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PIONEER MUNICIPAL HIGH INCOME TRUST  
Form N-Q  
March 31, 2009

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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)

Dorothy E. Bourassa, 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, 2009

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.

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### ITEM 1. Schedule of Investments.

Pioneer Municipal High Income Trust  
SCHEDULE OF INVESTMENTS 1/31/09 (unaudited)

Principal Amount		Value (\$)
	TAX EXEMPT OBLIGATIONS - 133.4% of Net Assets	
	Alabama - 0.7%	
1,000,000	Huntsville-Redstone Village Special Care Facilities F	629,300
2,000,000	Huntsville-Redstone Village Special Care Facilities F	1,054,120
		1,683,420
	Arizona - 2.3%	
5,000,000	Apache County Industrial Development Authority, 5.85%	4,275,200
970,000	Pima County Industrial Development Authority, 7.25%	789,716
500,000	Yavapai County Industrial Development Authority, 6.0%	377,405
		5,442,321
	California - 12.1%	
7,885,000 (a)	California State University Revenue, RIB, 9.142%, 11/	6,865,864
4,500,000	California Statewide Communities Development Authority Environmental Facilities Revenue, 9.0%, 12/1/38	3,576,780
1,000,000	California Statewide Communities Development Authorit	731,360
5,150,000 +	Golden State Tobacco Securitization Corp., 7.8%, 6/1/	6,355,048
7,000,000 +	Golden State Tobacco Securitization Corp., 7.875%, 6/	8,658,580
2,500,000	University of California Revenue, 5.0%, 5/15/25	2,528,675
655,000	Valley Health System Hospital Revenue, 6.5%, 5/15/25	399,353
		29,115,660
	Connecticut - 5.7%	
10,335,000 (a)	Connecticut Health & Educational Facilities Authority	10,283,532
5,000,000	Mohegan Tribe Indians Gaming Authority, 6.25%, 1/1/31	3,467,200
		13,750,732
	Delaware - 0.4%	
765,000	Sussex County Delaware Revenue, 5.9%, 1/1/26	522,235
600,000	Sussex County Delaware Revenue, 6.0%, 1/1/35	363,366
		885,601
	District of Columbia - 3.2%	
5,000,000	District of Columbia Tobacco Settlement Financing Cor	3,415,900
6,000,000	District of Columbia Tobacco Settlement Financing Cor	4,144,980
		7,560,880
	Florida - 4.3%	
1,800,000	Beacon Lakes Community Development, 6.9%, 5/1/35	1,256,382
2,000,000	Brevard County Health Facilities Authority Revenue, 5	1,373,300
2,500,000	Liberty County Subordinate Revenue, 8.25%, 7/1/28	2,029,500
1,000,000	St. Johns County Industrial Development Authority Rev	613,200
2,000,000	St. Johns County Industrial Development Authority Rev	1,078,960
5,000,000	Tallahassee Health Facilities Revenue, 6.375%, 12/1/3	4,070,300
		10,421,642
	Georgia - 3.7%	
4,240,000 (a)	Atlanta Georgia Water & Waste Revenue, RIB, 8.622%, 1	3,049,238
2,400,000	Fulton County Residential Care Facilities Revenue, 5.	1,427,472
2,600,000	Fulton County Residential Care Facilities Revenue, 5.	1,326,494
7,500,000 (b)	Main Street Natural Gas Project Revenue, 6.25%, 7/15/	1,481,175
4,500,000 (b)	Main Street Natural Gas Project Revenue, 6.375%, 7/15	888,705
1,000,000	Rockdale County Development Authority Revenue, 6.125%	644,860
		8,817,944
	Guam - 1.5%	
5,000,000	Northern Mariana Islands, 5.0%, 10/1/22	3,508,700
	Idaho - 1.6%	

