



# ONTARIO PAPER INDUSTRY

## Economic Obsolescence Analysis

As of January 1, 2015

*Prepared for*  
Municipal Property Assessment Corporation

American Appraisal Canada, Inc.  
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Leading / Thinking / Performing

May 19, 2015

Mr. Paul Campbell  
Director Valuation and Customer Relations, Business Properties  
Municipal Property Assessment Corporation  
1340 Pickering Parkway, Suite 101  
Pickering, ON L1V 0C4

Dear Mr. Campbell:

At your request, American Appraisal Canada, Inc. prepared the attached report concerning the estimation of economic obsolescence in the Ontario paper industry as of January 1, 2015. While we understand that our report may be used by MPAC as an input to establish the current value of land as at January 1, 2016, the information required to calculate economic obsolescence at that future date has not yet been revealed. Our report and conclusions can be updated when such information becomes available. Economic events and/or changes in the relative competitiveness of the subject industry between January 1, 2015 and January 1, 2016, may lead to a concluded rate of economic obsolescence different to that cited in this report.

If you have any questions or if there is anything else we can do for you, please contact either of us at 416-593-3409 or 416-593-3408.

Sincerely,

James A. Skinner MBA, CPA, CA, CBV  
Vice President and Senior Managing Director

Michael A. Smith, MBA, CFA, CBV  
Director



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May 19, 2015

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1340 Pickering Parkway, Suite 101  
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**EXECUTIVE SUMMARY**

American Appraisal Canada, Inc. (“American Appraisal”) was retained by the Municipal Property Assessment Corporation (“MPAC”) to complete an economic obsolescence analysis pertaining to the Ontario paper industry (the “Industry”) as of January 1, 2015 (the “Effective Date”). We submit our findings in this narrative report.

Please note that for the purpose of this report, the paper industry is defined to include only the following industry segments: printing and writing papers, packaging and industrial papers, and newsprint. While the paper industry is typically defined to also include tissue papers, we have provided a separate report to MPAC regarding economic obsolescence in that segment.

The purpose of this study was to determine, at the Industry level, if economic obsolescence was applicable to the real property of firms operating in the Industry and to express our estimate of the quantum of any such obsolescence.

It is entirely inappropriate to use this report for any purpose other than the one stated. Only the signed client of record, MPAC, is the intended user of, and may rely on, American Appraisal’s report. No third party shall have the right of reliance on this report, and neither receipt nor possession of the report by any third party shall create any express or implied third-party beneficiary rights.

Based on the information and analysis summarized in this report, it is our view that economic obsolescence in the Ontario paper industry at January 1, 2015 was reasonably estimated as follows:

Industry	Economic Obsolescence at Jan. 1, 2015
Ontario Paper	22.0%

## INTRODUCTION

### *Purpose and Scope of Work*

MPAC is responsible for classifying and valuing all real property within the Province of Ontario in compliance with the Assessment Act and regulations established by the Government of Ontario. As required by the Province's legislation, assessed value is based on Current Value. The Assessment Act defines Current Value in the following manner:

*"in relation to land, the amount of money the fee simple, if unencumbered, would realize if sold at arm's length by a willing seller to a willing buyer; ("valeur actuelle")"*

This means the price a property might reasonably be expected to sell for, in its current condition, on the open market.

In order to achieve MPAC's desired goal of equitability, the process of Current Value assessment parallels the intent of market value; its objective is to quantify the way in which location, physical characteristics and demand impact the value of a given real property. This is readily achievable when transaction data is available to compare a subject property to similar properties in the same market area. The more unique a property is, however, the more difficult it becomes to achieve and to be seen to achieve the objective of equitability amongst the Province's taxpayers. Current Value assessment of special purpose manufacturing plants, including those operating in the Industry, is particularly challenging because of their inevitable uniqueness.

We understand that MPAC relies upon the cost approach to assess special purpose manufacturing facilities, applied in the following manner:

- i. land value is based on highest and best use as though vacant;
- ii. cost new of improvements is derived using MPAC's Automated Cost System;
- iii. physical depreciation is based upon specific MPAC guidelines; and
- iv. functional obsolescence is estimated using MPAC guidelines.

MPAC has advised American Appraisal that it is contemplating refinement of this determination of value through the inclusion of a deduction for economic obsolescence ("EO"). Accordingly, our analysis resulted in an estimate of the EO that may be broadly present within the Ontario paper industry. Our estimate of EO may not be applicable to specific facilities, but has been provided at the Industry level and may or may not apply to individual tax payers.

The primary sources of information used in our investigation included the following:

- Statistics Canada;
- Industry Canada;

- North American Wood Fiber Review;
- RISI, Inc.;
- Standard & Poor's Capital IQ database;
- Standard & Poor's Industry Surveys – Paper & Forest Products;
- Ontario Ministry of Natural Resources and Forestry;
- Board of Governors of the Federal Reserve System;
- U.S. Bureau of Labor Statistics;
- United States Census Bureau;
- regulatory filings of publicly traded industry participants; and
- other information as described in the relevant sections of this report.

We understand that MPAC expected, and accordingly we confirm that this analysis was performed, using data and information that was publicly available and that our analysis has been performed without the benefit of inspecting any real property locations in the subject Industry.

### *Economic Obsolescence*

Economic obsolescence, also referred to as external obsolescence, is defined as:

*“a form of depreciation or loss in value of usefulness of a property caused by factors external to the property. These may include such things as the economics of the industry; availability of financing; loss of material and/or labor sources; passage of new legislation; changes in ordinances; increased cost of raw materials, labor or utilities (without an offsetting increase in product price); reduced demand for the product; increased competition; inflation or high interest rates; or similar factors.”<sup>1</sup>*

The economic principles of supply, demand, and competition drive the loss in value associated with EO. Typically, EO cannot be reduced by capital investments, but it can change and even decline to zero through changing economic conditions.

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<sup>1</sup> Valuing Machinery and Equipment: The Fundamentals of Appraising Machinery and Technical Assets, Second Edition, American Society of Appraisers, 2005.

## ECONOMIC CONDITIONS

A sound analysis of economic obsolescence must consider current and prospective economic conditions, in both the national economies in which the subject Industry operates, and in the Industry itself. The major variables reviewed in order to evaluate the overall state of a national economy include, among others, the current level of and changes in the real gross domestic product (“GDP”), interest rates, unemployment rates and inflation. Given the impact of both the Canadian and U.S. economies on the Industry analyzed, an overview of those economies for the last several years, as well as a consideration of forecast data follows.

### Canada

#### Gross Domestic Product

GDP measures the value of all final goods and services produced in a given economy. Two measures of GDP are currently quoted, nominal and real GDP. Due to inflationary pressures, nominal GDP will tend to increase over time, thus preventing analysts from obtaining an accurate picture of the overall economy. As a result, a more accurate measure of economic growth is obtained using real GDP. Real GDP removes the effects of inflation from nominal GDP, thereby increasing comparability and consistency.

The following excerpts are from the Bank of Canada’s January 2015 *Monetary Policy Report*.

Oil prices have plummeted over the past six months. Lower oil prices are expected to boost global economic growth while widening the divergences among economies. These developments are taking place against the backdrop of a modest pickup in global growth.

Within this mixed global picture, the main area of strength is the United States, Canada’s largest trading partner. Economic growth in the United States is expected to become increasingly self-sustaining, further propelled by the large positive impact from oil-price declines, despite the drag from the appreciation of the U.S. dollar. In other advanced economies, particularly the euro area and Japan, growth is expected to remain weak despite additional policy stimulus, as the headwinds from deleveraging and uncertainty dissipate gradually. Those headwinds are also expected to temper the positive effects of lower oil prices on advanced economies. In the rest of the world, GDP growth is expected to be held back by the negative effects of lower oil prices on oil-exporting countries; however, growth should strengthen gradually through 2016 as foreign demand in advanced economies picks up and growth-enhancing structural reforms are implemented.

Taking these various countervailing factors into account, the Bank of Canada (the “Bank”) anticipates a pickup in global economic growth to about 3.5% over the next two years.

The oil price shock is occurring against a backdrop of solid and more broadly-based growth in Canada in recent quarters. Outside the energy sector, we are beginning to see the anticipated sequence of increased foreign demand, stronger exports, improved business confidence and

investment, and employment growth. However, there is considerable uncertainty about the speed with which this sequence will evolve and how it will be affected by the drop in oil prices.

Although there is considerable uncertainty around the outlook, the Bank is projecting real GDP growth will slow to about 1.5% and the output gap to widen in the first half of 2015. The negative impact of lower oil prices will gradually be mitigated by a stronger U.S. economy, a weaker Canadian dollar, and the Bank’s monetary policy response. The Bank expects Canada’s economy to gradually strengthen in the second half of this year, with real GDP growth averaging 2.1% in 2015 and 2.4% in 2016. The economy is expected to return to full capacity around the end of 2016, a little later than was expected in October.

Historical and forecast Canadian real GDP growth for 2006 to 2016 (projected) is shown below.

Year	Annual Change (%)
2006	2.8
2007	2.2
2008	0.7
2009	-2.8
2010	3.2
2011	2.5
2012	1.7
2013	2.0
2014*	2.4
2015*	2.1
2016*	2.4

\*Estimated  
Sources: Bank of Canada & Statistics Canada

### Consumer Prices and Inflation Rates

Compiled monthly by Statistics Canada, the Consumer Price Index (“CPI”) tracks retail price inflation (or deflation) for products sold to consumers. The rate of price inflation in the general economy directly influences pricing trends in the consumer goods market.

Both total CPI and core inflation have hovered near 2% in recent quarters, about 1 percentage point higher than a year earlier. The increase in core inflation over the past year is largely due to some sector-specific factors and the temporary effects of a lower Canadian dollar. Even without these factors, there has been a small upward drift in underlying inflation, consistent with the recent trend shown by alternative measures of core inflation.



Core inflation is expected to ease through the middle of 2015 as the temporary boost to inflation from sector-specific factors falls out of the inflation data. Thereafter, core inflation is expected to remain fairly steady, at close to 2 per cent, as the downward pressure arising from excess supply and retail competition gradually dissipates and the upward pressure from the pass through of the depreciation of the dollar fades.

