

Exhibit No.:
Issue: Noranda Rate
Witness: Steven Schwartz
Type of Exhibit: Direct Testimony
Sponsoring Party: Noranda Aluminum
Case No.: ER-2014-0258
Date Testimony Prepared: December 19, 2014

**BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI**

Filed
March 24, 2015
Data Center
Missouri Public
Service Commission

_____)
In the Matter of Union Electric)
Company d/b/a Ameren)
Missouri's Tariff to Increase its)
Revenues for Electric Service)
_____)

Case No. ER-2014-0258

Direct Testimony of Steven Schwartz

On behalf of

Noranda Aluminum, Inc.

December 19, 2014

Noranda Exhibit No. 610
Date 3-12-15 Reporter KE
File No. ER-2014-0258

**BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI**

**In the Matter of Union Electric
Company d/b/a Ameren's
Missouri's Tariff to Increase
Its Revenues for Electric
Service**

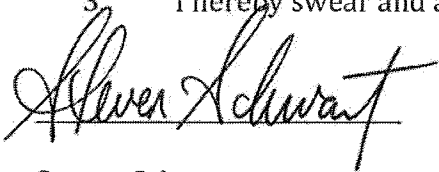
Case No. ER-2014-0258

STATE OF NEW YORK)
) SS
COUNTY OF NEW YORK)

Affidavit of Steven Schwartz

Steven Schwartz, being first duly sworn, on his oath states:

1. My name is Steven Schwartz. I am a Managing Director with Alvarez & Marsal, with my office located at 600 Madison Avenue, New York, NY 10022.
2. Attached hereto, and made a part hereof for all purposes, is my direct testimony, which was prepared in written form for introduction into evidence in Missouri Public Service Commission Case No. ER-2014-0258.
3. I hereby swear and affirm that the testimony is true and correct.



Steven Schwartz

Subscribed and sworn to before me this 12th day of December, 2014.


Notary Public

MARLO NAVARRO
Notary Public of New York
New York County
Reg. # 01NA5073516
Expires February 24, 2015

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

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In the Matter of Union Electric
Company d/b/a Ameren)
Missouri's Tariff to Increase its
Revenues for Electric Service)
_____)

Case No. ER-2014-0258

Direct Testimony of Steven Schwartz, Ph.D.

1 **Q: PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

2 A: Steven Schwartz, 600 Madison Avenue, New York, NY.

3

4 **Q: WHAT IS YOUR OCCUPATION?**

5 A: I am an economist. I am currently employed as an economist and
6 Managing Director with Alvarez & Marsal Global Forensics and Disputes
7 (also known as A&M), based in New York, New York.

8

9 **Q: CAN YOU BRIEFLY SUMMARIZE YOUR EDUCATION?**

10 A: I received my B.A. in Economics from Wesleyan University in Middletown,
11 CT. I graduated *cum laude* and with Departmental Honors in Economics. I
12 earned my M.A. in Economics from the University of Maryland in 1978 and
13 my PhD in Economics, also from the University of Maryland, in 1980.

14

15

16

1 Q: CAN YOU BRIEFLY SUMMARIZE YOUR EMPLOYMENT HISTORY?

2 A: While I was completing my PhD dissertation, I was an economist at the
3 Federal Trade Commission in the Bureau of Economics. After I completed
4 my dissertation and received my degree, I was a member of the
5 economics faculty at Miami University, Oxford, Ohio from 1980-1984.
6 From 1984 until 2011, when I joined Alvarez & Marsal, I was an economist
7 and consultant with NERA Economic Consulting, based in White Plains,
8 NY. I joined A&M in December, 2011. My resume sets forth my complete
9 educational and employment history and is attached to this testimony as
10 Exhibit 1.

11

12 Q: BRIEFLY, WHAT ARE YOUR RESPONSIBILITIES AT A&M?

13 A: I am responsible for managing engagements that require economic
14 analysis and expertise. I manage all aspects of the economic analysis,
15 prepare reports, as requested, and offer testimony explaining the results
16 of my analysis. I am also the head of A&M's economics practice, so my
17 job also include a variety of managerial and business development
18 responsibilities.

19

20 Q: IS ALL OF YOUR WORK IN CONNECTION WITH LITIGATION?

21 A: At present, all of my work is being done in connection with matters
22 currently in litigation or where litigation is contemplated, or in controverted
23 proceedings like this.

1 Q: HAVE YOU SERVED AS AN ECONOMIC EXPERT PRIOR TO YOUR
2 RETENTION IN THIS MATTER?

3 A: Yes. I have testified as an economic expert in many matters in US District
4 Courts, various state courts, arbitrated matters, and Federal administrative
5 agencies. A complete list of testimony is set forth in **Exhibit 1**.

6

7 Q: HAS YOUR PREVIOUS WORK AS AN ECONOMIST AND ECONOMIC
8 EXPERT ENCOMPASSED ISSUES SUCH AS THOSE RAISED IN THIS
9 PROCEEDING?

10 A: My work has been focused on analyzing complex economic issues that
11 arise in the context of commercial disputes and government
12 investigations. I have undertaken analyses of the ways in which various
13 market factors affect businesses' financial performance, health and
14 viability. For example, I have considered the effect of a change the price
15 of an input in a manufacturing process, on firms, their competitive position,
16 their viability and solvency. These analyses also extend to considering
17 the impact of macroeconomic factors on market outcomes and individual
18 firm behavior and results, viability and solvency. I have analyzed the
19 effect of such factors and events on financing terms and conditions, for
20 example, as well as whether contractual or debt covenants were met. I
21 have, as well, analyzed connections between changes in economic
22 conditions and changes in financing terms and conditions, including
23 disputes about contractual or debt covenants.

1 Q: WHO RETAINED ALVAREZ AND MARSAL IN THIS MATTER?

2 A: Noranda Aluminum, Inc. (Noranda) retained A&M. For convenience, in
3 the testimony that follows, I will refer to Noranda Aluminum, Inc. as
4 “Noranda”.

5
6 Q: WHAT WERE YOU ASKED TO DO?

7 A: I was asked to make an independent assessment of the impact of
8 electricity costs on Noranda’s operating (financial) performance at its plant
9 in New Madrid, MO. Specifically, I was asked to assess whether the rates
10 proposed by Ameren¹ in this proceeding or the alternative rates proposed
11 by Noranda would have an impact on Noranda’s financial performance,
12 financial outlook and viability as a going concern and/or its ability to
13 refinance lines of credit that are critical to its financial and operational
14 viability. Finally, I was asked to compare anticipated results under an
15 alternative schedule of electricity rates proposed by Noranda.

16
17 Q: IS THIS THE SORT OF ASSIGNMENT YOU HAVE UNDERTAKEN
18 BEFORE?

19 A: Yes, it is often the case that I am asked to assess how (changes in) the
20 cost of a crucial input or the terms on which such an input is supplied
21 affects a manufacturing business’ performance or its competitive and/or
22 financial viability. I have also studied and analyzed debt and equity

¹ The term “Ameren’s proposed rates” and/or “Ameren’s rate proposal” is used to describe the rates Ameren currently charges to Noranda, along with the increases to those rates that Noranda has projected based on Ameren’s rate filing.

1 markets, access to debt and equity capital, and the general terms and
2 conditions on which debt financing is available.

3

4 **Q: HAVE YOU FORMED ANY OPINIONS AS A RESULT OF YOUR**
5 **ANALYSIS IN THIS CASE?**

6 A: Yes.

7

8 **Q: CAN YOU SUMMARIZE THEM?**

9 A: Yes. First, Noranda's financial performance is essentially determined by
10 the world market price of aluminum and cost of electricity at the New
11 Madrid plant. Second, changing market conditions since 2012 have made
12 Noranda's financial situation precarious. Noranda's inability to generate
13 operating cash flow under the prevailing structure of aluminum market
14 prices and regulated electric prices has depleted the company of cash and
15 limited its ability to make capital expenditures.

16 ** _____

17 _____

18 _____

19 _____**. Finally, if the electricity

20 rate structure proposed by Ameren goes into effect, Noranda's ability to

21 generate cash flow from operations will remain impaired, its ability to

22 invest will be highly constrained, and its cash balances will continue to be

23 depleted. Noranda can replace cash shortfalls for a time with its line of

1 credit. However a consistent history of cash shortfalls and limited hopes
2 for cost abatements will eventually threaten Noranda's ability to access
3 the credit markets and the long-term viability of Noranda's business.

4
5 **Q: WHAT INFORMATION DID YOU RELY ON IN CONNECTION WITH**
6 **YOUR ANALYSIS?**

7 A: I relied on a variety of financial and operating information from Noranda,
8 information provided by Noranda personnel, and publicly available
9 information that my staff and I identified and analyzed in the course of our
10 work. I also utilized the financial model that Noranda prepared to analyze
11 the impact of the Ameren proposal on its financial situation and on
12 different aluminum price scenarios that Noranda prepared.²

13
14 **Q: HAVE YOU FORMED ANY OPINIONS ABOUT THE TECHNOLOGICAL**
15 **IMPORTANCE OF ELECTRICITY FOR AN ALUMINUM SMELTER**
16 **SUCH AS THE ONE NORANDA OPERATES IN NEW MADRID?**

17 A: Yes. My understanding of the technology used in a smelter is that a
18 reliable and constant supply of electricity is essential. I understand that
19 smelters are in constant operation and require a steady and reliable
20 source of electricity. The loss of electric power is devastating to a smelter,
21 since (a) there is no way the smelter can operate without it and (b) the
22 loss of electricity can cause (substantial) damage to the property, plant

² Members of my staff and I have analyzed the model, its inputs and structure. In my opinion, Noranda's approach to building this model is economically reasonable based on our review of the inputs to the model and the calculations embedded therein.

1 and equipment. The process used to produce aluminum is energy
2 intensive and there is no viable economic or technical alternative to
3 electricity.

4

5 **Q: HAVE YOU FORMED ANY OPINIONS ABOUT THE ECONOMIC**
6 **SIGNIFICANCE OF ELECTRICITY COSTS FOR ALUMINUM FIRMS**
7 **GENERALLY AND NORANDA SPECIFICALLY?**

8 A: For an integrated producer of aluminum like Noranda, the business
9 economics start with the smelting process. And for the smelter, electric
10 costs represent approximately 1/3 of the costs of operating a smelter. If
11 electric costs rise significantly in absolute terms and relative to electric
12 costs for competing producers, the underlying economics of a smelter are
13 likely to be eliminated and the viability of a smelter is likely to be in
14 question.

