



The Official Source for Municipal Disclosures and Market Data

EMMA Labs User Guide

Version 3.0, August 2023

MSRB Support

Phone: 202-838-1330

Email: MSRBsupport@msrb.org

Live support: 7:30 a.m. – 6:30 p.m. ET.

E-mail support: 7:00 a.m. – 7:00 p.m. ET.

Overview

About the MSRB

The Municipal Securities Rulemaking Board (MSRB) protects and strengthens the municipal bond market, enabling access to capital, economic growth, and societal progress in tens of thousands of communities across the country. The MSRB fulfills this mission by creating trust in our market through informed regulation of dealers and municipal advisors that protects investors, issuers and the public interest; building technology systems that power our market and provide transparency for issuers, institutions, and the investing public; and serving as the steward of market data that empowers better decisions and fuels innovation for the future. The MSRB is a self-regulatory organization governed by a board of directors that has a majority of public members, in addition to representatives of regulated entities. The MSRB is overseen by the Securities and Exchange Commission and Congress. ^[OBJ]

Contents

Part I: EMMA Labs Introduction	3
About EMMA Labs	3
Supported Browsers	3
Terms of Use	3
Technical Support	3
Part II: Accessing EMMA Labs	4
Signing up for EMMA Labs	4
Signing in to EMMA Labs	11
Resetting Your Password	14
Part III: Feedback.....	20
Part IV: Active Labs.....	22
Structured Data.....	22
Disclosure Search	28
Market Analysis Tool.....	33
Part IV: Idea Labs.....	36

Part I: EMMA Labs Introduction

About EMMA Labs

EMMA Labs provides a hub for municipal market participants and technology experts to collaborate, innovate and create potential applications for market data. Applications that are tested and refined in EMMA Labs may find their way to the MSRB's EMMA website, where they can contribute to a fair, efficient and transparent municipal market.

Users can explore active prototypes and provide feedback on the user experience, features and functionality. The MSRB also may seek feedback on early-stage concepts.

Supported Browsers

To ensure the best experience with EMMA Labs, please use a supported browser; currently these are Chrome, Firefox, Safari or Microsoft Edge.

Terms of Use

After logging into the site for the first time, you will be prompted to review the EMMA Labs Terms of Use. You must accept the terms of use to use the EMMA Labs site. If you do not agree to the Terms of Use, you may click Decline and you will exit the site.

Technical Support

If you require technical assistance with EMMA Labs, please contact the MSRB at 202-838-1330 or MSRBsupport@msrb.org.

Part II: Accessing EMMA Labs

Signing up for EMMA Labs

Sign Up Process

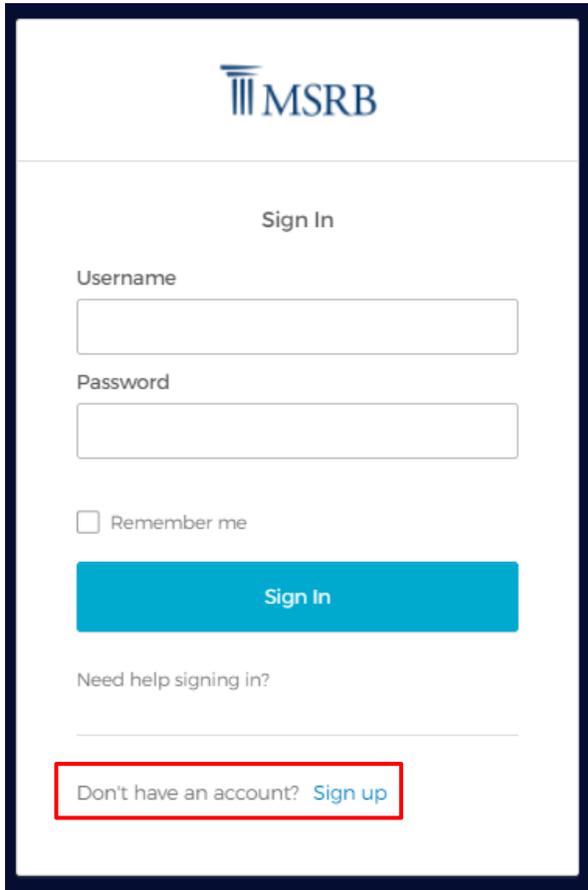
All EMMA Labs users are required to create an account before accessing EMMA Labs.

To sign up for an EMMA Labs account, open a supported browser and navigate to <https://emmalabs.msrb.org/>.

From the EMMA Labs homepage, click the **Sign In / Sign Up** button.



The MSB sign in page will appear. From the sign in page, click **Sign up**.



 MSRB

Sign In

Username

Password

Remember me

Need help signing in?
[Sign up](#)

Don't have an account? [Sign up](#)

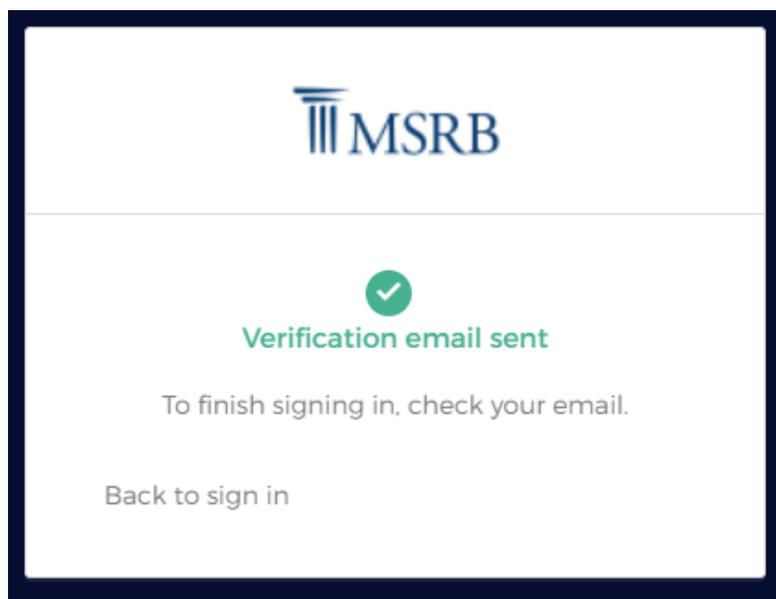
You will be prompted to fill out the sign-up form to create an account, ensuring all required fields are entered. Once complete, click **Register**.

The screenshot shows the MSRB 'Create Account' registration form. At the top is the MSRB logo. Below it is the heading 'Create Account'. The form contains the following fields and controls:

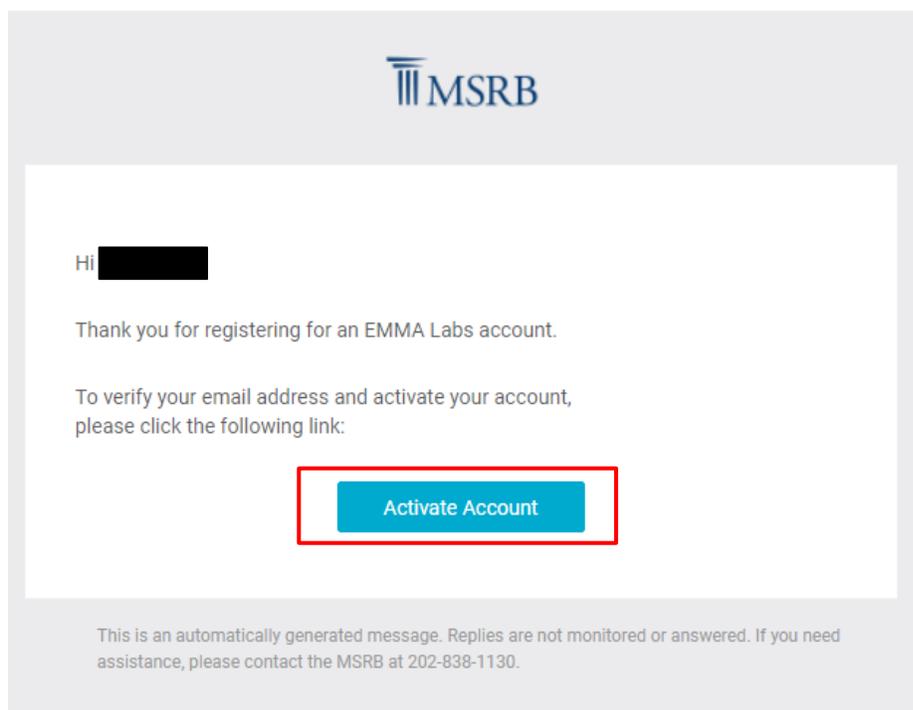
- Username ***: A text input field with an asterisk indicating it is required.
- Password ***: A password input field with an asterisk indicating it is required.
- First name ***: A text input field with an asterisk indicating it is required.
- Last name ***: A text input field with an asterisk indicating it is required.
- Role**: A dropdown menu with the placeholder text 'Select a role'.
- If Other Selected, Please Specify**: A text input field for specifying a role not in the dropdown.
- State**: A dropdown menu with the placeholder text 'Select a state'.
- Organization Name**: A text input field.
- Organization Size**: A dropdown menu with the placeholder text 'Select an organizatio...'.

Below the fields is a note: '* indicates required field'. At the bottom of the form is a blue button labeled 'Register', which is highlighted with a red rectangular border. Below the button is a link that says 'Back to sign in'.

A message indicating that a verification email has been sent to your email address will appear.