Based on the assumption of oil prices at USD 60, total CPI inflation is projected to fall sharply and to be below the inflation-control range during 2015. Given the magnitude of the shock to oil prices, there is an exceptional amount of uncertainty about the profile for total CPI. For example, if the base-case scenario were to assume that oil prices were 10% higher (lower), total CPI inflation would be higher (lower) by 0.3 percentage points over the coming year.

As the economy reaches and remains at full capacity by around the end of 2016, both core and total CPI are projected to be about 2% on a sustained basis.

Historical and forecast Canadian CPI growth rates for 2006 to 2016 (projected) are shown below.

Year	CPI (%)
2006	2.0
2007	2.2
2008	2.3
2009	0.3
2010	1.8
2011	2.9
2012	1.5
2013*	1.2
2014*	2.0
2015*	1.1
2016*	2.1

\*Estimated  
Sources: Statistics Canada and Consensus Economic Forecasts

**Credit Conditions and Interest Rates**

According to the Bank’s *Financial System Review – December 2014*:

The unexpectedly slow global recovery has meant that monetary conditions in advanced economies, including Canada, have been very stimulative for much longer than envisioned in the aftermath of the financial crisis. Interest rate expectations and yields on long-term government bonds in advanced economies have continued to fall since June, reaching near-

historical lows in Japan and the euro area, as the Bank of Japan and the European Central Bank continue to inject exceptional liquidity. Market rates suggest that the first rise in U.S. policy rates has been pushed back to the second half of 2015, in part reflecting concerns about spillovers to the United States from weakened growth prospects elsewhere in the world.

Yields on Canadian long-term government bonds have followed their foreign counterparts: 10-year yields have declined by about 35 basis points since the June FSR and are now only about 35 basis points off their all-time lows. In addition, yields on provincial government bonds have also declined to near-historical lows.

Corporate bond yields remain historically low, as fairly heavy issuance has been met by very strong investor demand. Overall business lending conditions have also continued to ease, owing to strong competition among financial institutions and capital markets.

Borrowing costs for Canadian households remain at very low levels. Interest rates on 5-year mortgages have declined further over the past year, owing to both lower funding costs—proxied by the Canadian-dollar 5-year swap rate—and a 30-basis-point reduction in implied spreads.

The Bank of Canada announced on December 3, 2014 that it was maintaining its target for the overnight rate at 1%. The target for the overnight rate is the average interest rate that the Bank wants to see in the marketplace for one-day (or "overnight") loans between financial institutions. Changes in this rate influence other interest rates, such as those for consumer loans and mortgages. The Bank Rate was correspondingly 1.25% and the deposit rate 0.75%.

## **Unemployment**

According to Statistics Canada, the nation's unemployment rate remained at 6.6% in December, as gains in full-time work were offset by losses in part-time. Employment gains in 2014 amounted to 186,000 jobs, with increases in the second half of the year accounting for most of the growth.

Provincially, unemployment declined in Prince Edward Island and was little changed in the other provinces.

There were fewer people working in accommodation and food services as well as 'other services' in December. At the same time, employment increased in agriculture, public administration and natural resources. The number of self-employed people, as well as private and public sector employees was virtually unchanged in December.

Historical and forecast Canadian unemployment rates were:

Year	Unemployment Rate (%)
2006	6.3
2007	6.1
2008	6.2
2009	8.3
2010	8.0
2011	7.4
2012	7.3
2013	7.1
2014	6.9
2015*	6.4
2016*	6.3

\*Estimated  
 Source: Statistics Canada and RBC Economics Research forecasts

## United States

In this analysis, we examine the general economic climate that existed in the U.S. at the end of the fourth quarter of 2014. This summary provides an overview of some selected economic factors that prevailed at that time as well as a discussion of the factors that are crucial over an extended time period.

### Gross Domestic Product

The Bureau of Economic Analysis reported that the nation's economy—as indicated by GDP—grew at an annual rate of 2.6% in the fourth quarter of 2014. This was below forecasts, as a survey conducted by Bloomberg found that the median forecast of economists was a 3.0% rate. This was also a deceleration from the third quarter, when GDP grew at a 5.0% rate—the fastest quarterly pace in 11 years. GDP is the total market value of goods and services produced in the U.S. economy and is generally considered the most comprehensive measure of economic growth. For all of 2014, the economy grew 2.4% from the year before, the biggest advance since 2010, following a 2.2% expansion in 2013.

Consumer spending, private inventory investment, exports, business investment, state and local government spending, and residential fixed investment all made positive contributions to the fourth-quarter GDP rate. Federal government spending made a negative contribution to GDP, while imports, which are a subtraction in the calculation of GDP, increased.

### Consumer Prices and Inflation Rates

According to the Bureau of Economic Analysis, the price index for gross domestic purchases decreased 0.3% in the fourth quarter of 2014, compared with an increase of 1.4% in the previous quarter. The price index for gross domestic purchases measures prices paid by U.S.

residents. Excluding food and energy prices, the price index for gross domestic purchases rose 0.7% in the fourth quarter, compared with an increase of 1.6% in the previous quarter.

The U.S. Department of Labor reported that the Consumer Price Index fell 0.4% in December, on a seasonally adjusted basis, its largest decline since December 2008. Over the last 12 months, CPI has risen 0.8%. CPI is a measure of a basket of products and services—including housing, electricity, food, and transportation—and is used as a measure of inflation. CPI is comprised of three main indexes: the food index, the energy index, and the all items less food and energy index (also known as “Core CPI”).

Core CPI, a measure of inflation that excludes volatile food and energy costs, was unchanged in December but up 1.6% over the past 12 months. The indexes for shelter, medical care, tobacco, and personal care all rose. Offsetting these increases were declines in the indexes for apparel, airline fares, used cars and trucks, alcoholic beverages, and household furnishings and operations.

The U.S. Department of Labor reported that the Producer Price Index (“PPI”) fell 0.3% in December, on a seasonally adjusted basis. December was PPI’s steepest decline since October 2011. Over the last 12 months, PPI has risen 1.1%. PPI is a gauge of inflation in the manufacturing process that can be a precursor to inflation in consumer prices. PPI for final demand is comprised of two main indexes: final demand services and final demand goods.

In December, the 0.3% decline in PPI was the result of a decrease in the index for final demand goods, which fell 1.2%. In contrast, prices for final demand services moved up 0.2%.

## **Interest Rates**

The Federal Open Market Committee (“FOMC”) met twice during the fourth quarter of 2014, issuing a statement from each meeting. At both meetings, the FOMC reaffirmed its desire to keep its target for the federal funds rate near zero. The FOMC’s goal with these decisions is to support its continued progress toward maximum employment and price stability. The FOMC noted that it will remain patient in deciding on whether to raise interest rates but will assess all available information in making that determination going forward. The federal funds rate is the interest rate at which a commercial bank lends immediately available funds in balances at the Federal Reserve to another commercial bank. The FOMC establishes a target rate and expands or contracts the money supply with the aim that the federal funds rate, a market rate, will approximate the target rate.

The FOMC found that economic activity was expanding at a moderate pace. It found that labor market conditions had improved, as job gains remained solid and the unemployment rate declined. Additionally, a range of labor market indicators suggested that underutilization of labor resources continued to diminish. The FOMC stated that the housing market recovery remained slow, but household spending and business spending rose. Inflation remained below the FOMC’s longer-run objective, due in part to declining energy prices. The FOMC also determined that the time had come to end its asset purchase program since there had been a substantial improvement in the outlook for the labor market since the inception of the

program. Further, the FOMC continued to see sufficient underlying strength in the broader economy.

During the fourth quarter of 2014, the Board of Governors of the Federal Reserve left the discount rate unchanged, at 0.75%. The discount rate is the interest rate a commercial bank is charged to borrow funds, typically for a short period, directly from a Federal Reserve Bank. The board of directors of each Reserve Bank establishes the discount rate every 14 days, subject to the approval of the Board of Governors.

### Unemployment

The U.S. Department of Labor reported that job creation continued in December, with 252,000 new jobs being created. This came after 261,000 and 353,000 new jobs were created in October and November, respectively. Employment gains have now exceeded 200,000 jobs a month for 11 straight months, the longest stretch since the 19 months that ended in March 1995. Job growth averaged 246,000 per month in 2014, compared with an average monthly gain of 194,000 in 2013. Total employment rose by 2.95 million in 2014, the most in any calendar year since 1999.

The unemployment rate (also known as the U3 unemployment rate) fell 0.2 percentage point to a six-and-a-half-year low of 5.6% in December. The annual average unemployment rate fell 1.2 percentage points between 2013 and 2014, the largest decline since 1984. The number of unemployed persons declined by 383,000 in December to 8.7 million. In 2014, the number of unemployed persons declined by approximately 1.7 million. The U3 unemployment rate is the official unemployment rate per the International Labour Organization definition and occurs when people who have actively looked for work within the past four weeks are still without jobs.

The labor-force participation rate edged down 0.2 percentage point in December to 62.7%. The labor-force participation rate has remained within a narrow range of 62.7% to 62.9% since April. The employment-population ratio—the share of the working-age population with a job—was unchanged in December for the third consecutive month at 59.2%. However, the employment-population ratio rose by 0.6 percentage point in 2014.

The number of unemployed persons who have been out of work for 27 weeks or more was essentially unchanged in December at 2.8 million, or 31.7% of the total unemployed. Over the past 12 months, the number of long-term unemployed has declined by 1.1 million. The average unemployment duration decreased slightly in December to 32.8 weeks from 33.0 weeks in November.

### Economic Outlook

Consensus Economics Inc., publisher of Consensus Forecasts—USA, reports that the consensus of U.S. forecasters is that real GDP will increase at a seasonally adjusted annual rate of 2.8% in both the first and second quarters of 2015. Every month, Consensus Economics surveys a panel of 30 prominent U.S. economic and financial forecasters for their predictions on a range of variables, including future growth, inflation, current account and budget balances, and interest rates. The forecasters expect GDP to grow 3.0% in 2015, 3.0% in 2016, and 2.8% in 2017.

They forecast personal consumption will increase at a rate of 3.0% in both the first and second quarters of 2015. They expect personal consumption to increase 2.8% in both 2015 and 2016.

