

ARK
Smart Contract
Audit Report



17 Dec 2022



# **TABLE OF CONTENTS**

### | Audited Details

- Audited Project
- Blockchain
- Addresses
- Project Website
- Codebase

### Summary

- Contract Summary
- Audit Findings Summary
- Vulnerabilities Summary

### Conclusion

### | Audit Results

### Smart Contract Analysis

- Detected Vulnerabilities

### Disclaimer

### About Us



# **AUDITED DETAILS**

## | Audited Project

Project name	Token ticker	Blockchain	
ARK	ARKFI	Binance Smart Chain	

## Addresses

Contract address	0x111120a4cfacf4c78e0d6729274fd5a5ae2b1111
Contract deployer address	0x810C5704d0b10254d36440c773402180ed973dd0

### Project Website

https://www.arkfi.io/

### Codebase

https://bscscan.com/address/0x111120a4cfacf4c78e0d6729274fd5a5ae2b1111#code



### **SUMMARY**

Ark Fi products and smart contracts are built on the BSC layer one blockchain for its' security, decentralization, low gas fees, and compatibility with Ethereum Virtual Machine (EVM). The native token BNB and stable coin BUSD are available on the Binance CEX and several other major exchanges worldwide. The BSC has made a name for itself in the DeFi space as a reliable, low-cost, and secure solution for decentralized applications. By launching on BSC, Ark Fi taps into a large community of users and liquidity that will speed the adoption and early growth of the protocol.

### Contract Summary

#### **Documentation Quality**

ARK provides a very good documentation with standard of solidity base code.

• The technical description is provided clearly and structured and also dont have any high risk issue.

#### **Code Quality**

The Overall quality of the basecode is standard.

 Standard solidity basecode and rules are already followed by ARK with the discovery of several low issues.

#### **Test Coverage**

Test coverage of the project is 100% (Through Codebase)

### Audit Findings Summary

• SWC-101 | It is recommended to use vetted safe math libraries for arithmetic operations consistently on lines 48, 48, 123, 131, 143, 170, 170, 172, 172, 173, 173, 173, 173, 186, 187, 193, 194, 195, 200, 201, 202 and 264.



## CONCLUSION

We have audited the ARK project released on December 2022 to discover issues and identify potential security vulnerabilities in ARK Project. This process is used to find technical issues and security loopholes which might be found in the smart contract.

The security audit report provides satisfactory results with low-risk issues.

The issues found in the ARK smart contract code do not pose a considerable risk. The writing of the contract is close to the standard of writing contracts in general. The low-risk issues found are some arithmetic operation issues. It is recommended to use vetted safe math libraries for arithmetic operations consistently throughout the smart contract system.



# **AUDIT RESULT**

Article	Category	Description	Result
Default Visibility	SWC-100 SWC-108	Functions and state variables visibility should be set explicitly. Visibility levels should be specified consciously.	PASS
Integer Overflow and Underflow	SWC-101	If unchecked math is used, all math operations should be safe from overflows and underflows.	
Outdated Compiler Version	SWC-102	It is recommended to use a recent version of the Solidity compiler.	PASS
Floating Pragma	SWC-103	Contracts should be deployed with the same compiler version and flags that they have been tested thoroughly.	PASS
Unchecked Call Return Value	SWC-104	The return value of a message call should be checked.	PASS
Unprotected Ether Withdrawal	SWC-105	Due to missing or insufficient access controls, malicious parties can withdraw from the contract.	PASS
SELFDESTRUCT Instruction	SWC-106	The contract should not be self-destructible while it has funds belonging to users.	PASS
Reentrancy	SWC-107	Check effect interaction pattern should be followed if the code performs recursive call.	PASS
Uninitialized Storage Pointer	SWC-109	Uninitialized local storage variables can point to unexpected storage locations in the contract.	PASS
Assert Violation	SWC-110 SWC-123	Properly functioning code should never reach a failing assert statement.	PASS
Deprecated Solidity Functions	SWC-111	Deprecated built-in functions should never be used.	PASS
Delegate call to Untrusted Callee	SWC-112	Delegatecalls should only be allowed to trusted addresses.	PASS



