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| Form 1<br>Page 1<br>Execution Page                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | U.S. SECURITIES AND EXCHANGE COMMISSION<br>WASHINGTON, D.C. 20549 | Date filed<br>(MM/DD/YY)<br><br>12/17/18 | OFFICIAL<br>USE<br>ONLY |
| APPLICATION FOR, AND AMENDMENTS TO APPLICATION<br>FOR, REGISTRATION AS A NATIONAL SECURITIES EXCHANGE<br>OR EXEMPTION FROM REGISTRATION PURSUANT TO<br>SECTION 5 OF THE EXCHANGE ACT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                   |                                          |                         |
| WARNING: Failure to keep this form current and to file accurate supplementary information on a timely basis, or the failure to keep accurate books and records or otherwise to comply with the provisions of law applying to the conduct of the applicant would violate the federal securities laws and may result in disciplinary, administrative or criminal action.                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                   |                                          |                         |
| INTENTIONAL MISSTATEMENTS OR OMISSIONS OF FACTS<br>MAY CONSTITUTE CRIMINAL VIOLATIONS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                   |                                          |                         |
| <input type="checkbox"/> APPLICATION <input checked="" type="checkbox"/> AMENDMENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                   |                                          |                         |
| 1. State the name of the applicant: <u>Cboe BZX Exchange, Inc.</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                   |                                          |                         |
| 2. Provide the applicant's primary street address (Do not use a P.O. Box):<br><u>400 South LaSalle Street</u><br><u>Chicago, Illinois 60605</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                   |                                          |                         |
| 3. Provide the applicant's mailing address (if different):<br>_____<br>_____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                   |                                          |                         |
| 4. Provide the business telephone and facsimile number:<br><u>(913) 815-7000</u> (Telephone) <u>(913) 815-7119</u> (Facsimile)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                   |                                          |                         |
| 5. Provide the name, title and telephone number of a contact employee:<br><u>Anders Franzen</u> SVP, Deputy General Counsel, Cboe BZX Exchange, Inc. <u>(913) 815-7154</u><br>(Name) (Title) (Telephone Number)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                   |                                          |                         |
| 6. Provide the name and address of counsel for the applicant:<br><u>Pat Sexton</u><br><u>400 S. LaSalle Street</u><br><u>Chicago, IL 60605</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                   |                                          |                         |
| 7. Provide the date that applicant's fiscal year ends: <u>December 31</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                   |                                          |                         |
| 8. Indicate legal status of the applicant: <input checked="" type="checkbox"/> Corporation <input type="checkbox"/> Sole Partnership <input type="checkbox"/> Partnership<br><input type="checkbox"/> Limited Liability Company <input type="checkbox"/> Other (specify): _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                   |                                          |                         |
| If other than a sole proprietor, indicate the date and place where applicant obtained its legal status (e.g. state where incorporated, place where partnership agreement was filed or where applicant entity was formed):<br>(a) Date (MM/DD/YY): <u>11/01/07</u> (b) State/Country of formation: <u>Delaware/United States of America</u><br>(c) Statute under which applicant was organized: <u>General Corporation Law of the State of Delaware</u>                                                                                                                                                                                                                                                                                                                                                                                  |                                                                   |                                          |                         |
| <b>EXECUTION:</b><br>The applicant consents that service of any civil action brought by, or notice of any proceeding before, the Securities and Exchange Commission in connection with the applicant's activities may be given by registered or certified mail or confirmed telegram to the applicant's contact employee at the main address, or mailing address if different, given in Items 2 and 3. The undersigned, being first duly sworn, deposes and says that he/she has executed this form on behalf of, and with the authority of, said applicant. The undersigned and applicant represent that the information and statement contained herein, including exhibits, schedules, or other documents attached hereto, and other information filed herewith, all of which are made a part hereof, are current, true and complete. |                                                                   |                                          |                         |
| Date: <u>12/17/18</u><br>(MM/DD/YY)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                   |                                          |                         |
| By: <u>[Signature]</u><br>(Signature)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                   |                                          |                         |
| Subscribed and sworn before me this _____ day of _____, _____ by _____<br>(Month) (Year) (Notary Public)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                   |                                          |                         |
| My Commission expires _____ County of _____ State of _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                   |                                          |                         |
| This page must always be completed in full with original, manual signature and notarization.<br>Affix notary stamp or seal where applicable.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                   |                                          |                         |



December 17, 2018

Via Federal Express

Ms. Jeanette Marshall  
Securities and Exchange Commission  
Division of Trading and Markets  
100 F Street, N.E.  
Mail Stop 6628  
Washington, DC 20549-0001

SEC Mail Processing

DEC 18 2018

Washington, DC

Re: **Cboe BZX Exchange, Inc.  
Form 1 Amendment**

Dear Jeanette:

On behalf of Cboe BZX Exchange, Inc. (or the "Exchange"), and in connection with the Cboe Form 1 that is on file with the Securities and Exchange Commission ("Commission"), enclosed please find one original and two copies of the Execution Page to Form 1 as well as the following exhibit<sup>1</sup>:

- Exhibit M (updated to provide a list of firms currently approved as members or other users of the Exchange)

This amendment is filed in accordance with SEC Rule 6a-2 and is intended to replace Exhibit M currently on file with the Commission. Please do not hesitate to contact me if you have any questions or require anything further.

Sincerely,

Kyle Murray  
Assistant General Counsel

Enclosures

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<sup>1</sup> See Attachment for a comprehensive list of updates to Exhibit M



Attachment

*Summary of changes made to Exhibit M:*

- Albert Fried & Company, LLC was terminated from Cboe BZX Exchange, Inc.
- Essex Radez LLC was terminated from Cboe BZX Exchange, Inc.

**Exhibit M**

**Exhibit Request:**

Provide an alphabetical list of all members, participants, subscribers or other users, including the following information:

1. Name,
2. Date of election to membership or acceptance as a participant, subscriber or other user,
3. Principal business address and telephone number,
4. If member, participant, subscriber or other user is an individual, the name of the entity with which such individual is associated and the relationship of such individual to the entity (e.g., partner, officer, director, employee, etc.),
5. Describe the type of activities primarily engaged in by the member, participant, subscriber, or other user (e.g., floor broker, specialist, odd lot dealer, other market maker, proprietary trader, non-broker dealer, inactive or other functions). A person shall be "primarily engaged" in an activity or function for purposes of this item when that activity or function is the one in which that person is engaged for the majority of their time. When more than one type of person at an entity engages in any of the six types of activities or functions enumerated in this item, identify each type (e.g., proprietary trader, Registered Competitive Trader and Registered Competitive Market Maker) and state the number of members, participants, subscribers, or other users in each, and
6. The class of membership, participation or subscription or other access.

**Response:**

Attached please find a list of the current Members and Sponsored Participants accepted as Users of the Exchange.

