SOLIDProof

Bring trust into your projects

Blockchain Security | Smart Contract Audits | KYC Development | Marketing

MADE IN GERMANY

GemSwap

Audit

Security Assessment
01. April, 2023

For

SolidProof_io

@solidproof_io

Disclaimer

SolidProof.io reports are not, nor should be considered, an “endorsement” or “disapproval” of any particular project or team. These reports are not, nor should be considered, an indication of the economics or value of any “product” or “asset” created by any team. SolidProof.io do not cover testing or auditing the integration with external contract or services (such as Unicrypt, Uniswap, PancakeSwap etc’...)

SolidProof.io Audits do not provide any warranty or guarantee regarding the absolute bug- free nature of the technology analyzed, nor do they provide any indication of the technology proprietors. SolidProof Audits should not be used in any way to make decisions around investment or involvement with any particular project. These reports in no way provide investment advice, nor should be leveraged as investment advice of any sort.

SolidProof.io Reports represent an extensive auditing 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. Blockchain technology and cryptographic assets present a high level of ongoing risk. SolidProof’s position is that each company and individual are responsible for their own due diligence and continuous security. SolidProof in no way claims any guarantee of security or functionality of the technology we agree to analyze.

Version	Date	Description
1.0	30. March 2023	• Layout project • Automated- /Manual-Security Testing • Summary

Network

ZkSync

Website

https://zks.gemswap.online/

Telegram

https://t.me/GemSwap_ZKS

Twitter

https://twitter.com/GemSwap_ZKS

Description

The gem of glory illuminates Knight in the dark and drives away stupid reptiles. Collect more $ZGem in #GemSwap, give Knight more power to dispel darkness and restore light.
#GemSwap is running on the ZkSync Era Network and it's comingnetwork, and our goal is to provide a comprehensive and convenient one-stop platform for the cryptocurrency community.

Project Engagement

During the Date of 30 March 2023, **Gemswap 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

- Provided as files

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)
Critical	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.
High	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 aspossible.
Medium	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.
Low	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.
Informational	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.

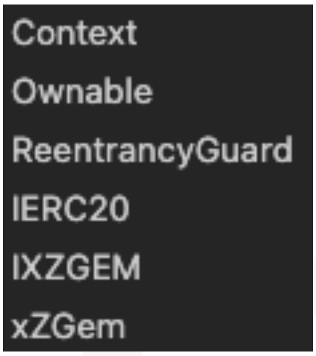
2. Testing and automated analysis that includes the following:
    - i) Test coverage analysis, which is the process of determining whether the test cases are actually covering the code and how much code is exercised when we run those test cases.
    - ii) Symbolic execution, which is analysing a program 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.

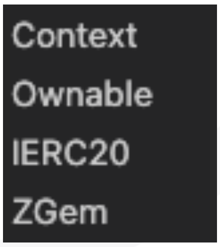
4. Specific, itemized, actionable recommendations to help you take steps to secure your smart contracts.

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

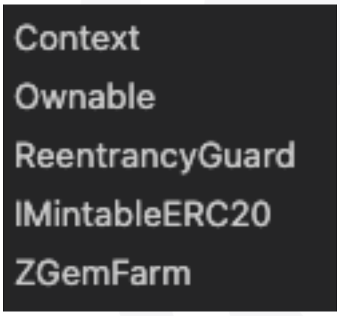
Imported packages:



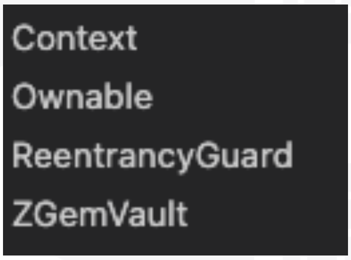
Context
Ownable
ReentrancyGuard
IERC20
IXZGEM
xZGem



