



SMART CONTRACT AUDIT

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PREPARED FOR

MINERSWAP



INTRODUCTION

Auditing Firm	InterFi Network
Client Firm	MinerSwap
Methodology	Automated Analysis, Manual Code Review
Language	Solidity
Contracts	Multiple Contracts
Blockchain	EthereumPoW
Centralization	Ownership is locked in a time-lock contract
Commit	bbff10b76a600ba69df970584cabae78d0b84e83
Website	https://minerswap.fi/
Telegram	https://t.me/minerswapfi
Twitter	https://twitter.com/minerswapfi
Discord	https://discord.gg/kPmsWNDarq
Prelim Analysis Date	October 22, 2022
Report v1 Date	October 28, 2022
Report v2 Date	November 05, 2022

 Verify the authenticity of this report on our website: <https://www.interfi.network/audits>



EXECUTIVE SUMMARY

InterFi has performed the automated and manual analysis of solidity codes. Solidity codes were reviewed for common contract vulnerabilities and centralized exploits. Here's a quick audit summary:

Status	Critical ●	Major ●	Medium ●	Minor ●	Unknown ●
Open	0	0	0	3	0
Acknowledged	1	0	0	4	0
Resolved	0	1	1	0	0
Noteworthy Privileges	Refer to PAGE 28 for centralization related privileges				

i Please note that smart contracts deployed on blockchains aren't resistant to exploits, vulnerabilities and/or hacks. Blockchain and cryptography assets utilize new and emerging technologies. These technologies present a high level of ongoing risks. For a detailed understanding of risk severity, source code vulnerability, and audit limitations, kindly review the audit report thoroughly.

i Please note that centralization privileges regardless of their inherited risk status – constitute an elevated impact on smart contract safety and security.



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SCOPE OF WORK

InterFi was consulted by MinerSwap to conduct the smart contract audit of their solidity source codes.

The audit scope of work is strictly limited to mentioned solidity file(s) only:

- IMinerSwapCore.sol
- IMinerSwapFactory.sol
- IMinerSwapPair.sol
- MinerSwapCore.sol
- MinerSwapFactory.sol
- MinerSwapRouter.sol
- MinerPool.sol
- MinerPoolAdmin.sol
- Token.sol
- Timelock.sol

 If source codes are not deployed on the main net, they can be modified or altered before main-net deployment. Verify the contract's deployment status below:

MinerSwapCore.sol #0x37cB3375151E1Dc6C7a51169cA64f07ACFaF9EdE

<https://explorer.minerswap.fi/address/0x37cB3375151E1Dc6C7a51169cA64f07ACFaF9EdE/contracts#address-tabs>

MinerSwapFactory #0x91836D77AF0A5fdA36C5a1F3c11DbC7766dE4D03

<https://explorer.minerswap.fi/address/0x91836D77AF0A5fdA36C5a1F3c11DbC7766dE4D03/contracts#address-tabs>



MinerSwapRouter #0x8f048e25fEcd0AFdE2af78d9966C010D94e76aEc

<https://explorer.minerswap.fi/address/0x8f048e25fEcd0AFdE2af78d9966C010D94e76aEc/contracts#address-tabs>

MinerPool #0x710a5dEE58a1845E1f17FC8fBF583FE0Ab29c021

<https://explorer.minerswap.fi/address/0x710a5dEE58a1845E1f17FC8fBF583FE0Ab29c021/contracts#address-tabs>

MinerPoolAdmin #0x8fD3849F4bb765bcF546F8b45D94443d18ea4464

<https://explorer.minerswap.fi/address/0x8fD3849F4bb765bcF546F8b45D94443d18ea4464/contracts#address-tabs>

MinerSwap Token #0x5Ee9Cb7AEC566bccF3b24C6C96744972878292d3

<https://explorer.minerswap.fi/address/0x5Ee9Cb7AEC566bccF3b24C6C96744972878292d3/contracts#address-tabs>

Timelock #0x91aEd49c1479FcF9D2a960bf65ABE2635C51e058

<https://explorer.minerswap.fi/address/0x91aEd49c1479FcF9D2a960bf65ABE2635C51e058/contracts#address-tabs>



AUDIT METHODOLOGY

Smart contract audits are conducted using a set of standards and procedures. Mutual collaboration is essential to performing an effective smart contract audit. Here's a brief overview of InterFi's auditing process and methodology:

CONNECT

- The onboarding team gathers source codes, and specifications to make sure we understand the size, and scope of the smart contract audit.

AUDIT

- Automated analysis is performed to identify common contract vulnerabilities. We may use the following third-party frameworks and dependencies to perform the automated analysis:
 - Remix IDE Developer Tool
 - Open Zeppelin Code Analyzer
 - SWC Vulnerabilities Registry
 - DEX Dependencies, e.g., Pancakeswap, Uniswap
- Simulations are performed to identify centralized exploits causing contract and/or trade locks.
- A manual line-by-line analysis is performed to identify contract issues and centralized privileges.

We may inspect below mentioned common contract vulnerabilities, and centralized exploits:

Centralized Exploits	<ul style="list-style-type: none">○ Token Supply Manipulation○ Access Control and Authorization○ Assets Manipulation○ Ownership Control○ Liquidity Access○ Stop and Pause Trading○ Ownable Library Verification
----------------------	---



Common Contract Vulnerabilities


- Integer Overflow
- Lack of Arbitrary limits
- Incorrect Inheritance Order
- Typographical Errors
- Requirement Violation
- Gas Optimization
- Coding Style Violations
- Re-entrancy
- Third-Party Dependencies
- Potential Sandwich Attacks
- Irrelevant Codes
- Divide before multiply
- Conformance to Solidity Naming Guides
- Compiler Specific Warnings
- Language Specific Warnings

REPORT

- The auditing team provides a preliminary report specifying all the checks which have been performed and the findings thereof.
- The client's development team reviews the report and makes amendments to solidity codes.
- The auditing team provides the final comprehensive report with open and unresolved issues.

PUBLISH






- The client may use the audit report internally or disclose it publicly.