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5,000,000	Power County Industrial Development Corp., 6.45%, 8/1	3,893,900
	Illinois - 7.8%	
2,000,000 (c)	Centerpoint Intermodal Center, 10.0%, 6/15/23 (144A)	1,537,900
1,000,000	Illinois Finance Authority Revenue, 6.0%, 11/15/27	678,860
4,000,000	Illinois Finance Authority Revenue, 6.0%, 11/15/39	2,297,720
1,500,000 (b)	Illinois Health Facilities Authority Revenue, 6.9%, 1	814,050
16,880,000 (d)	Metropolitan Pier & Exposition Authority Dedicated St	12,132,838
1,800,000	Southwestern Illinois Development Authority Revenue,	1,151,478
		18,612,846
	Indiana - 3.4%	
5,000,000	Indiana Health & Educational Facility Financing Autho	3,449,400
1,000,000	Indiana State Development Finance Authority Revenue,	727,050
4,300,000	Indiana State Development Finance Authority Revenue,	4,068,015
		8,244,465
	Louisiana - 2.0%	
1,500,000	Louisiana Local Government Environmental Facilities R	1,041,780
5,000,000	Louisiana Public Facilities Authority Revenue, 5.5%,	3,660,700
		4,702,480
	Massachusetts - 4.2%	
2,440,000	Massachusetts Development Finance Agency Revenue, 7.1	1,830,171
3,500,000	Massachusetts Health & Educational Facilities Authori	2,980,845
2,500,000	Massachusetts Health & Educational Facilities Authori	1,665,075
5,000,000	Massachusetts Health & Educational Facilities Authori	3,541,000
		10,017,091
	Michigan - 2.2%	
950,000	Doctor Charles Drew Academy, 5.7%, 11/1/36	515,195
1,700,000	Flint Michigan Hospital Building Authority Revenue, 5	1,369,282
1,500,000	John Tolfree Health System Corp., 6.0%, 9/15/23	1,107,435
2,000,000	Michigan State Hospital Finance Authority Revenue, 5.	1,299,660
1,470,000	Star International Academy Certificates of Participat	923,968
		5,215,540
	Minnesota - 0.6%	
1,675,000	Duluth Economic Development Authority Health Care Fac	1,317,538
	Mississippi - 1.0%	
3,000,000	Mississippi Business Finance Corp. Pollution Control	2,437,710
	Montana - 0.3%	
1,600,000	Two Rivers Authority, Inc. Correctional Facility Impr	640,576
	Nebraska - 0.6%	
2,000,000	Grand Island Solid Waste Disposal Facilities Revenue,	1,513,100
	Nevada - 0.1%	
2,000,000	Nevada State Department of Business & Industry, 7.25%	299,760
	New Jersey - 11.1%	
2,000,000	New Jersey Economic Development Authority Revenue, 6.	1,428,700
13,350,000	New Jersey Economic Development Authority Revenue, 6.	8,343,483
1,000,000	New Jersey Economic Development Authority Revenue, 6.	672,250
6,150,000	New Jersey Economic Development Authority Revenue, 7.	4,007,586
10,000,000 +	Tobacco Settlement Financing Corp., 6.75%, 6/1/39	12,083,400
		26,535,419
	New Mexico - 1.3%	
1,500,000	Otero County New Mexico Project Revenue, 6.0%, 4/1/23	1,111,275
2,960,000	Otero County New Mexico Project Revenue, 6.0%, 4/1/28	2,078,956
		3,190,231
	New York - 11.1%	
2,500,000	Albany New York Industrial Development Agency Civic F	1,858,600
3,000,000	Dutchess County Industrial Development Agency Revenue	2,676,990
2,000,000	Nassau County New York Industrial Development Agency	1,376,580

