HackSafe

Smart Contract Security Audit Report

MEDACOIN

December 2022

Security Status

★★★★½

www.hacksafe.io

Audit Details

Audited project
MEDACOIN

Deployer address
0x964a121f3734bc940648f443c75e438503b8d490

Client contacts
MEDACOIN Team

Blockchain
Binance smart chain

Website
https://www.medabots.io/

Disclaimer

This is a limited report on our findings based on our analysis, in accordance with good industry practice as at 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 us on the basis of what it says or doesn't say, or how we produced it, and it is important for you to conduct your own independent investigations before making any decisions. We go into more detail on this in the below disclaimer below – please make sure to read it in full.

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The analysis of the security is purely based on the smart contracts alone. No applications or operations were reviewed for security. No product code has been reviewed.

Procedure

Step 1 - In-Depth Manual Review

Manual line-by-line code reviews to ensure the logic behind each function is sound and safe from various attack vectors. This is the most important and lengthy portion of the audit process (as automated tools often cannot find the nuances that lead to exploits such as flash loan attacks).

Step 2 - Automated Testing

Simulation of a variety of interactions with your Smart Contract on a test blockchain leveraging a combination of automated test tools and manual testing to determine if any security vulnerabilities exist.

Step 3 – Leadership Review

The engineers assigned to the audit will schedule meetings with our leadership team to review the contracts, any comments or findings, and ask questions to further apply adversarial thinking to discuss less common attack vectors.

Step 4 - Resolution of Issues

Consulting with the team to provide our recommendations to ensure the code's security and optimize its gas efficiency, if possible. We assist project team's in resolving any outstanding issues or implementing our recommendations.

Step 5 - Published Audit Report

Boiling down results and findings into an easy-to-read report tailored to the project. Our audit reports highlight resolved issues and any risks that exist to the project or its users, along with any remaining suggested remediation measures. Diagrams are included at the end of each report to help users understand the interactions which occur within the project.

Background

HackSafe was commissioned by MEDACOIN to perform an audit of smart contracts:

- https://bscscan.com/token/0x9130990dD16eD8BE8BE63E46CAd305C2C339Dac9#code

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 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.

Contract Details

Token contract details for 19.12.2022

Token Type	: DEFI
Contract name	: MEDACOIN
Contract address	: 0x9130990dD16eD8BE8BE63E46CAd305C2C339Dac9
Total supply	: 100,000,000,000
Token ticker	: MEDA
Decimals	: 9
Token Holders	: 33,380
Transactions count	: 226,778
Compiler version	: v0.6.12+commit.27d51765
Contract deployer address	: 0x964a121f3734bc940648f443c75e438503b8d490
Owner address	: 0x964a121f3734bc940648f443c75e438503b8d490

Audit Summary

According to the standard audit assessment, Customer`s solidity smart contracts are **“Secure”.** This token contract does contain owner control, which do not make it fully decentralized.

Insecure	Poor secured	Secure	Well-secured

You are here 

We used various tools like Slither, Mythril and Remix IDE. At the same time this finding is based on critical analysis of the manual audit. All issues found during automated analysis were manually reviewed and applicable vulnerabilities are presented in the issues checking status.

We found 0 critical, 0 high, 1 medium and 0 low.