These forecasters believe unemployment will average 5.7% in the first quarter of 2015 and 5.6% in the second quarter. They believe unemployment will average 5.5% in 2015.

They also believe consumer prices will rise at a rate of 0.9% in the first quarter of 2015 and 1.6% in the second quarter. They expect consumer prices to increase 1.3% in 2015 and 2.1% in 2016. They expect producer prices to increase at a rate of 0.7% in the first quarter of 2015 and 1.1% in the second quarter. The forecasters anticipate producer prices will rise 0.9% in 2015.

The most recent release of The Livingston Survey (the Survey) predicts fairly steady output growth through the end of 2015. The Survey, conducted by the Federal Reserve Bank of Philadelphia, is the oldest continuous survey of economists' expectations. It summarizes the forecasts of economists from industry, government, banking, and academia. The participants project real GDP to grow at an annual rate of 2.9% in the first half of 2015 and 2.7% in the second half of 2015. They believe GDP will grow 2.5% annually over the next 10 years. The Survey forecasted the unemployment rate to be 5.6% in June 2015, before declining to 5.4% in December 2015.

The forecasters in the Survey expect CPI inflation to be 1.4% in 2015 and 2.1% in 2016. The Survey expects CPI to average 2.3% over the next 10 years. The Survey expects PPI inflation to be 1.1% in 2015 and 1.5% in 2016.

## THE ONTARIO PAPER INDUSTRY

### *Forest Products in Ontario*

According to data provided by the Ontario Forest Industries Association, Ontario's forests cover approximately 800,000 km<sup>2</sup>; comprising 17% of Canada's forests.

The province has four distinct forest regions; the boreal forest in the north and, at its uppermost reaches, the boreal-barrens, and further south the deciduous and Great Lakes/St. Lawrence forest regions. Of these, the boreal forest is by far the largest, covering 550,000 km<sup>2</sup> (close to 50% of the province) and accounting for 76% of Ontario woodlands. Characterized by needle bearing coniferous trees such as spruce and jack pine, and leaf bearing deciduous trees such as poplar and birch, the boreal forest is the primary source of raw material for the forest products industry.



89% of Ontario's forests are publicly owned (88% by the Province, 1% federally), with the 11% balance being privately held.

Ontario's forestry industry has long been a key component of the province's economy, and according to most recently available data from Natural Resources Canada, generates annual revenues of approximately \$10.58 billion, divided between forestry and logging (8.9% of total revenues), pulp and paper manufacturing (62.1%), and wood products manufacturing (28.9%). Industry participants range from local sawmills and small scale logging operators with a few employees, to integrated multi-national companies with thousands of employees.

### *Paper Industry Overview*

Recall that for the purpose of this report, the paper industry is defined to include only the following industry segments: printing and writing papers, packaging and industrial papers, and newsprint. While the paper industry is typically defined to also include tissue papers, we have provided a separate report to MPAC regarding economic obsolescence in that segment.

### **The Paper Production Process**

The paper production process begins in a pulp mill, which converts wood chips or other fibre into a raw material used in the production of almost all paper types. Wood pulp is made by separating wood fibres from a substance called lignin which acts as a glue holding the fibres together. Fibre separation can be achieved through various methods, each of which imparts specific characteristics to the resulting pulp that make it suited to particular end uses. The major methods of fibre separation are described below.

Mechanical Pulp is produced using refiners in which wood chips are subjected to intense shearing forces between a rotating steel disc and a fixed plate. In a modification of this process, the wood chips are pre-softened by heat (thermo-mechanical pulp, or "TMP") to make the fibre separation process more effective. After grinding, the pulp is sorted by screening into suitable grades, and can then be bleached for use in higher value-added products. The resulting pulp consists of a mix of whole fibres and fibre fragments of different sizes.

Chemical Pulp is produced by combining wood chips and chemicals in large vessels known as digesters where heat, pressure and chemicals break down the lignin and separate the wood into cellulose fibres. The resulting slurry contains loose but intact fibres which maintain their strength and flexibility. During the process, approximately half of the wood dissolves into what is called black liquor. The cooked pulp is then washed and screened to achieve a more uniform quality, with the black liquor separated out of the pulp before the bleaching process. The kraft process is the dominant chemical pulping method, followed by the sulfite process.

Semi-Chemical Pulp is a hybrid of the previously described types and is manufactured in a two-step process which involves partial digestion with chemicals, followed by mechanical treatment in a disc refiner. Chemi-thermomechanical pulp (“CTMP”) is produced in a similar manner to TMP, but the wood chips are chemically treated before entering the refiner.

Recycled Pulp (also called de-inked pulp) is made from recovered paper from which the inks and other contaminants have been removed. Many newsprint, toilet paper and facial tissue grades contain 100% de-inked pulp.

Using chemical pulp to produce paper is more expensive than using mechanical or recycled pulp, but it has superior strength and brightness properties. The yield from chemical processes though, (approximately 45%) is much lower than in the manufacture of mechanical pulp (about 95%) because the lignin is completely dissolved and separated from the fibres.

The manufactured pulp is fed to a paper machine and pumped onto a moving screen or mesh. As the pulp travels along the screen, excess water is drained away and recycled, and a paper sheet made from interlocking cellulose fibres begins to form. As it moves through the paper making machine it is pressed between huge rollers to extract water and subsequently through heated rollers to remove any remaining water. Once the paper has been dried and pressed and depending upon its end use, it may be finished with coatings or other additives to impart certain desired physical properties.

The final stage of paper manufacturing is known as converting. In this stage, the large diameter rolls produced by paper mills are slit and rewound, or folded, into the final sizes and formats sold to the consumer, and final packaging takes place.

## Industry Segmentation

The paper industry is typically segmented as follows:

- Printing and Writing is the dominant segment, accounting for an estimated 57% of total U.S. paper production. Printing and Writing is divided into four sub-segments: uncoated free sheet, uncoated mechanical, coated free sheet and coated mechanical paper. Free sheet is defined as paper containing no more than 10% mechanical wood pulp. Uncoated papers are typically used in printers, copiers, and for digital image printing. End products include books, brochures, business forms and records, direct mail materials, envelopes and pamphlets. Coated paper is

used primarily for magazines, catalogues, annual reports, and other publications that require coloured inks. These papers are covered with a thin, transparent clay coating that provides a smooth surface for superior colour reproduction. Most coated paper has a glossy finish on both sides.

Printing and writing paper demand is influenced by the general level of business activity and continues to experience falling demand due to technological change. New forms of electronic communication, including the growth of e-books, e-readers and tablets continue to fuel the “digital substitution” of traditional paper grades.

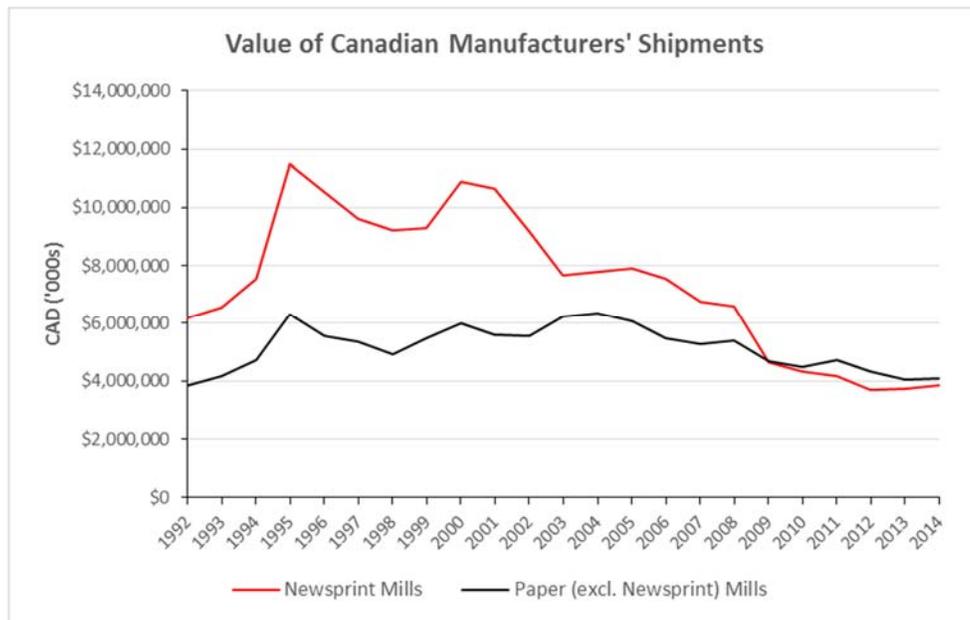
- Newsprint is manufactured specifically for printing newspapers and is a lightweight, opaque paper designed to provide quality printing contrast and to tolerate repeated folding. The grade is generally made with a majority of mechanical pulp. The newspaper industry continues to experience deep declines in print circulation as customers continue to migrate from print readership to electronic media. Consequently, its share of total paper production has fallen to an estimated 10%.
- Packaging and Industrial accounts for 12% of total paper production and comprises non-paperboard packaging and converted products. Specifically, packaging and industrial papers include specialty packaging, specialty industrial, unbleached kraft and bleached packaging paper. Specialty packaging papers are commonly used to package food items such as candy bars, crackers and butter, and other consumer products such as soap, cosmetics, toiletries and pharmaceuticals. Uses for specialty industrial grades include masking tapes, electrical insulators, gaskets, filter papers, decorative laminates and cigarette papers. Typical end uses for unbleached kraft and bleached packaging papers include shipping sacks, grocery and retail bags, wrapping papers, and flexible counter packaging for various consumer goods. Demand is influenced by the level of economic activity and trends in end-use industries, especially non-durable goods. While the packaging market is impacted by economic conditions, it tends to be somewhat more resilient than the overall economy given its significant exposure to the non-cyclical food and beverage sectors.
- Tissue paper is used in the production of sanitary products such as bathroom tissue, paper towels, facial tissue and napkins. About two-thirds of tissue paper sales go to the consumer market, with the balance going to the commercial/industrial away-from-home market. Tissue paper production is one of the most stable segments of the paper industry, due to the non-discretionary nature of its products. As a result, demand is driven more by population and demographic trends than by economic growth. Tissue accounts for the remaining 21% of total paper industry production.