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2,000,000	New York City Industrial Development Agency, 5.375%,	1,615,220
12,990,000	New York City Industrial Development Agency, 6.9%, 8/	5,332,005
7,040,000 (a)	New York State Dormitory Authority Revenue, RIB, 12.0	8,098,957
2,000,000	Suffolk County Industrial Development Agency, 7.25%,	1,542,480
4,000,000	Triborough Bridge & Tunnel Authority Revenue, 5.25%,	4,009,760
		26,510,592
	North Carolina - 2.4%	
4,030,000	Charlotte North Carolina Special Facilities Revenue,	2,079,641
5,740,000	Charlotte North Carolina Special Facilities Revenue,	3,664,244
		5,743,885
	Oklahoma - 6.3%	
3,000,000 +	Oklahoma Development Finance Authority Revenue, 5.625	3,104,430
7,000,000 +	Oklahoma Development Finance Authority Revenue, 5.625	7,243,670
1,225,000	Tulsa Municipal Airport Revenue, 6.25%, 6/1/20	837,165
4,350,000	Tulsa Municipal Airport Revenue, 7.35%, 12/1/11	3,880,635
		15,065,900
	Pennsylvania - 8.3%	
3,000,000	Allegheny County Hospital Development Authority Reven	1,624,650
1,550,000	Allegheny County Hospital Development Authority Reven	1,275,588
12,300,000 +	Allegheny County Hospital Development Authority Reven	14,270,952
1,000,000	Columbia County Hospital Authority Health Care Revenu	625,120
925,000	Hazleton Health Services Authority Hospital Revenue,	723,905
1,280,000	Langhorne Manor Borough Higher Education & Health Aut	956,032
500,000	Pennsylvania Higher Educational Facilities Authority	370,285
		19,846,532
	Rhode Island - 1.7%	
6,000,000	Central Falls Detention Facilities Revenue, 7.25%, 7/	4,092,960
	South Carolina - 2.9%	
5,185,000 +	South Carolina Jobs Economic Development Authority Re	6,133,336
665,000 +	South Carolina Jobs Economic Development Authority Re	793,571
		6,926,907
	Tennessee - 5.5%	
7,000,000 +	Johnson City Health & Educational Facilities Board Ho	8,020,040
2,480,000	Knox County Health, Educational & Housing Facilities	
	Board Hospital Revenue, 6.375%, 4/15/22	2,472,039
4,600,000	Sullivan County Health, Educational & Housing Facilities Board	
Hospital Revenue, 5.25%, 9/1/36		2,677,798
		13,169,877
	Texas - 15.2%	
1,345,000	Bexar County Housing Finance Corp., 8.0%, 12/1/36	960,182
1,000,000	Dallas-Fort Worth International Airport Revenue, 6.0%	599,990
4,000,000	Decatur Hospital Authority Revenue, 7.0%, 9/1/25	3,120,240
2,000,000	Gulf Coast Industrial Development Authority Revenue,	1,284,080
3,750,000	Houston Airport System Special Facilities Revenue, 5.	2,106,375
5,340,000	Lubbock Health Facilities Development Corp., 6.625%,	3,637,875
10,000,000	North Texas Tollway Authority Revenue, 5.75%, 1/1/33	8,984,000
2,810,000 (a)	Northside Independent School District, RIB, 10.555%,	2,833,773
500,000	Sabine River Authority Pollution Control Revenue, 6.1	264,740
7,040,000 (a)	Texas State, RIB, 11.348%, 4/1/30 (144A)	7,085,971
735,000 (e)	Willacy County Local Government Corp. Revenue, 6.0%,	738,175
1,075,000	Willacy County Local Government Corp. Revenue, 6.0%,	1,025,088
5,250,000	Willacy County Local Government Corp. Revenue, 6.875%	3,802,470
		36,442,959
	Utah - 0.2%	
800,000	Spanish Fork City Charter School Revenue, 5.55%, 11/1	546,552
	Vermont - 0.6%	
1,500,000	Vermont Educational & Health Buildings Financing Agen	1,526,685
	Virginia - 0.3%	
1,000,000	Peninsula Ports Authority, 6.0%, 4/1/33	825,950

