

Draft
Security Assessment for

78-2022-01-behodler (10K-FLP) (1Positive-ANC)

July 24, 2023



Executive Summary

Overview Open	
Project Name	78-2022-01-behodler (10K-FLP) (1Positive-ANC)
Codebase URL	https://github.com/code-423n4/2022- 01-behodler
Scan Engine	Al Analyzer
Scan Time	2023/07/24 02:05:31
Commit Id	71bc7f3

Overview	
Project Name	78-2022-01-behodler (10K-FLP) (1Positive-ANC)
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Scan Engine	Al Analyzer
Scan Time	2023/07/24 02:05:31
Commit Id	71bc7f3

Total	No
Critical Issues	PIAL AUDIT REPORT
High risk Issues	6
Medium risk Issues	0
Low risk Issues	0
Informational Issues	0

Critical Issues	The issue can cause large economic losses, large-scale data disorder, loss of control of authority management, failure of key functions, or indirectly affect the correct operation of other smart contracts interacting with it.
High Risk Issues	The issue puts a large number of users' sensitive information at risk or is reasonably likely to lead to catastrophic impacts on clients' reputations or serious financial implications for clients and users.
Medium Risk Issues	The issue puts a subset of users' sensitive information at risk, would be detrimental to the client's reputation if exploited, or is

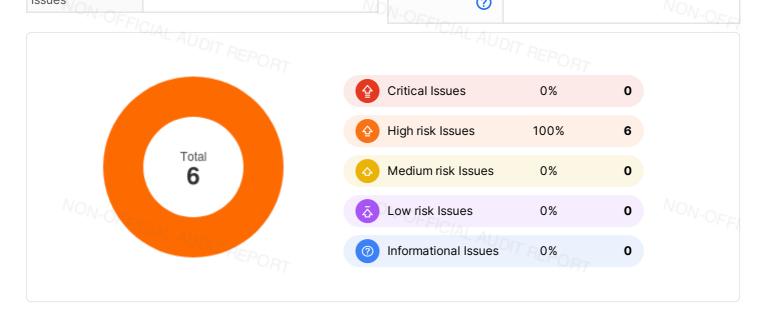
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Low Risk Issues	<u></u>
Informational Iss	A/S

The issue does not pose an immediate risk but is relevant to security best practices or Defence in Depth.

The risk is relatively small and could

not be exploited on a recurring basis, or is a risk that the client has indicated is low-impact in view of the client's business circumstances.

reasonably likely to lead to moderate financial impact.

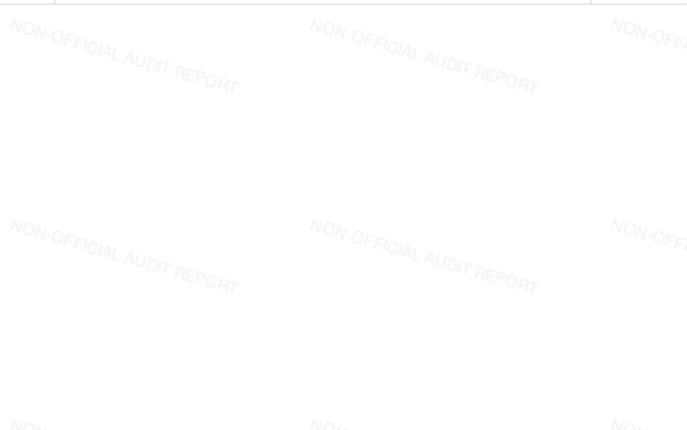




Summary of Findings

MetaScan security assessment was performed on July 24, 2023 02:05:31 on project 78-2022-01-behodler (10K-FLP) (1Positive-ANC) with the repository https://github.com/code-423n4/2022-01-behodler on branch default branch. The assessment was carried out by scanning the project's codebase using the scan engine Al Analyzer. There are in total 6 vulnerabilities / security risks discovered during the scanning session, among which 0 critical vulnerabilities, 6 high risk vulnerabilities, 0 medium risk vulnerabilities, 0 low risk vulnerabilities, 0 informational issues.