15

16 **Q: WHY IS THAT THE CASE?**

17 A: Based on my review of Noranda's financials and those of other aluminum
18 companies, they operate on generally thin margins, especially at the
19 smelting level. The aluminum they sell is a commodity; there is little
20 meaningful product differentiation at this stage of the production process.
21 As such, these companies are price-takers in the classic sense. There is
22 little they can do to affect the price of the product they produce and prices
23 tend to be driven down to costs. Hence, margins are thin. An increase in

1 a crucial input like electricity that affects one competitor and not others
2 puts that competitor in a disadvantageous position. The affected firm's
3 costs rise, but there is no general cost pressure that raises market prices.
4 Hence, they are in a difficult position as rising costs erode margins that
5 are already thin.

6
7 **Q: HAVE YOU ANALYZED WHAT PORTION OF NORANDA'S COSTS IS**
8 **ACCOUNTED FOR BY ELECTRICITY?**

9 A: Yes. Based on my review of the financial records from Noranda and other
10 documents that I reviewed, electricity represents, on average, 31.8% of
11 the costs of producing aluminum. That percentage has varied from a low
12 of 30.91% in 2012 to a high of 32.69% in 2013. **Exhibit 2** shows that for
13 Noranda, electricity is the single largest cost item per pound of aluminum
14 produced. The data also suggest that electricity is used in a roughly fixed
15 proportion in producing aluminum. While the relationship has some
16 variability, the data indicate that it takes approximately 7 kwh to produce
17 one pound of aluminum.³ This amount has varied slightly over time.

18
19 **Q: WHAT ECONOMIC INFERENCES DO YOU DRAW FROM THIS?**

20 A: The fact that electricity is used in roughly fixed proportions in producing
21 aluminum and represents a large percentage of the costs of producing
22 aluminum indicates that electricity will necessarily be a critical element in

³ See Noranda Financial Model and "12_December Management Report_0214 2013.xlsx" tab 5-Primry Inputs; "December Management Report 02.23.11.xlsx" tab 5-Primary Inputs" and "2014 Management Report_11 14 2014.xlsx" tab 5-Primary Inputs.

1 the production process—a smelter will have little flexibility to adjust the
2 amount of electricity used in the production process. The fact that there is
3 a roughly fixed amount of electricity needed for production indicates that
4 the cost of electricity will necessarily be a key driver of Noranda's
5 profitability.

6 **

7 _____
8 _____ **

9
10 **Q: AS AN ECONOMIST, HOW GENERALLY DO YOU GO ABOUT**
11 **ASSESSING NORANDA'S FINANCIAL SITUATION?**

12 A: From an economic perspective, the process involves gaining an
13 understanding of the way in which the business operates, the markets in
14 which it sells, and the business drivers on the demand side. Then we do
15 the same thing on the cost side. Also, it is important to understand the
16 unique features of a specific business. For Noranda, that means
17 understanding its investment requirements, the drivers of its operating
18 cash flows and liquidity needs, its financing needs and resources, and so
19 forth.

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22
23

1 Q: WHAT IS YOUR OPINION ABOUT NORANDA'S CURRENT FINANCIAL
2 SITUATION?

3 A: **
4 _____
5 _____
6 _____ **

7
8 Q: WHY IS THAT SIGNIFICANT?

9 A: **
10 _____
11 _____
12 _____

13 _____**. An absence of free cash flow will limit Noranda's ability to raise
14 debt or equity financing.

15
16 Q: WHY IS IT RELEVANT IF NORANDA CAN RAISE EITHER DEBT OR
17 EQUITY FINANCING?

18 A: **
19 _____
20 _____
21 _____
22 _____ **.

23 Noranda has a revolving line of credit that must be refinanced in early 2017. It must

1 be able to complete the refinancing in order to operate, since access to
2 that revolving line of credit is a critically important source of working
3 capital. There are subsequent refinancing's that will occur through 2019,
4 and the issue is similar. ** _____

5 _____ **

6
7 **Q: IN YOUR OPINION, WILL NORANDA HAVE DIFFICULTY IN**
8 **SECURING THE DEBT FINANCING THAT IT NEEDS STARTING IN**
9 **2017?**

10 A: ** _____
11 _____
12 _____ **; its credit rating has been downgraded, and in
13 its downgrade report, Standard & Poor's pointed to its liquidity issues and
14 declining operating performance as important factors behind its rating
15 decrease.⁴

16
17 **Q: WHAT HAS HAPPENED TO NORANDA'S CASH?**

18 A: Noranda's free cash flow was negative in 2013 ** _____
19 _____
20 _____
21 _____
22 _____

⁴ _____
Research Update: Noranda Aluminum Holding Corp. Rating Lowered To 'B-' From 'B'; Outlook Is Stable; pp. 2-3 Rationale; Oct 13, 2014.

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_____**. Specifically, cash from operations has fallen from over \$270 million in 2010 to just above \$64 million in 2013. Meanwhile, the only factor preventing Noranda's cash balances from falling even more was its borrowings in 2012 and 2013.⁵

Q: WHAT HAS HAPPENED TO ITS CAPITAL EXPENDITURES?

A: **

**

Q: WHY IS A CREDIT RATING DOWNGRADE MEANINGFUL FOR A BUSINESS LIKE NORANDA?

A: Noranda's credit rating downgrade is meaningful for several reasons. First, it means, at best, that any credit it obtains will be more expensive.

⁵ See Exhibits 3A-B.

1 The credit rating agencies complete detailed reviews of a business,
2 including all aspects of its financial history and, more relevant in this case,
3 its future prospects. Since those future prospects are critical to a
4 business's ability to service its debt in the future, credit rating agencies
5 pay particular attention to the future. Lenders also inquire into a
6 borrower's future prospects, so, at the very best, the ratings downgrade
7 sends strong negative signals to the lending market and will result in
8 higher borrowing costs for Noranda. At the very best, the ratings
9 downgrade will make it more difficult for Noranda to refinance its debt.

10
11 **Q: WHAT, GENERALLY, ARE THE FACTORS THAT CREDIT RATING**
12 **AGENCIES CONSIDER IN EVALUATING A BUSINESS'**
13 **CREDITWORTHINESS?**

14 **A:** I think the best reference for that question is to look at the ratings report.
15 Standard & Poor's looked at profits and losses, cash flow and future
16 conditions in aluminum markets and on the cost side.⁶ They paid
17 particular focus on electricity costs. Clearly, the expectation of high
18 electricity costs created a concern for Noranda's future financial stability
19 and viability.⁷

20

⁶ *Research Update: Noranda Aluminum Holding Corp. Rating Lowered To 'B-' From 'B'; Outlook Is Stable; pp. 2 Overview; Oct 13, 2014*

⁷ *Research Update: Noranda Aluminum Holding Corp. Rating Lowered To 'B-' From 'B'; Outlook Is Stable; pp. 2-3 Rationale; Oct 13, 2014.*

1 Q: TO PUT THIS IN CONTEXT, OTHER THAN BAD PRESS, ARE THERE
2 REAL ECONOMIC CONSEQUENCES FROM A CREDIT DOWNGRADE
3 BY ONE OF THE RATINGS AGENCIES?

4 A: Yes. As I mentioned earlier, it means, at best, that any newly issued debt
5 will be more expensive. More likely, perhaps, is the fact that debt will also
6 be encumbered with restrictive covenants that will affect Noranda's
7 operations. At worst, Noranda will be unable to refinance its debt.⁸ A
8 lower credit rating signals to lenders that there are doubts about the
9 borrower's credit worthiness. Lenders will look skeptically at optimistic
10 business scenarios, and they will look at the sensitivity of performance
11 forecasts to changing assumptions. If they deem a borrower worthy of a
12 loan, they will charge more to make that loan. Or, they can view the
13 borrower as not credit worthy and simply decline to lend. What makes this
14 particularly problematic here is that Noranda was already starting from a
15 junk credit rating. **

16 _____
17 _____
18 _____
19 _____
20 _____
21 _____ **

22

⁸ Note that for a business with thin operating margins, a relatively high degree of leverage is needed for the company to be viable as a stand-alone public company.

1 Q: WHY ARE MARGINS AN IMPORTANT METRIC TO RATINGS
2 AGENCIES, LENDERS AND ECONOMISTS LIKE YOU?

3 A: Margins represent a way to measure profitability. Specifically, they
4 measure profitability relative to revenue. Profits for some company might
5 be \$100 million, but that number looks very different if it is relative to a
6 billion dollars of revenue versus five billion dollars of revenue. Margins
7 provide a way to control for the size of businesses and allow for ready
8 comparisons over time.

9

10 Q: WHAT HAS HAPPENED TO NORANDA'S MARGINS OVER TIME?

11 A: I have prepared an **Exhibit 4** that shows Noranda's gross margins,
12 EBITDA and net income margins. Regardless of how profitability is
13 measured, Noranda's margins have declined. From 2010-2013,
14 Noranda's gross margin—expressed in percentage terms—declined
15 steadily from a high of 14.1% to 5.3%. Note that even though the dollar
16 gross profit increased from 2010 to 2011, the percentage margin actually
17 declined. Similar patterns exist for EBITDA and net income margins: after
18 rising from 2010 to 2011, they have fallen precipitously through 2013. In
19 fact, Noranda's net margin in 2013 was negative.