| Company Name                         | BZX Approval Date | BYX Approval Date | EDGA Approval Date | EDGX Approval Date | CBOE Effective Date | C2 Effective Date | Type of User          | Address                                                                    | Phone Number    | Primary Activities                                                                        |
|--------------------------------------|-------------------|-------------------|--------------------|--------------------|---------------------|-------------------|-----------------------|----------------------------------------------------------------------------|-----------------|-------------------------------------------------------------------------------------------|
| ABN AMRO Clearing Chicago LLC        | 10/15/2008        | 10/1/2010         | 5/25/2010          | 5/27/2010          | 5/13/1985           | 9/24/2010         | Member TPH            | 175 W Jackson Boulevard Suite 400 Chicago, IL 60604                        | 312-604-8000    | Clearing, Transact Business with the Public, Brokerage                                    |
| ACS Execution Services, LLC          | 1/15/2016         | 1/15/2016         | 1/15/2016          | 1/15/2016          | NA                  | NA                | Member TPH            | 12 Broad Street 2nd Floor Red Bank, NJ 07701                               | 732-204-8999    | Proprietary Trading                                                                       |
| Agency Desk, LLC                     | 7/1/2009          | NA                | NA                 | NA                 | NA                  | NA                | Member TPH            | 590 Madison Avenue 21st Floor New York, NY 10022                           | 212-935-9835    | Market Maker                                                                              |
| Akuna Securities LLC                 | 9/15/2015         | NA                | NA                 | 8/14/2017          | 2/2/2012            | 2/12/2015         | Member TPH            | 333 S Wabash Avenue Suite 2600 Chicago, IL 60604                           | 312-994-4640    | Market Maker, Proprietary Trading                                                         |
| All Rise Trading LLC                 | NA                | NA                | NA                 | NA                 | 8/14/2018           | NA                | Member TPH            | 141 W Jackson Blvd., Suite 300A, Chicago, IL 60604                         | 312-483-2147    | Floor Broker                                                                              |
| Alpha Direct LLC                     | 8/20/2015         | 8/20/2015         | 8/20/2015          | 8/20/2015          | NA                  | NA                | Sponsored Participant | 533 2nd Street Encinitas, CA 92024                                         | 858-947-8650    | Proprietary Trading                                                                       |
| Alpha Trading, LP                    | 10/24/2017        | 10/24/2017        | 10/24/2017         | 10/24/2017         | NA                  | NA                | Member TPH            | 640 W California Avenue Sunnyvale, CA 94086                                | 408-990-1940    | Market Maker, Proprietary Trading                                                         |
| Alpine Securities Corporation        | 11/3/2008         | 11/15/2010        | NA                 | NA                 | NA                  | NA                | Member TPH            | 39 Exchange Place Salt Lake City, UT 84111                                 | 801-355-5588    | Agency                                                                                    |
| AMS Derivatives B.V.                 | NA                | NA                | NA                 | NA                 | 12/1/2017           | NA                | Member TPH            | Strawinskylaan 3095 Amsterdam, 1077ZX Netherlands                          | 31-020-708-7000 | Proprietary Trading                                                                       |
| Andrie Trading LLC                   | NA                | NA                | NA                 | NA                 | 10/1/1999           | NA                | Member TPH            | 440 S LaSalle Street Suite 1110 Chicago, IL 60605                          | 312-663-8195    | Market Maker                                                                              |
| Apex Clearing Corporation            | 6/5/2012          | 6/5/2012          | 6/5/2012           | 6/5/2012           | 6/6/2012            | 6/6/2012          | Member TPH            | One Dallas Center 350 N St. Paul, Suite 1300 Dallas, TX 75201              | 214-765-1055    | Clearing, Transact Business with the Public                                               |
| Archipelago Securities LLC           | 8/18/2008         | 9/1/2010          | 5/25/2010          | 5/27/2010          | NA                  | NA                | Member TPH            | 353 N Clark Street Suite 3200 Chicago, IL 60654                            | 312-836-6700    | Limited Routing Facility of ICE affiliated Exchanges                                      |
| Athena Capital Research, LLC         | 7/1/2009          | 10/20/2010        | NA                 | NA                 | NA                  | NA                | Sponsored Participant | 440 9th Avenue 11th Floor New York, NY 10001                               | 212-931-9056    | Proprietary Trading                                                                       |
| ATM Execution LLC                    | 3/15/2012         | 3/15/2012         | 3/21/2012          | 3/21/2012          | NA                  | NA                | Member TPH            | 599 Lexington Avenue 21st Floor New York, NY 10022                         | 646-562-1010    | Public Customer Business                                                                  |
| Barclays Capital Inc.                | 8/18/2008         | 10/1/2010         | 5/14/2010          | 5/14/2010          | 9/22/2008           | 10/6/2010         | Member TPH            | 745 7th Avenue New York, NY 10019                                          | 212-526-7000    | Clearing, Market Maker, Transact Business with the Public, Brokerage, Proprietary Trading |
| Bay Crest Partners, LLC              | 10/15/2008        | NA                | 5/25/2010          | 5/27/2010          | NA                  | NA                | Member TPH            | 40 Wall Street 42nd Floor New York, NY 10005                               | 212-480-1400    | Agency                                                                                    |
| Belvedere Trading LLC                | 11/1/2011         | 3/1/2012          | 11/29/2011         | 10/16/2018         | 1/3/2005            | 4/4/2011          | Member TPH            | 10 S Riverside Plaza Suite 2100 Chicago, IL 60606                          | 312-893-3750    | Market Maker, Proprietary Trading                                                         |
| Bengal Capital Trading LLC           | NA                | NA                | NA                 | NA                 | 1/15/2013           | NA                | Member TPH            | 440 S LaSalle Street Suite 2121 Chicago, IL 60605                          | 312-362-4928    | Proprietary Trading                                                                       |
| Benjamin & Jerold Brokerage I LLC    | 10/1/2009         | 12/11/2017        | 12/11/2017         | 12/11/2017         | NA                  | NA                | Member TPH            | 80 Broad Street 6th Floor New York, NY 10005                               | 646-558-0055    | Agency                                                                                    |
| BGC Financial, LP                    | 8/17/2009         | NA                | NA                 | NA                 | NA                  | NA                | Member TPH            | One Seaport Plaza 19th Floor New York, NY 10038                            | 646-346-7000    | Agency                                                                                    |
| Bloomberg Tradebook LLC              | 10/23/2008        | 10/4/2010         | 5/14/2010          | 5/14/2010          | NA                  | NA                | Member TPH            | 919 3rd Avenue New York, NY 10022                                          | 646-324-3178    | Agency                                                                                    |
| Bluefin Trading, LLC                 | 8/3/2009          | 6/1/2015          | 9/27/2013          | 8/13/2013          | 4/27/2009           | NA                | Member TPH            | 3 Park Avenue 37th Floor New York, NY 10016                                | 212-457-9150    | Market Maker, Proprietary Trading                                                         |
| BMO Capital Markets Corp.            | 8/18/2008         | 11/15/2010        | 7/15/2014          | 7/15/2014          | 10/8/2013           | 11/15/2013        | Member TPH            | 3 Times Square New York, NY 10036                                          | 212-885-4000    | Clearing, Proprietary Trading, Transact Business with the Public, Brokerage               |
| BMT Trading, LLC                     | 2/1/2010          | NA                | NA                 | NA                 | NA                  | NA                | Sponsored Participant | 800 3rd Avenue New York, NY 10022                                          | 212-813-0870    | Proprietary Trading                                                                       |
| BNP Paribas Securities Corp.         | 8/18/2008         | 9/15/2010         | 5/25/2010          | 5/27/2010          | 1/5/2005            | 10/15/2010        | Member TPH            | 787 7th Avenue New York, NY 10019                                          | 212-841-2000    | Clearing, Order Flow Provider, Proprietary Trading, Transact Business with the Public     |
| BNY Mellon Capital Markets, LLC      | NA                | NA                | NA                 | 1/17/2017          | NA                  | NA                | Member TPH            | 101 Barclay Street New York, NY 10286                                      | 212-815-4972    | Market Maker                                                                              |
| Boerboel Capital LLC                 | 11/17/2017        | NA                | NA                 | NA                 | 2/1/2017            | NA                | Member TPH            | 300 N LaSalle Street Suite 2060 Chicago, IL 60654                          | 708-967-6843    | Market Maker                                                                              |
| Boerboel Trading LP                  | 10/15/2018        | 10/15/2018        | 10/15/2018         | 10/15/2018         | NA                  | NA                | Sponsored Participant | Maples Corporate Services PO Box 309, Ugland House Cayman Islands KY1-1104 | *****           | Proprietary Trading                                                                       |
| BoiAML Securities, Inc.              | 9/19/2018         | 9/19/2018         | 9/19/2018          | 9/19/2018          | NA                  | NA                | Member TPH            | One Bryant Park New York, NY 10036                                         | 201-671-5685    | Clearing Services, Firm Proprietary Trading, Public Customer Business                     |
| BTIG, LLC                            | 8/18/2008         | 11/15/2010        | 5/25/2010          | 5/27/2010          | NA                  | NA                | Member TPH            | 600 Montgomery Street 6th Floor San Francisco, CA 94111                    | 415-248-2200    | Market Maker                                                                              |
| C&C Trading LLC                      | 8/18/2008         | 10/11/2010        | 5/25/2010          | 5/27/2010          | NA                  | NA                | Member TPH            | 71 Arch Street 1st Floor Greenwich, CT 06830                               | 212-706-1227    | Proprietary Trading                                                                       |
| Canaccord Genuity LLC                | 10/1/2013         | 10/1/2013         | 6/10/2010          | 6/10/2010          | NA                  | NA                | Member TPH            | 535 Madison Avenue New York, NY 10022                                      | 212-389-8000    | Market Maker                                                                              |
| Canadian Imperial Holdings, Inc.     | 10/15/2008        | 11/15/2010        | NA                 | NA                 | NA                  | NA                | Sponsored Participant | 300 Madison Avenue 5th Floor New York, NY 10017                            | 212-856-3877    | Proprietary Trading                                                                       |
| Cantor Fitzgerald & Co.              | 10/23/2008        | 2/13/2015         | 5/25/2010          | 5/27/2010          | NA                  | NA                | Member TPH            | 110 E 59th Street 4th Floor New York, NY 10022                             | 212-938-5000    | Agency, Institutional Trading                                                             |
| Capital Institutional Services, Inc. | 8/18/2008         | NA                | 5/25/2010          | 5/27/2010          | NA                  | NA                | Member TPH            | 1700 Pacific Avenue Suite 1100 Dallas, TX 75201                            | 214-720-0055    | Agency                                                                                    |
| Cardinal Capital Management, LLC     | NA                | NA                | NA                 | NA                 | 10/1/2007           | NA                | Member TPH            | 141 W Jackson Boulevard Suite 2200A Chicago, IL 60604                      | 312-477-8400    | Market Maker                                                                              |
| Cboe Trading, Inc.                   | 10/23/2008        | 9/1/2010          | 5/14/2010          | 5/14/2010          | NA                  | 4/18/2018         | Member TPH            | 8050 Marshall Drive Suite 120 Lenexa, KS 66214                             | 913-815-7000    | Limited Routing Facility of Cboe affiliated Exchanges                                     |
| CF Global Trading, LLC               | 10/23/2008        | 1/3/2011          | NA                 | NA                 | NA                  | NA                | Member TPH            | 60 E 42nd Street Suite 1455 New York, NY 10165                             | 212-888-4711    | Market Maker                                                                              |
| Charles Schwab & Co., Inc.           | NA                | NA                | NA                 | 4/3/2017           | 6/2/1980            | NA                | Member TPH            | 211 Main Street San Francisco, CA 94105                                    | 415-636-7000    | Clearing, Transact Business with the Public                                               |
| Chimera Securities, LLC              | 6/2/2014          | 6/2/2014          | 6/25/2014          | 6/25/2014          | NA                  | NA                | Member TPH            | 27 Union Square W 4th Floor New York, NY 10003                             | 646-597-6100    | Proprietary Trading                                                                       |