Context
Ownable
IERC20
ZGem



Context
Ownable
ReentrancyGuard
IMintableERC20
ZGemFarm



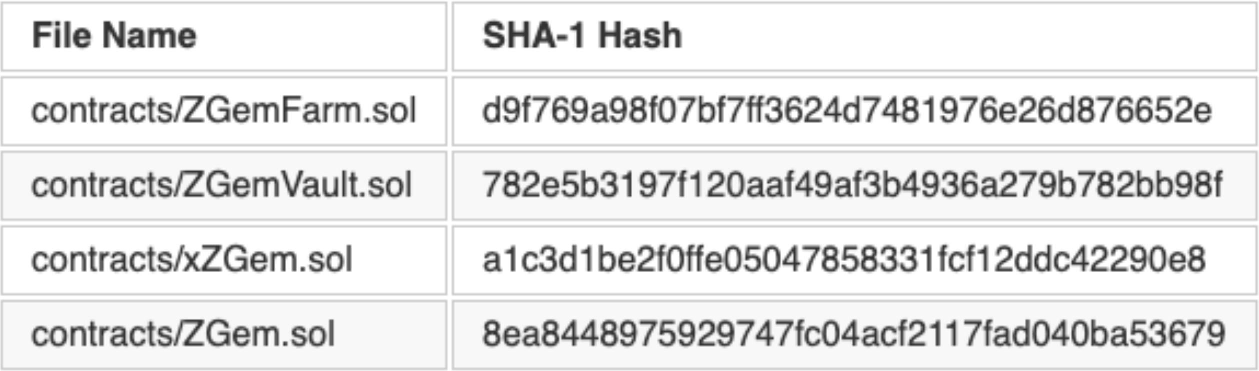
Context
Ownable
ReentrancyGuard
ZGemVault

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

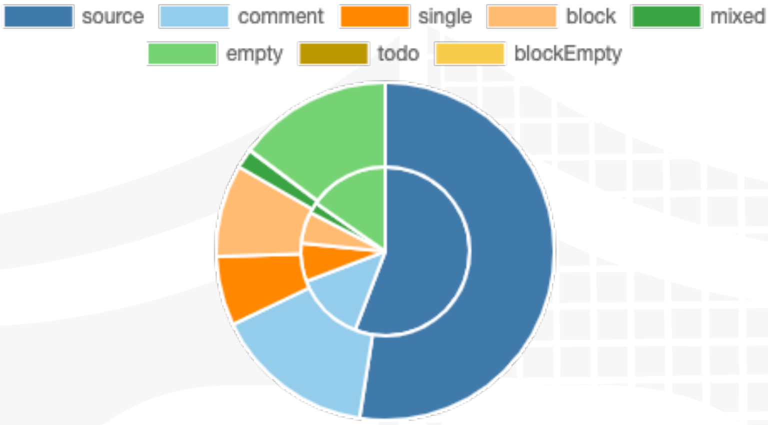


File Name	SHA-1 Hash
contracts/ZGemFarm.sol	d9f769a98f07bf7ff3624d7481976e26d876652e
contracts/ZGemVault.sol	782e5b3197f120aaf49af3b4936a279b782bb98f
contracts/xZGem.sol	a1c3d1be2f0ffe05047858331fcf12ddc42290e8
contracts/ZGem.sol	8ea8448975929747fc04acf2117fad040ba53679

