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PIONEER MUNICIPAL HIGH INCOME TRUST  
Form N-Q  
April 01, 2013

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UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION  
Washington, D.C. 20549

FORM N-Q

CERTIFIED SHAREHOLDER REPORT OF REGISTERED  
MANAGEMENT INVESTMENT COMPANIES

Investment Company Act file number 811-21321

Pioneer Municipal High Income Trust  
(Exact name of registrant as specified in charter)

60 State Street, Boston, MA 02109  
(Address of principal executive offices) (ZIP code)

Terrence J Cullen, Pioneer Investment Management, Inc.,  
60 State Street, Boston, MA 02109  
(Name and address of agent for service)

Registrant's telephone number, including area code: (617) 742-7825

Date of fiscal year end: April 30

Date of reporting period: January 31, 2013

Form N-Q is to be used by management investment companies, other than small business investment companies registered on Form N-5 (239.24 and 274.5 of this chapter), to file reports with the Commission, not later than 60 days after close of the first and third fiscal quarters, pursuant to Rule 30b1-5 under the Investment Company Act of 1940 (17 CFR 270.30b-5). The Commission may use the information provided on Form N-Q in its regulatory, disclosure review, inspection, and policymaking roles.

A registrant is required to disclose the information specified by Form N-Q, and the Commission will make this information public. A registrant is not required to respond to the collection of information contained in Form N-Q unless the Form displays a currently valid Office of Management and Budget ("OMB") control number. Please direct comments concerning the accuracy of the information collection burden estimate and any suggestions for reducing the burden to Secretary, Securities and Exchange Commission, 450 Fifth Street, NW, Washington, DC 20549-0609. The OMB has reviewed this collection of information under the clearance requirements of 44 U.S.C. ss. 3507.

<PAGE>

ITEM 1. Schedule of Investments.

Pioneer Municipal  
High Income Trust  
NQI January 31, 2013

Ticker Symbol: MHI

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Schedule of Investments | 1/31/13 (unaudited)

| Principal<br>Amount<br>USD (\$) | S&P/Moody's<br>Rating |   | Value                     |
|---------------------------------|-----------------------|---|---------------------------|
|                                 |                       | TAX EXEMPT OBLIGATIONS  |                           |
|                                 |                       | - 126.5% of Net Assets  |                           |
|                                 |                       | Alabama - 2.1%  |                           |
| 2,500,000                       | B-/B2                 | Alabama Industrial Development<br>Authority Solid Waste Disposal<br>Revenue, 6.45%, 12/1/23                             | \$ 2,499,700              |
| 4,500,000                       | NR/NR                 | Huntsville-Redstone Village Special<br>Care Facilities Financing Authority<br>Nursing Home Revenue, 5.5%,<br>1/1/43     | 4,402,845<br>\$ 6,902,545 |
|                                 |                       | Arizona - 0.7%  |                           |
| 974,000                         | NR/Baa3               | Pima County Industrial<br>Development Authority Education<br>Revenue, 6.75%, 7/1/31                                     | \$ 977,614                |
| 950,000                         | NR/Baa3               | Pima County Industrial<br>Development Authority Education<br>Revenue, 7.25%, 7/1/31                                     | 955,329                   |
| 500,000                         | NR/Baa2               | Yavapai County Industrial<br>Development Authority Mediical<br>Revenue, 6.0%, 8/1/33                                    | 511,970<br>\$ 2,444,913   |
|                                 |                       | California - 13.9%  |                           |
| 3,000,000(a)                    | NR/A1                 | Abag Finance Authority for<br>Nonprofit Corp. Revenue, 5.75%,<br>7/1/37   | \$ 3,437,910              |
| 5,100,000                       | B-/NR                 | California County Tobacco<br>Securitization Agency Revenue,<br>5.125%, 6/1/38   | 4,456,380                 |
| 1,450,000                       | NR/NR                 | California Enterprise Development<br>Authority Recovery Zone Facility<br>Revenue, 8.5%, 4/1/31                          | 1,678,114                 |
| 5,000,000                       | NR/Baa3               | California Pollution Control<br>Financing Authority, 5.0%, 7/1/37   | 5,202,500                 |
| 568,006(b)                      | NR/NR                 | California Statewide Communities<br>Development Authority<br>Environmental Facilities Revenue,<br>9.0%, 12/1/38         | 5,021                     |
| 4,000,000                       | BB/NR                 | California Statewide Communities<br>Development Authority Revenue<br>Higher Education Revenue, 7.25%,<br>10/1/38 (144A) | 4,062,320                 |

