414 Nicollet Mall
Minneapolis, MN 55401

August 25, 2017

**—Via Electronic Filing—**

Daniel P. Wolf
Executive Secretary
Minnesota Public Utilities Commission
121 7th Place East, Suite 350
St. Paul, MN 55101

RE: COMPLIANCE FILING-THIRD PARTY EVALUATION
NUCLEAR DECOMMISSIONING ACCRUAL
DOCKET NO. E002/M-14-761

Dear Mr. Wolf:

Northern States Power Company, doing business as Xcel Energy, submits to the Minnesota Public Utilities Commission this compliance filing in response to the Commission's February 27, 2017 Order. Order Point 2B states:

> Xcel shall retain a third-party expert in long-term institutional investment strategies to evaluate Xcel's investment strategy with respect to the NDT with a goal of assuring sufficient funding to meet the decommissioning obligations at the time they are expected to come due and maximize return from the investment consistent with the appropriate risk level. The expert shall file a report on the matter with the Commission within six months of this order.

Enclosed is LCG Associates Inc.'s evaluation of the Company's NDT investment strategy.

We note that our next NDT triennial petition will be filed on December 1, 2017. Consistent with past triennial dockets, in our upcoming filing we intend to discuss our investment assumptions and strategy, as well as request approval for any changes to our investment assumptions from our last triennial filing. In the interest of efficiency, the Commission may want to include discussion of this report in the upcoming NDT triennial docket.

We recognize that our stakeholders—and particularly the Department of Commerce—will be interested in LCG's findings and likely also their assumptions and analysis. We welcome the opportunity to engage with these parties in the coming months to review the report's findings and to answer any question that arise in the course of that review.

We have electronically filed this document with the Minnesota Public Utilities Commission, and copies have been served on the parties on the attached service list. Please contact Al Krug at allen.krug@xcelenergy.com or (612) 330-6270 if you have any questions regarding this filing.

Sincerely,

/s/

AAKASH CHANDARANA
Regional V.P., Rates and Regulatory Affairs

Enclosure
c: Service List

# Xcel Energy
# Nuclear Decommissioning Trusts

## *Asset Allocation and Strategy Review*

**August 25, 2017**

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## Executive Summary

At the order of the Minnesota Public Utilities Commission (MPUC), Xcel Energy retained LCG Associates as an expert to evaluate the investment strategy related to Xcel Energy's Nuclear Decommissioning Trust (NDT). The scope of this project is designed to evaluate whether the Xcel NDT is being managed with best practices in mind while attempting to meet the best possible outcome of meeting or exceeding the cost of decommissioning the three generating units at the appropriate time.

To accomplish the goal of this project, LCG evaluated the current asset allocation of the NDT to see if the allocation can provide an optimal risk adjusted rate of return on a net of fee basis. This included evaluating the costs and benefits of active versus passive management of the various asset classes, as well as the use of alternative investments. Finally, LCG evaluated the effect of taxes on the construction of the portfolio.

As part of the review, LCG evaluated the current portfolio of the Xcel NDT, a passively managed portfolio that was recommended as a benchmark by the Minnesota Department of Commerce in Dkt. No. E002/D-14-761 (DoC Portfolio) and three portfolios derived by LCG – conservative, moderate and aggressive. LCG used expected rates of returns by asset class for both a 10-year consensus expectation as well as an internally generated 30-year basis, while relying on historically generated risk and correlation factors. LCG also evaluated the escalation rate methodology for the growth rate factor of the liabilities by looking at three different inflation scenarios.

We examined whether the Xcel portfolio was diversified enough, or perhaps too much. Diversification decisions have been shown to provide the vast majority of a portfolio's performance. In our opinion, the processes and allocation decisions that Xcel follows are sound and similar to those of their peers. They follow all of the best practices that we implement for our other clients, including the use of alternative investments to generate excess returns over long periods of time. While it is possible to be too diversified, we believe that Xcel has found an appropriate balance to achieving a reasonable risk adjusted return.

We believe that there is a place for passive investing in efficient asset classes, such as U.S. large cap equities, especially when factoring in the tax cost of trading, but that less efficient asset classes such as U.S. small cap equities, international and emerging markets and fixed income are best managed actively while being aware of the tax consequences resulting from trading.

Furthermore, we believe that the escalation rate assumption is fair, and in many cases, more conservative (higher) than Xcel's peers, reflecting our belief that cost escalation is generally understated

by the industry. We do not recommend a change to the current approach to constructing an escalation rate.