Metrics

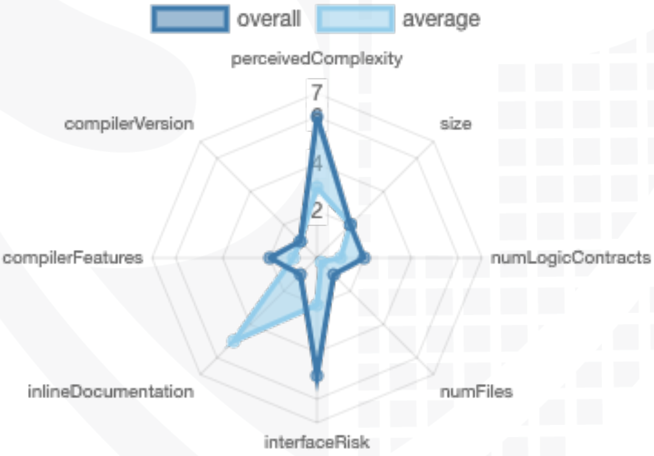
Source Lines

v1.0



Risk Level

v1.0



Capabilities

Components

Version	Contracts	Libraries	Interfaces	Abstract
1.0	8	0	4	7

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	79	0

Version	External	Internal	Private	Pure	View
1.0	24	94	0	2	34

State Variables

Version	Total	Public
1.0	56	33

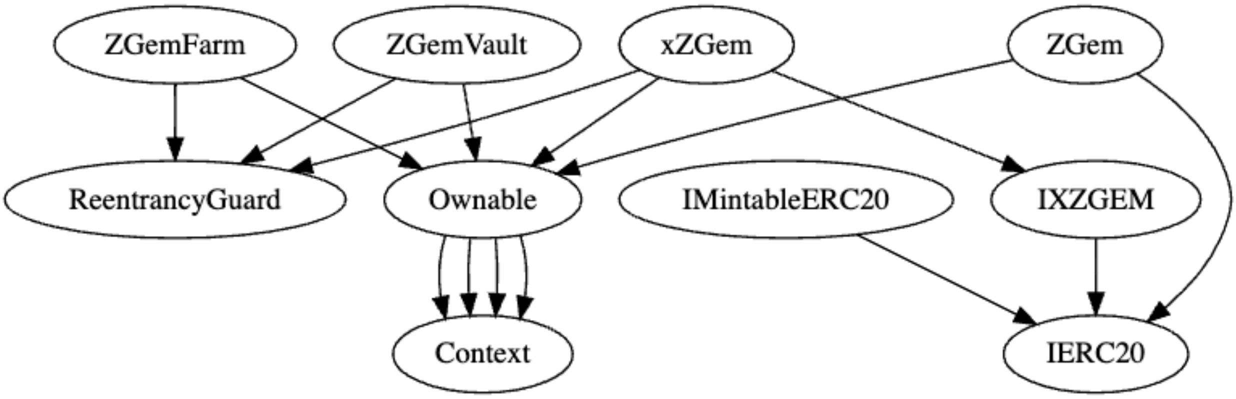
Capabilities

Version	Solidity Versions observed	Experimental Features	Can Receive Funds	Uses Assembly	Has Destroyable Contracts
1.0	^0.8.0				

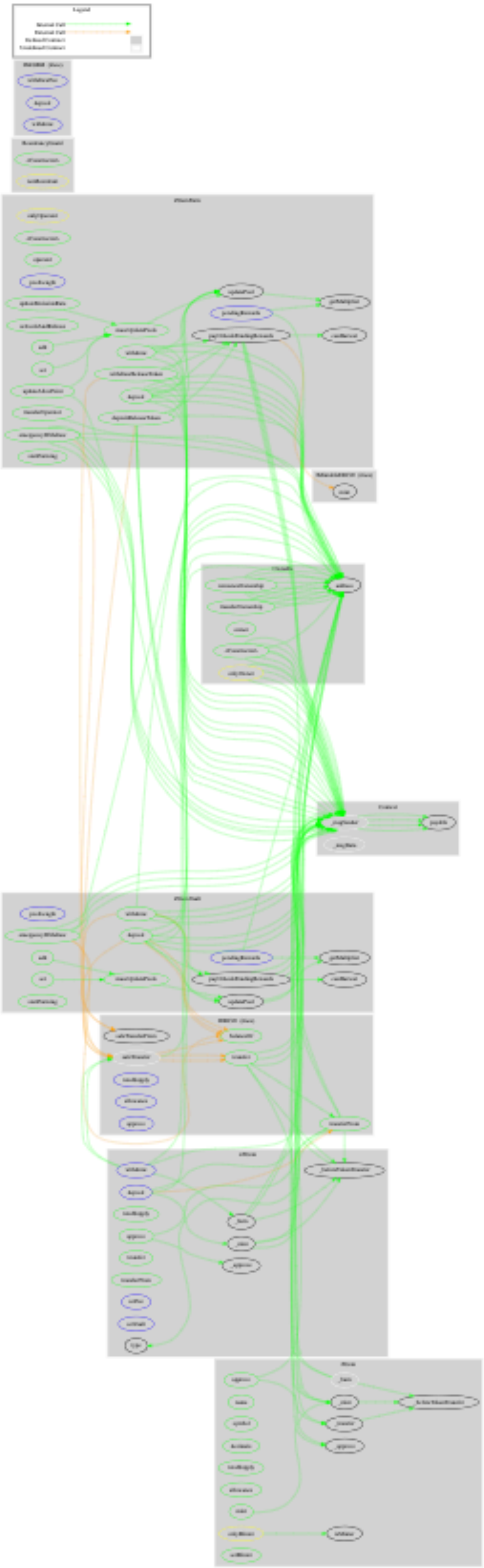
Version	Transfers ETH	Low-Level Calls	DelegateCall	Uses Hash Functions	ECRecover	New/ Create/ Create2
1.0	yes					