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|                           |                    |  |               |
|---------------------------|--------------------|--|---------------|
| 5,150,000(a)              | AA+/Aaa            | Golden State Tobacco Securitization Corp., Revenue Bonds, 7.8%, 6/1/42             | 5,279,883     |
| 7,000,000(a)              | AA+/Aaa            | Golden State Tobacco Securitization Corp., Revenue Bonds, 7.875%, 6/1/42           | 7,178,220     |
| 7,885,000                 | AA-/WR             | Lehman Municipal Trust Receipts Revenue, RIB, 10.999%, 9/20/28 (144A)              | 10,488,469    |
| 2,000,000                 | B-/Caa1            | Tobacco Securitization Authority of Northern California, Revenue, 5.375%, 6/1/38   | 1,764,640     |
| 3,000,000                 | BB+/B3             | Tobacco Securitization Authority of Southern California Revenue, 5.0%, 6/1/37      | 2,725,200     |
|                           |                    | Colorado - 0.9%  | \$ 46,278,657 |
| 2,000,000                 | BBB+/NR            | Colorado Health Facilities Authority Revenue, 5.25%, 5/15/42                       | \$ 2,064,080  |
| 1,000,000                 | NR/NR              | Kremmling Memorial Hospital District Certificate of Participation, 7.125%, 12/1/45 | 1,116,150     |
|                           |                    | Connecticut - 6.0%   | \$ 3,180,230  |
| 1,000,000                 | NR/NR              | Hamden Connecticut Facility Revenue, 7.75%, 1/1/43                                 | \$ 1,087,790  |
| 10,335,000(c)             | AAA/WR             | Lehman Municipal Trust Receipts Revenue, 11.729%, 8/21/35                          | 14,012,813    |
| 5,000,000                 | B/NR               | Mohegan Tribe of Indians Gaming Authority, 6.25%, 1/1/31                           | 5,004,100     |
|                           |                    | District of Columbia - 3.6%  | \$ 20,104,703 |
| 5,000,000                 | BBB/Baa1           | District of Columbia Tobacco Settlement Financing Corp., 6.5%, 5/15/33             | \$ 5,863,950  |
| 6,000,000                 | BBB/Baa1           | District of Columbia Tobacco Settlement Financing Corp., 6.75%, 5/15/40            | 6,239,940     |
|                           |                    | Florida - 7.3%   | \$ 12,103,890 |
| 1,500,000                 | NR/NR              | Alachua County Health Facilities Authority Revenue, 8.125%, 11/15/41               | \$ 1,763,310  |
| 1,500,000                 | NR/NR              | Alachua County Health Facilities Authority Revenue, 8.125%, 11/15/46               | 1,763,310     |
| Principal Amount USD (\$) | S&P/Moody's Rating |  | Value         |

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|              |   |               |
|--------------|---|---------------|
|              | Florida - (continued)   |               |
| 1,400,000    | NR/NRBeacon Lakes Community<br>Development District Special<br>Assessment, 6.9%, 5/1/35       | \$ 1,421,672  |
| 500,000      | NR/BI Capital Trust Agency Revenue<br>Bonds, 7.75%, 1/1/41                                    | 563,185       |
| 1,000,000    | NR/NRFlorida Development Finance Corp.,<br>Educational Facilities Revenue,<br>6.0%, 9/15/40   | 1,087,750     |
| 2,000,000    | NR/NRFlorida Development Finance Corp.,<br>Educational Facilities Revenue,<br>7.625%, 6/15/41 | 2,347,480     |
| 1,000,000    | NR/NRFlorida Development Finance Corp.,<br>Educational Facilities Revenue,<br>7.75%, 6/15/42  | 1,140,800     |
| 1,000,000(a) | NR/WRHillsborough County Industrial<br>Development Authority Revenue,<br>8.0%, 8/15/32        | 1,410,560     |
| 2,260,000    | NR/NRLiberty County Subordinate<br>Revenue, 8.25%, 7/1/28                                     | 2,288,566     |
| 2,500,000    | A/A2Miami-Dade County Florida<br>Aviation Revenue, 5.5%, 10/1/41                              | 2,849,075     |
| 1,000,000    | NR/NRSt. Johns County Industrial<br>Development Authority Revenue,<br>5.25%, 1/1/26           | 913,860       |
| 2,000,000    | NR/NRSt. Johns County Industrial<br>Development Authority Revenue,<br>5.375%, 1/1/40          | 1,680,580     |
| 5,000,000    | NR/Baa1Tallahassee Health Facilities<br>Revenue, 6.375%, 12/1/30                              | 5,083,400     |
|              |   | \$ 24,313,548 |
|              | Georgia - 2.7%  |               |
| 4,240,000    | AA-/WRAtlanta Georgia Water and<br>Wastewater Revenue, RIB,<br>10.813%, 11/1/43 (144A)        | \$ 4,939,049  |
| 500,000      | B-/NRClayton County Development<br>Authority Revenue, 9.0%, 6/1/35                            | 559,295       |
| 2,400,000    | NR/NRFulton County Residential Care<br>Facilities Revenue, 5.0%, 7/1/27                       | 2,421,648     |
| 1,100,000    | NR/NRFulton County Residential Care<br>Facilities Revenue, 5.125%, 7/1/42                     | 1,098,790     |
|              |   | \$ 9,018,782  |
|              | Idaho - 1.5%  |               |
| 5,000,000    | A-/Baa1Power County Industrial<br>Development Corp., Revenue,<br>6.45%, 8/1/32                | \$ 5,008,550  |
|              | Illinois - 14.5%  |               |
| 1,827,000(d) | NR/NR   | \$ 227,070    |

