Hands-on Part

*ERC20/ERC721*の発行

株式会社Neo Breakthrough
山科 優希

使用するもの

- ***Google Chrome***
- ***Metamask***（インストール済み）
- ***Remix***

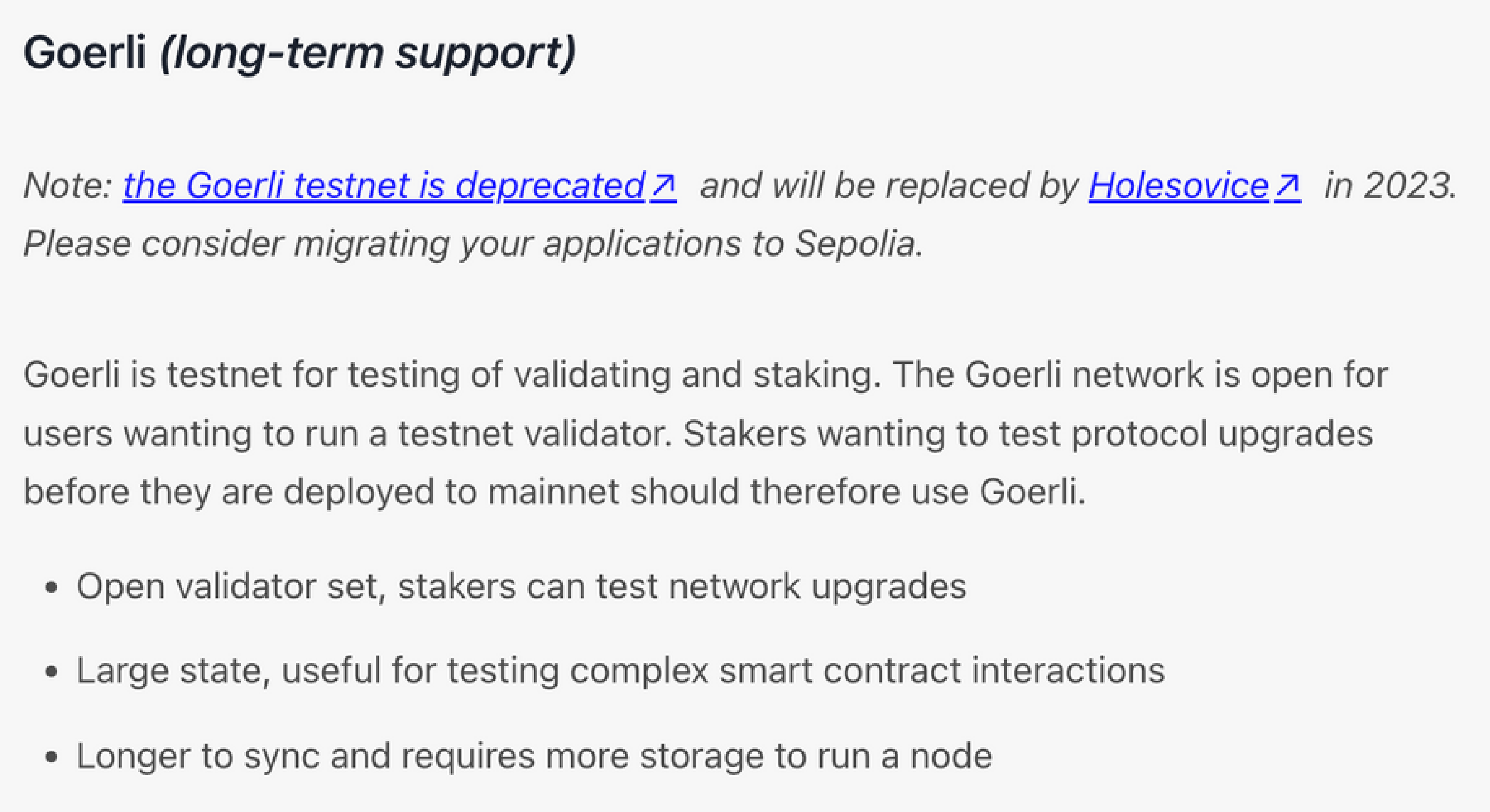
  →*Remix*は*Web*ブラウザ上で*Solidity*言語によるコントラクトの作成・コンパイル・実行を行える開発環境
- ***~~GoerliETH~~ or Mumbai MATIC***

  →Testnetトークン（G~~oerli：Ethereum Mu~~mbai：Matic Mainnet）
- ***OpenZeppelin***

  →*Solidity*言語によるスマートコントラクトのオープンフレームワーク
- ***OpenZeppelin Contract Wizard***

  →スマートコントラクトの実装がGUI画面にて可能であり、Remixへの連携アリ

Goerli Testnet



Goerli *(long-term support)*

Note: the Goerli testnet is deprecated↗ and will be replaced by Holesovice↗ in 2023. Please consider migrating your applications to Sepolia.

Goerli is testnet for testing of validating and staking. The Goerli network is open for users wanting to run a testnet validator. Stakers wanting to test protocol upgrades before they are deployed to mainnet should therefore use Goerli.

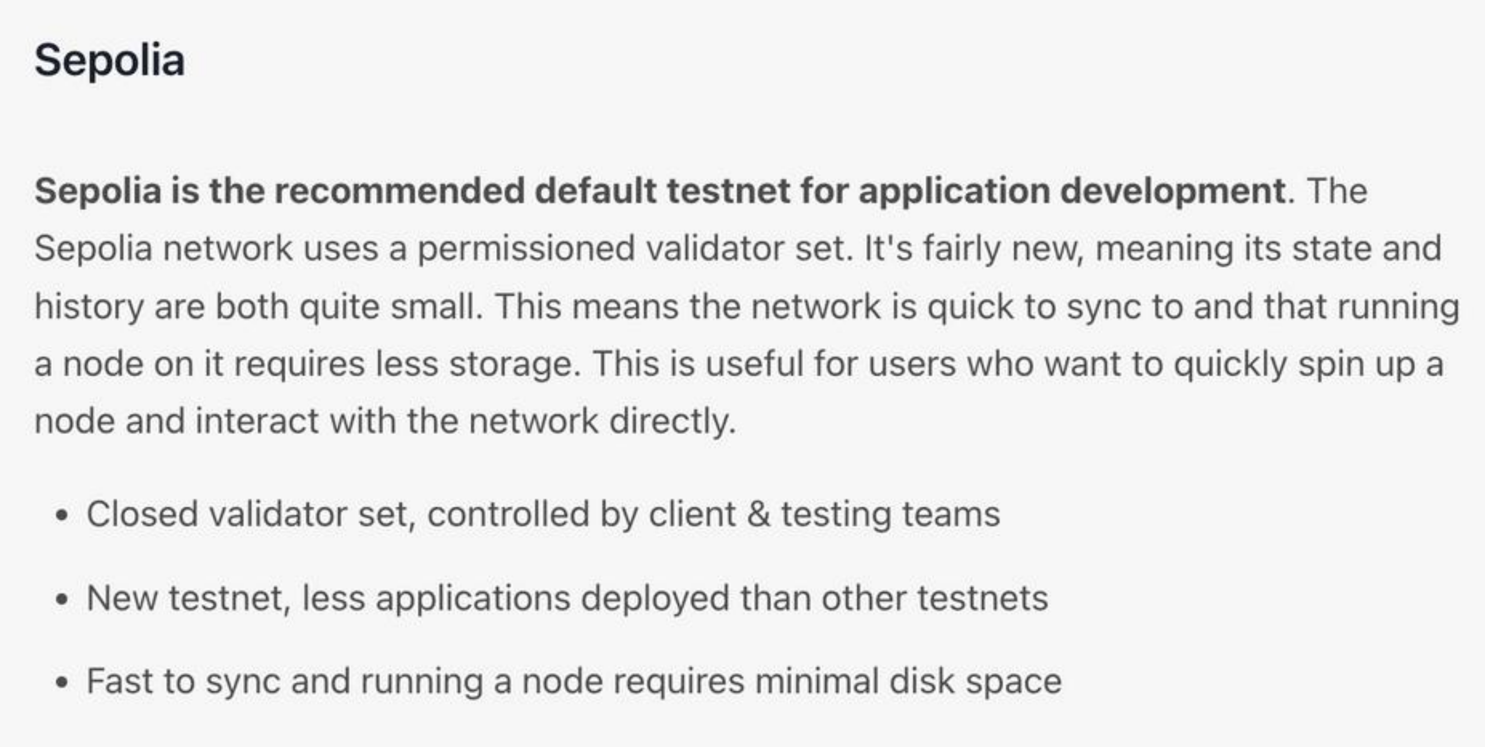
- Open validator set, stakers can test network upgrades
- Large state, useful for testing complex smart contract interactions
- Longer to sync and requires more storage to run a node

”Goerliテストネットは非推奨で、2023年にHolesoviceに置き換わる予定”

”Goerliネットワークは、テストネットバリデータを実行したいユーザーのために開かれている″

”オープンなバリデータセットで、ステイカーはネットワークのアップグレードをテストすることができる”

Sepolia Testnet



Sepolia

Sepolia is the recommended default testnet for application development. The Sepolia network uses a permissioned validator set. It's fairly new, meaning its state and history are both quite small. This means the network is quick to sync to and that running a node on it requires less storage. This is useful for users who want to quickly spin up a node and interact with the network directly.

- Closed validator set, controlled by client & testing teams
- New testnet, less applications deployed than other testnets
- Fast to sync and running a node requires minimal disk space

”*Sepolia*は、アプリケーション開発のための
推奨されるデフォルトのテストネット”

”許可されたバリデータを使用している”

”新しいテストネットであり、他のテストネット
に比べてアプリケーションのデプロイが少ない”

*Goerli*ではなく*Polygon Mumbai*を選択

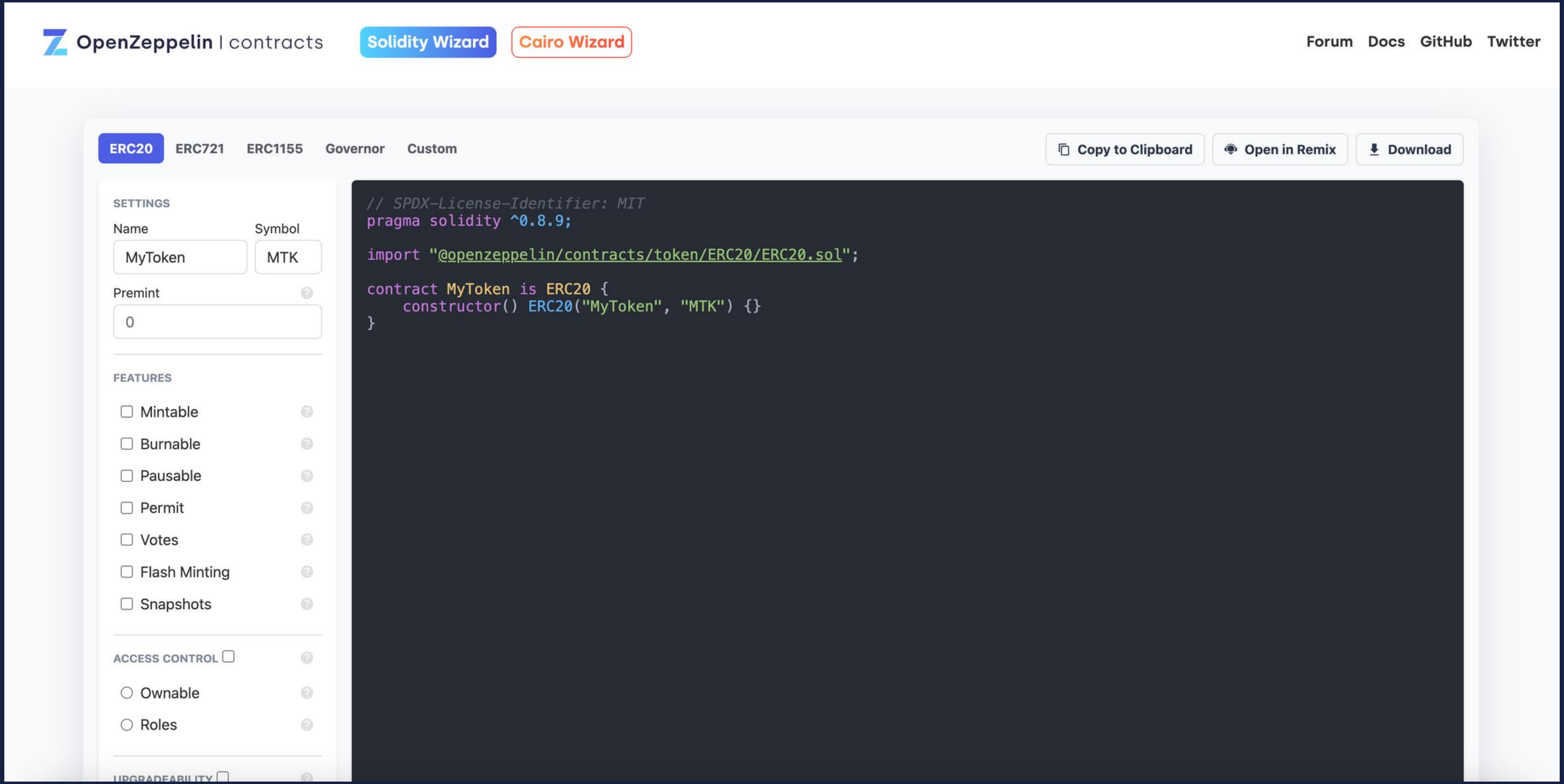
- *Ethereum*も*Polygon*も*solidity*でスマコン書ける
- *Polygon*の方が手数料安い
- 資料作成時（3月17日）においてGoerli FaucetでClaimできない（なぜ）

  →Faucetは『蛇口』を意味しており、Faucetを利用することで

  *Testnet Token*を獲得できる

*ERC20*発行 事前準備

1.OpenZeppelin Contract Wizard


OpenZeppelin | contracts
Solidity Wizard
Cairo Wizard
Forum
Docs
GitHub
Twitter
ERC20
ERC721
ERC1155
Governor
Custom
Copy to Clipboard
Open in Remix
Download

SETTINGS

Name: MyToken

Symbol: MTK

Premint: 0

FEATURES

- ☐ Mintable
- ☐ Burnable
- ☐ Pausable
- ☐ Permit
- ☐ Votes
- ☐ Flash Minting
- ☐ Snapshots

ACCESS CONTROL ☐

- ○ Ownable
- ○ Roles

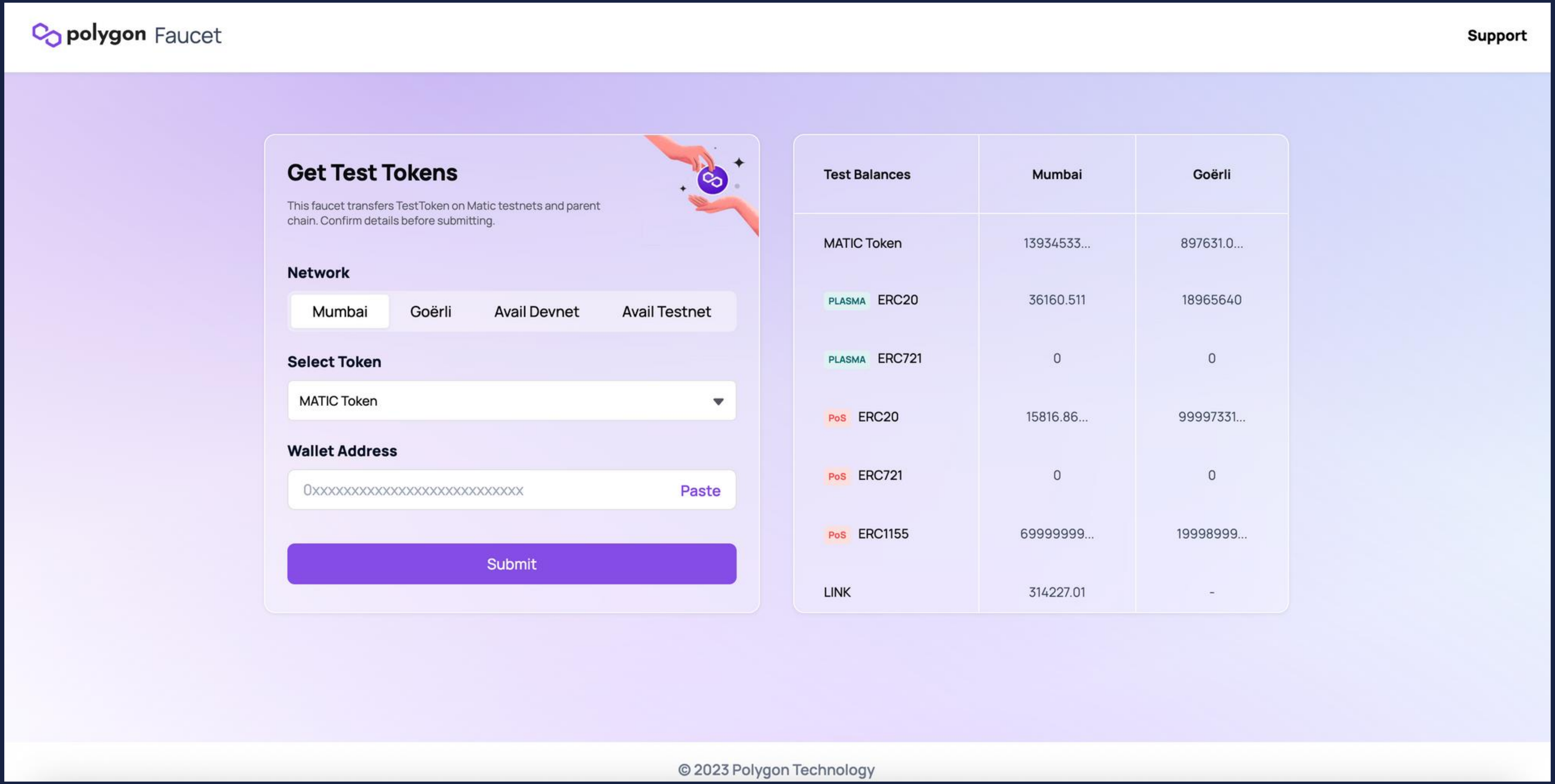
UPGRADEABILITY ☐

```
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.9;

import "@openzeppelin/contracts/token/ERC20/ERC20.sol";

contract MyToken is ERC20 {
    constructor() ERC20("MyToken", "MTK") {}
}
```

2.Polygon Faucet


polygon Faucet
Support

Get Test Tokens

This faucet transfers TestToken on Matic testnets and parent chain. Confirm details before submitting.

Network

Mumbai
Goërli
Avail Devnet
Avail Testnet

Select Token

MATIC Token

Wallet Address

0xxxxxxxxxxxxxxxxxxxxxxxxxxxx

Paste
Submit

Test Balances	Mumbai	Goërli
MATIC Token	13934533...	897631.0...
PLASMA ERC20	36160.511	18965640
PLASMA ERC721	0	0
PoS ERC20	15816.86...	99997331...
PoS ERC721	0	0
PoS ERC1155	69999999...	19998999...
LINK	314227.01	-

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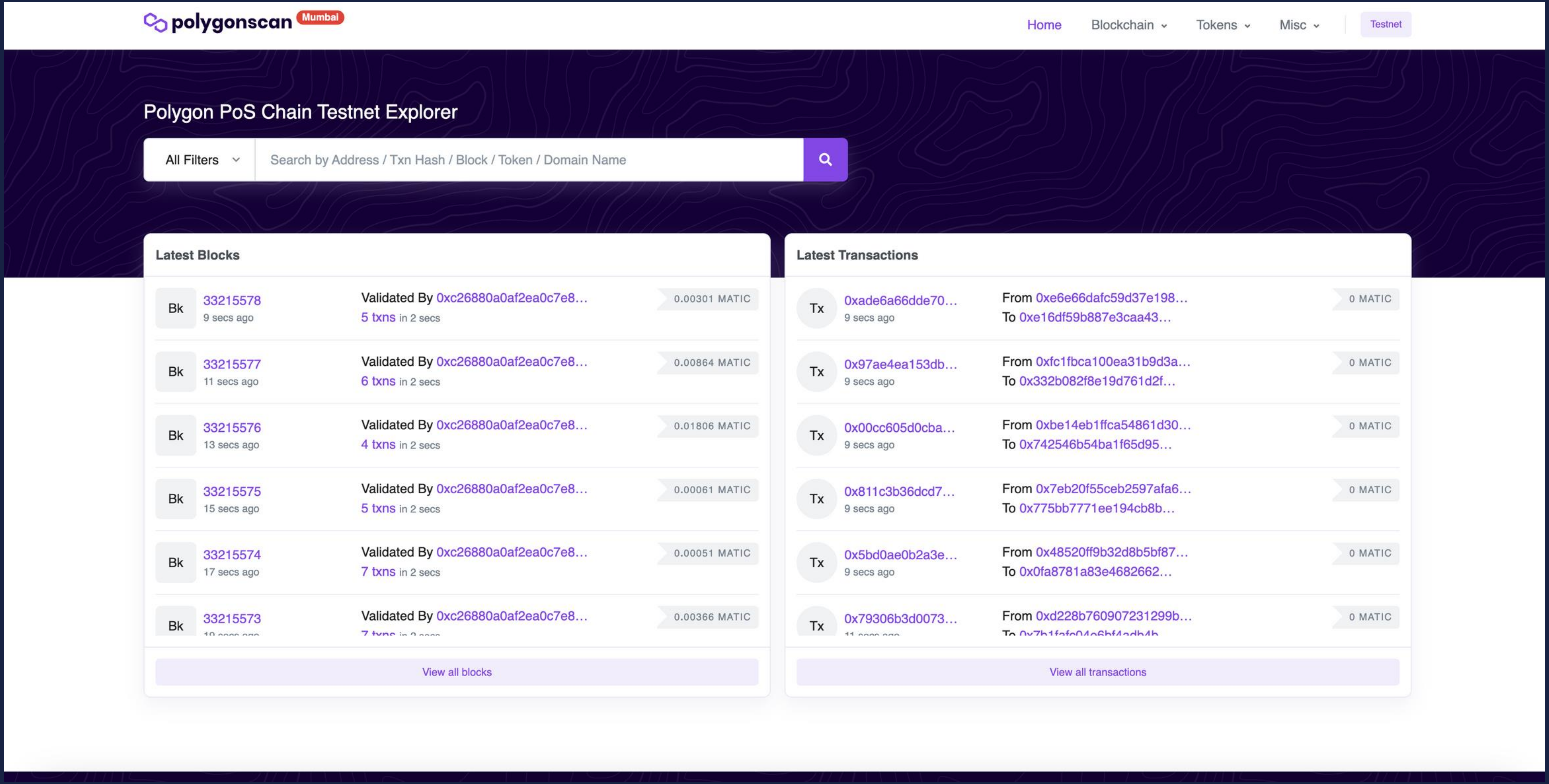
3.Mumbai Polygonscan


polygonscan Mumbai
Home
Blockchain
Tokens
Misc
Testnet
All Filters
Search by Address / Txn Hash / Block / Token / Domain Name
View all blocks
View all transactions

Polygon PoS Chain Testnet Explorer

Latest Blocks

Bk 33215578 9 secs ago
Validated By 0xc26880a0af2ea0c7e8…
5 txns in 2 secs
0.00301 MATIC

Bk 33215577 11 secs ago
Validated By 0xc26880a0af2ea0c7e8…
6 txns in 2 secs
0.00864 MATIC

Bk 33215576 13 secs ago
Validated By 0xc26880a0af2ea0c7e8…
4 txns in 2 secs
0.01806 MATIC

Bk 33215575 15 secs ago
Validated By 0xc26880a0af2ea0c7e8…
5 txns in 2 secs
0.00061 MATIC

Bk 33215574 17 secs ago
Validated By 0xc26880a0af2ea0c7e8…
7 txns in 2 secs
0.00051 MATIC

Bk 33215573
Validated By 0xc26880a0af2ea0c7e8…
0.00366 MATIC

Latest Transactions

Tx 0xade6a66dde70… 9 secs ago
From 0xe6e66dafc59d37e198…
To 0xe16df59b887e3caa43…
0 MATIC

Tx 0x97ae4ea153db… 9 secs ago
From 0xfc1fbca100ea31b9d3a…
To 0x332b082f8e19d761d2f…
0 MATIC

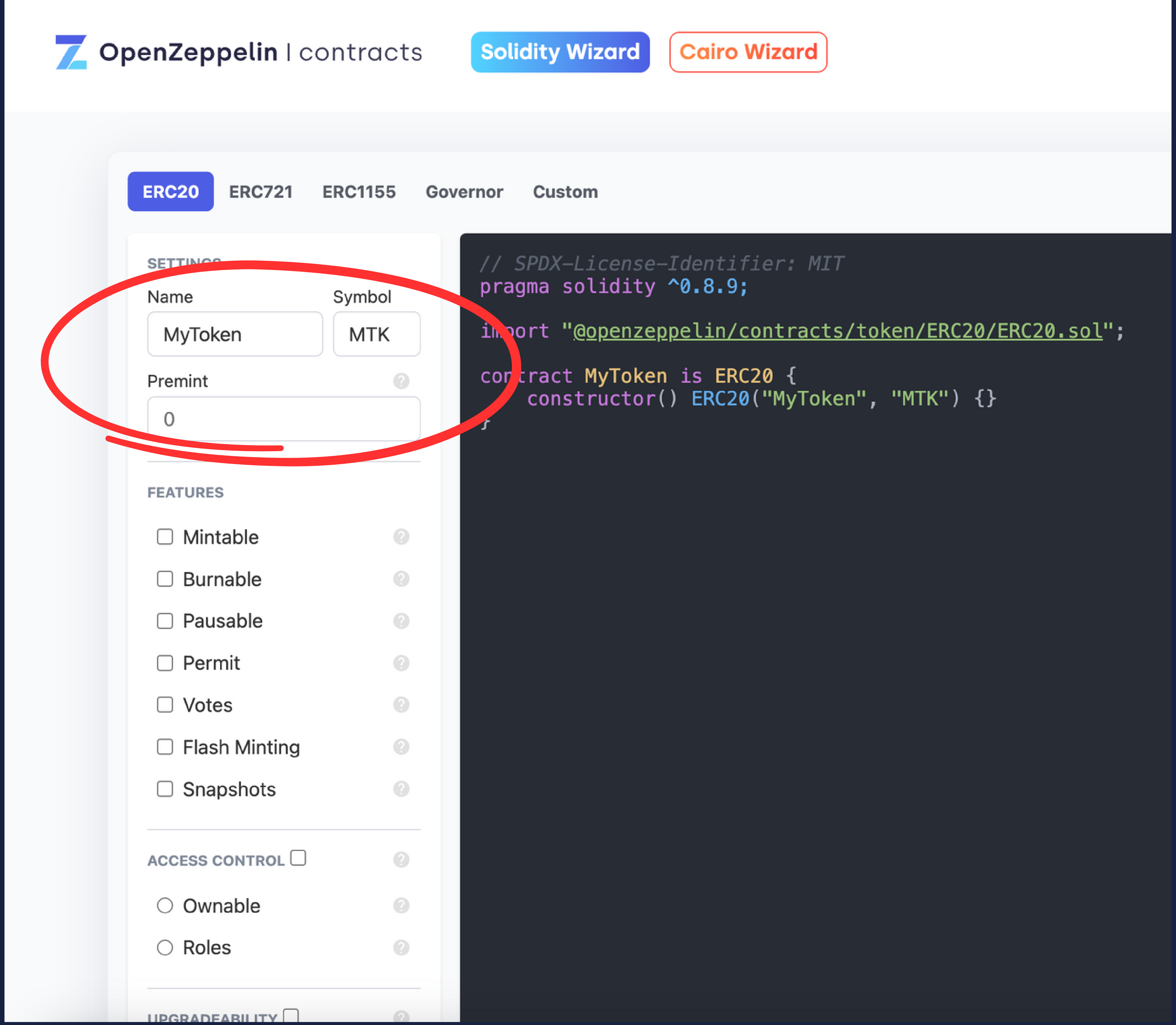
Tx 0x00cc605d0cba… 9 secs ago
From 0xbe14eb1ffca54861d30…
To 0x742546b54ba1f65d95…
0 MATIC

Tx 0x811c3b36dcd7… 9 secs ago
From 0x7eb20f55ceb2597afa6…
To 0x775bb7771ee194cb8b…
0 MATIC

Tx 0x5bd0ae0b2a3e… 9 secs ago
From 0x48520ff9b32d8b5bf87…
To 0x0fa8781a83e4682662…
0 MATIC

Tx 0x79306b3d0073…
From 0xd228b760907231299b…
0 MATIC

*ERC20*を発行する


OpenZeppelin | contracts
Solidity Wizard
Cairo Wizard
ERC20
ERC721
ERC1155
Governor
Custom

SETTINGS

Name: MyToken

Symbol: MTK

Premint: 0

FEATURES

☐ Mintable
☐ Burnable
☐ Pausable
☐ Permit
☐ Votes
☐ Flash Minting
☐ Snapshots

ACCESS CONTROL ☐

○ Ownable
○ Roles

UPGRADEABILITY ☐

```
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.9;

import "@openzeppelin/contracts/token/ERC20/ERC20.sol";

contract MyToken is ERC20 {
    constructor() ERC20("MyToken", "MTK") {}
}
```

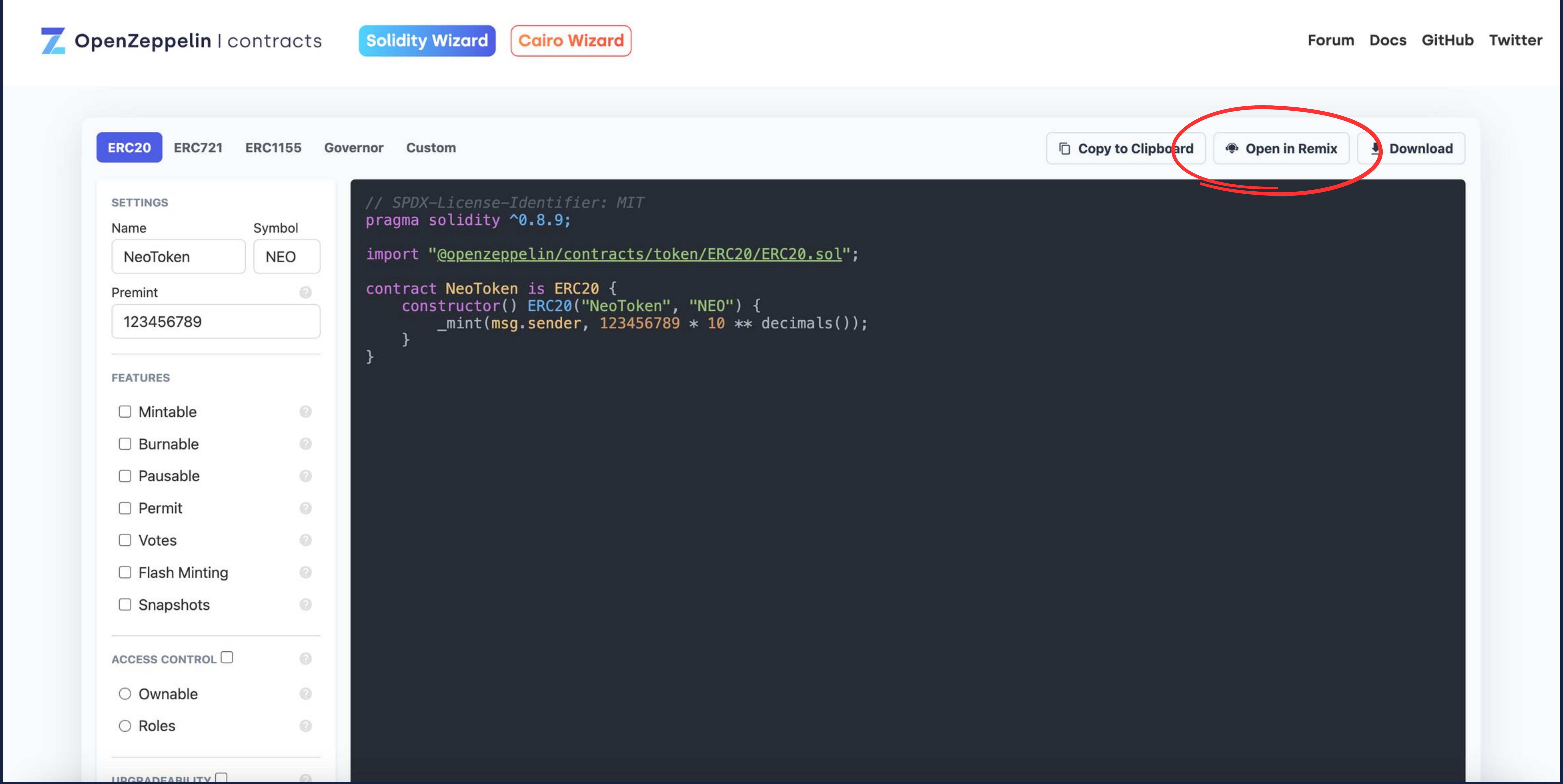
Name：トークン名

ex)Ethereum

Symbol：シンボル

ex)ETH

Premint：初期発行枚数


OpenZeppelin | contracts
Solidity Wizard
Cairo Wizard
Forum
Docs
GitHub
Twitter
ERC20
ERC721
ERC1155
Governor
Custom
Copy to Clipboard
Open in Remix
Download

SETTINGS

Name: NeoToken
Symbol: NEO
Premint: 123456789

FEATURES

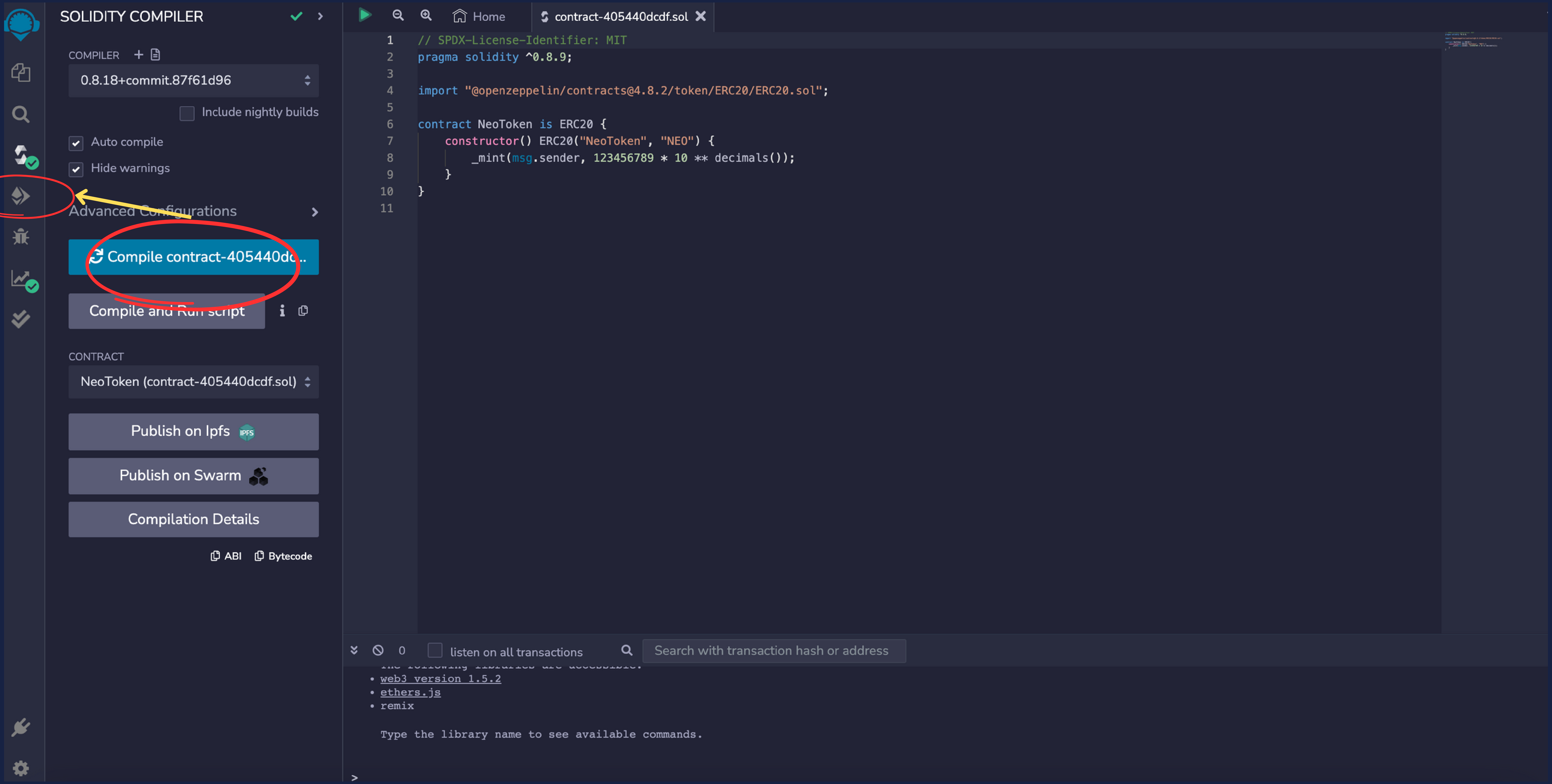
☐ Mintable
☐ Burnable
☐ Pausable
☐ Permit
☐ Votes
☐ Flash Minting
☐ Snapshots

