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**Blockchain Security | Smart Contract Audits | KYC**

MADE IN GERMANY

# Audit

**Security Assessment**  
**14. September, 2021**

**For**



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Version	Date	Description
1.0	14. September 2021	<ul style="list-style-type: none"><li>• Layout project</li><li>• Automated- /Manual-Security Testing</li><li>• Summary</li></ul>

## **Network**

Binance Smart Chain (BEP20)

## **Website**

<https://bravesoul.io/>

## **Telegram**

<https://t.me/BravesoulNFT>

<https://t.me/BravesoulNFTannouncement>

## **Twitter**

<https://twitter.com/bravesoulnft>

## **Medium**

<https://medium.com/@bravesoulNFT>

## Description

Brave Soul is a Digimon world universe where anyone can earn tokens through skilled gameplay and contributions to the ecosystem. Players can battle, collect, raise, evolve, hatch and build a land-based kingdom for their Soul.

Brave soul also taken on characteristics of a social network and jobs platform due to the strong community and play to earn opportunities that will come success in the future.

## Project Engagement

During the 10th of September 2021, **Brave Soul Team** engaged Solidproof.io to audit smart contracts that they created. The engagement was technical in nature and focused on identifying security flaws in the design and implementation of the contracts. They provided Solidproof.io with access to their code repository and whitepaper.

## Logo



## Contract Link

**v1.0**

<https://bscscan.com/address/0xC9bFCe0D6e89d9b2255075a4c7Af5c541C7D17D2#code>

# Vulnerability & Risk Level

Risk represents the probability that a certain source-threat will exploit vulnerability, and the impact of that event on the organization or system. Risk Level is computed based on CVSS version 3.0.

Level	Value	Vulnerability	Risk (Required Action)
<b>Critical</b>	9 - 10	A vulnerability that can disrupt the contract functioning in a number of scenarios, or creates a risk that the contract may be broken.	Immediate action to reduce risk level.
<b>High</b>	7 – 8.9	A vulnerability that affects the desired outcome when using a contract, or provides the opportunity to use a contract in an unintended way.	Implementation of corrective actions as soon as possible.
<b>Medium</b>	4 – 6.9	A vulnerability that could affect the desired outcome of executing the contract in a specific scenario.	Implementation of corrective actions in a certain period.
<b>Low</b>	2 – 3.9	A vulnerability that does not have a significant impact on possible scenarios for the use of the contract and is probably subjective.	Implementation of certain corrective actions or accepting the risk.
<b>Informational</b>	0 – 1.9	A vulnerability that have informational character but is not effecting any of the code.	An observation that does not determine a level of risk

# Auditing Strategy and Techniques Applied

Throughout the review process, care was taken to evaluate the repository for security-related issues, code quality, and adherence to specification and best practices. To do so, reviewed line-by-line by our team of expert pentesters and smart contract developers, documenting any issues as there were discovered.

## **Methodology**

The auditing process follows a routine series of steps:

1. Code review that includes the following:
  - i) Review of the specifications, sources, and instructions provided to SolidProof to make sure we understand the size, scope, and functionality of the smart contract.
  - ii) Manual review of code, which is the process of reading source code line-by-line in an attempt to identify potential vulnerabilities.
  - iii) Comparison to specification, which is the process of checking whether the code does what the specifications, sources, and instructions provided to SolidProof describe.
2. Testing and automated analysis that includes the following:
  - i) Test coverage analysis, which is the process of determining whether the test cases are actually covering the code and how much code is exercised when we run those test cases.
  - ii) Symbolic execution, which is analysing a program to determine what inputs causes each part of a program to execute.
3. Best practices review, which is a review of the smart contracts to improve efficiency, effectiveness, clarify, maintainability, security, and control based on the established industry and academic practices, recommendations, and research.
4. Specific, itemized, actionable recommendations to help you take steps to secure your smart contracts.