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|                                 |   |               |
|---------------------------------|---|---------------|
|                                 | Illinois Finance Authority Revenue,<br>0.0%, 11/15/52   |               |
| 2,087,000(c)                    | NR/NRIllinois Finance Authority Revenue,<br>4.0%, 11/15/52                                      | 1,539,163     |
| 3,865,000                       | BBB+/NRllinois Finance Authority Revenue,<br>6.0%, 8/15/38                                      | 4,390,872     |
| 2,000,000                       | AA+/Aa2Illinois Finance Authority Revenue,<br>6.0%, 8/15/39                                     | 2,349,920     |
| 2,450,000                       | NR/NRIllinois Finance Authority Revenue,<br>6.375%, 5/15/17                                     | 2,453,185     |
| 2,500,000                       | NR/Baa3Illinois Finance Authority Revenue,<br>6.5%, 4/1/39                                      | 2,855,800     |
| 240,000                         | NR/NRIllinois Finance Authority Revenue,<br>7.0%, 11/15/17                                      | 238,526       |
| 500,000                         | NR/NRIllinois Finance Authority Revenue,<br>7.0%, 5/15/18                                       | 500,840       |
| 855,000                         | NR/NRIllinois Finance Authority Revenue,<br>7.0%, 11/15/27                                      | 849,729       |
| 1,700,000                       | NR/NRIllinois Finance Authority Revenue,<br>7.625%, 5/15/25                                     | 2,035,971     |
| 600,000                         | NR/NRIllinois Finance Authority Revenue,<br>7.75%, 5/15/30                                      | 714,018       |
| 2,000,000                       | NR/NRIllinois Finance Authority Revenue,<br>8.0%, 5/15/40                                       | 2,385,420     |
| 3,200,000                       | NR/NRIllinois Finance Authority Revenue,<br>8.0%, 5/15/46                                       | 3,816,672     |
| 4,000,000                       | NR/NRIllinois Finance Authority Revenue,<br>8.25%, 5/15/45                                      | 4,242,400     |
| 2,500,000                       | NR/NRIllinois Finance Authority Revenue,<br>8.25%, 2/15/46                                      | 2,731,375     |
| 16,880,000(e)                   | AAA/A3Metropolitan Pier & Exposition<br>Authority Dedicated State Tax<br>Revenue, 0.0%, 6/15/22 | 15,837,322    |
| 1,450,000                       | NR/NRSouthwestern Illinois Development<br>Authority Revenue, 5.625%,<br>11/1/26                 | 1,235,313     |
|                                 | Indiana - 1.6%  | \$ 48,403,596 |
| 250,000                         | NR/NRCity of Carmel Indiana Nursing<br>Home Revenue, 7.0%, 11/15/32                             | \$ 270,972    |
| 750,000                         | NR/NRCity of Carmel Indiana Nursing<br>Home Revenue, 7.125%, 11/15/42                           | 813,428       |
| 500,000                         | NR/NRCity of Carmel Indiana Nursing<br>Home Revenue, 7.125%, 11/15/47                           | 540,360       |
| 3,570,000                       | NR/NRVigo County Hospital Authority<br>Revenue, 5.8%, 9/1/47 (144A)                             | 3,703,554     |
|                                 |   | \$ 5,328,314  |
| Principal<br>Amount<br>USD (\$) | S&P/Moody's<br>Rating   | Value         |