| Company Name                                | BZX Approval Date | BYX Approval Date | EDGA Approval Date | EDGX Approval Date | CBOE Effective Date | C2 Effective Date | Type of User          | Address                                                                  | Phone Number | Primary Activities                                                                        |
|---------------------------------------------|-------------------|-------------------|--------------------|--------------------|---------------------|-------------------|-----------------------|--------------------------------------------------------------------------|--------------|-------------------------------------------------------------------------------------------|
| Chimera Securities, LLC                     | 11/17/2017        | 11/27/2017        | 11/27/2017         | 11/17/2017         | NA                  | NA                | Sponsored Participant | 27 Union Square W<br>4th Floor<br>New York, NY 10003                     | 646-597-6100 | Proprietary Trading                                                                       |
| CIBC World Markets Corp.                    | 8/18/2008         | 11/15/2010        | NA                 | NA                 | 2/14/1973           | NA                | Member<br>TPH         | 425 Lexington Avenue<br>New York, NY 10017                               | 212-856-4000 | Clearing, Transact Business with the Public                                               |
| Citadel Securities LLC                      | 10/23/2008        | 10/1/2010         | 5/14/2010          | 5/14/2010          | 4/17/2002           | 10/7/2010         | Member<br>TPH         | 131 S Dearborn Street<br>32nd Floor<br>Chicago, IL 60603                 | 312-395-2100 | Market Maker, Order Flow Provider, Brokerage                                              |
| Citi Order Routing and Execution, LLC       | 8/18/2008         | 9/15/2010         | 5/25/2010          | 5/27/2010          | 10/1/2008           | 9/24/2010         | Member<br>TPH         | 11 Ewall Street<br>Mount Pleasant, SC 29464                              | 843-789-2080 | Clearing, Transact Business with the Public                                               |
| Citigroup Derivatives Markets Inc.          | 2/15/2018         | NA                | NA                 | 2/15/2018          | 12/3/2004           | 2/25/2011         | Member<br>TPH         | 130 Cheshire Lane<br>Suite 102<br>Minnetonka, MN 55305                   | 212-723-2960 | Market Maker                                                                              |
| Citigroup Global Markets Inc.               | 9/24/2008         | 12/15/2010        | 5/25/2010          | 5/27/2010          | 5/2/2011            | NA                | Member<br>TPH         | 390-388 Greenwich Street<br>New York, NY 10013                           | 212-816-6000 | Clearing, Proprietary Trading, Transact Business with the Public                          |
| Clarksons Platau Securities, Inc.           | NA                | NA                | 1/15/2015          | NA                 | NA                  | NA                | Member<br>TPH         | 280 Park Avenue<br>21st Floor<br>New York, NY 10017                      | 212-317-7080 | Public Customer Business                                                                  |
| Clearpool Execution Services, LLC           | 5/15/2014         | 5/15/2014         | 6/16/2014          | 6/16/2014          | NA                  | NA                | Member<br>TPH         | 17 State Street<br>38th Floor<br>New York, NY 10004                      | 212-531-8500 | Public Customer Business                                                                  |
| CLSA Americas, LLC                          | NA                | NA                | 5/21/2013          | 5/21/2013          | NA                  | NA                | Member<br>TPH         | 1301 Avenue of the Americas<br>15th Floor<br>New York, NY 10019          | 212-549-5097 | Agency                                                                                    |
| CM-CIC Market Solutions, Inc.               | 8/18/2008         | NA                | NA                 | NA                 | NA                  | NA                | Member<br>TPH         | 520 Madison Avenue<br>New York, NY 10022                                 | 212-659-6292 | Agency                                                                                    |
| CMT Fund XXV Limited                        | 7/2/2012          | 7/2/2012          | NA                 | NA                 | NA                  | NA                | Sponsored Participant | 500 W Monroe Street<br>Suite 2630<br>Chicago, IL 60661                   | 312-320-7897 | Agency                                                                                    |
| CMT Trading LLC                             | 3/17/2014         | 3/17/2014         | 3/5/2014           | 3/5/2014           | NA                  | NA                | Member<br>TPH         | 500 W Monroe Street<br>Suite 2630<br>Chicago, IL 60661                   | 312-930-9050 | Market Maker, Proprietary Trading                                                         |
| CMZ Trading, LLC                            | NA                | NA                | NA                 | NA                 | 10/1/2004           | NA                | Member<br>TPH         | 141 W Jackson Boulevard<br>Suite 826<br>Chicago, IL 60604                | 312-604-3310 | Market Maker, Proprietary Trading                                                         |
| CODA Markets, Inc.                          | 10/15/2008        | 10/4/2010         | 5/26/2010          | 5/27/2010          | NA                  | NA                | Member<br>TPH         | 2624 Patriot Boulevard<br>Glenview, IL 60026                             | 224-521-2700 | ATS                                                                                       |
| Cognitive Capital, LLC                      | NA                | NA                | NA                 | NA                 | 5/13/2004           | NA                | Member<br>TPH         | 141 W Jackson Boulevard<br>Suite 1620<br>Chicago, IL 60604               | 312-431-0400 | Proprietary Trading                                                                       |
| Comhar Capital Markets, LLC                 | 2/27/2017         | NA                | NA                 | NA                 | NA                  | NA                | Member<br>TPH         | 311 S Wacker Drive<br>Suite 2280A<br>Chicago, IL 60606                   | 872-205-0190 | Proprietary Trading                                                                       |
| Consolidated Trading, LLC                   | NA                | NA                | NA                 | NA                 | 1/2/2002            | NA                | Member<br>TPH         | 71 S Wacker Drive<br>Suite 2300<br>Chicago, IL 60606                     | 312-360-7300 | Market Maker                                                                              |
| COR Clearing LLC                            | 10/15/2009        | NA                | NA                 | NA                 | NA                  | NA                | Member<br>TPH         | 1200 Landmark Center<br>1299 Farmers Street Suite 800<br>Omaha, NE 68102 | 402-384-6100 | Clearing Services                                                                         |
| Cowen and Company, LLC                      | 8/18/2008         | 10/7/2010         | 5/14/2010          | 5/14/2010          | NA                  | NA                | Member<br>TPH         | 599 Lexington Avenue<br>20th Floor<br>New York, NY 10022                 | 646-562-1010 | Market Maker                                                                              |
| Cowen Execution Services LLC                | 10/15/2008        | 9/1/2010          | 5/25/2010          | 5/27/2010          | NA                  | NA                | Member<br>TPH         | 1633 Broadway<br>48th Floor<br>New York, NY 10019                        | 800-367-8998 | Full Service                                                                              |
| Cowen Prime Services LLC                    | 3/15/2011         | 3/15/2011         | NA                 | NA                 | NA                  | NA                | Member<br>TPH         | 599 Lexington Avenue<br>21st Floor<br>New York, NY 10022                 | 646-562-1010 | Public Customer Business, Proprietary Trading                                             |
| Credit Suisse Securities (USA) LLC          | 9/3/2008          | 10/1/2010         | 5/25/2010          | 5/27/2010          | 8/14/1981           | 10/8/2010         | Member<br>TPH         | 11 Madison Avenue<br>New York, NY 10010                                  | 212-325-2000 | Clearing, Proprietary Trading, Transact Business with the Public, Brokerage               |
| Critical Trading, LLC                       | 7/1/2014          | 6/8/2018          | NA                 | 6/8/2018           | NA                  | NA                | Member<br>TPH         | 120 W 45th Street<br>15th Floor<br>New York, NY 10036                    | 646-918-0529 | Market Maker, Proprietary Trading                                                         |
| CSS, LLC                                    | NA                | NA                | NA                 | NA                 | 8/21/1998           | NA                | Member<br>TPH         | 175 W Jackson Boulevard<br>Suite 440<br>Chicago, IL 60604                | 312-542-8505 | Proprietary Trading                                                                       |
| CTC, LLC                                    | 3/15/2018         | NA                | NA                 | NA                 | 3/25/1998           | 3/3/2011          | Member<br>TPH         | 440 S LaSalle Street<br>4th Floor<br>Chicago, IL 60605                   | 312-863-8000 | Market Maker                                                                              |
| Cutler Group, LP                            | 4/1/2010          | 10/6/2010         | NA                 | 10/16/2015         | 4/5/1999            | 9/4/2018          | Member<br>TPH         | 101 Montgomery Street<br>Suite 700<br>San Francisco, CA 94104            | 415-293-3956 | Market Maker, Proprietary Trading                                                         |
| Dash Financial Technologies LLC             | 10/23/2008        | 7/2/2012          | 6/9/2010           | 6/9/2010           | 5/19/2000           | 9/30/2010         | Member<br>TPH         | 311 S Wacker Drive<br>Suite 1000<br>Chicago, IL 60606                    | 312-986-2006 | Clearing, Floor Broker, Order Flow Provider, Transact Business with the Public, Brokerage |
| Deutsche Bank Securities Inc.               | 10/15/2008        | 10/11/2010        | 5/21/2010          | 5/21/2010          | 4/25/1996           | 8/15/2011         | Member<br>TPH         | 60 Wall Street<br>New York, NY 10005                                     | 212-250-2500 | Clearing, Proprietary Trading, Transact Business with the Public, Brokerage               |
| DRW Securities, LLC                         | 9/1/2009          | 11/1/2010         | 5/25/2010          | 5/27/2010          | 11/23/1998          | 1/22/2016         | Member<br>TPH         | 540 W Madison Street<br>Suite 2500<br>Chicago, IL 60661                  | 312-542-1000 | Market Maker, Proprietary Trading                                                         |
| DRW Singapore Ltd.                          | 11/19/2018        | NA                | NA                 | 11/19/2018         | NA                  | NA                | Sponsored Participant | 8 Marina View<br>Asia Square Tower 1   #32-05<br>Singapore 018960        | 312-542-1005 | Proprietary Trading                                                                       |
| Dynamic Technology Lab Pte. Ltd.            | 11/5/2018         | 11/5/2018         | 11/5/2018          | 11/5/2018          | NA                  | NA                | Sponsored Participant | 07-00, 178 Clemenceau Avenue<br>Singapore 239926                         | 656-610-4693 | Proprietary Trading                                                                       |
| E*TRADE Securities LLC                      | NA                | NA                | NA                 | 6/10/2010          | NA                  | NA                | Member<br>TPH         | 11 Times Square<br>32nd Floor<br>New York, NY 10036                      | 646-521-4300 | Public Customer Business                                                                  |
| EG Market Technologies LLC                  | 4/3/2017          | 4/3/2017          | 4/3/2017           | 4/3/2017           | NA                  | NA                | Member<br>TPH         | 787 5th Avenue<br>45th Floor<br>New York, NY 10153                       | 646-757-2831 | Market Maker, Proprietary Trading                                                         |
| Electronic Transaction Clearing, Inc.       | 10/23/2008        | 9/1/2010          | 5/25/2010          | 5/27/2010          | NA                  | NA                | Member<br>TPH         | 660 S Figueroa Street<br>Los Angeles, CA 90017                           | 949-533-1885 | Market Maker                                                                              |
| Essex Radez LLC                             | NA                | 10/1/2010         | NA                 | NA                 | NA                  | NA                | Member<br>TPH         | 440 S LaSalle Street<br>Suite 1111<br>Chicago, IL 60605                  | 312-212-1815 | Market Maker                                                                              |
| Evercore Group LLC                          | NA                | NA                | 5/10/2017          | NA                 | NA                  | NA                | Member<br>TPH         | 55 E 52nd Street<br>New York, NY 10055                                   | 212-857-3100 | Public Customer Business                                                                  |
| FIS Brokerage & Securities Services LLC     | 8/18/2008         | 10/1/2010         | 5/6/2010           | 5/6/2010           | NA                  | NA                | Member<br>TPH         | 2100 Enterprise Avenue<br>Geneva, IL 60134                               | 630-482-7100 | Agency                                                                                    |
| Flow Traders U.S. Institutional Trading LLC | NA                | NA                | 6/1/2016           | NA                 | NA                  | NA                | Member<br>TPH         | 1114 Avenue of the Americas<br>4th Floor<br>New York, NY 10036           | 917-210-5000 | Riskless Principal                                                                        |
| Flow Traders U.S. LLC                       | 10/1/2009         | 8/1/2012          | 2/28/2014          | 2/28/2014          | 8/31/2010           | NA                | Member<br>TPH         | 1114 Avenue of the Americas<br>4th Floor<br>New York, NY 10036           | 917-210-5000 | Proprietary Trading                                                                       |
| G1 Execution Services, LLC                  | 8/18/2008         | 12/1/2010         | 4/17/2010          | 4/17/2010          | NA                  | NA                | Member<br>TPH         | 175 W Jackson Boulevard<br>Suite 1700<br>Chicago, IL 60604               | 312-362-0404 | Market Maker                                                                              |