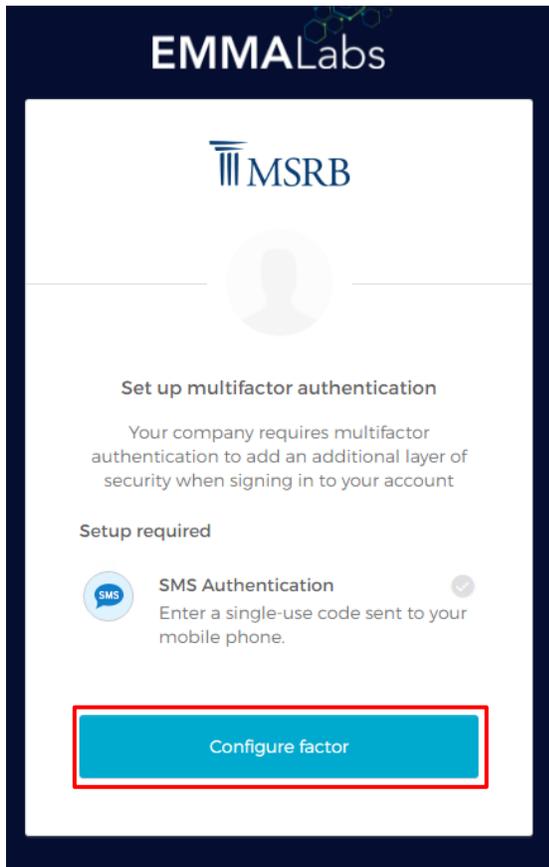
Navigate to the email box that you signed up with. In the email sent from donotreply@msrb.org, please click on the **Activate Account** button.



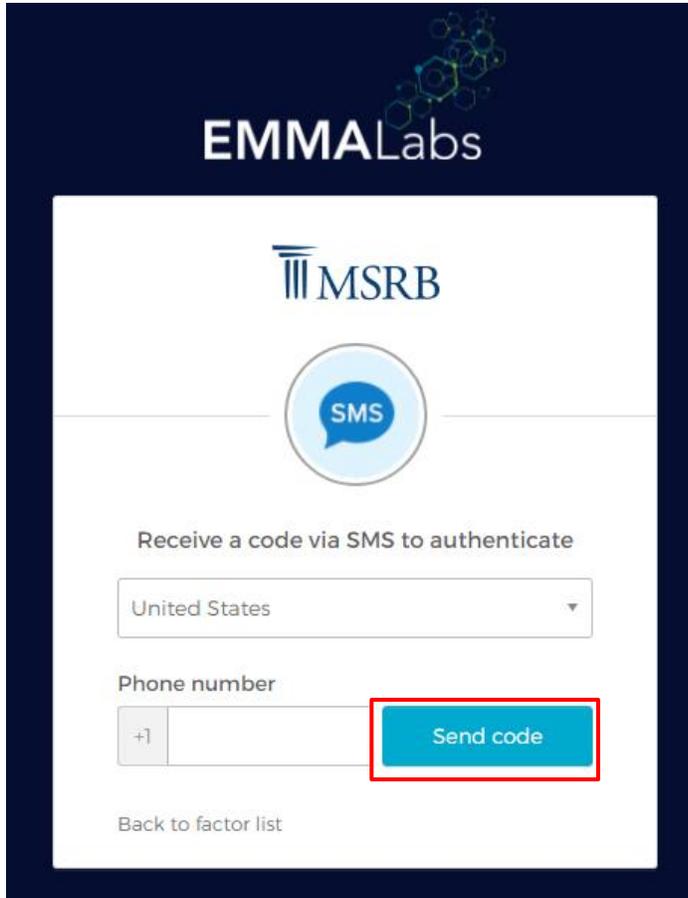
Confirm Account

After clicking on the **Activate Account** button from your email, you will be directed the EMMA Labs login screen. Click **Sign In / Sign Up** to complete your account setup by setting up multi-factor authentication.

SMS authentication is required to increase the security of your account, click **Configure Factor** to add your mobile phone number.

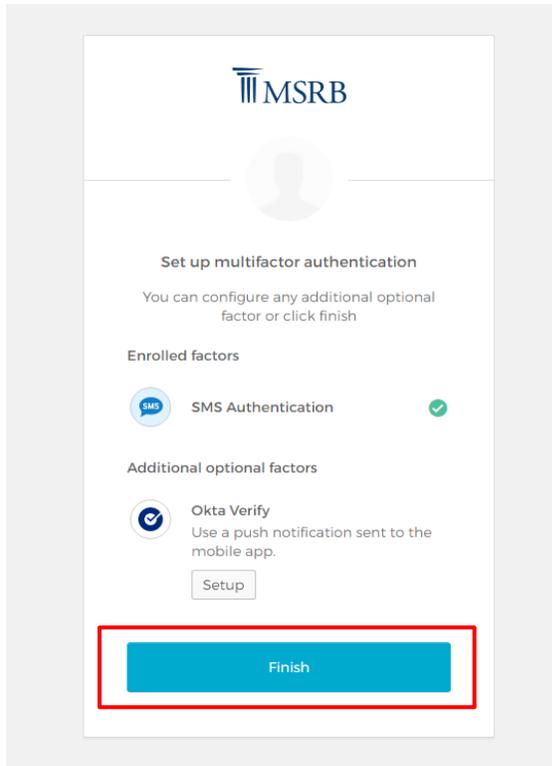


Enter your mobile phone number and click **Send Code**, you will receive a verification code.
Enter your code to verify your account.



The screenshot displays the EMMA Labs authentication interface. At the top, the EMMA Labs logo is visible. Below it, the MSRB logo is centered. A circular icon with 'SMS' inside is positioned below the MSRB logo. The text 'Receive a code via SMS to authenticate' is displayed. A dropdown menu shows 'United States'. Below this, the 'Phone number' field is shown with a '+1' prefix and a 'Send code' button highlighted with a red box. A 'Back to factor list' link is at the bottom.

You can add additional multifactor authentication options by setting up the optional Okta Verify app. Otherwise, click **Finish** to login to EMMA Labs Homepage.



Signing in to EMMA Labs

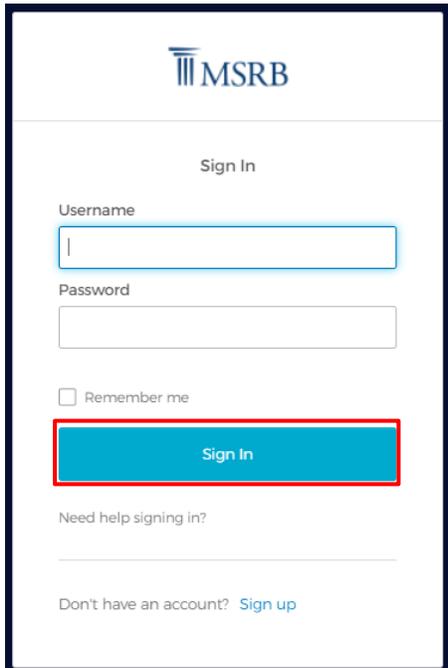
To sign in to EMMA Labs, open a supported browser and navigate to <https://emmalabs.msrb.org/>.

From the EMMA Labs homepage, click the **Sign In / Sign Up** button.



You will be directed to EMMA Labs sign in page. To sign in to an existing account, enter your Username, password and hit the **Sign In** button.

Your Username is the email address you registered with.



The image shows a screenshot of the MSRB Sign In page. At the top, the MSRB logo is displayed. Below the logo, the text "Sign In" is centered. There are two input fields: "Username" and "Password". Below the "Password" field is a checkbox labeled "Remember me". A blue "Sign In" button is highlighted with a red border. Below the button, there is a link for "Need help signing in?". At the bottom, there is a link for "Don't have an account? Sign up".

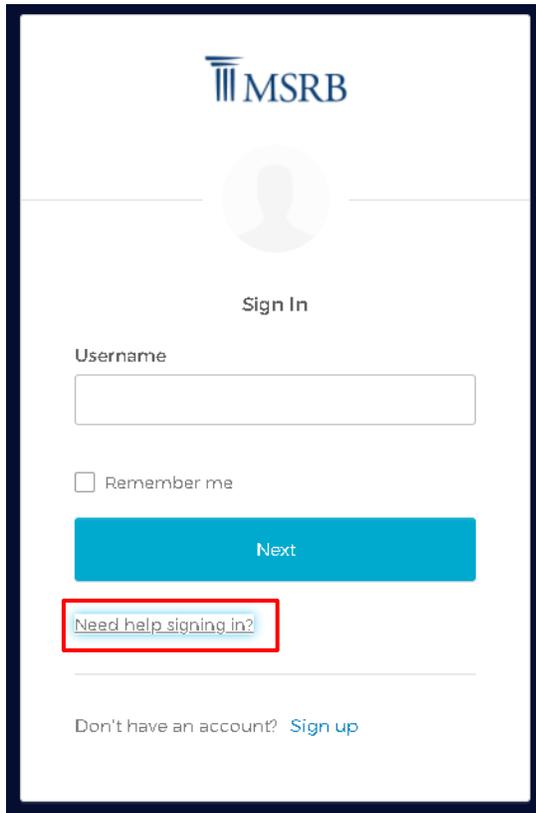
If you need to confirm your account again using multi-factor authentication, you will be prompted to receive a code via SMS. Enter the code to confirm your account and you will be taken to the EMMA Labs home page. Otherwise, you will be taken to the EMMA Labs home page once you hit the **Sign In** button.

The screenshot shows the SMS Authentication interface for the MSRB. At the top is the MSRB logo. Below it is a circular icon with 'SMS' inside. The text 'SMS Authentication' is centered, followed by a phone number '(+1 XXX-XXX-XXXX)' where the last four digits are redacted with a black box. Below this is the label 'Enter Code' above a text input field. To the right of the input field is a 'Send code' button. A large blue button labeled 'Verify' is highlighted with a red border. At the bottom right, there is a link that says 'Back to sign in'.