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|              |           |  |                            |
|--------------|-----------|--|----------------------------|
|              |           | Louisiana - 2.1%   |                            |
| 1,500,000    | BBB-/Baa3 | Louisiana Local Government<br>Environmental Facilities &<br>Community Development Authority<br>Revenue, 6.75%, 11/1/32 | \$ 1,705,200               |
| 5,000,000    | NR/Baa1   | Louisiana Public Facilities<br>Authority Revenue, 5.5%, 5/15/47  | 5,323,600<br>\$ 7,028,800  |
|              |           | Maine - 0.6%   |                            |
| 1,500,000    | NR/Baa3   | Maine Health & Higher Educational<br>Facilities Authority Revenue, 7.5%,<br>7/1/32                                     | \$ 1,926,510               |
|              |           | Massachusetts - 5.3%   |                            |
| 7,100,000    | A/WR      | Massachusetts Development<br>Finance Agency Revenue, 5.75%,<br>1/1/42  | \$ 9,485,884               |
| 2,250,000    | NR/NR     | Massachusetts Development<br>Finance Agency Revenue, 7.1%,<br>7/1/32   | 2,251,125                  |
| 790,000      | AA/NR     | Massachusetts Educational<br>Financing Authority Revenue, 6.0%,<br>1/1/28  | 918,802                    |
| 4,500,000(b) | NR/NR     | Massachusetts Health &<br>Educational Facilities Authority<br>Revenue, 6.5%, 1/15/38                                   | 23,355                     |
| 5,000,000    | BB-/NR    | Massachusetts Health &<br>Educational Facilities Authority<br>Revenue, 6.75%, 10/1/33                                  | 5,078,250<br>\$ 17,757,416 |
|              |           | Michigan - 3.4%  |                            |
| 935,000      | NR/NR     | Doctor Charles Drew Academy<br>Certificate of Participation, 5.7%,<br>11/1/36  | \$ 683,662                 |
| 1,500,000    | BB-/NR    | John Tolfree Health System Corp.<br>Revenue, 6.0%, 9/15/23   | 1,499,925                  |
| 2,000,000    | BB+/NR    | Kent Hospital Finance Authority<br>Revenue, 6.25%, 7/1/40  | 2,102,840                  |
| 5,830,000    | B-/NR     | Michigan Tobacco Settlement<br>Finance Authority Revenue, 6.0%,<br>6/1/48  | 5,541,765                  |
| 1,410,000(a) | BBB/NR    | Star International Academy<br>Certificates of Participation,<br>6.125%, 3/1/37   | 1,444,672<br>\$ 11,272,864 |
|              |           | Minnesota - 0.3%   |                            |
| 1,000,000    | NR/NR     | Port Authority of the City of<br>Bloomington, Minnesota Recovery<br>Zone Facility Revenue, 9.0%,<br>12/1/35            | \$ 1,193,120               |

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|                           |                    |   |               |
|---------------------------|--------------------|---|---------------|
|                           |                    | Montana - 0.1%  |               |
| 1,600,000(b)(f)           | NR/NR              | Two Rivers Authority Inc., Project Revenue, 7.375%, 11/1/27             | \$ 237,568    |
|                           |                    | New Jersey - 8.0%   |               |
| 1,500,000                 | NR/NR              | New Jersey Economic Development Authority Revenue, 10.5%, 6/1/32 (144A) | \$ 1,651,245  |
| 5,000,000                 | B/B3               | New Jersey Economic Development Authority Revenue, 5.25%, 9/15/29       | 5,095,350     |
| 2,500,000                 | B/B3               | New Jersey Economic Development Authority Revenue, 5.75%, 9/15/27       | 2,574,275     |
| 6,150,000                 | B/B3               | New Jersey Economic Development Authority Revenue, 7.0%, 11/15/30       | 6,173,001     |
| 3,000,000                 | B-/B1              | Tobacco Settlement Financing Corp., Revenue, 4.625%, 6/1/26             | 2,911,170     |
| 8,000,000(a)              | AA+/#Aaa           | Tobacco Settlement Financing Corp., Revenue, 6.75%, 6/1/39              | 8,174,240     |
|                           |                    |   | \$ 26,579,281 |
|                           |                    | New Mexico - 1.2%   |               |
| 1,500,000                 | NR/NR              | Otero County New Mexico Project Revenue, 6.0%, 4/1/23                   | \$ 1,373,130  |
| 2,960,000                 | NR/NR              | Otero County New Mexico Project Revenue, 6.0%, 4/1/28                   | 2,577,154     |
|                           |                    |   | \$ 3,950,284  |
|                           |                    | New York - 7.8%   |               |
| 2,000,000                 | NR/NR              | Chautauqua County Capital Resource Corp., Revenue, 8.0%, 11/15/30       | \$ 2,158,740  |
| 3,000,000                 | NR/NR              | Dutchess County Industrial Development Agency Revenue, 7.5%, 3/1/29     | 3,078,390     |
| 2,000,000                 | BBB+/NR            | Hempstead Local Development Corp. Revenue, 5.75%, 7/1/39                | 2,282,460     |
| Principal Amount USD (\$) | S&P/Moody's Rating |   | Value         |
|                           |                    | New York - (continued)  |               |
| 2,000,000                 | BB/B2              | New York City Industrial Development Agency Revenue, 5.25%, 12/1/32     | \$ 2,000,000  |
| 2,000,000                 | BB/B2              | New York City Industrial Development Agency Revenue, 7.625%, 12/1/32    | 2,050,180     |
| 7,040,000(c)              | AAA/WR             | New York State Dormitory Authority Revenue, 13.299%, 5/29/14 (144A)     | 10,294,099    |
| 1,000,000                 | NR/Ba1             |   | 1,115,850     |