DoS (Denial of Service)	SWC-113 SWC-128	Execution of the code should never be blocked by a specific contract state unless required.	PASS
Race Conditions	SWC-114	Race Conditions and Transactions Order Dependency should not be possible.	PASS
Authorization through tx.origin	SWC-115	tx.origin should not be used for authorization.	PASS
Block values as a proxy for time	SWC-116	Block numbers should not be used for time calculations.	PASS
Signature Unique ID	SWC-117 SWC-121 SWC-122	Signed messages should always have a unique id. A transaction hash should not be used as a unique id.	PASS
Incorrect Constructor Name	SWC-118	Constructors are special functions that are called only once during the contract creation.	PASS
Shadowing State Variable	SWC-119	State variables should not be shadowed.	PASS
Weak Sources of Randomness	SWC-120	Random values should never be generated from Chain Attributes or be predictable.	PASS
Write to Arbitrary Storage Location	SWC-124	The contract is responsible for ensuring that only authorized user or contract accounts may write to sensitive storage locations.	PASS
Incorrect Inheritance Order	SWC-125		PASS
Insufficient Gas Griefing	SWC-126	Insufficient gas griefing attacks can be performed on contracts which accept data and use it in a sub-call on another contract.	PASS
Arbitrary Jump Function	SWC-127	As Solidity doesnt support pointer arithmetics, it is impossible to change such variable to an arbitrary value.	PASS



Typographical Error	SWC-129	A typographical error can occur for example when the intent of a defined operation is to sum a number to a variable.	PASS
Override control character	SWC-130	Malicious actors can use the Right-To-Left-Override unicode character to force RTL text rendering and confuse users as to the real intent of a contract.	
Unused variables	SWC-131 SWC-135	Unused variables are allowed in Solidity and they do not pose a direct security issue.	PASS
Unexpected Ether balance	SWC-132	Contracts can behave erroneously when they strictly assume a specific Ether balance.	PASS
Hash Collisions Variable	SWC-133	Using abi.encodePacked() with multiple variable length arguments can, in certain situations, lead to a hash collision.	PASS
Hardcoded gas amount	SWC-134	The transfer() and send() functions forward a fixed amount of 2300 gas.	PASS
Unencrypted Private Data	SWC-136	It is a common misconception that private type variables cannot be read.	PASS



# **SMART CONTRACT ANALYSIS**

Started	Friday Dec 16 2022 12:26:51 GMT+0000 (Coordinated Universal Time)		
Finished	Saturday Dec 17 2022 11:06:40 GMT+0000 (Coordinated Universal Time)		
Mode	Standard		
Main Source File	ARK_TOKEN.sol		

## Detected Issues

ID	Title	Severity	Status
SWC-101	ARITHMETIC OPERATION "*" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "**" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "+" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "-" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "-=" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "/" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "*" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "/" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "*" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "/" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "*" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "-" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "-" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "-=" DISCOVERED	low	acknowledged



SWC-101	ARITHMETIC OPERATION "+=" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "-" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "+=" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "+=" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "-" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "+=" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "+=" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "+" DISCOVERED	low	acknowledged



## SWC-101 | ARITHMETIC OPERATION "\*" DISCOVERED

LINE 48

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- ARK\_TOKEN.sol

```
uint8 private constant _decimals = 18;
uint256 private _totalSupply = 800_000 * (10**_decimals);

mapping(address => uint256) private _balances;
mapping(address => mapping(address => uint256)) private _allowances;

mapping(address => mapping(address => uint256)) private _allowances;
```



## SWC-101 | ARITHMETIC OPERATION "\*\*" DISCOVERED

LINE 48

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- ARK\_TOKEN.sol

```
uint8 private constant _decimals = 18;
uint256 private _totalSupply = 800_000 * (10**_decimals);

mapping(address => uint256) private _balances;
mapping(address => mapping(address => uint256)) private _allowances;

mapping(address => mapping(address => uint256)) private _allowances;
```



# SWC-101 | ARITHMETIC OPERATION "+" DISCOVERED

**LINE 123** 

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- ARK\_TOKEN.sol

```
require(spender != address(0), "Can't use zero address here");

_allowances[msg.sender][spender] = allowance(msg.sender, spender) + addedValue;

emit Approval(msg.sender, spender, _allowances[msg.sender][spender]);

return true;

}

127
```



# SWC-101 | ARITHMETIC OPERATION "-" DISCOVERED

**LINE 131** 

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- ARK\_TOKEN.sol

```
130 require(allowance(msg.sender, spender) >= subtractedValue, "Can't subtract more
than current allowance");
131 _allowances[msg.sender][spender] = allowance(msg.sender, spender) -
subtractedValue;
132 emit Approval(msg.sender, spender, _allowances[msg.sender][spender]);
133 return true;
134 }
135
```