While we have identified an alternative asset allocation that would provide slightly better performance than Xcel is currently targeting, it would potentially introduce additional risk into the portfolio. The differences are relatively small and it ultimately is a decision as to whether to take more risk for slightly more return, or to take slightly less risk, and protect a little more in a down market. In our opinion, either scenario is acceptable given how close the two outcomes are.

## LCG Associates

LCG Associates, Inc. ("LCG") provides investment consulting services for utilities, corporations, non-profit organizations, healthcare systems, endowments, foundations, family offices, private investors, and other asset pools. We work with 87 clients representing approximately $90 billion in assets under advisement. Approximately 7% of LCG's assets under advisement are U.S. NDT assets. LCG is headquartered in Atlanta, Georgia with offices in Seattle, Washington and Dallas, Texas.

LCG has been involved with utility clients since the mid-1970s. LCG works with NDTs in all stages of a plant's life cycle, including several that are near or in decommissioning – a highly specialized time when a customized strategy is necessary. We work with 9 clients (retainer and project work) that have 46 generating units, all at different stages in their lifecycles, including 5 clients that have 9 generating units in various stages of decommissioning. Additionally, LCG has prepared and presented expert witness testimony in rate cases related to NDTs, including those in decommissioning.

LCG's NDT services include asset liability modeling; capital market, asset class and investment manager research; and performance reporting. We have been providing these services to utilities with NDTs since launching the NDT practice at LCG in 1997.

David Emerson leads the NDT consulting team and leads most of LCG's NDT relationships. David has been in the investment industry for 21 years, including the past 14 at LCG. David is a frequent nuclear industry speaker on topics related to the management of NDTs both in the accumulation phase and during decommissioning. David holds an AB in political science from the University of Michigan and an MBA in finance from the University of Maryland. Additionally, David is a CFA charterholder and CAIA charterholder.

Katalin Egyed is part of the NDT consulting team and is involved in some of LCG's NDT relationships. Katalin has been in the investment industry for 17 years, all of which have been at LCG. Katalin's

responsibilities include capital market and asset class research. Katalin has a BA from Canisius College. Additionally, Katalin is a CFA charterholder and CAIA charterholder.

## Philosophy

Xcel follows an investment philosophy that attempts to maximize return while not taking on undue risk that could potentially cost the rate payers more money should the markets experience another drop similar to 2008/2009. LCG has long believed that understanding downside risk is important for NDTs, especially as they enter decommissioning. While we are not engineers, and cannot comment on the accuracy of a cost estimate, we do know that cost surprises have occurred in past projects, some of which could not reasonably be predicted ahead of time. We believe that in order to prepare for the unknown costs, as well as the known costs that may be higher than expected, a utility should maximize their returns, after taxes. However, a typical decommissioning project happens over 8 – 10 years, with additional costs over time for spent fuel and greenfielding. These costs are spent regularly during this time and can be fluid in their timing. Large drawdowns in asset values at any key spending point can be catastrophic to the NDT asset balance for the remaining life of the project. As such, risk management is key to maximizing the long term rate of return of the NDT.

Risk management can be accomplished by diversifying the portfolio across asset classes. A study done in 1991 by Gary Brinson, Brian Singer and Gilbert Beebower[1], found that 91.5% of returns were determined by the asset allocation decisions that were made by an investor. The study showed that adding asset classes that were not correlated with one another would form a portfolio that would help protect on the downside in periods of stress as some asset classes should do better in those periods. They also found that being tactical with the asset allocation can be difficult at best. Exhibit 1 provides the historical correlations for a wide variety of asset classes that were used in this asset allocation review.

[1] Determinants of Portfolio Performance II: An Update, *Financial Analysts Journal;* May/June 1991.