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|              |  |   |                            |
|--------------|--|---|----------------------------|
|              |  | New York State Dormitory Authority Revenue,<br>6.125%, 12/1/29  |                            |
| 3,000,000    |  | NR/NRSuffolk County Industrial Development Agency<br>Revenue, 7.25%, 1/1/30                                   | 3,002,940<br>\$ 25,982,659 |
|              |  | North Carolina - 3.4%   |                            |
| 4,795,000    |  | NR/NRCharlotte North Carolina Special Facilities Revenue,<br>7.75%, 2/1/28                                    | \$ 4,802,145               |
| 6,685,000    |  | NR/NRCharlotte Special Facilities Revenue, 5.6%, 7/1/27   | 6,587,265<br>\$ 11,389,410 |
|              |  | North Dakota - 0.8%   |                            |
| 2,525,000    |  | BBB+/NRCounty of Burleigh Health Care Revenue, 5.0%,<br>7/1/38  | \$ 2,744,145               |
|              |  | Ohio - 0.7%   |                            |
| 2,000,000    |  | AA/A2JobsOhio Beverage System Liquor Profits Revenue,<br>5.0%, 1/1/38   | \$ 2,281,880               |
|              |  | Oklahoma - 0.4%   |                            |
| 1,225,000    |  | NR/WRTulsa Municipal Airport Trust Revenue, 6.25%,<br>6/1/20  | \$ 1,227,965               |
|              |  | Pennsylvania - 2.2%   |                            |
| 1,550,000    |  | NR/Baa2Allegheny County Hospital Development Authority<br>Revenue, 5.125%, 5/1/25                             | \$ 1,550,558               |
| 1,280,000(b) |  | NR/WRLanghorne Manor Borough Higher Education<br>Authority Revenue, 7.35%, 7/1/22                             | 371,264                    |
| 5,000,000    |  | B-/Caa2Pennsylvania Economic Development Financing<br>Authority Solid Waste Disposal Revenue, 6.0%,<br>6/1/31 | 5,000,350                  |
| 500,000      |  | BBB+/NRPennsylvania Higher Educational Facilities Authority<br>Development Revenue, 5.4%, 7/15/36             | 508,945<br>\$ 7,431,117    |
|              |  | Rhode Island - 2.1%   |                            |
| 6,000,000(f) |  | NR/NRCentral Falls Rhode Island Detention Facility Corp.,<br>Revenue, 7.25%, 7/15/35                          | \$ 5,197,320               |
| 1,500,000    |  | NR/NRRhode Island Health & Educational Building Corp.,<br>Revenue, 8.375%, 1/1/46                             | 1,778,970<br>\$ 6,976,290  |
|              |  | South Carolina - 1.2%   |                            |
| 3,850,000(a) |  | BBB+/Baa1South Carolina Jobs Economic Development<br>Authority Revenue, 6.375%, 8/1/34                        | \$ 3,967,694               |
|              |  | Tennessee - 1.4%  |                            |
| 4,600,000    |  | BBB+/NRSullivan County Health, Educational & Housing<br>Facilities Board Revenue, 5.25%, 9/1/36               | \$ 4,857,646               |
|              |  | Texas - 16.9%   |                            |
| 1,345,000    |  | NR/Caa2Bexar County Housing Finance Corp., Multi Family<br>Housing Revenue, 8.0%, 12/1/36                     | \$ 931,116                 |
| 2,500,000    |  | BB+/Ba1Central Texas Regional Mobility Authority Revenue,<br>6.75%, 1/1/41                                    | 2,925,475                  |