 It is important to note that there is no pass or fail in the audit, it is recommended to view the audit as an unbiased assessment of the safety of solidity codes.



RISK CATEGORIES

Smart contracts are generally designed to hold, approve, and transfer tokens. This makes them very tempting attack targets. A successful external attack may allow the external attacker to directly exploit. A successful centralization-related exploit may allow the privileged role to directly exploit. All risks which are identified in the audit report are categorized here for the reader to review:

Risk Type	Definition
Critical 	These risks could be exploited easily and can lead to asset loss, data loss, asset, or data manipulation. They should be fixed right away.
Major 	These risks are hard to exploit but very important to fix, they carry an elevated risk of smart contract manipulation, which can lead to high-risk severity.
Medium 	These risks should be fixed, as they carry an inherent risk of future exploits, and hacks which may or may not impact the smart contract execution. Low-risk re-entrancy-related vulnerabilities should be fixed to deter exploits.
Minor 	These risks do not pose a considerable risk to the contract or those who interact with it. They are code-style violations and deviations from standard practices. They should be highlighted and fixed nonetheless.
Unknown 	These risks pose uncertain severity to the contract or those who interact with it. They should be fixed immediately to mitigate the risk uncertainty.

All statuses which are identified in the audit report are categorized here for the reader to review:

Status Type	Definition
Open	Risks are open.
Acknowledged	Risks are acknowledged, but not fixed.
Resolved	Risks are acknowledged and fixed.



CENTRALIZED PRIVILEGES


Centralization risk is the most common cause of cryptography asset loss. When a smart contract has a privileged role, the risk related to centralization is elevated.

There are some well-intended reasons have privileged roles, such as:

- Privileged roles can be granted the power to pause() the contract in case of an external attack.
- Privileged roles can use functions like, `include()`, and `exclude()` to add or remove wallets from fees, swap checks, and transaction limits. This is useful to run a presale and to list on an exchange.




Authorizing privileged roles to externally-owned-account (EOA) is dangerous. Lately, centralization-related losses are increasing in frequency and magnitude.

- The client can lower centralization-related risks by implementing below mentioned practices:
- Privileged role's private key must be carefully secured to avoid any potential hack.
- Privileged role should be shared by multi-signature (multi-sig) wallets.
- Authorized privilege can be locked in a contract, user voting, or community DAO can be introduced to unlock the privilege.
- Renouncing the contract ownership, and privileged roles.
- Remove functions with elevated centralization risk.












 Understand the project's initial asset distribution. Assets in the liquidity pair should be locked. Assets outside the liquidity pair should be locked with a release schedule.



AUTOMATED ANALYSIS

Symbol	Definition
	Function modifies state
	Function is payable
	Function is internal
	Function is private
!	Function is important

```

| **IMinerSwapCore** | Interface | |||
| L | initialize | External ! |  |NO ! |
| L | factory | External ! | |NO ! |
| L | feeToSetter | External ! | |NO ! |
| L | vaultController | External ! | |NO ! |
| L | WETH | External ! | |NO ! |
| L | Stable | External ! | |NO ! |
| L | ethPrice | External ! | |NO ! |
| L | ethStablePair | External ! | |NO ! |
| L | feePoint | External ! | |NO ! |
| L | initPair | External ! |  |NO ! |
| L | mint | External ! |  |NO ! |
| L | emitMint | External ! |  |NO ! |
| L | burn | External ! |  |NO ! |
| L | emitBurn | External ! |  |NO ! |
| L | swap | External ! |  |NO ! |
| L | emitSwap | External ! |  |NO ! |
| L | emitTransfer | External ! |  |NO ! |
| L | skim | External ! |  |NO ! |
| L | sync | External ! |  |NO ! |

```



```

|  L | getFees | External ! | |NO! |
|  L | getPairType | External ! | |NO! |
|  L | getCumulativePrice | External ! | |NO! |
|  L | getKlast | External ! | |NO! |
|  L | getReserves | External ! | |NO! |
|  L | getAmountOut | External ! | |NO! |
|  L | getAmountIn | External ! | |NO! |
|  L | getAmountsOut | External ! | |NO! |
|  L | getAmountsIn | External ! | |NO! |
|  L | getPair | External ! | |NO! |
|  L | getPairTokens | External ! | |NO! |
|  L | getPairLength | External ! | |NO! |
|  L | getEncodedRates | External ! | |NO! |
|  L | getEffectiveRates | External ! | |NO! |
|  L | getEffectivePrices | External ! | |NO! |
|  L | getPairPrices | External ! | |NO! |
|  L | getTracking | External ! | |NO! |
|  L | getBlacklisted | External ! | |NO! |
|||||

```

```

| **IMinerSwapFactory** | Interface | |||
|  L | INIT_CODE_PAIR_HASH | External ! | |NO! |
|  L | feeTo | External ! | |NO! |
|  L | feeToSetter | External ! | |NO! |
|  L | getPair | External ! | |NO! |
|  L | allPairs | External ! | |NO! |
|  L | allPairsLength | External ! | |NO! |
|  L | createPair | External ! | 🚫 |NO! |
|  L | setFeeToSetter | External ! | 🚫 |NO! |
|||||

```

```

| **IMinerSwapPair** | Interface | |||
|  L | name | External ! | |NO! |

```



```

|  | symbol | External ! | |NO! |
|  | decimals | External ! | |NO! |
|  | totalSupply | External ! | |NO! |
|  | balanceOf | External ! | |NO! |
|  | allowance | External ! | |NO! |
|  | approve | External ! | ● |NO! |
|  | transfer | External ! | ● |NO! |
|  | transferFrom | External ! | ● |NO! |
|  | DOMAIN_SEPARATOR | External ! | |NO! |
|  | PERMIT_TYPEHASH | External ! | |NO! |
|  | nonces | External ! | |NO! |
|  | permit | External ! | ● |NO! |
|  | MINIMUM_LIQUIDITY | External ! | |NO! |
|  | factory | External ! | |NO! |
|  | token0 | External ! | |NO! |
|  | token1 | External ! | |NO! |
|  | getReserves | External ! | |NO! |
|  | getPairInfo | External ! | |NO! |
|  | price0CumulativeLast | External ! | |NO! |
|  | price1CumulativeLast | External ! | |NO! |
|  | kLast | External ! | |NO! |
|  | mint | External ! | ● |NO! |
|  | burn | External ! | ● |NO! |
|  | swap | External ! | ● |NO! |
|  | skim | External ! | ● |NO! |
|  | sync | External ! | ● |NO! |
|  | initialize | External ! | ● |NO! |
|  | checkVault | External ! | ● |NO! |
|||||
| **IERC20** | Interface | |||
|  | name | External ! | |NO! |