Inheritance Graph

v1.0



CallGraph
v1.0



Scope of Work/Verify Claims

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. Is contract an upgradeable
2. Overall checkup (Smart Contract Security)

Is contract an upgradeable

Name	
Is contract an upgradeable?	No

Overall checkup (Smart Contract Security)

Tested	Verified
✓	✓

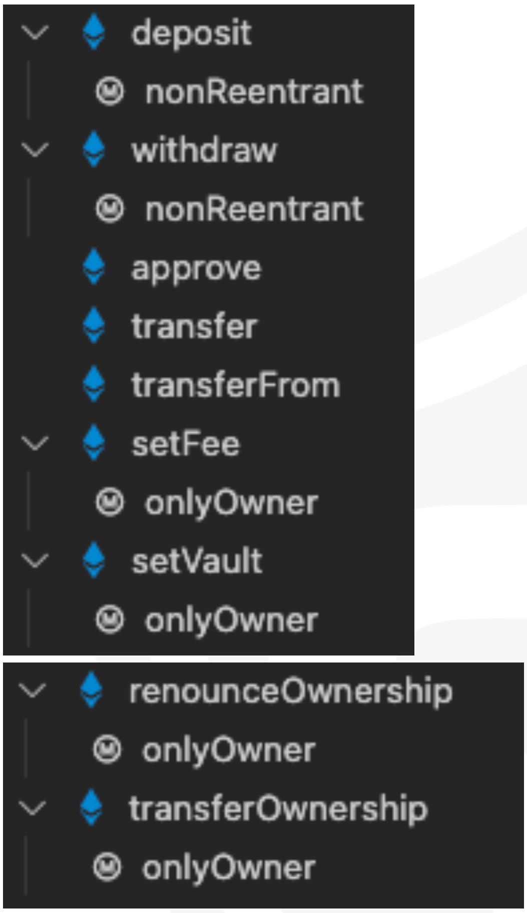
Legend

Attribute	Symbol
Verified / Checked	✓
Partly Verified	⚑
Unverified / Not checked	✗
Not available	–