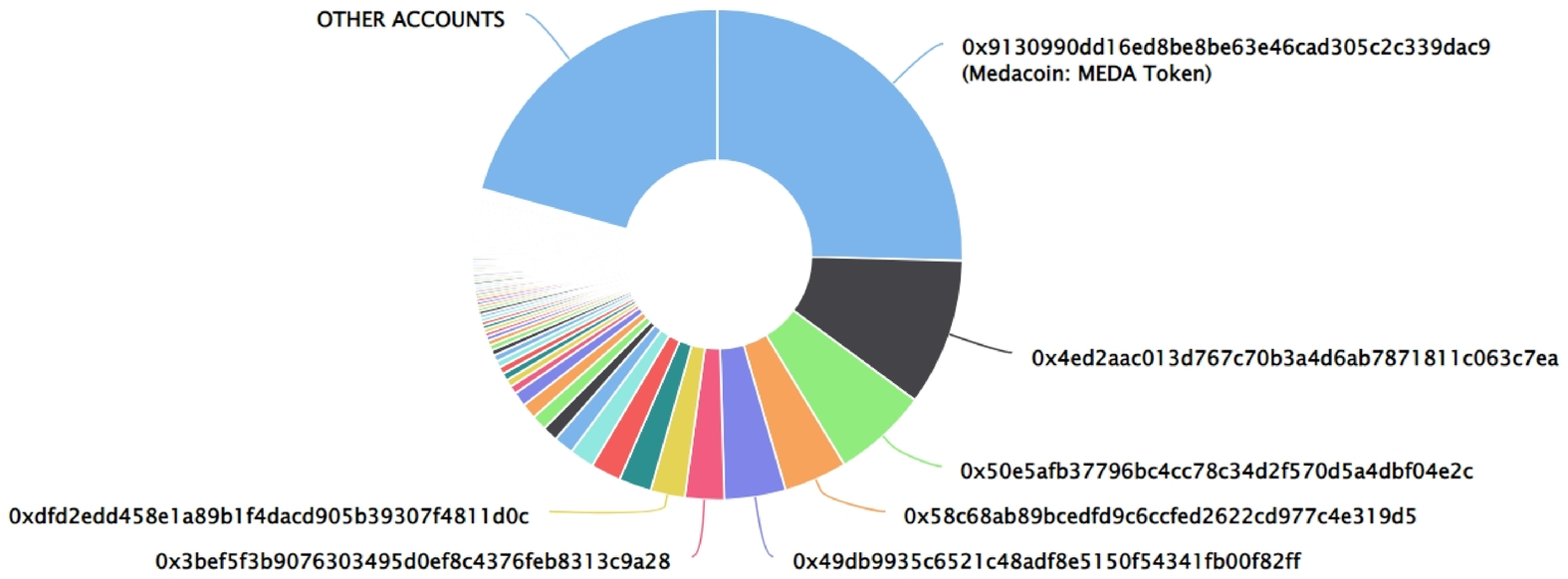
MEDACOIN Token Distribution

The top 100 holders collectively own 79.35% (79,354,583,529.03 Tokens) of MEDACOIN