```



```

|  | symbol | External ! | |NO! |
|  | decimals | External ! | |NO! |
|  | totalSupply | External ! | |NO! |
|  | balanceOf | External ! | |NO! |
|  | allowance | External ! | |NO! |
|  | approve | External ! | |NO! |
|  | transfer | External ! | |NO! |
|  | transferFrom | External ! | |NO! |

```

```

|||||

```

```

| **IMinerSwapCallee** | Interface | |||
|  | minerSwapCall | External ! | |NO! |

```

```

|||||

```

```

| **IController** | Interface | |||
|  | depositPair | External ! | |NO! |
|  | withdrawAll | External ! | |NO! |

```

```

|||||

```

```

| **Math** | Library | |||

```

```

|  | min | Internal | | |
|  | sqrt | Internal | | |

```

```

|||||

```

```

| **EnumerableSet** | Library | |||

```

```

|  | _add | Private | | |
|  | _remove | Private | | |
|  | _contains | Private | | |
|  | _length | Private | | |
|  | _at | Private | | |
|  | _values | Private | | |
|  | add | Internal | | |
|  | remove | Internal | | |
|  | contains | Internal | | |
|  | length | Internal | | |
|  | at | Internal | | |

```



```

| L | values | Internal | 🔒 | | |
| L | add | Internal | 🔒 | 🔴 | |
| L | remove | Internal | 🔒 | 🔴 | |
| L | contains | Internal | 🔒 | | |
| L | length | Internal | 🔒 | | |
| L | at | Internal | 🔒 | | |
| L | values | Internal | 🔒 | | |
| L | add | Internal | 🔒 | 🔴 | |
| L | remove | Internal | 🔒 | 🔴 | |
| L | contains | Internal | 🔒 | | |
| L | length | Internal | 🔒 | | |
| L | at | Internal | 🔒 | | |
| L | values | Internal | 🔒 | | |
|||||

```

```

| **SafeTransferLib** | Library | |||

```

```

| L | safeTransferETH | Internal | 🔒 | 🔴 | |
| L | safeTransferFrom | Internal | 🔒 | 🔴 | |
| L | safeTransfer | Internal | 🔒 | 🔴 | |
| L | safeApprove | Internal | 🔒 | 🔴 | |
|||||

```

```

| **UQ112x112** | Library | |||

```

```

| L | encode | Internal | 🔒 | | |
| L | uqdiv | Internal | 🔒 | | |
|||||

```

```

| **MinerSwapERC20** | Implementation | IERC20 |||

```

```

| L | updateDomainSeparator | Internal | 🔒 | 🔴 | |
| L | name | Public ! | | NO ! |
| L | symbol | Public ! | | NO ! |
| L | decimals | Public ! | | NO ! |
| L | totalSupply | Public ! | | NO ! |
| L | balanceOf | Public ! | | NO ! |
| L | allowance | Public ! | | NO ! |

```



```

| L | nonces | Public ! | |NO ! |
| L | _mint | Internal 🔒 | 🔴 | |
| L | _burn | Internal 🔒 | 🔴 | |
| L | _approve | Private 🗝️ | 🔴 | |
| L | _transfer | Private 🗝️ | 🔴 | |
| L | approve | Public ! | 🔴 |NO ! |
| L | transfer | Public ! | 🔴 |NO ! |
| L | transferFrom | Public ! | 🔴 |NO ! |
| L | permit | Public ! | 🔴 |NO ! |
|||||
| **MinerSwapPair** | Implementation | IMinerSwapPair, MinerSwapERC20 |||
| L | price0CumulativeLast | External ! | |NO ! |
| L | price1CumulativeLast | External ! | |NO ! |
| L | kLast | External ! | |NO ! |
| L | getReserves | External ! | |NO ! |
| L | getPairInfo | External ! | |NO ! |
| L | initialize | External ! | 🔴 |NO ! |
| L | _update | Private 🗝️ | 🔴 | |
| L | mint | External ! | 🔴 | lock |
| L | burn | External ! | 🔴 | lock |
| L | swap | External ! | 🔴 | lock |
| L | skim | External ! | 🔴 | lock |
| L | sync | External ! | 🔴 | lock |
| L | checkVault | External ! | 🔴 | onlyCore |
| L | name | Public ! | |NO ! |
| L | symbol | Public ! | |NO ! |
| L | decimals | Public ! | |NO ! |
| L | totalSupply | Public ! | |NO ! |
| L | balanceOf | Public ! | |NO ! |
| L | allowance | Public ! | |NO ! |
| L | approve | Public ! | 🔴 |NO ! |

```




```

| L | transfer | Public ! | ● | NO ! |
| L | transferFrom | Public ! | ● | NO ! |
| L | nonces | Public ! | | NO ! |
| L | DOMAIN_SEPARATOR | External ! | | NO ! |
| L | PERMIT_TYPEHASH | External ! | | NO ! |
| L | permit | Public ! | ● | NO ! |
|||||

```

```

| **MinerSwapFactory** | Implementation | IMinerSwapFactory |||

```

```

| L | initialize | External ! | ● | NO ! |
| L | allPairsLength | External ! | | NO ! |
| L | feeTo | External ! | | NO ! |
| L | INIT_CODE_PAIR_HASH | External ! | | NO ! |
| L | createPair | External ! | ● | NO ! |
| L | setFeeToSetter | External ! | ● | NO ! |
| L | transfer | External ! | ● | NO ! |
|||||