## Paper Demand

The demand for paper has varied significantly between the above segments. We note that Canadian manufacturers’ shipments of paper (excluding newsprint) have increased slowly since 1992 at a

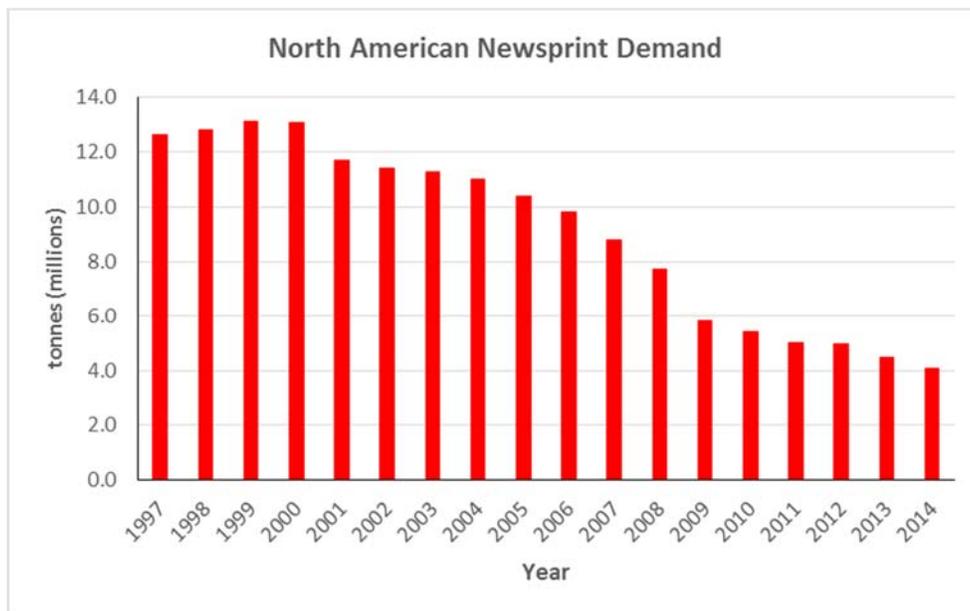
compound annual growth rate (“CAGR”) of just 0.3%. Newsprint sales on the other hand have plummeted, by approximately one-third since 1992 and nearly two-thirds from their peak, due primarily to rapidly declining demand. RISI expects the long-established negative trend to continue into 2015 with newsprint demand expected to fall by at least 9%.

Chart 1



Source: Statistics Canada

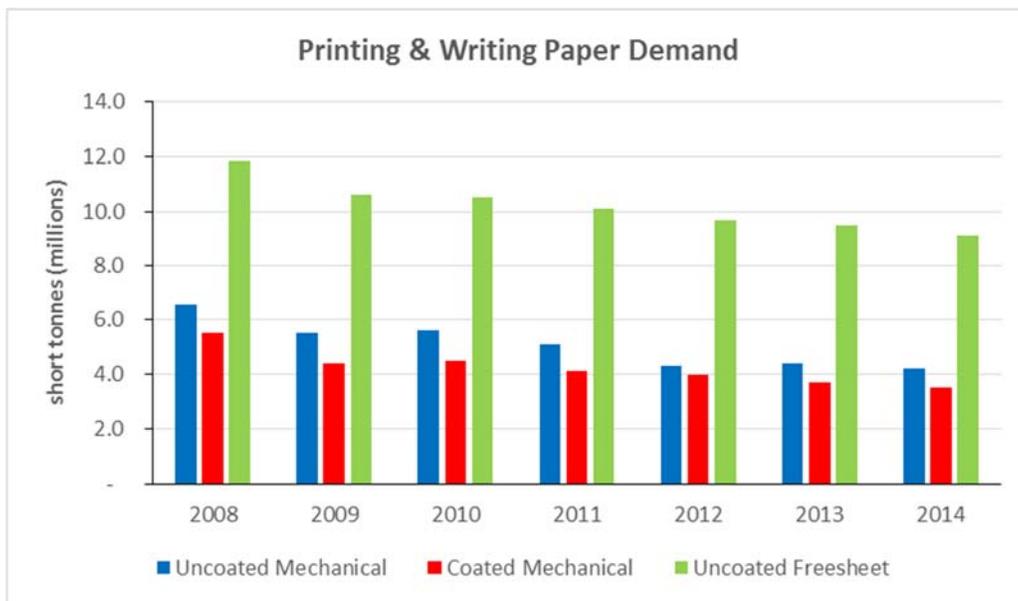
Chart 2



Source: Natural Resources Canada, RISI, and filings of publicly traded companies

North American demand for printing and writing papers has also continued to decline, though at a slower rate than newsprint. RISI expects printing and writing paper demand to fall an additional 3.2% in 2015 and 2.6% in 2016, with continuing reductions in U.S. capacity.

Chart 3

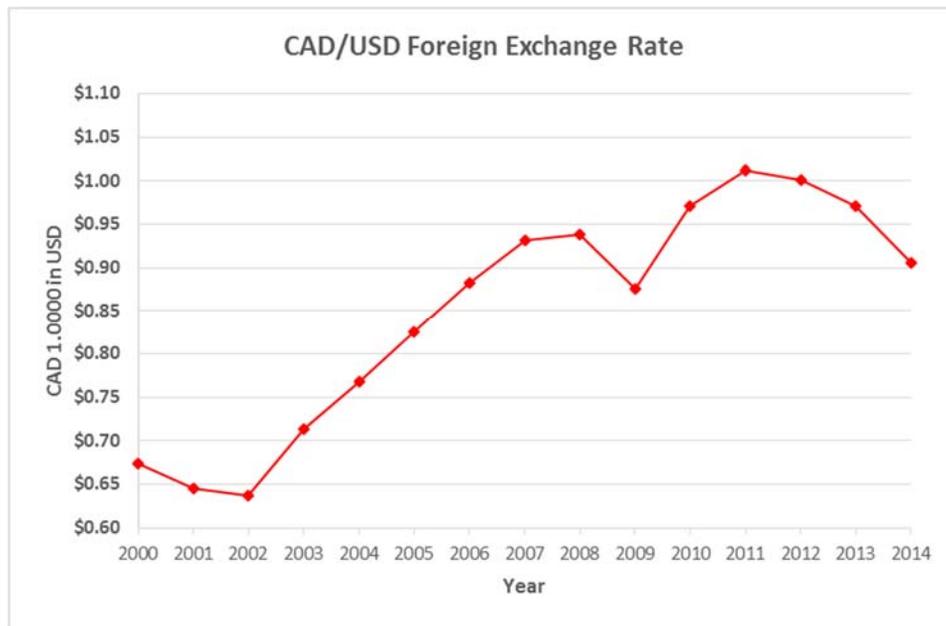


Source: Annual Reports of publicly traded guideline companies

Packaging and industrial papers have been the bright spot in the North American paper industry, with demand fuelled by economic growth and rising consumer expenditures on food and general merchandise. The outlook for this segment was positive with U.S. consumer expenditures on non-durable goods forecast by RISI to rise 3.0% in both 2015 and 2016, with consequent positive growth in bleached and unbleached kraft paper volumes over that period. Kraft paper prices were also expected to rise over this period, with RISI forecasting annual increases of 2.9% and 0.8% based on the weighted average price of all unbleached kraft grades.

In addition to the segment-specific demand drivers previously noted, paper production in Ontario is also a function of domestic market and U.S. export demand, the Canadian dollar (“CAD”) to U.S. dollar (“USD”) foreign exchange rate, and paper prices. According to Statistics Canada, 96.6% of Ontario’s 2014 newsprint exports were destined for the United States, as well as 98.4% of the province’s other paper exports. With export revenues denominated in U.S. dollars, and labour and certain other input costs paid in Canadian dollars, the profitability of exporting Ontario paper mills has been eroded over the years by an appreciating domestic currency. From the following chart, we can see that the Canadian dollar has appreciated in value from approximately USD 0.64 in 2002 to a 2014 year-to-date average of USD 0.9103. The exchange rate has eased somewhat in recent years, down from its 2011 high (average annual rate) of USD 1.0114. At the Effective Date, the Canadian dollar exchange rate stood at USD 0.8620.

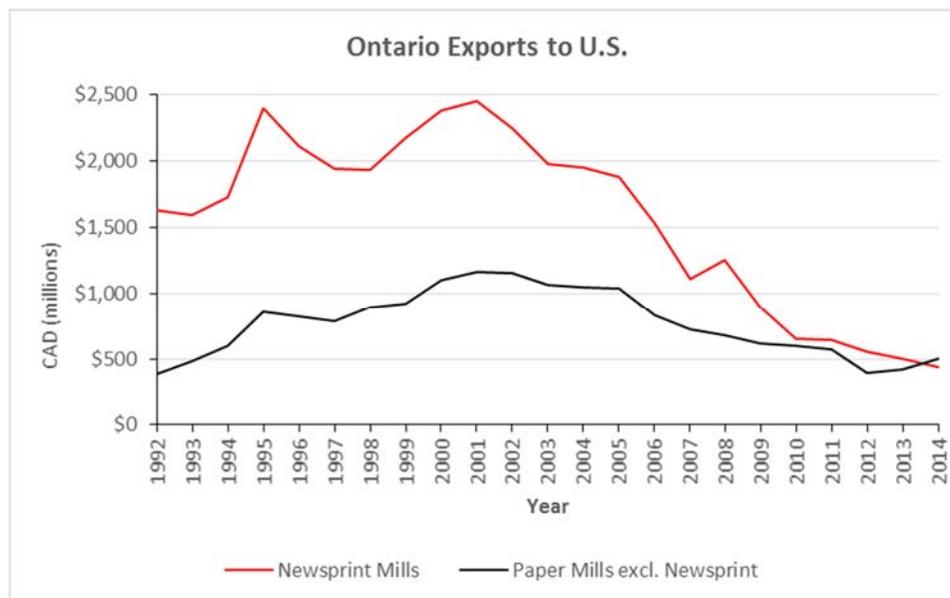
Chart 4



Source: Industry Canada & Board of Governors of the Federal Reserve System

Ontario's exports of newsprint to the U.S. have declined dramatically from their peak, though we note that the rate of decline has at least slowed in recent years. Exports of all other papers from Ontario to the U.S. have increased at a CAGR of 1.3% per annum since 1992.