Resetting Your Password

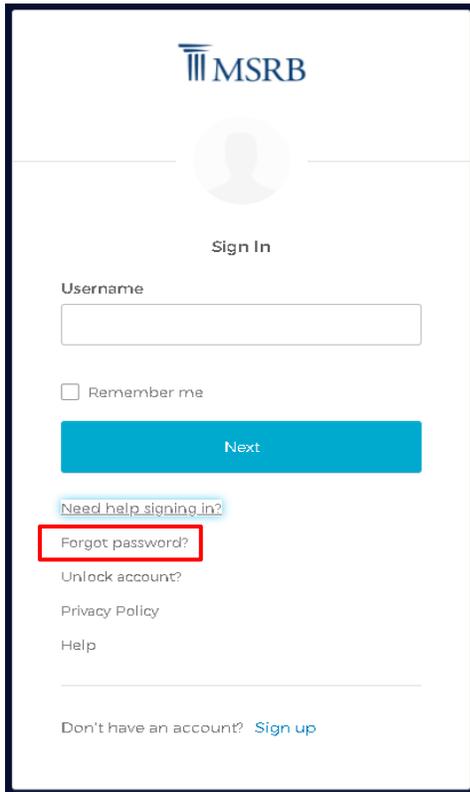
Forgot Password

If you forget or need to reset your password, click on **Need help signing in?** link on the Sign In page.



The screenshot shows the MSRB Sign In page. At the top is the MSRB logo. Below it is a placeholder for a user profile picture. The text "Sign In" is centered. There is a "Username" label above a text input field. Below the input field is a "Remember me" checkbox. A blue "Next" button is positioned below the checkbox. A red box highlights the link "Need help signing in?". At the bottom, there is a horizontal line and the text "Don't have an account? [Sign up](#)".

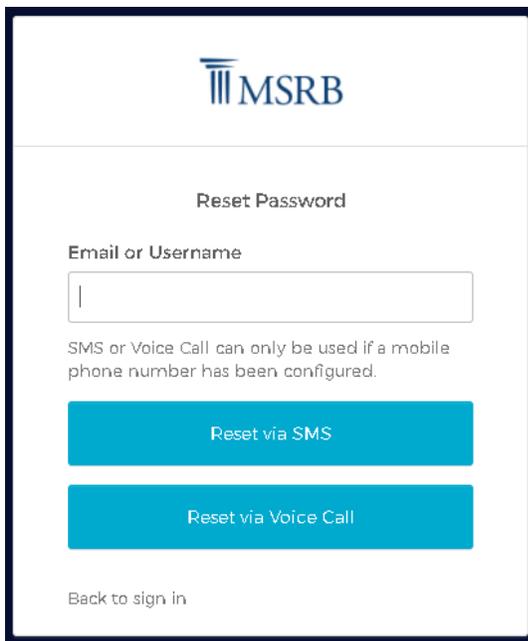
With the need help options open, select **Forgot password?**



The screenshot shows the MSRB Sign In page. At the top is the MSRB logo. Below it is a placeholder for a user profile picture. The text "Sign In" is centered. There is a "Username" label above a text input field. Below the input field is a "Remember me" checkbox. A blue "Next" button is positioned below the checkbox. Underneath the button is a link "Need help signing in?". The "Forgot password?" link is highlighted with a red rectangular box. Other links listed are "Unlock account?", "Privacy Policy", and "Help". At the bottom, there is a link "Don't have an account? Sign up".

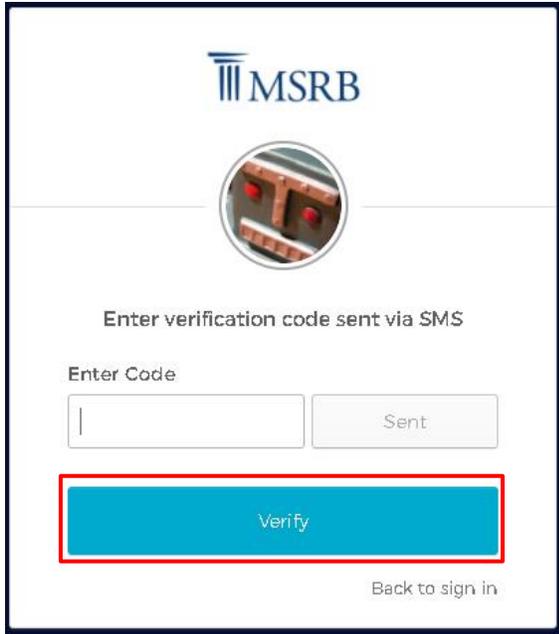
Enter your email or username, you will have two options to reset your password.

- 1) SMS: You will receive a text message with a verification code.
- 2) Voice Call: You will receive a verification code via voice call.



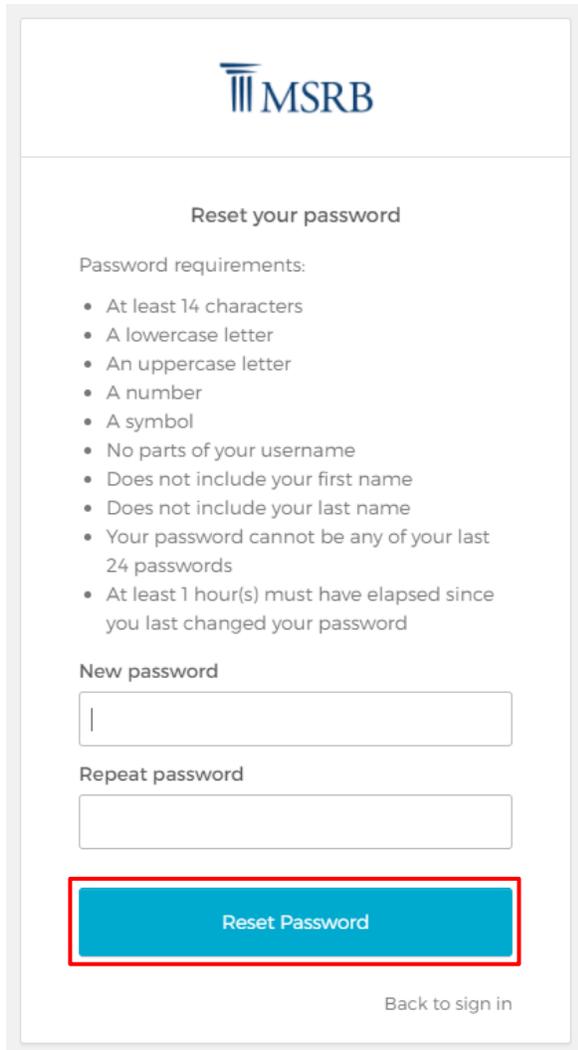
The screenshot shows the MSRB Reset Password page. At the top is the MSRB logo. Below it is the text "Reset Password". There is an "Email or Username" label above a text input field. Below the input field is a note: "SMS or Voice Call can only be used if a mobile phone number has been configured." There are two blue buttons: "Reset via SMS" and "Reset via Voice Call". At the bottom, there is a link "Back to sign in".

Once you receive the verification code, enter it and click **Verify**. After it is verified, you will be able to reset your password.



The screenshot shows the MSRB verification code entry screen. At the top is the MSRB logo, which consists of three vertical bars followed by the text "MSRB". Below the logo is a circular image of a circuit board. The main heading is "Enter verification code sent via SMS". Underneath is the label "Enter Code" above a text input field. To the right of the input field is a "Sent" button. Below the input field and "Sent" button is a large blue "Verify" button, which is highlighted with a red rectangular border. At the bottom right of the screen is a link that says "Back to sign in".

You will be prompted to enter a new password and to verify the password by typing it again. Enter your new password and hit the **Reset Password** button.



The screenshot shows a web form for resetting a password. At the top is the MSRB logo. Below it is the heading "Reset your password". Underneath is a section titled "Password requirements:" followed by a bulleted list of rules. Below the list are two input fields: "New password" and "Repeat password". A blue button labeled "Reset Password" is highlighted with a red border. At the bottom right is a link that says "Back to sign in".

MSRB

Reset your password

Password requirements:

- At least 14 characters
- A lowercase letter
- An uppercase letter
- A number
- A symbol
- No parts of your username
- Does not include your first name
- Does not include your last name
- Your password cannot be any of your last 24 passwords
- At least 1 hour(s) must have elapsed since you last changed your password

New password

Repeat password

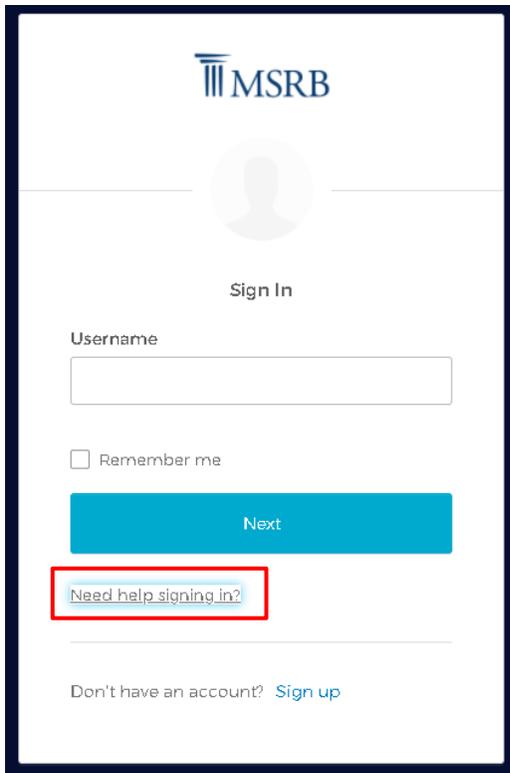
Reset Password

[Back to sign in](#)

You will be taken back to the sign in page where you can sign in using your new password to access EMMA Labs.