```

```

| **MinerSwapCore** | Implementation | IMinerSwapCore |||

```

```

| L | newToken | Internal 🔒 | ● | |
| L | initialize | External ! | ● | NO ! |
| L | initPair | External ! | ● | onlyFactory |
| L | updateEffectiveRates | Internal 🔒 | ● | |
| L | _update | Private 🔒 | ● | |
| L | mint | External ! | ● | lock |
| L | emitMint | External ! | ● | NO ! |
| L | burn | External ! | ● | lock |
| L | emitBurn | External ! | ● | NO ! |
| L | swap | External ! | ● | lock |
| L | emitSwap | External ! | ● | NO ! |
| L | emitTransfer | External ! | ● | NO ! |
| L | skim | External ! | ● | lock |
| L | sync | External ! | ● | lock |

```



	^		getBalance		Internal	🔒				
	^		getValueDept		External	!			NO!	
	^		depositVault		Internal	🔒		🔴		
	^		withdrawVault		Internal	🔒		🔴		
	^		depositExternal		External	!		🔴		onlySetter
	^		withdrawExternal		External	!		🔴		onlySetter
	^		checkAmount		Internal	🔒		🔴		
	^		reDeposit		Internal	🔒		🔴		
	^		sortTokens		Internal	🔒				
	^		pairFor		Internal	🔒				
	^		getPair		External	!			NO!	
	^		getPairType		External	!			NO!	
	^		getPairTokens		External	!			NO!	
	^		getPairLength		External	!			NO!	
	^		getEncodedRates		Public	!			NO!	
	^		getEffectiveRates		Public	!			NO!	
	^		getEffectivePrices		Public	!			NO!	
	^		getPairPrices		External	!			NO!	
	^		getCumulativePrice		External	!			NO!	
	^		getTracking		External	!			NO!	
	^		getBlacklisted		External	!			NO!	
	^		getKlast		External	!			NO!	
	^		getReserves		External	!			NO!	
	^		_f		Internal	🔒				
	^		_d		Internal	🔒				
	^		_get_y		Internal	🔒				
	^		sCurve		Internal	🔒				
	^		verify		Internal	🔒				
	^		getFees		Public	!			NO!	
	^		collectFee		Internal	🔒		🔴		
	^		_getAmountOut		Internal	🔒				



```

|  L | _getAmountIn | Internal 🔒 |  |  |
|  L | getAmountOut | External ! |  | NO ! |
|  L | getAmountIn | External ! |  | NO ! |
|  L | getAmountsOut | External ! |  | NO ! |
|  L | getAmountsIn | External ! |  | NO ! |
|  L | updatePairType | External ! | 🔴 | onlySetter |
|  L | setFeePoint | External ! | 🔴 | onlySetter |
|  L | setTokenFeePoint | External ! | 🔴 | onlySetter |
|  L | setPairFeeAccount | External ! | 🔴 | onlySetter |
|  L | setVaultController | External ! | 🔴 | onlySetter |
|  L | setFeeToSetter | External ! | 🔴 | onlySetter |
|  L | updateStableToken | External ! | 🔴 | onlySetter |
|  L | addTracking | External ! | 🔴 | onlySetter |
|  L | removeTracking | External ! | 🔴 | onlySetter |
|  L | addBlacklist | External ! | 🔴 | onlySetter |
|  L | removeBlacklist | External ! | 🔴 | onlySetter |
|  L | setMinimumLiq | External ! | 🔴 | onlySetter |
|  L | transfer | External ! | 🔴 | onlySetter |

```

```

| **IMasterChef** | Interface | |||
|  L | add | External ! | 🔴 | NO ! |
|  L | set | External ! | 🔴 | NO ! |
|  L | setMultiplier | External ! | 🔴 | NO ! |
|  L | setDevRate | External ! | 🔴 | NO ! |
|  L | updateEmissionRate | External ! | 🔴 | NO ! |
|  L | transferOwnership | External ! | 🔴 | NO ! |

```

```

|||||

```

```

| **MinerPoolAdmin** | Implementation | |||
|  L | initialize | External ! | 🔴 | NO ! |
|  L | add | External ! | 🔴 | onlyTimelock |
|  L | set | External ! | 🔴 | onlyDev |

```



```

| L | setMultiplier | External ! | ● | onlyDev |
| L | setDevRate | External ! | ● | onlyTimelock |
| L | updateEmissionRate | External ! | ● | onlyDev |
| L | setMaxEmissionRate | External ! | ● | onlyTimelock |
| L | transferOwnership | External ! | ● | onlyTimelock |
| L | transferDev | External ! | ● | onlyTimelock |

```

```

| **SafeMath** | Library | |||

```

```

| L | add | Internal 🔒 | | |

```

```

| L | sub | Internal 🔒 | | |

```

```

| L | sub | Internal 🔒 | | |

```

```

| L | mul | Internal 🔒 | | |

```

```

| L | div | Internal 🔒 | | |

```

```

| L | div | Internal 🔒 | | |

```

```

| L | mod | Internal 🔒 | | |

```

```

| L | mod | Internal 🔒 | | |

```

```

|||||

```

```

| **Timelock** | Implementation | |||

```

```

| L | initialize | External ! | ● | NO ! |

```

```

| L | <Receive Ether> | External ! | 🚫 | NO ! |

```

```

| L | setDelay | Public ! | ● | NO ! |

```

```

| L | acceptAdmin | Public ! | ● | NO ! |

```

```

| L | setPendingAdmin | Public ! | ● | NO ! |

```

```

| L | queueTransaction | Public ! | ● | NO ! |

```

```

| L | cancelTransaction | Public ! | ● | NO ! |

```

```

| L | executeTransaction | Public ! | 🚫 | NO ! |

```

```

| L | getBlockTimestamp | Internal 🔒 | | |

```

```

| **SafeMath** | Library | |||

```

```

| L | tryAdd | Internal 🔒 | | |

```



```

|  | trySub | Internal | | |
|  | tryMul | Internal | | |
|  | tryDiv | Internal | | |
|  | tryMod | Internal | | |
|  | add | Internal | | |
|  | sub | Internal | | |
|  | mul | Internal | | |
|  | div | Internal | | |
|  | mod | Internal | | |
|  | sub | Internal | | |
|  | div | Internal | | |
|  | mod | Internal | | |
|||||