Token Total Supply: 100,000,000,000.00 Token | Total Token Holders: 33,380

MEDACOIN Top 100 Token Holders

Source: BscScan.com



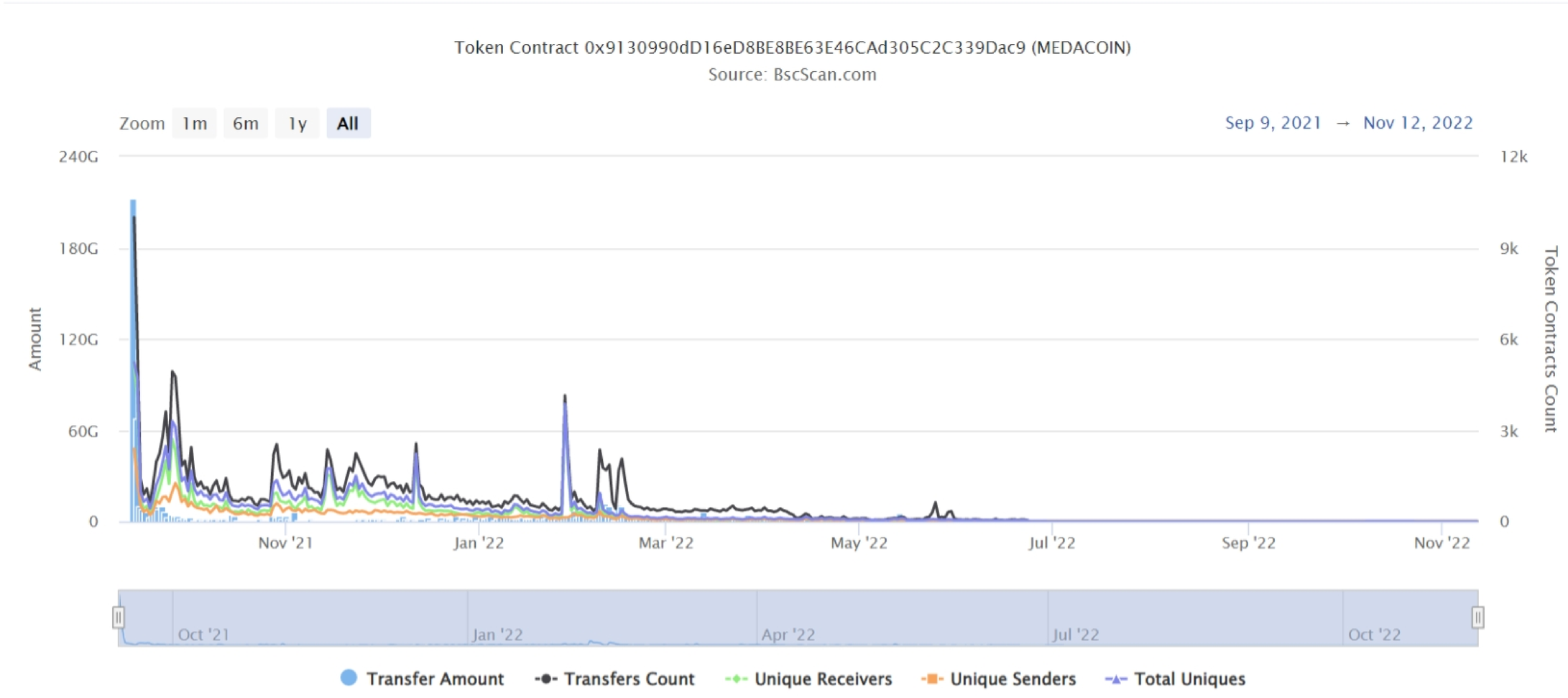
MEDACOIN Top 20 Token Holders

(A total of 79,354,583,529.03 tokens held by the top 100 accounts from the total supply of 100,000,000,000.00 token)

Rank	Address	Quantity (Token)	Percentage
1	Medacoin: MEDA Token	25,404,523,382.279654758	25.4045%
2	0x4ed2aac013d767c70b3a4d6ab7871811c063c7ea	9,707,036,038.365953001	9.7070%
3	0x50e5afb37796bc4cc78c34d2f570d5a4dbf04e2c	6,231,189,346.942097415	6.2312%
4	0x58c68ab89bcedfd9c6ccfed2622cd977c4e319d5	4,180,000,000	4.1800%
5	0x49db9935c6521c48adf8e5150f54341fb00f82ff	4,041,455,897.053160829	4.0415%
6	0x3bef5f3b9076303495d0ef8c4376feb8313c9a28	2,578,000,000	2.5780%
7	0xdfd2edd458e1a89b1f4dacd905b39307f4811d0c	2,258,300,000	2.2583%
8	Medacoin: Deployer	2,138,682,104.03863372	2.1387%
9	0xba16ae114d1914d1774715a3a553868551250a99	2,000,000,000	2.0000%
10	0x59e263e1601b8e48eaf2909136bf5049daef1cdd	1,623,267,413.669566439	1.6233%
11	0x1ca8163cf7aa56c89876c570a6bdbdcc028ae13d	1,313,449,507.215161015	1.3134%
12	0x4b4a4f205e53e035d18529de141fda207c06102e	1,011,371,770.439096278	1.0114%
13	0xa6301820e5c2306b7cab1112151662c49cd409f5	1,000,000,000	1.0000%
14	0xc0b2058c77c8dead4a363955819b2babd986307d	996,401,160.176085051	0.9964%
15	mexc.com	955,157,811.232139304	0.9552%
16	0xd4f0746a7679c9ade48ab9b964511b4b97a35c73	527,137,500	0.5271%
17	0xbff5346119a608bd330e5ff168fe9f24b6f2c346	492,376,454.238809445	0.4924%
18	HODL: LBank LP	479,172,529.77280236	0.4792%
19	0xa1cc732bdd7d489716e3efaf4ab3c119bd5df6bf	470,493,644.026478176	0.4705%
20	0x674a83f829345eae36df14f48d4b9f72536fedfc	424,973,033.178543004	0.4250%

MEDACOIN Token Distribution

MEDACOIN Contract Overview



Contract functions details

+[Int] IERC20
    -[Ext] totalSupply
    -[Ext] balanceOf
    -[Ext] transfer
    -[Ext] allowance
    -[Ext] approve
    -[Ext] transferFrom