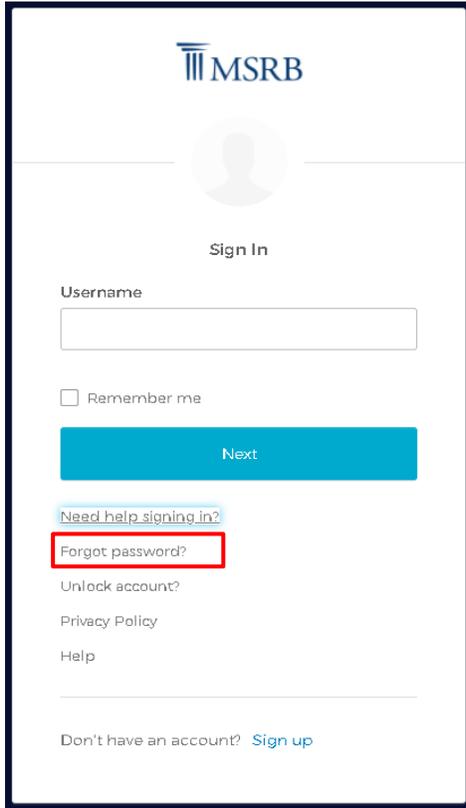
Unlocking Your Account

If you enter your password incorrectly multiple times, you will be locked out of your account. You will receive an email informing you that your account has been locked. To unlock your account, you can click the **Unlock Account** button in the email or navigate to the EMMA Labs Sign In page and click on **Need help signing in?** link.



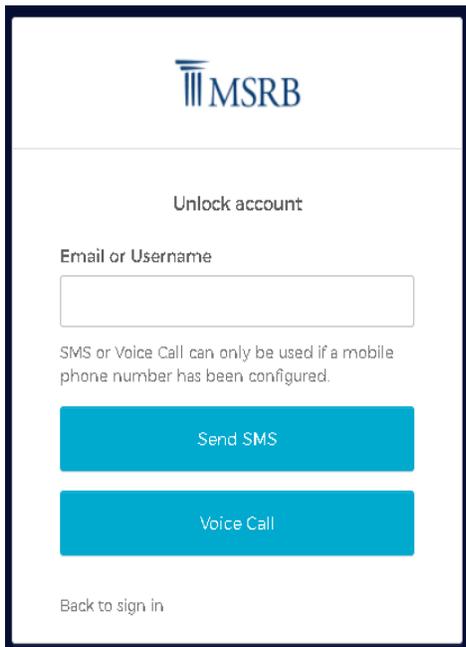
The screenshot shows the MSRB Sign In page. At the top is the MSRB logo. Below it is a placeholder for a user profile picture. The text "Sign In" is centered. There is a "Username" label above a text input field. Below the input field is a "Remember me" checkbox. A blue "Next" button is positioned below the checkbox. A red rectangular box highlights the link "Need help signing in?". At the bottom, there is a link "Don't have an account? Sign up".

With the need help options open, select **Unlock Account?**



The screenshot shows the MSRB Sign In page. At the top is the MSRB logo. Below it is a placeholder for a user profile picture. The text "Sign In" is centered. There is a "Username" input field. Below the input field is a checkbox labeled "Remember me". A blue "Next" button is positioned below the checkbox. Underneath the button, the text "Need help signing in?" is highlighted with a light blue box. Below this, the text "Forgot password?" is highlighted with a red box. Other options listed are "Unlock account?", "Privacy Policy", and "Help". At the bottom, there is a link: "Don't have an account? [Sign up](#)".

Enter your username and select an option to receive a code either via SMS or voice call



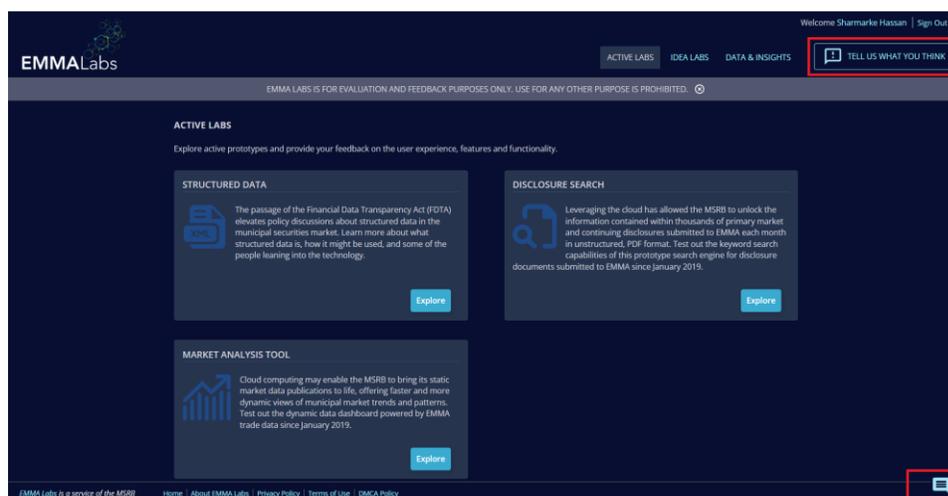
The screenshot shows the MSRB "Unlock account" page. At the top is the MSRB logo. Below it is the text "Unlock account". There is an "Email or Username" input field. Below the input field, a note states: "SMS or Voice Call can only be used if a mobile phone number has been configured." There are two blue buttons: "Send SMS" and "Voice Call". At the bottom, there is a link: "Back to sign in".

Enter your code and hit the **Verify** button. Once verified, you will be notified that your account has been unlocked and to return to the Sign In page to enter your username and password. If you forgot your password, follow the steps above to reset it.

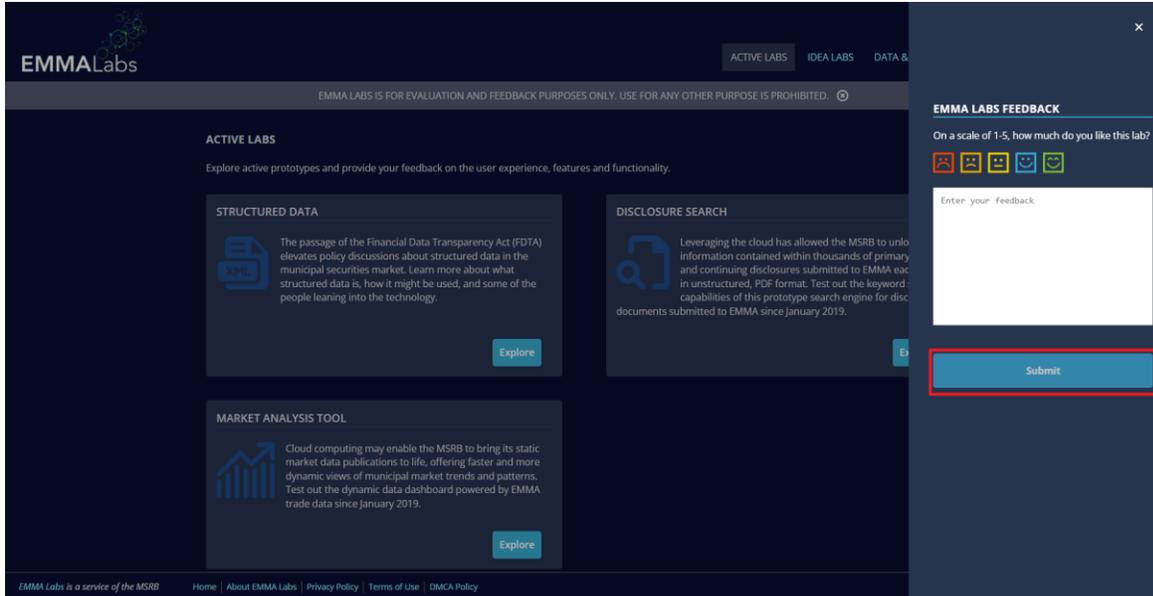
Part III: Feedback

EMMA Labs users can leave feedback using the feedback icon located at the lower right of the page and the **TELL US WHAT YOU THINK** button under the user profile. Both the icon and button remain at the same location on every page of EMMA Labs and recognize which page you provide feedback on.

If you would like to leave feedback, click the feedback icon or the **TELL US WHAT YOU THINK** button.



When the EMMA Labs feedback form appears, you can rate the current page using the icons and leave comments in the text box below. Once complete, hit the **Submit** button.



Part IV: Active Labs

There are currently three active labs available on EMMA Labs:

ACTIVE LABS

Explore active prototypes and provide your feedback on the user experience, features and functionality.

STRUCTURED DATA

The passage of the Financial Data Transparency Act (FDTA) elevates policy discussions about structured data in the municipal securities market. Learn more about what structured data is, how it might be used, and some of the people leaning into the technology.

[Explore](#)

DISCLOSURE SEARCH

Leveraging the cloud has allowed the MSRB to unlock the information contained within thousands of primary market and continuing disclosures submitted to EMMA each month in unstructured, PDF format. Test out the keyword search capabilities of this prototype search engine for disclosure documents submitted to EMMA since January 2019.

[Explore](#)

MARKET ANALYSIS TOOL

Cloud computing may enable the MSRB to bring its static market data publications to life, offering faster and more dynamic views of municipal market trends and patterns. Test out the dynamic data dashboard powered by EMMA trade data since January 2019.

[Explore](#)

Structured Data – Educational lab for market participants and the public that explores the difference between structured data and unstructured data.

Disclosure Search - Ability to perform keyword search on three years of disclosure documents submitted to the EMMA primary market disclosure service and EMMA continuing disclosure service.

Market Analysis Tool - Dynamic data dashboards and self-service charts and statistics quantifying trading patterns as reported to the Real-Time Transaction Reporting System (RTRS).