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	Washington - 8.7%	
4,710,000	Spokane Public Facilities District Hotel/Motel Tax &	4,811,077
7,025,000	Tobacco Settlement Authority Revenue, 6.625%, 6/1/32	5,121,225
14,315,000	Washington State General Obligation, 0.0%, 6/1/22	7,776,767
5,000,000	Washington State Housing Finance Committee Nonprofit	3,253,900
		20,962,969
	Wisconsin - 0.1%	
2,320,000	Aztalan Wisconsin Exempt Facilities Revenue, 7.5%, 5/	348,000
	TOTAL TAX-EXEMPT OBLIGATIONS	
	(Cost \$380,378,641)	319,817,324
	MUNICIPAL COLLATERALIZED DEBT OBLIGATION - 3.6% of Net Assets	
10,000,000 (c)	(Non-Profit Preferred Funding Trust I, 12.0%, 9/15/37 (	8,700,100
	TOTAL MUNICIPAL COLLATERALIZED DEBT OBLIGATION	
	(Cost \$10,000,000)	8,700,100
Shares	COMMON STOCK - 0.7% of Net Assets	
247,994 (g)	Delta Air Lines, Inc.	1,711,159
	TOTAL COMMON STOCK	
	(Cost \$6,612,756)	1,711,159
	TOTAL INVESTMENTS IN SECURITIES - 137.7%	
	(Cost \$396,991,397) (h) (i)	330,228,583
	OTHER ASSETS AND LIABILITIES - 4.4%	10,514,545
	PREFERRED SHARES AT REDEMPTION VALUE,	
	INCLUDING DIVIDENDS PAYABLE - (42.1)%	(101,007,570)
	NET ASSETS APPLICABLE TO COMMON SHAREOWNERS - 100.0%	239,735,558
RIB	Residual Interest Bonds	
(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, 2009 the value of these securities amounted to \$49,001,887 or 20.4% of net assets applicable to common shareowners.	
+	Prerefunded bonds have been collateralized by U.S. Treasury securities or U.S. Government Agencies 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.	
(a)	The interest rate is subject to change periodically and inversely based upon prevailing market rates. The interest rate shown is the coupon rate at January 31, 2009.	
(b)	Security is in default and is non-income producing.	
(c)	The interest rate is subject to change periodically. The interest rate shown is the coupon rate at January 31, 2009.	
(d)	Debt obligation initially issued at one coupon which converts to a higher coupon at a specific date. The rate shown is the coupon rate at January 31, 2009.	
(e)	Escrow to maturity.	
(f)	Indicates a security that has been deemed illiquid. The aggregate cost of illiquid securities is \$10,000,000. The aggregate value \$8,700,100	

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represents 3.6% of the net assets.

(g) Non-income producing.

(i) At January 31, 2009, the net unrealized loss on investments based on cost for federal income tax purposes of \$394,959,276 was as follows:

Aggregate gross unrealized gain for all investments \$18,015,249  
there is an excess of value over tax cost

Aggregate gross unrealized loss for all investments (82,745,942)  
there is an excess of tax cost over value \$(64,730,693)  
Net unrealized loss

For financial reporting purposes net unrealized loss on investments was \$66,762,814 and cost of investments aggregated \$396,991,397.

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

Highest priority is given to Level 1 inputs and lowest priority is given to Level 3.

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 risk, etc.)

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

The following is a summary of the inputs used as of January 31, 2009, in valuing the Fund's assets:

Valuation Inputs	Investments in Securities	Other Financial Instruments
Level 1 - Quoted Prices	\$1,711,159	\$0
Level 2 - Other Significant Observable Inputs	328,517,424	(244,233)
Level 3 - Significant Unobservable Inputs	0	0
Total	\$330,228,583	(\$244,233)

\* Other financial instruments include foreign exchange contracts.

### 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.

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(b) Disclose any change in the registrant's internal controls over financial reporting (as defined in Rule 30a-3(d) under the Act (17 CFR270.30a-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.

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

Date March 31, 2009

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 March 31, 2009

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

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Date March 31, 2009

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