| Company Name                                                   | BZX Approval Date | BYX Approval Date | EDGA Approval Date | EDGX Approval Date | CBOE Effective Date | C2 Effective Date | Type of User          | Address                                                                        | Phone Number | Primary Activities                                                                        |
|----------------------------------------------------------------|-------------------|-------------------|--------------------|--------------------|---------------------|-------------------|-----------------------|--------------------------------------------------------------------------------|--------------|-------------------------------------------------------------------------------------------|
| G2 Trading LLC                                                 | 6/1/2016          | NA                | NA                 | NA                 | NA                  | NA                | Member TPH            | 325 S Sangamon Street<br>Chicago, IL 60607                                     | 404-697-9915 | Market Maker, Proprietary Trading                                                         |
| Gelber Securities, LLC                                         | 5/1/2015          | NA                | NA                 | NA                 | NA                  | NA                | Member TPH            | 350 N Orleans Street<br>7th Floor<br>Chicago, IL 60654                         | 312-408-4354 | Market Maker, Proprietary Trading                                                         |
| Geneva Stock, LLC                                              | NA                | NA                | NA                 | NA                 | 4/6/2001            | NA                | Member TPH            | 440 S LaSalle Street<br>Suite 1711<br>Chicago, IL 60605                        | 312-362-4404 | Market Maker                                                                              |
| Global Execution Brokers, LP                                   | 2/1/2010          | 10/5/2010         | 12/1/2015          | 10/15/2015         | 12/23/2003          | 9/24/2010         | Member TPH            | 401 City Avenue<br>Bala Cynwyd, PA 19004                                       | 610-617-2600 | Floor Broker, Transact Business with the Public, Brokerage                                |
| Global HFT Management, LLC                                     | 10/1/2010         | NA                | NA                 | NA                 | NA                  | NA                | Sponsored Participant | 800 3rd Avenue<br>New York, NY 10022                                           | 212-813-0870 | Proprietary Trading                                                                       |
| Global Liquidity Partners, LLC                                 | 4/21/2011         | 5/15/2012         | NA                 | NA                 | NA                  | NA                | Sponsored Participant | 12 Broad Street<br>Suite 201<br>Redbank, NJ 07701                              | 773-459-4665 | Agency                                                                                    |
| Goldman Sachs & Co. LLC                                        | 10/23/2008        | 10/12/2010        | 5/14/2010          | 5/14/2010          | 2/21/1973           | 10/8/2010         | Member TPH            | 200 West Street<br>New York, NY 10282                                          | 212-902-1000 | Clearing, Market Maker, Proprietary Trading, Transact Business with the Public, Brokerage |
| Gordon, Haskett Capital Corporation                            | NA                | NA                | NA                 | 5/2/2016           | NA                  | NA                | Member TPH            | 441 Lexington Avenue<br>10th Floor<br>New York, NY 10017                       | 212-893-0600 | Agency, Institutional Trading                                                             |
| Green Street Trading, LLC                                      | 11/1/2011         | NA                | NA                 | NA                 | NA                  | NA                | Member TPH            | 660 Newport Center Drive<br>Suite 800<br>Newport Beach, CA 92660               | 214-749-4730 | Agency                                                                                    |
| Group One Trading, LP                                          | 6/2/2015          | NA                | NA                 | 9/29/2015          | 11/23/1994          | NA                | Member TPH            | 440 S LaSalle Street<br>Suite 3232<br>Chicago, IL 60605                        | 312-347-8664 | Market Maker                                                                              |
| GTS Securities LLC                                             | 12/17/2013        | 5/1/2012          | 6/2/2014           | 6/2/2014           | NA                  | NA                | Member TPH            | 545 Madison Avenue<br>15th Floor<br>New York, NY 10022                         | 212-715-2830 | Market Maker, Proprietary Trading                                                         |
| Hainey Investments Limited                                     | 6/16/2014         | NA                | NA                 | NA                 | NA                  | NA                | Sponsored Participant | Themistokli Derwi 41 #806-807<br>Nicosia, Cyprus                               | 704-248-8221 | Proprietary Trading                                                                       |
| HAP Trading, LLC                                               | 10/1/2009         | 11/15/2010        | NA                 | 6/2/2010           | 3/16/2001           | NA                | Member TPH            | 395 Hudson Street<br>Suite 701<br>New York, NY 10014                           | 212-380-5100 | Market Maker, Proprietary Trading                                                         |
| Hardcastle Trading USA LLC                                     | 4/15/2009         | NA                | 5/25/2010          | 5/27/2010          | 5/16/2005           | NA                | Member TPH            | 755 Secaucus Road<br>Suite F-1110<br>Secaucus, NJ 07094                        | 201-305-8888 | Proprietary Trading                                                                       |
| Headlands Technologies LLC                                     | 10/15/2018        | 10/15/2018        | 10/15/2018         | 10/15/2018         | NA                  | NA                | Sponsored Participant | 155 N Wacker Drive, Suite 1900<br>Chicago, IL 60606                            | 312-601-8649 | Proprietary Trading                                                                       |
| Hehmeyer, LLC                                                  | 10/3/2016         | 10/3/2016         | 10/3/2016          | 10/3/2016          | NA                  | NA                | Sponsored Participant | 601 S LaSalle Street<br>2nd Floor<br>Chicago, IL 60605                         | 312-327-4112 | Proprietary Trading                                                                       |
| Henning-Carey Proprietary Trading, LLC                         | 8/15/2012         | NA                | NA                 | NA                 | NA                  | NA                | Sponsored Participant | 141 W Jackson Boulevard<br>Suite 1801<br>Chicago, IL 60604                     | 312-789-8764 | Proprietary Trading                                                                       |
| Highbridge Capital Management, LLC                             | 10/23/2008        | NA                | NA                 | NA                 | NA                  | NA                | Sponsored Participant | 9 West 57th Street<br>27th Floor<br>New York, NY 10019                         | 212-287-4900 | Proprietary Trading                                                                       |
| Hilltop Securities Inc.                                        | 10/23/2008        | 9/1/2010          | NA                 | 5/21/2013          | 10/1/2010           | NA                | Member TPH            | 1201 Elm Street<br>Suite 3500<br>Dallas, TX 75270                              | 214-859-1800 | Clearing, Transact Business with the Public                                               |
| HRT Execution Services LLC                                     | 8/18/2008         | 10/1/2010         | 5/26/2010          | 5/27/2010          | NA                  | NA                | Member TPH            | 100 S Wacker Drive<br>Suite 300<br>Chicago, IL 60606                           | 312-924-4777 | Market Maker, Proprietary Trading                                                         |
| HRT Financial LLC                                              | 2/1/2010          | 10/1/2010         | 5/18/2010          | 5/18/2010          | 1/24/2011           | 1/24/2011         | Member TPH            | 4 World Trade Center<br>150 Greenwich Street, 57th Floor<br>New York, NY 10007 | 212-293-1444 | Proprietary Trading                                                                       |
| HSBC Securities (USA) Inc.                                     | 4/3/2017          | 4/3/2017          | 4/3/2017           | 4/3/2017           | 11/21/2005          | NA                | Member TPH            | 452 Fifth Avenue<br>New York, NY 10018                                         | 224-880-7116 | Clearing, Transact Business with the Public                                               |
| ICAP Corporates LLC                                            | NA                | NA                | 3/28/2013          | NA                 | NA                  | NA                | Member TPH            | Harborside 5<br>Hudson Street, Suite 1200<br>Jersey City, NJ 07311             | 212-341-9944 | Agency                                                                                    |
| IEX Services LLC                                               | 10/1/2013         | 10/1/2013         | 9/24/2013          | 9/24/2013          | NA                  | NA                | Member TPH            | 4 World Trade Center<br>44th Floor<br>New York, NY 10007                       | 646-343-2000 | Limited Routing Facility of IEX affiliated Exchanges                                      |
| IMC-Chicago LLC dba IMC Financial Markets                      | 8/18/2008         | 10/1/2010         | 5/25/2010          | 5/27/2010          | 7/5/2000            | 9/24/2010         | Member TPH            | 233 S Wacker Drive<br>Suite 4300<br>Chicago, IL 60606                          | 312-244-3300 | Market Maker, Proprietary Trading                                                         |
| IMC-Chicago LLC dba IMC Financial Markets                      | 11/5/2018         | 11/5/2018         | 11/5/2018          | 11/5/2018          | NA                  | NA                | Sponsored Participant | 233 S Wacker Drive<br>Suite 4300<br>Chicago, IL 60606                          | 312-244-3300 | Market Maker, Proprietary Trading                                                         |
| Industrial and Commercial Bank of China Financial Services LLC | 5/15/2014         | 5/15/2014         | NA                 | NA                 | NA                  | NA                | Member TPH            | 1633 Broadway<br>28th Floor<br>New York, NY 10019                              | 212-993-7300 | Clearing Services                                                                         |
| Instinet LLC                                                   | 8/18/2008         | 9/1/2010          | 5/14/2010          | 5/14/2010          | 12/29/2009          | 10/6/2010         | Member TPH            | Worldwide Plaza<br>309 W 49th Street<br>New York, NY 10019                     | 212-310-9500 | Clearing, Transact Business with the Public, Brokerage                                    |
| Interactive Brokers Corp.                                      | NA                | NA                | NA                 | NA                 | 4/21/2009           | 10/6/2010         | Member TPH            | 8 Greenwich Office Park<br>Greenwich, CT 06831                                 | 203-618-5700 | Floor Broker, Brokerage                                                                   |
| Interactive Brokers LLC                                        | 8/18/2008         | 9/15/2010         | 5/25/2010          | 5/27/2010          | NA                  | NA                | Member TPH            | One Pickwick Plaza<br>2nd Floor<br>Greenwich, CT 06830                         | 203-618-5710 | Full Service                                                                              |
| International Correspondent Trading, Inc.                      | 8/18/2008         | NA                | NA                 | NA                 | NA                  | NA                | Member TPH            | One University Plaza<br>Suite 301<br>Hackensack, NJ 07601                      | 201-222-9300 | Agency                                                                                    |
| Israel A. Englander & Co., LLC                                 | NA                | NA                | NA                 | NA                 | 10/27/1995          | 9/24/2010         | Member TPH            | 666 5th Avenue<br>14th Floor<br>New York, NY 10103                             | 212-841-4567 | Floor Broker, Transact Business with the Public, Brokerage                                |
| ISTRAL, LLC                                                    | 12/15/2011        | 12/15/2011        | NA                 | NA                 | NA                  | NA                | Sponsored Participant | 230 Park Avenue<br>10th Floor<br>New York, NY 10169                            | 718-618-4929 | Proprietary Trading                                                                       |
| ITG Inc.                                                       | 8/18/2008         | 10/1/2010         | 5/25/2010          | 5/27/2010          | NA                  | NA                | Member TPH            | One Liberty Plaza<br>165 Broadway, 4th Floor<br>New York, NY 10006             | 212-588-4000 | Agency                                                                                    |
| J.P. Morgan Securities LLC                                     | 8/18/2008         | 9/15/2010         | 5/14/2010          | 5/14/2010          | 10/29/1985          | 11/18/2010        | Member TPH            | 383 Madison Avenue<br>New York, NY 10179                                       | 212-272-2000 | Clearing, Transact Business with the Public                                               |
| Jane Street Capital, LLC                                       | 5/1/2009          | 11/15/2010        | 5/14/2010          | 5/14/2010          | 9/4/2012            | NA                | Member TPH            | 250 Vesey Street<br>5th Floor<br>New York, NY 10281                            | 646-759-6000 | Market Maker, Proprietary Trading                                                         |
| Jane Street Options, LLC                                       | 4/15/2016         | NA                | NA                 | 11/9/2018          | 5/2/2005            | NA                | Member TPH            | 250 Vesey Street<br>5th Floor<br>New York, NY 10281                            | 646-759-6000 | Market Maker                                                                              |
| Jefferies Investment Advisers                                  | 7/1/2011          | 7/15/2011         | NA                 | NA                 | NA                  | NA                | Sponsored Participant | 520 Madison Avenue<br>New York, NY 10022                                       | 212-323-3993 | Full Service                                                                              |
| Jefferies LLC                                                  | 10/23/2008        | 10/19/2010        | 5/25/2010          | 5/27/2010          | 7/9/2012            | 7/18/2012         | Member TPH            | 520 Madison Avenue<br>New York, NY 10022                                       | 212-284-2300 | Clearing, Proprietary Trading, Transact Business with the Public, Brokerage               |
| JNK Securities Corp                                            | 11/17/2008        | 11/15/2010        | NA                 | NA                 | NA                  | NA                | Member TPH            | 140 E 45th Street<br>27th Floor<br>New York, NY 10017                          | 212-885-6300 | Agency                                                                                    |