**Exhibit 1**

| Asset Class | Domestic Large Cap | Domestic Small Cap | Int'l Equity | EM Equity | Global Equity | Fixed Income | Long Corporate | High Yield | EM Debt | Private Equity | Real Estate | Commodities | Hedge Funds | Private Debt | Cash | Inflation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Domestic Large Cap | 1.00 | | | | | | | | | | | | | | | |
| Domestic Small Cap | 0.84 | 1.00 | | | | | | | | | | | | | | |
| Int'l Equity | 0.84 | 0.75 | 1.00 | | | | | | | | | | | | | |
| EM Equity | 0.76 | 0.71 | 0.82 | 1.00 | | | | | | | | | | | | |
| Global Equity | 0.96 | 0.88 | 0.97 | 0.85 | 1.00 | | | | | | | | | | | |
| Fixed Income | -0.04 | -0.09 | 0.01 | -0.01 | -0.33 | 1.00 | | | | | | | | | | |
| Long Corporate | 0.07 | 0.03 | 0.12 | 0.09 | 0.11 | 0.76 | 1.00 | | | | | | | | | |
| High Yield | 0.64 | 0.63 | 0.66 | 0.66 | 0.70 | 0.18 | 0.34 | 1.00 | | | | | | | | |
| EM Debt | 0.55 | 0.49 | 0.55 | 0.68 | 0.58 | 0.32 | 0.38 | 0.55 | 1.00 | | | | | | | |
| Private Equity | 0.24 | 0.16 | 0.26 | 0.22 | 0.77 | -0.17 | -0.06 | 0.07 | 0.08 | 1.00 | | | | | | |
| Real Estate | 0.11 | 0.08 | 0.07 | -0.02 | 0.12 | -0.07 | -0.15 | -0.08 | -0.03 | 0.19 | 1.00 | | | | | |
| Commodities | 0.32 | 0.32 | 0.44 | 0.47 | 0.33 | 0.06 | 0.02 | 0.36 | 0.30 | 0.08 | 0.11 | 1.00 | | | | |
| Hedge Funds | 0.63 | 0.66 | 0.68 | 0.72 | 0.74 | -0.01 | 0.00 | 0.55 | 0.50 | 0.35 | 0.12 | 0.44 | 1.00 | | | |
| Private Debt | 0.45 | 0.45 | 0.49 | 0.46 | 0.58 | -0.03 | 0.14 | 0.77 | 0.27 | 0.15 | -0.06 | 0.35 | 0.49 | 1.00 | | |
| Cash | -0.02 | -0.04 | -0.02 | -0.04 | -0.04 | 0.11 | -0.07 | -0.11 | -0.01 | 0.08 | 0.26 | 0.06 | 0.12 | -0.06 | 1.00 | |
| Inflation | 0.02 | 0.03 | 0.04 | 0.06 | 0.09 | -0.14 | -0.23 | 0.12 | 0.03 | 0.08 | 0.16 | 0.26 | 0.14 | 0.32 | 0.10 | 1.00 |

As an example, no one would question having a combination of fixed income and equities in a portfolio. Fixed income provides easy liquidity to a portfolio as well as downside protection, while equities provide the upside potential that is typically needed for a portfolio. Furthermore, the two asset classes are negatively correlated. But what about asset classes like private equity or private debt? They have low correlation with the equity and fixed income markets (and each other), and provide a potential for outsized returns relative to their public market equivalents. We will make the case for adding these asset classes, and others, to a portfolio later on in this report, but the rationale is based on correlation. If they have a return profile that zigs when the rest of the portfolio zags, that will help returns in periods of market stress.

So if diversification is important, how should we implement it? We think there are three primary strategies:

1. Tactically managing the asset allocation by raising cash and/or going into other asset classes as the markets move, or through some set process based on valuations
2. Have a strategic allocation to a broad number of asset classes including alternative asset classes that can reduce risk and/or increase return
3. Buy and hold a traditional asset allocation weighted towards equities with the idea that equities will prevail over the long term.

Tactically managing a portfolio is difficult to impossible. History has shown that investors can get calls right, such as to exit the market at times of high valuations, but become overcome by fear of losing more money and not re-entering the market during periods of low valuations, a time when one should actually be re-entering the market. The failure to re-enter the market negates the benefit of tactical

trading. Furthermore, when assessing the impact of taxes, it may not be tax efficient to move the portfolio around on a frequent basis.

Adding alternative asset classes such as private capital – private equity, private debt, private real estate, or public capital – hedge funds – can in fact help the risk management of the portfolio, and in some cases help the return in both up and down markets. We will discuss this in greater detail in a separate section of the report. The key take away from this is that private investments are illiquid, something that matches the long-dated liabilities of an NDT very nicely, and investors should be rewarded for this illiquidity through excess return. This illiquidity premium can certainly help boost the returns of a portfolio, but because of the illiquidity, the combination of the lack of daily or even monthly mark to markets issues and the fact that all investors are locked into the investment, can lead to a smoother return pattern, reducing volatility. For liquid strategies such as hedge funds, the volatility tends to be lower because the strategies have market betas of less than one, and in many cases around 0.5. The exception to alternatives helping to reduce the risk profile of a portfolio is with the use of commodities. Commodities are highly volatile, but if timed correctly, may lead to excess returns relative to the broad equity and fixed income markets. In general, LCG does not support the use of commodities for NDTs because of the volatility of the assets, and the impact that can have on the risk adjusted return.