```

```

| **EnumerableSet** | Library | | |

```

```

|  | _add | Private | | |

```

```

|  | _remove | Private | | |

```

```

|  | _contains | Private | | |

```

```

|  | _length | Private | | |

```

```

|  | _at | Private | | |

```

```

|  | _values | Private | | |

```

```

|  | add | Internal | | |

```

```

|  | remove | Internal | | |

```

```

|  | contains | Internal | | |

```

```

|  | length | Internal | | |

```

```

|  | at | Internal | | |

```

```

|  | values | Internal | | |

```

```

|  | add | Internal | | |

```

```

|  | remove | Internal | | |

```

```

|  | contains | Internal | | |

```

```

|  | length | Internal | | |

```

```

|  | at | Internal | | |

```



```

|  L | values | Internal | 🔒 |  |  |
|  L | add | Internal | 🔒 | 🔴 |  |
|  L | remove | Internal | 🔒 | 🔴 |  |
|  L | contains | Internal | 🔒 |  |  |
|  L | length | Internal | 🔒 |  |  |
|  L | at | Internal | 🔒 |  |  |
|  L | values | Internal | 🔒 |  |  |
|||||
| **Context** | Implementation |  |  |
|  L | _msgSender | Internal | 🔒 |  |  |
|  L | _msgData | Internal | 🔒 |  |  |
|||||
| **Ownable** | Implementation | Context |  |  |
|  L | <Constructor> | Public | ! | 🔴 | NO ! |
|  L | owner | Public | ! |  | NO ! |
|  L | _checkOwner | Internal | 🔒 |  |  |
|  L | renounceOwnership | Public | ! | 🔴 | onlyOwner |
|  L | transferOwnership | Public | ! | 🔴 | onlyOwner |
|  L | _transferOwnership | Internal | 🔒 | 🔴 |  |
|||||
| **Address** | Library |  |  |
|  L | isContract | Internal | 🔒 |  |  |
|  L | sendValue | Internal | 🔒 | 🔴 |  |
|  L | functionCall | Internal | 🔒 | 🔴 |  |
|  L | functionCall | Internal | 🔒 | 🔴 |  |
|  L | functionCallWithValue | Internal | 🔒 | 🔴 |  |
|  L | functionCallWithValue | Internal | 🔒 | 🔴 |  |
|  L | functionStaticCall | Internal | 🔒 |  |  |
|  L | functionStaticCall | Internal | 🔒 |  |  |
|  L | functionDelegateCall | Internal | 🔒 | 🔴 |  |
|  L | functionDelegateCall | Internal | 🔒 | 🔴 |  |
|  L | verifyCallResult | Internal | 🔒 |  |  |

```



|||||

| ****IERC20**** | Interface | |||| ^L | totalSupply | External ! | |NO ! || ^L | balanceOf | External ! | |NO ! || ^L | transfer | External ! | ● |NO ! || ^L | allowance | External ! | |NO ! || ^L | approve | External ! | ● |NO ! || ^L | transferFrom | External ! | ● |NO ! |

|||||

| ****IERC20Permit**** | Interface | |||| ^L | permit | External ! | ● |NO ! || ^L | nonces | External ! | |NO ! || ^L | DOMAIN_SEPARATOR | External ! | |NO ! |

|||||

| ****SafeERC20**** | Library | |||| ^L | safeTransfer | Internal 🔒 | ● | || ^L | safeTransferFrom | Internal 🔒 | ● | || ^L | safeApprove | Internal 🔒 | ● | || ^L | safeIncreaseAllowance | Internal 🔒 | ● | || ^L | safeDecreaseAllowance | Internal 🔒 | ● | || ^L | safePermit | Internal 🔒 | ● | || ^L | _callOptionalReturn | Private 🔒 | ● | |

|||||

| ****IMinerSwap**** | Interface | |||| ^L | mint | External ! | ● |NO ! |

|||||

| ****MasterChef**** | Implementation | Ownable |||| ^L | initialize | External ! | ● |NO ! || ^L | poolLength | External ! | |NO ! || ^L | add | External ! | ● | onlyOwner || ^L | set | External ! | ● | onlyOwner || ^L | getMultiplier | Public ! | |NO ! |

```

|  L | pendingMsp | External ! |  NO ! | |
|  L | massUpdatePools | Public ! |  NO ! |
|  L | updatePool | Internal  |  | |
|  L | deposit | External ! |  NO ! |
|  L | withdraw | External ! |  NO ! |
|  L | emergencyWithdraw | External ! |  NO ! |
|  L | setDevAddress | External ! |  NO ! |
|  L | setFeeAddress | External ! |  NO ! |
|  L | setStartBlock | External ! |  NO ! |
|  L | setMultiplier | External ! |  onlyOwner |
|  L | setDevRate | External ! |  onlyOwner |
|  L | updateEmissionRate | External ! |  onlyOwner |

```

```

| **AddressUpgradeable** | Library |  |||

```

```

|  L | isContract | Internal  |  | |
|  L | sendValue | Internal  |  | |
|  L | functionCall | Internal  |  | |
|  L | functionCall | Internal  |  | |
|  L | functionCallWithValue | Internal  |  | |
|  L | functionCallWithValue | Internal  |  | |
|  L | functionStaticCall | Internal  |  | |
|  L | functionStaticCall | Internal  |  | |
|  L | verifyCallResult | Internal  |  | |

```

```

|||||

```

```

| **Initializable** | Implementation |  |||

```

```

|  L | _disableInitializers | Internal  |  | |

```

```

|||||

```

```

| **ContextUpgradeable** | Implementation | Initializable |||

```

```

|  L | __Context_init | Internal  |  onlyInitializing | |
|  L | __Context_init_unchained | Internal  |  onlyInitializing |
|  L | _msgSender | Internal  |  | |