Modifiers and public functions

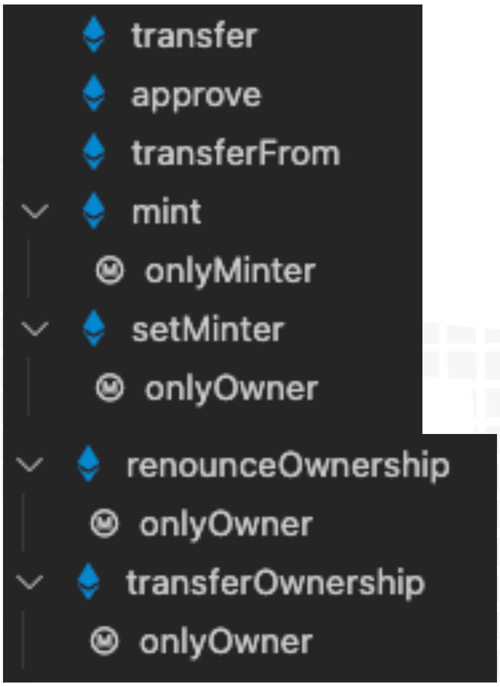
v1.0

xZGem



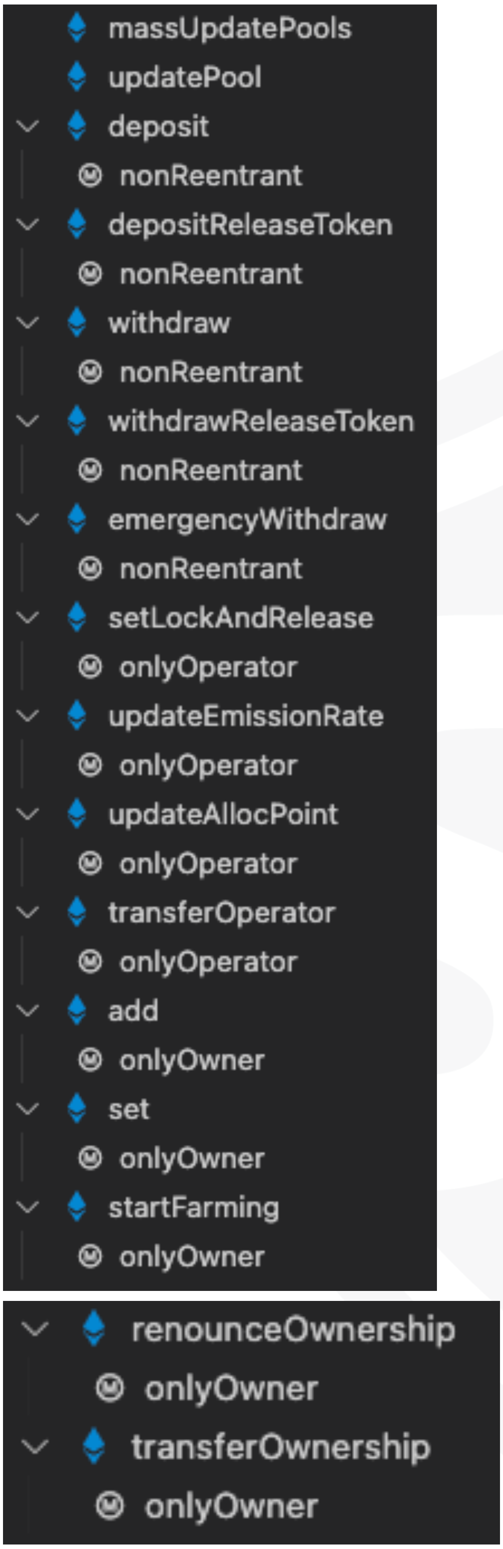
```
deposit
    nonReentrant
withdraw
    nonReentrant
approve
transfer
transferFrom
setFee
    onlyOwner
setVault
    onlyOwner
renounceOwnership
    onlyOwner
transferOwnership
    onlyOwner
```