Finally, holding a traditional basket of equities and bonds for the long-term is an option. Market theory suggests that this is a good approach for accumulating assets while doing so at a low fee. The markets have historically risen over time, and since the market crisis, the S&P 500 equity index is up over 17% per year. Of course, during the worst decade for equities, April 1999 – March 2009, the S&P was up less than 1% per year. Therein lies the problem. Xcel's NDTs are in the accumulation phase, but as is the case with any generating unit, there is always the risk of early shutdown. What if this risk comes to fruition and we are in the middle of the worst equity return decade? Or worse, at the bottom of that period? This could cause contributions from rate payers to increase at a higher rate than expected. This could potentially be avoided if alternatives were used. This strategy certainly gets a good head start from the lower fees, but in our opinion the lower fees do not justify the higher risk.

Given the uncertainty of the future liabilities and the need to maximize returns for a given level of risk, we believe that the best option for managing risk through diversification is to have a strategic allocation to non-correlated asset classes. An investor should identify the necessary return target and the risk level with which they are comfortable, and with an emphasis on downside risk in periods of economic and market stress. The investor should then minimize the risk for that given level of return. In the case of Xcel, we believe that they have accomplished the goal of having a diversified portfolio that should have a reasonable expectation to achieve the expected level of return while minimizing risk. We will later identify an alternative portfolio that could increase the return and the risk level

slightly; however, based on our review of the assets and the liabilities, we believe that Xcel has been prudently conservative in managing the rate payers' contribution.

## Review of Escalation Rate

As previously discussed, escalation rates tend to be underestimated. Upon reviewing the process that Xcel uses to derive their escalation rate, we believe that it is sound and reasonable. Their process begins with an expectation of inflation by deriving the breakeven inflation rate from Treasury Inflation Protection Securities (TIPS). They then add a risk premium on top of that to account Radiological or Non-radiological decommissioning costs. We believe that the premiums are reasonable. We further tested the escalation rate by looking at current breakeven rates as well as LCG's current 10 year and 30-year inflation assumptions (see Exhibit 2). Xcel's current escalation rate is most similar to our highest escalation rate assumption and represents a conservative approach to estimating costs towards a worse case scenario of cost escalation.

**Exhibit 2: Escalation Rates utilized by Xcel Energy**

| Escalation Component | 2014 Triennial Escalation Rate | 10-Year CPI + Premiums | 30-Year CPI + Premiums | Breakeven Inflation + Premiums |
|---|---|---|---|---|
| Inflation | 2.36% | 2.40% | 2.00% | 1.81% |
| Non-inflation escalation (Operations/Radiological) | 2.00% | 2.00% | 2.00% | 2.00% |
| **Total escalation (Operations/Radiological)** | **4.36%** | **4.40%** | **4.00%** | **3.81%** |
| Non-inflation escalation (ISFSI/Site Restoration) | 1.00% | 1.00% | 1.00% | 1.00% |
| **Total escalation (ISFSI/Site Restoration)** | **3.36%** | **3.40%** | **3.00%** | **2.81%** |

## Investment Structure

The current target asset allocation (Exhibit 3) is well diversified across many asset classes. In our experience with other utilities, Xcel's asset allocation strategy is within the norm of reasonableness. They limit their illiquid investments to 25% or less. They have a good mix of traditional and non-traditional public security investments, much of which can be traded in a few days. They are in the process of removing their commodity allocation (no longer part of the target allocation), something that we believe is a prudent move given the high volatility of commodity prices. While there is not a "typical" asset allocation mix for an NDT – we have seen allocations to equities range from 40% to 75% - their approach to the asset allocation appears sound.

## Exhibit 3: Xcel Target Asset Allocation

| | Current Target |
|---|---|
| *Total Equity* | *60.0%* |
| US Large Cap | 23.2% |
| US Small Cap | 2.6% |
| Int'l Developed | 14.1% |
| EM Equity | 10.1% |
| Global Equity | 0.0% |
| Private Equity | 10.0% |
| | |
| *Total Fixed Income* | *30.0%* |
| Investment Grade | 12.1% |
| High Yield | 10.0% |
| EM Debt | 7.9% |
| Long Corporate | 0.0% |
| | |
| Private Debt | 0.0% |
| Private Real Estate | 10.0% |
| Commodities | 0.0% |
| Hedge Fund of Funds | 0.0% |

After reviewing the 2014 cost study filing and assets, it is expected that future contributions from rate payers will be needed to continue to close the asset/liability gap. As will be shown later in the report, we believe that Xcel is properly diversified so as to maximize their return given their current risk profile which is reasonable and in line with industry best practices.