ID	Description	Severity
MSA-001	MWE-200: Insecure LP Token Value Calculation	High risk
MSA-002	MWE-200: Insecure LP Token Value Calculation	High risk
MSA-003	MWE-200: Insecure LP Token Value Calculation MWE-200: Insecure LP Token Value Calculation	High risk
MSA-004	MWE-200: Insecure LP Token Value Calculation	High risk
MSA-005	MWE-203: Approval Not Revoked	High risk
MSA-006	MWE-203: Approval Not Revoked	High risk





Findings



Critical (0)

No Critical vulnerabilities found here ICIAL AUDIT REPORT



High risk (6)

1. MWE-200: Insecure LP Token Value Calculation



High risk



Security Analyzer

Liquidity token value/price can be manipulated to cause flashloan attacks.

File(s) Affected

contracts/UniswapHelper.sol #147-157

```
function getLatestFLNQuote() internal view returns (uint256 dai_scx, uint256 daiBalanceOnBehodler) {
uint256 daiToRelease = BehodlerLike(VARS.behodler).withdrawLiquidityFindSCX(
   VARS.DAI,
   10000,
   1 ether,
   VARS.precision
 );
  dai_scx = (daiToRelease * EXA) / (1 ether);
  daiBalanceOnBehodler = IERC20(VARS.DAI).balanceOf(VARS.behodler);
```

contracts/UniswapHelper.sol #138-145

```
function generateFLNQuote() public override {
latestFlanQuotes[1] = latestFlanQuotes[0];
   latestFlanQuotes[0].DaiScxSpotPrice,
   latestFlanQuotes[0].DaiBalanceOnBehodler
  ) = getLatestFLNQuote();
  latestFlanQuotes[0].blockProduced = block.number;
```

Recommendation

Do not use AMM pool or custom liquidity calculation to caculate LP token value/price.



2. MWE-200: Insecure LP Token Value Calculation





Liquidity token value/price can be manipulated to cause flashloan attacks.

File(s) Affected

contracts/UniswapHelper.sol #217-235

```
function buyFlanAndBurn(
address inputToken,
uint256 amount,
address recipient

) public override {
address pair = VARS.factory.getPair(inputToken, VARS.flan);

uint256 flanBalance = IERC20(VARS.flan).balanceOf(pair);
uint256 inputBalance = IERC20(inputToken).balanceOf(pair);

uint256 amountOut = getAmountOut (amount, inputBalance, flanBalance);
uint256 amountOut = inputToken < VARS.flan ? 0 : amountOut;
uint256 amount1Out = inputToken < VARS.flan ? amountOut : 0;

IERC20(inputToken).transfer(pair, amount);

UniPairLike(pair).swap(amountOut, amount1Out, address(this), "");
uint256 reward = (amountOut / 100);

ERC20Burnable(VARS.flan).transfer(recipient, reward);
ERC20Burnable(VARS.flan).burn(amountOut - reward);

ERC20Burnable(VARS.flan).burn(amountOut - reward);
```

Recommendation

Do not use AMM pool or custom liquidity calculation to caculate LP token value/price.

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3. MWE-200: Insecure LP Token Value Calculation





Liquidity token value/price can be manipulated to cause flashloan attacks.

File(s) Affected

contracts/TokenProxies/RebaseProxy.sol #19-24

```
function redeemRate() public view returns (uint256) {
  uint256 balanceOfBase = IERC20(baseToken).balanceOf(address(this));
    if (totalSupply() == 0 || balanceOfBase == 0) return ONE;
     return (balanceOfBase * ONE) / totalSupply();
```

contracts/TokenProxies/RebaseProxy.sol #26-38

```
function mint (address to, uint256 amount)
       public
override
       returns (uint256)
       uint256 _redeemRate = redeemRate();
       require(
           IERC20(baseToken).transferFrom(msg.sender, address(this), amount)
       uint256 baseBalance = IERC20(baseToken).balanceOf(address(this));
       uint256 proxy = (baseBalance * ONE) / _redeemRate;
       _mint(to, proxy);
```

Recommendation

Do not use AMM pool or custom liquidity calculation to caculate LP token value/price.