+[Lib] SafeMath
    -[Int] add
    -[Int] sub
    -[Int] sub
    -[Int] mul
    -[Int] div
    -[Int] div
    -[Int] mod
    -[Int] mod

+Context
    -[Int] _msgSender
    -[Int] _msgData

+[Lib] Address
    -[Int] isContract
    -[Int] sendValue
    -[Int] functionCall
    -[Int] functionCall
    -[Int] functionCallWithValue
    -[Int] functionCallWithValue
    -[Pvt] _functionCallWithValue

+Ownable (Context)
    -[Int] <constructor>#
    -[Pub] owner
    -[Pub] renounceOwnership #
      - modifiers: onlyOwner
    -[Pub] transferOwnership #
      - modifiers: onlyOwner
    -[Pub] geUnlockTime

Contract functions details

-[Pub] lock #
  - modifiers: onlyOwner
-[Pub] unlock #

+[Int] IUniswapV2Factory
-[Ext] feeTo
-[Ext] feeToSetter
-[Ext] getPair
-[Ext] allPairs
-[Ext] allPairsLength
-[Ext] createPair #
-[Ext] setFeeTo #
-[Ext] setFeeToSetter #

+[Int] IUniswapV2Pair
-[Ext] name
-[Ext] symbol
-[Ext] decimals
-[Ext] totalSupply
-[Ext] balanceOf
-[Ext] allowance
-[Ext] approve #
-[Ext] transfer #
-[Ext] transferFrom #
-[Ext] DOMAIN_SEPARATOR
-[Ext] PERMIT_TYPEHASH
-[Ext] nonces
-[Ext] permit #
-[Ext] MINIMUM_LIQUIDITY
-[Ext] factory
-[Ext] token0
-[Ext] token1
-[Ext] getReserves
-[Ext] price0CumulativeLast
-[Ext] price1CumulativeLast
-[Ext] kLast
-[Ext] mint #
-[Ext] burn #
-[Ext] swap #

Contract functions details

-[Ext] skim #
-[Ext] sync #
-[Ext] initialize

+[Int] IUniswapV2Router01
-[Ext] factory
-[Ext] WETH
-[Ext] addLiquidity #
-[Ext] addLiquidityETH ($)
-[Ext] removeLiquidity #
-[Ext] removeLiquidityETH #
-[Ext] removeLiquidityWithPermit #
-[Ext] removeLiquidityETHWithPermit #
-[Ext] swapExactTokensForTokens #
-[Ext] swapTokensForExactTokens #
-[Ext] swapExactETHForTokens ($)
-[Ext] swapTokensForExactETH #
-[Ext] swapExactTokensForETH #
-[Ext] swapETHForExactTokens ($)
-[Ext] quote
-[Ext] getAmountOut
-[Ext] getAmountIn
-[Ext] getAmountsOut
-[Ext] getAmountsIn

+[Int] IUniswapV2Router02 (IUniswapV2Router01)
-[Ext] removeLiquidityETHSupportingFeeOnTransferTokens #
-[Ext] removeLiquidityETHWithPermitSupportingFeeOnTransferTokens #
-[Ext] swapExactTokensForTokensSupportingFeeOnTransferTokens #
-[Ext] swapExactETHForTokensSupportingFeeOnTransferTokens ($)
-[Ext] swapExactTokensForETHSupportingFeeOnTransferTokens #

+MEDACOIN (Context, IERC20, Ownable)
-[Pub] <Constructor>#
-[Pub] name
-[Pub] symbol
-[Pub] decimals
-[Pub] totalSupply
-[Pub] balanceOf

Contract functions details

-[Pub] transfer #
-[Pub] allowance
-[Pub] approve #
-[Pub] transferFrom #
-[Pub] increaseAllowance #
-[Pub] decreaseAllowance #
-[Pub] isExcludedFromReward
-[Pub] totalFees
-[Pub] deliver #
-[Pub] reflectionFromToken
-[Pub] tokenFromReflection
-[Pub] excludeFromReward #
  - modifiers: onlyOwner
-[Ext] includeInReward #
  - modifiers: onlyOwner
-[Pvt] _transferBothExcluded #
-[Pub] excludeFromFee #
  - modifiers: onlyOwner
-[Pub] includeInFee #
  - modifiers: onlyOwner
-[Ext] setTaxFeePercent #
  - modifiers: onlyOwner
-[Ext] setLiquidityFeePercent #
  - modifiers: onlyOwner
-[Ext] setMaxTxPercent #
  - modifiers: onlyOwner
-[Ext] setNumTokensSellToAddToLiquidity #
  - modifiers: onlyOwner
-[Ext] setMaxTxAmount #
  - modifiers: onlyOwner
-[Pub] setSwapAndLiquifyEnabled #
  - modifiers: onlyOwner
-[Ext] <Fallback>($)
-[Pvt] _reflectFee #
-[Pvt] _getValues
-[Pvt] _getTValues
-[Pvt] _getRValues
-[Pvt] _getRate

