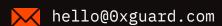


# Smart contracts security assessment

Final report
Tariff: Top

Brick By Brick





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# Introduction

The report has been prepared for **Brick By Brick**.

The audited contract is a Ponzi-like staking with rewards in the same token with fixed ROI without explicitly defined source of such rewards.

Up to 2.5% of deposit goes to the marketing address, 0.5% - to the dev address, 3% - to the admin address, and 61% - to the bbb address. Claiming and compounding requires 3.5% fee to the claim address and 0.5-1.0% to dev address to be taken. All these external wallets are out of scope and can be either EOA or contracts.

The SHA-1 hashes of audited files are:

brick (2).sol 863ded9a8c48ab7ea8ad82d0bfcb9f5cba20ddd9

**Update**. The updated code was deployed to the following address in the BNB Smart Chain:

StakingContract <u>0x41B5D46A2714e4d55371188B53Df8217106f222D</u>.

Name	Brick By Brick
Audit date	2023-09-14 - 2023-09-15
Language	Solidity
Platform	Binance Smart Chain

## Contracts checked

Name	Address
StakingContract	0xCCACc32C4429683c4035C6A497D04ec78dDe0961

# Procedure

We perform our audit according to the following procedure:

### **Automated analysis**

- Scanning the project's smart contracts with several publicly available automated Solidity analysis tools
- Manual verification (reject or confirm) all the issues found by the tools

#### Manual audit

- Manually analyze smart contracts for security vulnerabilities
- Smart contracts' logic check

# Known vulnerabilities checked

Title	Check result
Unencrypted Private Data On-Chain	passed
Code With No Effects	passed
Message call with hardcoded gas amount	passed
Typographical Error	passed
DoS With Block Gas Limit	passed
Presence of unused variables	passed
Incorrect Inheritance Order	passed
Requirement Violation	passed
Weak Sources of Randomness from Chain  Attributes	passed
Shadowing State Variables	passed

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Incorrect Constructor Name	passed
Block values as a proxy for time	passed
Authorization through tx.origin	passed
DoS with Failed Call	passed
Delegatecall to Untrusted Callee	passed
Use of Deprecated Solidity Functions	passed
Assert Violation	passed
State Variable Default Visibility	passed
Reentrancy	passed
<u>Unprotected SELFDESTRUCT Instruction</u>	passed
Unprotected SELFDESTRUCT Instruction Unprotected Ether Withdrawal	passed passed
Unprotected Ether Withdrawal	passed
Unprotected Ether Withdrawal Unchecked Call Return Value	passed passed
Unprotected Ether Withdrawal  Unchecked Call Return Value  Floating Pragma	passed passed passed

# Classification of issue severity

**High severity** High severity issues can cause a significant or full loss of funds, change

of contract ownership, major interference with contract logic. Such issues

require immediate attention.

Medium severity Medium severity issues do not pose an immediate risk, but can be

detrimental to the client's reputation if exploited. Medium severity issues may lead to a contract failure and can be fixed by modifying the contract

state or redeployment. Such issues require attention.



#### Low severity

Low severity issues do not cause significant destruction to the contract's functionality. Such issues are recommended to be taken into consideration.

### Issues

### **High severity issues**

# 1. Owner can change token address (StakingContract) Status: Open

Modification of the staking token address will break the economic model of

Modification of the staking token address will break the economic model of the contract as users will receive different tokens compared to the ones they've staked.

```
function setCoin(address _coin) external {
    require(
         msg.sender == adminWallet,
         "Only admin can whitelist addresses"
    );
    IERC20(coin).transfer(msg.sender, IERC20(coin).balanceOf(address(this)));
    coin = _coin;
}
```

**Recommendation:** Remove the setCoin function or include restrictions, e.g., no active users.

### 2. Source of rewards (StakingContract)

Status: Open

The staking offers fixed ROI percent but there's no source of rewards to harden this reward rate. The only possible source is the unclear nature of bbb wallet, which receives 61% of all deposits. If there will be not enough rewards, the claim and compound functions become unusable as token transfer will be reverted.

**Recommendation:** Fixed ROI should be removed, or source of rewards should be made public.

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### 3. Logic error in claim function (StakingContract)

Status: Fixed

The claimedAmount [msg.sender] is increased twice: once in if-else section and then in the end. This results in constant revert of claim function once

```
uint256 remainingPayment = (totalStaked[msg.sender] * 3) - claimedAmount[msg.sender]
```

starts underflowing.

```
function claim() public {
    uint256 claimableAmount = calculateClaimableAmount(msg.sender);
    require(claimableAmount > 0, "No claimable amount");
    uint256 claimedAmountAfterTax = 0;
    uint256 claimDevFee = 0;
    uint256 claimWalletFee = 0;
    if (
        claimedAmount[msg.sender] + claimableAmount <=</pre>
        totalStaked[msg.sender] * 3
    ) {
        claimedAmount[msg.sender] += claimableAmount;
    } else {
        . . .
        claimedAmount[msg.sender] += remainingPayment;
    }
    lastClaimTimestamp[msg.sender] = block.timestamp;
}
```

**Recommendation:** Remove the line claimedAmount[msg.sender] += claimableAmount in the end of claim function.

### **Medium severity issues**

#### No issues were found

### Low severity issues

### 1. Division before multiplication (StakingContract)

Status: Open

A loss of precision may occur in calculateClaimableAmount function:

```
function calculateClaimableAmount(address _user)
        public.
        view
        returns (uint256)
    {
        uint256 stakedAmount = totalStaked[_user];
        uint256 diff = block.timestamp - lastClaimTimestamp[msg.sender];
        uint256 claimableAmount = diff *
(calculateClaimAmountInSeconds(calculateROIPercentage(stakedAmount) / 1e18,
stakedAmount));
        return claimableAmount;
    }
    function calculateClaimAmountInSeconds(uint256 _percentage, uint256 _amountToken)
        internal
        pure
        returns (uint256)
    {
        return (((_amountToken / 30 / 24 / 60 / 60) * (_percentage)) / 100);
    }
```

### 2. Immutable variables (StakingContract)

Status: Fixed

Constructor-initializing variables can be declared as immutable: marketingWallet, bbbWallet, adminWallet, claimWallet, devFeeWallet, decimal.

### 3. Decimals possible mismatch (StakingContract)

Status: Partially fixed

The decimal variable is not derived from the actual IERC20(coin).decimals() value. Moreover, the coin address can be updated, but decimal can't.

**Recommendation:** Remove or modify setCoin function. Initialize decimal variable with on-chain data.

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# **○** Conclusion

Brick By Brick StakingContract contract was audited. 3 high, 3 low severity issues were found. 1 high, 1 low severity issues have been fixed in the update.

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