ACCESS CONTROL ☐

○ Ownable
○ Roles

UPGRADEABILITY ☐

```
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.9;

import "@openzeppelin/contracts/token/ERC20/ERC20.sol";

contract NeoToken is ERC20 {
    constructor() ERC20("NeoToken", "NEO") {
        _mint(msg.sender, 123456789 * 10 ** decimals());
    }
}
```


SOLIDITY COMPILER
COMPILER
Include nightly builds
Advanced Configurations
Compile contract-405440dc...
Compile and Run script
CONTRACT
Publish on Ipfs
Publish on Swarm
Compilation Details
ABI
Bytecode
Home
contract-405440dcdf.sol
listen on all transactions
Search with transaction hash or address

COMPILER: 0.8.18+commit.87f61d96

☐ Include nightly builds

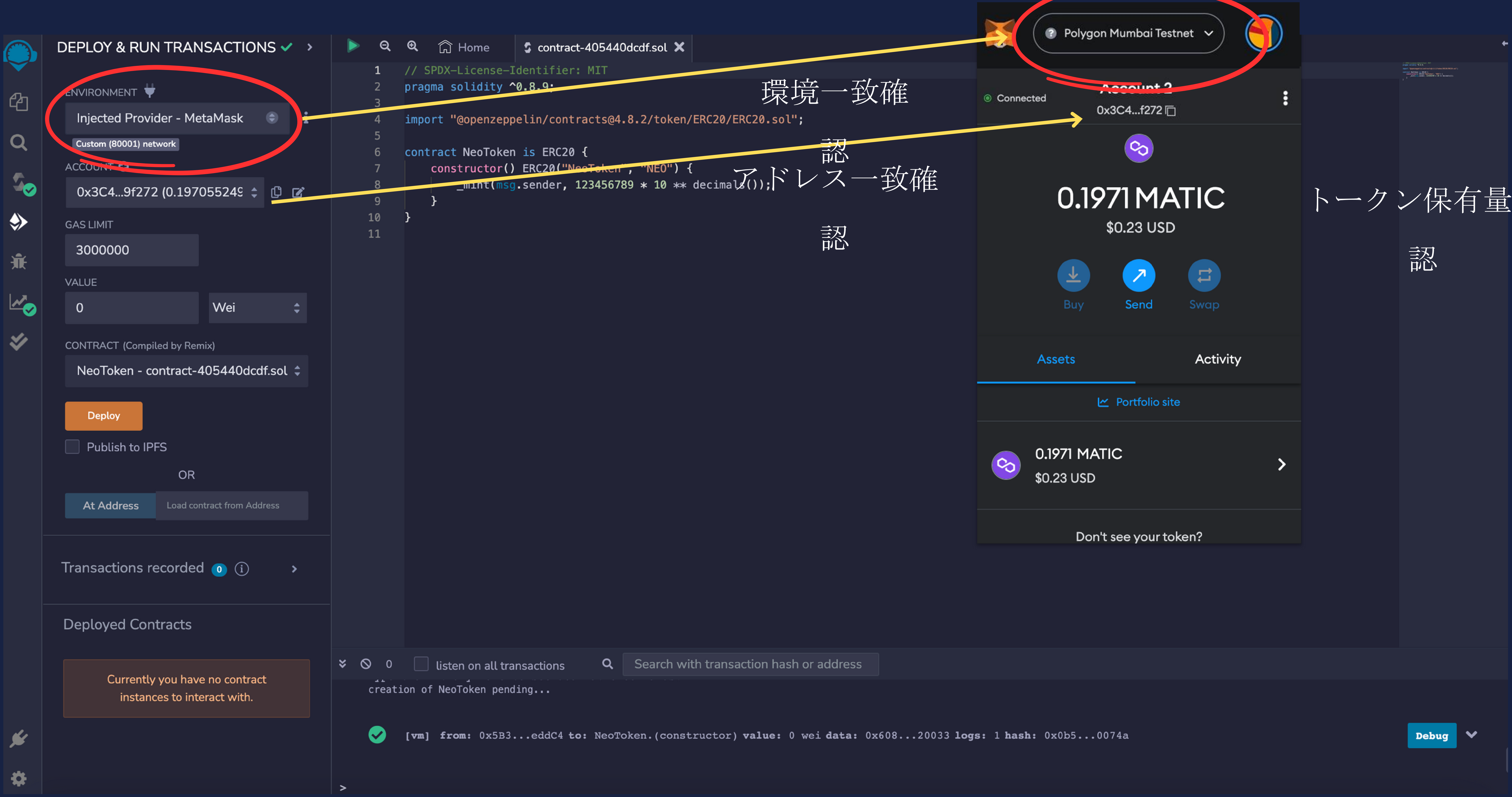
☑ Auto compile

☑ Hide warnings

CONTRACT: NeoToken (contract-405440dcdf.sol)

```
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.9;

import "@openzeppelin/contracts@4.8.2/token/ERC20/ERC20.sol";

contract NeoToken is ERC20 {
    constructor() ERC20("NeoToken", "NEO") {
        _mint(msg.sender, 123456789 * 10 ** decimals());
    }
}
```

```
The following libraries are accessible:
• web3 version 1.5.2
• ethers.js
• remix

Type the library name to see available commands.

>
```


DEPLOY & RUN TRANSACTIONS
Home
Deploy
Publish to IPFS
OR
At Address
Load contract from Address
Transactions recorded 0
Deployed Contracts
Buy
Send
Swap
Assets
Activity
Portfolio site
Don't see your token?
Debug

ENVIRONMENT: Injected Provider - MetaMask

Custom (80001) network

ACCOUNT: 0x3C4...9f272 (0.197055249

GAS LIMIT: 3000000

VALUE: 0 Wei

CONTRACT (Compiled by Remix): NeoToken - contract-405440dcdf.sol

Currently you have no contract instances to interact with.

contract-405440dcdf.sol

```
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.9;

import "@openzeppelin/contracts@4.8.2/token/ERC20/ERC20.sol";

contract NeoToken is ERC20 {
    constructor() ERC20("NeoToken", "NEO") {
        _mint(msg.sender, 123456789 * 10 ** decimals());
    }
}
```

Polygon Mumbai Testnet

Connected

Account 2

0x3C4...f272

0.1971 MATIC

$0.23 USD

0.1971 MATIC
$0.23 USD

0 ☐ listen on all transactions

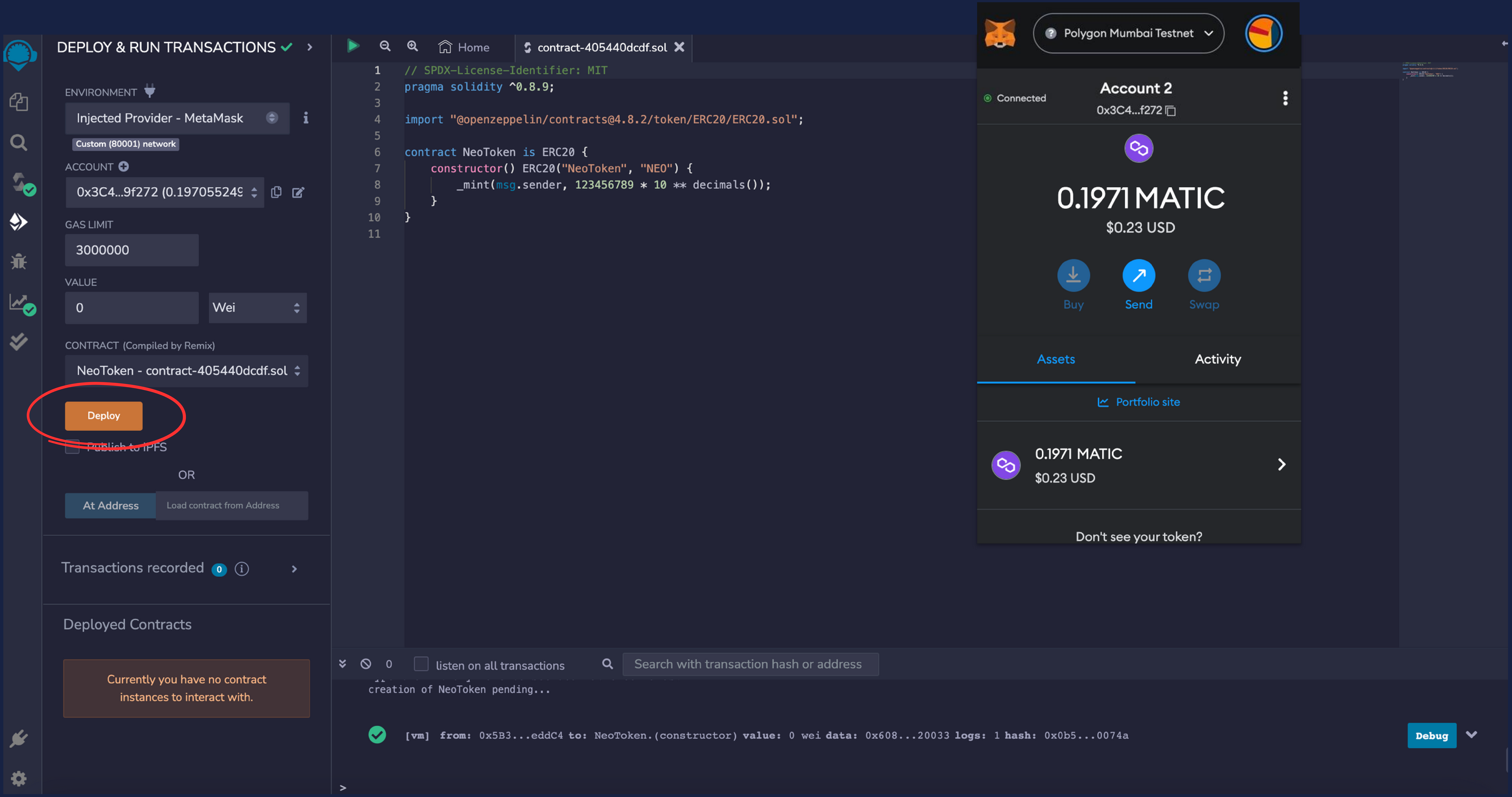
Search with transaction hash or address

```
creation of NeoToken pending...

[vm] from: 0x5B3...eddC4 to: NeoToken.(constructor) value: 0 wei data: 0x608...20033 logs: 1 hash: 0x0b5...0074a
```

環境一致確認

アドレス一致確認

トークン保有量確認


DEPLOY & RUN TRANSACTIONS
Home
contract-405440dcdf.sol
Deploy
Publish to IPFS
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Load contract from Address
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Deployed Contracts
listen on all transactions
Search with transaction hash or address
Debug
Buy
Send
Swap
Assets
Activity
Portfolio site
Don't see your token?

ENVIRONMENT: Injected Provider - MetaMask

Custom (80001) network

ACCOUNT: 0x3C4...9f272 (0.19705524

GAS LIMIT: 3000000

VALUE: 0 Wei

CONTRACT (Compiled by Remix): NeoToken - contract-405440dcdf.sol

```
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.9;

import "@openzeppelin/contracts@4.8.2/token/ERC20/ERC20.sol";

contract NeoToken is ERC20 {
    constructor() ERC20("NeoToken", "NEO") {
        _mint(msg.sender, 123456789 * 10 ** decimals());
    }
}
```

Currently you have no contract instances to interact with.

```
creation of NeoToken pending...

[vm] from: 0x5B3...eddC4 to: NeoToken.(constructor) value: 0 wei data: 0x608...20033 logs: 1 hash: 0x0b5...0074a
```

Polygon Mumbai Testnet

Connected

Account 2

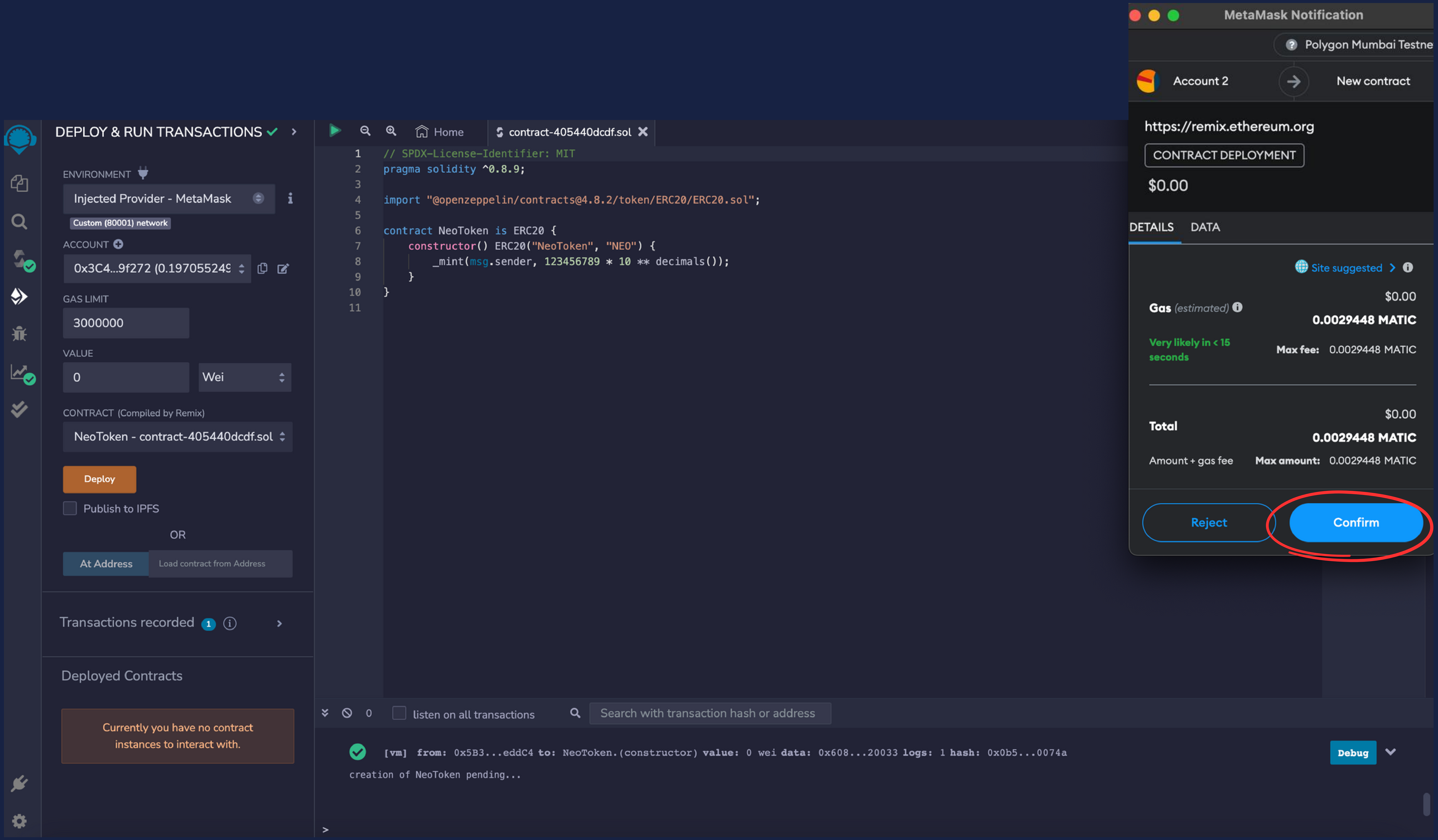
0x3C4...f272

0.1971 MATIC

$0.23 USD

0.1971 MATIC

$0.23 USD



DEPLOY & RUN TRANSACTIONS
Home
contract-405440dcdf.sol
Deploy
Publish to IPFS
OR
At Address
Load contract from Address
Transactions recorded 1
Deployed Contracts
listen on all transactions
Search with transaction hash or address
Debug
MetaMask Notification
DETAILS
DATA
Site suggested
Reject
Confirm

ENVIRONMENT: Injected Provider - MetaMask

Custom (80001) network

ACCOUNT: 0x3C4...9f272 (0.19705524

GAS LIMIT: 3000000

VALUE: 0 Wei

CONTRACT (Compiled by Remix): NeoToken - contract-405440dcdf.sol

```
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.9;

import "@openzeppelin/contracts@4.8.2/token/ERC20/ERC20.sol";

contract NeoToken is ERC20 {
    constructor() ERC20("NeoToken", "NEO") {
        _mint(msg.sender, 123456789 * 10 ** decimals());
    }
}

```

Currently you have no contract instances to interact with.

```
[vm] from: 0x5B3...eddC4 to: NeoToken.(constructor) value: 0 wei data: 0x608...20033 logs: 1 hash: 0x0b5...0074a
creation of NeoToken pending...
```

Polygon Mumbai Testne

Account 2 → New contract

https://remix.ethereum.org

CONTRACT DEPLOYMENT

$0.00

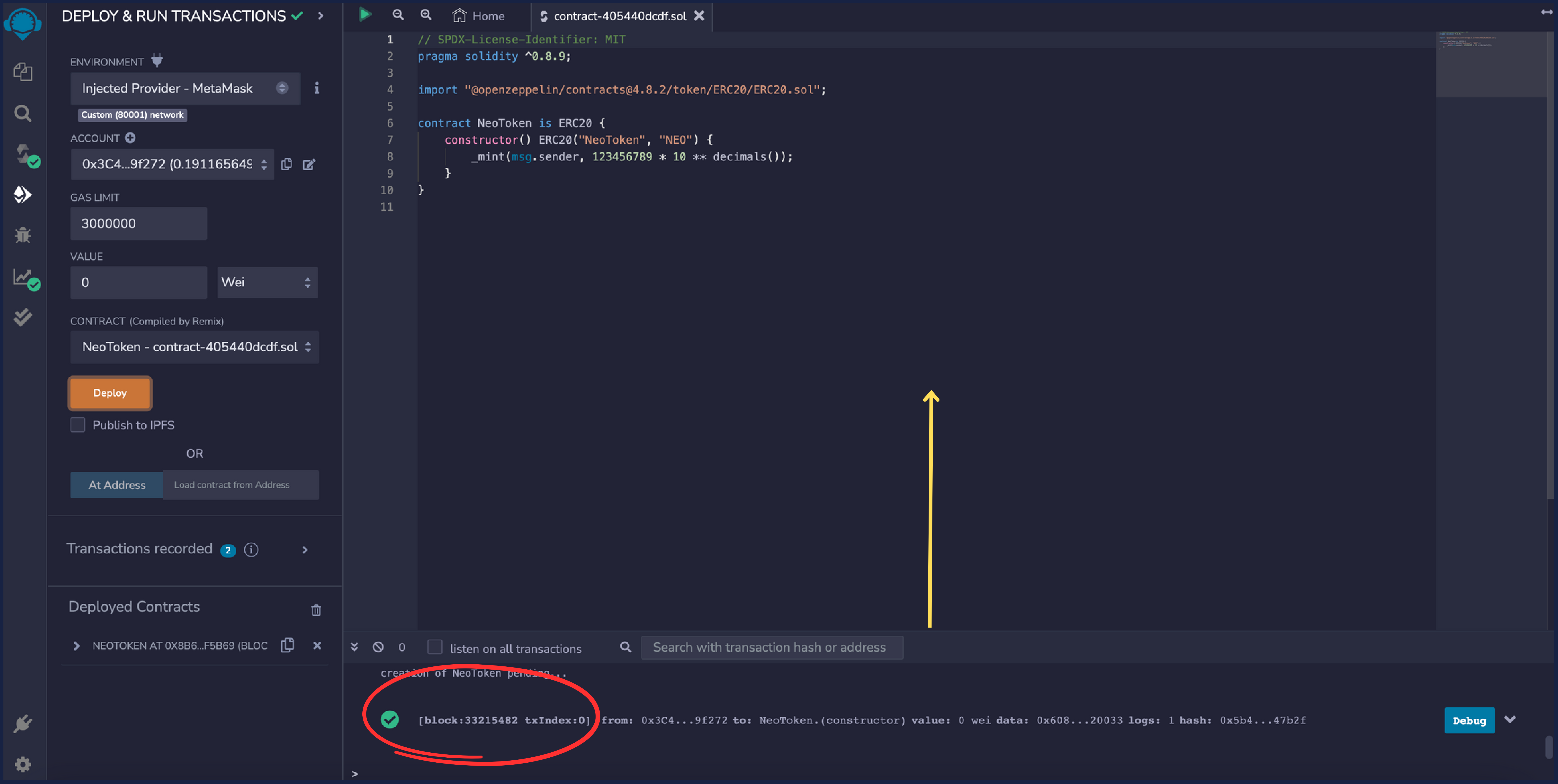
Gas *(estimated)* $0.00 **0.0029448 MATIC**

Very likely in < 15 seconds

Max fee: 0.0029448 MATIC

Total $0.00 **0.0029448 MATIC**

Amount + gas fee **Max amount:** 0.0029448 MATIC


DEPLOY & RUN TRANSACTIONS
Home
contract-405440dcdf.sol
Deploy
Publish to IPFS
OR
At Address
Load contract from Address
Transactions recorded 2
Deployed Contracts
listen on all transactions
Search with transaction hash or address
Debug

ENVIRONMENT: Injected Provider - MetaMask

Custom (80001) network

ACCOUNT: 0x3C4...9f272 (0.19116564

GAS LIMIT: 3000000

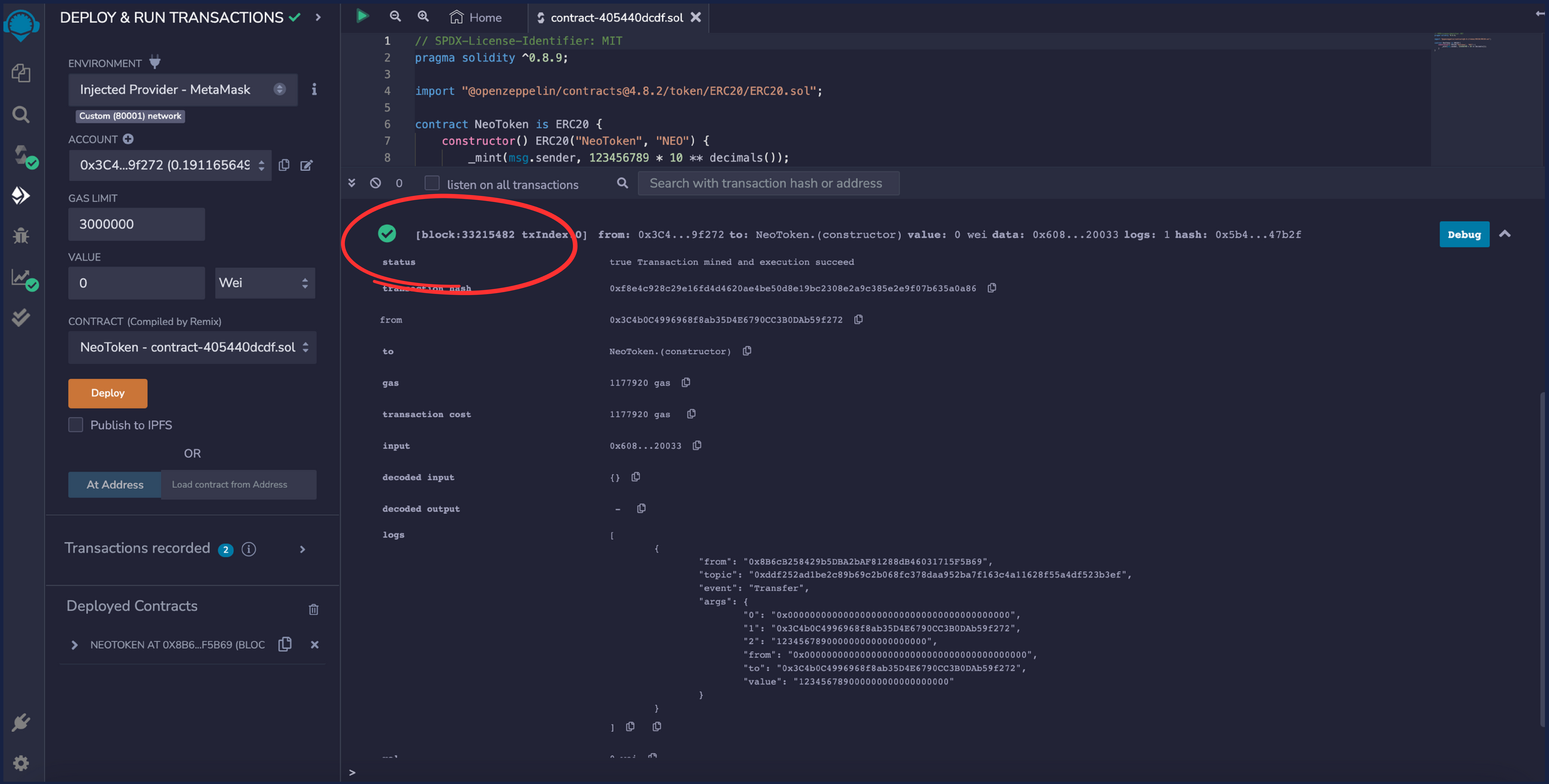
VALUE: 0 Wei

CONTRACT (Compiled by Remix): NeoToken - contract-405440dcdf.sol

NEOTOKEN AT 0X8B6...F5B69 (BLOC

```
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.9;

import "@openzeppelin/contracts@4.8.2/token/ERC20/ERC20.sol";

contract NeoToken is ERC20 {
    constructor() ERC20("NeoToken", "NEO") {
        _mint(msg.sender, 123456789 * 10 ** decimals());
    }
}

```

```
creation of NeoToken pending...

[block:33215482 txIndex:0] from: 0x3C4...9f272 to: NeoToken.(constructor) value: 0 wei data: 0x608...20033 logs: 1 hash: 0x5b4...47b2f
```


DEPLOY & RUN TRANSACTIONS
Home
contract-405440dcdf.sol
Deploy
Publish to IPFS
OR
At Address
Load contract from Address
Transactions recorded 2
Deployed Contracts
NEOTOKEN AT 0X8B6...F5B69 (BLOC
listen on all transactions
Search with transaction hash or address
Debug

ENVIRONMENT: Injected Provider - MetaMask

Custom (80001) network

ACCOUNT: 0x3C4...9f272 (0.19116564

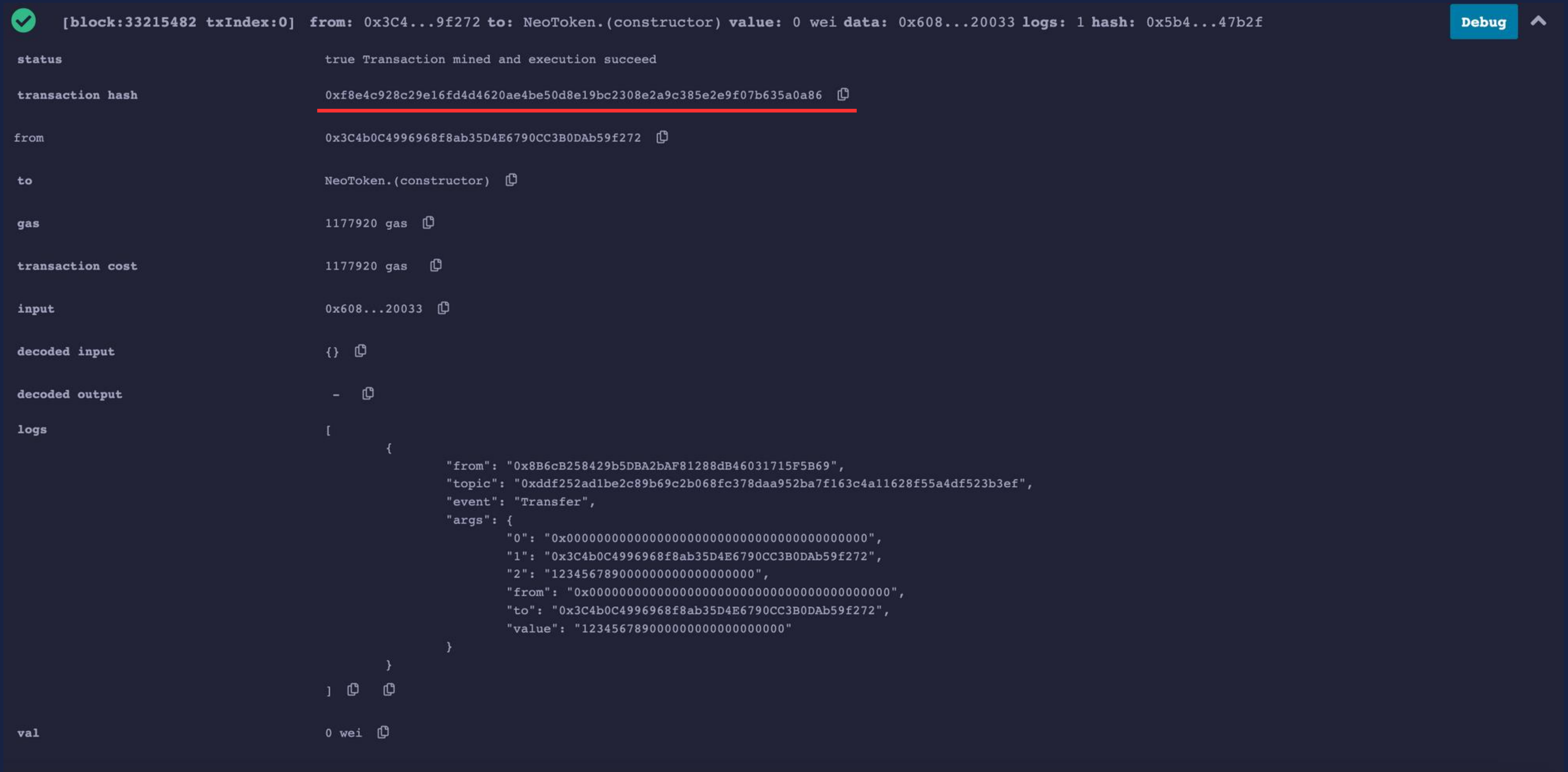
GAS LIMIT: 3000000

VALUE: 0 Wei

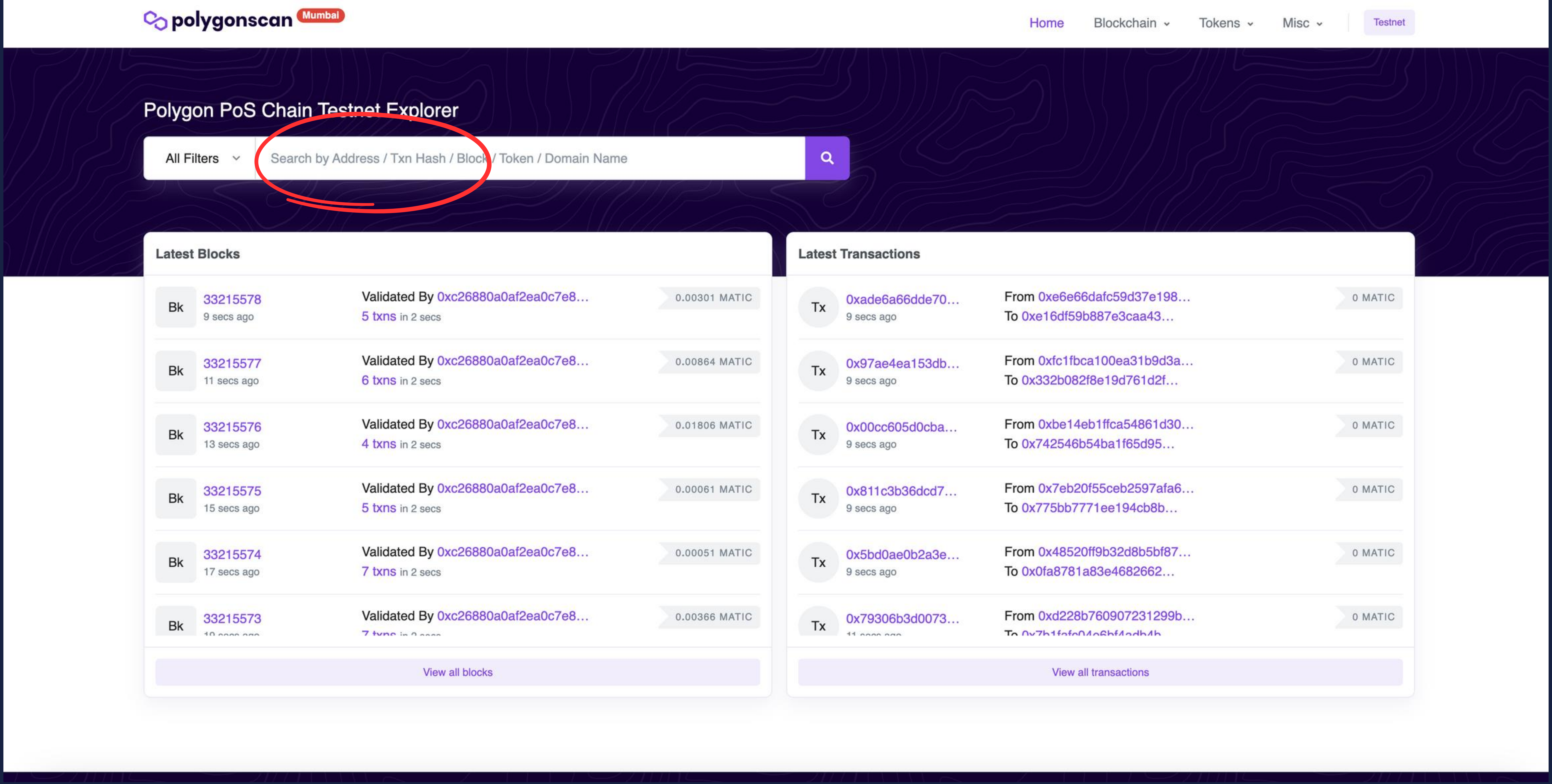
CONTRACT (Compiled by Remix): NeoToken - contract-405440dcdf.sol

```
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.9;

import "@openzeppelin/contracts@4.8.2/token/ERC20/ERC20.sol";

contract NeoToken is ERC20 {
    constructor() ERC20("NeoToken", "NEO") {
        _mint(msg.sender, 123456789 * 10 ** decimals());
```

```
[block:33215482 txIndex:0] from: 0x3C4...9f272 to: NeoToken.(constructor) value: 0 wei data: 0x608...20033 logs: 1 hash: 0x5b4...47b2f
status              true Transaction mined and execution succeed
transaction hash    0xf8e4c928c29e16fd4d4620ae4be50d8e19bc2308e2a9c385e2e9f07b635a0a86
from                0x3C4b0C4996968f8ab35D4E6790CC3B0DAb59f272
to                  NeoToken.(constructor)
gas                 1177920 gas
transaction cost    1177920 gas
input               0x608...20033
decoded input       {}
decoded output      -
logs                [
                        {
                            "from": "0x8B6cB258429b5DBA2bAF81288dB46031715F5B69",
                            "topic": "0xddf252ad1be2c89b69c2b068fc378daa952ba7f163c4a11628f55a4df523b3ef",
                            "event": "Transfer",
                            "args": {
                                "0": "0x0000000000000000000000000000000000000000",
                                "1": "0x3C4b0C4996968f8ab35D4E6790CC3B0DAb59f272",
                                "2": "123456789000000000000000000",
                                "from": "0x0000000000000000000000000000000000000000",
                                "to": "0x3C4b0C4996968f8ab35D4E6790CC3B0DAb59f272",
                                "value": "123456789000000000000000000"
                            }
                        }
                    ]
```



```
[block:33215482 txIndex:0] from: 0x3C4...9f272 to: NeoToken.(constructor) value: 0 wei data: 0x608...20033 logs: 1 hash: 0x5b4...47b2f
status                  true Transaction mined and execution succeed
transaction hash        0xf8e4c928c29e16fd4d4620ae4be50d8e19bc2308e2a9c385e2e9f07b635a0a86
from                    0x3C4b0C4996968f8ab35D4E6790CC3B0DAb59f272
to                      NeoToken.(constructor)
gas                     1177920 gas
transaction cost        1177920 gas
input                   0x608...20033
decoded input           {}
decoded output           -
logs                    [
                                {
                                        "from": "0x8B6cB258429b5DBA2bAF81288dB46031715F5B69",
                                        "topic": "0xddf252ad1be2c89b69c2b068fc378daa952ba7f163c4a11628f55a4df523b3ef",
                                        "event": "Transfer",
                                        "args": {
                                                "0": "0x0000000000000000000000000000000000000000",
                                                "1": "0x3C4b0C4996968f8ab35D4E6790CC3B0DAb59f272",
                                                "2": "123456789000000000000000000",
                                                "from": "0x0000000000000000000000000000000000000000",
                                                "to": "0x3C4b0C4996968f8ab35D4E6790CC3B0DAb59f272",
                                                "value": "123456789000000000000000000"
                                        }
                                }
                        ]
val                     0 wei
```


polygonscan
Mumbai
Home
Blockchain
Tokens
Misc
Testnet
All Filters
Search by Address / Txn Hash / Block / Token / Domain Name