## Used Code from other Frameworks/Smart Contracts (direct imports)

Imported packages:

- OpenZeppelin
  - Address
  - Ownable
  - SafeMath
  - Context
  - IERC20
- Uniswap
  - UniswapV2Factory
  - UniswapV2Pair
  - UniswapV2Router01
  - UniswapV2Router02





## Tested Contract Files

This audit covered the following files listed below with a SHA-1 Hash.

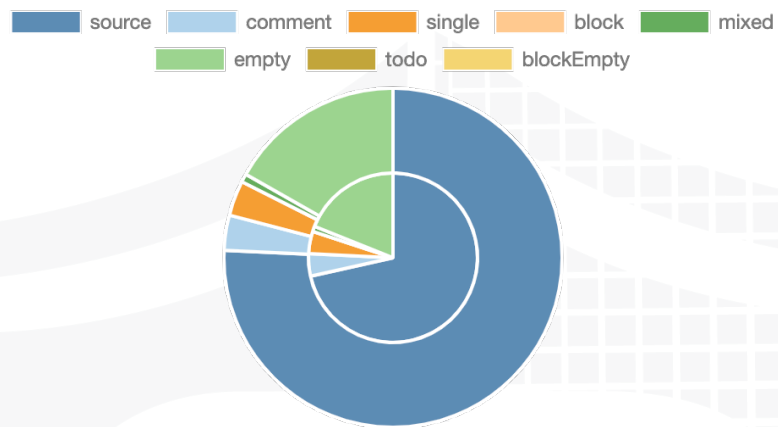
*A file with a different Hash has been modified, intentionally or otherwise, after the security review. A different Hash could be (but not necessarily) an indication of a changed condition or potential vulnerability that was not within the scope of this review.*

### v1.0

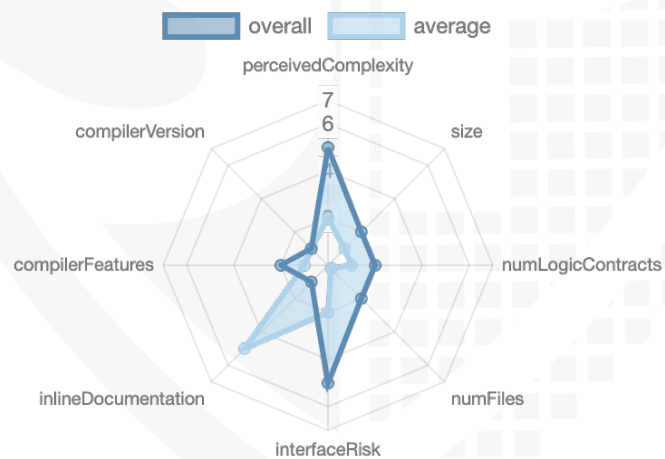
File Name	SHA-1 Hash
contracts/IUniswapV2Pair.sol	909fd54926b6d32e7dea134cdf2b755eb8e3da48
contracts/Context.sol	acdb24a42fb740c6518d9533f24315dd6d306cce
contracts/IUniswapV2Factory.sol	7322082307e86bf75c99c976c7bc569935d01199
contracts/BraveSoul.sol	9680de2efddd835da268b1de5a652f832561f4d8
contracts/Address.sol	7c7dc53c8f00718cc8f816a50902d643c29dd726
contracts/SafeMath.sol	fdc95c57a86989328c7cc47a8ae3ca3bfe78a23f
contracts/Ownable.sol	43c95573327131d95e52d3013dd284588e5a2a8f
contracts/IUniswapV2Router02.sol	d5cec52286c1ff89aa8e9195789af97730218049
contracts/IUniswapV2Router01.sol	41f67ddff67e635dbbc579f0770441b4fa231325
contracts/IERC20.sol	b037c0a57e1596d4efe58c7b85282179d2517332