| Company Name                                       | BZX Approval Date | BYX Approval Date | EDGA Approval Date | EDGX Approval Date | CBOE Effective Date | C2 Effective Date | Type of User          | Address                                                                    | Phone Number | Primary Activities                                                                        |
|----------------------------------------------------|-------------------|-------------------|--------------------|--------------------|---------------------|-------------------|-----------------------|----------------------------------------------------------------------------|--------------|-------------------------------------------------------------------------------------------|
| Juliet Group, LLC                                  | 3/1/2011          | 3/1/2011          | NA                 | NA                 | NA                  | NA                | Sponsored Participant | 240 E 35th Street<br>#3A<br>New York, NY 10016                             | 646-360-0595 | Proprietary Trading                                                                       |
| Juliet Labs, LLC                                   | 9/20/2017         | 9/20/2017         | 9/20/2017          | 9/20/2017          | NA                  | NA                | Sponsored Participant | 1 Northside Piers<br>Suite 14H<br>Brooklyn, NY 11249                       | 646-360-0595 | Proprietary Trading                                                                       |
| Jump Trading, LLC                                  | 8/18/2008         | 10/1/2010         | 5/14/2010          | 5/14/2010          | 4/2/2012            | 6/6/2017          | Member<br>TPH         | 600 W Chicago Avenue<br>Suite 825<br>Chicago, IL 60654                     | 312-205-8900 | Market Maker, Proprietary Trading                                                         |
| Keefe, Bruyette & Woods, Inc.                      | 8/18/2008         | 12/1/2010         | 6/8/2010           | 6/8/2010           | NA                  | NA                | Member<br>TPH         | 787 7th Avenue<br>New York, NY 10019                                       | 212-887-7777 | Agency                                                                                    |
| Lakeshore Securities, LP                           | NA                | NA                | NA                 | NA                 | 1/24/1983           | NA                | Member<br>TPH         | 401 S LaSalle Street<br>Suite 1000<br>Chicago, IL 60605                    | 312-663-1307 | Clearing, Floor Broker, Market Maker, Transact Business with the Public                   |
| Lamberson Capital LLC                              | NA                | NA                | NA                 | NA                 | 3/23/2016           | NA                | Member<br>TPH         | 71 S Wacker Drive<br>Suite 2300<br>Chicago, IL 60606                       | 312-360-7300 | Market Maker                                                                              |
| Lampert Capital Markets Inc.                       | NA                | 2/18/2014         | 2/26/2014          | NA                 | NA                  | NA                | Member<br>TPH         | 444 Madison Avenue<br>Suite 401<br>New York, NY 10022                      | 646-833-4900 | Introducing Broker                                                                        |
| Lamport Capital, LC                                | NA                | NA                | NA                 | 3/15/2016          | NA                  | NA                | Member<br>TPH         | 1900 Grades Road<br>Suite 205<br>Boca Raton, FL 33431                      | 561-883-0454 | Public Customer Business, Proprietary Trading                                             |
| Latour Trading LLC                                 | 8/17/2009         | 10/1/2010         | 5/26/2010          | 5/27/2010          | 4/8/2011            | NA                | Member<br>TPH         | 377 Broadway<br>10th Floor<br>New York, NY 10013                           | 917-388-8000 | Proprietary Trading                                                                       |
| Leerink Partners LLC                               | 8/18/2008         | 10/5/2010         | 5/26/2010          | 5/27/2010          | NA                  | NA                | Member<br>TPH         | 1 Federal Street<br>37th Floor<br>Boston, MA 02110                         | 617-918-4900 | Agency                                                                                    |
| LEK Securities Corporation                         | 8/18/2008         | 10/1/2010         | 5/26/2010          | 5/27/2010          | 1/9/2001            | 9/24/2010         | Member<br>TPH         | 1 Liberty Plaza<br>165 Broadway, 52nd Floor<br>New York, NY 10006          | 212-509-2300 | Clearing, Transact Business with the Public                                               |
| Lime Brokerage LLC                                 | 8/18/2008         | 10/1/2010         | 5/26/2010          | 5/27/2010          | NA                  | NA                | Member<br>TPH         | 11 E 44th Street<br>Suite 705<br>New York, NY 10017                        | 212-824-5000 | Transact Business with the Public                                                         |
| Liquidnet, Inc.                                    | 9/1/2009          | 9/15/2010         | NA                 | NA                 | NA                  | NA                | Member<br>TPH         | 498 7th Avenue<br>15th Floor<br>New York, NY 10018                         | 646-674-2000 | Agency                                                                                    |
| Lupo Securities, LLC                               | NA                | NA                | NA                 | NA                 | 8/1/1997            | NA                | Member<br>TPH         | 141 W Jackson Boulevard<br>Suite 2200A<br>Chicago, IL 60604                | 312-477-8400 | Market Maker, Proprietary Trading                                                         |
| Macquarie Capital (USA) Inc.                       | 12/1/2009         | NA                | 5/26/2010          | 5/27/2010          | NA                  | NA                | Member<br>TPH         | 125 W 55th Street<br>Level 22<br>New York, NY 10019                        | 212-231-1000 | Agency                                                                                    |
| Marathon Trading Group LLC                         | 2/13/2015         | NA                | NA                 | NA                 | 1/30/2013           | NA                | Member<br>TPH         | 100 Matsonford Road<br>Building 2, Suite 107<br>Wayne, PA 19087            | 610-254-4890 | Market Maker, Proprietary Trading                                                         |
| Matrix Executions, LLC                             | 8/18/2008         | 11/15/2010        | NA                 | 11/12/2015         | 2/1/2008            | 10/26/2010        | Member<br>TPH         | 601 S LaSalle Street<br>Suite 300<br>Chicago, IL 60605                     | 312-334-8000 | Transact Business with the Public, Brokerage                                              |
| Merrill Lynch Professional Clearing Corp.          | 8/18/2008         | 10/5/2010         | 5/14/2010          | 5/14/2010          | 4/8/1985            | 9/24/2010         | Member<br>TPH         | One Bryant Park, 6th Floor<br>NY1-100-06-01<br>New York, NY 10036          | 646-743-1295 | Clearing, Brokerage, Transact Business with the Public                                    |
| Merrill Lynch, Pierce, Fenner & Smith Incorporated | 8/18/2008         | 10/4/2010         | 5/14/2010          | 5/14/2010          | 4/25/1973           | 9/27/2010         | Member<br>TPH         | One Bryant Park<br>New York, NY 10036                                      | 800-637-7455 | Clearing, Transact Business with the Public, Brokerage, Market Maker, Proprietary Trading |
| Mint Global Markets, Inc.                          | NA                | NA                | 5/26/2010          | 5/27/2010          | NA                  | NA                | Member<br>TPH         | 1717 Route 6<br>Suite 102<br>Carmel, NY 10512                              | 800-874-3039 | Agency                                                                                    |
| Mizuho Securities USA, LLC                         | 6/1/2010          | 1/3/2011          | NA                 | NA                 | NA                  | NA                | Member<br>TPH         | 320 Park Avenue<br>12th Floor<br>New York, NY 10022                        | 212-209-9300 | Agency                                                                                    |
| MKM Partners LLC                                   | 8/3/2009          | NA                | 5/14/2010          | 5/14/2010          | NA                  | NA                | Member<br>TPH         | 300 First Stamford Place<br>4th Floor East Wing<br>Stamford, CT 06902      | 203-861-9060 | Agency                                                                                    |
| MNR Executions, LLC                                | NA                | NA                | NA                 | NA                 | 4/30/2008           | NA                | Member<br>TPH         | 141 W Jackson Boulevard<br>Suite 3900<br>Chicago, IL 60604                 | 312-878-4704 | Floor Broker, Transact Business with the Public                                           |
| Monadnock Capital Management, LP                   | NA                | NA                | NA                 | NA                 | 12/1/2014           | NA                | Member<br>TPH         | 1845 Walnut Street<br>Suite 940<br>Philadelphia, PA 19103                  | 267-239-0367 | Market Maker                                                                              |
| Moors & Cabot, Inc.                                | NA                | 4/2/2012          | NA                 | NA                 | NA                  | NA                | Member<br>TPH         | 111 Devonshire Street<br>Boston, MA 02109                                  | 617-426-0500 | Agency                                                                                    |
| Morgan Stanley & Co. International plc             | NA                | NA                | NA                 | NA                 | 4/12/2017           | NA                | Sponsored Participant | 20 Bank Street<br>Canary Wharf<br>London, UK E14 4A                        | #####        |                                                                                           |
| Morgan Stanley & Co. LLC                           | 10/23/2008        | 9/1/2010          | 5/14/2010          | 5/14/2010          | 8/20/1980           | 9/24/2010         | Member<br>TPH         | 1585 Broadway<br>New York, NY 10036                                        | 212-761-4000 | Clearing, Market Maker, Proprietary Trading, Transact Business with the Public, Brokerage |
| Nasdaq Execution Services, LLC                     | 8/19/2008         | 9/1/2010          | 5/26/2010          | 5/27/2010          | NA                  | NA                | Member<br>TPH         | One Liberty Plaza<br>165 Broadway<br>New York, NY 10006                    | 212-231-5100 | Limited Routing Facility of Nasdaq affiliated Exchanges                                   |
| National Financial Services LLC                    | 10/23/2008        | 10/4/2010         | 5/26/2010          | 5/27/2010          | 10/8/1987           | 4/16/2012         | Member<br>TPH         | 200 Seaport Boulevard<br>Boston, MA 02210                                  | 617-563-7000 | Clearing, Floor Broker, Transact Business with the Public                                 |
| National Securities Corporation                    | 7/1/2009          | NA                | NA                 | NA                 | NA                  | NA                | Member<br>TPH         | One Union Square<br>600 University Street, Suite 2900<br>Seattle, WA 98101 | 206-622-7200 | Agency                                                                                    |
| Needham & Company, LLC                             | 10/23/2008        | 10/1/2010         | NA                 | NA                 | NA                  | NA                | Member<br>TPH         | 445 Park Avenue<br>New York, NY 10022                                      | 212-371-8300 | Market Maker                                                                              |
| Nomura Securities International, Inc.              | 10/23/2008        | 10/1/2010         | 5/26/2010          | 5/27/2010          | 9/1/2009            | 11/16/2010        | Member<br>TPH         | Worldwide Plaza<br>309 W 49th Street<br>New York, NY 10019                 | 212-667-9000 | Clearing, Transact Business with the Public, Proprietary Trading                          |
| Northern Trust Securities, Inc.                    | 8/18/2008         | 10/5/2010         | 5/26/2010          | 5/27/2010          | NA                  | NA                | Member<br>TPH         | 50 S LaSalle Street<br>Chicago, IL 60603                                   | 312-557-2000 | Market Maker                                                                              |
| Northland Securities, Inc.                         | 12/15/2010        | 12/15/2010        | NA                 | NA                 | NA                  | NA                | Member<br>TPH         | 45 S 7th Street<br>20th Floor<br>Minneapolis, MN 55402                     | 612-851-5900 | Market Maker, Proprietary Trading                                                         |
| Old Mission Capital, LLC                           | 4/16/2012         | 4/16/2012         | 4/25/2012          | 4/25/2012          | 9/27/2017           | NA                | Member<br>TPH         | 314 W Superior<br>Suite 200<br>Chicago, IL 60654                           | 312-260-3031 | Market Maker                                                                              |
| Olivetree Financial, LLC                           | NA                | NA                | 9/1/2016           | NA                 | NA                  | NA                | Member<br>TPH         | 420 Lexington Avenue<br>Suite 800<br>New York, NY 10170                    | 646-930-5600 | Agency                                                                                    |
| Oppenheimer & Co. Inc.                             | NA                | NA                | NA                 | NA                 | 5/17/1973           | NA                | Member<br>TPH         | 85 Broad Street<br>22nd, 24th Floors<br>New York, NY 10004                 | 212-668-8000 | Clearing, Transact Business with the Public                                               |
| Optiver US, LLC                                    | 6/15/2009         | NA                | NA                 | 5/30/2018          | 6/1/2005            | 9/24/2010         | Member<br>TPH         | 130 E Randolph Street<br>14th Floor<br>Chicago, IL 60601                   | 312-821-9500 | Market Maker                                                                              |
| Oscar Gruss & Son Incorporated                     | 8/7/2017          | NA                | NA                 | NA                 | NA                  | NA                | Member<br>TPH         | 430 Park Avenue<br>6th Floor<br>New York, NY 10022                         | 212-419-4000 | Agency                                                                                    |
| OTA LLC                                            | 8/18/2008         | 10/7/2010         | NA                 | NA                 | NA                  | NA                | Member<br>TPH         | One Manhattanville Road<br>Purchase, NY 10577                              | 914-694-5800 | Institutional Trading                                                                     |