Given that the liabilities are a moving target based on escalation assumptions, changes in decommissioning technology, and inflation pressures, we believe that it is difficult to benchmark Xcel, or any utility, vs. a peer group of other NDTs. There are too many variables that are unique to a given utility that may not be relevant to other utilities. Instead, we believe the best way to benchmark a utility's progress to achieving their decommissioning goal is through periodic reviews of the asset allocation relative to the most recent set of cost estimates. This will establish a baseline return assumption that is needed, and from there, a regular review of the portfolio to see that if the portfolio is achieving that return target should be sufficient.

## Review of Current Investment Return Assumptions

LCG acknowledges that there are shortcomings in utilizing any set of asset class risk/return assumptions. As an example, in Exhibits 4 and 5, one can see the wide dispersion around the mean in

the historical 1-, 5- and 10-year rolling returns of domestic large cap equities. These near-term fluctuations become even more relevant during the decommissioning phase of the Trust as spending is occurring on a regular basis.

**Exhibit 4: Summary of Large Cap Equities Rolling Returns**

| | 1 Yr | 5 Yr | 10 Yr |
|---|---|---|---|
| Max | 162.88% | 34.78% | 21.39% |
| Average | 12.39% | 10.05% | 10.36% |
| Minimum | -67.57% | -17.20% | -3.94% |

**Exhibit 5: Percentage of observations above 8.5%**
**(1/1926 – 12/2016)**

| | 1 Yr | 5 Yr | 10 Yr |
|---|---|---|---|
| % above 8.5% | 59% | 63% | 59% |
| Number of Observations | 361 | 345 | 325 |

Unlike historical data which is quantitative, forecasted returns are forward looking and are virtually impossible to predict in the near term with any degree of certainty. It is for this reason that LCG utilizes the following two different sets of asset class assumptions in our modeling to help clients frame the conversation around asset allocation:

**1. 30-Year Investment Return Assumptions**

For long-term modeling, our experience has taught us that the markets exhibit patterns over time, which can be extrapolated – assuming the time horizon is sufficiently long to allow the use of averages and statistical methods. Using historical risk premia of various asset classes (analyzing data as far back as 1926), we develop initial estimates of future return, risk, and correlation. We also incorporate the current market environment to potentially adjust risk. Our Senior Consultants establish base case expected returns, risks, and correlations. Because of an NDT's long liability profile, we believe that the long-term assumptions are the most appropriate set of data to use for asset/liability modeling as there is not enough long historical time periods for most asset classes. LCG's current 30-year return expectations are as follows:

**Exhibit 6: LCG's 30 Year Return Projections as of January 31, 2017**

*(Net of fee, Pre- and After-Tax Returns %)*

| Asset Class | Pre-Tax | After-Tax[2] |
|---|---|---|
| Large Cap US Equities | 8.5 | 6.1 |
| Small Cap US Equities | 9.3 | 6.7 |
| Developed International Equities | 8.5 | 6.1 |
| Emerging Market Equities | 10.0 | 7.2 |
| Global Equities | 8.7 | 6.3 |
| Private Equity | 11.5 | 8.3 |
| Core Fixed Income | 4.5 | 3.2 |
| High Yield | 6.0 | 4.3 |
| Emerging Markets Debt | 6.5 | 4.7 |
| Long Corporate Debt | 5.0 | 3.6 |
| Private Debt | 7.5 | 5.4 |
| Hedge Fund of Funds | 6.8 | 4.9 |
| Commodities | 3.5 | 2.5 |
| Private Real Estate | 6.5 | 4.7 |
| Cash | 2.5 | 1.8 |
| Inflation | 2.0 | n/a |

**2. 10- Year Return Assumptions:**

LCG does not believe that anyone can predict the short-term changes in the market. As such, we conduct a "Wall Street Consensus" survey of 30 – 40 leading economists and market strategists to learn their expected market returns for the next decade (Exhibit 7). What we find is that when looking at the range of returns given for any specific asset class there can be a wide range of predicted outcomes, furthering the point that predicting near-term returns is more of a guess than anything. Another issue that we encounter with this study is that the 10-year expected return tends to be heavily influenced by recent market events, such as after the global financial crisis in 2008 and 2009. While this data is informative, we do not believe long-term strategic policy should be based off of it. However, when we compile these returns into an average, and assess the change from year to year, we can notice trends that may impact short-term decisions in the portfolio structure. Still, for an NDT that is in the accumulation phase, 30 year or greater return assumptions often make more sense.