Zgem



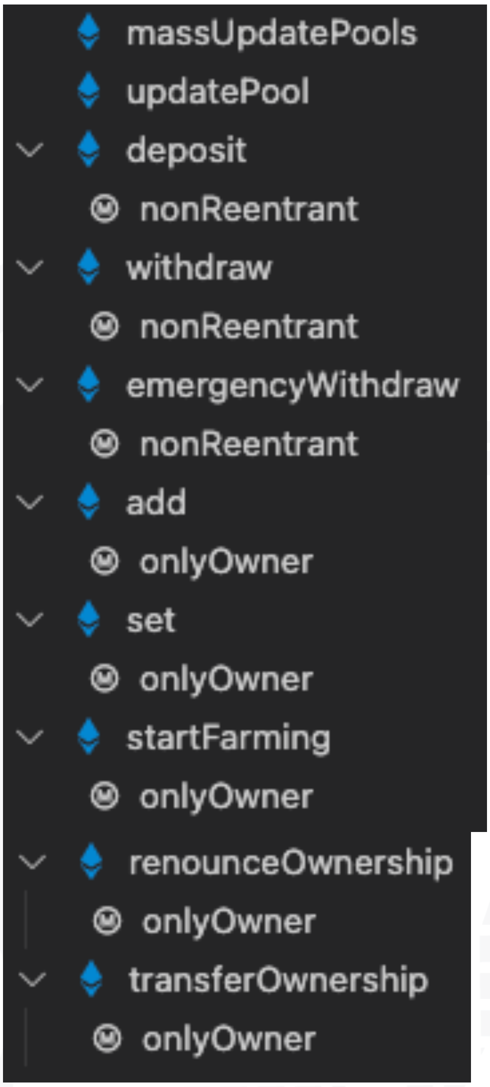
```
transfer
approve
transferFrom
mint
    onlyMinter
setMinter
    onlyOwner
renounceOwnership
    onlyOwner
transferOwnership
    onlyOwner
```

ZGemFarm



```
massUpdatePools
updatePool
deposit
  nonReentrant
depositReleaseToken
  nonReentrant
withdraw
  nonReentrant
withdrawReleaseToken
  nonReentrant
emergencyWithdraw
  nonReentrant
setLockAndRelease
  onlyOperator
updateEmissionRate
  onlyOperator
updateAllocPoint
  onlyOperator
transferOperator
  onlyOperator
add
  onlyOwner
set
  onlyOwner
startFarming
  onlyOwner
renounceOwnership
  onlyOwner
transferOwnership
  onlyOwner
```

ZGemVault



```
massUpdatePools
updatePool
deposit
  nonReentrant
withdraw
  nonReentrant
emergencyWithdraw
  nonReentrant
add
  onlyOwner
set
  onlyOwner
startFarming
  onlyOwner
renounceOwnership
  onlyOwner
transferOwnership
  onlyOwner
```

Comments

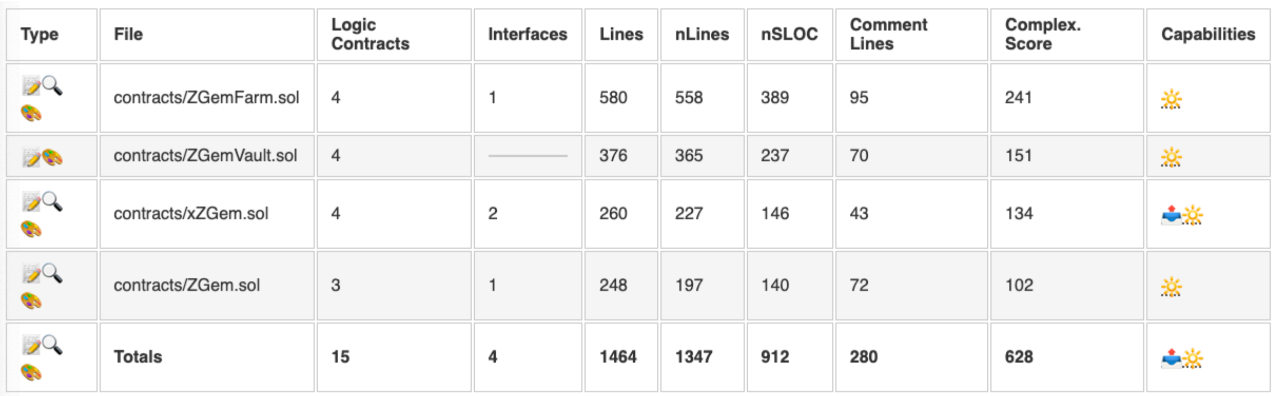
- xZGem
    - Owner is able to
        - Update
            - vault address
            - Withdraw fee to max 2%