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|--------------------------------------|-------------------|-------------------|--------------------|--------------------|---------------------|-------------------|-----------------------|-----------------------------------------------------------------|--------------|-----------------------------------------------------------------------------|
| PEAK6 Capital Management LLC         | 8/1/2014          | NA                | NA                 | 2/1/2016           | 12/2/1997           | NA                | Member TPH            | 141 W Jackson Boulevard Suite 500 Chicago, IL 60604             | 312-444-8000 | Proprietary Trading                                                         |
| PEAK6 Capital Management, LLC        | 11/3/2008         | 7/15/2011         | NA                 | NA                 | NA                  | NA                | Sponsored Participant | 141 W Jackson Boulevard Suite 500 Chicago, IL 60604             | 312-362-2401 | Market Maker                                                                |
| Penserra Securities, LLC             | 8/18/2008         | 10/6/2010         | NA                 | NA                 | NA                  | NA                | Member TPH            | 4 Orinda Way Suite 100-A Orinda, CA 94563                       | 212-607-3190 | Agency                                                                      |
| Pershing LLC                         | 8/18/2008         | 9/15/2010         | 5/26/2010          | 5/27/2010          | 2/21/1973           | 9/28/2010         | Member TPH            | One Pershing Plaza Jersey City, NJ 07399                        | 201-413-2000 | Clearing, Transact Business with the Public                                 |
| Phillip Capital Inc.                 | NA                | NA                | NA                 | 11/27/2017         | NA                  | NA                | Member TPH            | 141 W Jackson Boulevard Suite 3050 Chicago, IL 60604            | 312-356-9001 | Clearing Services                                                           |
| Pictet Overseas Inc.                 | 6/1/2015          | 6/1/2015          | 5/26/2010          | 5/27/2010          | NA                  | NA                | Member TPH            | 1000 de la Gauchetiere West Suite 3100 Montreal, Quebec H3B 4W5 | 514-288-8161 | Agency                                                                      |
| Piper Jaffray & Co.                  | 10/15/2008        | 11/15/2012        | 5/14/2010          | 5/14/2010          | NA                  | NA                | Member TPH            | 800 Nicollet Mall Minneapolis, MN 55402                         | 612-303-6000 | Market Maker                                                                |
| Potamus Trading, LLC                 | 4/15/2013         | 4/15/2013         | 4/11/2013          | 4/11/2013          | NA                  | NA                | Member TPH            | 2 Seaport Lane 8th Floor Boston, MA 02210                       | 617-855-8722 | Market Maker, Proprietary Trading                                           |
| Princeton Alpha Management, LP       | 12/1/2015         | 12/1/2015         | 12/1/2015          | 12/1/2015          | NA                  | NA                | Sponsored Participant | 61 Princeton Hightstown Road West Windsor, NJ 08550             | 609-269-9212 | Agency                                                                      |
| PTR, Inc.                            | NA                | NA                | NA                 | NA                 | 8/2/1995            | NA                | Member TPH            | 1800 JFK Boulevard Suite 401 Philadelphia, PA 19103             | 267-909-8368 | Floor Broker, Transact Business with the Public                             |
| Puma Capital, LLC                    | NA                | NA                | 6/15/2016          | 6/15/2016          | NA                  | NA                | Member TPH            | 287 Bowman Avenue 3rd Floor Purchase, NY 10577                  | 212-269-4100 | Market Maker, Proprietary Trading                                           |
| Pundion LLC                          | 2/27/2017         | 2/27/2017         | 2/27/2017          | 2/27/2017          | NA                  | NA                | Member TPH            | 230 Park Avenue 10th Floor New York, NY 10169                   | 718-618-4929 | Proprietary Trading                                                         |
| Pundion LLC                          | 10/15/2018        | 10/15/2018        | 10/15/2018         | 10/15/2018         | NA                  | NA                | Sponsored Participant | 230 Park Avenue 10th Floor New York, NY 10169                   | 718-618-4929 | Proprietary Trading                                                         |
| Quantbot Technologies LP             | 3/27/2018         | 3/27/2018         | 3/27/2018          | 3/27/2018          | NA                  | NA                | Sponsored Participant | 369 Lexington Avenue New York, NY 10017                         | 212-622-6510 | Proprietary Trading                                                         |
| Quantex Clearing, LLC                | 10/3/2011         | 12/27/2011        | 5/17/2011          | 5/17/2011          | NA                  | NA                | Member TPH            | 70 Hudson Street Hoboken, NJ 07030                              | 201-706-7157 | Clearing Services                                                           |
| Quantlab Securities LP               | 8/18/2008         | 11/1/2010         | 5/26/2010          | 5/27/2010          | NA                  | NA                | Member TPH            | 3 Greenway Plaza Suite 200 Houston, TX 77046                    | 713-333-3700 | Transact Business with the Public, Brokerage                                |
| Quiet Light Securities, LLC          | NA                | NA                | NA                 | NA                 | 5/1/2001            | NA                | Member TPH            | 141 W Jackson Boulevard Suite 2020A Chicago, IL 60604           | 312-431-0573 | Market Maker, Proprietary Trading                                           |
| R.W. Pressprich & Co.                | 2/17/2009         | 11/15/2010        | 6/2/2010           | 6/2/2010           | NA                  | NA                | Member TPH            | 452 5th Avenue New York, NY 10018                               | 212-832-6200 | Agency                                                                      |
| Rackson Asset Management, LLC        | 10/1/2009         | NA                | NA                 | NA                 | NA                  | NA                | Sponsored Participant | 2000 Broadway Suite 22C New York, NY 10023                      | 212-724-2567 | Proprietary Trading                                                         |
| Radix Trading LLC                    | 11/5/2018         | 11/5/2018         | 11/5/2018          | 11/5/2018          | NA                  | NA                | Sponsored Participant | 353 N Clark Street Suite 3200 Chicago, IL 60654                 | 773-377-8080 | Research Firm                                                               |
| Rainier Investment Management, Inc.  | 1/4/2010          | NA                | NA                 | NA                 | NA                  | NA                | Sponsored Participant | 601 Union Street Suite 2801 Seattle, WA 98101                   | 206-518-6658 | Hedge Fund                                                                  |
| RBC Capital Markets, LLC             | 9/18/2008         | 10/14/2010        | 5/14/2010          | 5/14/2010          | 11/24/1993          | 10/19/2010        | Member TPH            | 3 World Financial Center 200 Vesey Street New York, NY 10281    | 212-858-7000 | Clearing, Proprietary Trading, Transact Business with the Public            |
| Robert W. Baird & Co. Incorporated   | 10/23/2008        | 1/3/2011          | NA                 | NA                 | NA                  | NA                | Member TPH            | 777 E Wisconsin Avenue Milwaukee, WI 53202                      | 414-765-3500 | Market Maker                                                                |
| Ronin Capital, LLC                   | NA                | NA                | NA                 | NA                 | 12/17/2001          | NA                | Member TPH            | 350 N Orleans Street Suite 2N Chicago, IL 60654                 | 312-244-5000 | Market Maker                                                                |
| Ronin Professional, LLC              | 8/18/2008         | 10/1/2010         | 5/25/2010          | 5/27/2010          | 1/2/2008            | 10/20/2010        | Member TPH            | 350 N Orleans Street Suite 2N Chicago, IL 60654                 | 312-244-5400 | Order Flow Provider, Transact Business with the Public, Brokerage           |
| Rosenblatt Securities Inc.           | 8/18/2008         | 10/6/2010         | 5/26/2010          | 5/27/2010          | NA                  | NA                | Member TPH            | 40 Wall Street 59th Floor New York, NY 10005                    | 212-607-3100 | Agency                                                                      |
| Roth Capital Partners, LLC           | 8/18/2008         | NA                | NA                 | NA                 | NA                  | NA                | Member TPH            | 888 San Clemente Suite 400 Newport Beach, CA 92660              | 949-720-5700 | Market Maker                                                                |
| SAC Capital Advisors, LP             | 10/23/2008        | NA                | NA                 | NA                 | NA                  | NA                | Sponsored Participant | 72 Cummings Point Road Stamford, CT 06902                       | 203-890-2275 | Hedge Fund                                                                  |
| Saltra Securities LLC                | NA                | NA                | 5/26/2010          | 5/27/2010          | NA                  | NA                | Member TPH            | 546 5th Avenue New York, NY 10036                               | 212-704-5500 | Market Maker                                                                |
| SageTrader, LLC                      | 3/1/2016          | 6/5/2017          | 6/5/2017           | 6/1/2016           | NA                  | NA                | Member TPH            | 340 Pine Street Suite 501 San Francisco, CA 94104               | 415-293-3894 | Public Customer Business                                                    |
| SAL Equity Trading, GP               | 9/3/2008          | 10/5/2010         | 5/26/2010          | 5/27/2010          | NA                  | NA                | Member TPH            | 401 City Avenue Suite 220 Bala Cynwyd, PA 19004                 | 610-617-3000 | Agency, Institutional Trading                                               |
| Sanford C. Bernstein & Co, LLC       | 9/10/2008         | 10/21/2010        | 5/26/2010          | 5/27/2010          | 8/13/2013           | NA                | Member TPH            | 1345 Avenue of the Americas New York, NY 10105                  | 212-969-1000 | Clearing, Proprietary Trading, Transact Business with the Public            |
| Santander Investment Securities Inc. | 4/15/2009         | 1/3/2011          | NA                 | NA                 | NA                  | NA                | Member TPH            | 45 E 53rd Street New York, NY 10022                             | 212-350-3500 | Institutional Trading                                                       |
| Scotia Capital (USA) Inc.            | 3/2/2009          | 9/15/2010         | 5/26/2010          | 5/27/2010          | NA                  | NA                | Member TPH            | 250 Vesey Street New York, NY 10281                             | 212-225-6500 | Institutional Trading                                                       |
| Sea Otter Securities Group LLC       | 10/9/2018         | 10/9/2018         | NA                 | 10/9/2018          | NA                  | NA                | Sponsored Participant | 107 Grand Street 7th Floor New York, NY 10013                   | 646-762-9972 | Proprietary Trading                                                         |
| Seven Points Capital, LLC            | NA                | NA                | 5/14/2010          | NA                 | NA                  | NA                | Member TPH            | 805 3rd Avenue 15th Floor New York, NY 10022                    | 212-760-0760 | Agency                                                                      |
| SG Americas Securities, LLC          | 9/17/2008         | 11/15/2011        | 5/14/2010          | 5/14/2010          | 4/23/2004           | 1/2/2015          | Member TPH            | 245 Park Avenue New York, NY 10167                              | 212-278-6000 | Clearing, Proprietary Trading, Transact Business with the Public, Brokerage |
| Simplex Trading, LLC                 | 3/16/2015         | NA                | NA                 | 4/13/2017          | 8/12/2010           | 3/1/2017          | Member TPH            | 230 S LaSalle Street Suite 4-100 Chicago, IL 60604              | 312-360-2440 | Market Maker, Proprietary Trading                                           |
| SMBC Nikko Securities America, Inc.  | 8/7/2017          | 8/7/2017          | 8/7/2017           | 8/7/2017           | NA                  | NA                | Member TPH            | 277 Park Avenue 5th Floor New York, NY 10172                    | 212-224-5039 | Institutional Trading                                                       |
| SogoTrade, Inc.                      | NA                | NA                | NA                 | 6/19/2017          | NA                  | NA                | Member TPH            | 11 Broadway Suite 514 New York, NY 10004                        | 646-885-6486 | Public Customer Business                                                    |