```




```

|  L | _msgData | Internal 🔒 |  |  |
|||||
| **IERC20Upgradeable** | Interface |  |||
|  L | totalSupply | External ! |  |NO ! |
|  L | balanceOf | External ! |  |NO ! |
|  L | transfer | External ! | 🔴 |NO ! |
|  L | allowance | External ! |  |NO ! |
|  L | approve | External ! | 🔴 |NO ! |
|  L | transferFrom | External ! | 🔴 |NO ! |
|||||
| **IERC20MetadataUpgradeable** | Interface | IERC20Upgradeable |||
|  L | name | External ! |  |NO ! |
|  L | symbol | External ! |  |NO ! |
|  L | decimals | External ! |  |NO ! |
|||||
| **ERC20Upgradeable** | Implementation | Initializable, ContextUpgradeable,
IERC20Upgradeable, IERC20MetadataUpgradeable |||
|  L | __ERC20_init | Internal 🔒 | 🔴 | onlyInitializing |
|  L | __ERC20_init_unchained | Internal 🔒 | 🔴 | onlyInitializing |
|  L | name | Public ! |  |NO ! |
|  L | symbol | Public ! |  |NO ! |
|  L | decimals | Public ! |  |NO ! |
|  L | totalSupply | Public ! |  |NO ! |
|  L | balanceOf | Public ! |  |NO ! |
|  L | transfer | Public ! | 🔴 |NO ! |
|  L | allowance | Public ! |  |NO ! |
|  L | approve | Public ! | 🔴 |NO ! |
|  L | transferFrom | Public ! | 🔴 |NO ! |
|  L | increaseAllowance | Public ! | 🔴 |NO ! |
|  L | decreaseAllowance | Public ! | 🔴 |NO ! |
|  L | _transfer | Internal 🔒 | 🔴 |  |
|  L | _mint | Internal 🔒 | 🔴 |  |

```



```

|  L | _burn | Internal | 🔒 | 🔴 | | |
|  L | _approve | Internal | 🔒 | 🔴 | | |
|  L | _spendAllowance | Internal | 🔒 | 🔴 | | |
|  L | _beforeTokenTransfer | Internal | 🔒 | 🔴 | | |
|  L | _afterTokenTransfer | Internal | 🔒 | 🔴 | | |
|||||
| **OwnableUpgradeable** | Implementation | Initializable, ContextUpgradeable | |||
|  L | __Ownable_init | Internal | 🔒 | 🔴 | onlyInitializing |
|  L | __Ownable_init_unchained | Internal | 🔒 | 🔴 | onlyInitializing |
|  L | owner | Public | ! | | NO! |
|  L | _checkOwner | Internal | 🔒 | | | |
|  L | renounceOwnership | Public | ! | 🔴 | onlyOwner |
|  L | transferOwnership | Public | ! | 🔴 | onlyOwner |
|  L | _transferOwnership | Internal | 🔒 | 🔴 | | |
|||||
| **EnumerableSetUpgradeable** | Library | |||
|  L | _add | Private | 🔒 | 🔴 | | |
|  L | _remove | Private | 🔒 | 🔴 | | |
|  L | _contains | Private | 🔒 | | | |
|  L | _length | Private | 🔒 | | | |
|  L | _at | Private | 🔒 | | | |
|  L | _values | Private | 🔒 | | | |
|  L | add | Internal | 🔒 | 🔴 | | |
|  L | remove | Internal | 🔒 | 🔴 | | |
|  L | contains | Internal | 🔒 | | | |
|  L | length | Internal | 🔒 | | | |
|  L | at | Internal | 🔒 | | | |
|  L | values | Internal | 🔒 | | | |
|  L | add | Internal | 🔒 | 🔴 | | |
|  L | remove | Internal | 🔒 | 🔴 | | |
|  L | contains | Internal | 🔒 | | | |