20

1 Q: HAVE YOU DONE AN ANALYSIS OF THE EFFECT OF THE RATES
2 NORANDA WOULD PAY FOR ELECTRICITY UNDER THE RATE
3 PROPOSAL SUBMITTED BY AMEREN ON NORANDA?⁹

4 A: Yes.

5

6 Q: WHAT DID YOUR ANALYSIS ENTAIL?

7 A: My analysis begins with the financial model that Noranda developed.
8 Noranda prepared a full-scale financial model of its operations at New
9 Madrid. This financial model accounts for the crucial production and
10 technological drivers and analyzes Noranda's financial performance over
11 time. The model is structured such that I can assess the impact of
12 different assumptions about the path of aluminum prices over time, as well
13 as electricity prices, and determine how Noranda performs. As I noted
14 earlier in my testimony, I reviewed the Noranda model carefully and I have
15 concluded that the model is economically reasonable and fairly presents
16 the potential scenarios that Noranda believes are most likely to occur. I
17 used the Noranda financial model to assess the impact of alternative
18 electric rates on Noranda's financial viability, measured in terms of its
19 liquidity, cash balances, and cash flow. I took the Noranda assumptions
20 about aluminum prices and used the Noranda model to further model
21 results under the electric price series that I understand would be in place

⁹ As I understand it, under the Ameren proposal, Noranda will pay the current base rate PLUS an increase every 18 months of 6.4% of the rate then in effect. (This assumes a rate case every 18 months with an average rate increase of 6.4%). Noranda would also pay a fuel adjustment charge (FAC) throughout the period of the proposed rate schedule.

1 under the Ameren proposal. I compared those results to the financial
2 results we would predict under the \$32.50+ rate proposed by Noranda.
3 Finally, since Noranda's financial performance is also sensitive to different
4 aluminum price paths, I performed the same analysis under two different
5 sets of aluminum pricing assumptions presented by Noranda to test the
6 sensitivity of my results.

7
8 **Q: WHY, IN PERFORMING YOUR ANALYSIS, DID YOU DO SO BY**
9 **ANALYZING EVENTS OVER TIME?**

10 A: The issue for Noranda is not just what happens immediately. It is also
11 looking at what its financial health will be, going forward, under reasonable
12 assumptions about aluminum prices and alternative electricity prices.
13 Creditors will lend Noranda money if its prospects seem likely to improve.
14 Absent prospects for improvement, however, Noranda is an unattractive
15 borrower.

16
17 **Q: ARE THERE PARTICULAR RELEVANT TIME PERIODS TO**
18 **CONSIDER?**

19 A: Yes, the period from the present time until 2016. Because of the schedule
20 for refinancing, Noranda will need to begin the process about a year from
21 now, perhaps even a little sooner. Therefore, Noranda's operating
22 performance in 2015 and expectations about 2016 will, at a minimum,
23 color the way that potential lenders evaluate Noranda.

1 Q: DID YOU DETERMINE WHAT THE PROPOSED RATES WOULD BE?

2 A: No. Noranda provided them to me. The rates that I have assumed would
3 be in effect under the Ameren proposal are set forth in **Exhibit 5**.

4

5 Q: WHO FORMED ASSUMPTIONS ABOUT THE PATH THAT ALUMINUM
6 PRICES WOULD FOLLOW OVER TIME?

7 A: Noranda.

8

9 Q: IN YOUR ANALYSIS, DID YOU CONSIDER OTHER POSSIBLE
10 ALUMINUM PRICE PATHS?

11 A: Yes. While I understand that Noranda determined that the price path
12 characterized by the '99 volatility curve represents the base case for
13 forecasting purposes, Noranda also presented other aluminum price
14 scenarios. It was important to test the sensitivity of my conclusions to
15 varying assumptions about aluminum price movements over time. I
16 concluded that they were not materially affected, and this gives me a high
17 degree of confidence that my conclusions are robust.

18

19 Q: HAVE YOU PREPARED AN EXHIBIT THAT COMPARES THE
20 DIFFERENT ELECTRIC AND ALUMINUM PRICE SCENARIOS YOU
21 CONSIDERED?

1 A: Yes. Exhibits 6A-B show each of the scenarios I considered. Exhibit 6A
2 reflects that the expected rates under the Ameren proposal are higher
3 than under the Noranda proposal.

4
5 Q: WHAT CONCLUSIONS DO YOU REACH BASED ON THE
6 ALTERNATIVE ALUMINUM AND ELECTRICITY PRICE SCENARIOS?

7 A: **
8 _____
9 _____
10 _____
11 _____
12 _____
13 _____
14 _____
15 _____
16 _____ **

17
18 Q: **
19 _____ **?

20 A: **
21 _____
22 _____ **

23

1 Q: BUT, WON'T NORANDA'S NEED TO BORROW BE REDUCED
2 BECAUSE IT IS PAYING ON ITS EXISTING LINE OF CREDIT
3 BALANCES NOW?

4 A: No. As I understand it, Noranda is paying interest only. It is not
5 amortizing the loan; no principal is being paid.

6

7 Q: WHY DOES THIS MATTER?

8 A: It matters because if Noranda is unable to refinance, it will be unable to
9 pay back the money that it owes under its existing loans. If Noranda ends
10 up in a situation where it defaults on its loans, it will be in a restructuring
11 situation.

12

13 Q: HAVE YOU CONSIDERED WHETHER NORANDA WILL HAVE
14 ACCESS TO FUNDING FROM EQUITY MARKETS? PUT
15 DIFFERENTLY, CAN IT RAISE FUNDS BY ISSUING ADDITIONAL
16 EQUITY?

17 A: ** _____
18 _____**. Exhibit 8 shows how Noranda's stock price has moved
19 since 2010. While it rose in 2011, it has generally declined since 2011.
20 Its market capitalization—reflected in Exhibit 9A-B—has fallen by over
21 700 million dollars, from June 2011 to June 2014. Its market capitalization
22 has fallen by more than half—about 270 million dollars to 211 million—
23 since it negotiated its current line of credit. ** _____

1 _____**. The patterns are similar for
2 Enterprise Value (the sum of debt plus market capitalization): increases in
3 Noranda's debt load have been more than offset by declines in equity
4 value.

5

6 **Q: BUT, ALUMINUM IS A COMMODITY BUSINESS. HAVE YOU**
7 **CONSIDERED WHETHER THAT RESULT YOU OBSERVE IS REALLY**
8 **JUST DRIVEN BY CONDITIONS IN THE ALUMINUM INDUSTRY**
9 **GENERALLY AS OPPOSED TO NORANDA-SPECIFIC ISSUES?**

10 A: I have considered it. I looked at the stock price and market capitalization
11 of the three other public aluminum companies in the United States.
12 **Exhibit 8** also shows stock prices for each of Alcoa, Kaiser and Century.
13 While each of them had stock price declines from 2011-2012, along with
14 Noranda, each of them has recovered to levels near or above 2011 stock
15 price levels. Similarly, their market capitalization has recovered to be
16 either approximately equal to or above 2011 levels. So, while there was
17 clearly an issue in the aluminum industry in 2012, the rest of the publicly
18 traded participants in the market have recovered. ** _____

19 _____**.

20

21

22

1 Q: WHY ARE STOCK PRICES AN IMPORTANT INDICATOR OF A
2 COMPANY'S HEALTH?

3 A: A company's stock price is a reflection of the stock market's expectations
4 of its future profitability. Steadily declining stock prices are a reflection of
5 the market's negative views of that business, in particular, they reflect
6 diminished expectations about whether there will be free cash flow
7 available after debt service.

8

9 Q: UNDER THE SCENARIO THAT YOU HAVE PRESENTED IN EXHIBIT
10 7A, WHAT WOULD BE THE LIKELY RESULT OF AN EFFORT BY
11 NORANDA TO RAISE MONEY IN THE STOCK MARKET?

12 A: ** _____
13 _____

14 _____ **

15

16 Q: NOW, WHAT HAPPENS UNDER THE RATE SCENARIO PROPOSED
17 BY NORANDA, WHICH STARTS WITH A \$32.50 RATE AND
18 INCREASES AT 1% PER YEAR, AS DEPICTED IN EXHIBIT 7B?

19 A: ** _____

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_____ **

Q: IS THERE A GUARANTEE THAT NORANDA SURVIVES EVEN UNDER ITS ALTERNATIVE?

A: No. But its prospects are much better under this electric price scenario than under the Ameren alternative. Under the Ameren proposal, survival seems unlikely.

Q: WHAT ABOUT THE ALTERNATE SCENARIOS THAT YOU CONSIDERED?

A: ** _____

_____ **

1 Q: AS AN ECONOMIST, WHAT IMPLICATIONS DO YOU DRAW FROM
2 YOUR ANALYSIS?

3 A: Forecasting is an inherently uncertain exercise. So, it is difficult, as an
4 economic matter, to make statements of absolute certainty in a forecasting
5 situation. That said, under the models I have analyzed, I see little
6 prospect for Noranda to survive as an economically viable going concern
7 under the Ameren rate proposal for any aluminum price scenario. The
8 rate proposal from Noranda provides a path to viability. Under that
9 proposal, there is a meaningful chance that Noranda can successfully
10 refinance its debt and be a viable business going forward. Note that under
11 Noranda's proposed rates, Noranda still faces struggles. Noranda still
12 bears significant business risk. If aluminum prices, for example, are below
13 what is forecast, Noranda's financial viability will be threatened. But, given
14 the best assumptions about what the world will look like going forward, the
15 Noranda price proposal allows Noranda to survive. ** _____

16 _____
17 _____ **

18
19 Q: DOES THIS END YOUR DIRECT TESTIMONY?

20 A: Yes it does.

21

22

Steven Schwartz, PhD

Managing Director

Global Forensic and Dispute Services

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Professional History

NERA Economic Consulting.
(1984 – 2011)
Miami University (1980 – 1984))
Federal Trade Commission (1979 - 1980)
Coalition of Northeastern Governors
(01/1979)
Consulting Economist (06/1979)

Education

University of Maryland,
PhD in Economics
MA in Economics
Wesleyan University,
BA with Honors in Economics

Professional Activities

Associate Member,
American Bar Association

Fellowships and Awards

Outstanding Young Men of America (1978)
Lilly Post-Doctoral Fellowship (1981 –
1982)

Dr. Schwartz specializes in antitrust, intellectual property, valuation, and damage estimation matters. He has performed numerous antitrust analyses in connection with private antitrust litigation and merger investigations. He has particular expertise in analyzing the economics of vertical relationships. Dr. Schwartz has analyzed the competitive implications of a variety of restrictions on distributor behavior (e.g., product or territorial exclusivity) and incentive programs designed by suppliers to encourage certain types of behavior by distributors (e.g., co-op advertising programs). Dr. Schwartz has also undertaken many analyses arising out of allegations of illegal price discrimination, on both liability and damages questions. In addition, he has been involved in a variety of cases at the intersection of antitrust and intellectual property issues. Dr. Schwartz has measured damages in antitrust and commercial disputes and he has testified as an expert witness on both antitrust liability and antitrust damage issues in a number of Federal Courts, the International Trade Commission and arbitration proceedings.