4. MWE-200: Insecure LP Token Value Calculation





Liquidity token value/price can be manipulated to cause flashloan attacks.

File(s) Affected

contracts/TokenProxies/RebaseProxy.sol #26-38

```
function mint(address to, uint256 amount)

public

override

returns (uint256)

uint256 _redeemRate = redeemRate();

require(

IERC20 (baseToken).transferFrom(msg.sender, address(this), amount)

);

uint256 baseBalance = IERC20 (baseToken).balanceOf (address(this));

uint256 proxy = (baseBalance * ONE) / _redeemRate;
   _mint(to, proxy);

}

ADDRESS
```

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contracts/UniswapHelper.sol #162-197

```
function stabilizeFlan(uint256 rectangleOfFairness) public override onlyLimbo ensurePriceStability re
                 uint256 localSCXBalance = IERC20(VARS.behodler).balanceOf(address(this));
                 //SCX transfers incur a 2% fee. Checking that SCX balance === rectangleOfFairness must take this in
                 //Note that for hardcoded values, this contract can be upgraded through governance so we're not ign
                 require((localSCXBalance * 100) / rectangleOfFairness == 98, "EM");
                 rectangleOfFairness = localSCXBalance;
                 //get DAI per scx
                 uint256 existingSCXBalanceOnLP = IERC20(VARS.behodler).balanceOf(address(VARS.Flan_SCX_tokenPair));
                 uint256 finalSCXBalanceOnLP = existingSCXBalanceOnLP + rectangleOfFairness;
                 //the DAI value of SCX is the final quantity of Flan because we want Flan to hit parity with Dai.
                 uint256 DesiredFinalFlanOnLP = ((finalSCXBalanceOnLP * latestFlanQuotes[0].DaiScxSpotPrice) / EXA);
                 address pair = address(VARS.Flan_SCX_tokenPair);
                 uint256 existingFlanOnLP = IERC20(VARS.flan).balanceOf(pair);
                 if (existingFlanOnLP < DesiredFinalFlanOnLP) {</pre>
                     \verb|uint256| flanToMint = ((DesiredFinalFlanOnLP - existingFlanOnLP) * (100 - VARS.priceBoostOvershoot)| | (100 - VARS.priceBoostOvershoot
                      flanToMint = flanToMint == 0 ? DesiredFinalFlanOnLP - existingFlanOnLP : flanToMint;
                     FlanLike(VARS.flan).mint(pair, flanToMint);
                     IERC20(VARS.behodler).transfer(pair, rectangleOfFairness);
                         lpMinted = VARS.Flan_SCX_tokenPair.mint(VARS.blackHole);
                } else {
                    uint256 minFlan = existingFlanOnLP / VARS.Flan_SCX_tokenPair.totalSupply();
                    FlanLike(VARS.flan).mint(pair, minFlan + 2);
                     IERC20(VARS.behodler).transfer(pair, rectangleOfFairness);
193 lpMinted = VARS.Flan_SCX_tokenPair.mint(VARS.blackHole);
                 } [ (C/A/
                 //Don't allow future migrations to piggy back off the data collected by recent migrations. Forces a
                 _zeroOutQuotes();
```

Recommendation

Do not use AMM pool or custom liquidity calculation to caculate LP token value/price.











5. MWE-203: Approval Not Revoked





Approval is not revoked or reset after the code functionality finishes.