# Metrics

## Source Lines v1.0



## Risk Level v1.0



## Capabilities

### Components

Version	Contracts	Libraries	Interfaces	Abstract
1.0	2	2	5	1

### Exposed Functions

*This section lists functions that are explicitly declared public or payable. Please note that getter methods for public stateVars are not included.*

Version	Public	Payable
1.0	107	5

Version	External	Internal	Private	Pure	View
1.0	75	96	26	19	47

### State Variables

Version	Total	Public
1.0	32	10

### Capabilities

Version	Solidity Versions observed	Experimental Features	Can Receive Funds	Uses Assembly	Has Destroyable Contracts
1.0	<code>^0.8.4</code>		yes	yes (2 asm blocks)	

Version	Transfers ETH	Low-Level Calls	DelegateCall	Uses Hash Functions	ECRecover	New/Create/Create2
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1.0	yes					
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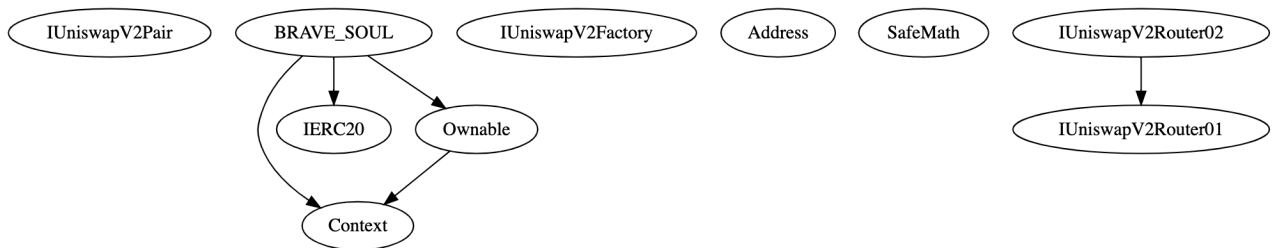
## Scope of Work

The above token Team provided us with the files that needs to be tested (Github, Bscscan, Etherscan, files, etc.). The scope of the audit is the main contract (usual the same name as team appended with .sol).

We will verify the following claims:

1. Correct implementation of Token standard
2. Deployer cannot mint any new tokens
3. Deployer cannot burn or lock user funds
4. Deployer cannot pause the contract
5. Overall checkup (Smart Contract Security)

## Inheritance Graph v1.0



## Verify Claims

### Correct implementation of Token standard

Tested	Verified
✓	✓

Function	Description	Exist	Tested	Verified
TotalSupply	provides information about the total token supply	✓	✓	✓
BalanceOf	provides account balance of the owner's account	✓	✓	✓
Transfer	executes transfers of a specified number of tokens to a specified address	✓	✓	✓
TransferFrom	executes transfers of a specified number of tokens from a specified address	✓	✓	✓
Approve	allow a spender to withdraw a set number of tokens from a specified account	✓	✓	✓
Allowance	returns a set number of tokens from a spender to the owner	✓	✓	✓

### Optional implementations

Function	Description	Exist	Tested	Verified
renounceOwnership	Owner renounce ownership for more trust	✓	✓	✗

## Deployer cannot mint any new tokens

Name	Exist	Tested	Verified	File
Deployer cannot mint	✓	✓	✓	Main
Comment	Line: -			

Max / Total Supply: 100.000.000



1. approve	→
2. decreaseAllowance	→
3. deliver	→
4. enableReflection	→
5. enableRouter	→
6. excludeFromFee	→
7. excludeFromReward	→
8. includeInFee	→
9. includeInReward	→
10. increaseAllowance	→
11. lock	→
12. renounceOwnership	→
13. setBuyBackEnabled	→
14. setBuybackUpperLimit	→
15. setLiquidityFeePercent	→
16. setMarketingAddress	→
17. setMarketingDivisor	→
18. setMaxTxAmount	→
19. setNumTokensSellToAddToLiquidity	→
20. setSwapAndLiquifyEnabled	→
21. setTaxFeePercent	→
22. startTrade	→
23. transfer	→
24. transferFrom	→
25. transferOwnership	→
26. unlock	→