Dr. Schwartz has extensive experience analyzing competition in both consumer goods industries (e.g., soft drinks, pet foods and other grocery products) and manufacturing industries (e.g., including steel fabrication, polyester fiber, and semi-conductor manufacturing components).

Dr. Schwartz also has extensive experience in Lanham Act matters. He has estimated damages in both trademark infringement and false advertising matters. Dr. Schwartz is also an expert in intellectual property matters. He has undertaken numerous investigations of the damages associated with alleged patent infringement. He has also advised clients on the value of their intellectual property portfolios and licensing strategies with respect to intellectual property. Dr. Schwartz has also appeared as an expert in the United States Tax Court in matters involving tax-related disputes about the value of intellectual property, including trademarks and other intangibles. He has also testified as an expert in Federal Court in intellectual property litigation, measuring damages in patent infringement cases.

Dr. Schwartz has published articles in economics journals concerning mergers, the persistence of monopoly profits, and arbitrator bias. He has also co-authored papers for the Practising Law Institute. He has

also made presentations to a variety of competition groups on a variety of competition issues and the intersection of intellectual property and competition economics.

From 1980-1984, Dr. Schwartz served as an Assistant Professor of Economics at Miami (Ohio) University and as an antitrust economist in the Bureau of Economics at the Federal Trade Commission.

Testimony and Affidavits

- Trial Testimony in *Aloe Vera of America et al. v. United States of America* United States District Court for the District of Arizona, CIV-99-1794-JAT, July-August 2014.
- Trial Testimony in *M.B. Signal, Inc. v. AT&T/Cingular Wireless*, American Arbitration Association Case No. 54 494 Y 00237 09, June 2014.
- Deposition Testimony in *M.B. Signal, Inc. v. AT&T/Cingular Wireless*, American Arbitration Association Case No. 54 494 Y 00237 09 and *Cellular Cellutions, Inc. et al. v. AT&T/Cingular Wireless*, American Arbitration Association Case No. 54 494 Y 1382 08, February 2014.
- Deposition Testimony in *Aloe Vera of America et al. v. United States of America* United States District Court for the District of Arizona, CIV-99-1794-JAT, August 2013.
- Deposition Testimony in *Bristol-Myers Squibb Company v. Apotex, Inc. and Apotex Corp.*, United States District Court for the District of New Jersey, Civil Action No. 10-CV-5810, May 2013.
- Trial Testimony in *RegScan, Inc. v. The Bureau of National Affairs, Inc.*, United States District Court for the Eastern District of Virginia, Alexandria Division, Civil Action No. 1:11-cv-01129 (JCC-JFA), November 2012.
- Deposition Testimony in *Realtime Data, LLC d/b/a IXO v. Goldman Sachs*, United States District Court for the Southern District of New York, Civil Action Nos. 1:11-CV-6696-KBF, 1:11-CV-6701-KBF; 1:11-CV-6704-KBF, July 2012.
- Deposition Testimony in *Realtime Data, LLC d/b/a IXO v. J.P. Morgan Chase*, United States District Court for the Southern District of New York, Civil Action Nos. 1:11-CV-6696-KBF, 1:11-CV-6701-KBF; 1:11-CV-6704-KBF, July 2012.
- *Deposition Testimony in Realtime Data, LLC d/b/a IXO v. Morgan*

Stanley, et al. (III), United States District Court for the Southern District of New York, Civil Action Nos. 1:11-CV-6696-KBF, 1:11-CV-6701-KBF; 1:11-CV-6704-KBF, July 2012.

- Deposition Testimony in *RegScan, Inc. v. The Bureau of National Affairs, Inc.*, United States District Court for the Eastern District of Virginia, Alexandria Division, Civil Action No. 1:11-cv-01129 (JCC-JFA), May 2012.
- Deposition Testimony in *Jackson Hewitt, Inc. v. H&R Block, Inc., HRB Tax Group, Inc., and H&R Block Tax Services, LLC and HRB Tax Group, Inc. v. Jackson-Hewitt, Inc. and Jackson Hewitt Tax Service, Inc.*, United States District Court for the Southern District of New York, Civil Action No. 11-Civ-0641 (AKH), December 2011.
- Rebuttal Affidavit in *Cellular Cellutions, Inc. et al. v. AT&T/Cingular Wireless*, American Arbitration Association Case No. 54 494 Y 1382 08, August 15, 2011.
- Rebuttal Affidavit in *M.B. Signal, Inc. v. AT&T/Cingular Wireless*, American Arbitration Association Case No. 54 494 Y 00237 09, August 15, 2011.
- Affidavit in *M.B. Signal, Inc. v. AT&T/Cingular Wireless*, American Arbitration Association Case No. 54 494 Y 00237 09, June 2011.
- Affidavit in *Cellular Cellutions, Inc. et al. v. AT&T/Cingular Wireless*, American Arbitration Association Case No. 54 494 Y 1382 08, June 2011.
- Deposition Testimony in *CareFusion 213, LLC v. Professional Disposables International, Inc., and Nice-Pak Products, Inc.*, United States District Court for the District of Kansas, Civil Action No. 09-CV-2616 KHV/DJW, December 8, 2010.
- Trial Testimony in connection with Sudesh Agrawal's Motion for Class Certification in *Ford Motor Credit Company v. Sudesh Agrawal*, Cuyahoga County Court of Common Pleas, Case No. CV-04-536688, December 3, 2010.
- Trial Testimony in *Food Holdings, Ltd. and Dairy Holdings, Ltd. v. Bank of America*, United States District Court, Southern District of New York, 05CV9934, September 2009.
- Deposition Testimony in *CNET Networks, Inc. v. Etilize, Inc.*, United States District Court, Northern District of California, Case No. C 06 5378, Fall 2008.

- Deposition Testimony in *Gary W. Ogg and Janice Ogg v. Mediacom LLC*, Circuit Court of Clay County, Missouri at Liberty, Case No. CV101 2809CC, March 2008.
- Deposition Testimony in *AVX Corporation and AVX Limited v. Cabot Corporation*, United States District Court, District of Massachusetts, Civil Action No. 04-10467- RGS, February 2008.
- Deposition Testimony In *re Parmalat Securities Litigation*, United States District Court, Southern District of New York, (MDL) No. 04-MD-1653 (LAK), August 2007.
- Deposition Testimony in *Amgen, Inc. v. F. Hoffman-LaRoche, Ltd., Roche Diagnostics GmbH and Hoffman-La Roche, Inc.*, United States District Court, District of Massachusetts, Civil Action No. 05 Civ 12237 WGY, June 2007.
- Deposition Testimony in *Hospira Incorporated v. Alphagary Corporation*, State of North Carolina, County of Mecklenburg, April 2007.
- Trial Testimony in *RLH Industries, Inc. v. SBC Communications, Inc. and Pacific Bell Telephone Co. and Does 1 through 100, inclusive*, Superior Court of the State of California for the Court of Orange, Case No. O2CC16869, March 2007.
- Trial Testimony in *Maintainco, Inc. v. Mitsubishi Caterpillar Forklift America, Inc., et al.*, Superior Court of New Jersey, Chancery Division, Bergen County, Docket No. C-300-00, January 2007.
- Deposition Testimony in *Budget Pest Prevention, Inc., National Pest Control, Inc., and Pest Pros, Inc., individually and on behalf of persons similarly situated v. Bayer Corporation, Bayer Cropscience, L.P., and BASF Corporation*, United States District Court, Western District of North Carolina, Asheville Division, Civil Action No. 1:05CV90, October 2006.
- Deposition Testimony in *Atofina Chemicals, Inc. and Atofina v. Hercules Incorporated and Hercules Incorporated v. Atofina Chemicals, Inc., Atofina, S.A., Elf Atochem, S.A., and Elf Atochem North America, Inc.*, United States District Court, District of Delaware, Case No. 02-1613, November 2005.
- Affidavit of Steven Schwartz, In *Re: Bankest Capital Corporation, Debtor, Soneet Kapila, as the Chapter 7 Trustee for the Estate of Bankest Capital Corp. v. Espirito Santo Bank*, United States Bankruptcy Court, Southern District of Florida, Miami Division, ADV. No. 05-1113-BKC-AJC-A, October 2005.

- Trial Testimony in *Advanced Executive Aircraft Ltd, v. Lucas Aerospace Ltd.*, in Arbitration, Case No. 50 T 181 00064 00, New York, New York, June 2005.
- Deposition Testimony in *USA Cellular, Inc. v. Verizon Wireless*, in Arbitration, April 2005.
- Declaration of Steven Schwartz in *John B. Hayes Real Estate and Auction, Inc., d/b/a Hayes Equipment v. American Honda Motor Co., Inc.*, United States District Court for the Western District of Oklahoma, Case No. 04-6922-L, November 2004.
- Deposition Testimony in *Crown Equipment Corporation v. Florida Lift Systems, Inc.*, in Arbitration, September 2004.
- Deposition Testimony in *RLH Industries, Inc. v. SBC Communications, Inc. Pacific Bell Telephone Company and Does 1 through 100, inclusive*, Superior Court of the State of California For the County of Orange, Case No. 02CC16869, August 2004.
- Trial Testimony in *Crown Equipment Corporation v. Florida Lift Systems, Inc.*, United States District Court, Southern District of Ohio, Western Division (Dayton), Case No. C-3-04-007, July 2004 (Motion for Preliminary Injunction).
- Trial Testimony in *Greene, Tweed of Delaware, Inc. v. DuPont Dow Elastomers, L.L.C. and E.I. duPont de Nemours and Company, Inc.*, United States District Court, Eastern District of Pennsylvania, Civil Action No. 00-CV-3058, June 2003.
- Deposition Testimony in *The Iams Company v. Nutro Products, Inc.*, United States District Court for the Southern District of Ohio, Western Division (Dayton), Case No. C-3-00-566, March 2003 and May 2003.
- Trial Testimony in *E.I. duPont de Nemours and Company, Claimant v. Unifi, Inc., Respondent and Unifi, Inc., Counterclaimant v. E.I. duPont de Nemours and Company, Counterclaim-Respondent*, In Arbitration, Washington, D.C., November, 2002.
- Deposition Testimony in *Greene, Tweed of Delaware, Inc. v. DuPont Dow Elastomers, L.L.C. and E.I. duPont de Nemours and Company, Inc.*, United States District Court, Eastern District of Pennsylvania, Civil Action No. 00-CV-3058, September 2002.
- Deposition Testimony in *Madison/OHI Liquidity Investors, LLC v. Omega Healthcare Investors, Inc.*, United States District Court,

Eastern District of Michigan (Southern Division), Case No. 00-CV-72793-DT, January 2002.