```



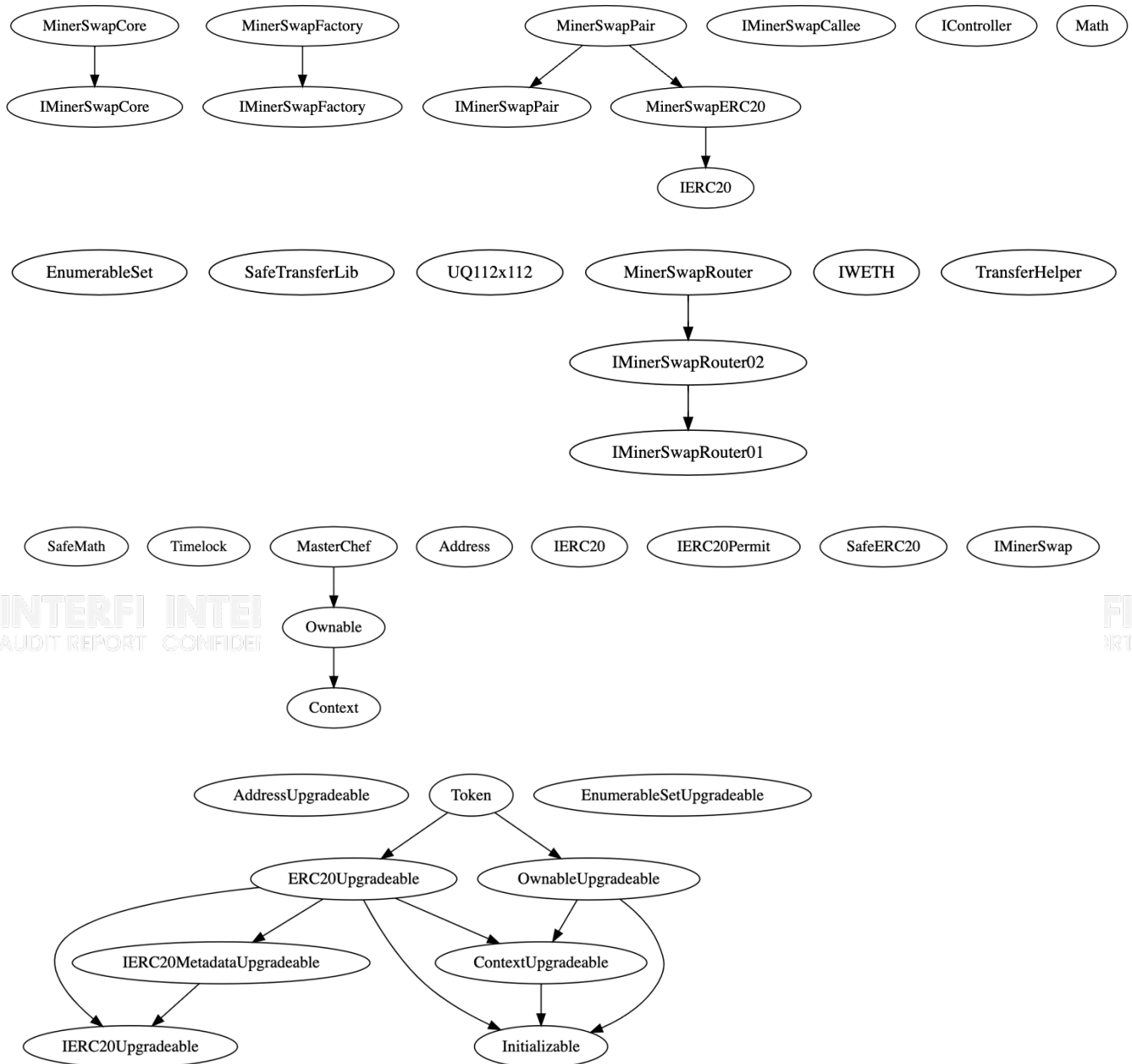
```

|  L | length | Internal 🔒 |  |  |
|  L | at | Internal 🔒 |  |  |
|  L | values | Internal 🔒 |  |  |
|  L | add | Internal 🔒 | 🔴 |  |
|  L | remove | Internal 🔒 | 🔴 |  |
|  L | contains | Internal 🔒 |  |  |
|  L | length | Internal 🔒 |  |  |
|  L | at | Internal 🔒 |  |  |
|  L | values | Internal 🔒 |  |  |
|||||
| **Token** | Implementation | ERC20Upgradeable, OwnableUpgradeable |||
|  L | initialize | External ! | 🔴 | initializer |
|  L | addMinter | External ! | 🔴 | onlyOwner |
|  L | removeMinter | External ! | 🔴 | onlyOwner |
|  L | getMinters | External ! |  | NO ! |
|  L | mintersCount | External ! |  | NO ! |
|  L | mint | External ! | 🔴 | onlyMinter |

```



INHERITANCE GRAPH



MANUAL REVIEW

Identifier	Definition	Severity
CEN-01	Centralization privileges of MinerSwap	Major 🟡
CEN-07	Authorizations and access controls	Minor 🟢

- Smart contract MinerSwapPair.sol sets `onlyFactory` and `onlyCore` modifiers.

```

modifier onlyFactory() {
    require(msg.sender == factory, 'Not factory');
}
modifier onlyCore() {
    require(msg.sender == address(core), 'Not core');
}

initPair onlyFactory
checkVault onlyCore

```

- Smart contract MinerSwapCore.sol sets `onlyFactory` and `onlySetter` modifiers.

```

modifier onlyFactory() {
    require(msg.sender == factory, 'Not factory');
}
modifier onlySetter() {
    require(msg.sender == feeToSetter, 'Not feeToSetter');
}

depositExternal onlySetter
withdrawExternal onlySetter

```

- Smart contract MinerPool.sol sets `onlyOwner` modifier.

```

modifier onlyOwner() {
    _checkOwner();
}

renounceOwnership onlyOwner
transferOwnership onlyOwner
add onlyOwner
set onlyOwner
updateEmissionRate onlyOwner

```



- Smart contract MinerPoolAdmin.sol sets `onlyDev` and `onlyTimelock` modifiers.

```

modifier onlyTimelock() {
    require(msg.sender == timelock, "Not timelock");
}
modifier onlyDev() {
    require(msg.sender == dev, "Not dev");
}

add onlyTimelock
set onlyDev
setMultiplier onlyDev
setDevRate onlyTimelock
updateEmissionRate onlyDev
setMaxEmissionRate onlyTimelock
transferOwnership onlyTimelock
transferDev onlyTimelock

```

- Smart contract Token.sol sets `onlyOwner` and `onlyMinter` modifiers.

```

modifier onlyOwner() {
    _checkOwner();
}
modifier onlyMinter() {
    require(minters.contains(_msgSender()), "FORBIDDEN");
}

renounceOwnership onlyOwner
transferOwnership onlyOwner
initialize onlyOwner
addMinter onlyOwner
removeMinter onlyOwner
mint onlyMinter

```

RECOMMENDATION

Private keys of all privileged roles must be secured carefully. Please refer to PAGE-09 CENTRALIZED PRIVILEGES for a detailed understanding.



RESOLUTION

Smart contract ownership is forwarded to a time-lock contract.

Ownership transfers:

<https://explorer.minerswap.fi/tx/0xfe2646416957805aaa73248bb1ee16d5b173d41a96c155f5d88118521ee954b3>

<https://explorer.minerswap.fi/tx/0x116ddaf8d22bfcb1066381c56b701b2b3b8ca337266848f0ee7948609ddf9292>

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Identifier	Definition	Severity
CEN-09	Use of proxy and upgradeable contracts	Critical ●

Privileged role can initiate contract implementation. Contract upgradeability allows privileged roles to change current contract implementation.

```
contract Token is ERC20Upgradeable, OwnableUpgradeable {
    using EnumerableSetUpgradeable for EnumerableSetUpgradeable.AddressSet;
```

```
    function initialize(string memory name_, string memory symbol_, uint8 decimal_, address
owner_) external initializer {
        __ERC20_init(name_, symbol_, decimal_);
        _transferOwnership(owner_);
        minters.add(owner_);
        emit NewMiner(owner_);
        emit Initialize(name_, symbol_, decimal_);
    }
}
```

RECOMMENDATION

Test and validate current contract thoroughly before deployment. Future contract upgradeability negatively elevates centralization risk.