Polygon PoS Chain Testnet Explorer

Latest Blocks

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Bk	33215577 11 secs ago	Validated By 0xc26880a0af2ea0c7e8... 6 txns in 2 secs	0.00864 MATIC
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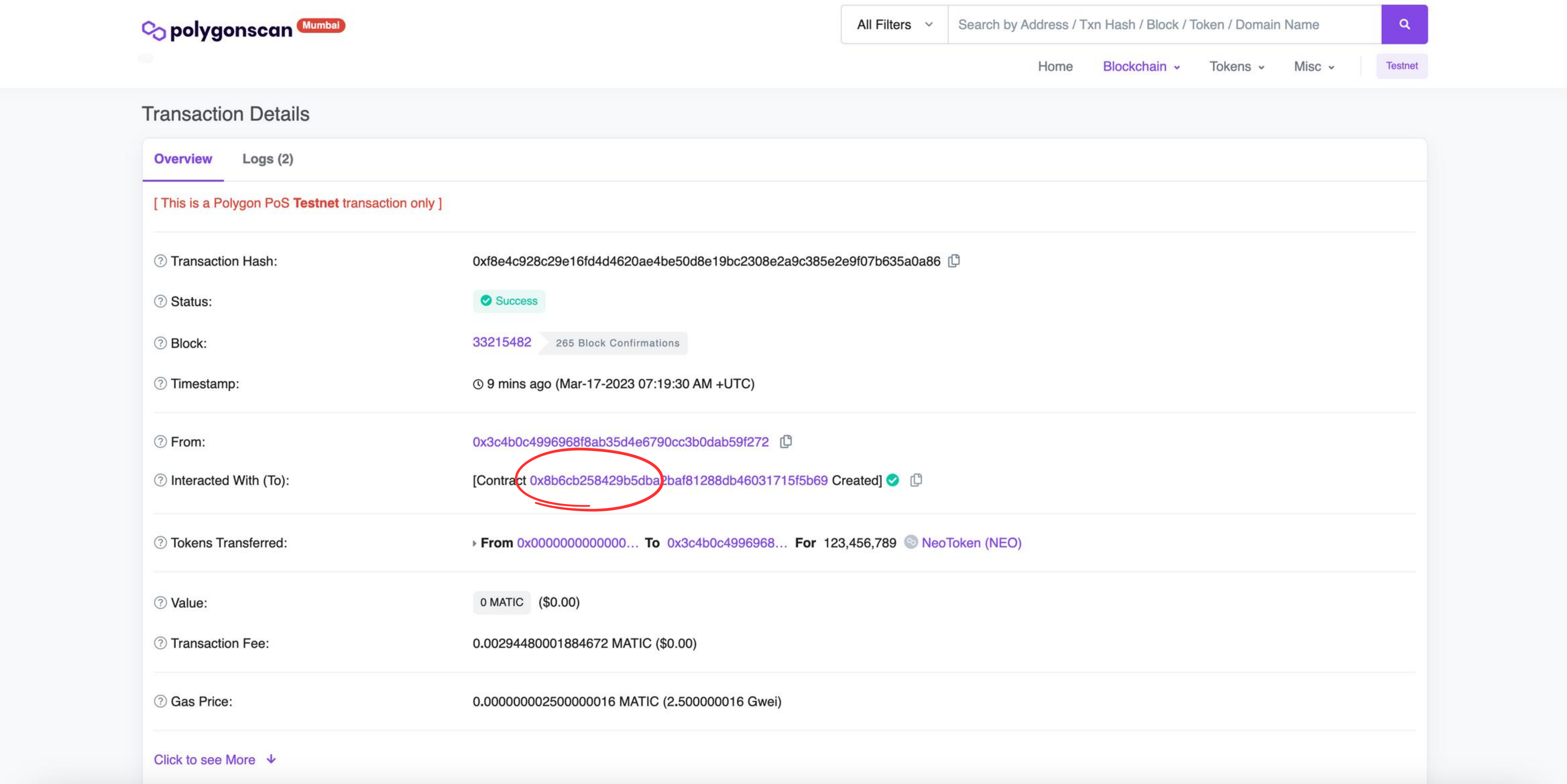
Bk	33215574 17 secs ago	Validated By 0xc26880a0af2ea0c7e8... 7 txns in 2 secs	0.00051 MATIC
Bk	33215573	Validated By 0xc26880a0af2ea0c7e8...	0.00366 MATIC

View all blocks

Latest Transactions

Tx	0xade6a66dde70... 9 secs ago	From 0xe6e66dafc59d37e198... To 0xe16df59b887e3caa43...	0 MATIC
Tx	0x97ae4ea153db... 9 secs ago	From 0xfc1fbca100ea31b9d3a... To 0x332b082f8e19d761d2f...	0 MATIC
Tx	0x00cc605d0cba... 9 secs ago	From 0xbe14eb1ffca54861d30... To 0x742546b54ba1f65d95...	0 MATIC
Tx	0x811c3b36dcd7... 9 secs ago	From 0x7eb20f55ceb2597afa6... To 0x775bb7771ee194cb8b...	0 MATIC
Tx	0x5bd0ae0b2a3e... 9 secs ago	From 0x48520ff9b32d8b5bf87... To 0x0fa8781a83e4682662...	0 MATIC
Tx	0x79306b3d0073...	From 0xd228b760907231299b...	0 MATIC

View all transactions


polygonscan
Mumbai
All Filters
Search by Address / Txn Hash / Block / Token / Domain Name
Home
Blockchain
Tokens
Misc
Testnet
Overview
Logs (2)
Click to see More

Transaction Details

[This is a Polygon PoS **Testnet** transaction only]

Transaction Hash: 0xf8e4c928c29e16fd4d4620ae4be50d8e19bc2308e2a9c385e2e9f07b635a0a86

Status: Success

Block: 33215482 265 Block Confirmations

Timestamp: 9 mins ago (Mar-17-2023 07:19:30 AM +UTC)

From: 0x3c4b0c4996968f8ab35d4e6790cc3b0dab59f272

Interacted With (To): [Contract 0x8b6cb258429b5dba2baf81288db46031715f5b69 Created] ✓

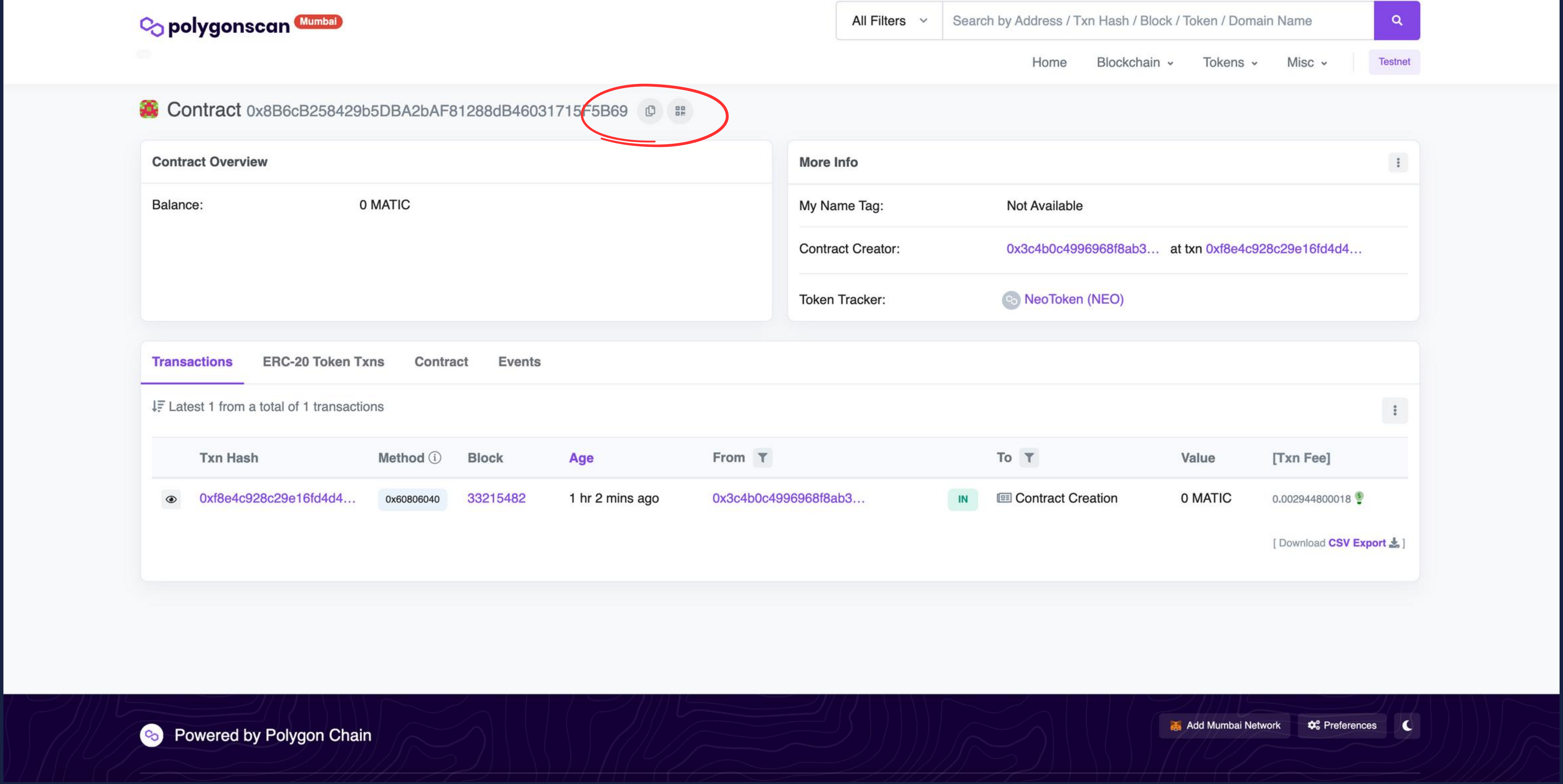
Tokens Transferred: **From** 0x0000000000000… **To** 0x3c4b0c4996968… **For** 123,456,789 NeoToken (NEO)

Value: 0 MATIC ($0.00)

Transaction Fee: 0.002944800018884672 MATIC ($0.00)

Gas Price: 0.000000002500000016 MATIC (2.500000016 Gwei)

発行したERC20をMetamaskに表示


polygonscan Mumbai
All Filters
Search by Address / Txn Hash / Block / Token / Domain Name
Home
Blockchain
Tokens
Misc
Testnet

Contract 0x8B6cB258429b5DBA2bAF81288dB46031715F5B69

Contract Overview

Balance: 0 MATIC

More Info

My Name Tag: Not Available

Contract Creator: 0x3c4b0c4996968f8ab3… at txn 0xf8e4c928c29e16fd4d4…

Token Tracker: NeoToken (NEO)

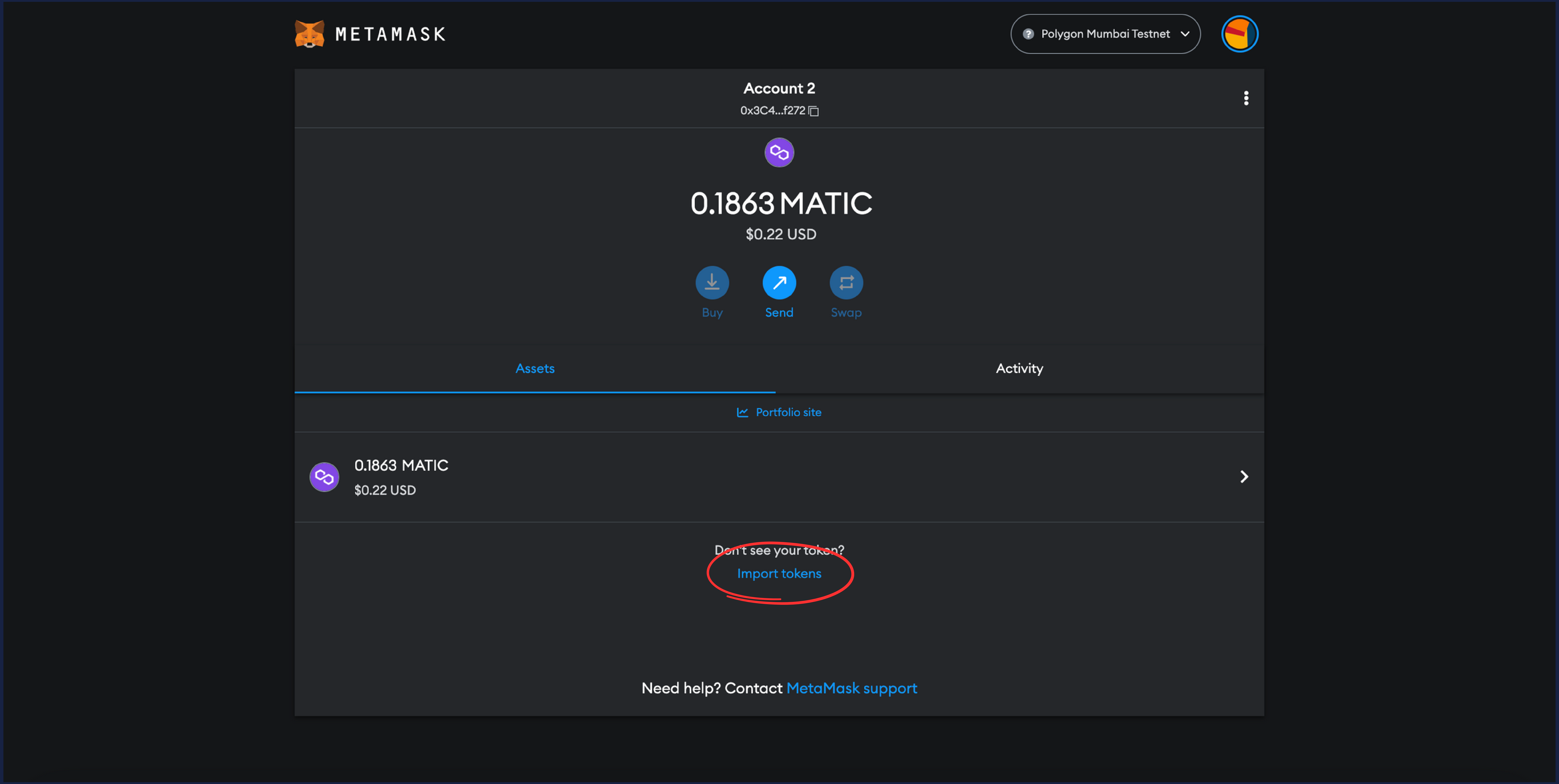
Transactions
ERC-20 Token Txns
Contract
Events

Latest 1 from a total of 1 transactions

Txn Hash	Method	Block	Age	From		To	Value	[Txn Fee]
0xf8e4c928c29e16fd4d4…	0x60806040	33215482	1 hr 2 mins ago	0x3c4b0c4996968f8ab3…	IN	Contract Creation	0 MATIC	0.002944800018

[Download **CSV Export**]

Powered by Polygon Chain
Add Mumbai Network
Preferences


METAMASK
Polygon Mumbai Testnet
Buy
Send
Swap
Assets
Activity
Portfolio site

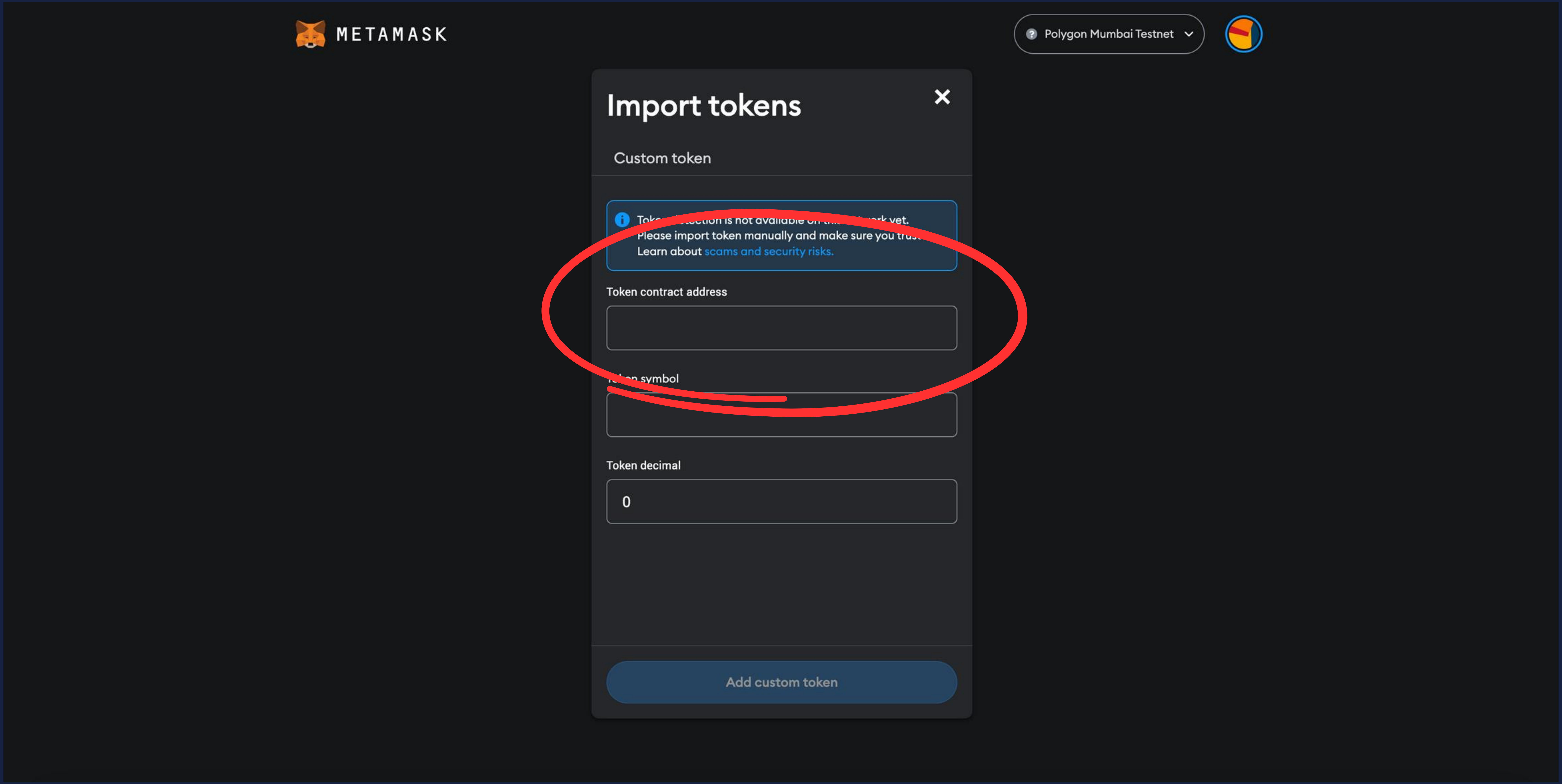
Account 2
0x3C4...f272

0.1863 MATIC
$0.22 USD

0.1863 MATIC
$0.22 USD

Don't see your token?
Import tokens

Need help? Contact MetaMask support


METAMASK
Polygon Mumbai Testnet

Import tokens

Custom token

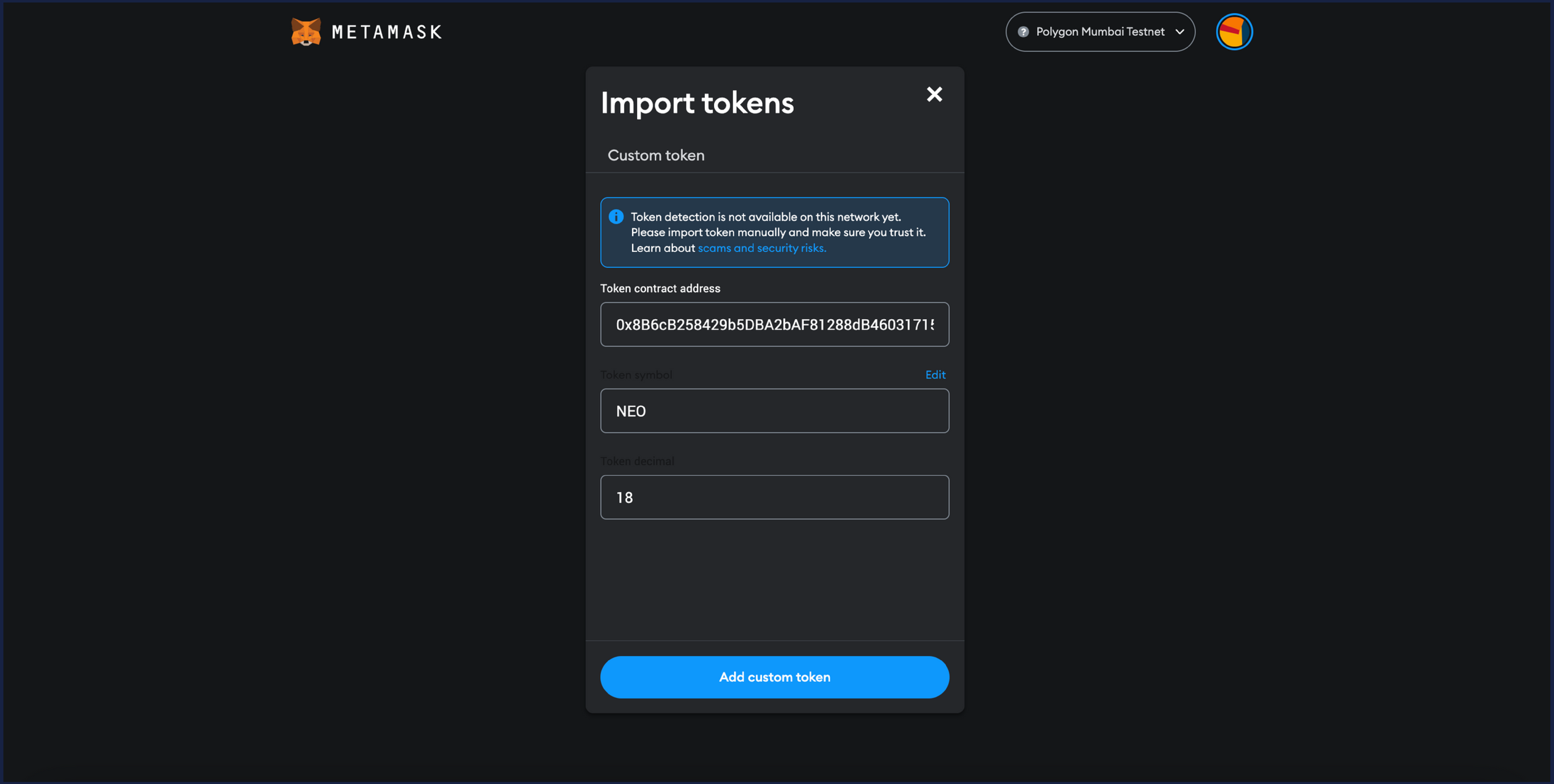
Token detection is not available on this network yet. Please import token manually and make sure you trust
Learn about scams and security risks.

Token contract address

Token symbol

Token decimal
0

Add custom token



METAMASK
Polygon Mumbai Testnet

Import tokens

Custom token

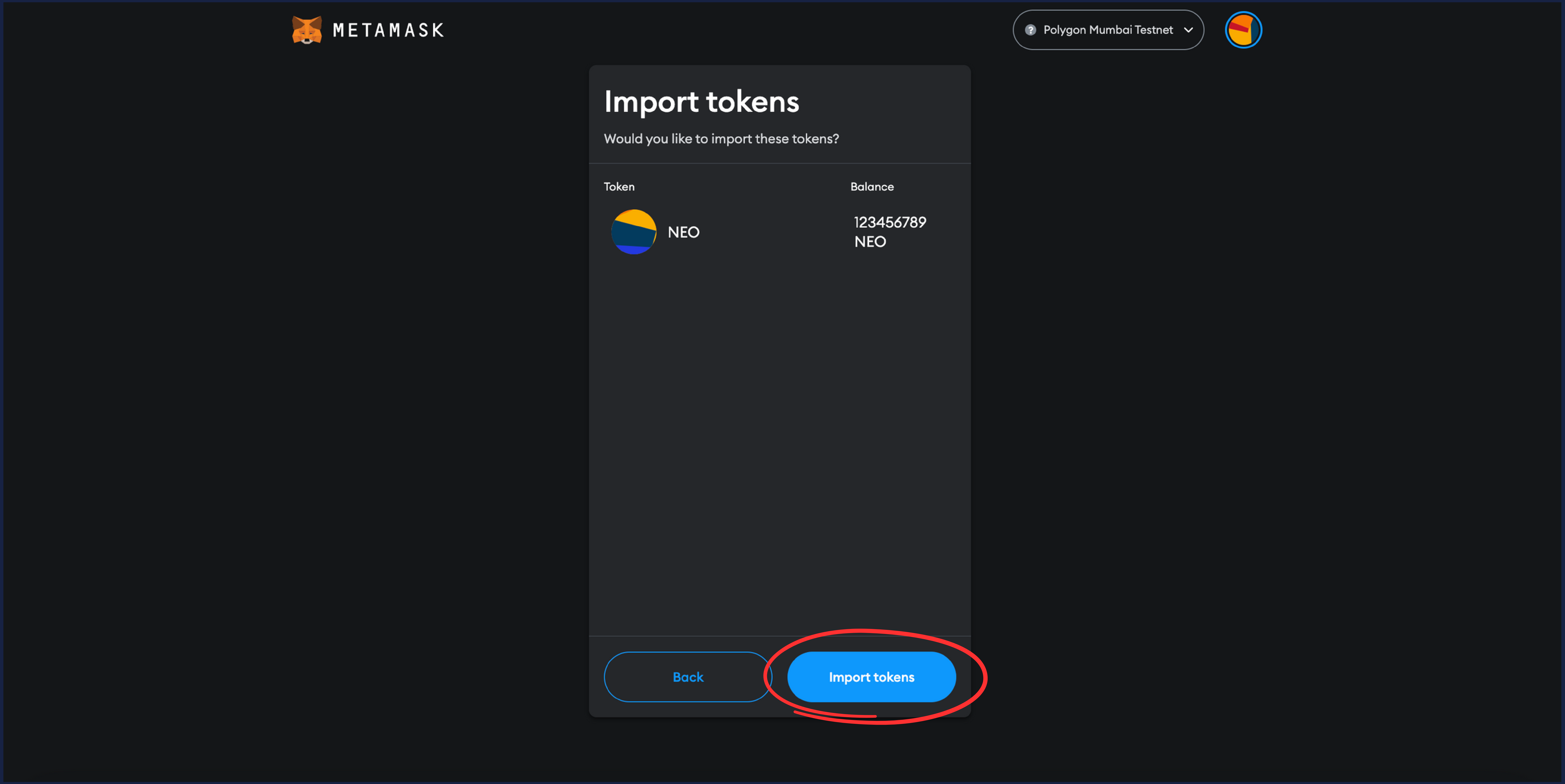
Token detection is not available on this network yet. Please import token manually and make sure you trust it. Learn about scams and security risks.

Token contract address: 0x8B6cB258429b5DBA2bAF81288dB4603171

Token symbol: NEO

Token decimal: 18

Edit
Add custom token



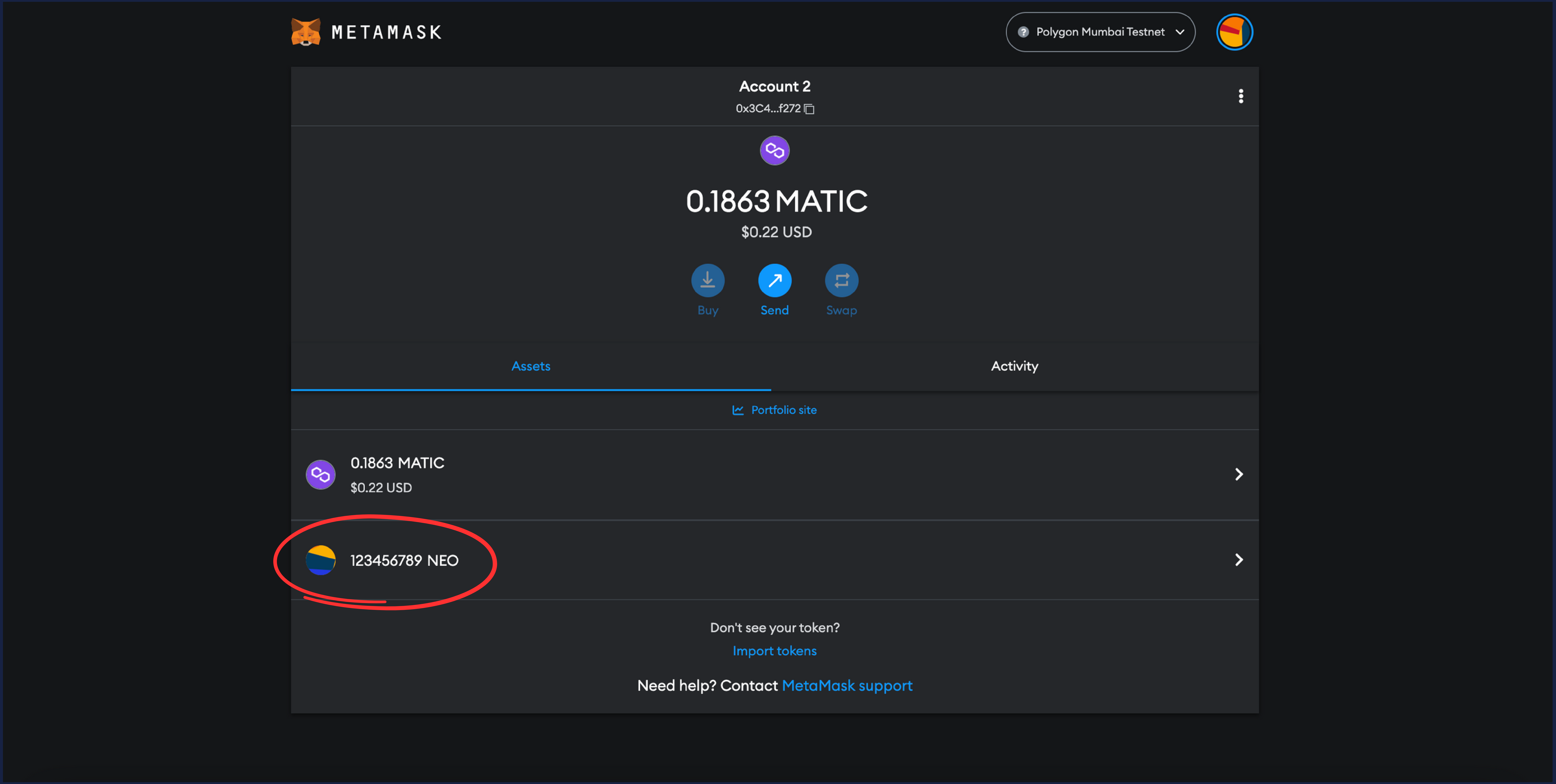
METAMASK
Polygon Mumbai Testnet

Import tokens

Would you like to import these tokens?

Token	Balance
NEO	123456789 NEO

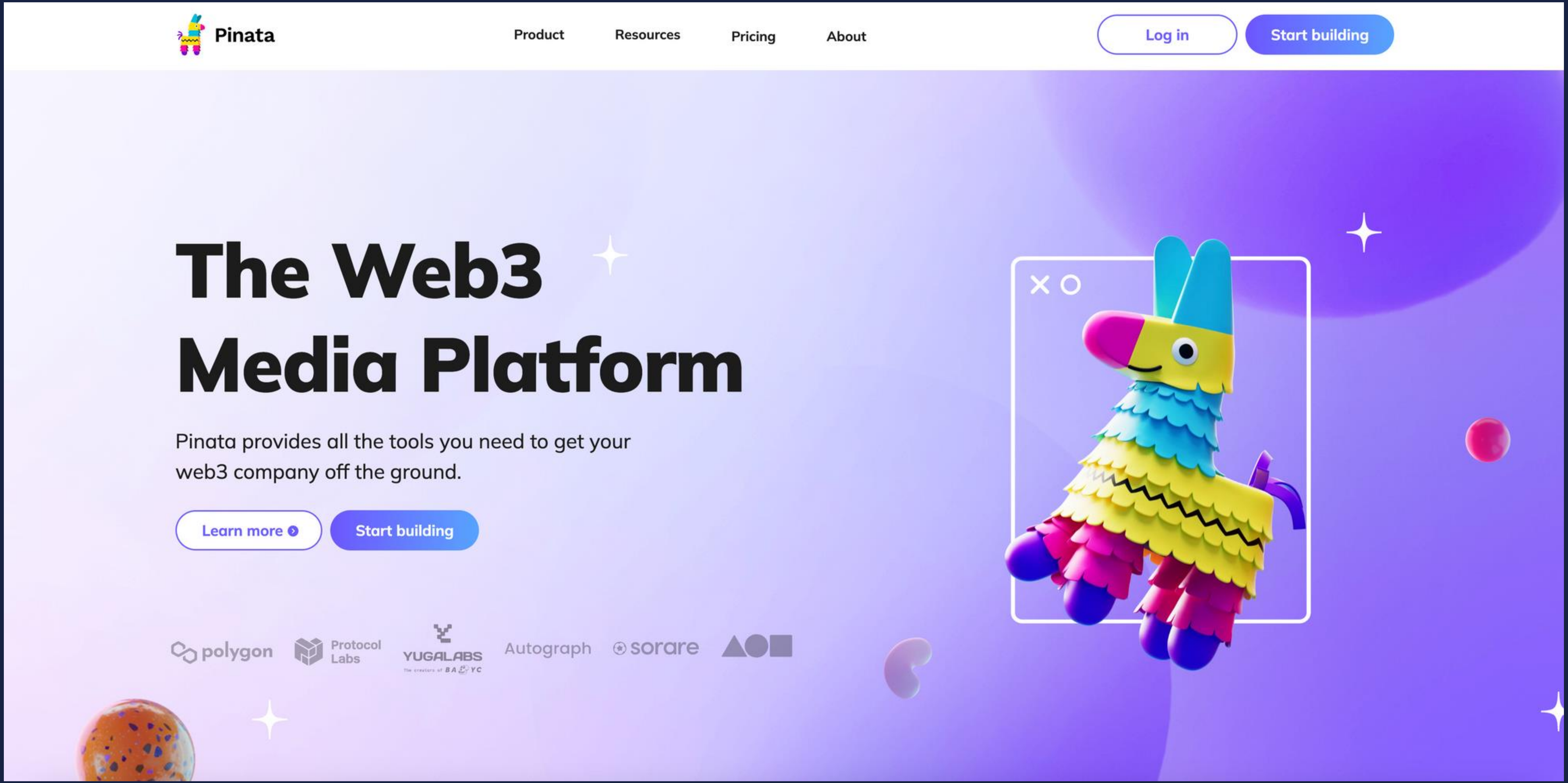
Back
Import tokens


METAMASK
Polygon Mumbai Testnet
Account 2
0x3C4...f272
0.1863 MATIC
$0.22 USD
Buy
Send
Swap
Assets
Activity
Portfolio site
0.1863 MATIC
$0.22 USD
123456789 NEO
Don't see your token?
Import tokens
Need help? Contact MetaMask support

*ERC20*発行 終

*ERC721*発行 事前準備

Pinata（*IPFS*と通信を行う*Public Gateway*サービスの一種）


Pinata
Product
Resources
Pricing
About
Log in
Start building
Learn more
Start building
polygon
Protocol Labs
YUGALABS
Autograph
sorare

The Web3 Media Platform

Pinata provides all the tools you need to get your web3 company off the ground.

