart contracts given for audit have been analyzed in accordance with the best industry practices at the date of this report, in relation to cybersecurity vulnerabilities and issues in smart contract source code, the details of which are disclosed in this report (Source Code); the Source Code compilation, deployment, and functionality (performing the intended functions).

The audit makes no statements or warranties on security of the code. It also cannot be considered as a sufficient assessment regarding the utility and safety of the code, bugfree status or any other statements of the contract. While we have done our best in conducting the analysis and producing this report, it is important to note that you should not rely on this report only - we recommend proceeding with several independent audits and a public bug bounty program to ensure security of smart contracts.

Technical Disclaimer

Smart contracts are deployed and executed on the blockchain platform. The platform, its programming language, and other software related to the smart contract can have its vulnerabilities that can lead to hacks. Thus, the audit can't guarantee the explicit security of the audited smart contracts.