## Deployer cannot burn or lock user funds

Name	Exist	Tested	Verified
Deployer cannot lock	✓	✓	✗
Deployer cannot burn	✓	✓	✓

Comments:

**v1.0**

- Deployer can
  - Lock user funds when maxTxAmount is set to zero

1. approve	→
2. decreaseAllowance	→
3. deliver	→
4. enableReflection	→
5. enableRouter	→
6. excludeFromFee	→
7. excludeFromReward	→
8. includeInFee	→
9. includeInReward	→
10. increaseAllowance	→
11. lock	→
12. renounceOwnership	→
13. setBuyBackEnabled	→
14. setBuybackUpperLimit	→
15. setLiquidityFeePercent	→
16. setMarketingAddress	→
17. setMarketingDivisor	→
18. setMaxTxAmount	→
19. setNumTokensSellToAddToLiquidity	→
20. setSwapAndLiquifyEnabled	→
21. setTaxFeePercent	→
22. startTrade	→
23. transfer	→
24. transferFrom	→
25. transferOwnership	→
26. unlock	→



## Deployer cannot pause the contract

Name	Exist	Tested	Verified
Deployer cannot pause	✓	✓	✓

1. approve	→
2. decreaseAllowance	→
3. deliver	→
4. enableReflection	→
5. enableRouter	→
6. excludeFromFee	→
7. excludeFromReward	→
8. includeInFee	→
9. includeInReward	→
10. increaseAllowance	→
11. lock	→
12. renounceOwnership	→
13. setBuyBackEnabled	→
14. setBuybackUpperLimit	→
15. setLiquidityFeePercent	→
16. setMarketingAddress	→
17. setMarketingDivisor	→
18. setMaxTxAmount	→
19. setNumTokensSellToAddToLiquidity	→
20. setSwapAndLiquifyEnabled	→
21. setTaxFeePercent	→
22. startTrade	→
23. transfer	→
24. transferFrom	→
25. transferOwnership	→
26. unlock	→