Chart 5



Source: Statistics Canada

The North American paper industry is highly competitive and concentrated at the top, due to its high capital costs which provide a barrier to entry. The 5 largest North American newsprint producers, for example, account for approximately 80% of total capacity while the top 5 uncoated mechanical paper producers represent 76% of total North American capacity. Industry competitors include large global producers and numerous smaller regional players, with price, quality and customer relationships being the key competitive factors. Specialty papers that use proprietary processes or formulas are less prone to competitive pressures than commodity products, with competition based on the ability to design and develop customized product features to meet customer specifications while maintaining quality, customer service and price. The intensity of competition from offshore producers is dependent upon exchange rate movements and ocean freight rates. Ontario paper mills also face competition from other paper grades, and electronic media and document storage alternatives.

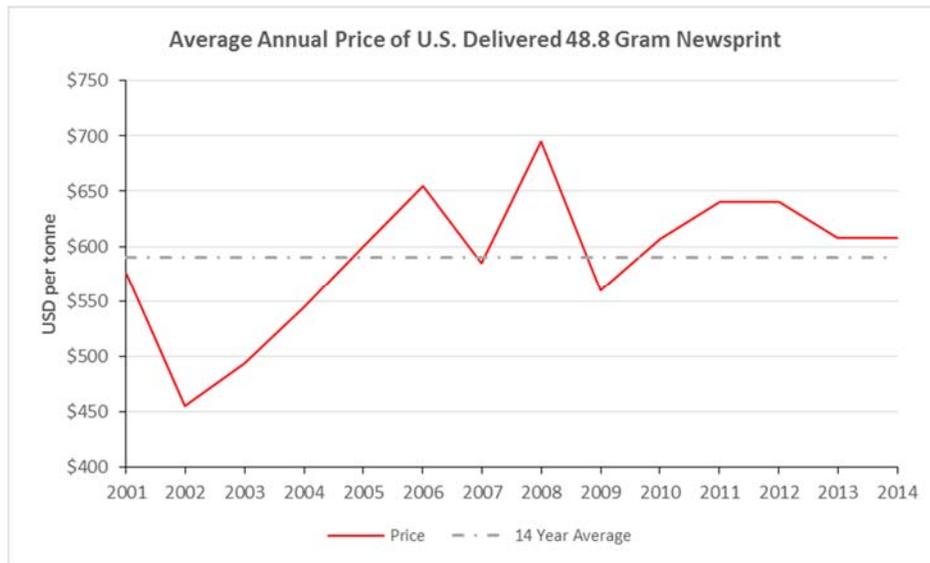
### *Existence of Economic Obsolescence*

The existence of EO in an industry may be indicated by one or more of the following factors:

- reduced demand for the industry's products;
- overcapacity in the industry;
- dislocation of raw material supplies;
- increasing cost of raw materials, labour, utilities, or transportation, while the selling price of the product remains fixed or increases at a much lower rate;
- government regulations that require capital expenditures to be made with little or no return on the new investment; and
- environmental considerations that require capital expenditures to be made with little or no return on the new investment.

A significantly reduced, and still declining demand for Ontario's newsprint from the U.S. was previously noted (see Chart 5). Newsprint prices remain just above their 14 year average and have remained steady since 2013 due primarily to the removal of some excess supply through the closure of mills and repurposing of newspaper machines. In fact, RISI estimates that North American producers have shuttered 1.7 million tonnes of net newsprint capacity from 2010 to 2013. With weaker export markets, closures continued in 2014 including Resolute Forest Products' announcement on December 5 that it will permanently close its Iroquois Falls, ON newsprint mill. Additionally, by the end of 2014, the North American newsprint industry will have converted a total of 925,000 tonnes of newsprint capacity to a variety of packaging grades, with 468,000 tonnes of these conversions occurring in 2014 alone. Atlantic Packaging converted the idle newsprint machine at its Whitby, ON mill in the second quarter of 2013, and Kruger Inc. is reportedly studying the possible conversion of a 214,000 tonne per year machine in Trois Rivieres, QC.

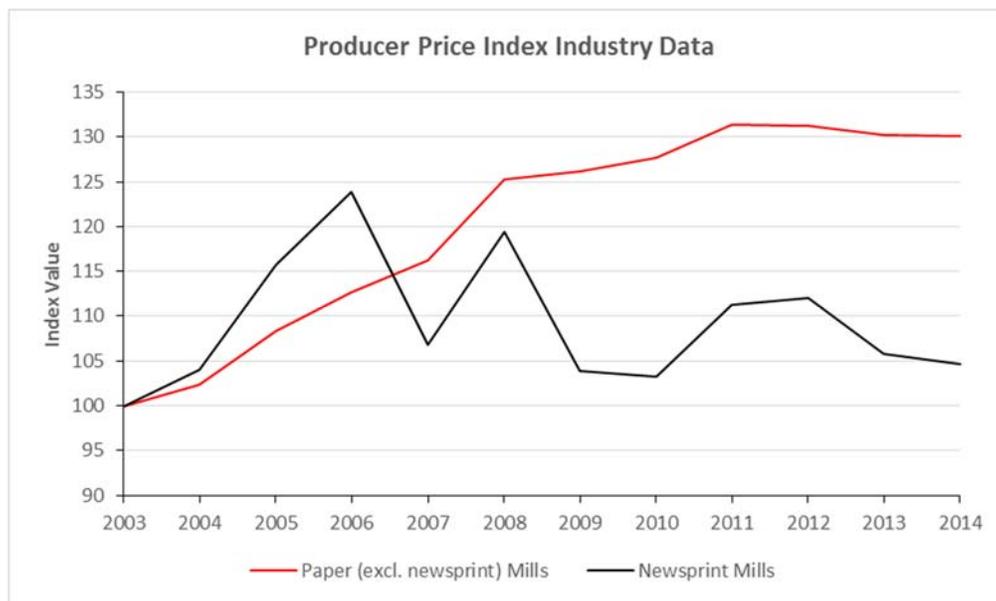
Chart 6



Source: West Fraser Timber

Using the Producer Price Index (“PPI”) from the U.S. Bureau of Labour Statistics to represent the mixed nature of ‘all other papers excluding newsprint’, we can see that their average price has significantly outperformed newsprint. The PPI program measures the average change over time in the selling prices received by domestic producers for their output. The indices presented below use 2003 as a base year.

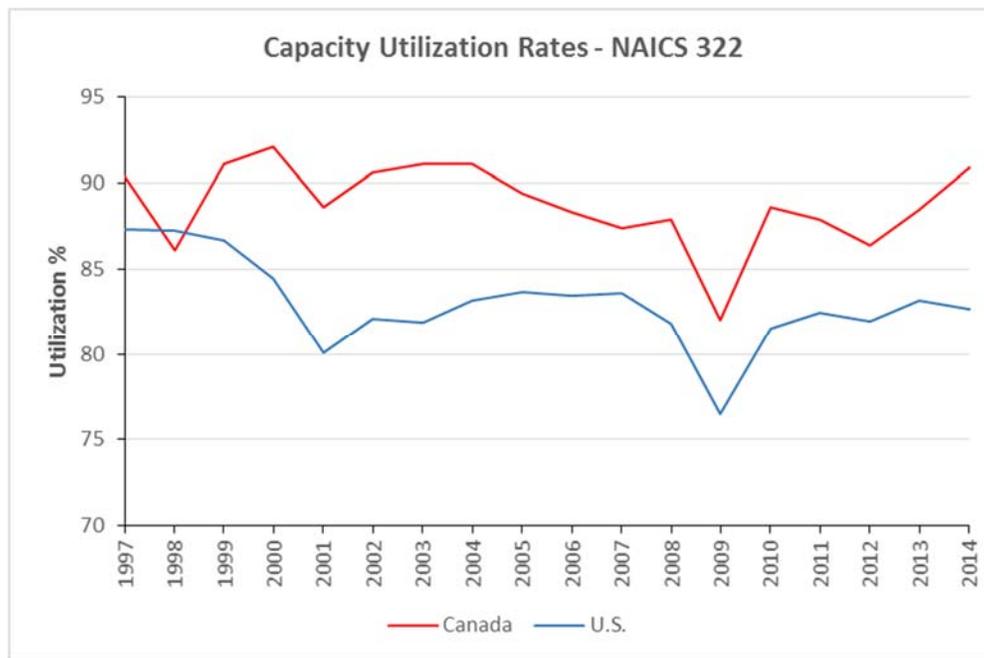
Chart 7



Source: U.S. Bureau of Labor Statistics

In terms of capacity utilization, the paper industry as a whole (as defined by NAICS code 322 to include establishments primarily engaged in the manufacture of pulp, paper and paper products) has bounced back from its recessionary lows, with the recovery more pronounced in Canada over the last two years.

Chart 8



Source: Statistics Canada & the Federal Reserve Bank of St. Louis

Evidence for the existence of EO in the Ontario paper industry, at least in the printing and writing and newsprint segments is considerable. It includes the recently announced permanent closure of the Iroquois Falls, ON newsprint mill, Atlantic Packaging’s conversion of its idle newsprint machine in Whitby, ON to produce packaging grades, and ongoing North American mill closures and conversions. An expected continuation of the historical trend toward decreased demand from the digital substitution of traditional paper grades provides additional, compelling evidence. The only positive developments in these segments have been energy and transportation cost relief from significantly lower fuel prices, and a depreciating Canadian dollar that has lowered Ontario fibre costs to something approximating the North American average at the Effective Date (see Fibre Cost Analysis in a subsequent section of this report).

While a separate EO analysis of the packaging and industrial paper segment is beyond the scope of this report, its very different demand drivers, current and continuing forecast positive performance suggests little evidence of EO in this particular segment.