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| 4,000,000     | NR/NRDecatur Hospital Authority Medical Revenue, 7.0%,<br>9/1/25                          | 4,240,680  |
| 725,078(b)(f) | NR/NRGulf Coast Industrial Development Authority<br>Revenue, 7.0%, 12/1/36                | 6,700      |
| 3,750,000     | B/B3Houston Airport System Special Facilities Revenue,<br>5.7%, 7/15/29                   | 3,759,150  |
| 3,000,000     | NR/NRJefferson County Industrial Development Corp.,<br>Revenue, 8.25%, 7/1/32             | 3,078,510  |
| 5,340,000     | NR/NRLubbock Health Facilities Development Corp.,<br>Nursing Home Revenue, 6.625%, 7/1/36 | 5,594,291  |
| 10,000,000    | BBB+/A3North Texas Tollway Authority Transportation<br>Revenue, 5.75%, 1/1/33             | 11,156,100 |

| Principal<br>Amount<br>USD (\$) | S&P/Moody's<br>Rating | Value |
|---------------------------------|-----------------------|-------|
|---------------------------------|-----------------------|-------|

|              |  |                            |
|--------------|--|----------------------------|
|              | Texas - (continued)  |                            |
| 2,810,000(c) | AAA/AaaNorthside Independent School<br>District, GO, 13.701%, 9/29/12<br>(144A)                              | \$ 3,239,480               |
| 1,500,000    | NR/NRRed River Health Facilities<br>Development Corp., Revenue, 8.0%,<br>11/15/41                            | 1,737,975                  |
| 3,000,000    | NR/NRSanger Industrial Development<br>Corp., Revenue, 8.0%, 7/1/38   | 3,214,770                  |
| 7,040,000(c) | AA+/AaaState of Texas, GO, 12.536%,<br>4/1/13  | 8,950,093                  |
| 2,000,000    | NR/NRTarrant County Cultural Education<br>Facilities Finance Corp., Revenue,<br>8.0%, 11/15/34               | 2,293,960                  |
| 1,000,000    | NR/NRTarrant County Cultural Education<br>Facilities Finance Corp., Revenue,<br>8.125%, 11/15/39             | 1,119,300                  |
| 1,500,000    | NR/NRTarrant County Cultural Education<br>Facilities Finance Corp., Revenue,<br>8.25%, 11/15/44              | 1,684,845                  |
| 2,500,000    | NR/NRTravis County Health Facilities<br>Development Corp., Revenue,<br>7.125%, 1/1/46                        | 2,677,125<br>\$ 56,609,570 |
|              | Vermont - 0.5%   |                            |
| 1,500,000(a) | A-/Baa1Vermont Educational & Health<br>Buildings Financing Agency Higher<br>Education Revenue, 6.0%, 10/1/28 | \$ 1,556,790               |
|              | Virginia - 0.3%  |                            |
| 1,000,000    | BBB/Ba1Peninsula Ports Authority Revenue,<br>6.0%, 4/1/33  | \$ 1,013,610               |

Washington - 10.3%

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|                  |   |                |
|------------------|---|----------------|
| 4,710,000        | A+/A2Spokane Public Facilities District<br>Hotel/Motel Tax & Sales, 5.75%,<br>12/1/27                     | \$ 4,876,357   |
| 14,315,000(d)    | AA+/Aa1State of Washington, GO, 0.0%,<br>6/1/22   | 11,670,876     |
| 7,025,000        | BBB/Baa1Tobacco Settlement Authority<br>Revenue, 6.625%, 6/1/32   | 7,193,530      |
| 3,795,000        | A/A2Washington State Health Care<br>Facilities Authority Revenue, 6.0%,<br>1/1/33                         | 4,275,523      |
| 5,000,000        | NR/NRWashington State Housing Finance<br>Committee Nonprofit Revenue,<br>5.625%, 1/1/27                   | 5,073,300      |
| 1,150,000        | NR/NRWashington State Housing Finance<br>Committee Nonprofit Revenue,<br>6.75%, 10/1/47                   | 1,167,791      |
|                  | West Virginia - 0.9%  | \$ 34,257,377  |
| 2,000,000        | NR/NRCity of Philippi, 7.75%, 10/1/44   | \$ 2,051,580   |
| 745,000          | NR/NRWest Virginia Hospital Finance<br>Authority Hospital Revenue,<br>9.125%, 10/1/41                     | 955,693        |
|                  | Wisconsin - 1.8%  | \$ 3,007,273   |
| 2,320,000(g)     | NR/NRAztalan Township, 7.5%, 5/1/18   | \$ -           |
| 2,500,000        | NR/NRWisconsin Public Finance Authority<br>Continuing Care Retirement<br>Community Revenue, 8.25%, 6/1/46 | 3,012,375      |
| 1,500,000        | NR/NRWisconsin State Public Finance<br>Authority Revenue, 8.375%, 6/1/20                                  | 1,517,445      |
| 1,500,000        | NR/NRWisconsin State Public Finance<br>Authority Revenue, 8.625%, 6/1/47                                  | 1,621,500      |
|                  |   | \$ 6,151,320   |
|                  | TOTAL TAX EXEMPT<br>OBLIGATIONS<br>(Cost \$374,898,476)   | \$ 422,488,317 |
|                  | MUNICIPAL COLLATERALIZED<br>DEBT OBLIGATION - 1.9% of<br>Net Assets                                       |                |
| 10,000,000(c)(f) | NR/NRNon-Profit Preferred Funding Trust<br>I, 6.75%, 9/15/37 (144A)                                       | \$ 6,366,200   |
|                  | TOTAL MUNICIPAL<br>COLLATERALIZED DEBT<br>OBLIGATION<br>(Cost \$10,000,000)                               | \$ 6,366,200   |