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| Stifel, Nicolaus & Company, Incorporated      | 8/18/2008         | NA                | 6/2/2010           | 6/2/2010           | NA                  | NA                | Member TPH            | 501 N Broadway<br>St. Louis, MO 63102                                         | 314-342-2000 | Agency                                                                      |
| Summit Securities Group, LLC                  | 7/16/2012         | 7/16/2012         | 8/20/2012          | 8/20/2012          | 6/6/2012            | NA                | Member TPH            | 55 Broadway<br>Suite 2102<br>New York, NY 10006                               | 646-738-4066 | Market Maker, Proprietary Trading                                           |
| Sumo Capital, LLC                             | 7/15/2013         | NA                | NA                 | 10/15/2015         | 3/3/2008            | NA                | Member TPH            | 440 S LaSalle Street<br>Suite 2101<br>Chicago, IL 60605                       | 312-324-0326 | Market Maker, Proprietary Trading                                           |
| SumRidge Partners, LLC                        | NA                | NA                | NA                 | 12/27/2017         | NA                  | NA                | Member TPH            | 111 Town Square Place<br>Suite 320<br>Jersey City, NJ 07310                   | 201-898-2520 | Proprietary Trading                                                         |
| Susquehanna Financial Group, LLLP             | 9/3/2008          | 10/5/2010         | 5/26/2010          | 5/27/2010          | NA                  | NA                | Member TPH            | 401 City Avenue<br>Suite 220<br>Bala Cynwyd, PA 19004                         | 800-825-9550 | Agency, Institutional Trading                                               |
| Susquehanna Investment Group                  | NA                | NA                | NA                 | NA                 | 5/1/1987            | NA                | Member TPH            | 401 City Avenue<br>Suite 220<br>Bala Cynwyd, PA 19004                         | 610-617-2600 | Market Maker                                                                |
| Susquehanna Securities                        | 10/15/2014        | 10/15/2014        | 10/15/2014         | 10/15/2014         | 4/4/1994            | 9/24/2010         | Member TPH            | 401 City Avenue<br>Suite 220<br>Bala Cynwyd, PA 19004                         | 610-617-2600 | Market Maker, Proprietary Trading                                           |
| Synergy Capital Management, LLC               | 8/1/2016          | NA                | NA                 | NA                 | 6/5/2007            | NA                | Member TPH            | 141 W Jackson Boulevard<br>Suite 1530<br>Chicago, IL 60604                    | 312-986-8869 | Proprietary Trading                                                         |
| TD Ameritrade Clearing, Inc.                  | 5/3/2011          | 5/3/2011          | NA                 | 5/27/2010          | NA                  | NA                | Member TPH            | 200 S 108th Avenue<br>Omaha, NE 68154                                         | 800-669-3900 | Public Customer Business, Clearing Services                                 |
| Telsey Advisory Group, LLC                    | 1/24/2011         | 8/15/2014         | NA                 | NA                 | NA                  | NA                | Member TPH            | 555 5th Avenue<br>7th Floor<br>New York, NY 10017                             | 212-973-9700 | Public Customer Business                                                    |
| Tewksbury Investment Fund, Ltd.               | 7/1/2011          | 7/1/2011          | 1/6/2015           | 1/6/2015           | NA                  | NA                | Sponsored Participant | Washington Mall I<br>20th Church Street, 4th Floor<br>Hamilton, HM 11 Bermuda | 610-971-5000 | Proprietary Trading                                                         |
| Tewksbury Investment Fund, Ltd.               | 10/23/2008        | 11/15/2010        | NA                 | NA                 | NA                  | NA                | Sponsored Participant | Washington Mall I<br>20th Church Street, 4th Floor<br>Hamilton, HM 11 Bermuda | 212-310-7076 | Proprietary Trading                                                         |
| Themis Trading LLC                            | 8/18/2008         | 10/1/2010         | NA                 | NA                 | NA                  | NA                | Member TPH            | 10 Town Square<br>Suite 100<br>Chatham, NJ 07928                              | 973-665-9600 | Agency                                                                      |
| ThinkTrade, LLC                               | 2/1/2010          | 10/20/2010        | 1/9/2015           | 1/9/2015           | NA                  | NA                | Sponsored Participant | 2210 Encinitas Boulevard<br>Suite 1<br>Encinitas, CA 92024                    | 760-452-2451 | Proprietary Trading                                                         |
| Timber Hill LLC                               | NA                | NA                | NA                 | NA                 | 12/27/1996          | 12/15/2010        | Member TPH            | One Pickwick Plaza<br>Suite 200<br>Greenwich, CT 06830                        | 203-618-5800 | Clearing, Market Maker                                                      |
| TJM Investments, LLC                          | NA                | NA                | NA                 | NA                 | 3/11/2013           | NA                | Member TPH            | 318 W Adams Street<br>9th Floor<br>Chicago, IL 60606                          | 312-432-5100 | Floor Broker, Transact Business with the Public                             |
| Tradebot Systems, Inc.                        | 8/18/2008         | 9/1/2010          | 5/26/2010          | 5/27/2010          | NA                  | NA                | Member TPH            | 1251 NW Branciff Parkway<br>Suite 700<br>Kansas City, MO 64118                | 816-285-6400 | Proprietary Trading                                                         |
| TradeStation Securities, Inc.                 | 8/18/2008         | 9/1/2010          | 5/25/2010          | 5/25/2010          | NA                  | NA                | Member TPH            | 8050 SW 10th Street<br>Suite 2000<br>Plantation, FL 33324                     | 954-652-7900 | Market Maker                                                                |
| TRC Helepolis, Ltd.                           | 12/11/2009        | NA                | NA                 | NA                 | NA                  | NA                | Sponsored Participant | 377 Broadway<br>11th Floor<br>New York, NY 10013                              | 646-472-1792 | Proprietary Trading                                                         |
| TRC Markets LLC                               | 4/13/2017         | 4/13/2017         | 4/13/2017          | 4/13/2017          | NA                  | NA                | Member TPH            | 710 Johnnie Dodds Boulevard<br>Suite 300<br>Mt. Pleasant, SC 29464            | 917-388-8644 | Agency                                                                      |
| Trinity Executions, LLC                       | NA                | NA                | NA                 | NA                 | 11/1/2011           | NA                | Member TPH            | 141 W Jackson Boulevard<br>Suite 3900<br>Chicago, IL 60604                    | 312-878-4704 | Floor Broker, Transact Business with the Public                             |
| Tudor, Pickering, Holt & Co. Securities, Inc. | 8/18/2008         | 10/17/2011        | NA                 | NA                 | NA                  | NA                | Member TPH            | 1111 Bagby<br>Suite 4900<br>Houston, TX 77002                                 | 713-333-7100 | Agency                                                                      |
| Two Sigma Investments, LLC                    | 9/1/2009          | NA                | NA                 | NA                 | NA                  | NA                | Sponsored Participant | 100 Avenue of the Americas<br>4th Floor<br>New York, NY 10013                 | 212-775-6678 | Proprietary Trading                                                         |
| Two Sigma Partners Master Fund, Ltd.          | 3/2/2009          | NA                | NA                 | NA                 | NA                  | NA                | Sponsored Participant | 100 Avenue of the Americas<br>4th Floor<br>New York, NY 10013                 | 212-775-6678 | Proprietary Trading                                                         |
| Two Sigma Securities, LLC                     | 7/1/2009          | NA                | NA                 | NA                 | NA                  | NA                | Sponsored Participant | 100 Avenue of the Americas<br>4th Floor<br>New York, NY 10013                 | 646-292-6643 | Proprietary Trading                                                         |
| Two Sigma Securities, LLC                     | 10/1/2009         | 10/5/2010         | 5/27/2010          | 5/27/2010          | 9/15/2017           | 7/18/2018         | Member TPH            | 100 Avenue of the Americas<br>19th Floor<br>New York, NY 10013                | 212-625-5700 | Market Maker, Broker                                                        |
| U.S. Securities, Int'l. Corp.                 | NA                | NA                | NA                 | NA                 | 7/3/1973            | NA                | Member TPH            | 120 Broadway<br>Suite 1017<br>New York, NY 10271                              | 212-227-0800 | Transact Business with the Public                                           |
| UBS Financial Services Inc.                   | NA                | NA                | NA                 | NA                 | 12/11/1972          | NA                | Member TPH            | 1200 Harbor Boulevard<br>Weehawken, NJ 07086                                  | 201-352-3000 | Clearing, Transact Business with the Public                                 |
| UBS Securities LLC                            | 10/15/2008        | 10/1/2010         | 4/12/2010          | 4/12/2010          | 10/1/1998           | 10/8/2010         | Member TPH            | 1285 Avenue of the Americas<br>New York, NY 10019                             | 203-719-3000 | Clearing, Proprietary Trading, Transact Business with the Public            |
| Ustocktrade Securities, Inc.                  | 4/17/2015         | NA                | NA                 | NA                 | NA                  | NA                | Member TPH            | 275 Grove Street<br>Suite 2-400<br>Newton, MA 02466                           | 617-340-3041 | Public Customer Business, Proprietary Trading                               |
| ViewTrade Securities, Inc.                    | 8/18/2008         | 11/15/2010        | 6/10/2010          | 6/10/2010          | NA                  | NA                | Member TPH            | 7280 W Palmetto Park Road<br>Suite 310<br>Boca Raton, FL 33433                | 561-620-0306 | Agency                                                                      |
| Virtu Americas LLC                            | 9/15/2009         | 10/14/2010        | 1/3/2011           | 1/3/2011           | 9/18/2009           | 3/17/2011         | Member TPH            | 300 Vesey Street<br>New York, NY 10282                                        | 646-682-6000 | Clearing, Proprietary Trading, Transact Business with the Public, Brokerage |
| Virtu Financial BD LLC                        | 11/17/2008        | 10/7/2010         | 5/27/2010          | 5/27/2010          | 3/1/2010            | 6/12/2012         | Member TPH            | 307 Camp Craft Road<br>Austin, TX 78743                                       | 800-544-7508 | Proprietary Trading                                                         |
| Virtu Financial Capital Markets LLC           | 8/18/2008         | 9/1/2010          | 5/25/2010          | 5/27/2010          | NA                  | NA                | Member TPH            | 300 Vesey Street<br>New York, NY 10282                                        | 212-418-0100 | Proprietary Trading                                                         |
| Vision Financial Markets LLC                  | 4/1/2009          | 11/15/2010        | 7/13/2012          | 7/13/2012          | 12/11/2006          | NA                | Member TPH            | 120 Long Ridge Road<br>3 North<br>Stamford, CT 06902                          | 203-388-2700 | Clearing, Transact Business with the Public                                 |
| Volant Execution, LLC                         | 6/15/2011         | NA                | NA                 | 10/1/2015          | 4/12/2005           | 9/24/2010         | Member TPH            | 111 W Jackson Boulevard<br>20th Floor<br>Chicago, IL 60604                    | 312-692-5000 | Clearing, Brokerage                                                         |
| Volant Liquidity, LLC                         | 4/15/2011         | NA                | 5/27/2010          | 5/27/2010          | 2/1/2010            | 3/23/2011         | Member TPH            | 250 Vesey Street<br>Suite 2601<br>New York, NY 10281                          | 646-804-7900 | Market Maker, Order Flow Provider, Brokerage                                |
| Wall Street Access                            | 11/3/2008         | 10/17/2011        | 5/27/2010          | 5/27/2010          | NA                  | NA                | Member TPH            | 17 Battery Place<br>11th Floor<br>New York, NY 10004                          | 212-709-9400 | Agency                                                                      |
| Walleye Trading LLC                           | 12/1/2008         | 11/12/2010        | NA                 | 4/17/2018          | 6/1/2006            | NA                | Member TPH            | 2800 Niagara Lane North<br>Plymouth, MN 55447                                 | 952-345-6611 | Market Maker                                                                |
| Wedbush Securities Inc.                       | 8/18/2008         | 9/1/2010          | 5/27/2010          | 5/27/2010          | 2/23/2012           | 3/8/2012          | Member TPH            | 1000 Wilshire Boulevard<br>Suite 900<br>Los Angeles, CA 90017                 | 213-688-8090 | Clearing                                                                    |