## QUANTIFICATION OF ECONOMIC OBSOLESCENCE

### *Utilization Analysis*

One method used to quantify EO is to review the subject asset's utilization. If the asset is being utilized at less than 100% or whatever is the industry norm, then EO may exist because demand in the industry is substantially less than available supply. Mathematically, this is based on the relationship whereby EO equals actual utilized capacity (demand) divided by maximum capacity (supply) with the result taken to an exponent (scale factor), subtracted from 1. The scale factor is a relationship of cost to capacity, which reflects the concept that as capacity increases, the cost of construction increases at a different, typically slower, rate. Typically, when a specific scale factor is not known, a value of 0.68 is used for manufacturing facilities based on data published in engineering and construction texts.

$$EO = 1 - (\text{Demand/Capacity})^{0.68}$$

We researched industry sources and were able to obtain Canadian and U.S. pulp, paper and paper product manufacturing (aggregated) operating rates, plus operating rates for the U.S. newsprint industry. Additionally, we were also able to obtain operating rates for each of the 4 sub-segments of the U.S. printing and writing paper market, specifically; coated freesheet, coated mechanical, uncoated freesheet and uncoated mechanical paper. We also investigated other data sources including capacity utilization data for Canadian and U.S. paper mills and converting facilities contained in the current annual reports of publicly traded industry participants. Data availability enabled us to separately estimate EO rates for the newspaper and writing paper industry segments.

For the newsprint segment, we selected an 85.1% Demand/Capacity ratio for use in our valuation based on the average of the 3 Ontario mills identified, since this was the most direct comparison to our subject Industry. For printing and writing papers, we employed a 92.8% Demand/Capacity ratio based on the average rate observed for the 4 sub-segments.

Based on Utilization Analysis, as of the Effective Date, the EO present in the newsprint and writing and printing segments of the Industry was estimated to be:

Segment	Economic Obsolescence
Newsprint	10.4%
Printing & Writing	5.0%

The results of our Utilization Analysis are presented in Exhibits B-1 and B-2.

Please note that there was not sufficient market data to separately estimate EO based on Utilization Analysis for the packaging and industrial segment. All subsequent methodologies used in this report produce Industry level, rather than segment level EO estimates.

High utilization rates by themselves, however, are not necessarily indicative of low EO when it comes to an analysis of the paper industry. The pulp and paper industry generally, is highly capital intensive and characterized by significant fixed costs. A large paper machine, for example, can cost between USD 300 million and USD 500 million to construct, and building a large integrated pulp and paper facility can require an investment of more than USD 1 billion. This significant fixed cost base encourages producers to run their facilities at high operating rates to reduce their capital cost per ton and generate cash. Because building a paper mill and/or converting facility is an extremely capital intensive proposition, operators make every effort to keep their mills running continuously, with sufficient downtime to perform scheduled maintenance, make repairs, and address any pricing and inventory situations. Consequently, utilization analysis should be used in conjunction with profitability-based and other methodologies to reliably estimate Industry EO.

### *Gross Margin Analysis*

The study of company or industry returns by comparing gross profit margins over time can also provide a useful measure of EO. Simply put, gross margin is a company's revenues less its cost of goods sold, where cost of goods sold is defined to include the direct costs attributable to the production of the goods sold by a company. This amount includes the cost of the materials used in creating a product, along with the direct labour costs used in its production, but excludes indirect expenses such as distribution and sales force costs. If gross margins have been declining or are currently lower than in the past, EO may be present even if capacity utilization is high. EO can be measured using the formula:

$$EO = \frac{\text{Benchmark GM \%} - \text{Current GM \%}}{\text{Benchmark GM \%}}$$

Our gross margin analysis is presented in Exhibit C.

In the gross margin analysis, a review is typically made of the relationship of the gross margin percentages realized by a universe of selected guideline companies in the 12 months to the Effective Date, versus their returns during a period of time when profitability in the paper industry was considered to be normal. Since the guideline companies produce a very diverse range of paper products, no such common period of normal profitability existed. We therefore selected a unique period of normal profitability for each company based on an examination of their respective historical gross margins.

In selecting the guideline companies, we used the following sources:

- OneSource database

- Standard and Poor's Capital IQ database

We searched the Onesource database for companies operating in Standard Industrial Classification ("SIC") code 2621 – paper mills, and also searched using the keyword "paper". We then reviewed the identified companies for a focus on, or significant exposure to the paper industry (since some were integrated paper or forest products companies) and ideally significant exposure to foreign currency risk. Of the companies reviewed, 6 were selected as being most suitable for use in our analysis including:

- Catalyst Paper Corporation (CYT - TSX)
- P.H. Glatfelter Co. (GLT - NYSE)
- Neenah Paper, Inc. (NP - NYSE)
- Resolute Forest Products Inc. (RFP – TSX/NYSE)
- Domtar Corporation (USF - TSX)
- Verso Corporation (VRS – NYSE)

EO for each of the guideline companies was calculated using the following formula:

$$EO = \frac{\text{Benchmark Avg. GM \%} - \text{Current GM \%}}{\text{Benchmark Avg. GM \%}}$$

Industry EO, calculated using the median EO of the selected guideline companies, was estimated to be 20.3%.

### *Return-on-Capital Analysis*

An additional approach to quantifying EO is a return-on-capital analysis ("ROCA"). In such an analysis, the relationship of earnings is compared to the magnitude of investment used to generate those earnings.

In the ROCA, a review was made of the relationship of the percent earned on total capital by each of our 6 selected guideline companies in the 12 months to December 31, 2014, versus their returns during a period of time when their profitability was considered to be normal. Again, we selected a unique benchmark period of normal profitability for each company based on an examination of their respective returns-on-capital.

*Percent earned on total capital* is defined as "a company's return on its stockholders' equity and long-term debt obligations." The summation of long-term debt and stockholders' equity represents the total invested capital of a business enterprise. When the economics of the industry are good, the return on capital will be high; when poor, low. Hence, a return on capital analysis can be a meaningful indicator of economic obsolescence.

Recall that EO can be determined for each of the guideline companies using the following formula:

$$EO = \frac{\text{Benchmark Avg. ROC \%} - \text{Current ROC \%}}{\text{Benchmark Avg. ROC \%}}$$

Using the median of the guideline companies, EO based on a ROCA was estimated to be 8.5%. We do note, however, that two of the guideline companies, due to either current or historical negative returns-on-capital, produced EO estimates that were not meaningful, effectively reducing the number of guideline companies to 4.

Please see Exhibit D for calculations.

### *Price-to-Book Ratio Analysis*

Another method for estimating the EO present in a given asset or industry, is to analyze investors' perception of the investment in that industry using common stock prices. The ratio of price paid for common stock relative to its book value may be indicative of the investors' perception of the obsolescence present in the investment. Book value of the stock relates to original capital contributed to the firm in exchange for the stock, plus retained earnings that have accumulated since the initial investment.

From a legal perspective, stockholders own the firm in which they have invested. From an investor's viewpoint, stock ownership is considered to represent a net ownership position in the firm's assets. At any point in time, if the total value of all assets is considered and a deduction is made for all liabilities, the net amount is representative of the value of the aggregate value of the common stock (as per the balance sheet identity Assets - Liabilities = Shareholder's Equity). Thus, an investor purchasing shares of common stock is making a decision on the value of the total assets.

Book value of common stocks of publically held companies is calculated with reasonable consistency for most publicly traded companies due to accounting regulations. The regulations involve not only the general methodology used in the calculations, but also regulate the type of data available to investors. Due to the consistency of reporting, the book values can be useful as a benchmark for certain types of measurements.

The selection of our guideline companies has been previously described. For each of the guideline companies we obtained Effective Date; i) stock price data, ii) number of shares issued and outstanding, and iii) book value of equity from the Capital IQ database. From this information we were able to calculate Effective Date price-to-book ("PTB") ratios for each of the guideline companies. For baseline comparison purposes, a PTB ratio was available from Bloomberg for the S&P 500 Equal Weight Industrials Index. A comparison of equity PTB value ratios for general industrial stocks versus the Industry was possible, using this data.

The results of our PTB analysis are shown in Exhibit E, with EO estimated using the formula:

$$EO = \frac{\text{S\&P 500 Equal Weight Industrials} - \text{Paper Industry}}{\text{S\&P 500 Equal Weight Industrials}}$$

$$EO = (3.62 - 0.84) / 3.62 = 76.7\%$$

Economic obsolescence was calculated using the median PTB ratio of the guideline companies, in light of the significant variation in individual guideline company ratios.

This relationship is indicative of investors' relative valuation of paper industry assets when compared with general industrial stocks. Owners of general industrial stocks appear willing to pay about 76.7% more for such stocks than they would pay for stock in the paper industry, based on the PTB value ratio.

In this case, we do not believe that the PTB analysis is a reliable indicator of the quantum of Industry obsolescence given the extreme variability in the PTB ratios of the individual guideline companies i.e. two had negative PTB ratios while the high price-to-book ratio was 3.50.

### *Wood Fibre Cost Analysis*

Wood cost is a significant determinant of the competitiveness of pulp and paper mills. According to Wood Resources International, this cost typically varies between 40% and 65% of total cash costs depending on product grade. Consequently, an analysis of the average fibre cost for Ontario mills versus the average fibre cost for competing North American regions can be used to estimate Industry EO. This same approach to estimating EO has been employed by the Ontario Assessment Review Board ("ARB"), an independent adjudicative tribunal whose main function is to hear appeals from taxpayers who believe that their properties have been incorrectly assessed or classified.