*IPFS*の復習

- *IPFS*はコンテンツ指向型のハイパーメディア分散プロトコル
- *IPFS*は*HTTP*をベースとした既存のネットワークとは独立したネットワーク
  →既存のブラウザからアクセスするにはIPFSに橋渡ししてくれる存在が必要
  →IPFS Gateway
- *IPFS Gateway*の中でも任意ユーザーに常時公開されている***IPFS Public Gateway***（https://ipfs.io/ipfsなど）を利用する必要がある
- *https://ipfs.io/ipfs/*〜〜〜の『〜〜〜』部にコンテンツ（*Content*）の*ID*（画像等のコンテンツのハッシュ値）を入れる必要がある（*CID*）
  →逆に言えば、上記のコンテンツIDを知っているものであれば閲覧可能
- *P2P*ファイル共有システムによって耐障害性、耐検閲性、耐改ざん性がある
- 詳細な仕組みについては添付リンク参照

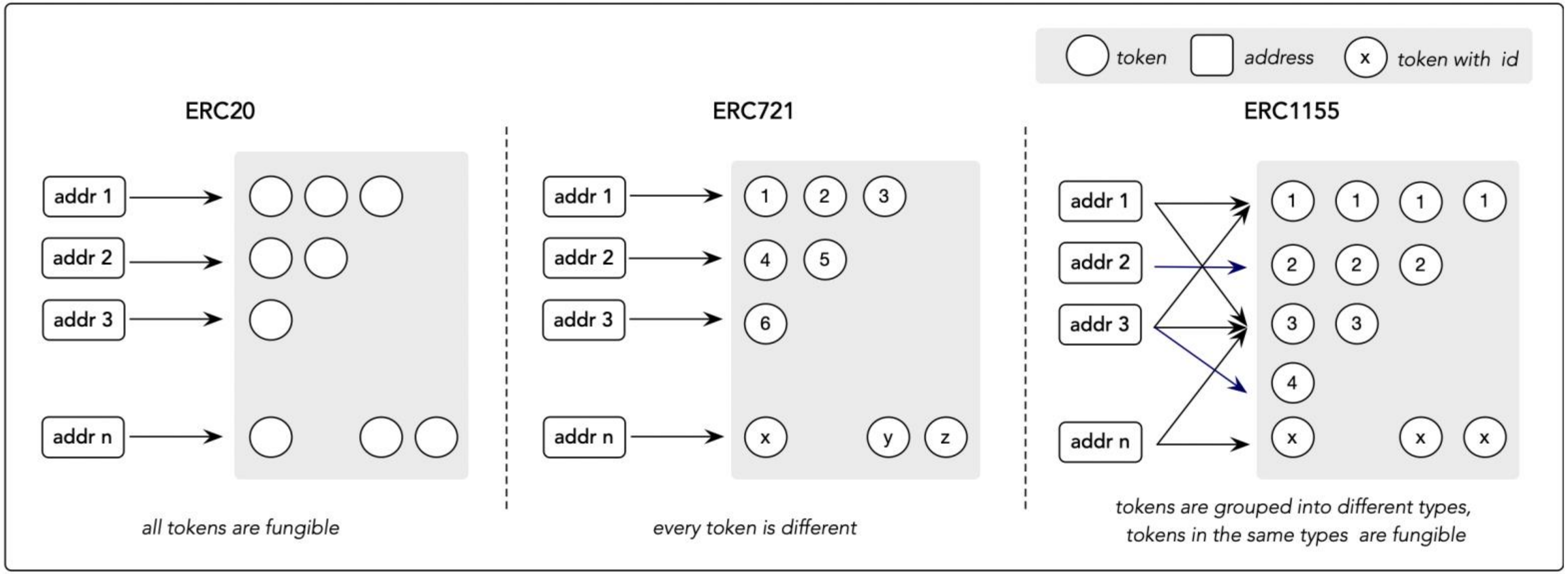
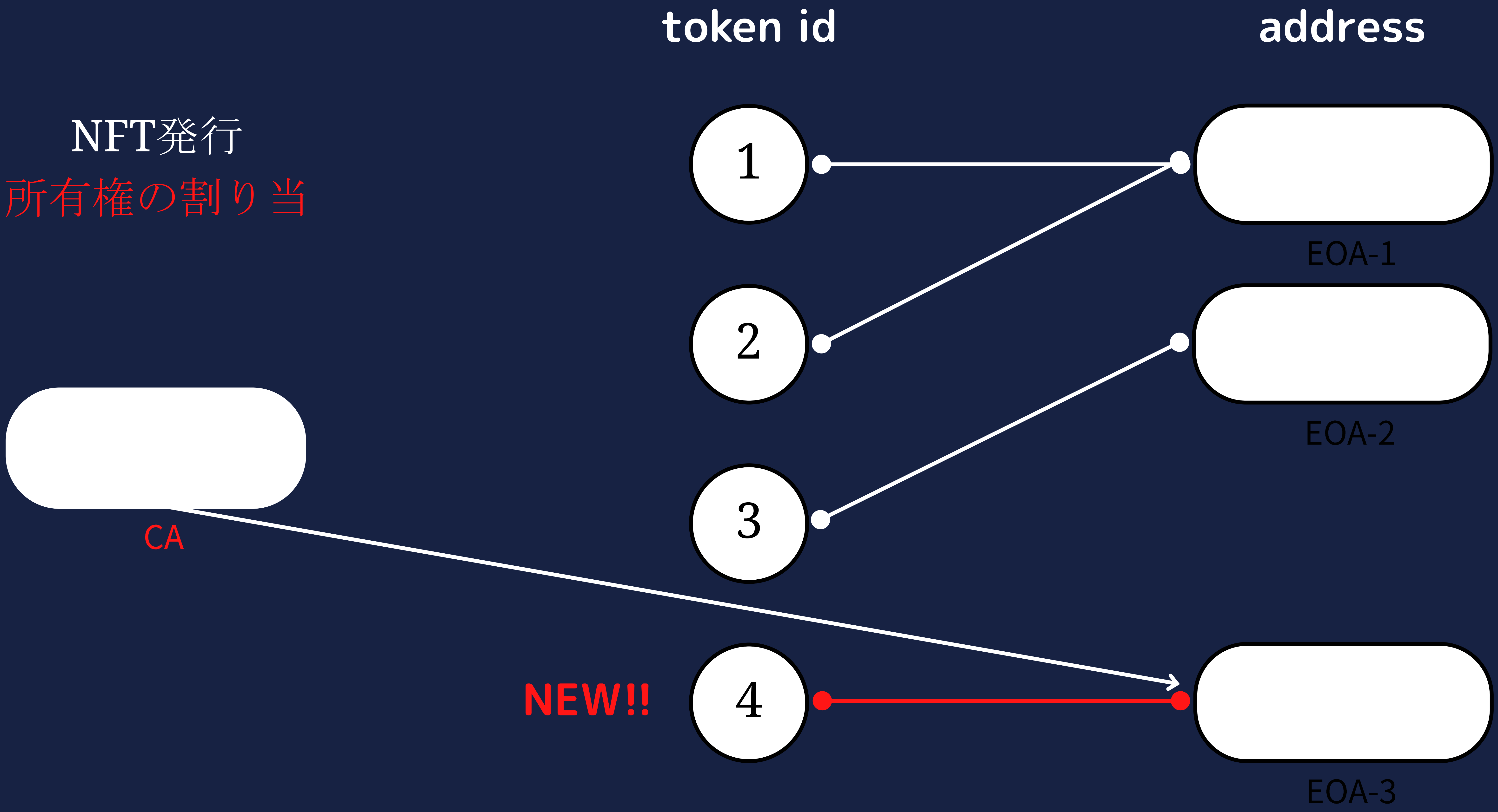

token
address
x
token with id
ERC20
addr 1
addr 2
addr 3
addr n
all tokens are fungible
ERC721
addr 1
addr 2
addr 3
addr n
1
2
3
4
5
6
x
y
z
every token is different
ERC1155
addr 1
addr 2
addr 3
addr n
1
1
1
1
2
2
2
3
3
4
x
x
x
tokens are grouped into different types,
tokens in the same types are fungible

Fig. 2: NFT-related Token Standards

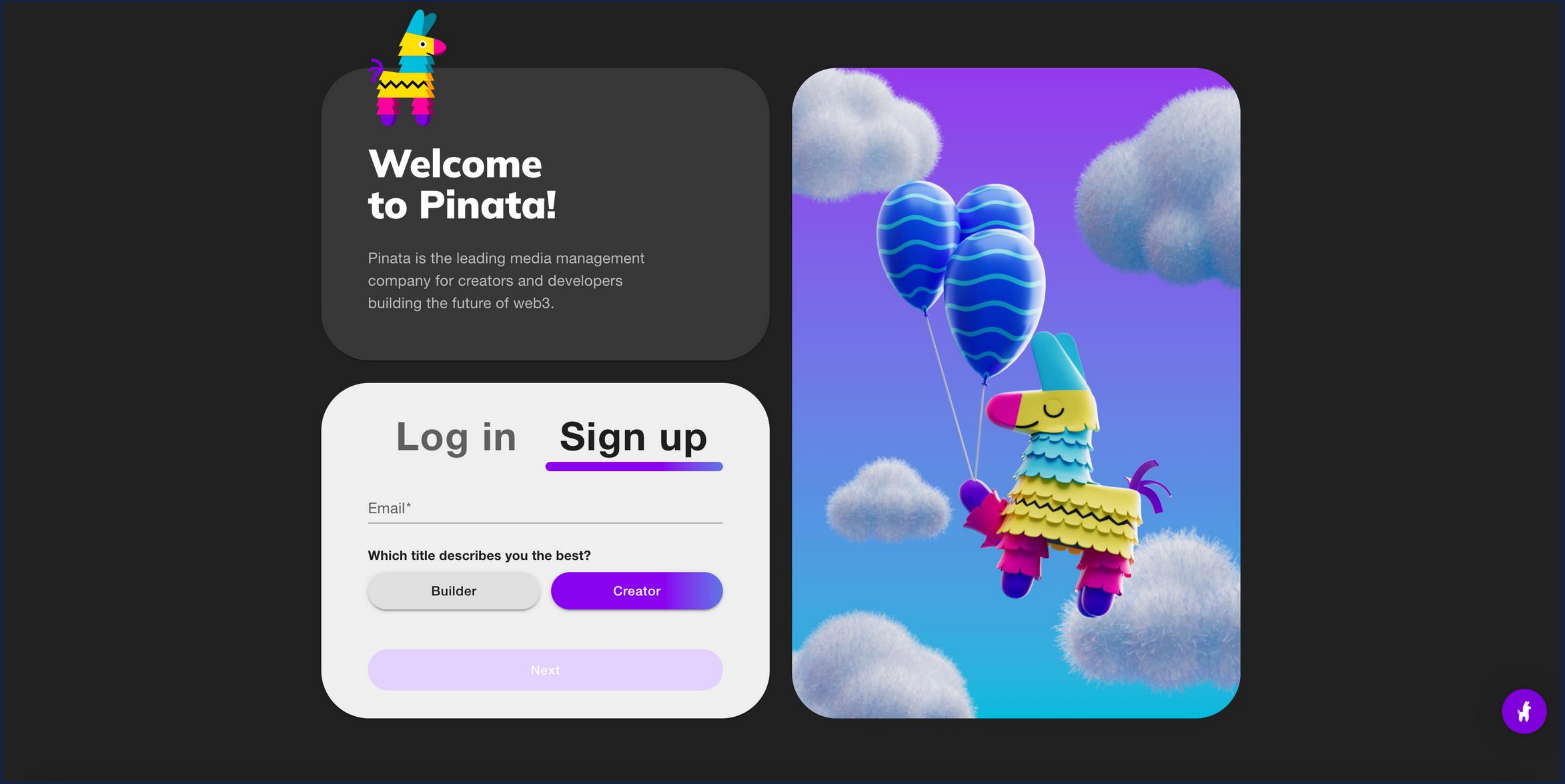
出典：Non-Fungible Token (NFT): Overview, Evaluation, Opportunities and Challenges

NFT発行
＝所有権の割り当て


token id
address
1
2
3
4
NEW!!
EOA-1
EOA-2
EOA-3
CA

*ERC721*を発行する

画像データの準備



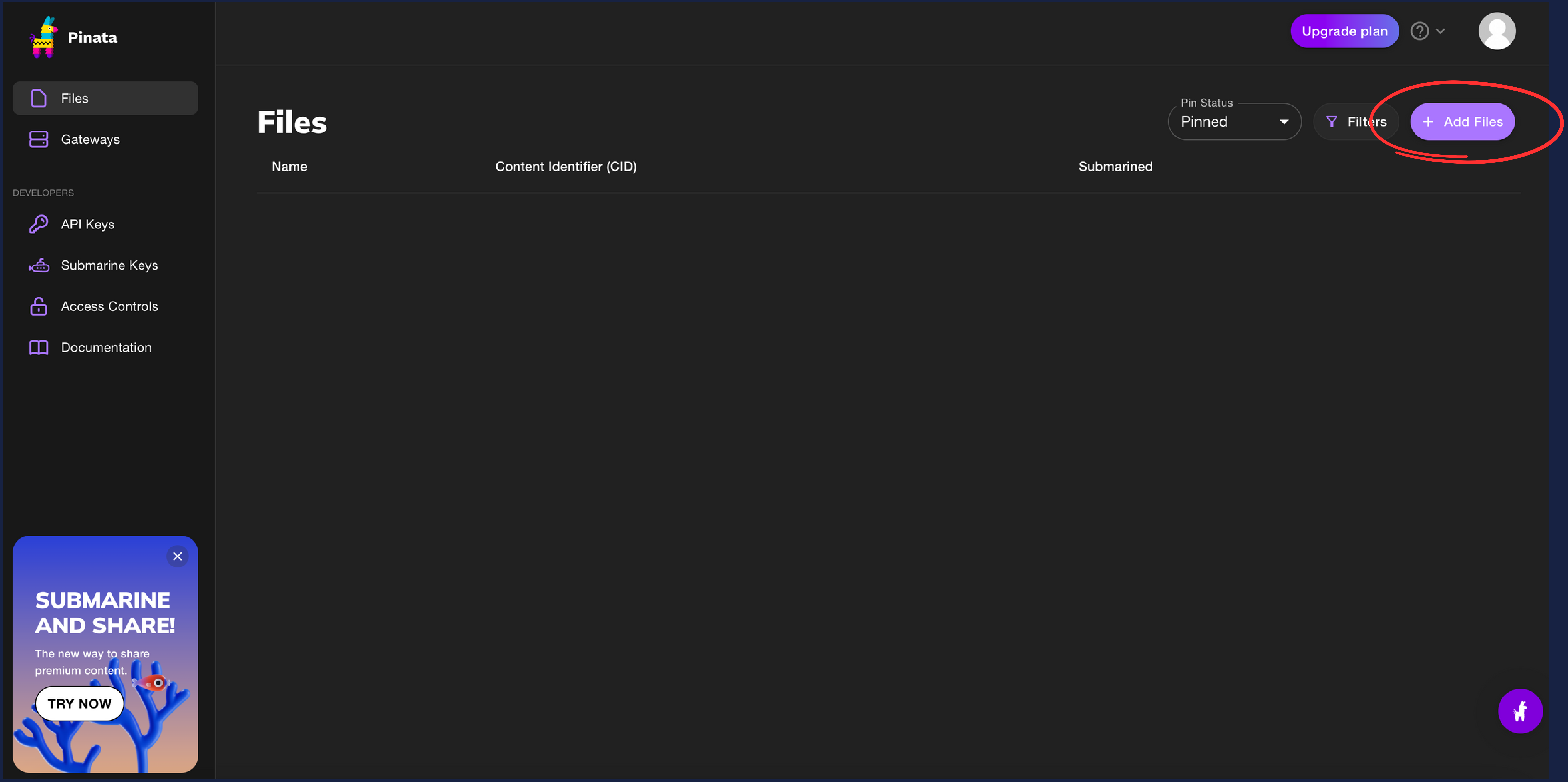
Welcome
to Pinata!

Pinata is the leading media management company for creators and developers building the future of web3.

Email*

Which title describes you the best?

Log in
Sign up
Builder
Creator
Next


Pinata
Files
Gateways
DEVELOPERS
API Keys
Submarine Keys
Access Controls
Documentation
Upgrade plan
Filters
+ Add Files
TRY NOW

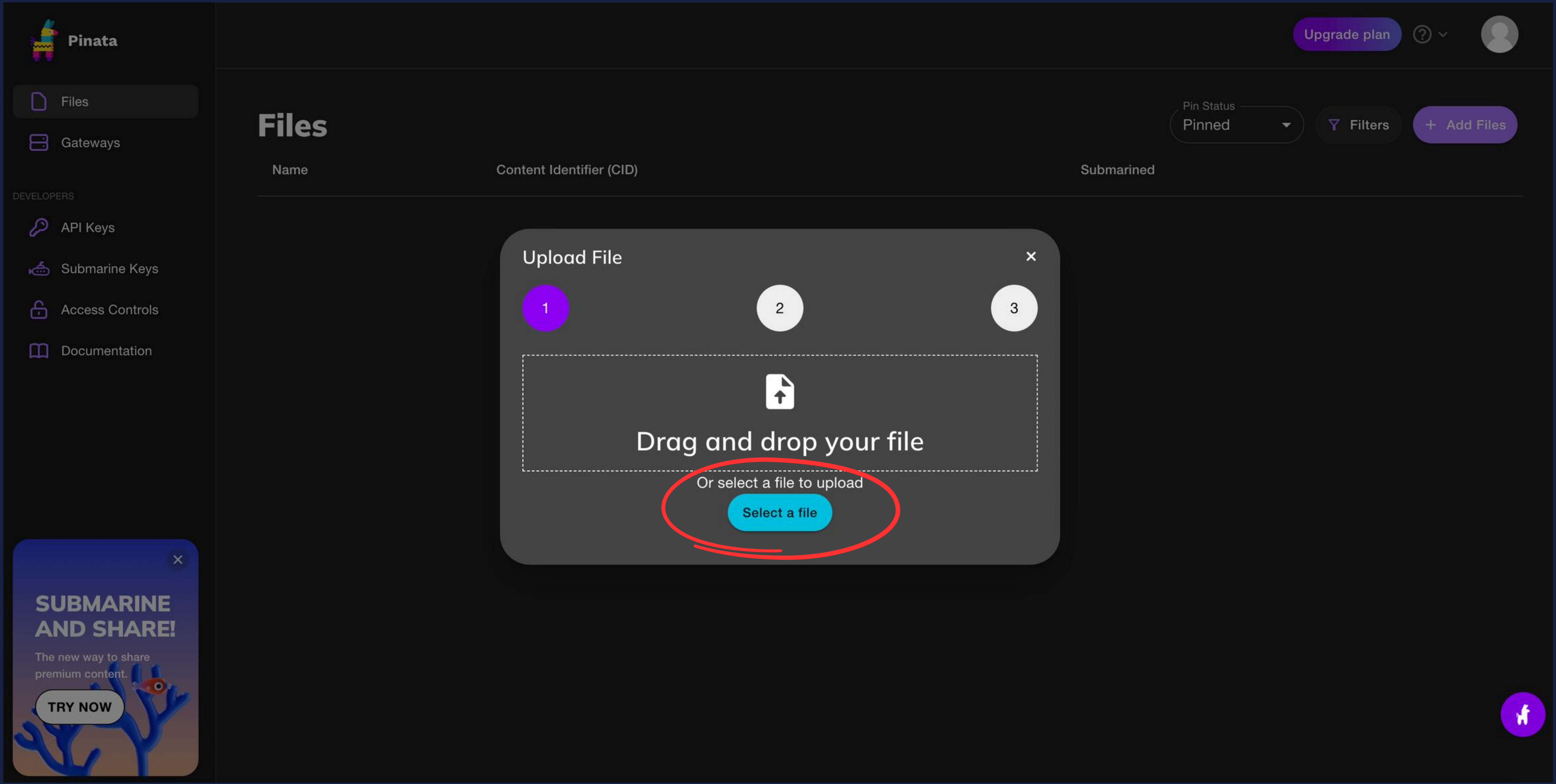
Files

Pin Status: Pinned

Name	Content Identifier (CID)	Submarined

SUBMARINE AND SHARE!

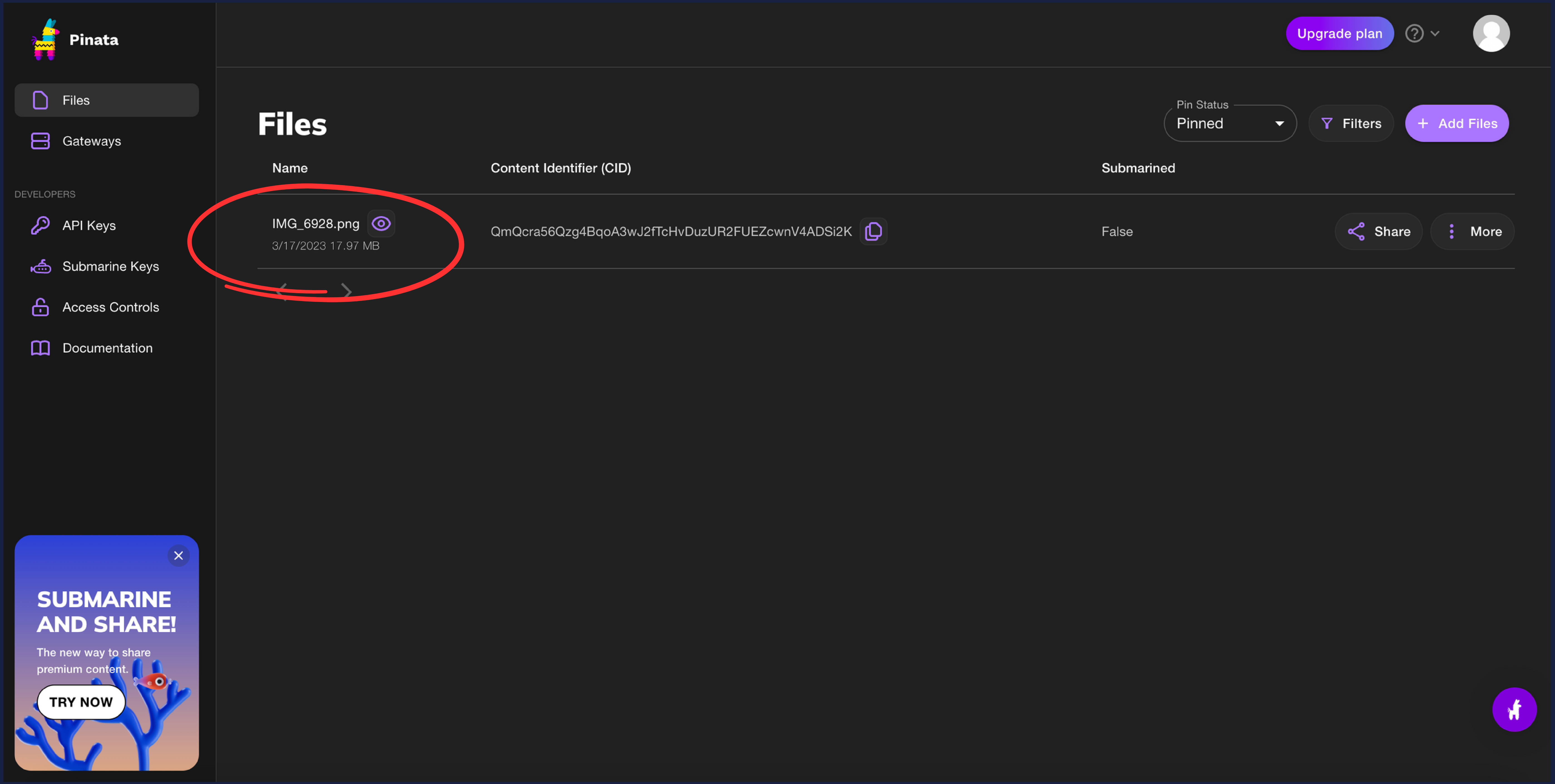
The new way to share premium content.


Pinata
Files
Gateways
DEVELOPERS
API Keys
Submarine Keys
Access Controls
Documentation
Upgrade plan
Files
Pin Status
Pinned
Filters
Add Files
Name
Content Identifier (CID)
Submarined
Upload File
1
2
3
Select a file
SUBMARINE AND SHARE!
TRY NOW

Drag and drop your file

Or select a file to upload

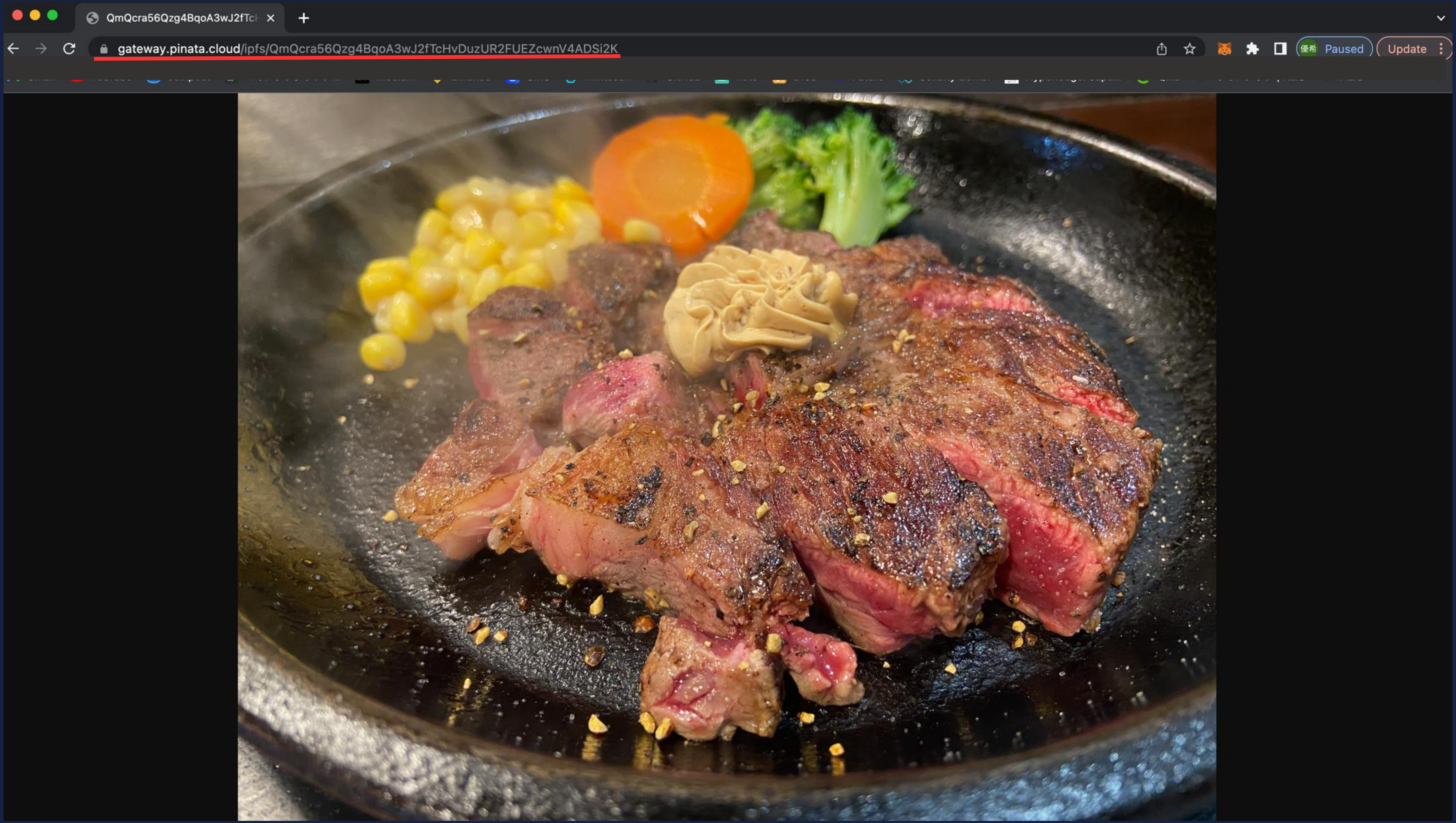
The new way to share premium content.


Pinata
Files
Gateways
DEVELOPERS
API Keys
Submarine Keys
Access Controls
Documentation
SUBMARINE AND SHARE!
The new way to share premium content.
TRY NOW
Upgrade plan
Add Files
Filters
Share
More

Files

Pin Status: Pinned

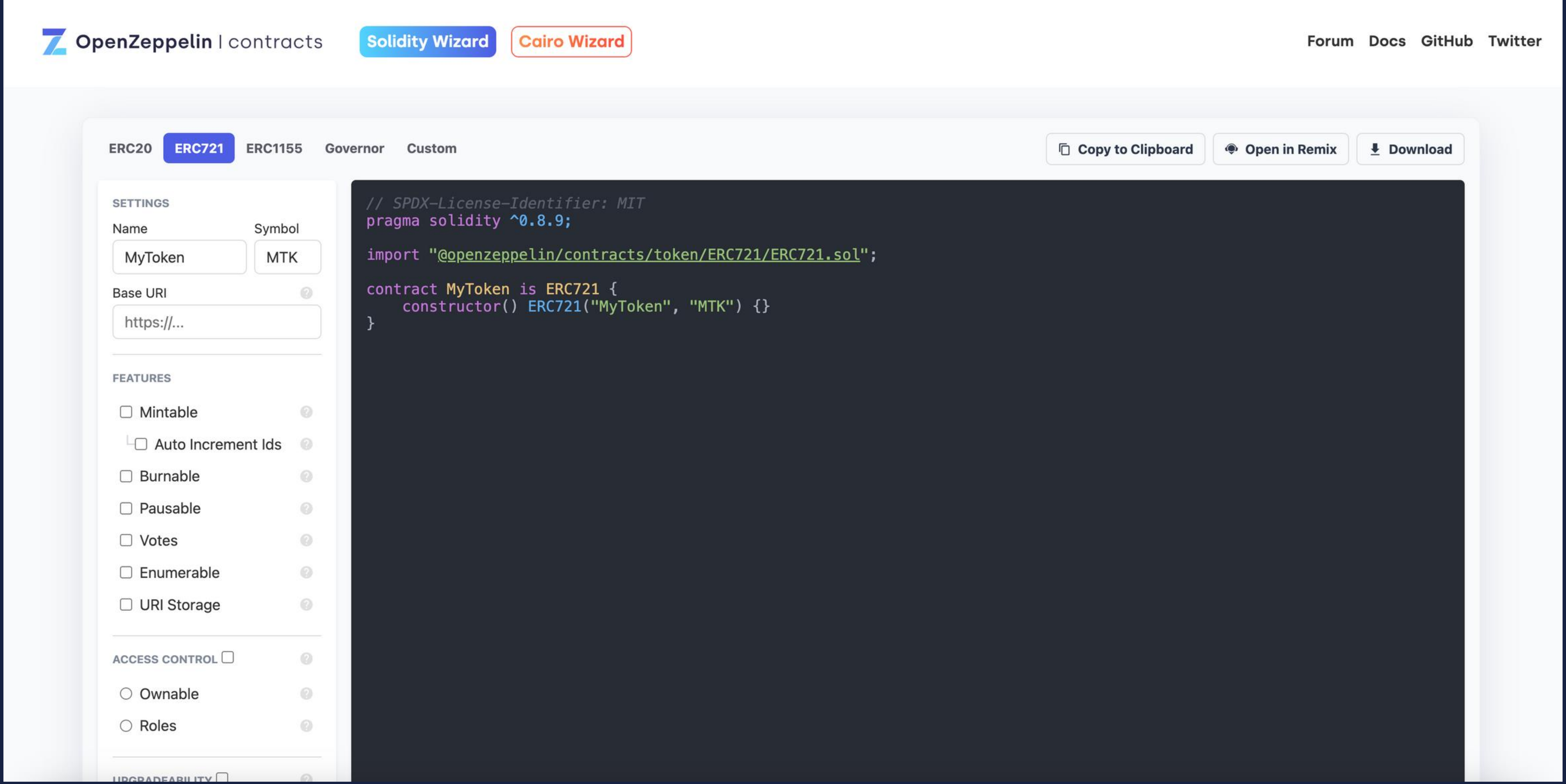
Name	Content Identifier (CID)	Submarined
IMG_6928.png 3/17/2023 17.97 MB	QmQcra56Qzg4BqoA3wJ2fTcHvDuzUR2FUEZcwnV4ADSi2K	False



gateway.pinata.cloud/ipfs/QmQcra56Qzg4BqoA3wJ2fTcHvDuzUR2FUEZcwnV4ADSi2K

QmQcra56Qzg4BqoA3wJ2fTc
Paused
Update

コントラクト


OpenZeppelin | contracts
Solidity Wizard
Cairo Wizard
Forum
Docs
GitHub
Twitter
ERC20
ERC721
ERC1155
Governor
Custom
Copy to Clipboard
Open in Remix
Download

SETTINGS

Name: MyToken

Symbol: MTK

Base URI: https://...