Structured Data

The Structured Data Lab provides education and case studies related to using XBRL to create and share financial statements.

Navigation Section

The navigation panel has three sections: Learn More, Case Studies, and See XBRL in Action. Clicking on each link takes you to that section in the lab, for the Learn More links it will open that page for you to read.

STRUCTURED DATA

LEARN MORE

- What is Structured Data?
- Enabling Machine Readability
- Types of Structured Data
- Structured Data in Financial Markets
- Additional Resources

CASE STUDIES

Learn more about the Chief Financial Officers that completed projects to present their financial data as structured data.

[Read](#)

SEE XBRL IN ACTION

In the future, EMMA could be enriched by leveraging structured financial data. See one possible approach.

[Explore](#)

Learn More

The Learn More pages give users access to comprehensive information on structured data broken into five sections.

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WHAT IS STRUCTURED DATA?

Structured data has been the dominant form of data since the beginning of the computer age. Whenever a computer is storing, reading, or transmitting information, some kind of structure will generally be applied to the data. Structured data is the bedrock of most data made available on the internet.

The word structure indicates that a scheme has been used to organize the data. In most cases, the scheme is to simply put the information into rows and columns or to apply tags to the data. Adding a scheme allows for proper interpretation of data, especially by computers.

Structure also allows for efficient data updates. A computer can make use of the structure to find the correct place in the data to perform an action such as "change the next interest payment date to be six months later than its current value."

The content of most structured data is limited to certain types: numbers, names and descriptions, dates, identifiers, and categories.

STRUCTURED VS UNSTRUCTURED DATA

THE CHALLENGE OF SHARING DATA

ENABLING MACHINE READABILITY

Enabling computers to pull data out of a set of files is called machine readability.

TYPES OF STRUCTURED DATA

Different methodologies will optimize for different objectives.

STRUCTURED DATA IN FINANCIAL MARKETS

Constructing metadata in a way that eliminates confusion caused by ambiguous language.

ADDITIONAL RESOURCES

Some more additional information for research purposes.

[Next Section: Enabling Machine Readability](#)

To navigate back and forth through the general background pages, click on the navigation panel on the left or on the tiles on the first section with icons and text that will take you to the appropriate pages when clicked. You can also click directly on the navigation buttons that are labeled "Next Section" and "Previous Section" for ease of sequential navigation.

Case Studies

The Case Studies section provides examples of three organizations that have completed projects that present their financial data as structured data. These three organizations are: City of Flint, Michigan; College of DuPage; and the MSRB.

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SEE XBRL IN ACTION

In the future, EMMA could be enriched by leveraging structured financial data. See one possible approach.

[Explore](#)

CASE STUDIES

One area of structured data getting significant attention is the presentation of financial data in Extensible Business Mark-up Language (XBRL) format. Some Chief Financial Officers have leaned into the technology and completed projects that present their financial data as structured data. Learn more about their journeys here.

CITY OF FLINT, MICHIGAN COLLEGE OF DUPAGE MUNICIPAL SECURITIES RULEMAKING BOARD

"This is about more than just reporting and compliance. It's about getting the most out of our data to improve decision-making and tell our story. If you ask me, it is about time we modernize and digitize municipal financial reporting, especially if it brings about transparency and better governance." – Rob Widigan, former CFO, City of Flint, Michigan

SEE THE FINANCIALS

Compare financial data in structured and unstructured formats.

[View in PDF](#) [View in XBRL*](#)

*XBRL documents provided on EMMA Labs should not be relied upon, official audited financial reports can be found on the City of Flint, Michigan website (Financial Reports - City of Flint) or EMMA.

- PERSONAL CONNECTIONS LEAD TO EXPLORING XBRL
- KEEPING THE BIGGER PICTURE IN MIND
- SAVING TIME ON ANNUAL REPORTING
- A ONE-TIME LIFT
- CONSIDERATIONS FOR OTHER LOCAL GOVERNMENTS
- BIOGRAPHY

To access the case studies home page, click the “Read” button in the case studies section on the left navigation panel.

Once on the case studies home page, you can view versions of Annual Comprehensive Financial Reports (ACFRs) for the three organizations in PDF and XBRL format for comparison. Each case study has collapsible subheadings discussing the organization's relationship with XBRL.

XBRL in Action with Municipal Obligors

The XBRL in Action with Municipal Obligors page provides a demonstration of how the Security Details page on EMMA might work if XBRL financial data were collected by the MSRB. The page provides a mock-up of a Security Details page with two interactive features. The first is the ability to “pop-up” an interactive chart tool that allows users to view data from the underlying ACFRs for charts. The second is the ability to click on a link for a single document, which opens a new page with that XBRL document displayed.

The chart allows comparisons of a single data point over multiple years with one company, comparison of current ratio and debt ratio for multiple companies in the same industry, and comparison of a single data point over multiple years across multiple companies.

To access the security details mockup page, click the “Explore” button in the see XBRL in action section on the left navigation panel.

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CASE STUDIES

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Read

XBRL IN ACTION WITH MUNICIPAL OBLIGORS

Certain corporations that are obligated persons with regard to municipal securities may submit annual financial disclosures to both EMMA and the SEC's EDGAR system. On the EDGAR system, one such disclosure, the Form 10-K, is submitted as structured data but the copy is submitted to EMMA as an unstructured PDF document.

American Electric Power Company, Inc. is one such obligor which submits to both EMMA and EDGAR. One of its subsidiaries, Appalachian Power Company, is an obligated person for a West Virginia Economic Development Authority refunding bond (see associated page on EMMA with PDF Form 10-K filings). The charts below imagine one possible way an obligor's financial information could be used if the annual financial filings were provided as structured data instead of as a PDF.

Obligor Financial Data

SECURITY DETAILS

CUSIP: 95648VBE8*

WEST VIRGINIA ECONOMIC DEVELOPMENT AUTHORITY SOLID WASTE DISPOSAL FACILITIES REVENUE REFUNDING BONDS (APPALACHIAN POWER COMPANY - AMOS PROJECT), SERIES 2015A (WV)

WEST VIRGINIA ECONOMIC DEV AUTH SOLID WASTE DISP FACS REV REF BDS AMOS PROJ 2015A (WV)*

Coupon:	2.55%
Maturity Date:	03/01/2040
Dated Date:	04/01/2015
Initial Offering Price/Yield:	100% / 2.55%
Principal Amount at Issuance:	\$86,000,000
Time of Formal Award:	03/13/2019 04:18 PM
Time of First Execution:	03/14/2019 10:00 AM
Closing Date:	04/01/2019
Fiscal Year End Date:	12/31/2021

Price

Yield

Obligor Data

TW | 1M | 3M | 6M | YTD | 1Y | ALL

Mar 15, 2022 - Mar 14, 2021

Trade Date

NOTICE: * CUSIP numbers and certain related descriptive information are copyrighted by the American Bankers Association (ABA) and are used with permission from CUSIP Global Services managed on behalf of the ABA by Standard & Poor's. © 2023 ABA See EMMA's Terms and Conditions of Use for a description of proprietary rights in and restrictions on use of such data. "CUSIP" is a registered trademark of ABA.

To navigate to the comparison charts, click on the blue Obligor Financial Data button or on the Obligor Data tab to the right of yield.

XBRL IN ACTION WITH MUNICIPAL OBLIGORS

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Obligor Financial Data

SECURITY DETAILS

CUSIP: 95648VBE8*

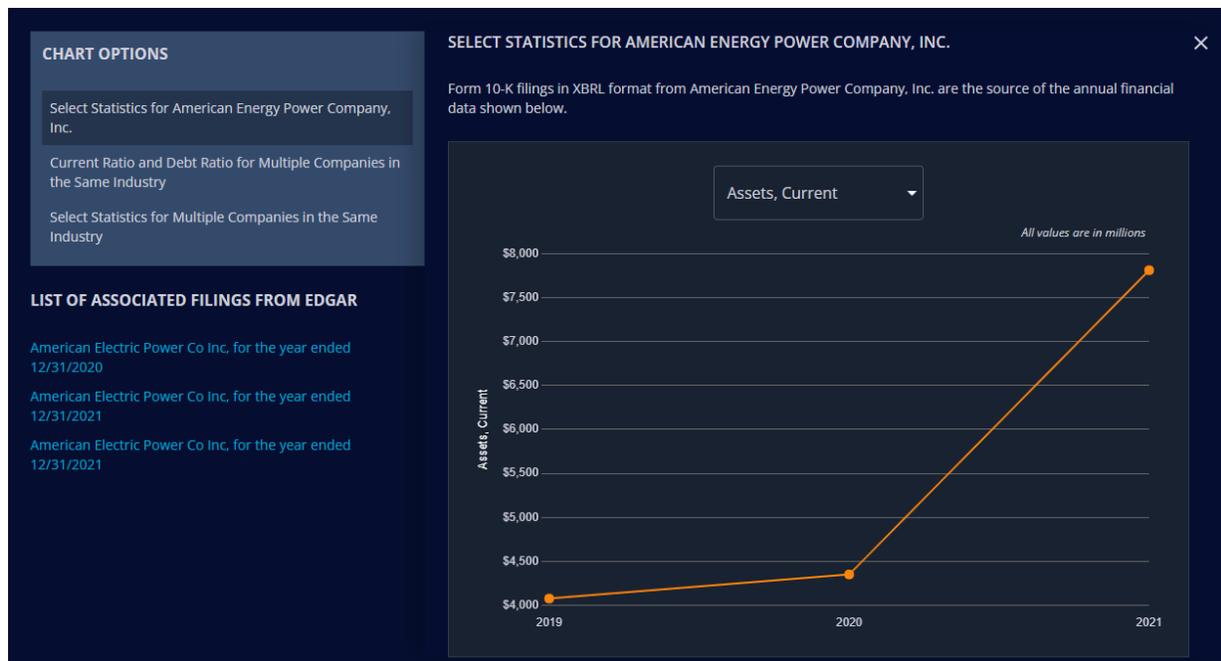
WEST VIRGINIA ECONOMIC DEVELOPMENT AUTHORITY SOLID WASTE DISPOSAL FACILITIES REVENUE REFUNDING BONDS (APPALACHIAN POWER COMPANY - AMOS PROJECT), SERIES 2015A (WV)