ALLEVIATION

Smart contract ownership is forwarded to a time-lock contract.

Ownership transfers:

<https://explorer.minerswap.fi/tx/0xfe2646416957805aaa73248bb1ee16d5b173d41a96c155f5d88118521ee954b3>

<https://explorer.minerswap.fi/tx/0x116ddaf8d22bfcb1066381c56b701b2b3b8ca337266848f0ee7948609ddf9292>



Identifier	Definition	Severity
CEN-11	Privileged role performing mint	Medium ●

In smart contract Token.sol, Privileged role can mint assets.

```
function mint(address _to, uint256 _amount) external onlyMinter {
    _mint(_to, _amount);
    emit Mint(_to, _amount);
}
```

RECOMMENDATION

Declare and lock total asset supply. Access to mint function negatively elevates centralization risk.

RESOLUTION


Smart contract ownership is forwarded to a time-lock contract.

Ownership transfers:

<https://explorer.minerswap.fi/tx/0xfe2646416957805aaa73248bb1ee16d5b173d41a96c155f5d88118521ee954b3>

<https://explorer.minerswap.fi/tx/0x116ddaf8d22bfcbl066381c56b701b2b3b8ca337266848f0ee7948609ddf9292>



Identifier	Definition	Severity
LOG-02	Potential sandwich attack	Minor 

Potential sandwich attack happens when an attacker observes a transaction swapping tokens or adding liquidity without setting restrictions on slippage or minimum output amount. The attacker can manipulate the exchange rate by front-running a transaction to purchase assets and make profits by back-running a transaction to sell assets. Below mentioned functions are called without setting restrictions on slippage or minimum output:

```


addLiquidity()
swapExactTokensForTokens()
swapTokensForExactTokens()
swapExactETHForTokens()
swapTokensForExactETH()
swapExactTokensForETH()
swapETHForExactTokens()
swapExactTokensForTokensSupportingFeeOnTransferTokens()
swapExactETHForTokensSupportingFeeOnTransferTokens()
swapExactTokensForETHSupportingFeeOnTransferTokens()

```

RECOMMENDATION

These functions should be provided reasonable minimum output amounts, instead of zero. Read more: <https://coinmarketcap.com/alexandria/article/what-are-sandwich-attacks-in-defi-and-how-can-you-avoid-them>



Identifier	Definition	Severity
LOG-03	Missing important checks	Minor 

Below mentioned functions are missing parameter validation.

`updatePool()`

`deposit()`


`emergencyWithdraw()`

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RECOMMENDATION

Add require checks to ensure that the token of the given pool is valid.



Identifier	Definition	Severity
LOG-04	Missing verification of checks-effects-interactions method	Minor 


In function `add()`, `_lpToken` is pointing to a smart contract that is implemented based on ERC20. This smart contract can only be passed into function `add()` by owner as one of the parameters while the implementation of `_lpToken` is unknown statically, even if `_lpToken` followed the ERC20.

```
function add(uint256 _allocPoint, IERC20 _lpToken, uint16 _depositFeeBP, bool
_withUpdate) public onlyOwner {
    require(!_poolAddresses.contains(address(_lpToken)), "add: duplicate pool");
    require(_depositFeeBP <= 10000, "add: invalid deposit fee basis points");
    if (_withUpdate) {
        massUpdatePools();
    }
    uint256 lastRewardBlock = block.number > startBlock ? block.number : startBlock;
    totalAllocPoint = totalAllocPoint.add(_allocPoint);
    poolInfo.push(PoolInfo({
        lpToken: _lpToken,
        allocPoint: _allocPoint,
        lastRewardBlock: lastRewardBlock,
        accMspPerShare: 0,
        depositFeeBP: _depositFeeBP
    }));
    _poolAddresses.add(address(_lpToken));
}
```

RECOMMENDATION

Implement checks-effects-interactions verification method. Review https://fravoll.github.io/solidity-patterns/checks_effects_interactions.html for more information.




Identifier	Definition	Severity
COD-01	Use of <code>.call</code>	Minor 

`.call()` used across smart contracts.

RECOMMENDATION

Avoid using `.call()` whenever possible when executing another contract function as it bypasses type checking, function existence check, and argument packing.



Identifier	Definition	Severity
COD-02	Timestamp manipulation via <code>block.timestamp</code> Avoid using <code>block.number</code> as timestamp	Minor 

Be aware that the timestamp of the block can be manipulated by a miner. When the contract uses the timestamp to seed a random number, the miner can actually post a timestamp within 15 seconds of the block being validated, effectively allowing the miner to precompute an option more favorable to their chances, this is a critical exploit for contracts calculating random numbers, e.g., lottery.

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RECOMMENDATION

To maintain block integrity, follow 15 seconds rule, and scale time dependent events accordingly.



Identifier	Definition	Severity
COD-04	Unclear error messages	

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RECOMMENDATION

Provide accurate information strings for **require** related errors.




Identifier	Definition	Severity
COD-05	Missing zero address validation	

Validate if the input EOA is zero or not. Missing zero address validations across smart contracts.

RECOMMENDATION

Validate if the modified address is dead(\emptyset) or not.



Identifier	Definition	Severity
COD-11	Missing emit events	Minor 

MasterChef.sol

Add missing emit events to `dev()`, `setFeeAddress()`, `updateEmissionRate()`.

MinerPoolAdmin.sol

Add missing emit events to `setMultiplier()`, `setDevRate()`, `updateEmissionRate()`, `setMaxEmissionRate()`.

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RECOMMENDATION

Add events for important functions, and emit them.



Identifier	Definition	Severity
COM-01	Floating compiler status	

Compiler is set to ^0.8.17

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RECOMMENDATION

Pragma should be fixed to the version that you're indenting to deploy your contracts with.



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InterFi Network is built by engineers, developers, UI experts, and blockchain enthusiasts. Our team currently consists of 4 core members, and 6+ casual contributors.

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