|  |                  |
|--|------------------|
| TOTAL INVESTMENTS IN<br>SECURITIES - 128.4%  |                  |
| (Cost - \$384,898,476) (h) (i)   | \$ 428,854,517   |
| OTHER ASSETS AND<br>LIABILITIES - 1.8%   | \$ 6,060,080     |
| PREFERRED SHARES AT<br>REDEMPTION VALUE,<br>INCLUDING DIVIDENDS<br>PAYABLE - (30.2)% | \$ (101,000,768) |
| NET ASSETS APPLICABLE TO<br>COMMON SHAREOWNERS -<br>100.0%                           | \$ 333,913,829   |

|        |   |
|--------|---|
| NR     | Security not rated by S&P or Moody's.   |
| WR     | Rating withdrawn by either S&P or Moody's.  |
| (144A) | Security is exempt from registration under Rule 144A of the Securities Act of 1933. Such securities may be resold normally to qualified institutional buyers in a transaction exempt from registration. At January 31, 2013, the value of these securities amounted to \$44,744,416, or 13.4% of total net assets applicable to common shareowners. |
| RIB    | Residual Interest Bond. The interest rate is subject to change periodically and inversely based upon prevailing market rates. The interest rate shown is the rate at January 31, 2013.  |
| GO     | General Obligation.   |

- (a) Prerefunded bonds have been collateralized by U.S. Treasury or U.S. Government Agency securities which are held in escrow to pay interest and principal on the tax exempt issue and to retire the bonds in full at the earliest refunding date.
- (b) Security is in default and is non income producing.
- (c) The interest rate is subject to change periodically. The interest is shown is the rate at January 31, 2013.
- (d) Security issued with a zero coupon. Income is recognized through accretion of discount.
- (e) Debt obligation initially issued at one coupon which converts to a higher coupon at a specific date. The rate shown is the rate at January 31, 2013.
- (f) Indicates a security that has been deemed as illiquid. The aggregate cost of illiquid securities is \$18,159,633. The aggregate fair value of \$11,807,788 represents 3.5% of total net assets applicable to common shareowners.
- (g) Security is valued using fair value methods.

(h) The concentration of investments by type of obligation/ market sector is as follows :

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|                           |        |
|---------------------------|--------|
| Insured                   |        |
| NATL-RE                   | 4.8%   |
| FSA                       | 3.6    |
| NATL-RE FGIC              | 2.7    |
| AMBAC GO OF INSTN         | 2.2    |
| PSF-GTD                   | 0.8    |
| Revenue Bonds:            |        |
| Health Revenue            | 16.6   |
| Facilities Revenue        | 14.8   |
| Other Revenue             | 14.7   |
| Tobacco Revenue           | 13.4   |
| Development Revenue       | 9.5    |
| Education Revenue         | 6.4    |
| Airport Revenue           | 5.0    |
| Transportation Revenue    | 2.6    |
| Pollution Control Revenue | 1.7    |
| Water Revenue             | 1.2    |
| Utilities Revenue         | 0.0*   |
|                           | 100.0% |

\* Amount is less than 0.1%

(i) At January 31, 2013 the net unrealized gain on investments based on cost for federal tax purposes \$384,898,476 was as follows:

|  |               |
|--|---------------|
| Aggregate gross unrealized gain for all investments in which there is an excess of value over tax cost | \$ 54,371,492 |
| Aggregate gross unrealized loss for all investments in which there is an excess of tax cost over value | (10,415,451)  |
| Net unrealized gain  | \$ 43,956,041 |

For financial reporting purposes net unrealized gain on investments was \$43,956,041 and cost of investments aggregated \$384,898,476.