WEST VIRGINIA ECONOMIC DEV AUTH SOLID WASTE DISP FACS REV REF BDS AMOS PROJ 2015A (WV)*

Coupon:	2.55%
Maturity Date:	03/01/2040
Dated Date:	04/01/2015
Initial Offering Price/ Yield:	100% / 2.55%
Principal Amount at Issuance:	\$86,000,000
Time of Formal Award:	03/13/2019 04:18 PM
Time of First Execution:	03/14/2019 10:00 AM
Closing Date:	04/01/2019
Fiscal Year End Date:	12/31/2021



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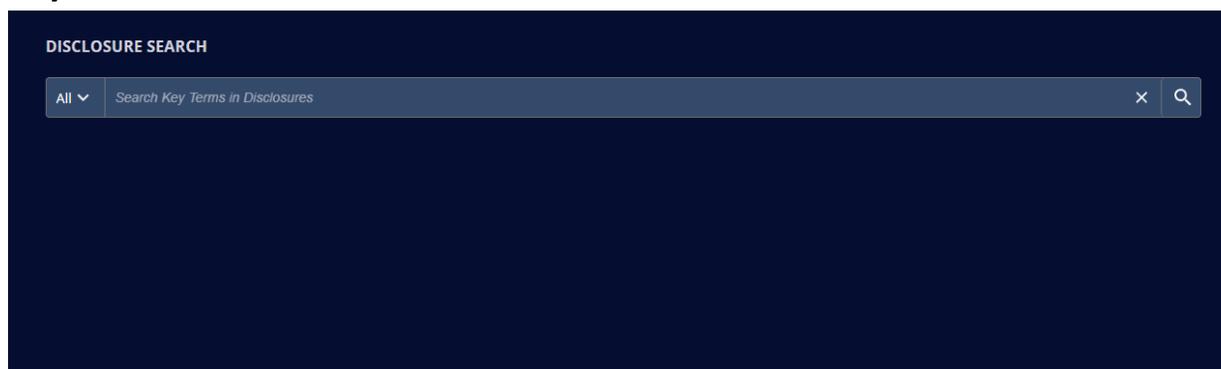
Once opened, the chart tool provides the ability to select different financial statistics on the 3 separate charts using a drop down at the top of the chart page. Each chart provides different selections based on the underlying ACFR documents and the comparisons being made.

You can see a list of Associated Filings from EDGAR to the left of the comparison charts. The list updates dynamically to display the source XBRL document based on what the user selected from the drop-down menu.

Disclosure Search

Disclosure Search processes EMMA's PDF repository into a format that makes it available for search and analytics.

Key Term



To search for disclosure documents on EMMA Labs, enter at least three characters of key terms to the Disclosure Search bar and hit the magnifying glass icon.

Disclosure Type



To search for specific types of disclosure documents, you can use the “Type” drop-down within the search bar to return results based on your specification.

Results Page

The screenshot shows the 'DISCLOSURE SEARCH' interface with the search term 'green bonds'. The search results are displayed in a table format. The table has the following columns: Issuer Name, Issuer State, Disclosure Type, Disclosure Category, and Document Date. The results show 10 documents, all of which are 'Continuing Disclosure' filings. The issuers listed include East Bay California Regional Park District, District Columbia Water & Sewer Authority, Washington Suburban Sanitary District, and Massachusetts St Clean Water Trust.

Issuer Name	Issuer State	Disclosure Type	Disclosure Category	Document Date
EAST BAY CALIFORNIA REGIONAL PARK DISTRICT	CA	Continuing Disclosure	Financial/Operating Filing(s)	09/23/2019
DISTRICT COLUMBIA WATER & SEWER AUTHORITY PUBLIC UTILITY REV	DC	Continuing Disclosure	Event Filing	08/05/2019
EAST BAY CALIFORNIA REGIONAL PARK DISTRICT	CA	Continuing Disclosure	Financial/Operating Filing(s)	09/28/2020
EAST BAY CALIFORNIA REGIONAL PARK DISTRICT	CA	Continuing Disclosure	Financial/Operating Filing(s)	09/27/2021
WASHINGTON SUBURBAN SANITARY DISTRICT MARYLAND	MD	Continuing Disclosure	Financial/Operating Filing(s)	09/09/2021
WASHINGTON SUBURBAN SANITARY DISTRICT MARYLAND	MD	Continuing Disclosure	Financial/Operating Filing(s)	09/09/2021
MASSACHUSETTS ST CLEAN WATER TRUST	MA	Continuing Disclosure	Financial/Operating Filing(s)	09/30/2021
MASSACHUSETTS ST CLEAN WATER TRUST	MA	Continuing Disclosure	Financial/Operating Filing(s)	09/27/2019
MASSACHUSETTS ST CLEAN WATER TRUST	MA	Continuing Disclosure	Financial/Operating Filing(s)	09/30/2020

On the results page, your search term and/or the disclosure type are shown at the top of the results table to inform you what selection(s) were made on the initial search page. To search for a new key term, simply type in a new term in the search bar and hit the magnifying glass icon.

The filters located on the left side of the screen allow you to further refine your results. If you have previously selected a disclosure type, the disclosure type should be selected under the “Disclosure Type” filter. These filters allow for multi-select and you can select as few or as many of them as you prefer. When a filter is selected or unselected, the results table updates to reflect what you have selected. You can reset the filters at any time by hitting the **Reset** button.

Results Table

Results for Search Term: "green bonds", Search Hits: 10000, Downloaded: 1000

View 10 Reset Sort Showing 1 to 10 of 1000 documents. < >

Issuer Name	Issuer State	Disclosure Type ↑	Disclosure Category	Document Date
LONG BEACH CALIFORNIA HARBOR REV	CA	Continuing Disclosure	Financial/Operating Filing(s)	04/20/2020
COLUMBIA S C PARK FACILITIES REV	SC	Continuing Disclosure	Financial/Operating Filing(s)	01/25/2019
REGIONAL TRANSPORTATION DISTRICT COLO SALES TAX REV	CO	Continuing Disclosure	Event Filing	01/28/2021
AMERICAN MUNICIPAL POWER OHIO INCORPORATE SOLAR ELECTRICITY PREPAYMENT PROJ REV	OH	Continuing Disclosure	Financial/Operating Filing(s)	11/25/2020
NORTH TEXAS MUNICIPAL WATER DISTRICT TEXAS REGIONAL WASTEWATER SYSTEM CONTRACT REV	TX	Continuing Disclosure	Financial/Operating Filing(s)	03/31/2021
NEW YORK ST HOUSING FINANCE AGENCY REV	NY	Continuing Disclosure	Financial/Operating Filing(s)	09/30/2021
CHICAGO ILL METROPOLITAN WATER RECLAMATION DISTRICT GREATER CHICAGO	IL	Continuing Disclosure	Financial/Operating Filing(s)	05/13/2020
WASHINGTON ST CONVENTION CENTER PUBLIC FACILITIES DISTRICT	WA	Continuing Disclosure	Financial/Operating Filing(s)	12/20/2021
SANTA FE N MEX GASOLINE TAX GROSS RCPTS TAX IMPROVEMENT REV	NM	Continuing Disclosure	Financial/Operating Filing(s)	03/31/2020
SANTA FE N MEX NET WASTEWATER UTILITY SYSTEM /ENVIRONMENTAL SERVICE GROSS RCPTS TAX IMPROVEMENT REV	NM	Continuing Disclosure	Financial/Operating Filing(s)	03/31/2020

The Results Table displays documents from the most relevant to the search terms to the least relevant. You can sort your result by clicking on the column you would like the results to be ordered by. Click the column again to reverse the sort order. If you would like to return to the original sort order of the results you can click the **Reset Sort** button.

Document Page

When you click on an individual document in the results, the documents page will appear. This page provides the details of the document and allows you to view the pages of the document where the search term was found, highlighting any instances of the term.

The screenshot displays the 'DISCLOSURE SEARCH' interface. On the left sidebar, there are navigation links: 'Back to Results', 'New Search', 'Previous Doc', and 'Next Doc'. Below these, the document details are listed: Issuer Name: LONG BEACH CALIFORNIA HARBOR REV, Issuer State: CA, Disclosure Type: Continuing Disclosure, Disclosure Category: Financial/Operating Filing(s), and Document Date: 04/20/2020. At the bottom of the sidebar are 'EMMA Link' and 'Download' buttons, and a page navigation bar showing 'Page 1 of 24'.

The main content area shows the document title 'THE HARBOR DEPARTMENT OF THE CITY OF LONG BEACH' and 'Notes to Financial Statements' for 'September 30, 2019'. The document text includes three sections: (j) 2017B Harbor Revenue Bonds, (k) 2017C Harbor Revenue Bonds, and (l) 2019A Harbor Revenue Bonds. Each section describes the bond series, their purpose, and redemption terms. The page number '47' and '(Continued)' are visible at the bottom of the document content.

Within the document page, there is a **Back to Results** button you can use to go back to the results page. You can return to the search page and make a new search by using the **New**

Search button. You can use the **Previous Doc** and **Next Doc** button to go to the previous or next document based on the results table.

Additionally, document information such as Issuer Name, Issuer State, Disclosure Type, Disclosure Category, and Document Date are listed on top of the PDF. If you want to view the Document on EMMA, you can click on the **EMMA Link**. This will open a new tab on your browser with the document details of the Issuer.