- Trial Testimony In the Matter of *Certain Personal Watercraft and Components Thereof*, United States International Trade Commission, Investigation No. 337-TA-452, January 2002.
- Deposition Testimony In the Matter of *Certain Personal Watercraft and Components Thereof*, United States International Trade Commission, Investigation No. 337-TA-452, October 2001.
- Trial Testimony in *US Polo Association v. Meridian Hosiery Mills, Inc.*, American Arbitration Association, New York, New York, March 2001.
- Deposition Testimony in *Dupont Pharmaceuticals Company and Dupont Contrast Imaging v. Molecular Biosystems, Inc., Mallinckrodt, Inc. and Nycomed Imaging AS*; United States District Court for the District of Delaware, 99-273 (JJF), February 2001.
- Deposition Testimony in *Main Street Marketing of America, Inc. v. ICT Group, Inc.*, December 2000.
- Affidavit in *Filetech S.A. and Filetech USA, Inc. v. France Telecom S.A. and France Telecom, Inc.*; United States District Court, Southern District of New York, No. 95 Civ1848 (CSH), March 2000.
- Deposition Testimony in *The Iams Company v. Kal Kan Foods, Inc.*, United States District Court, District of Ohio, Case No. C-3-97-449, November 1999.
- Deposition Testimony in *Watkins & Son Pet Supplies v. The Iams Company*, United States District Court of Ohio, July 1999.
- Trial Testimony *In the matter of the arbitration between Upfront Technology Co., Ltd. and Cheyenne Communications, Inc.* No.: 9796/FMS/KGA, May 1999.
- Deposition Testimony in *Fitz-Randolph and Up Against the Wall v. Ralph Wilson Plastics*, U.S. District Court, District of New Jersey, February 1999.
- Trial Testimony in *Mr. Mattress Limited Partnership v. Sealy Mattress Co.*, United States District Court, District of Maryland, Northern Division, Case No. WMN-95-1157, January 1999.
- Deposition Testimony in *JTC Petroleum Company v. Koch Materials Company, et al.* United States District Court, Southern

District of Illinois, Case No.: 96-334-GPM, August 1998.

- Trial Testimony in *DHL Corporation and Subsidiaries et al. v. Commissioner of Internal Revenue*, Docket Nos. 19570-95 and 26103-95, August 1997.
- Deposition Testimony in *Mr. Mattress Limited Partnership v. Sealy Mattress Company*, U.S. District Court, District of Maryland, March 1997.
- Reply Affidavit in *The Iams Company v. Anthony Falduti d/b/a Countryside Feed and Supply*, U.S. District Court, Eastern District of Missouri, Eastern Division, No. 4:95-CV-1804-CDP, February, 1997.
- Deposition Testimony in *The Iams Company v. Anthony Falduti d/b/a Countryside Feed and Supply*, U.S. District Court, Eastern District of Missouri, Eastern Division, No. 4:95-CV-1804-CDP, December 1996.
- Affidavit in *The Iams Company v. Anthony Falduti d/b/a Countryside Feed and Supply*, U.S. District Court, Eastern District of Missouri, Eastern Division, No. 4:95-CV-1804-CDP, October 1996.
- Deposition Testimony in *Lerch v. Citizens First Bancorp, et al.*, U.S. District Court, District of New Jersey (testimony given September 1994).
- Affidavit in Support of *The Iams Company's Motions for Summary Judgment, The Iams Company v. L.A. Pet Foods, Inc., et al.*, U.S. District Court, Western District of Ohio, September 1994.
- Trial and Deposition Testimony in *American Professional Testing Service v. Harcourt Brace Legal and Professional Publications, Inc.*, U.S. District Court, Central District of California (testimony given March and May 1994).
- Trial Testimony *In the Matter of Nestle Holdings, Inc., On Its Own Behalf and As the Successor In Interest to Nestle Enterprises, Inc. and Related Petitioners v. Commissioner of Internal Revenue*, U.S. Tax Court, Docket Nos. 21558-90; 21559-90; 21560-90; 21562-90; and 12245-91 (testimony given May 1994).
- Trial and Deposition Testimony in *Koch Engineering Co., Inc. v. Glitsch, Inc., et al.*, U.S. District Court, Northern District of Texas, Dallas Division, Case No. CA 3:38-CV-0460-T (testimony given February and March 1993).

- Deposition Testimony in re: *Zenith Laboratories Securities Litigation*, Civil Action, U.S. District Court of New Jersey (testimony given February 1993).
- Deposition Testimony in *The Iams Company v. American Superior Feeds, et al.*, Civil Action No. C-3-90-14, U.S. District Court, Southern District of Ohio, Western Division (testimony given July 1992).
- Trial and Deposition Testimony in *Trademark Research Corp. v. Maxwell Online, Inc.*, 90 Civ 5166(RJW), U.S. District Court, Southern District of New York (testimony given February, March and May, 1992).
- Trial and Deposition Testimony in *Extrel FTMS, Inc. v. Bruker Instruments, Inc.*, Case 90-C-305-S, U.S. District Court, Western District of Wisconsin (testimony given August 1990 and September 1990).
- Trial and Deposition Testimony in *Medcom Holding Co., v. Baxter Travenol Laboratories, Inc. and Medtrain, Inc.*, Civil Action No. 87C 9853, U.S. District Court, Northern District of Illinois, Eastern Division (testimony given September 1988, February 1990, October 1990, February 1991 and September 1993).
- Trial Testimony in *Worlco Data Systems et al. v. Maxwell Communication Corp., et al.*, Civil Action No. 88-6597, U.S. District Court, Eastern District of Pennsylvania (testimony given February 1990).
- Testimony before the New York State Moreland Act Commission to Investigate the Operation and Administration of the Returnable Container Act (testimony given October 11, 1989).
- Trial and Deposition Testimony in *Revelations Antoine Ltee. v. K Mart Corp., et al.*, Case No. 88-0624, U. S. District Court, Eastern District of Virginia, Alexandria Division (testimony given July and September 1988).
- Trial Testimony in *Data Systems of New Jersey, Inc.; et al. v. Philips Business Systems, Inc.*, Case No. 78 Civ 6015 (CLB), U.S. District Court, Southern District of New York (testimony given March 1988).
- Deposition Testimony in *Microbyte Corporation v. New Jersey State Golf Association*, U.S. District Court, District of New Jersey (testimony given October 1985 and February 1986).

- Deposition Testimony in *Monroe Systems for Business, Division of Litton Business Systems, Inc. v. SCI Systems, Inc.*, Case No. 84-2650-D, U.S. District Court, District of New Jersey (testimony given September 1986).
- Affidavit in Opposition to Plaintiff's Motion for Summary Judgment, *Henson Associates, Inc. v. Atari Games, Inc., et al.*, July 1985.

Reports

- Expert Report in *M.B. Signal, Inc. v. AT&T/Cingular Wireless*, American Arbitration Association Case No. 54 494 Y 00237 09, January 2014.
- Expert Report in *Cellular Cellutions, Inc. et al. v. AT&T/Cingular Wireless*, American Arbitration Association Case No. 54 494 Y 1382 08, January 2014.
- Expert Report and Rebuttal Expert Report in *Aloe Vera of America, Inc. et al. v. United States of America*, United States District Court for the District of Arizona Civil Action No. CIV-99-1794-PHX-JAT, June 2013 and July 2013.
- Expert Report in *Bristol-Myers Squibb Company v. Apotex, Inc. and Apotex Corp.*, United States District Court for the District of New Jersey, Civil Action No. 10-CV-5810, March 2013.
- Expert Rebuttal Report of Steven Schwartz, *Realtime Data, LLC d/b/a IXO v. Goldman Sachs*, United States District Court for the Southern District of New York, Civil Action Nos. 1:11-CV-6696-KBF, 1:11-CV-6701-KBF; 1:11-CV-6704-KBF, July 2012.
- Expert Rebuttal Report of Steven Schwartz, *Realtime Data, LLC d/b/a IXO v. J.P. Morgan Chase*, United States District Court for the Southern District of New York, Civil Action Nos. 1:11-CV-6696-KBF, 1:11-CV-6701-KBF; 1:11-CV-6704-KBF, July 2012.
- Expert Rebuttal Report of Steven Schwartz, *Realtime Data, LLC d/b/a IXO v. Morgan Stanley, et al. (III)*, United States District Court for the Southern District of New York, Civil Action Nos. 1:11-CV-6696-KBF, 1:11-CV-6701-KBF; 1:11-CV-6704-KBF, July 2012.