FEATURES

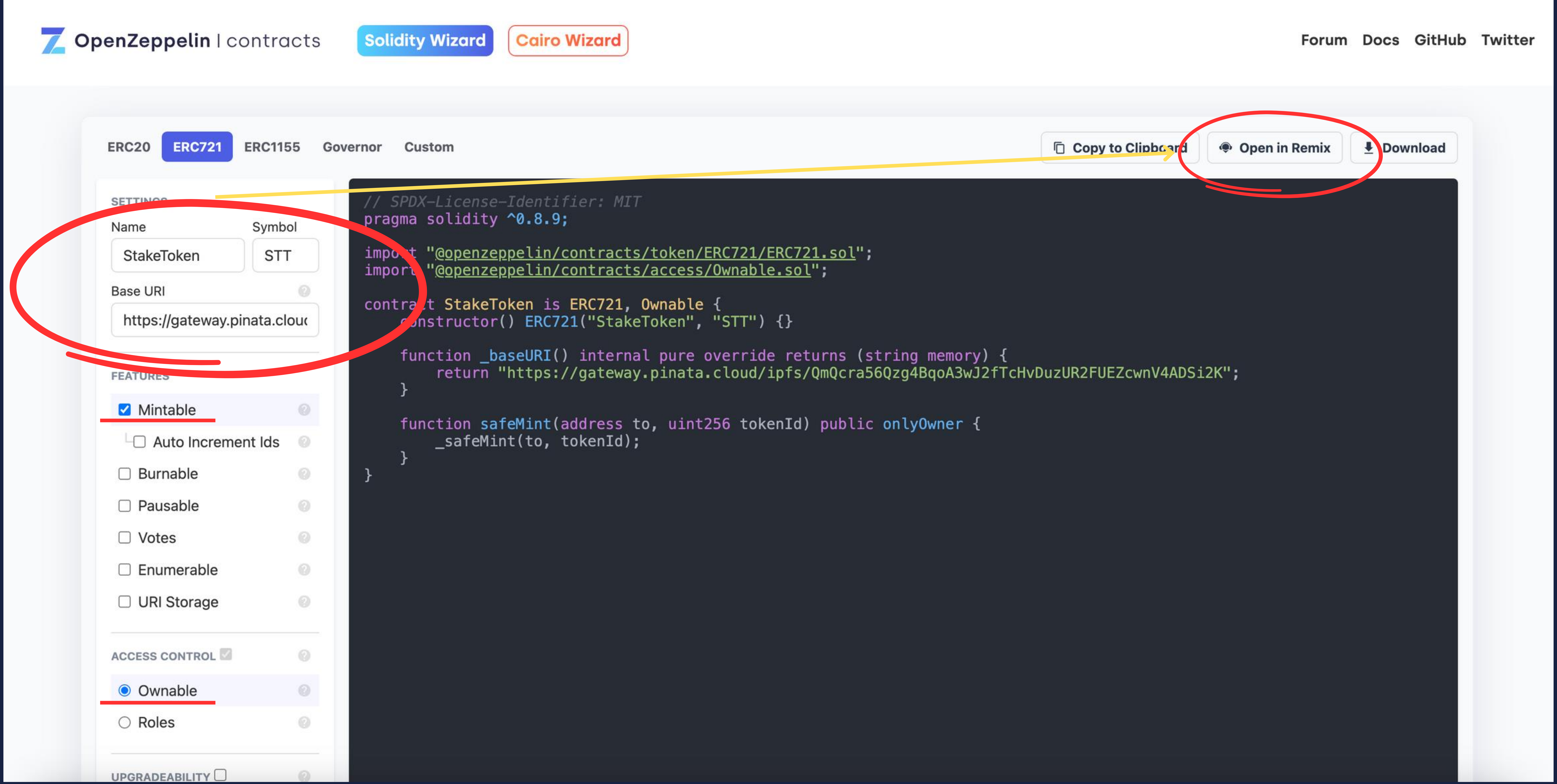
☐ Mintable
  ☐ Auto Increment Ids
☐ Burnable
☐ Pausable
☐ Votes
☐ Enumerable
☐ URI Storage

ACCESS CONTROL ☐

○ Ownable
○ Roles

UPGRADEABILITY ☐

```
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.9;

import "@openzeppelin/contracts/token/ERC721/ERC721.sol";

contract MyToken is ERC721 {
    constructor() ERC721("MyToken", "MTK") {}
}
```


OpenZeppelin | contracts
Solidity Wizard
Cairo Wizard
Forum
Docs
GitHub
Twitter
ERC20
ERC721
ERC1155
Governor
Custom
Copy to Clipboard
Open in Remix
Download

SETTINGS

Name: StakeToken

Symbol: STT

Base URI: https://gateway.pinata.clou

FEATURES

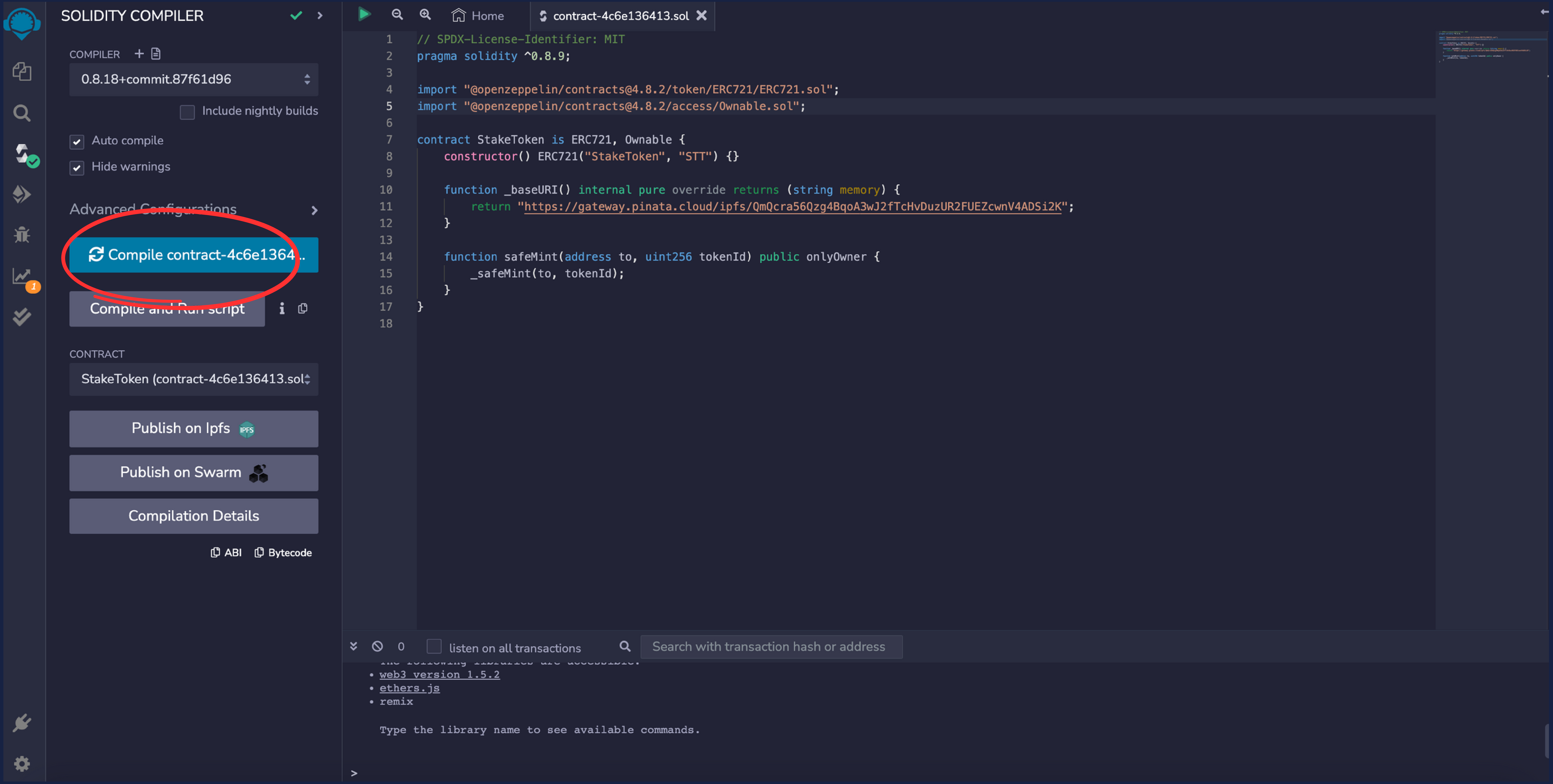
- ☑ Mintable
  - ☐ Auto Increment Ids
- ☐ Burnable
- ☐ Pausable
- ☐ Votes
- ☐ Enumerable
- ☐ URI Storage

ACCESS CONTROL ☑

- ● Ownable
- ○ Roles

UPGRADEABILITY ☐

```solidity
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.9;

import "@openzeppelin/contracts/token/ERC721/ERC721.sol";
import "@openzeppelin/contracts/access/Ownable.sol";

contract StakeToken is ERC721, Ownable {
    constructor() ERC721("StakeToken", "STT") {}

    function _baseURI() internal pure override returns (string memory) {
        return "https://gateway.pinata.cloud/ipfs/QmQcra56Qzg4BqoA3wJ2fTcHvDuzUR2FUEZcwnV4ADSi2K";
    }

    function safeMint(address to, uint256 tokenId) public onlyOwner {
        _safeMint(to, tokenId);
    }
}
```


SOLIDITY COMPILER
Home
contract-4c6e136413.sol
Advanced Configurations
Compile contract-4c6e1364...
Compile and Run script
Publish on Ipfs
IPFS
Publish on Swarm
Compilation Details
ABI
Bytecode
1

COMPILER
0.8.18+commit.87f61d96

☐ Include nightly builds

☑ Auto compile

☑ Hide warnings

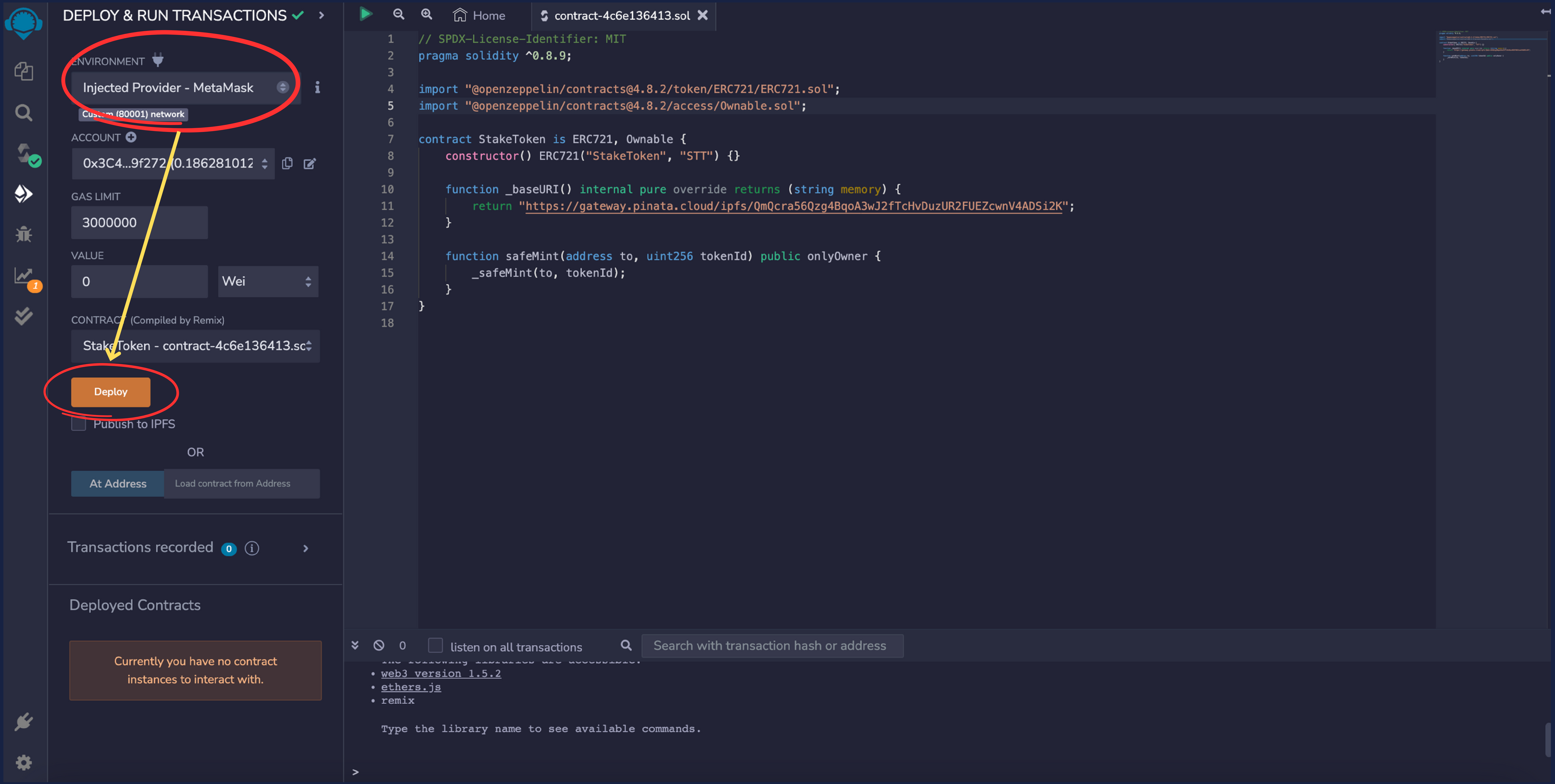
CONTRACT
StakeToken (contract-4c6e136413.sol)

```solidity
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.9;

import "@openzeppelin/contracts@4.8.2/token/ERC721/ERC721.sol";
import "@openzeppelin/contracts@4.8.2/access/Ownable.sol";

contract StakeToken is ERC721, Ownable {
    constructor() ERC721("StakeToken", "STT") {}

    function _baseURI() internal pure override returns (string memory) {
        return "https://gateway.pinata.cloud/ipfs/QmQcra56Qzg4BqoA3wJ2fTcHvDuzUR2FUEZcwnV4ADSi2K";
    }

    function safeMint(address to, uint256 tokenId) public onlyOwner {
        _safeMint(to, tokenId);
    }
}
```

☐ listen on all transactions

Search with transaction hash or address

```
The following libraries are accessible:
• web3 version 1.5.2
• ethers.js
• remix

Type the library name to see available commands.

>
```


DEPLOY & RUN TRANSACTIONS
Home
contract-4c6e136413.sol

ENVIRONMENT
Injected Provider - MetaMask
Custom (80001) network

ACCOUNT
0x3C4...9f272 (0.186281012

GAS LIMIT
3000000

VALUE
0 Wei

CONTRACT (Compiled by Remix)
StakeToken - contract-4c6e136413.sol

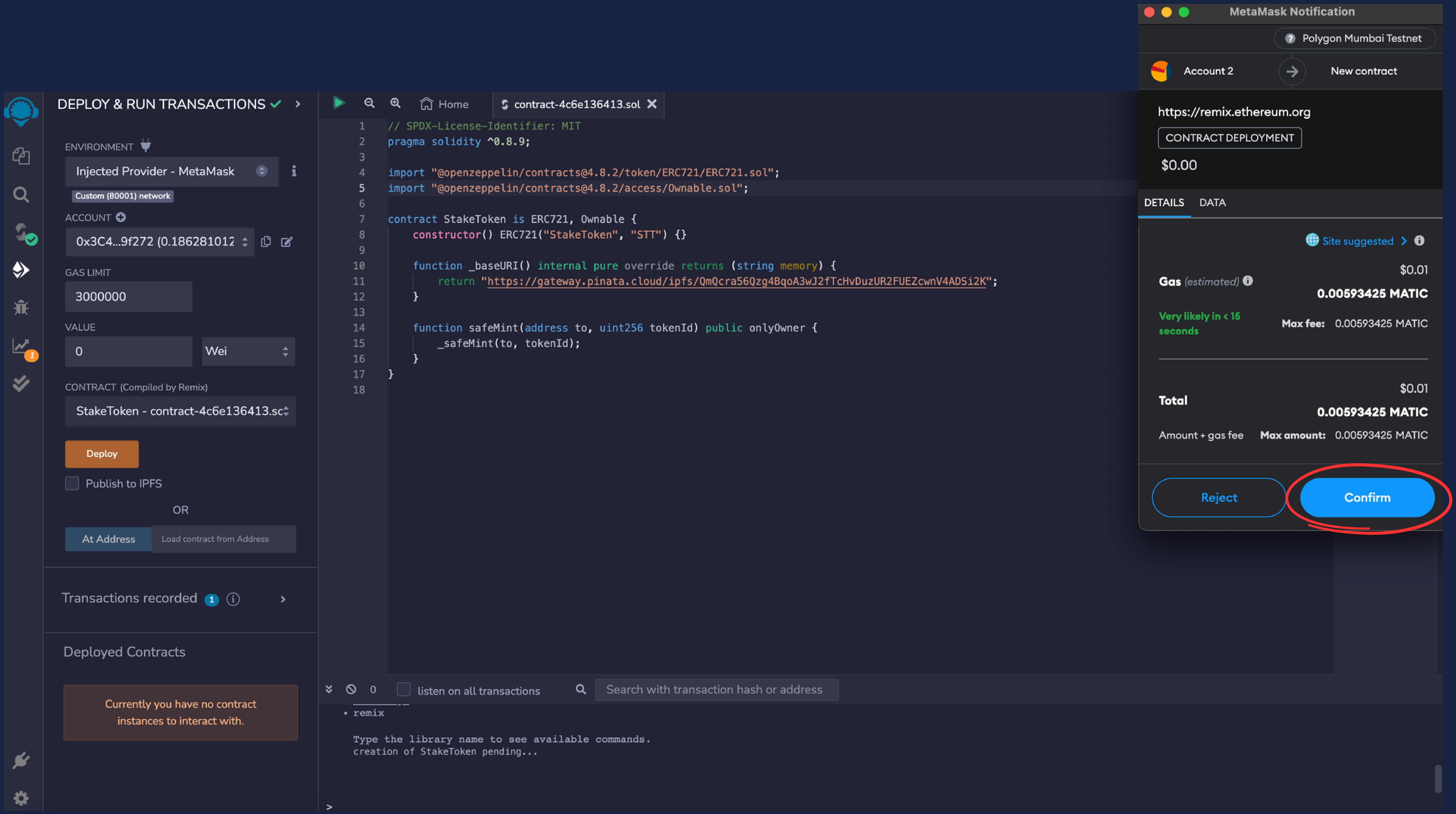
Deploy
☐ Publish to IPFS
OR
At Address
Load contract from Address
Transactions recorded 0
Deployed Contracts

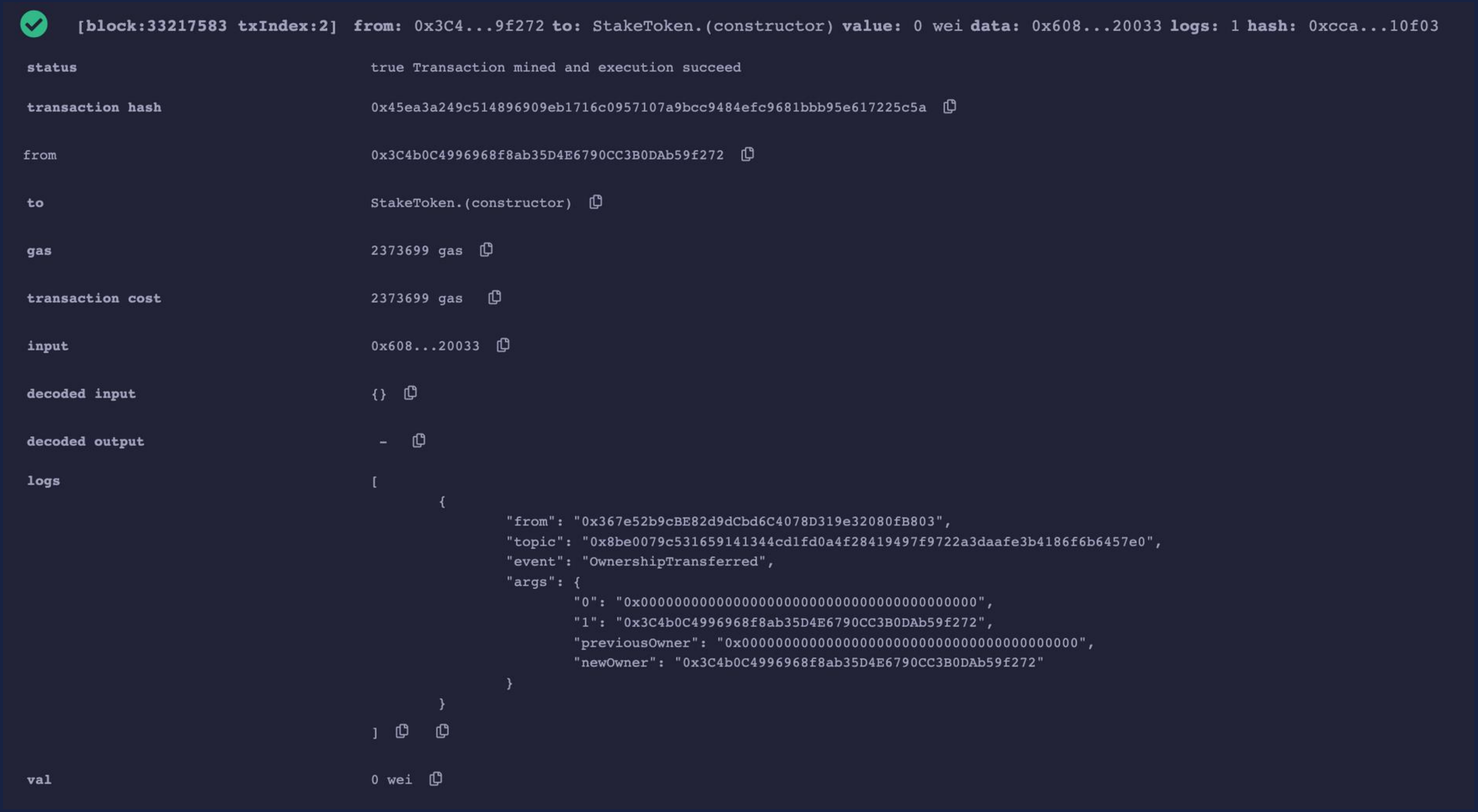
Currently you have no contract instances to interact with.

```
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.9;

import "@openzeppelin/contracts@4.8.2/token/ERC721/ERC721.sol";
import "@openzeppelin/contracts@4.8.2/access/Ownable.sol";

contract StakeToken is ERC721, Ownable {
    constructor() ERC721("StakeToken", "STT") {}

    function _baseURI() internal pure override returns (string memory) {
        return "https://gateway.pinata.cloud/ipfs/QmQcra56Qzg4BqoA3wJ2fTcHvDuzUR2FUEZcwnV4ADSi2K";
    }

    function safeMint(address to, uint256 tokenId) public onlyOwner {
        _safeMint(to, tokenId);
    }
}
```

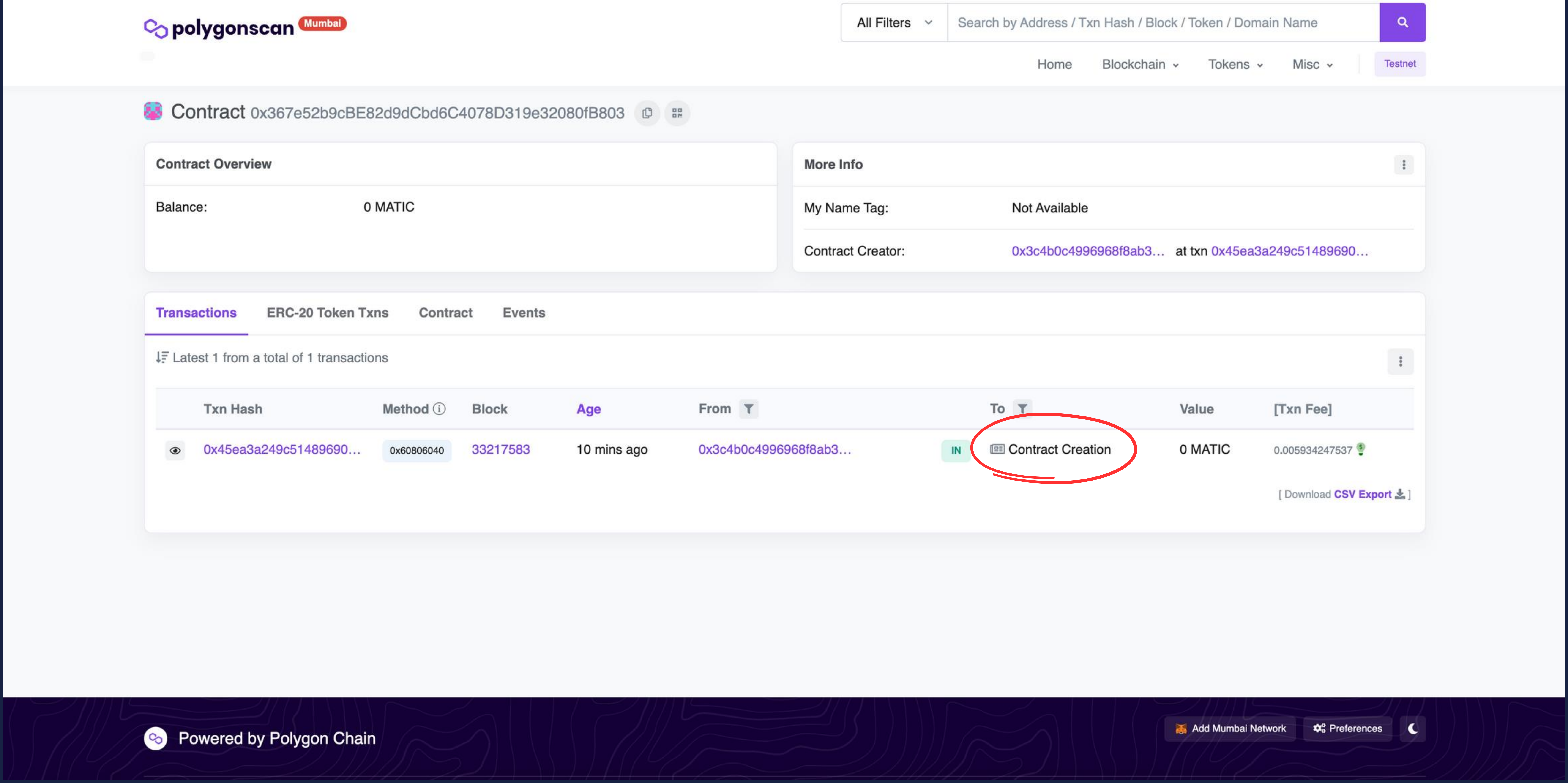
0
☐ listen on all transactions
Search with transaction hash or address

```
• web3 version 1.5.2
• ethers.js
• remix

Type the library name to see available commands.

>
```





```
[block:33217583 txIndex:2] from: 0x3C4...9f272 to: StakeToken.(constructor) value: 0 wei data: 0x608...20033 logs: 1 hash: 0xcca...10f03
status                          true Transaction mined and execution succeed
transaction hash                0x45ea3a249c514896909eb1716c0957107a9bcc9484efc9681bbb95e617225c5a
from                            0x3C4b0C4996968f8ab35D4E6790CC3B0DAb59f272
to                              StakeToken.(constructor)
gas                             2373699 gas
transaction cost                2373699 gas
input                           0x608...20033
decoded input                   {}
decoded output                   -
logs                            [
                                        {
                                                "from": "0x367e52b9cBE82d9dCbd6C4078D319e32080fB803",
                                                "topic": "0x8be0079c531659141344cd1fd0a4f28419497f9722a3daafe3b4186f6b6457e0",
                                                "event": "OwnershipTransferred",
                                                "args": {
                                                        "0": "0x0000000000000000000000000000000000000000",
                                                        "1": "0x3C4b0C4996968f8ab35D4E6790CC3B0DAb59f272",
                                                        "previousOwner": "0x0000000000000000000000000000000000000000",
                                                        "newOwner": "0x3C4b0C4996968f8ab35D4E6790CC3B0DAb59f272"
                                                }
                                        }
                                ]
val                             0 wei
```



polygonscan Mumbai
All Filters
Search by Address / Txn Hash / Block / Token / Domain Name
Home
Blockchain
Tokens
Misc
Testnet

Contract 0x367e52b9cBE82d9dCbd6C4078D319e32080fB803

Contract Overview

Balance: 0 MATIC

More Info

My Name Tag: Not Available

Contract Creator: 0x3c4b0c4996968f8ab3… at txn 0x45ea3a249c51489690…

Transactions
ERC-20 Token Txns
Contract
Events

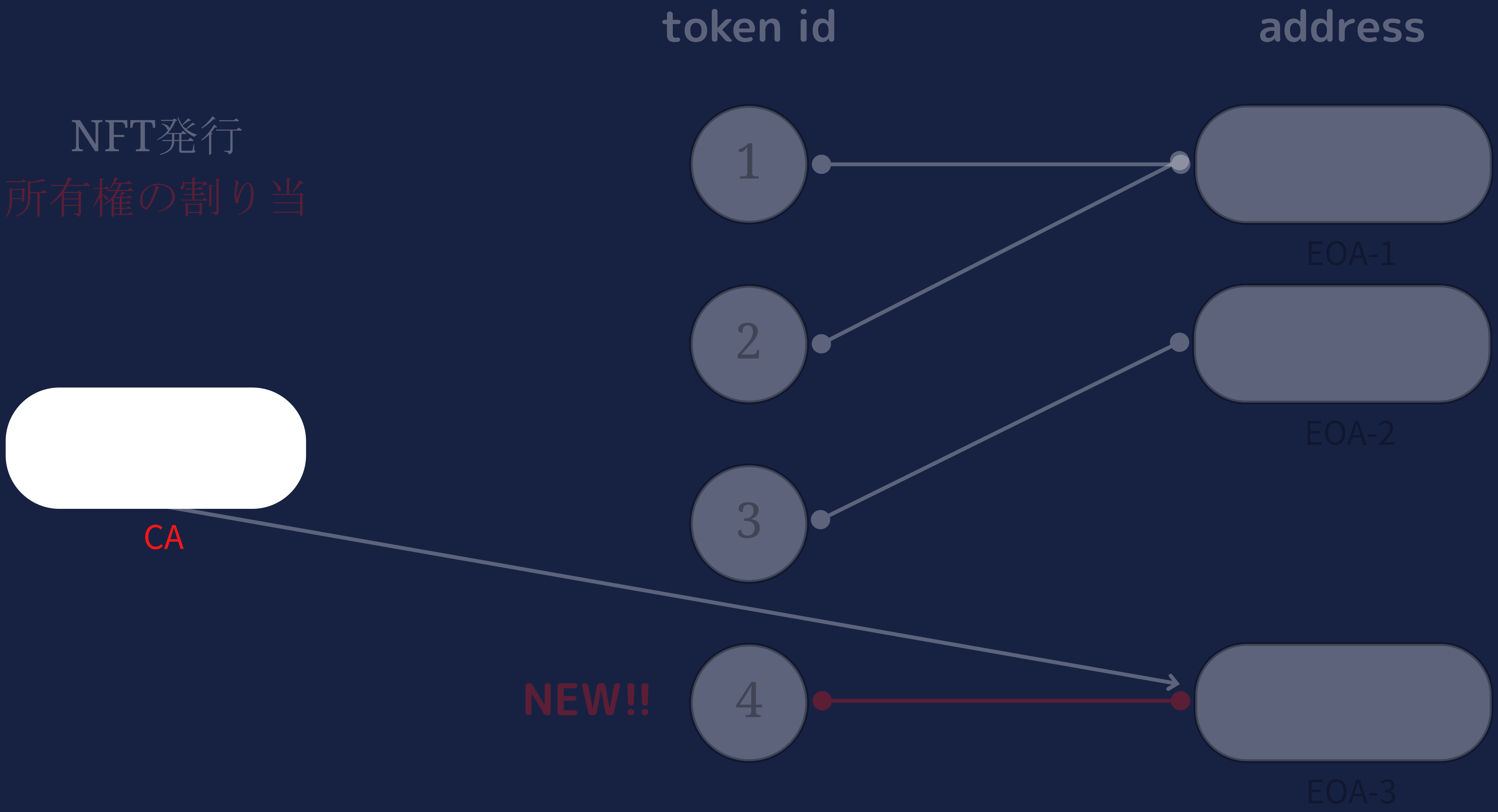
Latest 1 from a total of 1 transactions

	Txn Hash	Method	Block	Age	From		To	Value	[Txn Fee]
👁	0x45ea3a249c51489690…	0x60806040	33217583	10 mins ago	0x3c4b0c4996968f8ab3…	IN	Contract Creation	0 MATIC	0.005934247537

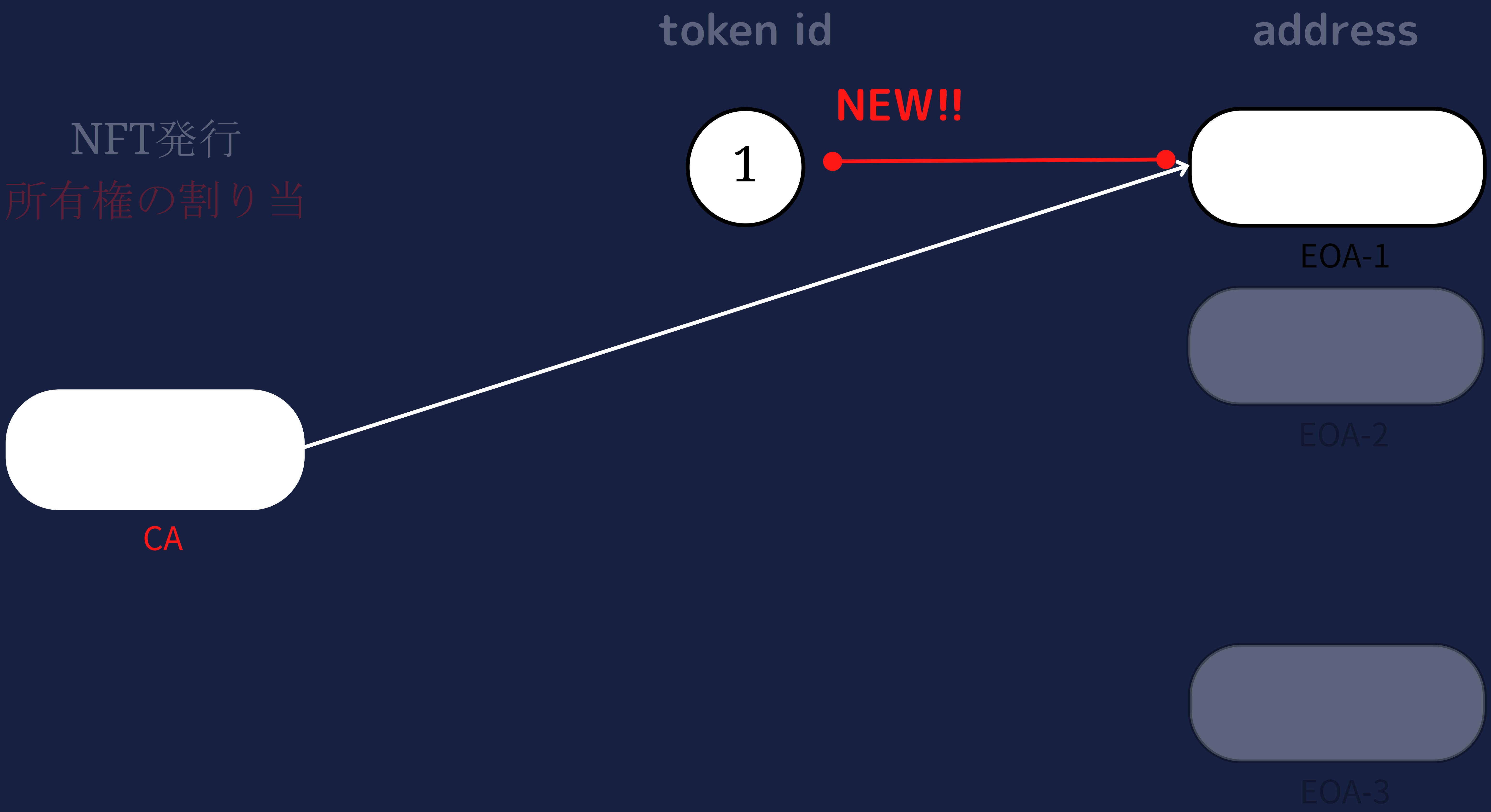
[Download CSV Export]

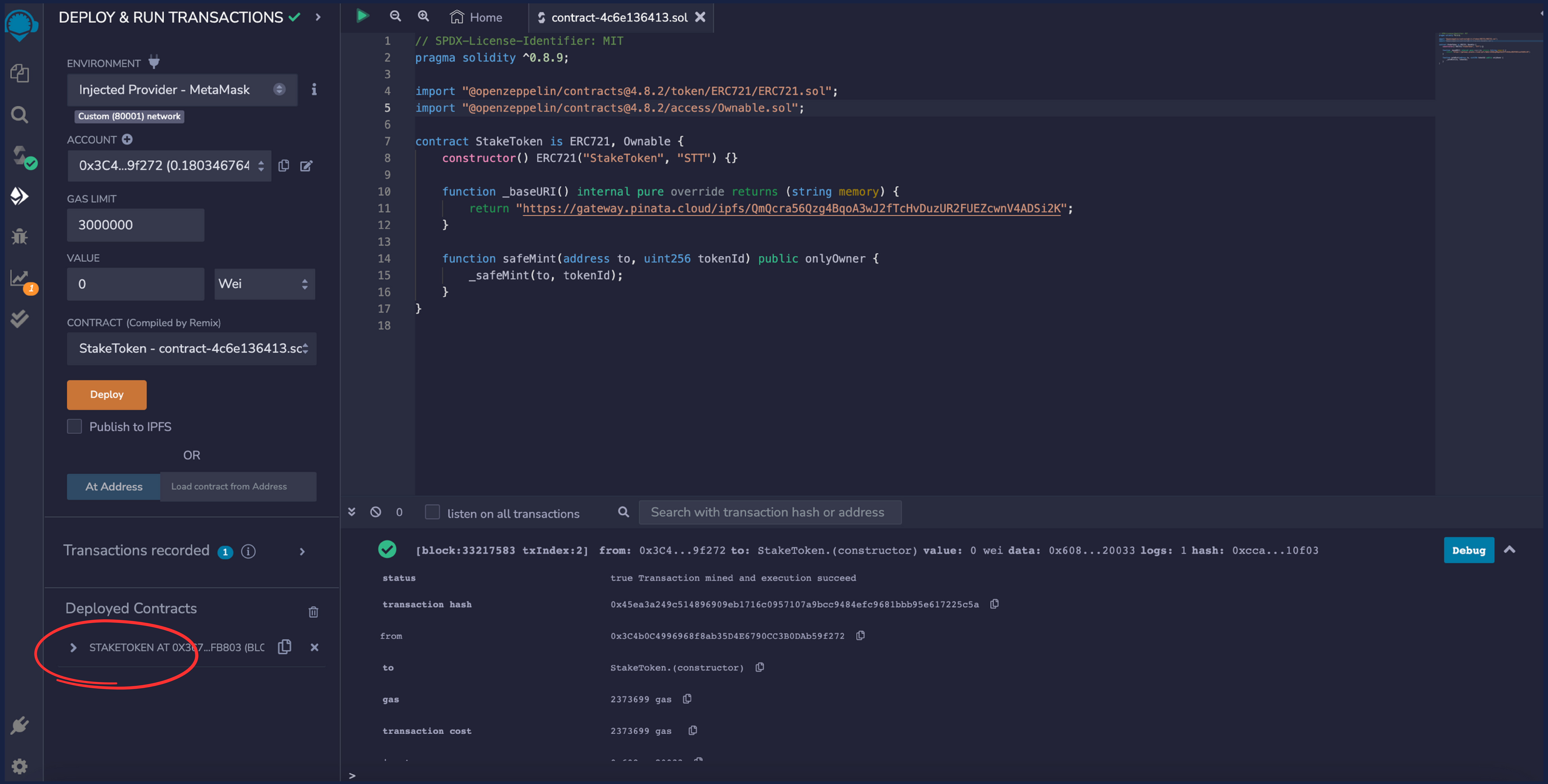
Powered by Polygon Chain
Add Mumbai Network
Preferences