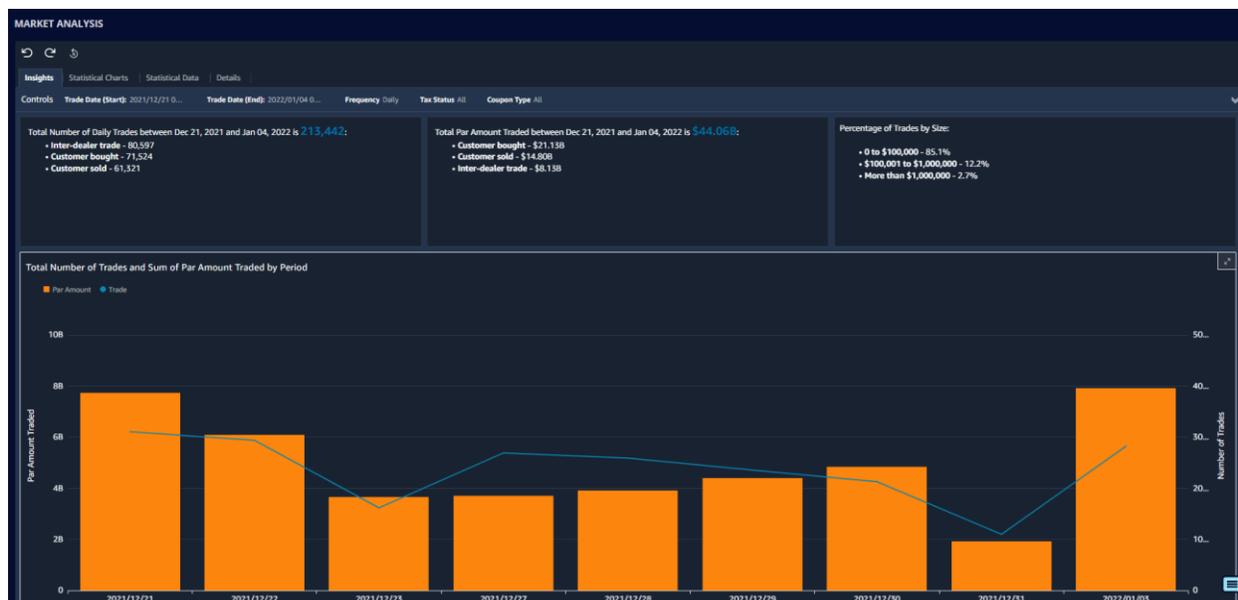
You can download the document you are viewing by clicking the **Download** button. To download documents from EMMA Labs, please ensure your browser allows pop-ups from the EMMA Labs site.

You can also navigate within pages where the search term was located in the document by using the **Page Back** and **Page Forward** button under the **EMMA Link and Download** button.

Market Analysis Tool

The Market Analysis Tool allows users to access, discover and visualize trading trends across the municipal market. The tool makes it easy to use controls and dynamic charts and graphs to manipulate data and analyze the secondary market trading data from RTRS.

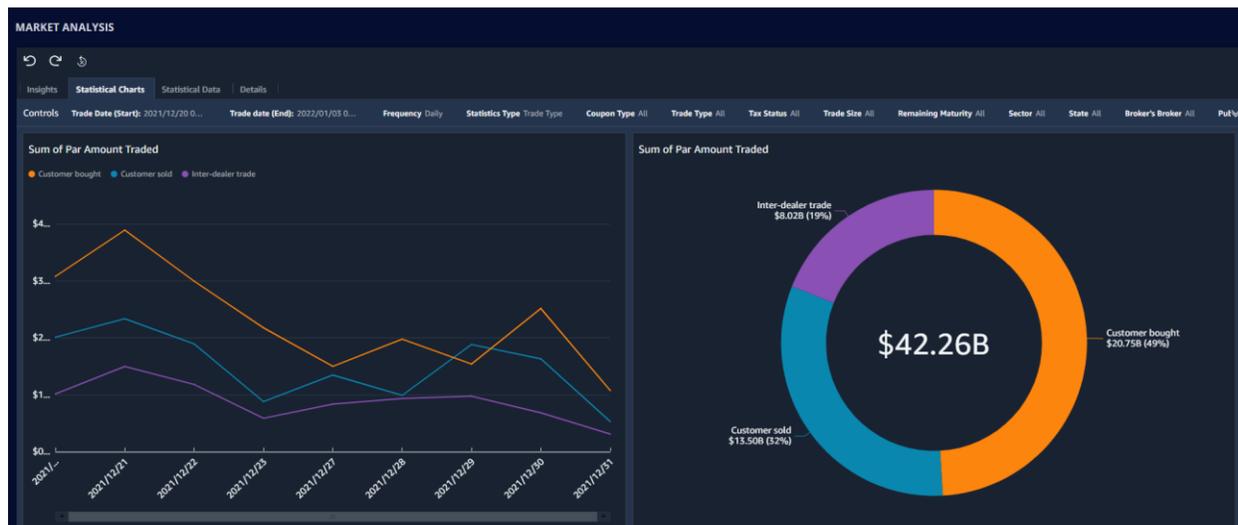
Insights



The Insights tab displays a summary of market activity using tables and graphs to provide users with high-level trade trends. You can further filter the trade data that is displayed on the charts and tables by using the controls listed above the charts, including selecting start and end dates, the frequency to display in dashboard, the tax status and coupon type. There are controls across all tabs of the Market Analysis tool and they may differ depending on which tab you are on.

You can also dynamically update the charts and graphs by clicking on a data point, for example a State on the Total Number of Trades by State chart or a Sector in the Top 10 Sectors by Total Par Amount chart. You can click on the same data point again to return the charts and graphs to their original values.

Statistical Charts



The Statistical Charts tab shows additional detailed trade data charts and graphs, the first two charts displaying the sum of par amount traded, the middle two charts displaying total number of trades and the bottom two charts displaying the total number of distinct securities. You can modify the charts and graphs by using the controls at the top of page and dynamically update them by clicking a data point in any of the sections.

Statistical Data

The Statistical Data tab displays four tables of trade data:

Statistics for Overall Volume

Period	Total Trade	Total Par Amount	Daily Average	No of Days
2021/12/20	29,680	6,106,201,150	6,106,201,150.00	1
2021/12/21	31,062	7,725,203,190	7,725,203,190.00	1
2021/12/22	29,371	6,070,436,693	6,070,436,693.00	1
2021/12/23	16,158	3,643,017,762	3,643,017,762.00	1
2021/12/27	26,919	3,680,780,277	3,680,780,277.00	1
2021/12/28	25,900	3,899,407,456	3,899,407,456.00	1
2021/12/29	23,552	4,397,606,914	4,397,606,914.00	1
2021/12/30	21,274	4,829,211,541	4,829,211,541.00	1
2021/12/31	10,966	1,910,877,000	1,910,877,000.00	1

Statistics for Trade Type

Trade Type	Period	Total Trade	Total Par Amount	Daily Average	No of Days
Customer bought	2021/12/20	9,711	3,080,495,750	3,080,495,750.00	1
	2021/12/21	10,457	3,893,374,658	3,893,374,658.00	1
	2021/12/22	9,854	2,995,660,839	2,995,660,839.00	1
	2021/12/23	5,544	2,176,419,074	2,176,419,074.00	1
	2021/12/27	8,302	1,498,872,731	1,498,872,731.00	1
	2021/12/28	8,970	1,975,834,648	1,975,834,648.00	1
	2021/12/29	7,775	1,539,385,754	1,539,385,754.00	1
	2021/12/30	7,333	2,516,127,203	2,516,127,203.00	1
	2021/12/31	4,246	1,074,061,000	1,074,061,000.00	1
Subtotal	72,192	20,750,231,657	2,305,581,295.22	9	
Customer sold	2021/12/20	10,000	2,010,886,300	2,010,886,300.00	1
	2021/12/21	9,404	2,335,044,310	2,335,044,310.00	1
	2021/12/22	9,361	1,893,815,876	1,893,815,876.00	1
Total	214,882	42,262,741,983	4,695,860,220.33	9	

Statistics for Tax Status

Tax Status	Period	Total Trade	Total Par Amount	Daily Average	No of Days
Not Available	2021/12/21	2	60,000,000	60,000,000.00	1
	Subtotal	2	60,000,000	60,000,000.00	1
Tax Exempt	2021/12/20	27,456	5,424,558,150	5,424,558,150.00	1

Statistics for Coupon Type

Coupon Type	Period	Total Trade	Total Par Amount	Daily Average	No of Days
Fixed Rate	2021/12/20	28,625	3,904,225,400	3,904,225,400.00	1
	2021/12/21	29,843	4,600,561,487	4,600,561,487.00	1
	2021/12/22	28,304	3,634,252,430	3,634,252,430.00	1

The Statistical Data tab shows statistics of trade data in a tabular format, such as the statistics for overall volume, statistics for trade type, statistics for tax status and statistics for coupon type. You can modify the tables by applying controls at the top of the page.

Details

The Details tab on the Market Analysis Tool provides detailed information down to the trade level. You can modify the data provided in the table by applying controls using the panel at the top of the page.