American Appraisal obtained quarterly wood fibre prices for the period from Q3 2007 through Q4 2014 from the North American Wood Fibre Review ("NAWFR"). Price data was obtained for both softwood and hardwood wood chips and roundwood, with data available for each of the following North American regions:

<u>United States</u>	<u>Canada</u>
Northwest	British Columbia
Lake States	Alberta
Northeast	Ontario
Southeast	Quebec
South Central	Maritimes

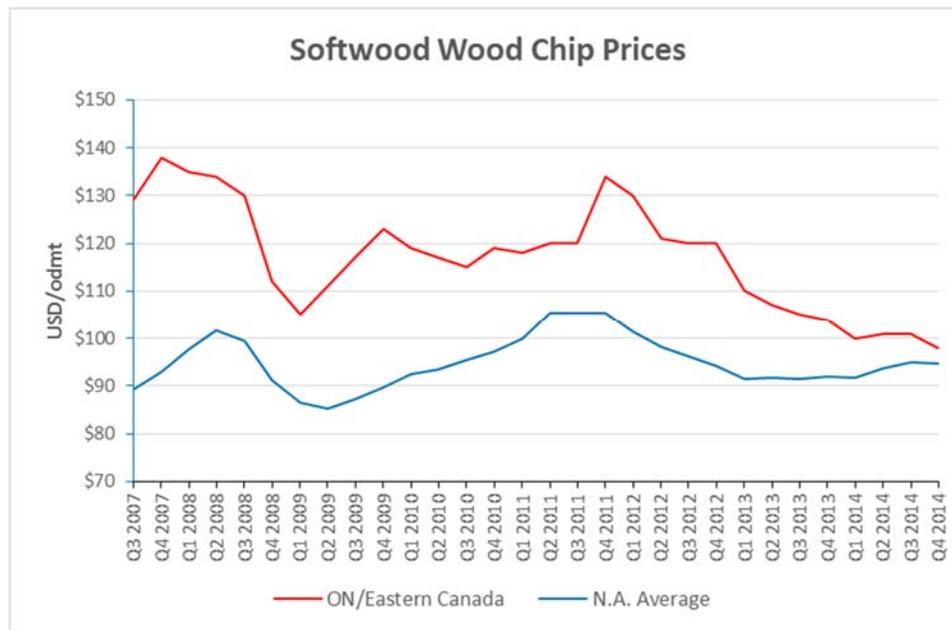
Please note that beginning in Q4 2011, the data provider aggregates Ontario and Quebec as 'Eastern Canada', whereas in prior periods both provinces are separately identified. Consequently, 'Eastern Canada' data (used as the best proxy for Ontario fibre costs after Q4 2011), will tend to somewhat

overstate actual Ontario costs due to the aggregation with Quebec which has historically been a higher cost region than Ontario.

According to the NAWFR, publication of hardwood wood chip costs for Ontario was suspended in Q1 2012 due to the minimal volumes generated. NAWFR also notes that while softwood roundwood prices are provided for Eastern Canada, this source is a relatively small component of the region’s total wood fibre consumption. Considering the above, and the fact that pulp and paper mills typically resort to higher priced roundwood only in the absence of the availability of lower priced chips, we believe that that most relevant comparison for the purpose of estimating Industry EO is that of Ontario softwood chips versus the North American average (excluding Ontario) for such chips.

We note that the cost of Eastern Canadian softwood chips has become significantly more competitive in recent years due in part to a weakening of the CAD versus the USD, with Eastern Canadian and North American softwood chip costs drawing close to parity at the Effective Date. Prices in the following chart are quoted in USD per oven-dry metric tonnes (“odmt”), and chip prices are for residual chips and do not include chips manufactured from roundwood.

Chart 9



Source: North American Wood Fibre Review

Industry EO was estimated based on the average excess cost of Ontario over North American softwood chips from Q3 2007 to Q4 2014. An average excess cost over a number of years was employed, in order to provide a sufficiently reliable representative sample.

$$EO = (\text{Ontario Average Chip Cost} / \text{North American Average Chip Cost}) - 1$$



EO = 23.4%

In other words, Ontario fibre costs as measured by the cost of softwood chips have been, on average, 23.4% more expensive than the North American average over the observation period. This figure is somewhat overstated by the previously mentioned issue of the combination of Ontario with higher-cost Quebec into an Eastern Canada aggregate cost beginning in Q4 2011.

**Correlation and Conclusion for the Ontario Paper Industry**

Application of the multiple analyses of EO as described above resulted in the following indicators for the Ontario paper industry:

Method	Economic Obsolescence
Utilization Analysis - Newsprint	10.4%
Utilization Analysis – All Other paper	5.0%
Gross Margin Analysis	20.3%
Return-on-Capital Analysis	8.5%
Price-to-Book Ratio Analysis	76.7%
Wood Fibre Cost Analysis	23.4%

The concluded EO rate for the Industry was 22.0% based on consideration of North American paper industry conditions, gross margin analysis, and the rate indicated by wood fibre cost analysis with its incorporation of Ontario-specific data. ROCA analysis was not considered since the number of guideline companies was effectively reduced to just 4 by the existence of negative returns in the EO equation. Utilization analysis was not relied upon, since industry conditions and gross margin analysis indicated that high utilization rates were more indicative of the large fixed costs characteristic of the pulp and paper industry, than of low EO. A price-to-book analysis was used more as a broad indicator of the existence of Industry EO, and to widen our analysis.

For reasons stated previously, we believe the concluded rate would be more appropriately applied to the newsprint and printing and writing paper segments, with little if any EO ascribed to the packaging and industrial paper segment.



**CONCLUSION**

Based on the information and analysis summarized in this report, it is our view that EO in the Ontario paper industry at January 1, 2015 was reasonably estimated as follows:

Industry	Economic Obsolescence at Jan. 1, 2015
Ontario Paper	22.0%

We reserve the right, but will be under no obligation, to review all calculations referred to in this report and, if considered necessary by us, to revise our estimates in the light of any new facts, trends or changing conditions existing at any date prior to or at the Effective Date, which become apparent to us subsequent to the date of this report.

The engagement of, and compensation for, American Appraisal and its employees was not contingent on the development or reporting of predetermined values or a direction in value that favors the cause of the client; the amount of the value estimates; the attainment of stipulated results; nor the occurrence of a subsequent event directly related to the intended use of this appraisal.

This report represents American Appraisal’s impartial and unbiased analysis, estimates, and conclusions limited only by the Terms and Conditions which were part of our Letter of Engagement, and the Assumptions and Limiting Conditions which are part of this report.

Neither American Appraisal nor its employees who were assigned to this engagement (including their immediate family members) have any substantial interest, direct or indirect, in MPAC or in any party directly or indirectly controlling or, controlled by or, under direct or indirect common control with MPAC.

We also confirm we are not connected with MPAC or any party directly or indirectly controlling or, controlled by or, under direct or indirect common control of MPAC as an officer, employee, promoter, underwriter, trustee, partner, director or persons performing similar functions.

Respectfully submitted,

*American Appraisal Canada, Inc.*

No third party shall have the right of reliance on this report, and neither receipt nor possession of this report by any third party shall create any express or implied third-party beneficiary rights.

# Exhibit A

## Economic Obsolescence Summary

**Municipal Property Assessment Corporation**  
**Economic Obsolescence Analysis of the Ontario Paper Industry**  
**Economic Obsolescence Summary**  
**As of January 1, 2015**

**Exhibit A**

<u>Method</u>	<u>Economic Obsolescence</u>
(1) Utilization Analysis - Newsprint	10.4%
(2) Utilization Analysis - Other Paper excl. Newsprint	5.0%
(3) Gross Margin Analysis	20.3%
(4) Return-on-Capital Analysis	8.5%
(5) Price-to-Book Ratio Analysis	76.7%
(6) Fibre Cost Analysis	23.4%
Selected Range	20.3% to 23.4%
<b>(7) Selected Obsolescence Rate</b>	<b>22.0%</b>

Notes:

- (1) See Exhibit B-1.
- (2) See Exhibit B-2.
- (3) See Exhibit C.
- (4) See Exhibit D.
- (5) See Exhibit E.
- (6) Based on a cost comparison of Ontario softwood chips versus the North American average (excluding Ontario) for the period Q3 2007 through Q4 2014. Source is North American Wood Fiber Review.
- (7) Based on consideration of overall industry conditions, and the E.O. rates indicated by gross margin and wood fibre cost analyses.

# Exhibit B

## Utilization Analysis

**Municipal Property Assessment Corporation**  
**Economic Obsolescence Analysis of the Ontario Paper Industry - Newsprint**  
**Utilization Analysis**  
**As of January 1, 2015**

**Exhibit B-1**

<u>Owner</u>	<u>Facility Location</u>	<u>Products</u>	<u>Total Capacity (tonnes '000s)</u>	<u>Total Production (tonnes '000s)</u>	<u>Total Production Total Capacity</u>
(1) Resolute Forest products Inc.	Amos, QC	Newsprint	197.0	174.0	88.3%
	Baie-Comeau, QC	Newsprint	340.0	304.0	89.4%
	Gatineau, QC	Newsprint	186.0	163.0	87.6%
	Augusta, GA	Newsprint	408.0	372.0	91.2%
	Grenada, MS	Newsprint	246.0	227.0	92.3%
	Usk, WA	Newsprint	244.0	197.0	80.7%
	Thorold, ON	Newsprint	197.0	151.0	76.6%
	Thunder Bay, ON	Newsprint & market pulp	564.0	512.0	90.8%
(2) Tembec Inc.	Kapuskasing, ON	Newsprint	240.0	210.8	87.8%
(1) West Fraser Timber Co. Ltd.	Whitecourt, AB	Newsprint	135.0	132.0	97.8%
(1) Catalyst Paper Corporation	Crofton, BC	Newsprint & NBSK pulp	350.0	351.8	100.5%
(3) 2014 North American Newsprint Industry Operating Rate					91.0%
(4) 2014 Average Canadian Capacity Utilization Rate (NAICS 322)					90.9%
(5) 2014 Average U.S. Capacity Utilization Rate (NAICS 322)					82.6%
(6) Selected Demand/Capacity					85.1%
<b>EO = 1 - (Demand/Capacity)<sup>0.68</sup></b>					<b>10.4%</b>

Notes:

- (1) Source: most recently available annual reports.
- (2) Total 2014 shipments have been used as a proxy for total production since the latter was not separately disclosed.
- (3) Source: RISI, Inc.
- (4) Source: Statistics Canada. NAICS code 322 comprises establishments primarily engaged in the manufacture of pulp, paper and paper products.
- (5) Source: Federal Reserve Bank of St. Louis.
- (6) Selected Demand/Capacity is based on the average 2014 operating rates of the 3 Ontario newsprint mills, specifically; Thorold, Thunder Bay and Kapuskasing.