Contract functions details

-[Pvt] _getCurrentSupply
-[Pvt] _takeLiquidity #
-[Pvt] calculateTaxFee
-[Pvt] calculateLiquidityFee
-[Pvt] removeAllFee #
-[Pvt] restoreAllFee #
-[Pub] isExcludedFromFee
-[Pvt] _approve #
-[Pvt] _transfer #
-[Pvt] swapAndLiquify #
  - modifiers: lockTheSwap
-[Pvt] swapTokensForEth #
-[Pvt] addLiquidity #
-[Pvt] _tokenTransfer #
-[Pvt] _transferStandard #
-[Pvt] _transferToExcluded #
-[Pvt] _transferFromExcluded #

($) = payable function
= non-constant function

Issues Checking Status

No.	Title	Status
1.	Unlocked Compiler Version	Passed
2.	Missing Input Validation	Passed
3.	Race conditions and Reentrancy. Cross-function race conditions.	Passed
4.	Possible delays in data delivery	Passed
5.	Oracle calls.	Passed
6.	Timestamp dependence.	Passed
7.	Integer Overflow and Underflow	Passed
8.	DoS with Revert.	Passed
9.	DoS with block gas limit.	Medium Issue
10.	Methods execution permissions.	Passed
11.	Economy model of the contract.	Passed
12.	Private use data leaks.	Passed
13.	Malicious Event log.	Passed
14.	Scoping and Declarations.	Passed
15.	Uninitialized storage pointers.	Passed
16.	Arithmetic accuracy.	Passed
17.	Design Logic.	Passed
18.	Safe Open Zeppelin contracts implementation and usage.	Passed
19.	Incorrect Naming State Variable	Passed
20.	Too old version	Passed

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.

Security Issues

- **Critical Severity Issues**

  No critical severity issue found.

- **High Severity Issues**

  No high severity issue found.

- **Medium Severity Issues**

  One medium severity issue found.

1. Out of gas

- **Issue:**

  The function includeInReward() uses the loop to find and remove addresses from the _excluded list. Function will be aborted with OUT_OF_GAS exception if there will be a long excluded addresses list.

  The function _getCurrentSupply also uses the loop for evaluating total supply. It also could be aborted with OUT_OF_GAS exception if there will be a long excluded addresses list.

- **Recommendation**

  Check that the excluded array length is not too big.

- **Low Severity Issues**

  No low severity issue found.

Centralization

Owner privileges :

- MEDACOIN Contract:
    - Owner can change the tax and liquidity fee.
    - Owner can exclude from the fee.
    - Owner can change the maximum transaction amount.
    - Owner can change numTokensSellToAddToLiquidity.
    - Owner can lock and unlock. By the way, using these functions the owner could leave as owner even after the ownership was renounced.

This smart contract has some functions which can be executed by the admin (Owner) only. If the admin wallet private key would be compromised, then it would create trouble, as smart contract ownership has not been renounced.Following are admin functions:

- renounceOwnership
- transferOwnership
- lock
- excludeFromReward
- includeInReward
- excludeFromFee
- includeInFee
- setTaxFeePercent
- setLiquidityFeePercent
- setMaxTxPercent
- setNumTokensSelltoAddToLiquidity
- setMaxTxAmount
- setSwapAndLiquifyEnabled

Conclusion

Smart contract contains medium severity issues! The further transfer and operations with the fund raised are not related to this particular contract.

HackSafe note: Please check the disclaimer above and note, the audit makes no statements or warranties on business model, investment attractiveness or code sustainability. The report is provided for the only contract mentioned in the report and does not include any other potential contracts deployed by Owner.