MARKET ANALYSIS

Insights | Statistical Charts | Statistical Data | **Details**

Controls Trade Date (Start): 2021/12/20 0... Trade Date (End): 2022/01/03 0... Frequency Daily Coupon Type All Trade Type All Tax Status All Trade Size All Remaining Maturity All Sector All State All Broker's Broker All Published to Emma All

Par amount may be masked for trades over \$5 million

Trade Date	Issuer Name	MSRB Secur...	Security Description	Maturity ...	Trade
Dec 31, 2021	ABILENE TEXAS	DB-5.0%-dat...	ABILENE TEX CTFS OBLIG	Feb 15, 20...	Custc
Dec 31, 2021	ABILENE TEXAS	DB-5.0%-dat...	ABILENE TEX CTFS OBLIG	Feb 15, 20...	Custc
Dec 31, 2021	ABILENE TEXAS	DB-5.0%-dat...	ABILENE TEX CTFS OBLIG	Feb 15, 20...	Custc
Dec 31, 2021	ABILENE TEXAS	DB-5.0%-dat...	ABILENE TEX CTFS OBLIG	Feb 15, 20...	Inter-
Dec 31, 2021	ABILENE TEXAS	DB-5.0%-dat...	ABILENE TEX CTFS OBLIG	Feb 15, 20...	Custc
Dec 31, 2021	ABILENE TEXAS	DB-5.0%-dat...	ABILENE TEX CTFS OBLIG	Feb 15, 20...	Custc
Dec 31, 2021	ACALANES CALIFORNIA UNION HIGH SCHOOL DISTRICT	GO-4.0%-dat...	ABILENE TEX REF	Feb 15, 20...	Custc
Dec 31, 2021	ACALANES CALIFORNIA UNION HIGH SCHOOL DISTRICT	GO-3.13%-d...	ACALANES CALIF UN HIGH SCH DIST REF-TAXABLE-2015 CROSSOVER-	Aug 1, 2023	Custc
Dec 31, 2021	ACALANES CALIFORNIA UNION HIGH SCHOOL DISTRICT	GO-3.13%-d...	ACALANES CALIF UN HIGH SCH DIST REF-TAXABLE-2015 CROSSOVER-	Aug 1, 2023	Inter-
Dec 31, 2021	ADAMS & HANCOCK CNTYS ILL COMMUNITY UNIT SCHOOL DISTRICT NO 4	GO-4.0%-dat...	ADAMS & HANCOCK CNTYS ILL CMNTY UNIT SCH DIST NO 4 SCH BLDG	Dec 1, 2034	Custc
Dec 31, 2021	ADAMS & HANCOCK CNTYS ILL COMMUNITY UNIT SCHOOL DISTRICT NO 4	GO-4.0%-dat...	ADAMS & HANCOCK CNTYS ILL CMNTY UNIT SCH DIST NO 4 SCH BLDG	Dec 1, 2034	Custc
Dec 31, 2021	ADAMS & HANCOCK CNTYS ILL COMMUNITY UNIT SCHOOL DISTRICT NO 4	GO-4.0%-dat...	ADAMS & HANCOCK CNTYS ILL CMNTY UNIT SCH DIST NO 4 SCH BLDG	Dec 1, 2034	Inter-
Dec 31, 2021	ADAMS & HANCOCK CNTYS ILL COMMUNITY UNIT SCHOOL DISTRICT NO 4	GO-4.0%-dat...	ADAMS & HANCOCK CNTYS ILL CMNTY UNIT SCH DIST NO 4 SCH BLDG	Dec 1, 2034	Inter-
Dec 31, 2021	ADAMS & WELD CNTYS COLO SCHOOL DISTRICT NO 027J BRIGHTON	GO-5.0%-dat...	ADAMS & WELD CNTYS COLO SCH DIST NO 027J BRIGHTON	Dec 1, 2040	Custc
Dec 31, 2021	ADAMS COUNTY COLO CERTIFICATE PARTN	REV-5.0%-da...	ADAMS CNTY COLO CTFS PARTN REF & IMPT	Dec 1, 2023	Custc
Dec 31, 2021	ADAMS COUNTY COLO SCHOOL DISTRICT NO 050 WESTMINSTER	GO-4.0%-dat...	ADAMS CNTY COLO SCH DIST NO 050 WESTMINSTER REF	Dec 1, 2023	Custc
Dec 31, 2021	ADAMS COUNTY COLO SCHOOL DISTRICT NO 050 WESTMINSTER	GO-4.0%-dat...	ADAMS CNTY COLO SCH DIST NO 050 WESTMINSTER REF	Dec 1, 2023	Inter-
Dec 31, 2021	ADAMS COUNTY PENNSYLVANIA GENERAL AUTHORITY COLLEGE REV	REV-3.0%-da...	ADAMS CNTY PA GEN AUTH COLLEGE REV GETTYSBURG COLLEGE	Aug 15, 2...	Custc
Dec 31, 2021	ADAMS COUNTY PENNSYLVANIA GENERAL AUTHORITY COLLEGE REV	REV-3.0%-da...	ADAMS CNTY PA GEN AUTH COLLEGE REV GETTYSBURG COLLEGE	Aug 15, 2...	Custr
Dec 31, 2021	ADAMS COUNTY PENNSYLVANIA GENERAL AUTHORITY COLLEGE REV	REV-3.0%-da...	ADAMS CNTY PA GEN AUTH COLLEGE REV GETTYSBURG COLLEGE	Aug 15, 2...	Inter-

Control Panel

The control panel is available across the tabs of the Market Analysis tool and allows you to further select which trade data you would like to view on the charts, graphs, and tables. To display the available controls on a tab, click the down arrow on the top of the table.

MARKET ANALYSIS

Insights | Statistical Charts | Statistical Data | **Details**

Controls Trade Date (Start): 2021/10/20 ... Trade Date (End): 2021/11/03 ... Frequency Daily Tax Status All Coupon Type All

Total Number of Daily Trades between Oct 20, 2021 and Nov 03, 2021 is **318,587**:

- Customer bought - 114,998
- Inter-dealer trade - 111,094
- Customer sold - 92,295

Total Par Amount Traded between Oct 20, 2021 and Nov 03, 2021 is **\$90,958**:

- Customer bought - \$49,488
- Customer sold - \$23,358
- Inter-dealer trade - \$17,528

Percentage of Trades by Size:

- 0 to \$100,000 - 79.7%
- \$100,001 to \$1,000,000 - 15.6%
- More than \$1,000,000 - 4.6%

The control panel will open, and you will be able to add filters and drill down into the different data available on each tab using the data fields and drop downs.

MARKET ANALYSIS

Insights | Statistical Charts | Statistical Data | **Details**

Controls

Trade Date (Start): 2021/10/20 00:00:00 Trade Date (End): 2021/11/03 00:00:00 Frequency: Daily Tax Status: All

Coupon Type: All

Part IV: Idea Labs

The Idea Labs link provides information on potential concepts you can review and leave feedback on. Idea Labs consist of descriptions of the proposed idea and any additional details or potential value that the idea may provide to municipal market participants.

Navigate to Idea Labs

To navigate to Idea Labs, click on the **Idea Labs** link.

On the Idea Labs page, you can see all the ideas for potential prototypes or concepts. Each idea lab has a topic and a short description of the concept, you can read more about the idea by clicking **Read More**.

The screenshot displays the 'IDEA LABS' section of the EMMA Labs user interface. At the top, it says 'Consider ideas for potential future prototypes and provide your feedback on the concept and prioritization.' Below this, there are six idea cards arranged in a 2x3 grid. Each card has a title, a description, and a 'Read More' link. The first card, 'CUSTOM EMMA EXPERIENCE', has its 'Read More' link highlighted with a red box. The other cards are 'DIGITIZE FACTBOOK', 'STANDARDIZE MUNICIPAL SECURITY CORE DATA', 'ENHANCE SEARCH', 'COMPLIANCE SUPPORT TOOLS', and 'YOUR IDEA LAB'.

Idea Title	Description	Action
CUSTOM EMMA EXPERIENCE	Personalize the EMMA User Experience to Streamline Access to Relevant Information and Tools	Read More
DIGITIZE FACTBOOK	Digitize Annual Fact Book to Provide Dynamic, Interactive Access to Market Data	Read More
STANDARDIZE MUNICIPAL SECURITY CORE DATA	Standardize Municipal Security Core Reference Data to Enhance Market Data Quality	Read More
ENHANCE SEARCH	Enhance Search/Indexing of Disclosure PDFs to Advance Disclosure Analytics	Read More
COMPLIANCE SUPPORT TOOLS	Add Capabilities/Tools for Broker-Dealers and Municipal Advisors to Support Compliance Activity	Read More
YOUR IDEA LAB	Share Your Concept for Collaboration and Testing	Read More

How to review and leave feedback

In the idea lab, there is a description that explains the concept in more detail, and the potential value that the concept would provide. If you would like to leave feedback on the concept, you can click on the **Tell Us What You Think** link.

CUSTOM EMMA EXPERIENCE



Allow for EMMA users to curate their own personalized dashboard, featuring their frequently visited securities, issuers, market statistics pages, tools and more.

Potential Value

Allow for EMMA users to curate their own personalized dashboard, featuring their frequently visited securities, issuers, market statistics pages, tools and more. Since investors, issuers, broker-dealers and municipal advisors often have unique use cases for EMMA, a tailored dashboard for logged-in users could offer streamlined access to relevant municipal market content. Seamlessly add EMMA pages, charts and tables to a user dashboard in order to reduce users' time navigating EMMA for desired information.

Tell Us What You Think

The feedback form will show up on the right side of the screen, you can rate the lab using the icons and leave any comment related to the concept for the MSRB team to review.

The screenshot shows the 'CUSTOM EMMA EXPERIENCE' content from the previous image on the left. On the right, a dark blue feedback form is overlaid. The form has the title 'EMMA LABS FEEDBACK' and the question 'On a scale of 1-5, how much do you like this lab?'. Below the question are five icons representing a scale from 1 (sad face) to 5 (happy face). Underneath the icons is a text input field with the placeholder 'Enter your feedback'. At the bottom of the form is a blue 'Submit' button.

Municipal Securities Rulemaking Board

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EMMA Website: emma.msrb.org