# SWC-101 | ARITHMETIC OPERATION "-=" DISCOVERED

**LINE 143** 

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- ARK\_TOKEN.sol

```
require(_allowances[sender][msg.sender] >= amount, "Insufficient Allowance");

allowances[sender][msg.sender] -= amount;

emit Approval(sender, msg.sender, _allowances[sender][msg.sender]);

}

145 }

146

147
```



## SWC-101 | ARITHMETIC OPERATION "/" DISCOVERED

**LINE 170** 

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- ARK\_TOKEN.sol

```
function takeTax(address sender, uint256 amount) internal returns (uint256){
    _transfer(sender, pair, amount * liqTax / 100);
    IDEXPair(pair).sync();
    _transfer(sender, vault, amount * vaultTax / 100);
    return amount * (100 - vaultTax - liqTax) / 100;
    174
```



## SWC-101 | ARITHMETIC OPERATION "\*" DISCOVERED

**LINE 170** 

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- ARK\_TOKEN.sol

```
function takeTax(address sender, uint256 amount) internal returns (uint256){
    _transfer(sender, pair, amount * liqTax / 100);
    IDEXPair(pair).sync();
    _transfer(sender, vault, amount * vaultTax / 100);
    return amount * (100 - vaultTax - liqTax) / 100;
    174
```



## SWC-101 | ARITHMETIC OPERATION "/" DISCOVERED

**LINE 172** 

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- ARK\_TOKEN.sol

```
171    IDEXPair(pair).sync();
172    _transfer(sender, vault, amount * vaultTax / 100);
173    return amount * (100 - vaultTax - liqTax) / 100;
174    }
175
176
```



## SWC-101 | ARITHMETIC OPERATION "\*" DISCOVERED

**LINE 172** 

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- ARK\_TOKEN.sol

```
171   IDEXPair(pair).sync();
172   _transfer(sender, vault, amount * vaultTax / 100);
173   return amount * (100 - vaultTax - liqTax) / 100;
174  }
175
176
```



## SWC-101 | ARITHMETIC OPERATION "/" DISCOVERED

**LINE 173** 

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- ARK\_TOKEN.sol

```
172   _transfer(sender, vault, amount * vaultTax / 100);
173   return amount * (100 - vaultTax - liqTax) / 100;
174  }
175
176   function checkSwap(address sender, address recipient) internal view returns (bool)
{
177
```



## SWC-101 | ARITHMETIC OPERATION "\*" DISCOVERED

**LINE 173** 

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- ARK\_TOKEN.sol

```
172   _transfer(sender, vault, amount * vaultTax / 100);
173   return amount * (100 - vaultTax - liqTax) / 100;
174  }
175
176   function checkSwap(address sender, address recipient) internal view returns (bool)
{
177
```



## SWC-101 | ARITHMETIC OPERATION "-" DISCOVERED

**LINE 173** 

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- ARK\_TOKEN.sol

```
172   _transfer(sender, vault, amount * vaultTax / 100);
173   return amount * (100 - vaultTax - liqTax) / 100;
174  }
175
176   function checkSwap(address sender, address recipient) internal view returns (bool)
{
177
```



## SWC-101 | ARITHMETIC OPERATION "-" DISCOVERED

**LINE 173** 

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- ARK\_TOKEN.sol

```
172   _transfer(sender, vault, amount * vaultTax / 100);
173   return amount * (100 - vaultTax - liqTax) / 100;
174  }
175
176   function checkSwap(address sender, address recipient) internal view returns (bool)
{
177
```



# SWC-101 | ARITHMETIC OPERATION "-=" DISCOVERED

**LINE 186** 

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- ARK\_TOKEN.sol

```
require(amount <= _balances[sender], "Can't transfer more than you own");

_balances[sender] -= amount;

_balances[recipient] += amount;

emit Transfer(sender, recipient, amount);

return true;

190
```



## SWC-101 | ARITHMETIC OPERATION "+=" DISCOVERED

**LINE 187** 

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- ARK\_TOKEN.sol

```
186   _balances[sender] -= amount;
187   _balances[recipient] += amount;
188   emit Transfer(sender, recipient, amount);
189   return true;
190  }
191
```



## SWC-101 | ARITHMETIC OPERATION "-" DISCOVERED

**LINE 193** 

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- ARK\_TOKEN.sol

```
function _swapTopUp(uint256 amountNeeded) internal {
   uint256 howMuchIsMissing = amountNeeded - _balances[swap];
   _balances[swap] += howMuchIsMissing;
   _totalSupply += howMuchIsMissing;
   emit SwapToppedUp(howMuchIsMissing);

196
```