NFT発行
＝所有権の割り当て


token id
address
1
2
3
4
NEW!!
EOA-1
EOA-2
EOA-3
CA

NFT発行
＝所有権の割り当て


token id
address
NEW!!
1
EOA-1
EOA-2
EOA-3
CA


DEPLOY & RUN TRANSACTIONS
Home
contract-4c6e136413.sol
Deploy
At Address
Load contract from Address
Debug
Search with transaction hash or address

ENVIRONMENT: Injected Provider - MetaMask

Custom (80001) network

ACCOUNT: 0x3C4...9f272 (0.180346764

GAS LIMIT: 3000000

VALUE: 0 Wei

CONTRACT (Compiled by Remix): StakeToken - contract-4c6e136413.sc

☐ Publish to IPFS

OR

Transactions recorded 1

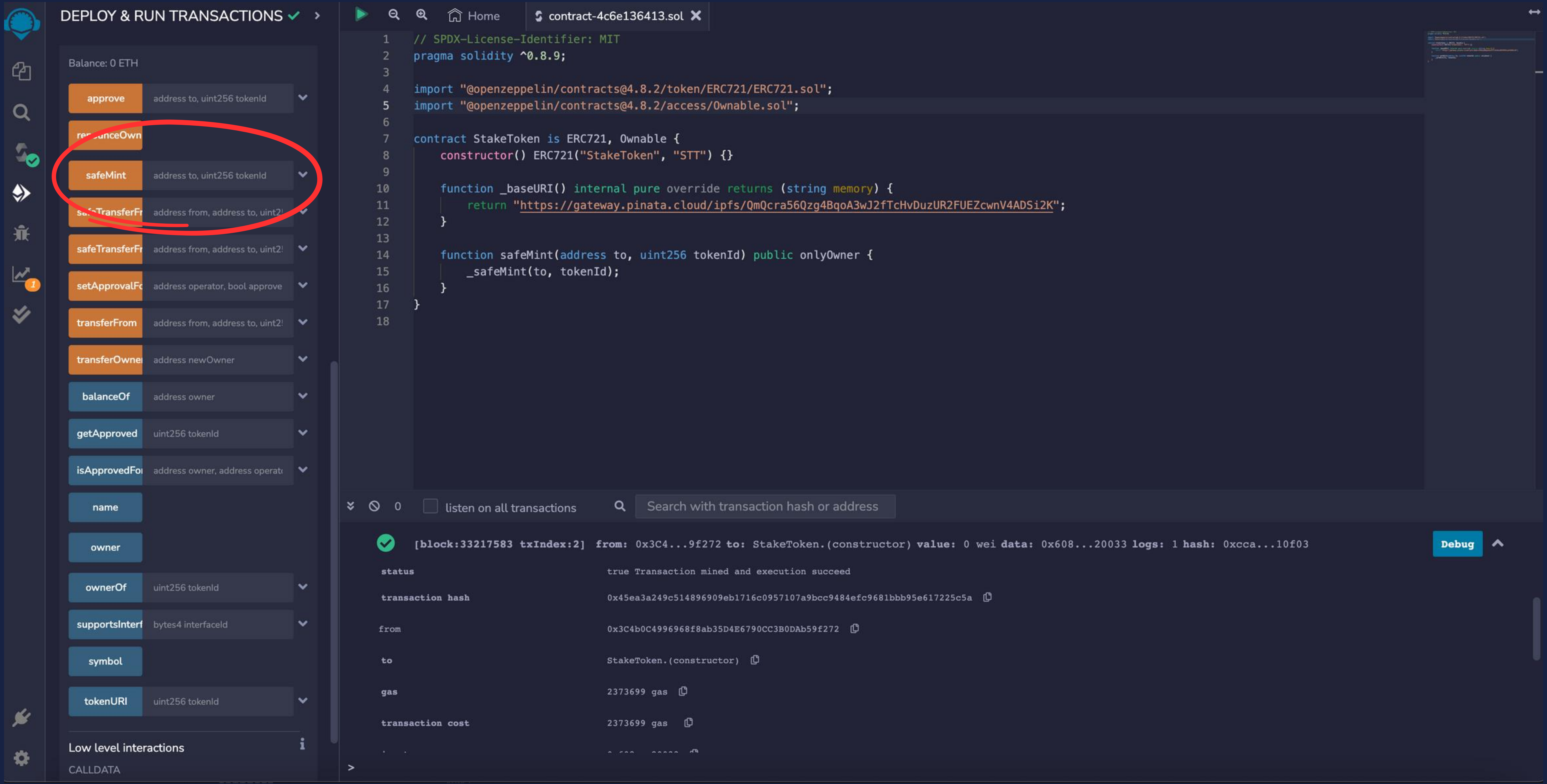
Deployed Contracts

STAKETOKEN AT 0X3C7...FB803 (BLC

```solidity
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.9;

import "@openzeppelin/contracts@4.8.2/token/ERC721/ERC721.sol";
import "@openzeppelin/contracts@4.8.2/access/Ownable.sol";

contract StakeToken is ERC721, Ownable {
    constructor() ERC721("StakeToken", "STT") {}

    function _baseURI() internal pure override returns (string memory) {
        return "https://gateway.pinata.cloud/ipfs/QmQcra56Qzg4BqoA3wJ2fTcHvDuzUR2FUEZcwnV4ADSi2K";
    }

    function safeMint(address to, uint256 tokenId) public onlyOwner {
        _safeMint(to, tokenId);
    }
}
```

0 ☐ listen on all transactions

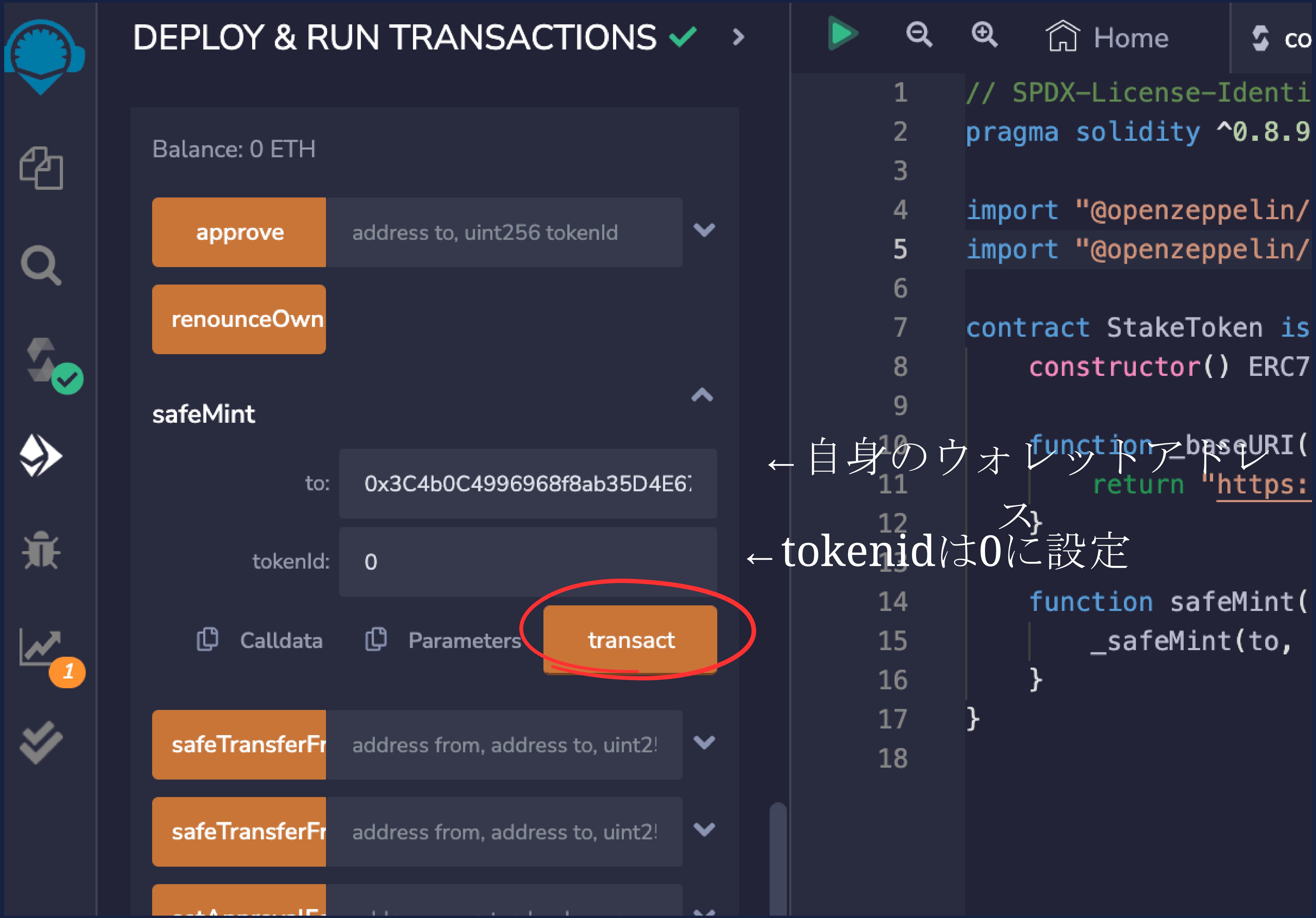
```
[block:33217583 txIndex:2] from: 0x3C4...9f272 to: StakeToken.(constructor) value: 0 wei data: 0x608...20033 logs: 1 hash: 0xcca...10f03
status                 true Transaction mined and execution succeed
transaction hash       0x45ea3a249c514896909eb1716c0957107a9bcc9484efc9681bbb95e617225c5a
from                   0x3C4b0C4996968f8ab35D4E6790CC3B0DAb59f272
to                     StakeToken.(constructor)
gas                    2373699 gas
transaction cost       2373699 gas
```


DEPLOY & RUN TRANSACTIONS
Home
contract-4c6e136413.sol
approve
address to, uint256 tokenId
renounceOwn
safeMint
address to, uint256 tokenId
safeTransferFr
address from, address to, uint2
safeTransferFr
address from, address to, uint2
setApprovalFo
address operator, bool approve
transferFrom
address from, address to, uint2
transferOwne
address newOwner
balanceOf
address owner
getApproved
uint256 tokenId
isApprovedFo
address owner, address operat
name
owner
ownerOf
uint256 tokenId
supportsInterf
bytes4 interfaceId
symbol
tokenURI
uint256 tokenId
Low level interactions
CALLDATA
listen on all transactions
Search with transaction hash or address
Debug

Balance: 0 ETH

```solidity
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.9;

import "@openzeppelin/contracts@4.8.2/token/ERC721/ERC721.sol";
import "@openzeppelin/contracts@4.8.2/access/Ownable.sol";

contract StakeToken is ERC721, Ownable {
    constructor() ERC721("StakeToken", "STT") {}

    function _baseURI() internal pure override returns (string memory) {
        return "https://gateway.pinata.cloud/ipfs/QmQcra56Qzg4BqoA3wJ2fTcHvDuzUR2FUEZcwnV4ADSi2K";
    }

    function safeMint(address to, uint256 tokenId) public onlyOwner {
        _safeMint(to, tokenId);
    }
}
```

```
[block:33217583 txIndex:2] from: 0x3C4...9f272 to: StakeToken.(constructor) value: 0 wei data: 0x608...20033 logs: 1 hash: 0xcca...10f03
status                  true Transaction mined and execution succeed
transaction hash        0x45ea3a249c514896909eb1716c0957107a9bcc9484efc9681bbb95e617225c5a
from                    0x3C4b0C4996968f8ab35D4E6790CC3B0DAb59f272
to                      StakeToken.(constructor)
gas                     2373699 gas
transaction cost        2373699 gas
```


DEPLOY & RUN TRANSACTIONS
Home
co
approve
address to, uint256 tokenId
renounceOwn
safeMint
Calldata
Parameters
transact
safeTransferFr
address from, address to, uint2!
safeTransferFr
address from, address to, uint2!

Balance: 0 ETH

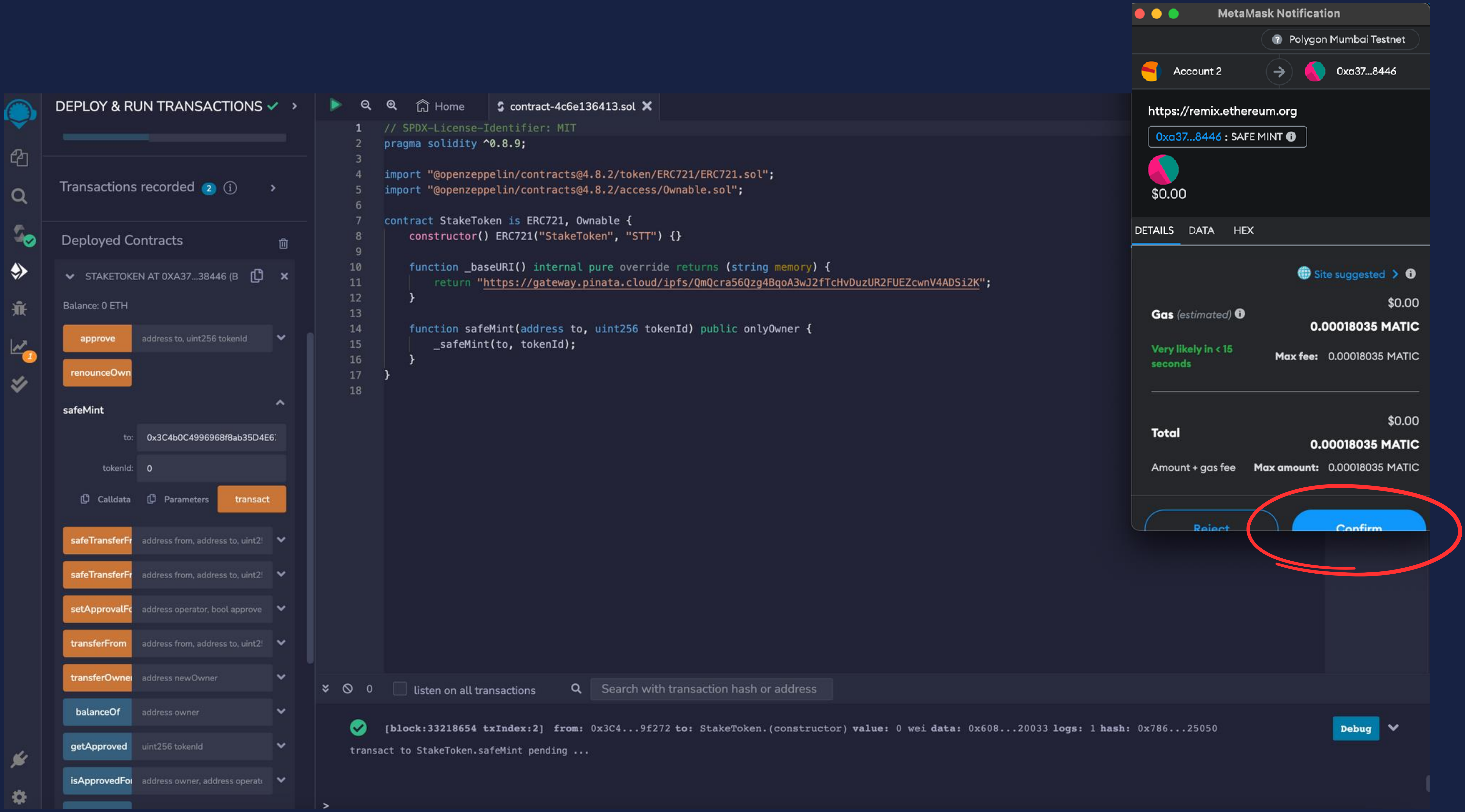
to: 0x3C4b0C4996968f8ab35D4E67

tokenId: 0

```
// SPDX-License-Identi
pragma solidity ^0.8.9

import "@openzeppelin/
import "@openzeppelin/

contract StakeToken is
    constructor() ERC7

    function _baseURI(
        return "https:
    }

    function safeMint(
        _safeMint(to,
    }
}
```

←自身のウォレットアドレス

←tokenidは0に設定


DEPLOY & RUN TRANSACTIONS
Transactions recorded 2
Deployed Contracts
STAKETOKEN AT 0XA37...38446 (B
approve
address to, uint256 tokenId
renounceOwn
safeMint
Calldata
Parameters
transact
safeTransferFr
address from, address to, uint2!
safeTransferFr
address from, address to, uint2!
setApprovalFo
address operator, bool approve
transferFrom
address from, address to, uint2!
transferOwne
address newOwner
balanceOf
address owner
getApproved
uint256 tokenId
isApprovedFo
address owner, address operat
Home
contract-4c6e136413.sol
listen on all transactions
Search with transaction hash or address
Debug
MetaMask Notification
Polygon Mumbai Testnet
Account 2
0xa37...8446
DETAILS
DATA
HEX
Site suggested
Reject
Confirm

Balance: 0 ETH

to: 0x3C4b0C4996968f8ab35D4E6

tokenId: 0

```
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.9;

import "@openzeppelin/contracts@4.8.2/token/ERC721/ERC721.sol";
import "@openzeppelin/contracts@4.8.2/access/Ownable.sol";

contract StakeToken is ERC721, Ownable {
    constructor() ERC721("StakeToken", "STT") {}

    function _baseURI() internal pure override returns (string memory) {
        return "https://gateway.pinata.cloud/ipfs/QmQcra56Qzg4BqoA3wJ2fTcHvDuzUR2FUEZcwnV4ADSi2K";
    }

    function safeMint(address to, uint256 tokenId) public onlyOwner {
        _safeMint(to, tokenId);
    }
}
```

```
0
[block:33218654 txIndex:2] from: 0x3C4...9f272 to: StakeToken.(constructor) value: 0 wei data: 0x608...20033 logs: 1 hash: 0x786...25050
transact to StakeToken.safeMint pending ...
>
```

https://remix.ethereum.org

0xa37...8446 : SAFE MINT

$0.00

Gas (estimated) $0.00 0.00018035 MATIC

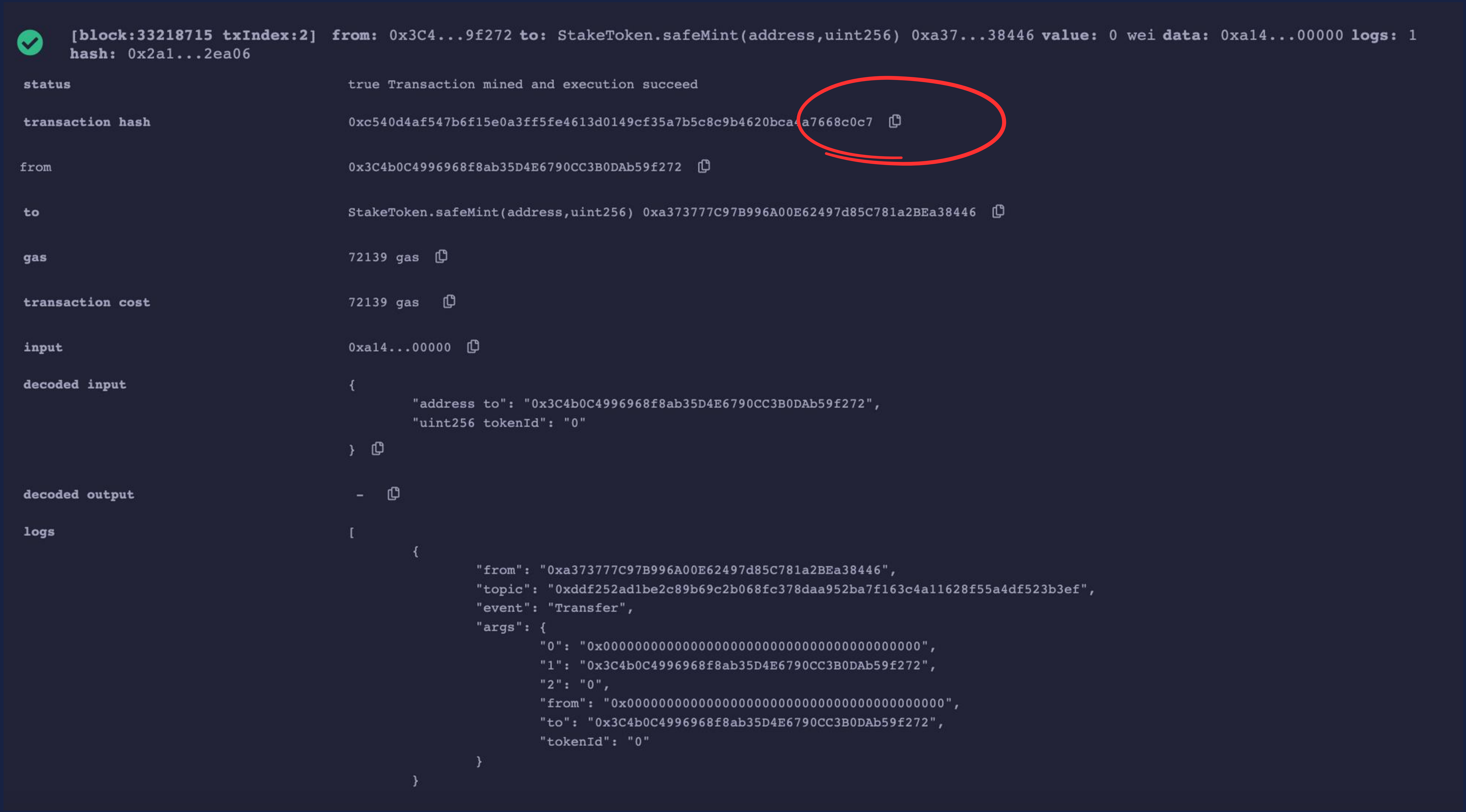
Very likely in < 15 seconds

Max fee: 0.00018035 MATIC

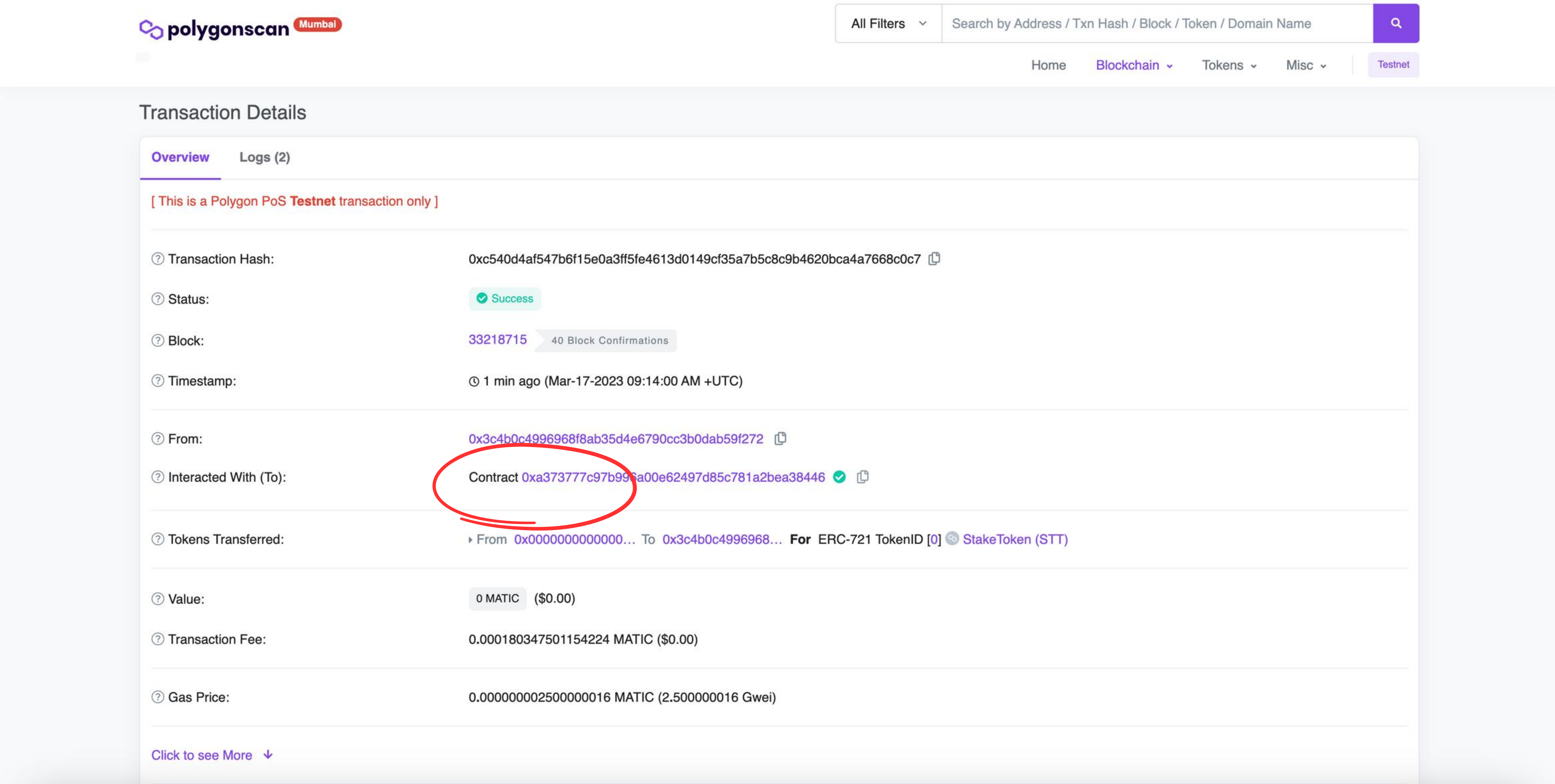
Total $0.00 0.00018035 MATIC

Amount + gas fee

Max amount: 0.00018035 MATIC



```
[block:33218715 txIndex:2] from: 0x3C4...9f272 to: StakeToken.safeMint(address,uint256) 0xa37...38446 value: 0 wei data: 0xa14...00000 logs: 1
hash: 0x2a1...2ea06
status                  true Transaction mined and execution succeed
transaction hash        0xc540d4af547b6f15e0a3ff5fe4613d0149cf35a7b5c8c9b4620bca4a7668c0c7
from                    0x3C4b0C4996968f8ab35D4E6790CC3B0DAb59f272
to                      StakeToken.safeMint(address,uint256) 0xa373777C97B996A00E62497d85C781a2BEa38446
gas                     72139 gas
transaction cost        72139 gas
input                   0xa14...00000
decoded input           {
                                "address to": "0x3C4b0C4996968f8ab35D4E6790CC3B0DAb59f272",
                                "uint256 tokenId": "0"
                        }
decoded output           -
logs                    [
                                {
                                        "from": "0xa373777C97B996A00E62497d85C781a2BEa38446",
                                        "topic": "0xddf252ad1be2c89b69c2b068fc378daa952ba7f163c4a11628f55a4df523b3ef",
                                        "event": "Transfer",
                                        "args": {
                                                "0": "0x0000000000000000000000000000000000000000",
                                                "1": "0x3C4b0C4996968f8ab35D4E6790CC3B0DAb59f272",
                                                "2": "0",
                                                "from": "0x0000000000000000000000000000000000000000",
                                                "to": "0x3C4b0C4996968f8ab35D4E6790CC3B0DAb59f272",
                                                "tokenId": "0"
                                        }
                                }
```


polygonscan Mumbai
All Filters
Search by Address / Txn Hash / Block / Token / Domain Name
Home
Blockchain
Tokens
Misc
Testnet

Transaction Details

Overview
Logs (2)

[This is a Polygon PoS **Testnet** transaction only]

Transaction Hash: 0xc540d4af547b6f15e0a3ff5fe4613d0149cf35a7b5c8c9b4620bca4a7668c0c7

Status: Success

Block: 33218715 40 Block Confirmations

Timestamp: 1 min ago (Mar-17-2023 09:14:00 AM +UTC)

From: 0x3c4b0c4996968f8ab35d4e6790cc3b0dab59f272

Interacted With (To): Contract 0xa373777c97b996a00e62497d85c781a2bea38446 ✓

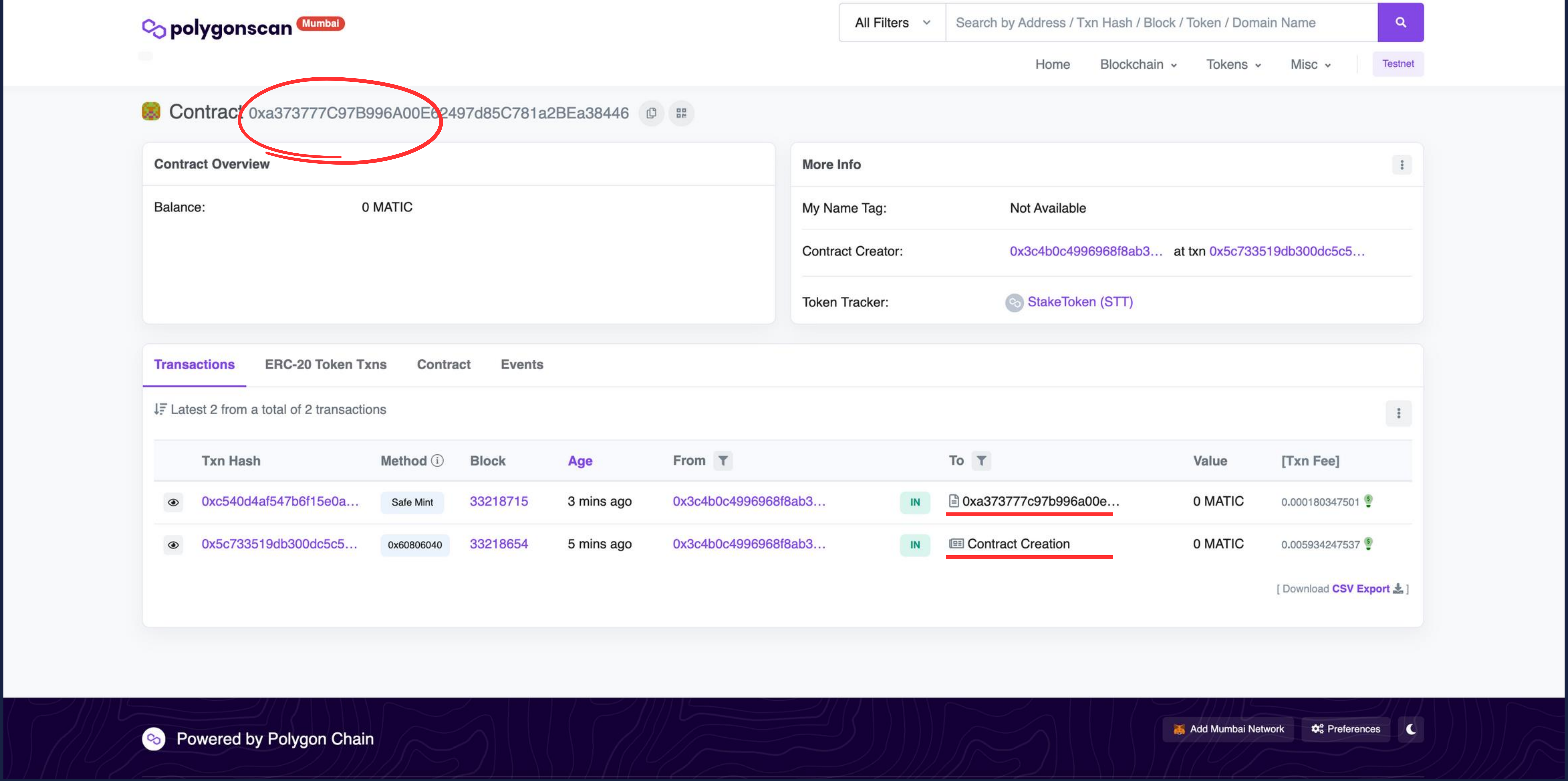
Tokens Transferred: From 0x0000000000000… To 0x3c4b0c4996968… **For** ERC-721 TokenID [0] StakeToken (STT)

Value: 0 MATIC ($0.00)

Transaction Fee: 0.000180347501154224 MATIC ($0.00)

Gas Price: 0.000000002500000016 MATIC (2.500000016 Gwei)

Click to see More



polygonscan Mumbai
All Filters
Search by Address / Txn Hash / Block / Token / Domain Name
Home
Blockchain
Tokens
Misc
Testnet

Contract 0xa373777C97B996A00E62497d85C781a2BEa38446

Contract Overview

Balance: 0 MATIC

More Info

My Name Tag: Not Available

Contract Creator: 0x3c4b0c4996968f8ab3… at txn 0x5c733519db300dc5c5…

Token Tracker: StakeToken (STT)

Transactions
ERC-20 Token Txns
Contract
Events

Latest 2 from a total of 2 transactions

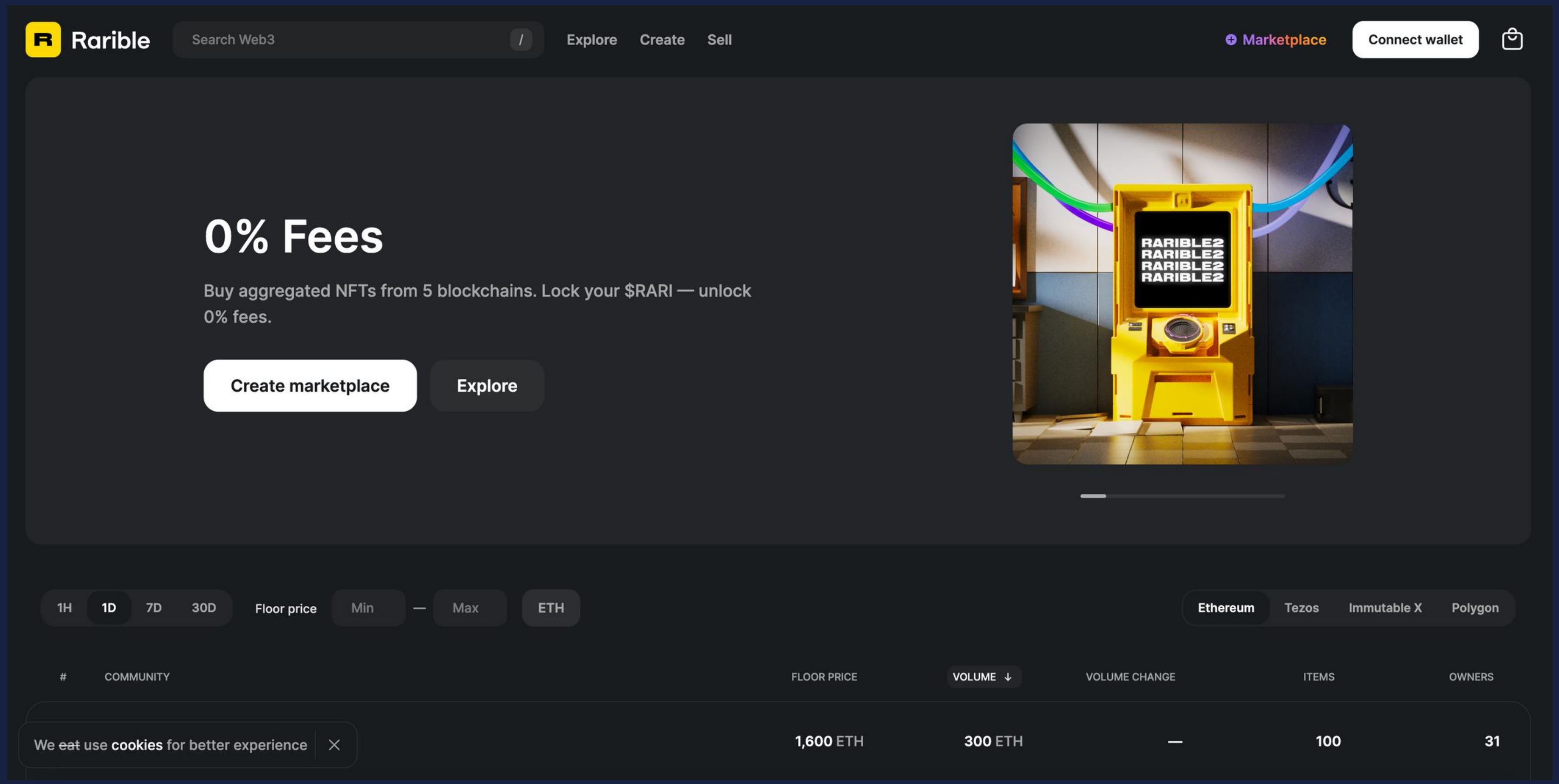
Txn Hash	Method	Block	Age	From		To	Value	[Txn Fee]
0xc540d4af547b6f15e0a…	Safe Mint	33218715	3 mins ago	0x3c4b0c4996968f8ab3…	IN	0xa373777c97b996a00e…	0 MATIC	0.000180347501
0x5c733519db300dc5c5…	0x60806040	33218654	5 mins ago	0x3c4b0c4996968f8ab3…	IN	Contract Creation	0 MATIC	0.005934247537

[Download CSV Export]

Powered by Polygon Chain
Add Mumbai Network
Preferences

発行したERC721をRaribleで確認

Rarible


Rarible
Search Web3
/
Explore
Create
Sell
Marketplace
Connect wallet
Create marketplace
Explore
1H
1D
7D
30D
Floor price
Min
—
Max
ETH
Ethereum
Tezos
Immutable X
Polygon
RARIBLE2
RARIBLE2
RARIBLE2
RARIBLE2

0% Fees

Buy aggregated NFTs from 5 blockchains. Lock your $RARI — unlock 0% fees.