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|----------------------------------------|-------------------|-------------------|--------------------|--------------------|---------------------|-------------------|---------------|-----------------------------------------------------------------------|--------------|----------------------------------------------------------------------|
| Wells Fargo Clearing Services, LLC     | 7/1/2016          | NA                | NA                 | NA                 | 11/14/2016          | NA                | Member<br>TPH | One N Jefferson Avenue<br>Mail Code: H0004-050<br>St. Louis, MO 63103 | 314-875-3000 | Clearing, Transact Business with the Public                          |
| Wells Fargo Securities, LLC            | 8/18/2008         | 10/11/2010        | 6/9/2010           | 6/9/2010           | 4/1/2014            | 4/1/2014          | Member<br>TPH | 550 S Tryon Street, 6th Floor<br>D1086-060<br>Charlotte, NC 28202     | 704-410-1913 | Clearing, Proprietary Trading                                        |
| Western International Securities, Inc. | 8/18/2008         | 11/15/2010        | NA                 | NA                 | NA                  | NA                | Member<br>TPH | 70 S Lake Avenue<br>Suite 700<br>Pasadena, CA 91101                   | 626-793-7717 | Market Maker                                                         |
| Wolverine Execution Services, LLC      | 8/18/2008         | 10/19/2010        | 5/14/2010          | 5/14/2010          | 3/1/2006            | 9/24/2010         | Member<br>TPH | 175 W Jackson Boulevard<br>Suite 200<br>Chicago, IL 60604             | 312-884-4000 | Clearing, Floor Broker, Transact Business with the Public, Brokerage |
| Wolverine Securities, LLC              | NA                | NA                | NA                 | 5/31/2017          | NA                  | NA                | Member<br>TPH | 175 W Jackson Boulevard<br>Suite 200<br>Chicago, IL 60604             | 312-884-4000 | Market Maker                                                         |
| Wolverine Trading, LLC                 | 10/3/2011         | NA                | NA                 | 10/1/2015          | 7/12/1994           | 9/24/2010         | Member<br>TPH | 175 W Jackson Boulevard<br>Suite 200<br>Chicago, IL 60604             | 312-884-4000 | Market Maker, Proprietary Trading                                    |
| X-Change Financial Access, LLC         | NA                | NA                | NA                 | NA                 | 5/1/2003            | NA                | Member<br>TPH | 440 S LaSalle Street<br>Suite 2900<br>Chicago, IL 60605               | 312-235-0320 | Clearing, Floor Broker, Transact Business with the Public            |
| XR Securities LLC                      | 1/15/2009         | 11/15/2010        | 5/10/2012          | 5/10/2012          | 11/30/2007          | NA                | Member<br>TPH | 550 W Jackson Boulevard<br>Suite 1000<br>Chicago, IL 60651            | 312-244-4500 | Market Maker, Proprietary Trading                                    |