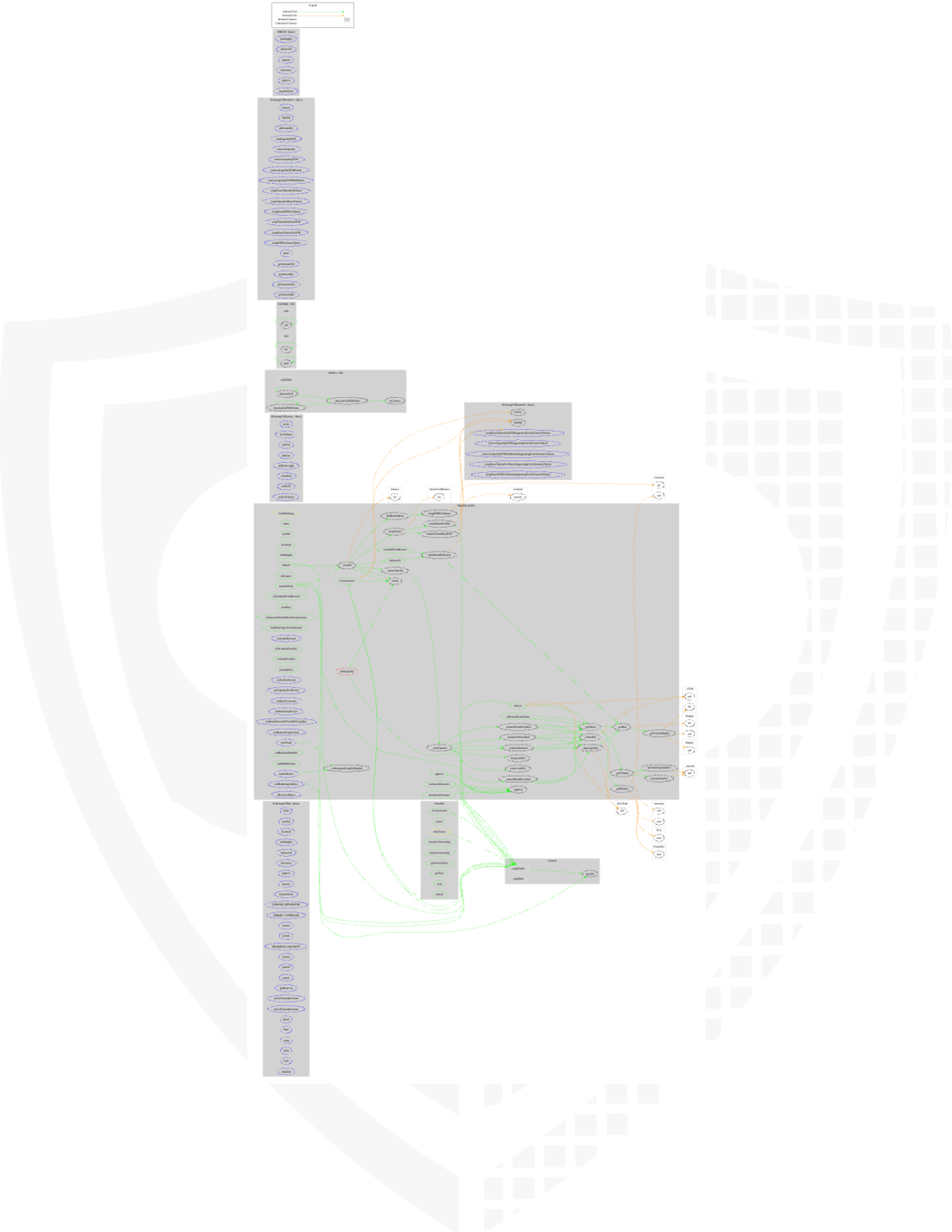
## Overall checkup (Smart Contract Security)

Tested	Verified
✓	✓

### Legend



















Attribute	Symbol
Verified / Checked	✓
Partly Verified	⚠
Unverified / Not checked	✗
Not available	—

# CallGraph



# Source Units in Scope

## v1.0

Type	File	Logic Contracts	Interfaces	Lines	nLines	nSLOC	Comment Lines	Complex. Score	Capabilities
	contracts/IUniswapV2Pair.sol	_____	1	51	8	5	1	53	_____
	contracts/Context.sol	1	_____	12	12	10	2	2	_____
	contracts/IUniswapV2Factory.sol	_____	1	20	9	4	2	17	_____
	contracts/BraveSoul.sol	1	_____	549	537	420	17	354	
	contracts/Address.sol	1	_____	61	49	35	6	37	
	contracts/SafeMath.sol	1	_____	56	56	39	2	10	
	contracts/Ownable.sol	1	_____	59	59	47	1	40	_____
	contracts/IUniswapV2Router02.sol	_____	1	44	6	4	1	16	
	contracts/IUniswapV2Router01.sol	_____	1	96	5	3	1	48	
	contracts/IERC20.sol	_____	1	14	6	3	1	13	
	<b>Totals</b>	<b>5</b>	<b>5</b>	<b>962</b>	<b>747</b>	<b>570</b>	<b>34</b>	<b>590</b>	

## Legend

Attribute	Description
Lines	total lines of the source unit
nLines	normalized lines of the source unit (e.g. normalizes functions spanning multiple lines)
nSLOC	normalized source lines of code (only source-code lines; no comments, no blank lines)
Comment Lines	lines containing single or block comments
Complexity Score	a custom complexity score derived from code statements that are known to introduce code complexity (branches, loops, calls, external interfaces, ...)