- Economist's Report in Connection with *RegScan, Inc. v. The Bureau of National Affairs, Inc.*, United States District Court for the Eastern District of Virginia, Alexandria Division, Civil Action No. 1:11-cv-01129 (JCC-JFA), April 19, 2012.
- Rebuttal Report of Steven Schwartz, *Jackson Hewitt Inc. v. H&R Block Tax Services LLC, et al.*, United States District Court for the Southern District of New York, Civil Action No. 11-CV-0641, September 26, 2011.
- Expert Report of Steven Schwartz, *Jackson Hewitt Inc. v. H&R Block Tax Services LLC, et al.*, United States District Court for the Southern District of New York, Civil Action No. 11-CV-0641, July 7, 2011 and August 31, 2011.
- Expert Report in *Official Committee of Administrative Claimants, on Behalf of LTV Steel Company, Inc. v. William H. Bricker, et al.*, United States District Court for the Northern District of Ohio, Eastern Division, Case No. 1:05 CV 2158 2011.
- Expert Report of Steven Schwartz, *CareFusion 213, LLC v. Professional Disposables International, Inc. and Nice-Pak Products, Inc.*, United States District Court for the District of Kansas, Civil Action No. 09-CV-2616 KHV/DJW, September 13, 2010.
- Expert Report of Steven Schwartz, *Dish Network, L.L.C. and Dish Network Corporation v. Federal Communications Commission; Julius Genachowski Chairman, and Michael J. Copps, Robert M. McDowell, Mignon Clyburn, Meredith Attwell Baker, Commissioners; and United States of America*, United States District Court, District of Nevada, June 2010.
- Expert Report of Steven Schwartz, *Sleepy's, Inc. v. Select Comfort Wholesale Corporation, Select Comfort Retail Corporation and Select Comfort Corporation*, Supreme Court of the State of New York, County of Nassau, Index No. 07-015070, June 2009.
- Expert Report of Steven Schwartz, *CNET Networks, Inc. v. Etilize, Inc.*, United States District Court, Northern District of California, Case No. C 06 5378, July 21, 2008.
- Expert Report of Steven Schwartz, *Gary W. Ogg and Janice Ogg v. Mediacom LLC*, Circuit Court of Clay County, Missouri at Liberty, Case No. CV101 2809CC, March 2008.
- Expert Report of Steven Schwartz, *Ford Motor Credit Company v. Sudesh Agrawal*, Cuyahoga County Court of Common Pleas, Case No. CV-04-536688, January 2008.

- Expert Report of Steven Schwartz, *AVX Corporation and AVX Limited v. Cabot Corporation*, United States District Court, District of Massachusetts, Civil Action No. 04-10467-RGS, December 2007.
- Expert Report of Steven Schwartz, *In re Parmalat Securities Litigation*, United States District Court, Southern District of New York, (MDL) No. 04-MD-1653 (LAK), June 2007.
- Economist's Report in connection with *Amgen, Inc. v. F. Hoffman-LaRoche, Ltd., Roche Diagnostics GmbH and Hoffman-La Roche, Inc.* United States District Court, District of Massachusetts, Civil Action No. 05 Civ 12237 WGY, May 2007.
- Expert and Rebuttal Reports of Steven Schwartz, *Datascope Corp. v. Stanton Rowe*, Superior Court of New Jersey Law Division, Civil Part Bergen County, Docket No.: L-4786-05, November 2006 and December 2006.
- Expert Report of Steven Schwartz, *Budget Pest Prevention, Inc., National Pest Control, Inc., and Pest Pros, Inc., individually and on behalf of persons similarly situated v. Bayer Corporation, Bayer Cropscience, L.P., and BASF Corporation*, United States District Court, Western District of North Carolina, Asheville Division, Civil Action No. 1:05CV90, September 2006.
- Supplemental and Second Supplemental Expert Reports of Steven Schwartz, *United States of America Ex Rel. Thornton G. Sanders and Thornton G. Sanders v. North American Bus Industries, Inc., et al.*, United States District Court, District of Maryland. Civil Action No. 02-CV-3084, June 2006 and September 2006.
- Economist's Report in connection with *Hospira Incorporated v. Alphagary Corporation*, State of North Carolina, County of Mecklenburg, August 2006.
- Expert Report of Steven Schwartz, *United States of America Ex Rel. Thornton G. Sanders and Thornton G. Sanders v. North American Bus Industries, Inc., et al.*, United States District Court for the District of Maryland. Civil Action No. 02-CV-3084, June 2006
- Expert, Supplemental and Rebuttal Reports of Steven Schwartz, *Maintainco, Inc. vs. Mitsubishi Caterpillar Forklift America Inc., et al.*, Superior Court of New Jersey, Chancery Division: Bergen County, Docket No. C-300-00, May 2006.
- Expert and Rebuttal Reports of Steven Schwartz, *Atofina*

Chemicals, Inc. and Atofina v. Hercules Incorporated and Hercules Incorporated v. Atofina Chemicals, Inc., Atofina, S.A., Elf Atochem, S.A., and Elf Atochem North America, Inc., United States District Court, District of Delaware, Case No. 02-1613, October 2005 and November 2005.

- Economist's Report in Connection with *DenBraven Sealants B.V. v. Nedamco International B.V. and Nedamco North America Corporation, Inc.*, The Netherlands, Cause List Number, C0100350/BR, August 2005.
- Economist's Report in Connection with *Crown Equipment Corporation v. Toyota Material Handling, USA*, United States District Court for the Northern District of Ohio, August 2005.
- Expert Report and Supplemental Expert Report of Dr. Steven Schwartz in Connection with *USA Cellular, Inc. v. Verizon Wireless*, in Arbitration, April 2005.
- Rebuttal Expert Report of Dr. Steven Schwartz in Connection with Arbitration: *Florida Lift Systems, Inc. v. Crown Equipment Corp.*, October 2004.
- Economist's Rebuttal Report in Connection with *Advanced Executive Aircraft, Ltd., Claimant v. Lucas Aerospace, Ltd., Respondent*, September 2004.
- Expert and Supplemental Expert Reports of Dr. Steven Schwartz in Connection with *Hayes Equipment, Inc. v. American Honda Motors, Inc.*, United States District Court for the Western District of Oklahoma, Case No. 04-6922-L, September 2004 and October 2004.
- Expert Report of Dr. Steven Schwartz in Connection with Arbitration: *Florida Lift Systems, Inc. v. Crown Equipment Corp.*, September 2004.
- Economist's Report in Connection with *Advanced Executive Aircraft, Ltd., Claimant v. Lucas Aerospace, Ltd., Respondent*, August 2004.
- Economist's Report and Rebuttal Economist's Report in connection with *Crown Equipment Corporation v. Florida Lift Systems, Inc.*, United States District Court, Southern District of Ohio, Western Division (Dayton), Case No. C-3-04-007, May 2004 and June 2004.
- Rebuttal and Supplemental Economist's Reports in connection with *Kal Kan Foods, Inc. v. The Iams Company, et al.*, United States

District Court, Southern District of Ohio, Western Division (Dayton),
Case No. C-3-01-083, May 2003 and September 2003.

- Economist's Report of Steven Schwartz, *Duck Walk Vineyards, Inc. v. St. Helena Wine Co., Inc. d/b/a Duckhorn Vineyards*, CV-01-4896 (ADS) (MLO), United States District Court, Eastern District of New York, May 2003.
- Expert Report of Steven Schwartz, *Welch Allyn, Inc. v. Tyco International Services AG, et al.*, United States District Court, Northern District of New York, Civil Action No. 5:01-CV-1806 (FJS/GJD), January 2003.
- Preliminary, Rebuttal and Supplemental Economist's Reports of Steven Schwartz in Connection with *The Iams Company v. Nutro Products, Inc.*, United States District Court for the Southern District of Ohio, Western Division (Dayton), No. C-3-00-566, December 2002, January 2003 and March 2003.
- Expert Report and Rebuttal Expert Report in *E.I. duPont de Nemours and Company, Claimant v. Unifi, Inc., Respondent and Unifi, Inc., Counterclaimant v. E.I. duPont de Nemours and Company, Counterclaim-Respondent*, In Arbitration, Washington, D.C., October 2002.
- Supplemental Expert Report of Steven Schwartz in *Greene, Tweed of Delaware, Inc. v. DuPont Dow Elastomers L.L.C. and E.I. DuPont De Nemours and Co., Inc.*, United States District Court for the Eastern District of Pennsylvania, Civil Action No. 00-CV-3058, September 2002.
- Expert Witness Report of Dr. Steven Schwartz in *Sony Electronics, Inc. et al. v. Soundview Technologies, Inc.*, United States District Court, District of Connecticut, Lead Docket No. 3:00-CV-00754 (JBA) U.S.D.C./New Haven, June 2002.
- Expert Report of Steven Schwartz in *Greene, Tweed of Delaware, Inc. v. DuPont Dow Elastomers L.L.C. and E.I. DuPont De Nemours and Co., Inc.*, United States District Court for the Eastern District of Pennsylvania, Civil Action No. 00-CV-3058, March 2002.
- Expert Report of Steven Schwartz in Connection with *Madison/OHI Liquidity Investors, LLC v. Omega Healthcare Investors, Inc.*, United States District Court, Eastern District of Michigan (Southern Division), Case No. 00-CV-72793-DT, December 2001.
- Expert Report of Steven Schwartz *In the matter of CERTAIN PERSONAL WATERCRAFT AND COMPONENTS THEREOF*,

United States International Trade Commission, Investigation No. 337-TA-452, September 4, 2001.

- Economist's Report in Connection with *US Polo Association v. Meridian Hosiery Mills, Inc.*, American Arbitration Association, New York, New York, March 2001.
- Expert Report of Steven Schwartz and Answering Expert Report of Steven Schwartz in Connection with *Dupont Pharmaceuticals Company and Dupont Contrast Imaging v. Molecular Biosystems, Inc., Mallinckrodt, Inc. and Nycomed Imaging AS*, January 2001 and February 2001.
- Economist's Report in Connection with *Main Street Marketing of America, Inc. v. ICT Group, Inc.*, July 27, 2000.
- Economist's Report in Connection with *Wells Fargo Bank, National Association v. U.S. Bank National Association*, September 16, 1999.
- Supplemental Economist's Report in Connection with *The Iams Co. v. Kal Kan Foods*, May 26, 1999.
- Economist's Report in Connection with *Watkins & Son Pet Supplies v. The Iams Company*, May 4, 1999.
- Economist's Report for Mobil Corporation (with P. Beutel, B. Ray and J. Hall), April 15, 1999.
- Economist's Report for Mediation in Connection with *Pitney Bowes v. United States Postal Service*, April 1999 and May 1999.
- Economist's Report in Connection with *Braun Inc. and The Gillette Company v. Optiva Corporation*, February 1999.
- Economist's Report in Connection with *Biofertec Ltd. v. Louisville Laboratories, Inc., et al.*, December 1998.
- Economist's Report in Connection with *JTC Petroleum Company v. Koch Materials Company, et al.*, August 1998.
- Economist's Report in Connection with *Shimano Inc. and Shimano American Corporation v. SRAM Corporation*, August 1997.
- Economist's Report in Connection with *Up Against the Wall, Inc. et al. v. Ralph Wilson Plastics, et al.*, August 1997.
- Economist's Report in Connection with *Mr. Mattress Limited Partnership v. Sealy Mattress Company*, March 1997.