**Municipal Property Assessment Corporation**  
**Economic Obsolescence Analysis of the Ontario Paper Industry - Paper Excluding Newsprint**  
**Utilization Analysis**  
**As of January 1, 2015**

**Exhibit B-2**

	<u>Owner</u>	<u>Facility Location</u>	<u>Products</u>	<u>Total Capacity</u> <u>(tons '000s)</u>	<u>Total Production</u> <u>(tons '000s)</u>	<u>Total Production</u> <u>Total Capacity</u>
(1)	Resolute Forest products Inc.	Alma, QC	Specialty papers	349.0	336.0	96.3%
		Dolbeau, QC	Specialty papers	141.0	141.0	100.0%
		Kenogami, QC	Specialty papers	134.0	131.0	97.8%
		Calhoun, TN	Specialty papers & market pulp	610.0	513.0	84.1%
		Catawba, SC	Specialty papers & market pulp	719.0	656.0	91.2%
(1)	Neenah Paper, Inc.	Various	Technical papers			88.0%
			Specialty papers			86.0%
(2)	Domtar Corporation	Various	Communication & specialty papers	3,355.0	3,145.0	93.7%
(1) (3)	PH Glatfelter Co.	Various	Composite fibres	199.2	157.3	79.0%
			Advanced air laid materials	107.0	99.7	93.1%
			Specialty papers	820.0	802.9	97.9%
(4)	2014 Average Canadian Capacity Utilization Rate (NAICS 322)					90.9%
(5)	2014 Average U.S. Capacity Utilization Rate (NAICS 322)					82.6%
(6)	2014 U.S. Coated Freesheet Industry Operating Rate					90.0%
(6)	2014 U.S. Coated Mechanical Industry Operating Rate					94.0%
(6)	2014 U.S. Uncoated Freesheet Industry Operating Rate					92.0%
(6)	2014 U.S. Uncoated Mechanical Industry Operating Rate					95.0%
(7)	Selected Demand/Capacity					92.8%
	<b>EO = 1 - (Demand/Capacity)<sup>0.68</sup></b>					<b>5.0%</b>

Notes:

- (1) Source: most recently available annual reports.
- (2) Source: most recently available annual report of Domtar. Units are metric tonnes.
- (3) 2014 sales (in tons) have been used as a proxy for total production since the latter was not separately disclosed.
- (4) Source is Statistics Canada. NAICS code 322 comprises establishments primarily engaged in the manufacture of pulp, paper and paper products.
- (5) Source is Federal Reserve Bank of St. Louis.
- (6) Source is RISI, Inc.
- (7) Selected Demand/Capacity is based on the average 2014 operating rate of the 4 market sub-segments reported by RISI and noted in (6).

# Exhibit C

## Gross Margin Analysis

**Municipal Property Assessment Corporation**  
**Economic Obsolescence Analysis of the Ontario Paper Industry**  
**Gross Margin Analysis (1)**  
**As of January 1, 2015**

**Exhibit C**

<b>Guideline Company</b>	<b>Current GM %</b>	<b>High GM %</b>	<b>Benchmark Period</b>	<b>Benchmark Avg. GM % (2)</b>	<b><u>High % - Current %</u> High %</b>	<b><u>Benchmark% - Current %</u> Benchmark %</b>
Catalyst Paper Corporation	7.3%	24.2%	2004 to 2010	11.8%	69.8%	38.0%
PH Glatfelter Co.	16.9%	33.8%	1995 to 2005	26.7%	50.0%	36.7%
Neenah Paper, Inc.	19.6%	24.6%	2010 to 2014	19.0%	20.2%	0.0%
Resolute Forest Products Inc.	12.1%	41.7%	2011 to 2014	11.9%	70.9%	0.0%
Domtar Corporation	21.0%	25.7%	2010 to 2014	22.3%	18.3%	5.9%
Verso Corporation	9.8%	9.8%	2005 to 2013	15.0%	0.0%	34.8%
Mean	14.5%	26.6%		17.8%	38.2%	19.2%
Median	14.5%	25.1%		17.0%	35.1%	20.3%

(3) **Economic Obsolescence**

**20.3%**

Notes:

- (1) Source: Standard & Poor's Capital IQ database.
- (2) Given the diverse range of paper products manufactured by the guideline companies, no common benchmark period exists. Accordingly, we selected a unique benchmark period for each, comprising a period over which returns were considered to be normal.
- (3) Economic obsolescence was based on the observed median of the  $\{(Benchmark\% - Current\%) \div Benchmark\% \}$  calculations for the guideline companies. The  $\{(High\% - Current\%) \div High\% \}$  calculation is shown only for illustration purposes as a maximum E.O. level using this methodology. Current period represents latest 12 months results to December 31, 2014.

# Exhibit D

## Return-on-Capital Analysis

**Municipal Property Assessment Corporation**  
**Economic Obsolescence Analysis of the Ontario Paper Industry**  
**Return-on-Capital Analysis (1)**  
**As of January 1, 2015**

**Exhibit D**

<u>Guideline Company</u>	<u>Current ROC %</u>	<u>High ROC %</u>	<u>Benchmark Period</u>	<u>Benchmark Avg. ROC % (2)</u>	<u>High % - Current % High %</u>	<u>Benchmark% - Current % Benchmark %</u>
Catalyst Paper Corporation	1.5%	8.5%	2004 to 2010	-0.7%	82.3%	n.m.
PH Glatfelter Co.	6.0%	21.5%	1995 to 2005	7.1%	71.9%	15.6%
Neenah Paper, Inc.	11.8%	13.7%	2010 to 2014	11.1%	14.2%	0.0%
Resolute Forest Products Inc.	2.4%	16.5%	2011 to 2014	2.5%	85.4%	1.5%
Domtar Corporation	5.4%	11.5%	2010 to 2014	7.6%	53.5%	29.6%
Verso Corporation	-3.1%	4.9%	2005 to 2013	2.1%	n.m.	n.m.
Mean	4.0%	12.8%		4.9%	61.5%	11.7%
Median	3.9%	12.6%		4.8%	71.9%	8.5%

(3) **Economic Obsolescence**

**8.5%**

Notes:

- (1) Source: Standard & Poor's Capital IQ database.
- (2) Given the diverse range of paper products manufactured by the guideline companies, no common benchmark period exists. Accordingly, we selected a unique benchmark period for each, comprising a period over which returns were considered to be normal.
- (3) Economic obsolescence was based on the observed median of the  $\{(Benchmark\% - Current\%) \div Benchmark\% \}$  calculations for the guideline companies. The  $\{(High\% - Current\%) \div High\% \}$  calculation is shown only for illustration purposes as a maximum E.O. level using this methodology. Current period represents latest 12 months results to December 31, 2014.

# Exhibit E

## Price-to-Book Ratio Analysis

**Municipal Property Assessment Corporation**  
**Economic Obsolescence Analysis of the Ontario Paper Industry**  
**Price-to-Book Ratio Analysis (1)**  
**As of January 1, 2015**

**Exhibit E**

<b>Guideline Company</b>	<b>P/B Ratio</b>
Catalyst Paper Corporation	-0.46
PH Glatfelter Co.	1.70
Neenah Paper, Inc.	3.50
Resolute Forest Products Inc.	0.79
Domtar Corporation	0.89
Verso Corporation	-0.23
Mean	1.03
Median	0.84
(2) S&P 500 Equal Weight Industrials Index	3.62
(3) EO = (Industrials - Paper) / Industrials	<b>76.7%</b>

Notes:

- (1) Stock Price/Book Value ratios are calculated using Effective Date closing prices and the most recently available regulatory filings of the guideline companies.
- (2) Source: Bloomberg.
- (3) Economic obsolescence is calculated using the median Stock Price/Book Value ratio of the guideline companies, in light of the significant variation in individual guideline company ratios.

# Exhibit F

## Assumptions and Limiting Conditions

## **ASSUMPTIONS AND LIMITING CONDITIONS**

This service was performed with the following general assumptions and limiting conditions.

To the best of our knowledge, all data, including historical financial data, if any, relied upon in reaching opinions and conclusions or set forth in this report are true and accurate. Although gathered from sources that we believe are reliable, no guarantee is made nor liability assumed for the truth or accuracy of any data, opinions, or estimates furnished by others that have been used in this analysis.

No responsibility is assumed for matters legal in nature. No investigation has been made of the title to or any liabilities against the property appraised. We have assumed that the owner's claim is valid, the property rights are good and marketable, and there are no encumbrances that cannot be cleared through normal processes, unless otherwise stated in the report.

The value or values presented in this report are based upon the premises outlined herein.

The date of value to which the conclusions and opinions expressed apply is set forth in the report. The value opinion presented therein is based on the status of the economy and on the purchasing power of the currency stated in the report as of the date of value.

This report has been made only for the use or uses stated, and it is neither intended nor valid for any other use.

Possession of this report or any copy thereof does not carry with it the right of publication. No portion of this report (especially any conclusion, the identity of any individuals signing or associated with this report or the firms with which they are connected, or any reference to the professional associations or organizations with which they are affiliated or the designations awarded by those organizations) shall be disseminated to third parties through prospectus, advertising, public relations, news, or any other means of communication without the written consent and approval of American Appraisal.

Areas, dimensions, and descriptions of property, if any, used in this analysis have not been verified, unless stated to the contrary in the report. Any areas, dimensions, and descriptions of property included in the report are provided for identification purposes only, and no one should use this information in a conveyance or other legal document. Plans, if any, presented in the report are intended only as aids in visualizing the property and its environment. Although the material was prepared using the best available data, it should not be considered as a survey or scaled for size.

Unless stated to the contrary in the report, no environmental impact study has been ordered or made. Full compliance with all applicable laws and governmental regulations is assumed unless otherwise stated, defined, and considered in the report. We have also assumed responsible ownership and that all required licenses, consents, or other legislative or administrative authority from any applicable

government or private entity organization either have been or can be obtained or renewed for any use that is relevant to this analysis.

The value estimate contained within the report specifically excludes the impact of substances such as asbestos, urea-formaldehyde foam insulation, other chemicals, toxic wastes, or other potentially hazardous materials or of structural damage or environmental contamination resulting from earthquakes or other causes, unless stated to the contrary in the report. It is recommended that the reader of the report consult a qualified structural engineer and/or industrial hygienist for the evaluation of possible structural/environmental defects, the existence of which could have a material impact on value.