Schedule of Investments | 1/31/13 (unaudited)

Various inputs are used in determining the value of the Trust's investments. These inputs are summarized in the three broad levels below.

Level 1 - quoted prices in active markets for identical securities

Level 2 - other significant observable inputs (including quoted prices for similar securities, interest rates, prepayment speeds, credit risks, etc.)

Level 3 - significant unobservable inputs (including the Trust's own assumptions in determining fair value of investments)

Generally, equity securities are categorized as Level 1, fixed income securities and senior loans are categorized as Level 2, and securities valued using fair value methods (other than prices supplied by independent pricing services) as level 3.

The following is a summary of the inputs used as of January 31, 2013, in valuing the Trust's investments.

|  | Level 1 | Level 2       | Level 3 | Total         |
|--|---------|---------------|---------|---------------|
| TAX EXEMPT OBLIGATIONS                   | \$-     | \$422,488,317 | \$-     | \$422,488,317 |
| MUNICIPAL COLLATERALIZED DEBT OBLIGATION | -       | 6,366,200     | -       | 6,366,200     |
| TOTAL                                    | \$-     | \$428,854,517 | \$-     | \$428,854,517 |

The following is a reconciliation of assets valued using significant unobservable inputs (level 3):

|                        | Balance as of 4/30/12 | Realized gain (loss) | Change in Unrealized appreciation (depreciation) | Purchases | Sales | Accrued discounts/premiums | Transfers in to Level 3* | Transfers out of Level 3* | Balance as of 1/31/13 |    |
|------------------------|-----------------------|----------------------|--|-----------|-------|----------------------------|--------------------------|---------------------------|-----------------------|----|
| Tax exempt obligations | \$-                   | \$-                  | \$ -   | \$-       | \$-   | \$ -                       | \$-                      | \$-                       | \$-                   | ** |
| Total                  | \$-                   | \$-                  | \$ -   | \$-       | \$-   | \$ -                       | \$-                      | \$-                       | \$-                   |    |

\* Transfers are calculated on the end of period values.

\*\* Azatlan Township is fair valued at \$0.

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During the period ended January 31, 2013, there were no transfers between Levels 1, 2 and 3.

### ITEM 2. CONTROLS AND PROCEDURES.

(a) Disclose the conclusions of the registrant's principal executive officer or officers and principal financial officer or officers, or persons performing similar functions, about the effectiveness of the registrant's disclosure controls and procedures (as defined in Rule 30a-3(c) under the Act (17 CFR 270.30a-3(c))) as of a date within 90 days of the filing date of the report that includes the disclosure required by this paragraph, based on their evaluation of these controls and procedures required by Rule 30a-3(b) under the Act (17 CFR 270.30a-3(b)) and Rule 13a-15(b) or 15d-15(b) under the Exchange Act (17 CFR 240.13a-15(b) or 240.15d-15(b)).

The registrant's principal executive officer and principal financial officer have concluded that the registrant's disclosure controls and procedures are effective based on their evaluation of these controls and procedures as of a date within 90 days of the filing date of this report.

(b) Disclose any change in the registrant's internal controls over financial reporting (as defined in Rule 30a-3(d) under the Act (17 CFR 270.30a-3(d))) that occurred during the registrant's last fiscal quarter that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting.

There were no significant changes in the registrant's internal control over financial reporting that occurred during the second fiscal quarter of the period covered by this report that have materially affected, or are reasonably likely to materially affect, the registrant's internal control over financial reporting.

### ITEM 3. EXHIBITS.

(a) A separate certification for each principal executive officer and principal financial officer of the registrant as required by Rule 30a-2 under the Act (17 CFR 270.30a-2).

Filed herewith.

<PAGE>

### SIGNATURES

[See General Instruction F]

Pursuant to the requirements of the Securities Exchange Act of 1934 and the Investment Company Act of 1940, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

(Registrant) Pioneer Municipal High Income Trust

By (Signature and Title)\* /s/ John F. Cogan, Jr.  
John F. Cogan, Jr, President

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Date April 1, 2013

Pursuant to the requirements of the Securities Exchange Act of 1934 and the Investment Company Act of 1940, this report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated.

By (Signature and Title)\* /s/ John F. Cogan, Jr.  
John F. Cogan, Jr., President

Date April 1, 2013

By (Signature and Title)\* /s/ Mark Bradley  
Mark Bradley, Treasurer

Date April 1, 2013

\* Print the name and title of each signing officer under his or her signature.