- Economist's Report in Connection with DHL Corporation and Subsidiaries, et al. vs. Commissioner of Internal Revenue, Docket Nos. 19570-95 and 26103-95, March 13, 1997.
- Economist's Report in Connection with Federal Funding of the Corporation for Public Broadcasting, March 29, 1995.
- Economist's Report in Connection with U.S. Department of Justice Civil Investigative Demand No. 11882, February 24, 1995.
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- Economist's Report in Connection with *Citizen's First Securities Litigation*, May 1994.
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- Economist's Report in *AMCI v. Western Union*, Superior Court of New Jersey Law Division: Essex County, Docket No. L-45055-85E.
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Container Law (co-author).

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HIGHLY CONFIDENTIAL EXHIBIT

Noranda Aluminum Holding Corporation
Consolidated Statement of Cash Flows
2010 - 2013
(Millions of Dollars)

	2010	2011	2012	2013
OPERATING ACTIVITIES				
Net income	66.9	140.9	49.5	(47.6)
Adjustments to reconcile net income to cash provided by operating activities:				
Depreciation and amortization	98.7	97.7	98.5	96.0
Non-cash interest expense	23.7	11.7	2.8	2.6
Last in, first out and lower of cost or market inventory adjustments	4.1	12.6	(9.7)	(2.6)
(Gain) loss on disposal of assets	4.0	3.3	(5.0)	(0.5)
(Gain) loss on hedging activities, excluding cash settlements	100.0	(115.6)	(127.5)	(6.1)
Loss on debt repurchase	0.1	-	-	-
Asset Impairment	-	-	-	5.9
Debt refinancing expense	-	-	8.1	2.5
Deferred income taxes	14.8	(24.4)	(2.3)	(32.6)
Share-based compensation expense	5.9	5.3	4.8	4.8
Excess tax benefit related to share-based payment arrangements	-	(0.7)	(0.1)	-
Changes in other assets	(10.0)	(6.7)	(10.3)	1.0
Changes in pension, other post-retirement and other long-term liabilities	(0.6)	(14.3)	4.7	7.2
Changes in current operating assets and liabilities:				
Accounts receivable, net	(45.3)	24.0	1.0	19.9
Inventories, net	(25.0)	-	(0.7)	19.5
Taxes receivable and taxes payable	5.6	(1.9)	(4.8)	(1.0)
Other current assets	15.8	(17.9)	22.4	12.3
Accounts payable	9.7	7.2	16.2	(19.3)
Accrued liabilities	2.5	19.4	(28.7)	2.2
Cash provided by operating activities	270.9	140.6	18.9	64.2
INVESTING ACTIVITIES				
Capital expenditures	(61.3)	(64.6)	(87.9)	(72.7)
Proceeds from sale of property, plant and equipment	0.2	2.6	5.3	0.9
Cash used in investing activities	(61.1)	(62.0)	(82.6)	(71.8)
Free Cash Flow^[1]	209.6	76.0	(69.0)	(8.5)
FINANCING ACTIVITIES				
Proceeds from issuance of common shares, equity offerings	205.9	-	-	-
Proceeds from issuance of common shares, share-based payment arrangements, net of shares tendered for taxes	0.1	0.7	0.2	(0.2)
Dividends paid to shareholders	-	(69.3)	(95.1)	(8.8)
Distributions paid to share-based award holders	-	(1.8)	(3.1)	-
Repayments of long-term debt	(333.3)	-	(155.0)	(280.0)
Repayments on revolving credit facility	(215.9)	-	-	-
Borrowings on long-term debt	-	-	322.6	342.8
Payments of financing costs	-	-	(12.6)	(2.9)
Excess tax benefit related to share-based payment arrangements	-	0.7	0.1	-
Cash provided by (used in) financing activities	(343.2)	(69.7)	57.1	50.9
Change in cash and cash equivalents ^[2]	(133.4)	8.9	(6.6)	43.3
Cash and cash equivalents, beginning of period	167.2	33.8	42.7	36.1
Cash and cash equivalents, end of period^[3]	33.8	42.7	36.1	79.4

Notes:

[1] Cash provided by operating activities minus Capital expenditures.

[2] Sum of Cash provided by operating activities, Cash used by investing activities and Cash provided by (used in) financing activities.

[3] Sum of Change in cash and cash equivalents and Cash and cash equivalents, beginning of period.

Sources:

Noranda Aluminum Holding Corporation form 10-K filings for the fiscal year ended December 31, 2012, page 60.

Noranda Aluminum Holding Corporation form 10-K filings for the fiscal year ended December 31, 2013, page 61.

Noranda Aluminum Holding Corporation
Cash Balances and Flows
2010 - 2013
(Millions of Dollars)

Year	Cash and Cash Equivalents, Beginning of Period	Cash Flows			Cash and Cash Equivalents, End of Period
		Cash Flow from Operating Activities	Cash Flow from Investing Activities	Cash Flow from Financing Activities	
(1)	(2)	(3)	(4)	(5)	(6) (2)+(3)+(4)+(5)
2010	167.2	270.9	(61.1)	(343.2)	33.8
2011	33.8	140.6	(62.0)	(69.7)	42.7
2012	42.7	18.9	(82.6)	57.1	36.1
2013	36.1	64.2	(71.8)	50.9	79.4

Sources:

Noranda Aluminum Holding Corporation form 10-K filings for the fiscal year ended December 31, 2012, page 60.

Noranda Aluminum Holding Corporation form 10-K filings for the fiscal year ended December 31, 2013, page 61.

Noranda Aluminum Holding Corporation
Profit Metrics and Costs
2010 - 2013
(Millions of Dollars)

	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>
	(1)	(2)	(3)	(4)
Sales	1,294.9	1,559.8	1,394.9	1,343.5
COGS	1,112.4	1,344.5	1,277.7	1,271.9
Gross Profit ^[1]	182.5	215.3	117.2	71.6
<i>Gross Margin</i> ^[2]	14.09%	13.80%	8.40%	5.33%
SG&A	115.0	93.9	82.6	97.1
Interest Expense	31.1	21.5	33.1	47.5
Net Income	66.9	140.9	49.5	(47.6)
<i>Net Income Margin</i> ^[3]	5.17%	9.03%	3.55%	-3.54%
Sales	1,294.9	1,559.8	1,394.9	1,343.5
EBITDA	231.7	305.5	206.2	65.7
<i>EBITDA Margin</i> ^[4]	17.89%	19.59%	14.78%	4.89%

Notes:

[1] Sales minus Cost of goods sold.

[2] Gross profit divided by Sales.

[3] Net income divided by Sales.

[4] EBITDA divided by Sales.

Sources:

Noranda Aluminum Holding Corporation form 10-K filings for the fiscal year ended December 31, 2012, pages 26 and 57.

Noranda Aluminum Holding Corporation form 10-K filings for the fiscal year ended December 31, 2013, pages 26 and 58.

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**Monthly Dividend Adjusted Stock Price of
Noranda Aluminum Holding Corporation, Century, Alcoa and Kaiser
2010 - 2014
(Dollars per Share)**

Date	Noranda	Century ^[1]	Alcoa ^[1]	Kaiser ^[1]
6/1/2010	6.44	9.71	10.66	33.59
7/1/2010	4.88	8.68	9.57	32.03
8/1/2010	5.99	10.43	10.64	37.72
9/1/2010	6.15	10.54	10.05	36.50
10/1/2010	6.35	13.52	11.68	40.17
11/1/2010	7.48	13.41	12.46	41.41
12/1/2010	8.70	14.19	12.99	45.10
1/1/2011	11.04	15.53	14.73	46.34
2/1/2011	11.60	15.63	16.58	47.17
3/1/2011	11.54	15.88	15.56	45.69
4/1/2011	11.71	18.93	16.75	45.53
5/1/2011	12.84	19.98	16.30	46.84
6/1/2011	10.77	14.98	15.45	46.89
7/1/2011	11.64	16.08	15.66	51.89
8/1/2011	10.89	12.62	14.17	51.87
9/1/2011	8.66	11.49	12.02	47.61
10/1/2011	6.31	8.94	9.21	41.56
11/1/2011	6.51	10.58	10.01	42.76
12/1/2011	6.64	9.51	9.47	43.83
1/1/2012	6.94	8.51	8.35	43.30
2/1/2012	8.89	10.34	9.87	48.63
3/1/2012	10.99	10.13	9.94	46.02
4/1/2012	9.36	8.88	9.70	44.83
5/1/2012	9.77	9.22	9.65	50.04
6/1/2012	6.73	7.10	8.06	45.15
7/1/2012	7.51	7.33	8.50	49.43
8/1/2012	5.74	6.00	8.22	52.41
9/1/2012	5.66	6.23	8.34	53.52
10/1/2012	6.17	7.38	8.68	55.93
11/1/2012	6.30	7.60	8.56	58.56
12/1/2012	5.67	7.77	8.23	58.58
1/1/2013	5.84	8.76	8.49	59.37
2/1/2013	5.72	8.85	8.80	61.19
3/1/2013	3.99	8.01	8.28	58.90
4/1/2013	4.04	7.51	8.23	61.49
5/1/2013	3.53	8.04	8.27	60.02
6/1/2013	3.94	9.91	8.37	61.66
7/1/2013	3.24	9.55	7.74	60.86
8/1/2013	3.11	8.44	7.83	64.68
9/1/2013	2.69	7.81	7.61	67.49
10/1/2013	2.33	8.12	8.08	69.97
11/1/2013	2.67	8.78	9.16	65.95
12/1/2013	2.78	9.00	9.53	66.03
1/1/2014	3.26	10.46	10.54	68.90
2/1/2014	3.23	11.67	11.41	68.82
3/1/2014	4.28	11.84	11.67	69.55
4/1/2014	4.16	13.38	12.96	70.91
5/1/2014	3.56	14.13	13.56	69.66
6/1/2014	3.13	13.65	13.56	67.83
7/1/2014	3.56	16.01	14.75	72.35
8/1/2014	4.26	19.88	16.38	76.94
9/1/2014	4.06	24.98	16.58	80.17
10/1/2014	4.22	24.23	15.67	75.35
11/1/2014	4.40	29.28	16.73	69.55
12/1/2014	3.81	27.64	17.14	73.16
% Changes^[2]	-40.85%	184.65%	60.83%	117.82%

Note:

[1] The comparables are U.S. public companies selected from the S&P Capital IQ database based on the following 1) Industry category same as Noranda, which is under "Aluminum Production" and "Rolling, Drawing and Extruding of Aluminum", corresponding with SIC code 3334, 3353, 3354 and 3355. 2) S&P Capital IQ designated competitors of Noranda.