    - Anyone can withdraw
- ZGem
    - Owner is able to
        - Add many minters
            - The minters are able to mint new tokens until the max supply is reached
    - Minter is able to
        - Mint new tokens until the max supply is reached
- ZGemFarm
    - Owner is able to
        - Start the farming
        - Update pool informations
        - Add a new lp to the pool
    - Operator is able to
        - Transfer operator
        - Update
            - allocation points
            - Emission rate
        - Set lock and release
- ZGemVault
    - Owner is able to
        - Start the farming
        - Update pool informations
        - Add a new lp to the pool

Please check if an OnlyOwner or similar restrictive modifier has been forgotten.

Source Units in Scope

v1.0



Type	File	Logic Contracts	Interfaces	Lines	nLines	nSLOC	Comment Lines	Complex. Score	Capabilities
📝🔍🎨	contracts/ZGemFarm.sol	4	1	580	558	389	95	241	☀
📝🎨	contracts/ZGemVault.sol	4	----	376	365	237	70	151	☀
📝🔍🎨	contracts/xZGem.sol	4	2	260	227	146	43	134	📥☀
📝🔍🎨	contracts/ZGem.sol	3	1	248	197	140	72	102	☀
📝🔍🎨	**Totals**	**15**	**4**	**1464**	**1347**	**912**	**280**	**628**	📥☀

Legend

Attribute	Description
Lines	total lines of the source unit
nLines	normalised lines of the source unit (e.g. normalises functions spanning multiple lines)
nSLOC	normalised 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

Critical issues

No critical issues

High issues

No high issues

Medium issues

No medium issues

Low issues

Issue	File	Type	Line	Description
#1	All	Contract doesn't import npm packages from source (like OpenZeppelin etc.)	—	We recommend to import all packages from npm directly without flatten the contract. Functions could be modified or can be susceptible to vulnerabilities
#2	All	A floating pragma is set	—	The current pragma Solidity directive is „"^0.8.0".
#3	ZGem.sol	Missing Zero Address Validation (missing-zero-check)	245	Check that the address is not zero
#4	ZGem.sol	Local variables shadowing	183, 224	Rename the local variables that shadow another component
#5	ZGemVault.sol	Local variables shadowing	358	Rename the local variables that shadow another component
#6	xZGem.sol	Missing Events Arithmetic	252, 257	Emit an event for critical parameter changes

Informational issues

Issue	File	Type	Line	Description

#1	ZGem.sol	State variables that could be declared constant (constable-states)	145, 143, 146, 147	Add the `constant` attributes to state variables that never change
#2	ZGemFarm.sol	Dead Code	233-368	Remove unused functions or dead code. Before removing check the function, it could be possible, that you forget to implement it into the contract
#3	All	NatSpec documentation missing	—	If you started to comment your code, also comment all other functions, variables etc.

Audit Comments

We recommend you to use the special form of comments (NatSpec Format, Follow link for more information https://docs.soliditylang.org/en/latest/natspec-format.html) for your contracts to provide rich documentation for functions, return variables and more. This helps investors to make clear what that variables, functions etc. do.

01. April 2023:

- There is still an owner (Owner still has not renounced ownership)
- Owner can deploy a new version of the contract which can change any limit and give owner new privileges
- We recommend the GemSwap team to thoroughly unit test the contracts to rule out any calculation errors before deployment
- The owner can change the status of a particular pool and stop users from depositing in that particular pool.
- Read whole report and modifiers section for more information