# Audit Results

# AUDIT PASSED

## Critical issues

- no critical issues found -

## High issues

- no high issues found -

## Medium issues

- no medium issues found -

## Low issues

Issue	File	Type	Line	Description
#1	Main	A floating pragma is set	1	The current pragma Solidity directive is „^0.“.
#2	Main	Missing Zero Address Validation (missing-zero-check)	512	Check that the address is not zero
#3	Main	State variable visibility is not set	53	It is best practice to set the visibility of state variables explicitly

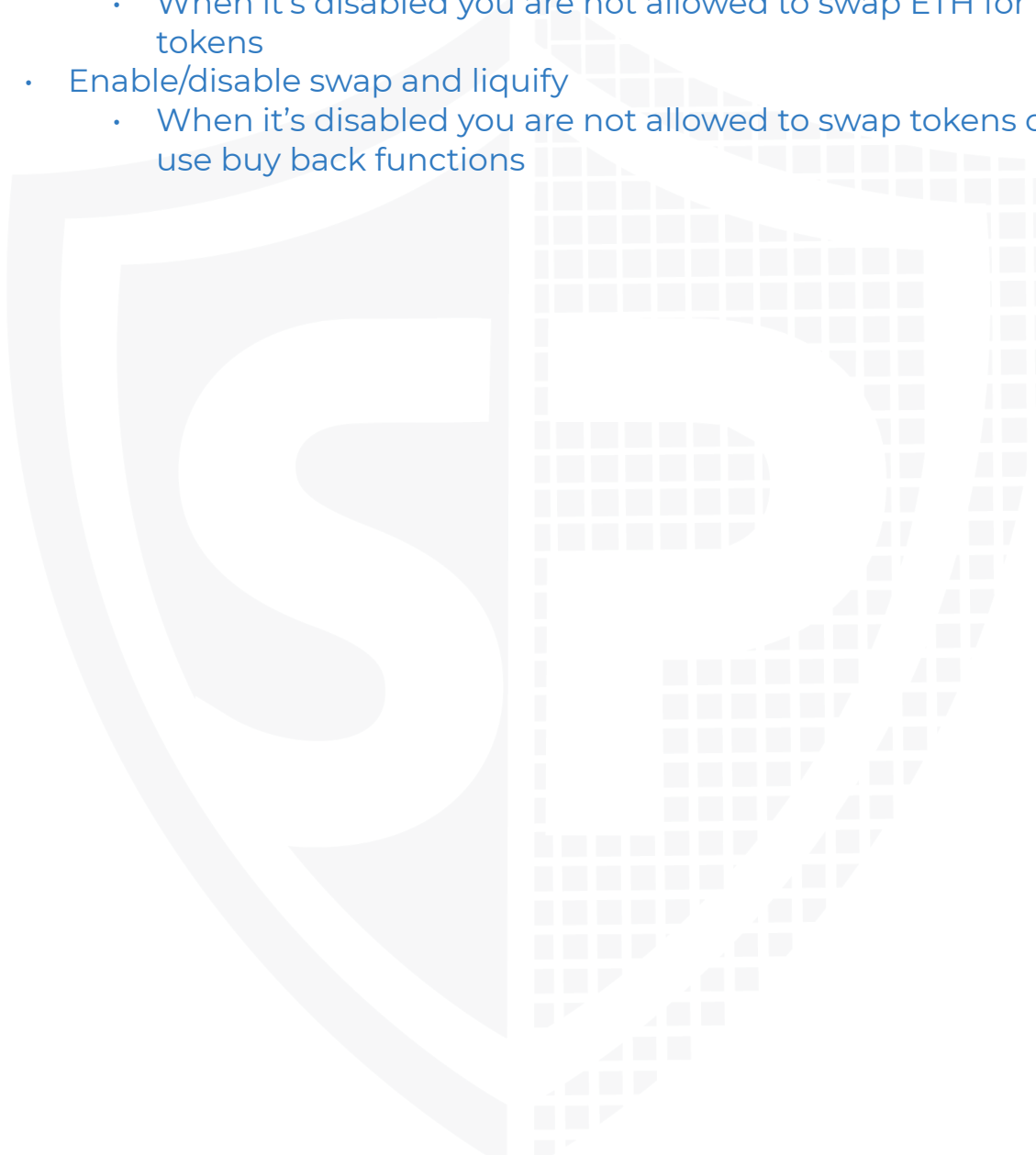
## Informational issues

Issue	File	Type	Line	Description
#1	Main	State variables that could be declared constant (constable-states)	35, 33, 34, 29, 18	Add the `constant` attributes to state variables that never change
#2	Main	Functions that are not used (dead-code)	320-333	Remove unused functions

## Audit Comments

### 14. September 2021:

- There is still an owner (Owner still has not renounced ownership)
- Developer can
  - set maxTxAmount to zero to lock transfer function
  - set buy back upper limit
  - Enable/disable buy back
    - When it's disabled you are not allowed to swap ETH for tokens
  - Enable/disable swap and liquify
    - When it's disabled you are not allowed to swap tokens or use buy back functions



## SWC Attacks

ID	Title	Relationships	Status
<a href="#">SW C-13 6</a>	Unencrypted Private Data On-Chain	<a href="#">CWE-767: Access to Critical Private Variable via Public Method</a>	PASSED
<a href="#">SW C-13 5</a>	Code With No Effects	<a href="#">CWE-1164: Irrelevant Code</a>	PASSED
<a href="#">SW C-13 4</a>	Message call with hardcoded gas amount	<a href="#">CWE-655: Improper Initialization</a>	PASSED
<a href="#">SW C-13 3</a>	Hash Collisions With Multiple Variable Length Arguments	<a href="#">CWE-294: Authentication Bypass by Capture-replay</a>	PASSED
<a href="#">SW C-13 2</a>	Unexpected Ether balance	<a href="#">CWE-667: Improper Locking</a>	PASSED