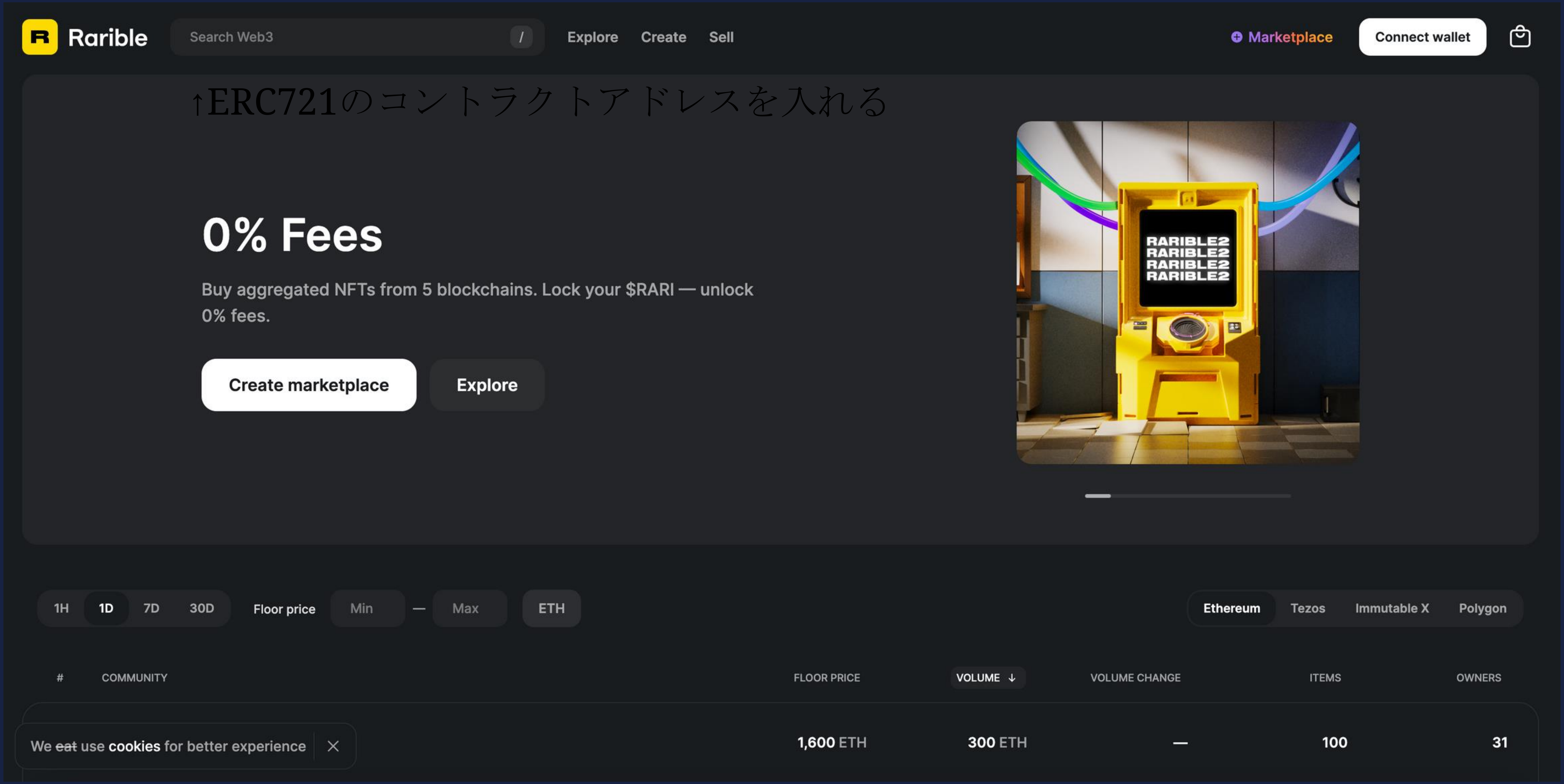
#	COMMUNITY	FLOOR PRICE	VOLUME ↓	VOLUME CHANGE	ITEMS	OWNERS
		1,600 ETH	300 ETH	—	100	31

We ~~eat~~ use **cookies** for better experience ✕

*Rarible*は世界最大の*NFT*マーケットプレイスの一つ

*NFT*マーケットプレイスはいわゆる
『NFTのECモール』であり、
誰もがコレクションを作成して販売可能。

*OpenSea*がメジャーではあるが、*Testnet*の不具合から
今回はRalibleを使用する。



Rarible
Search Web3
/
Explore
Create
Sell
Marketplace
Connect wallet
RARIBLE2
RARIBLE2
RARIBLE2
RARIBLE2
Create marketplace
Explore
1H
1D
7D
30D
Floor price
Min
Max
ETH
Ethereum
Tezos
Immutable X
Polygon

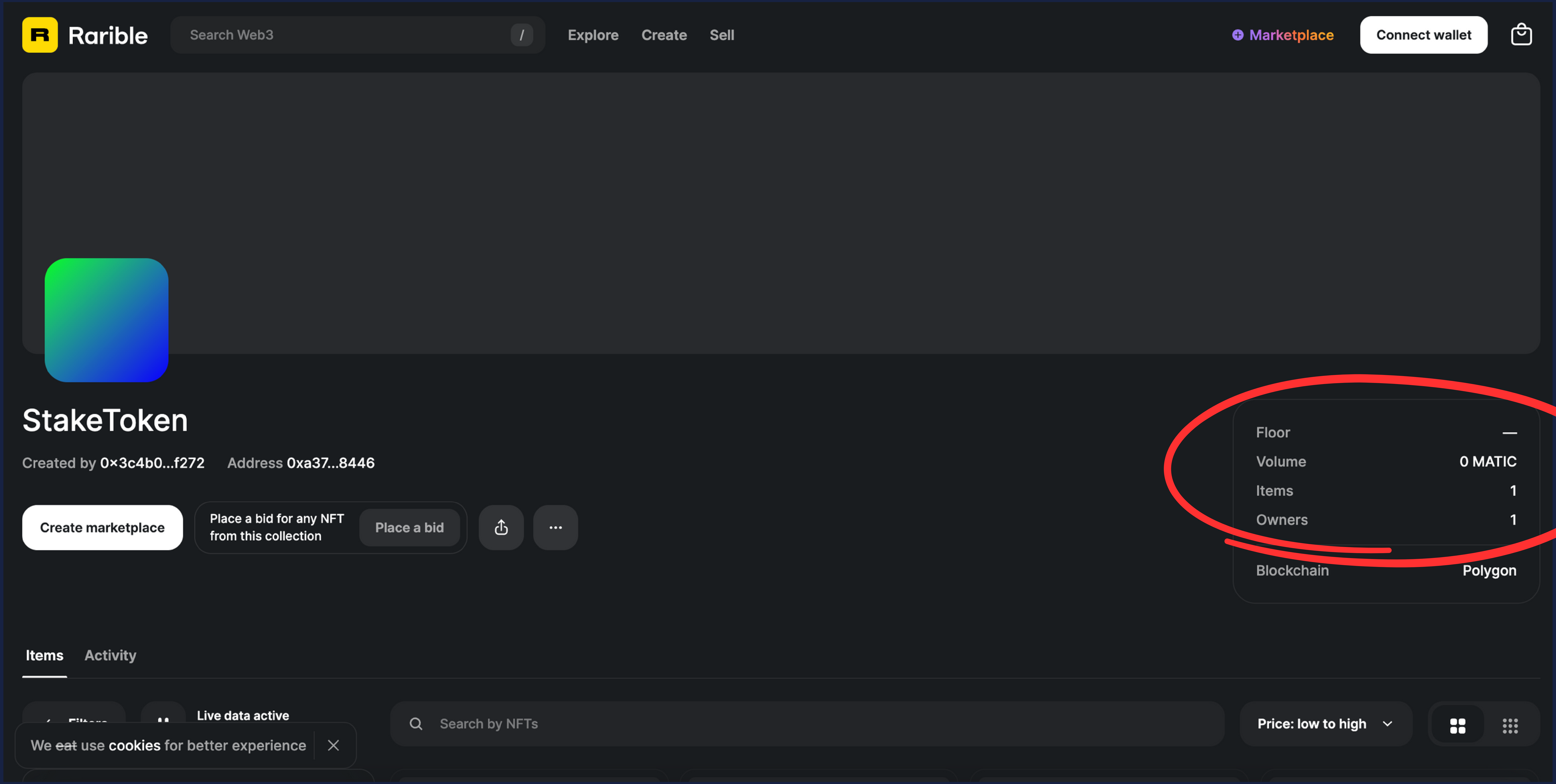
↑ERC721のコントラクトアドレスを入れる

0% Fees

Buy aggregated NFTs from 5 blockchains. Lock your $RARI — unlock 0% fees.

#	COMMUNITY	FLOOR PRICE	VOLUME ↓	VOLUME CHANGE	ITEMS	OWNERS
		1,600 ETH	300 ETH	—	100	31

We ~~eat~~ use cookies for better experience ✕


Rarible
Search Web3
Explore
Create
Sell
Marketplace
Connect wallet
Create marketplace
Place a bid
Items
Activity
Filters
Search by NFTs
Price: low to high

StakeToken

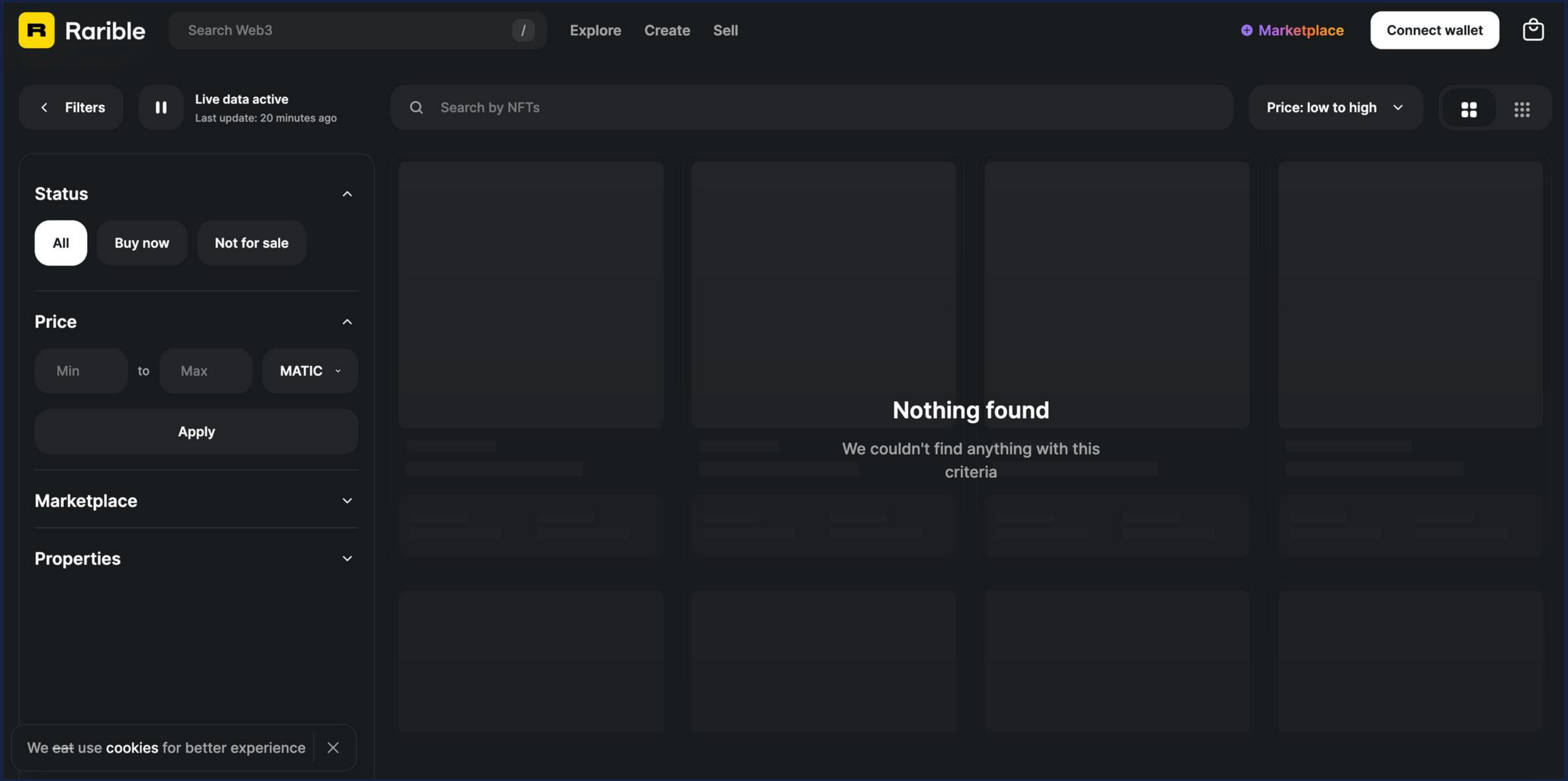
Created by 0×3c4b0...f272 Address 0xa37...8446

Place a bid for any NFT from this collection

Floor	—
Volume	0 MATIC
Items	1
Owners	1
Blockchain	Polygon

Live data active

We ~~eat~~ use cookies for better experience


Rarible
Search Web3
/
Explore
Create
Sell
Marketplace
Connect wallet
Filters
Search by NFTs
Price: low to high
Status
All
Buy now
Not for sale
Price
Min
to
Max
MATIC
Apply
Marketplace
Properties

Live data active
Last update: 20 minutes ago

Nothing found

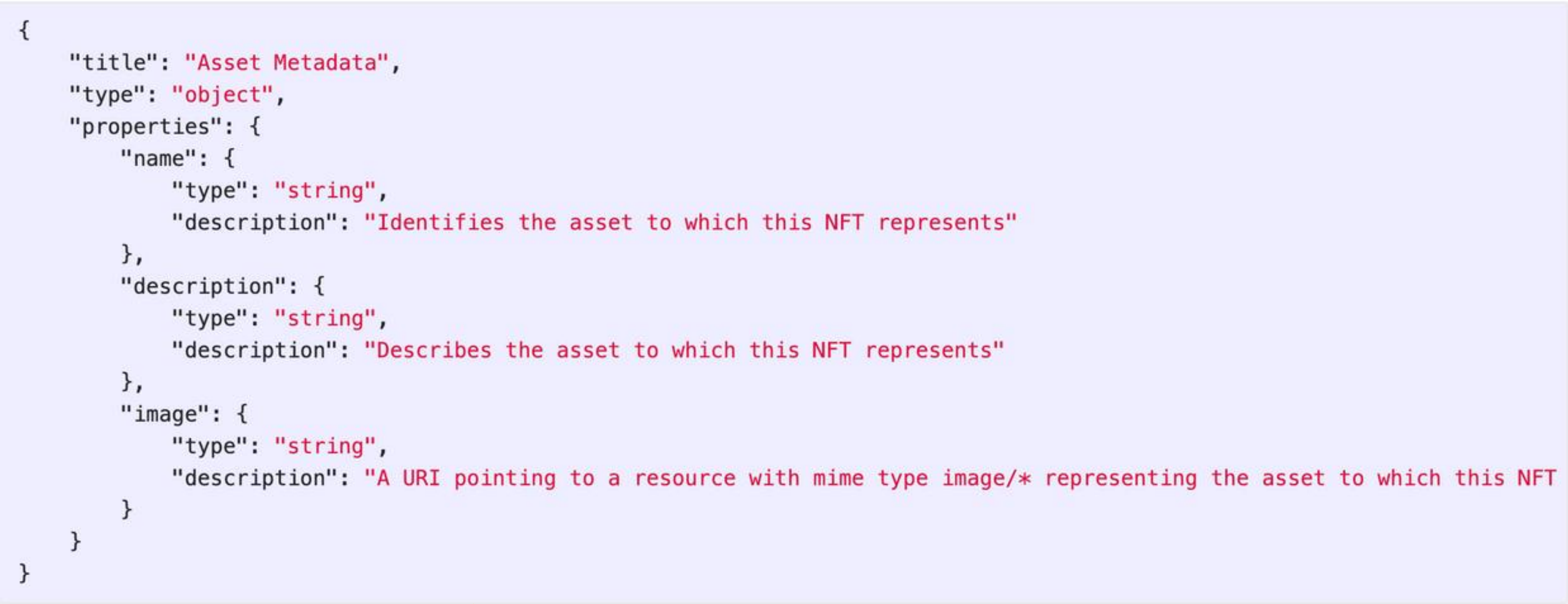
We couldn't find anything with this criteria

We ~~eat~~ use **cookies** for better experience

発行したERC721をRaribleで確認できない…?
発行されていることは分かるが、
画像データが表示されない…

Thinking Time

メタデータ（メタデータ自身もホスト先がHTTPかIPFS等かに分かれる）



```
{
    "title": "Asset Metadata",
    "type": "object",
    "properties": {
        "name": {
            "type": "string",
            "description": "Identifies the asset to which this NFT represents"
        },
        "description": {
            "type": "string",
            "description": "Describes the asset to which this NFT represents"
        },
        "image": {
            "type": "string",
            "description": "A URI pointing to a resource with mime type image/* representing the asset to which this NFT
        }
    }
}
```

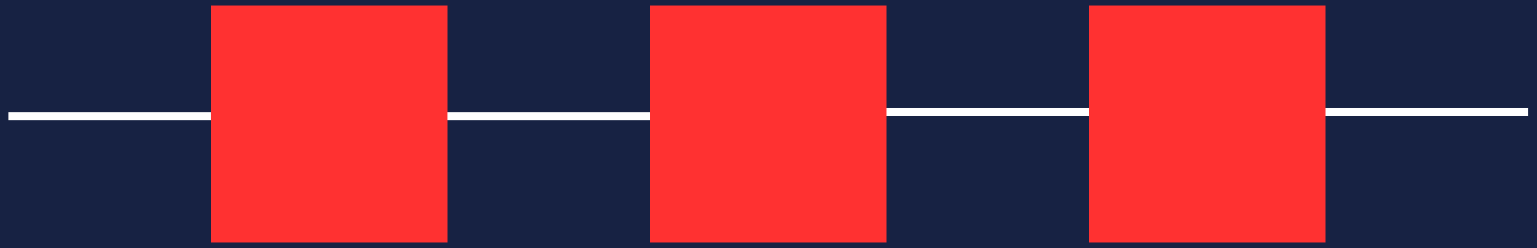
画像データ参照先

https://~

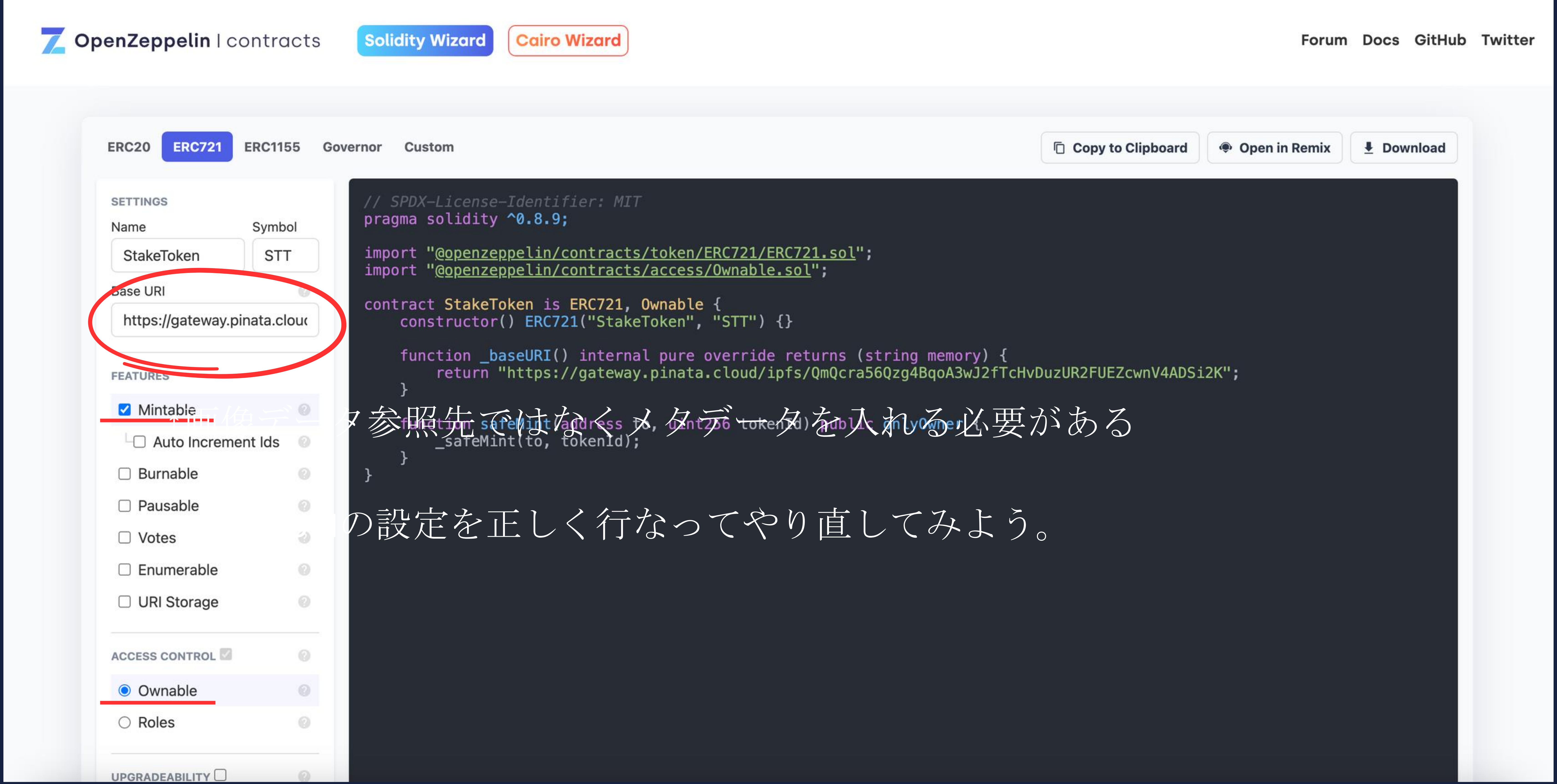
ipfs://
~

TokenID*を指定して
メタデータを参照

ブロックチェーン



*TokenID：それぞれのトークンを指定する数字。


OpenZeppelin | contracts
Solidity Wizard
Cairo Wizard
Forum
Docs
GitHub
Twitter
ERC20
ERC721
ERC1155
Governor
Custom
Copy to Clipboard
Open in Remix
Download

SETTINGS

Name: StakeToken

Symbol: STT

Base URI: https://gateway.pinata.clou(

FEATURES

- ☑ Mintable
  - ☐ Auto Increment Ids
- ☐ Burnable
- ☐ Pausable
- ☐ Votes
- ☐ Enumerable
- ☐ URI Storage

ACCESS CONTROL ☑

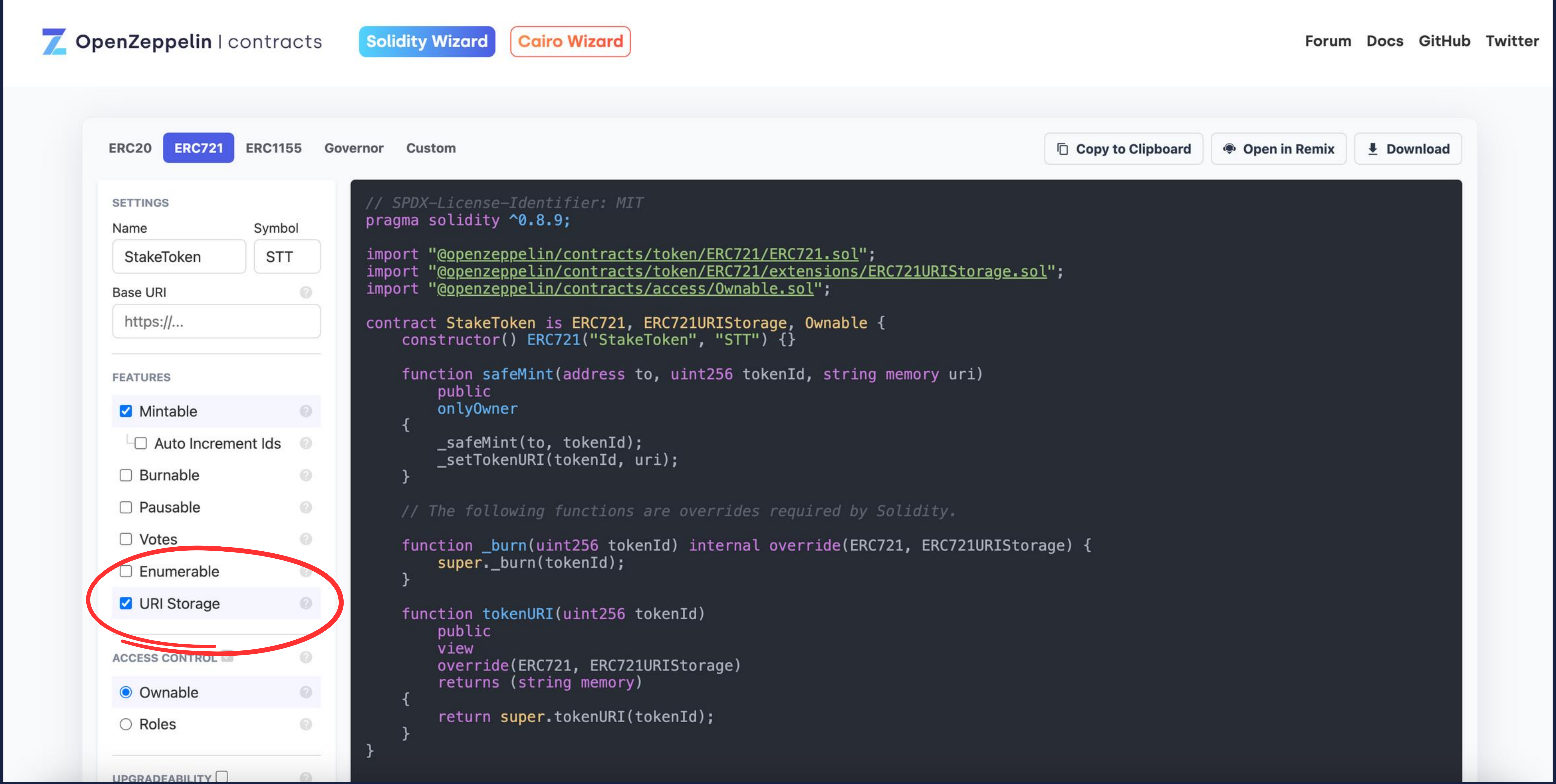
- ● Ownable
- ○ Roles

UPGRADEABILITY ☐

```
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.9;

import "@openzeppelin/contracts/token/ERC721/ERC721.sol";
import "@openzeppelin/contracts/access/Ownable.sol";

contract StakeToken is ERC721, Ownable {
    constructor() ERC721("StakeToken", "STT") {}

    function _baseURI() internal pure override returns (string memory) {
        return "https://gateway.pinata.cloud/ipfs/QmQcra56Qzg4BqoA3wJ2fTcHvDuzUR2FUEZcwnV4ADSi2K";
    }

    function safeMint(address to, uint256 tokenId) public onlyOwner {
        _safeMint(to, tokenId);
    }
}
```

画像データ参照先ではなくメタデータを入れる必要がある

の設定を正しく行なってやり直してみよう。


OpenZeppelin | contracts
Solidity Wizard
Cairo Wizard
Forum
Docs
GitHub
Twitter
ERC20
ERC721
ERC1155
Governor
Custom
Copy to Clipboard
Open in Remix
Download

SETTINGS

Name: StakeToken

Symbol: STT

Base URI: https://...

FEATURES

☑ Mintable

☐ Auto Increment Ids

☐ Burnable

☐ Pausable

☐ Votes

☐ Enumerable

☑ URI Storage

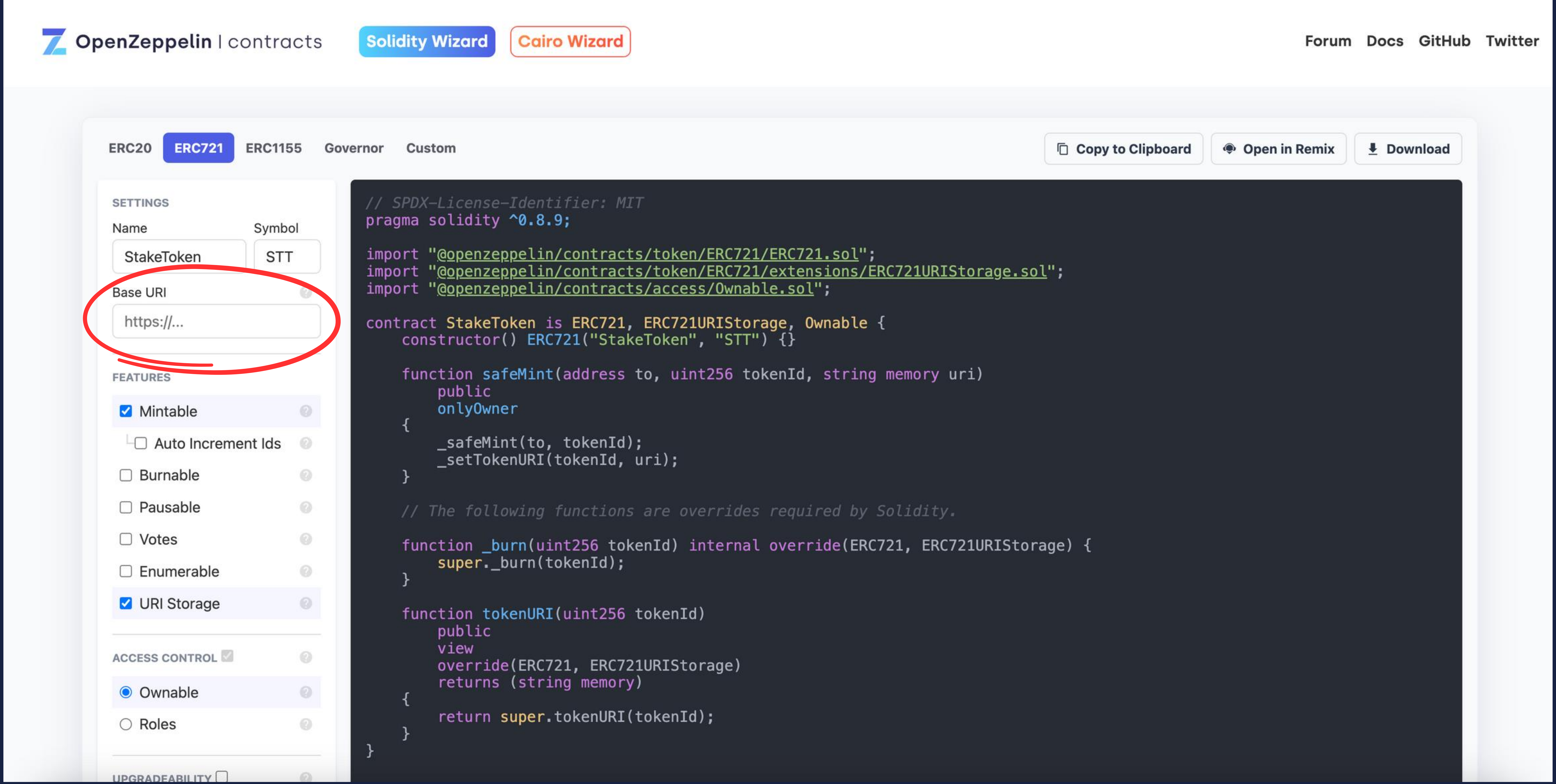
ACCESS CONTROL ☑

● Ownable

○ Roles

UPGRADEABILITY ☐

```
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.9;

import "@openzeppelin/contracts/token/ERC721/ERC721.sol";
import "@openzeppelin/contracts/token/ERC721/extensions/ERC721URIStorage.sol";
import "@openzeppelin/contracts/access/Ownable.sol";

contract StakeToken is ERC721, ERC721URIStorage, Ownable {
    constructor() ERC721("StakeToken", "STT") {}

    function safeMint(address to, uint256 tokenId, string memory uri)
        public
        onlyOwner
    {
        _safeMint(to, tokenId);
        _setTokenURI(tokenId, uri);
    }

    // The following functions are overrides required by Solidity.

    function _burn(uint256 tokenId) internal override(ERC721, ERC721URIStorage) {
        super._burn(tokenId);
    }

    function tokenURI(uint256 tokenId)
        public
        view
        override(ERC721, ERC721URIStorage)
        returns (string memory)
    {
        return super.tokenURI(tokenId);
    }
}
```


OpenZeppelin | contracts
Solidity Wizard
Cairo Wizard
Forum
Docs
GitHub
Twitter
ERC20
ERC721
ERC1155
Governor
Custom
Copy to Clipboard
Open in Remix
Download

SETTINGS

Name: StakeToken

Symbol: STT

Base URI: https://...