File(s) Affected

contracts/DAO/LimboDAO.sol #323-372

```
function setEYEBasedAssetStake(
  uint256 finalAssetBalance,
uint256 finalEYEBalance,
 uint256 rootEYE.
  address asset
) public isLive incrementFate {
 require(assetApproved[asset], "LimboDAO: illegal asset");
  address sender = _msgSender();
  FateGrowthStrategy strategy = fateGrowthStrategy[asset];
  //verifying that rootEYE value is accurate within precision.
  uint256 rootEYESquared = rootEYE * rootEYE;
  uint256 rootEYEPlusOneSquared = (rootEYE + 1) * (rootEYE + 1);
  require(
   rootEYESquared <= finalEYEBalance && rootEYEPlusOneSquared > finalEYEBalance,
    "LimboDAO: Stake EYE invariant."
  AssetClout storage clout = stakedUserAssetWeight[sender][asset];
  fateState[sender].fatePerDay -= clout.fateWeight;
 uint256 initialBalance = clout.balance;
 if (strategy == FateGrowthStrategy.directRoot) {
   require(finalAssetBalance == finalEYEBalance, "LimboDAO: staking eye invariant.");
   require(asset == domainConfig.eye);
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    clout.fateWeight = rootEYE;
 Clout.balance = finalAssetBalance;
    fateState[sender].fatePerDay += rootEYE;
  } else if (strategy == FateGrowthStrategy.indirectTwoRootEye) {
    clout.fateWeight = 2 * rootEYE;
    fateState[sender].fatePerDay += clout.fateWeight;
   uint256 actualEyeBalance = IERC20(domainConfig.eye).balanceOf(asset);
    require(actualEyeBalance > 0, "LimboDAO: No EYE");
   uint256 totalSupply = IERC20(asset).totalSupply();
    uint256 eyePerUnit = (actualEyeBalance * ONE) / totalSupply;
   uint256 impliedEye = (eyePerUnit * finalAssetBalance) / (ONE * precision);
                                                 OFFICIAL AUDIT REPORT
finalEYEBalance /= precision;
     finalEYEBalance == impliedEye, //precision cap
      "LimboDAO: stake invariant check 2."
   );
   clout.balance = finalAssetBalance;
 } else {
   revert("LimboDAO: asset growth strategy not accounted for");
  int256 netBalance = int256(finalAssetBalance) - int256(initialBalance);
  asset.ERC20NetTransfer(sender, address(this), netBalance);
```

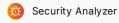


Recommendation

Try to remove the approval after the code finishes its job.

6. MWE-203: Approval Not Revoked





Approval is not revoked or reset after the code functionality finishes.

File(s) Affected

contracts/DAO/LimboDAO.sol #383-401

```
function burnAsset(address asset, uint256 amount) public isLive incrementFate {
 require(assetApproved[asset], "LimboDAO: illegal asset");
 address sender = _msgSender();
 require(ERC677(asset).transferFrom(sender, address(this), amount), "LimboDAO: transferFailed");
 uint256 fateCreated = fateState[_msgSender()].fateBalance;
 if (asset == domainConfig.eye) {
   fateCreated = amount * 10;
   ERC677 (domainConfig.eye).burn(amount);
} else {
   uint256 actualEyeBalance = IERC20(domainConfig.eye).balanceOf(asset);
   require(actualEyeBalance > 0, "LimboDAO: No EYE");
   uint256 totalSupply = IERC20(asset).totalSupply();
 uint256 eyePerUnit = (actualEyeBalance * ONE) / totalSupply;
   uint256 impliedEye = (eyePerUnit * amount) / ONE;
   fateCreated = impliedEye * 20;
 fateState[_msgSender()].fateBalance += fateCreated;
 emit assetBurnt(_msgSender(), asset, fateCreated);
```

Recommendation

Try to remove the approval after the code finishes its job.

Medium risk (0)

No Medium risk vulnerabilities found here



\Lambda Low risk (0)

No Low risk vulnerabilities found here



Informational (0)

No Informational vulnerabilities found here



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