<a href="#">SW C-13 1</a>	Presence of unused variables	<a href="#">CWE-1164: Irrelevant Code</a>	PASSED
<a href="#">SW C-13 0</a>	Right-To-Left-Override control character (U+202E)	<a href="#">CWE-451: User Interface (UI) Misrepresentation of Critical Information</a>	PASSED
<a href="#">SW C-12 9</a>	Typographical Error	<a href="#">CWE-480: Use of Incorrect Operator</a>	PASSED
<a href="#">SW C-12 8</a>	DoS With Block Gas Limit	<a href="#">CWE-400: Uncontrolled Resource Consumption</a>	PASSED

<a href="#">SW C-12 7</a>	Arbitrary Jump with Function Type Variable	<a href="#">CWE-695: Use of Low-Level Functionality</a>	<b>PASSED</b>
<a href="#">SW C-12 5</a>	Incorrect Inheritance Order	<a href="#">CWE-696: Incorrect Behavior Order</a>	<b>PASSED</b>
<a href="#">SW C-12 4</a>	Write to Arbitrary Storage Location	<a href="#">CWE-123: Write-what-where Condition</a>	<b>PASSED</b>
<a href="#">SW C-12 3</a>	Requirement Violation	<a href="#">CWE-573: Improper Following of Specification by Caller</a>	<b>PASSED</b>
<a href="#">SW C-12 2</a>	Lack of Proper Signature Verification	<a href="#">CWE-345: Insufficient Verification of Data Authenticity</a>	<b>PASSED</b>
<a href="#">SW C-12 1</a>	Missing Protection against Signature Replay Attacks	<a href="#">CWE-347: Improper Verification of Cryptographic Signature</a>	<b>PASSED</b>
<a href="#">SW C-12 0</a>	Weak Sources of Randomness from Chain Attributes	<a href="#">CWE-330: Use of Insufficiently Random Values</a>	<b>PASSED</b>
<a href="#">SW C-11 9</a>	Shadowing State Variables	<a href="#">CWE-710: Improper Adherence to Coding Standards</a>	<b>PASSED</b>
<a href="#">SW C-11 8</a>	Incorrect Constructor Name	<a href="#">CWE-665: Improper Initialization</a>	<b>PASSED</b>
<a href="#">SW C-11 7</a>	Signature Malleability	<a href="#">CWE-347: Improper Verification of Cryptographic Signature</a>	<b>PASSED</b>