FEATURES

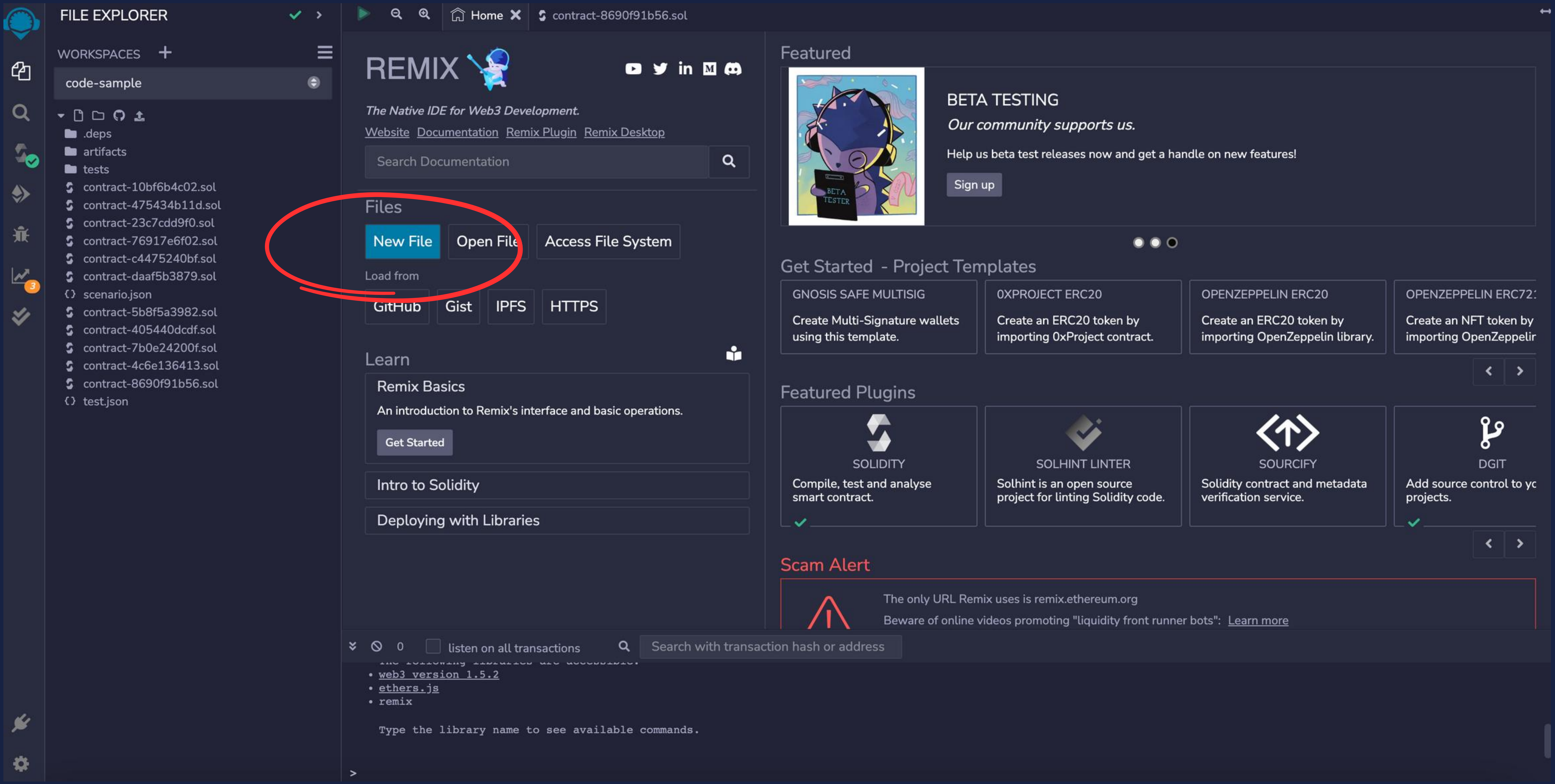
- ☑ Mintable
  - ☐ Auto Increment Ids
- ☐ Burnable
- ☐ Pausable
- ☐ Votes
- ☐ Enumerable
- ☑ URI Storage

ACCESS CONTROL ☑

- ● Ownable
- ○ Roles

UPGRADEABILITY ☐

```
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.9;

import "@openzeppelin/contracts/token/ERC721/ERC721.sol";
import "@openzeppelin/contracts/token/ERC721/extensions/ERC721URIStorage.sol";
import "@openzeppelin/contracts/access/Ownable.sol";

contract StakeToken is ERC721, ERC721URIStorage, Ownable {
    constructor() ERC721("StakeToken", "STT") {}

    function safeMint(address to, uint256 tokenId, string memory uri)
        public
        onlyOwner
    {
        _safeMint(to, tokenId);
        _setTokenURI(tokenId, uri);
    }

    // The following functions are overrides required by Solidity.

    function _burn(uint256 tokenId) internal override(ERC721, ERC721URIStorage) {
        super._burn(tokenId);
    }

    function tokenURI(uint256 tokenId)
        public
        view
        override(ERC721, ERC721URIStorage)
        returns (string memory)
    {
        return super.tokenURI(tokenId);
    }
}
```


FILE EXPLORER
WORKSPACES
code-sample
.deps
artifacts
tests
contract-10bf6b4c02.sol
contract-475434b11d.sol
contract-23c7cdd9f0.sol
contract-76917e6f02.sol
contract-c4475240bf.sol
contract-daaf5b3879.sol
scenario.json
contract-5b8f5a3982.sol
contract-405440dcdf.sol
contract-7b0e24200f.sol
contract-4c6e136413.sol
contract-8690f91b56.sol
test.json
Home
contract-8690f91b56.sol
REMIX
Website
Documentation
Remix Plugin
Remix Desktop
Search Documentation
Files
New File
Open File
Access File System
Load from
GitHub
Gist
IPFS
HTTPS
Learn
Get Started
Intro to Solidity
Deploying with Libraries
Featured
BETA TESTER
Sign up
GNOSIS SAFE MULTISIG
0XPROJECT ERC20
OPENZEPPELIN ERC20
OPENZEPPELIN ERC72
Featured Plugins
SOLIDITY
SOLHINT LINTER
SOURCIFY
DGIT
0
listen on all transactions
Search with transaction hash or address

The Native IDE for Web3 Development.

Remix Basics

An introduction to Remix's interface and basic operations.

BETA TESTING

Our community supports us.

Help us beta test releases now and get a handle on new features!

Get Started - Project Templates

GNOSIS SAFE MULTISIG: Create Multi-Signature wallets using this template.

0XPROJECT ERC20: Create an ERC20 token by importing 0xProject contract.

OPENZEPPELIN ERC20: Create an ERC20 token by importing OpenZeppelin library.

OPENZEPPELIN ERC72: Create an NFT token by importing OpenZeppelin

SOLIDITY: Compile, test and analyse smart contract.

SOLHINT LINTER: Solhint is an open source project for linting Solidity code.

SOURCIFY: Solidity contract and metadata verification service.

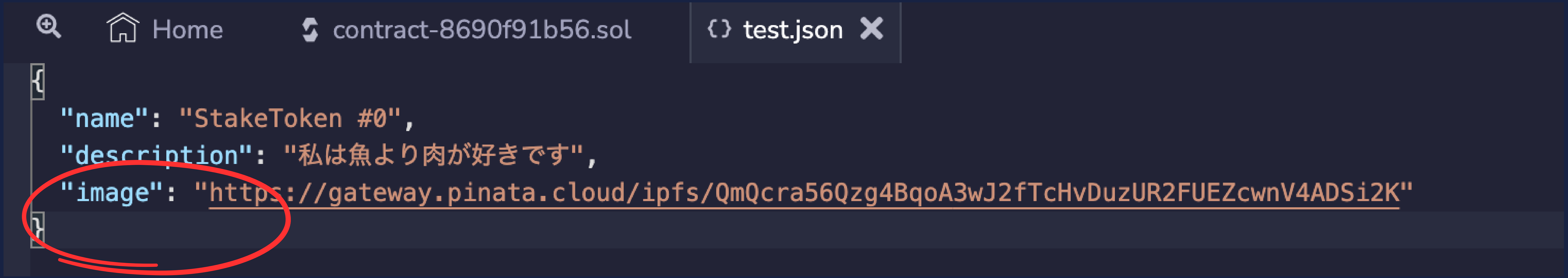
DGIT: Add source control to yc projects.

Scam Alert

The only URL Remix uses is remix.ethereum.org

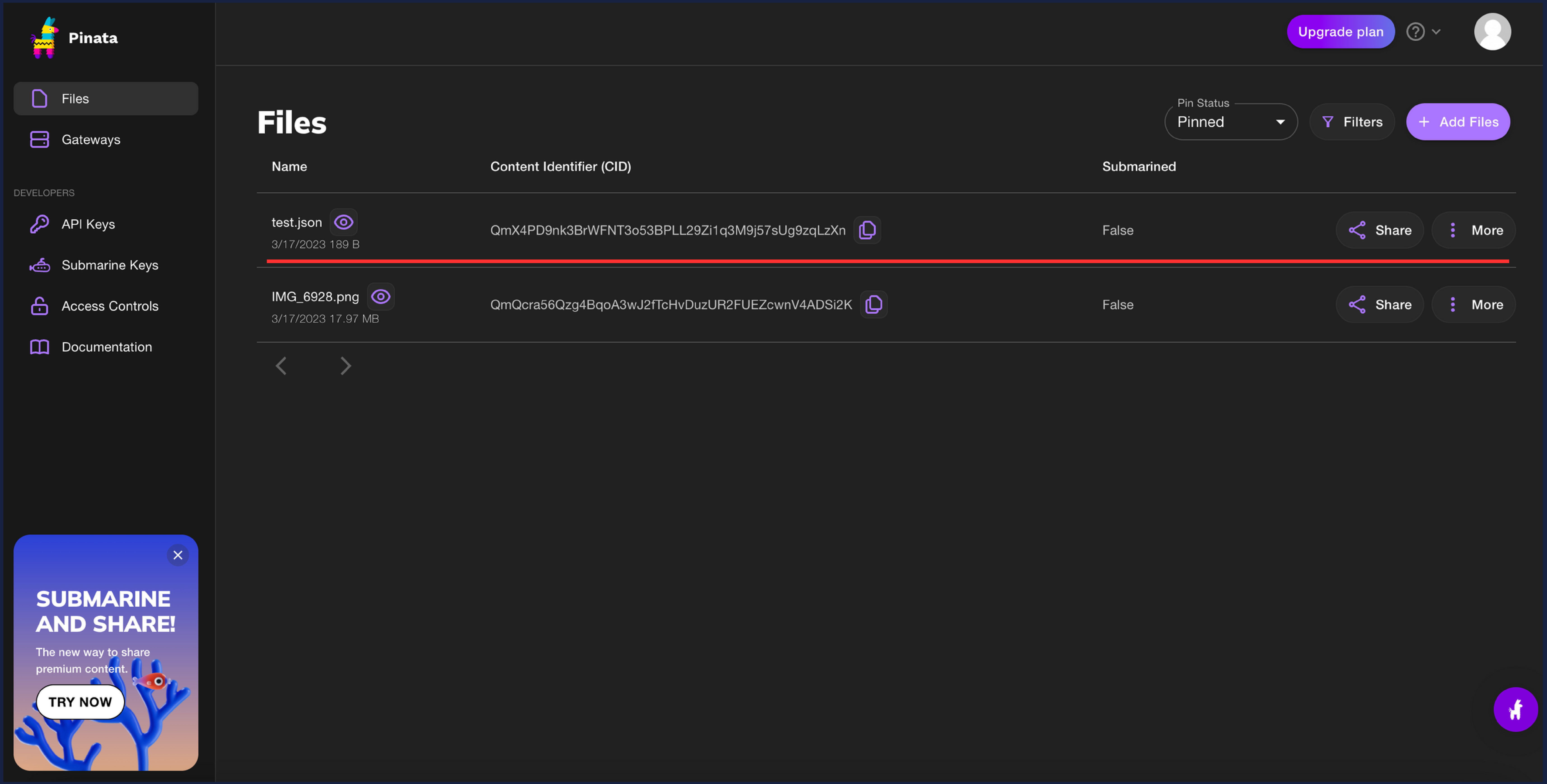
Beware of online videos promoting "liquidity front runner bots": Learn more

```
• web3 version 1.5.2
• ethers.js
• remix

 Type the library name to see available commands.

>
```


Home
contract-8690f91b56.sol
test.json

```
{
  "name": "StakeToken #0",
  "description": "私は魚より肉が好きです",
  "image": "https://gateway.pinata.cloud/ipfs/QmQcra56Qzg4BqoA3wJ2fTcHvDuzUR2FUEZcwnV4ADSi2K"
}
```

↑"image"にはPinataでIPFSにアップロードした画像のリンクを入れる


Pinata
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DEVELOPERS
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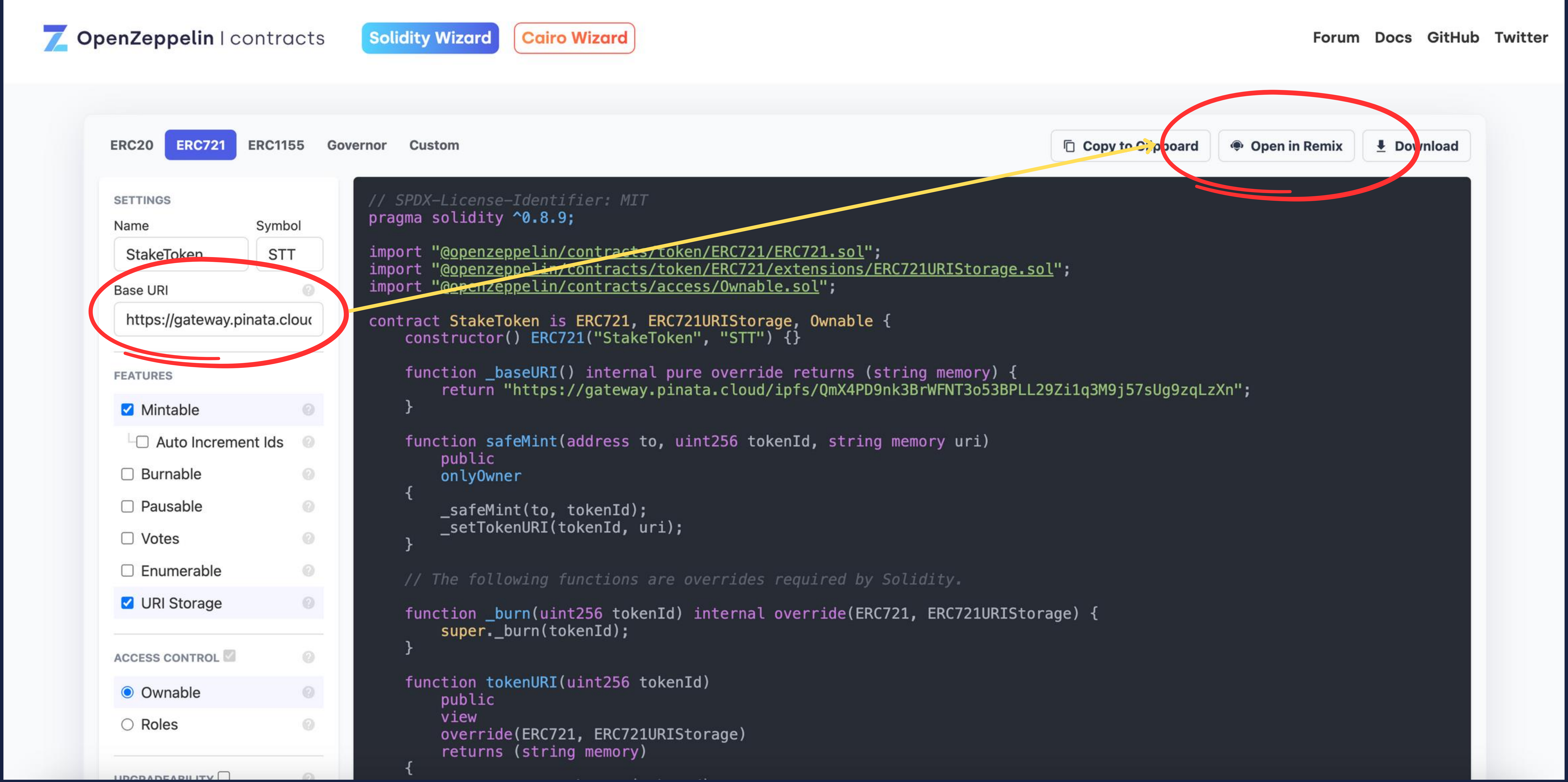
Share
More

Files

Pin Status: Pinned

Name	Content Identifier (CID)	Submarined
test.json 3/17/2023 189 B	QmX4PD9nk3BrWFNT3o53BPLL29Zi1q3M9j57sUg9zqLzXn	False
IMG_6928.png 3/17/2023 17.97 MB	QmQcra56Qzg4BqoA3wJ2fTcHvDuzUR2FUEZcwnV4ADSi2K	False


OpenZeppelin | contracts
Solidity Wizard
Cairo Wizard
Forum
Docs
GitHub
Twitter
ERC20
ERC721
ERC1155
Governor
Custom
Copy to Clipboard
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SETTINGS

Name: StakeToken

Symbol: STT

Base URI: https://gateway.pinata.clouc

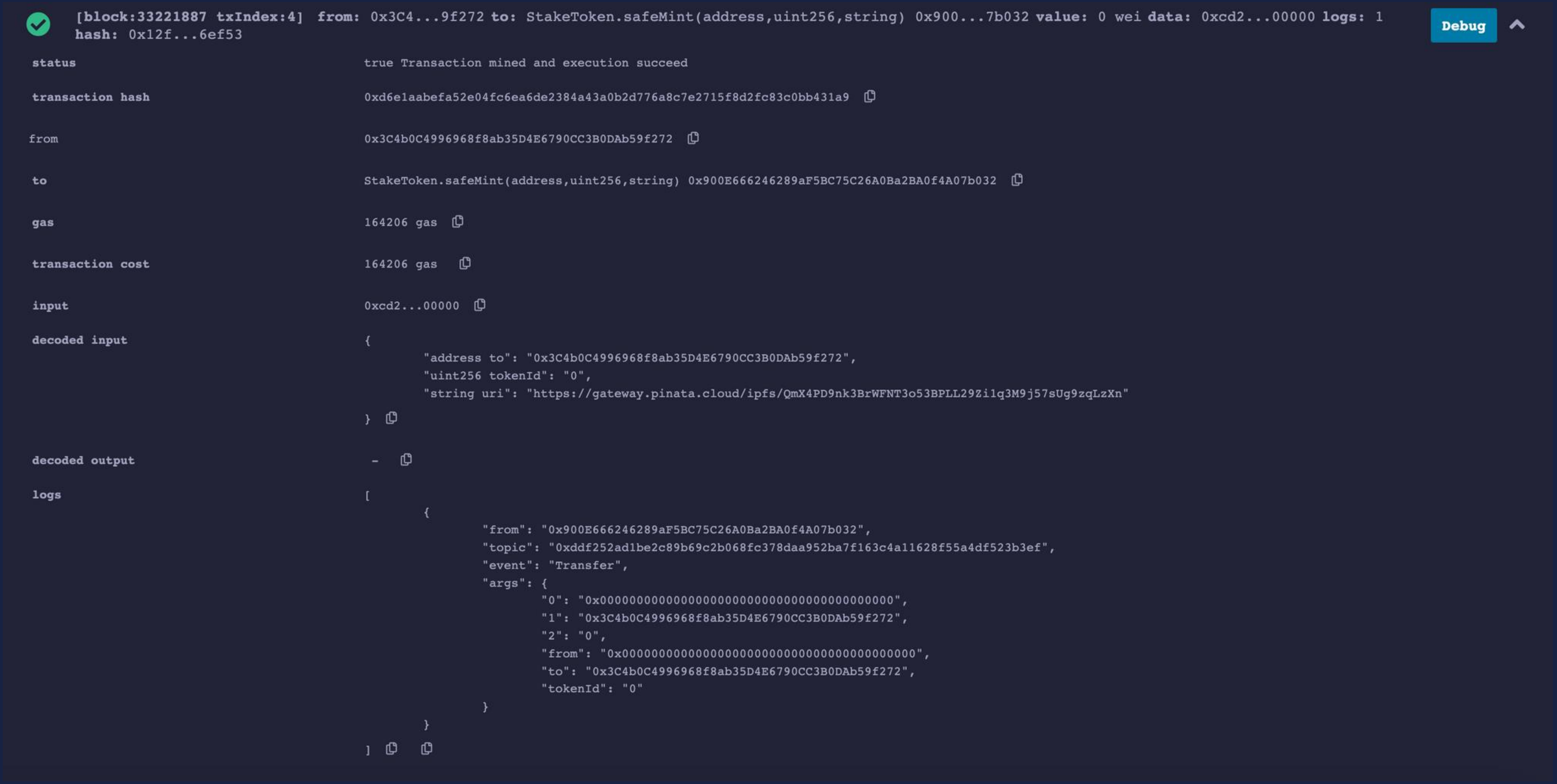
FEATURES

- ☑ Mintable
  - ☐ Auto Increment Ids
- ☐ Burnable
- ☐ Pausable
- ☐ Votes
- ☐ Enumerable
- ☑ URI Storage

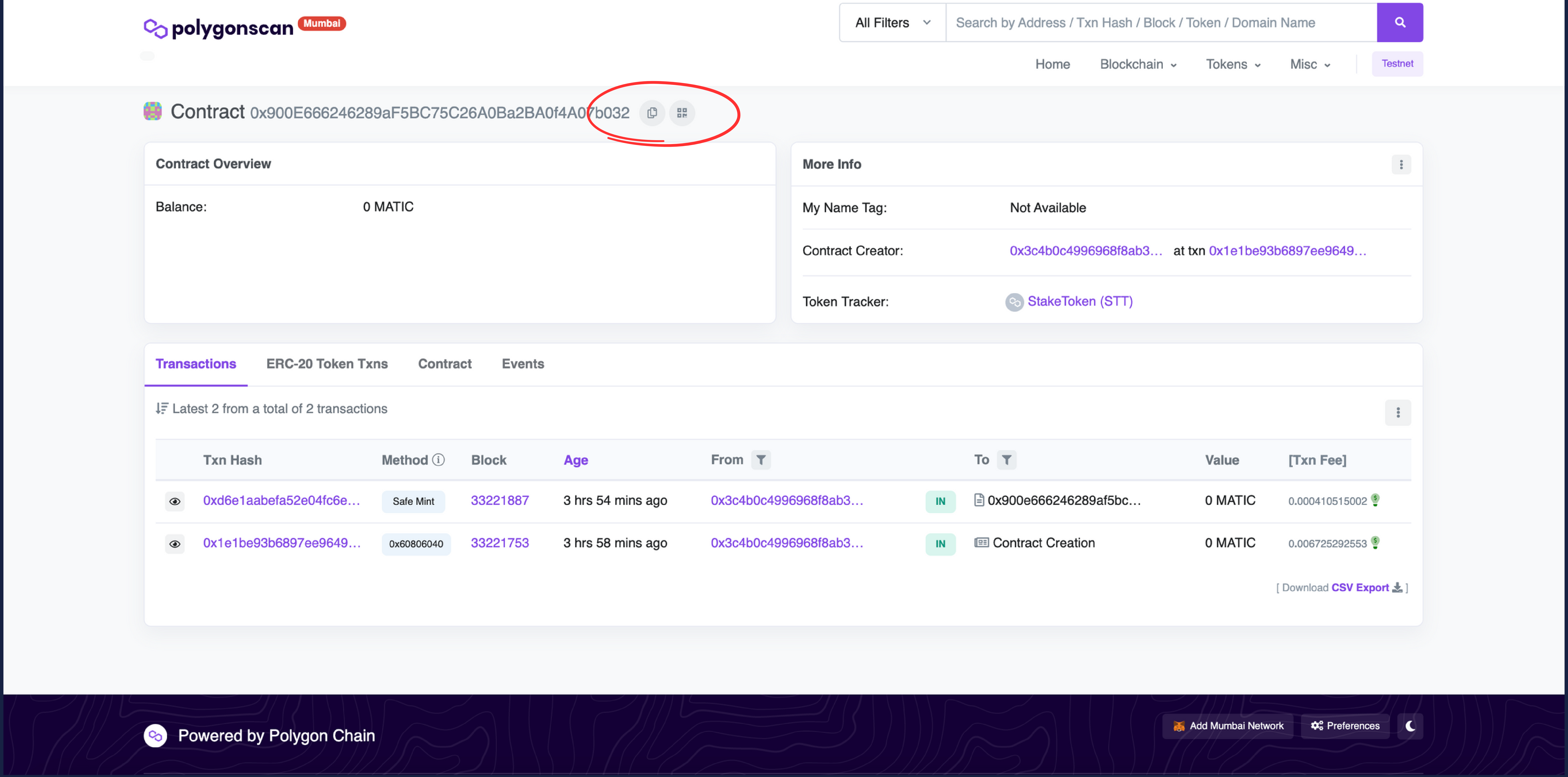
ACCESS CONTROL ☑

- ● Ownable
- ○ Roles

```
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.9;

import "@openzeppelin/contracts/token/ERC721/ERC721.sol";
import "@openzeppelin/contracts/token/ERC721/extensions/ERC721URIStorage.sol";
import "@openzeppelin/contracts/access/Ownable.sol";

contract StakeToken is ERC721, ERC721URIStorage, Ownable {
    constructor() ERC721("StakeToken", "STT") {}

    function _baseURI() internal pure override returns (string memory) {
        return "https://gateway.pinata.cloud/ipfs/QmX4PD9nk3BrWFNT3o53BPLL29Zi1q3M9j57sUg9zqLzXn";
    }

    function safeMint(address to, uint256 tokenId, string memory uri)
        public
        onlyOwner
    {
        _safeMint(to, tokenId);
        _setTokenURI(tokenId, uri);
    }

    // The following functions are overrides required by Solidity.

    function _burn(uint256 tokenId) internal override(ERC721, ERC721URIStorage) {
        super._burn(tokenId);
    }

    function tokenURI(uint256 tokenId)
        public
        view
        override(ERC721, ERC721URIStorage)
        returns (string memory)
    {
```



```
[block:33221887 txIndex:4] from: 0x3C4...9f272 to: StakeToken.safeMint(address,uint256,string) 0x900...7b032 value: 0 wei data: 0xcd2...00000 logs: 1
hash: 0x12f...6ef53
status               true Transaction mined and execution succeed
transaction hash     0xd6e1aabefa52e04fc6ea6de2384a43a0b2d776a8c7e2715f8d2fc83c0bb431a9
from                 0x3C4b0C4996968f8ab35D4E6790CC3B0DAb59f272
to                   StakeToken.safeMint(address,uint256,string) 0x900E666246289aF5BC75C26A0Ba2BA0f4A07b032
gas                  164206 gas
transaction cost     164206 gas
input                0xcd2...00000
decoded input        {
                             "address to": "0x3C4b0C4996968f8ab35D4E6790CC3B0DAb59f272",
                             "uint256 tokenId": "0",
                             "string uri": "https://gateway.pinata.cloud/ipfs/QmX4PD9nk3BrWFNT3o53BPLL29Zi1q3M9j57sUg9zqLzXn"
                     }
decoded output        -
logs                 [
                             {
                                     "from": "0x900E666246289aF5BC75C26A0Ba2BA0f4A07b032",
                                     "topic": "0xddf252ad1be2c89b69c2b068fc378daa952ba7f163c4a11628f55a4df523b3ef",
                                     "event": "Transfer",
                                     "args": {
                                             "0": "0x0000000000000000000000000000000000000000",
                                             "1": "0x3C4b0C4996968f8ab35D4E6790CC3B0DAb59f272",
                                             "2": "0",
                                             "from": "0x0000000000000000000000000000000000000000",
                                             "to": "0x3C4b0C4996968f8ab35D4E6790CC3B0DAb59f272",
                                             "tokenId": "0"
                                     }
                             }
                     ]
```



polygonscan Mumbai
All Filters
Search by Address / Txn Hash / Block / Token / Domain Name
Home
Blockchain
Tokens
Misc
Testnet

Contract 0x900E666246289aF5BC75C26A0Ba2BA0f4A07b032

Contract Overview

Balance: 0 MATIC

More Info

My Name Tag: Not Available

Contract Creator: 0x3c4b0c4996968f8ab3… at txn 0x1e1be93b6897ee9649…

Token Tracker: StakeToken (STT)

Transactions
ERC-20 Token Txns
Contract
Events

Latest 2 from a total of 2 transactions

Txn Hash	Method	Block	Age	From		To	Value	[Txn Fee]
0xd6e1aabefa52e04fc6e…	Safe Mint	33221887	3 hrs 54 mins ago	0x3c4b0c4996968f8ab3…	IN	0x900e666246289af5bc…	0 MATIC	0.000410515002
0x1e1be93b6897ee9649…	0x60806040	33221753	3 hrs 58 mins ago	0x3c4b0c4996968f8ab3…	IN	Contract Creation	0 MATIC	0.006725292553

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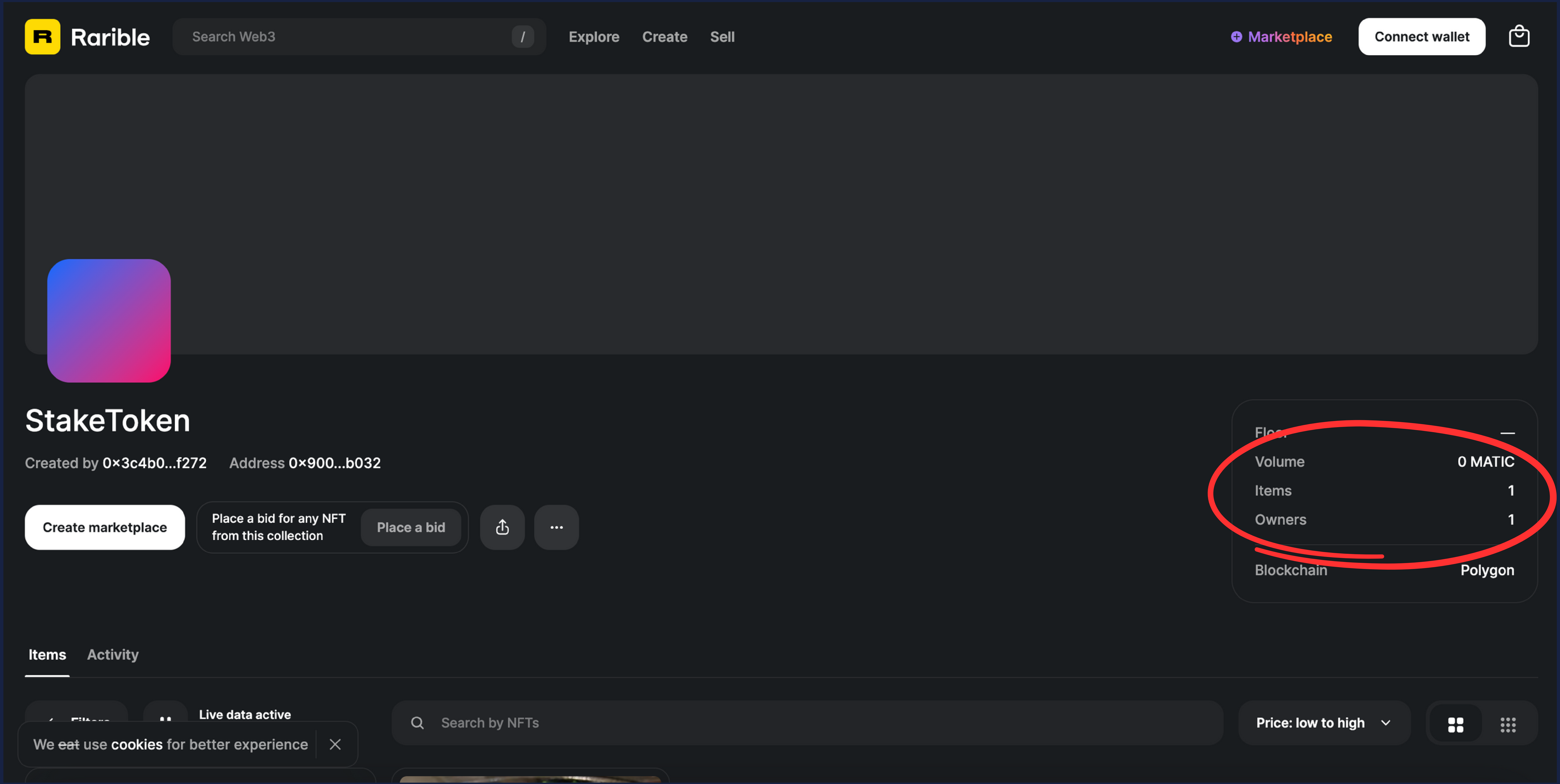
Rarible
Search Web3
/
Explore
Create
Sell
Marketplace
Connect wallet
Create marketplace
Place a bid
Items
Activity
Live data active
Search by NFTs
Price: low to high

StakeToken

Created by 0x3c4b0...f272 Address 0x900...b032

Place a bid for any NFT from this collection

Floor	—
Volume	0 MATIC
Items	1
Owners	1
Blockchain	Polygon

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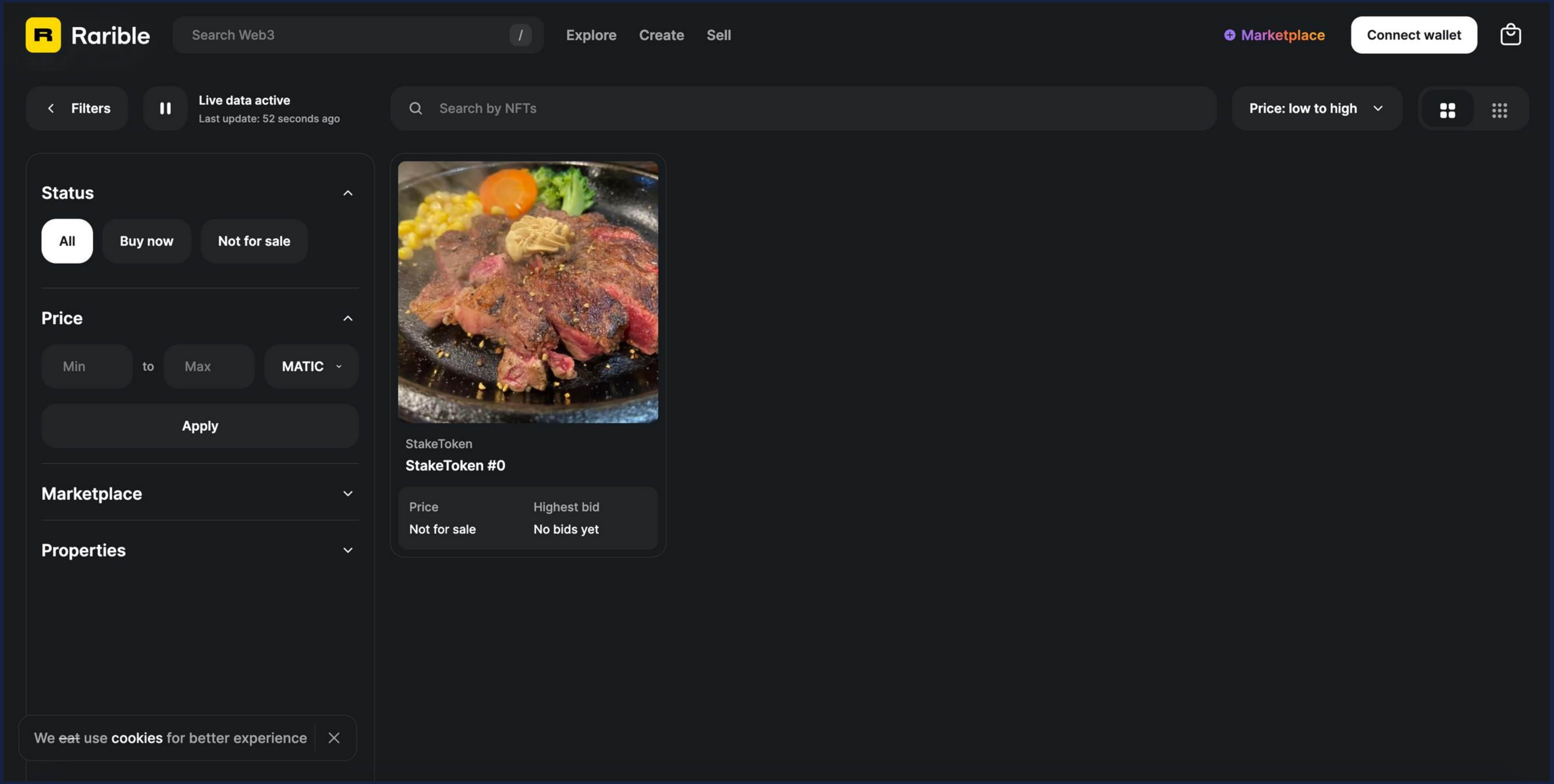
Rarible
Search Web3
Explore
Create
Sell
Marketplace
Connect wallet
Filters
Search by NFTs
Price: low to high
Status
All
Buy now
Not for sale
Price
Min
to
Max
MATIC
Apply
Marketplace
Properties

Live data active
Last update: 52 seconds ago

StakeToken
StakeToken #0

Price: Not for sale
Highest bid: No bids yet

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*ERC721*発行 終