[2] (Price as of 12/1/2014 - Price as of 06/01/2010)/Price as of 06/01/2010.

Source:

S&P Capital IQ database.

**Monthly Market Capitalization of
Noranda Aluminum Holding Corporation, Century, Alcoa and Kaiser
2010 - 2014
(Millions of Dollars)**

Date	Noranda	Century ^[1]	Alcoa ^[1]	Kaiser ^[1]
6/1/2010	458.27	899.73	11,425.21	705.51
7/1/2010	347.47	804.29	10,261.25	673.15
8/2/2010	444.45	1,011.73	11,958.42	789.60
9/1/2010	449.98	977.47	10,743.17	762.32
10/1/2010	464.35	1,253.83	12,489.45	838.99
11/1/2010	546.72	1,243.67	13,329.82	860.12
12/1/2010	636.27	1,316.01	13,860.97	936.79
1/3/2011	947.87	1,517.72	16,138.78	971.76
2/1/2011	1,001.40	1,449.56	17,701.49	974.84
3/1/2011	1,020.19	1,473.22	17,247.44	944.20
4/1/2011	1,035.15	1,759.88	18,565.18	940.93
5/2/2011	1,164.79	1,848.85	18,317.17	986.75
6/1/2011	952.28	1,394.55	17,080.81	966.72
7/1/2011	1,029.14	1,496.95	17,314.35	1,069.80
8/1/2011	968.50	1,174.85	15,696.70	1,064.79
9/1/2011	769.70	1,071.04	13,291.65	978.20
10/3/2011	469.89	736.40	9,471.23	796.14
11/1/2011	578.79	981.53	11,068.76	874.24
12/1/2011	531.12	852.12	10,440.82	896.04
1/3/2012	619.20	817.18	9,823.53	926.72
2/1/2012	710.63	926.50	10,857.00	989.24
3/1/2012	875.35	899.99	10,948.93	933.97
4/2/2012	711.64	803.15	10,842.20	933.01
5/1/2012	701.38	815.51	10,635.03	1,012.52
6/1/2012	481.31	627.55	8,853.63	913.55
7/2/2012	519.06	654.09	9,200.31	1,002.68
8/1/2012	412.23	530.80	8,993.90	1,056.29
9/4/2012	400.05	540.98	8,983.23	1,100.52
10/1/2012	439.99	652.88	9,506.01	1,127.18
11/1/2012	446.22	672.35	9,338.02	1,175.21
12/3/2012	398.15	689.31	8,975.17	1,173.09
1/2/2013	446.90	842.39	9,594.15	1,220.98
2/1/2013	405.59	783.10	9,604.91	1,222.14
3/1/2013	280.44	709.28	9,025.11	1,176.37
4/1/2013	283.82	665.05	8,971.65	1,228.13
5/1/2013	248.48	712.31	9,015.02	1,167.00
6/3/2013	288.53	907.22	9,111.26	1,197.80
7/1/2013	226.07	846.09	8,405.46	1,183.44
8/1/2013	214.23	747.83	8,502.93	1,239.08
9/3/2013	189.75	700.87	8,256.93	1,298.56
10/1/2013	160.50	719.47	8,738.23	1,340.47
11/1/2013	184.28	777.95	9,915.21	1,255.32
12/2/2013	178.90	791.05	10,214.70	1,250.46
1/2/2014	219.04	921.42	11,262.91	1,338.60
2/3/2014	211.55	1,019.85	12,027.45	1,278.85
3/3/2014	296.36	1,029.92	12,522.71	1,280.63
4/1/2014	285.95	1,187.03	14,057.07	1,305.31
5/1/2014	245.49	1,254.33	15,989.95	1,267.89
6/2/2014	211.89	1,236.82	16,212.69	1,239.22
7/1/2014	245.49	1,421.50	17,363.85	1,316.93
8/1/2014	293.49	1,765.48	19,338.75	1,381.49
9/2/2014	276.10	2,395.21	19,609.30	1,438.32
10/1/2014	291.25	2,151.87	18,488.96	1,352.90
11/3/2014	298.19	2,615.67	19,957.47	1,248.07
12/1/2014	262.38	2,458.52	20,205.03	1,301.63
% Changes^[2]	-42.75%	173.25%	76.85%	84.49%

Note:

[1] The comparables are U.S. public companies selected from the S&P Capital IQ database based on the following 1) Industry category same as Noranda, which is under "Aluminum Production" and "Rolling, Drawing and Extruding of Aluminum", corresponding with SIC code 3334, 3353, 3354 and 3355. 2) S&P Capital IQ designated competitors of Noranda.

[2] (Market capitalization as of 12/1/2014 - Market capitalization as of 06/01/2010)/Market capitalization as of 06/01/2010.

Source:

Total equity market value taken from S&P Capital IQ Database. Data for a given year-end are presented in January of the subsequent year.

**Monthly Enterprise Value of
Noranda Aluminum Holding Corporation, Century, Alcoa and Kaiser
2010 - 2014
(Millions of Dollars)**

Date	Noranda	Century ^[1]	Alcoa ^[1]	Kaiser ^[1]
6/1/2010	1,160.99	985.43	23,101.21	715.51
7/1/2010	1,050.19	889.99	21,937.25	683.15
8/2/2010	972.49	1,055.69	23,579.42	800.70
9/1/2010	978.01	1,021.43	22,364.17	773.42
10/1/2010	992.39	1,297.79	24,110.45	850.09
11/1/2010	1,052.78	1,279.45	25,264.82	869.72
12/1/2010	1,142.33	1,351.78	25,795.97	946.39
1/3/2011	1,453.93	1,553.50	28,073.78	981.36
2/1/2011	1,507.46	1,485.33	28,853.49	984.44
3/1/2011	1,412.09	1,470.75	28,393.44	963.10
4/1/2011	1,427.05	1,770.51	29,711.18	959.83
5/2/2011	1,548.99	1,859.47	30,386.17	1,086.55
6/1/2011	1,336.48	1,403.71	29,149.81	1,066.52
7/1/2011	1,413.34	1,506.11	29,383.35	1,169.60
8/1/2011	1,318.20	1,184.01	27,547.70	1,161.99
9/1/2011	1,119.40	1,095.47	25,142.65	1,075.40
10/3/2011	819.59	760.82	21,322.23	893.34
11/1/2011	928.49	1,022.20	22,463.76	1,001.94
12/1/2011	861.72	892.80	21,835.82	1,023.74
1/3/2012	949.80	857.86	21,218.53	1,054.42
2/1/2012	1,041.23	967.17	21,695.00	1,116.94
3/1/2012	1,267.15	987.87	21,778.93	1,036.87
4/2/2012	1,103.44	891.03	21,672.20	1,035.91
5/1/2012	1,232.28	890.55	22,168.03	1,089.72
6/1/2012	1,012.21	702.59	20,386.63	990.75
7/2/2012	1,049.96	729.13	20,733.31	1,079.88
8/1/2012	964.83	632.14	20,135.90	1,121.29
9/4/2012	952.65	656.98	20,125.23	1,165.52
10/1/2012	992.59	768.88	20,648.01	1,192.18
11/1/2012	1,014.82	757.09	20,769.02	1,222.11
12/3/2012	966.75	774.05	20,406.17	1,219.99
1/2/2013	1,015.50	927.13	21,025.15	1,267.88
2/1/2013	974.19	867.85	19,951.91	1,269.04
3/1/2013	846.04	783.70	19,372.11	1,202.97
4/1/2013	849.42	754.84	19,318.65	1,254.73
5/1/2013	840.08	775.52	19,793.02	1,216.10
6/3/2013	880.13	970.43	19,889.26	1,246.90
7/1/2013	817.67	909.30	19,183.46	1,232.54
8/1/2013	812.53	877.07	18,751.93	1,306.68
9/3/2013	788.05	830.11	18,505.93	1,366.16
10/1/2013	758.80	848.72	18,987.23	1,408.07
11/1/2013	775.48	907.20	20,305.21	1,309.32
12/2/2013	770.10	923.84	20,604.70	1,304.46
1/2/2014	810.24	1,054.20	21,652.91	1,392.60
2/3/2014	802.75	1,152.64	21,890.45	1,332.85
3/3/2014	882.06	1,200.18	22,382.71	1,380.03
4/1/2014	871.65	1,365.89	23,917.07	1,404.71
5/1/2014	864.79	1,456.27	26,107.95	1,379.29
6/2/2014	831.19	1,438.75	26,330.69	1,350.62
7/1/2014	864.79	1,623.43	27,481.85	1,428.33
8/1/2014	912.79	1,958.62	29,285.75	1,482.29
9/2/2014	912.70	2,588.34	29,556.30	1,539.12
10/1/2014	927.85	2,345.00	28,435.96	1,453.70
11/3/2014	943.09	2,736.87	28,464.47	1,337.67
12/1/2014	907.28	2,579.72	28,712.03	1,391.23
% Changes^[2]	-21.85%	161.79%	24.29%	94.44%

Note:

[1] The comparables are U.S. public companies selected from the S&P Capital IQ database based on the following 1) Industry category same as Noranda, which is under "Aluminum Production" and "Rolling, Drawing and Extruding of Aluminum", corresponding with SIC code 3334, 3353, 3354 and 3355. 2) S&P Capital IQ designated competitors of Noranda.

[2] (Enterprise value as of 12/01/2014-Enterprise value as of 06/01/2010)/Enterprise value as of 06/01/2010.

Source:

S&P Capital IQ database.

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