# SWC-101 | ARITHMETIC OPERATION "+=" DISCOVERED

**LINE 194** 

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- ARK\_TOKEN.sol



## SWC-101 | ARITHMETIC OPERATION "+=" DISCOVERED

**LINE 195** 

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- ARK\_TOKEN.sol

```
194   _balances[swap] += howMuchIsMissing;
195   _totalSupply += howMuchIsMissing;
196   emit SwapToppedUp(howMuchIsMissing);
197  }
198
199
```



## SWC-101 | ARITHMETIC OPERATION "-" DISCOVERED

**LINE 200** 

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- ARK\_TOKEN.sol

```
function _vaultTopUp(address vaultAddress, uint256 amountNeeded) internal {
  uint256 howMuchIsMissing = amountNeeded - _balances[vaultAddress];
  _balances[vaultAddress] += howMuchIsMissing;
  _totalSupply += howMuchIsMissing;
  emit VaultToppedUp(vaultAddress, howMuchIsMissing);
```



# SWC-101 | ARITHMETIC OPERATION "+=" DISCOVERED

**LINE 201** 

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- ARK\_TOKEN.sol

```
uint256 howMuchIsMissing = amountNeeded - _balances[vaultAddress];

balances[vaultAddress] += howMuchIsMissing;

ctotalSupply += howMuchIsMissing;

emit VaultToppedUp(vaultAddress, howMuchIsMissing);

}
```



## SWC-101 | ARITHMETIC OPERATION "+=" DISCOVERED

**LINE 202** 

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- ARK\_TOKEN.sol

```
201    _balances[vaultAddress] += howMuchIsMissing;
202    _totalSupply += howMuchIsMissing;
203    emit VaultToppedUp(vaultAddress, howMuchIsMissing);
204  }
205
206
```



## SWC-101 | ARITHMETIC OPERATION "+" DISCOVERED

**LINE 264** 

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- ARK\_TOKEN.sol

```
vaultTax = newVaultTax;
require(liqTax + vaultTax <= 100, "Taxes can't exceed 100%");
emit TaxesChanged(liqTax, vaultTax);
}
</pre>
```



### **DISCLAIMER**

This report is subject to the terms and conditions (including without limitation, description of services, confidentiality, disclaimer and limitation of liability) set forth in the Services Agreement, or the scope of services, and terms and conditions provided to you ("Customer" or the "Company") in connection with the Agreement. This report provided in connection with the Services set forth in the Agreement shall be used by the Company only to the extent permitted under the terms and conditions set forth in the Agreement. This report may not be transmitted, disclosed, referred to, or relied upon by any person for any purposes, nor may copies be delivered to any other person other than the Company, without Sysfixed's prior written consent in each instance.

This report is not, nor should be considered, an "endorsement" or "disapproval" of any particular project or team. This report is not, nor should be considered, an indication of the economics or value of any "product" or "asset" created by any team or project that contracts Sysfixed to perform a security assessment. This report does not provide any warranty or guarantee regarding the absolute bug-free nature of the technology analyzed, nor do they provide any indication of the technologies proprietors, business, business model, or legal compliance.

This is a limited report on our findings based on our analysis, in accordance with good industry practice as of 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.

This report should not be used in any way to make decisions around investment or involvement with any particular project. This report in no way provides investment advice, nor should be leveraged as investment advice of any sort. This report represents an extensive assessing process intending to help our customers increase the quality of their code while reducing the high level of risk presented by cryptographic tokens and blockchain technology.

This report is provided for information purposes only and on a non-reliance basis and does not constitute investment advice. No one shall have any right to rely on the report or its contents, and Sysfixed and its affiliates (including holding companies, shareholders, subsidiaries, employees, directors, officers, and other representatives) (Sysfixed) owe no duty of care.



### **ABOUT US**

Sysfixed is a blockchain security certification organization established in 2021 with the objective to provide smart contract security services and verify their correctness in blockchain-based protocols. Sysfixed automatically scans for security vulnerabilities in Ethereum and other EVM-based blockchain smart contracts. Sysfixed a comprehensive range of analysis techniques—including static analysis, dynamic analysis, and symbolic execution—can accurately detect security vulnerabilities to provide an in-depth analysis report. With a vibrant ecosystem of world-class integration partners that amplify developer productivity, Sysfixed can be utilized in all phases of your project's lifecycle. Our team of security experts is dedicated to the research and improvement of our tools and techniques used to fortify your code.