SWC Attacks

ID	Title	Relationships	Status
SWC-136	Unencrypted Private Data On-Chain	CWE-767: Access to Critical Private Variable via Public Method	PASSED
SWC-135	Code With No Effects	CWE-1164: Irrelevant Code	PASSED
SWC-134	Message call with hardcoded gas amount	CWE-655: Improper Initialization	PASSED
SWC-133	Hash Collisions With Multiple Variable Length Arguments	CWE-294: Authentication Bypass by Capture-replay	PASSED
SWC-132	Unexpected Ether balance	CWE-667: Improper Locking	PASSED
SWC-131	Presence of unused variables	CWE-1164: Irrelevant Code	PASSED
SWC-130	Right-To-Left-Override control character (U+202E)	CWE-451: User Interface (UI) Misrepresentation of Critical Information	PASSED
SWC-129	Typographical Error	CWE-480: Use of Incorrect Operator	PASSED
SWC-128	DoS With Block Gas Limit	CWE-400: Uncontrolled Resource Consumption	PASSED

SWC-127	Arbitrary Jump with Function Type Variable	CWE-695: Use of Low-Level Functionality	**PASSED**
SWC-125	Incorrect Inheritance Order	CWE-696: Incorrect Behavior Order	**PASSED**
SWC-124	Write to Arbitrary Storage Location	CWE-123: Write-what-where Condition	**PASSED**
SWC-123	Requirement Violation	CWE-573: Improper Following of Specification by Caller	**PASSED**
SWC-122	Lack of Proper Signature Verification	CWE-345: Insufficient Verification of Data Authenticity	**PASSED**
SWC-121	Missing Protection against Signature Replay Attacks	CWE-347: Improper Verification of Cryptographic Signature	**PASSED**
SWC-120	Weak Sources of Randomness from Chain Attributes	CWE-330: Use of Insufficiently Random Values	**PASSED**
SWC-119	Shadowing State Variables	CWE-710: Improper Adherence to Coding Standards	**NOT PASSED**
SWC-118	Incorrect Constructor Name	CWE-665: Improper Initialization	**PASSED**
SWC-117	Signature Malleability	CWE-347: Improper Verification of Cryptographic Signature	**PASSED**

SWC-116	Timestamp Dependence	CWE-829: Inclusion of Functionality from Untrusted Control Sphere	PASSED
SWC-115	Authorization through tx.origin	CWE-477: Use of Obsolete Function	PASSED
SWC-114	Transaction Order Dependence	CWE-362: Concurrent Execution using Shared Resource with Improper Synchronization ('Race Condition')	PASSED
SWC-113	DoS with Failed Call	CWE-703: Improper Check or Handling of Exceptional Conditions	PASSED
SWC-112	Delegatecall to Untrusted Callee	CWE-829: Inclusion of Functionality from Untrusted Control Sphere	PASSED
SWC-111	Use of Deprecated Solidity Functions	CWE-477: Use of Obsolete Function	PASSED
SWC-110	Assert Violation	CWE-670: Always-Incorrect Control Flow Implementation	PASSED
SWC-109	Uninitialized Storage Pointer	CWE-824: Access of Uninitialized Pointer	PASSED
SWC-108	State Variable Default Visibility	CWE-710: Improper Adherence to Coding Standards	PASSED
SWC-107	Reentrancy	CWE-841: Improper Enforcement of Behavioral Workflow	PASSED
SWC-106	Unprotected SELFDESTRUCT Instruction	CWE-284: Improper Access Control	PASSED

SWC-105	Unprotected Ether Withdrawal	CWE-284: Improper Access Control	PASSED
SWC-104	Unchecked Call Return Value	CWE-252: Unchecked Return Value	PASSED
SWC-103	Floating Pragma	CWE-664: Improper Control of a Resource Through its Lifetime	NOT PASSED
SWC-102	Outdated Compiler Version	CWE-937: Using Components with Known Vulnerabilities	PASSED
SWC-101	Integer Overflow and Underflow	CWE-682: Incorrect Calculation	PASSED
SWC-100	Function Default Visibility	CWE-710: Improper Adherence to Coding Standards	PASSED

SolidProof_io

@solidproof_io

Solid Proofed

Blockchain Security | Smart Contract Audits | KYC Development | Marketing

MADE IN GERMANY