<a href="#">SW C-11 6</a>	Timestamp Dependence	<a href="#">CWE-829: Inclusion of Functionality from Untrusted Control Sphere</a>	PASSED
<a href="#">SW C-11 5</a>	Authorization through tx.origin	<a href="#">CWE-477: Use of Obsolete Function</a>	PASSED
<a href="#">SW C-11 4</a>	Transaction Order Dependence	<a href="#">CWE-362: Concurrent Execution using Shared Resource with Improper Synchronization ('Race Condition')</a>	PASSED
<a href="#">SW C-11 3</a>	DoS with Failed Call	<a href="#">CWE-703: Improper Check or Handling of Exceptional Conditions</a>	PASSED
<a href="#">SW C-11 2</a>	Delegatecall to Untrusted Callee	<a href="#">CWE-829: Inclusion of Functionality from Untrusted Control Sphere</a>	PASSED
<a href="#">SW C-111</a>	Use of Deprecated Solidity Functions	<a href="#">CWE-477: Use of Obsolete Function</a>	PASSED
<a href="#">SW C-11 0</a>	Assert Violation	<a href="#">CWE-670: Always-Incorrect Control Flow Implementation</a>	PASSED
<a href="#">SW C-10 9</a>	Uninitialized Storage Pointer	<a href="#">CWE-824: Access of Uninitialized Pointer</a>	PASSED
<a href="#">SW C-10 8</a>	State Variable Default Visibility	<a href="#">CWE-710: Improper Adherence to Coding Standards</a>	NOT PASSED
<a href="#">SW C-10 7</a>	Reentrancy	<a href="#">CWE-841: Improper Enforcement of Behavioral Workflow</a>	PASSED
<a href="#">SW C-10 6</a>	Unprotected SELFDESTRUCT Instruction	<a href="#">CWE-284: Improper Access Control</a>	PASSED

<a href="#">SW C-10 5</a>	Unprotected Ether Withdrawal	<a href="#">CWE-284: Improper Access Control</a>	<b>PASSED</b>
<a href="#">SW C-10 4</a>	Unchecked Call Return Value	<a href="#">CWE-252: Unchecked Return Value</a>	<b>PASSED</b>
<a href="#">SW C-10 3</a>	Floating Pragma	<a href="#">CWE-664: Improper Control of a Resource Through its Lifetime</a>	<b>NOT PASSED</b>
<a href="#">SW C-10 2</a>	Outdated Compiler Version	<a href="#">CWE-937: Using Components with Known Vulnerabilities</a>	<b>PASSED</b>
<a href="#">SW C-10 1</a>	Integer Overflow and Underflow	<a href="#">CWE-682: Incorrect Calculation</a>	<b>PASSED</b>
<a href="#">SW C-10 0</a>	Function Default Visibility	<a href="#">CWE-710: Improper Adherence to Coding Standards</a>	<b>PASSED</b>

The logo features the words "Solid Proofed" in a white, elegant script font. The text is superimposed on a dark blue background that contains a faint, stylized shield emblem. The shield has a grid-like pattern and is partially obscured by the text.

Solid  
Proofed

**Blockchain Security | Smart Contract Audits | KYC**

A small horizontal bar representing the German flag, with black, red, and gold stripes.

MADE IN GERMANY