[2] Assumes fully-realized gains are taxed at a 27.84% rate

**Exhibit 7: LCG's 10 Year Return Projections as of January 31, 2017**

*(Net of fee, Pre- and After-Tax Returns %)*

| Asset Class | Pre-Tax | After-Tax[3] |
|---|---|---|
| Large Cap US Equities | 5.7 | 4.1 |
| Small Cap US Equities | 6.6 | 4.8 |
| Developed International Equities | 5.9 | 4.3 |
| Emerging Market Equities | 8.2 | 5.9 |
| Global Equities | 6.0 | 4.3 |
| Private Equity | 10.5 | 7.6 |
| Core Fixed Income | 2.8 | 2.0 |
| High Yield | 5.4 | 3.9 |
| Emerging Markets Debt | 5.3 | 3.8 |
| Long Corporate Debt | 4.2 | 3.0 |
| Private Debt | 7.5 | 5.4 |
| Hedge Fund of Funds | 5.0 | 3.6 |
| Commodities | 5.6 | 4.0 |
| Private Real Estate | 6.0 | 4.3 |
| Cash | 1.7 | 1.2 |
| Inflation | 2.4 | n/a |

**3. Total Portfolio Return Assumption**

LCG believes that the most important return assumption is that of the total portfolio. It is impossible to fully predict what portfolio return will be needed to satisfy the decommissioning costs because as stated before, we do not fully know the cost of decommissioning until the end of the project. We do know that project costs get revised throughout the life of the project due to unforeseen circumstances, typically negatively, and as such believe that we should attempt to generate as much return as possible, while not taking undue risk in the event of a large drawdown in the markets during the peak spend years early in the life of the project.

To derive the total portfolio return, we established appropriate return assumptions for the various asset classes, as shown in Exhibits 6 and 7. Based on the 30-year expected returns and current target allocation, we expect the NDT portfolio to return 5.7% after-taxes and net of fees. Using 10-year projected returns, the portfolio is expected to return 4.4%. The historical volatility, as measured by standard deviation, of the portfolio is 11.2%[4].

[3] Assumes fully-realized gains are taxed at a 27.84% rate
[4] From 1/1997 to 3/2017

## Additional Asset Allocation Mixes

As part of the project, LCG derived three additional asset allocation mixes and reviewed the passive DoC Portfolio (Exhibit 8). For the three portfolios that LCG derived, one mix is more conservative than the current portfolio whereas the other two are more aggressive. Furthermore, we introduce a new asset class, private debt, which is not currently in Xcel's target allocation. Private debt is a relatively new asset class, coming to prominence following the global financial crisis due to the regulatory changes for bank lenders whereby it was no longer profitable to lend to sub-$100mm EBITDA sized companies. Several of the largest NDTs are invested in private debt as a substitute to traditional fixed income due to the higher yield, and floating rate, and thus short duration, of the loans. In any of the mixes, we limited illiquid assets (private equity, private debt and private real estate) to 25% of the total assets. This is because the risk of an early shutdown scenario, however unlikely, necessitates having full liquidity 7 – 8 years into the start of decommissioning. 25% represents the portion that would not be needed before that. We believe that each of these portfolios represents an appropriate level of diversification amongst asset classes, with different asset classes, especially within the alternative asset classes.

The last portfolio is the DoC Portfolio. It is meant to show a long-term equity-heavy strategy that is passively managed, and combined with long-dated corporate bonds. This portfolio is less diversified than the other allocations that we reviewed, but still offers some diversification. When reviewing this portfolio, we see that it is equity centric, which over the long term, assuming no cash flows, is a reasonable approach. The long dated corporate bonds serve as a hedge should the equity markets start to fall during this time, as one would expect interest rates to be lowered to stimulate the economy. Historically, this has been a reasonable assumption. However, with interest rates near all-time lows, the U.S. Federal Reserve does not have much flexibility to offer stimulus to the market through interest rate easing policies. Continuing on the theme of low interest rates, if we make the assumption that equity markets will be rising over the long term, and interest rates will probably rise alongside (assumes that equities are increasing due to a strengthening economy) then the fixed income portfolio will lose value (when interest rates increase, bond prices fall). Given how low we are in rates, the convexity[5] of the bonds is much higher, and would exacerbate losses. In our opinion, we believe that this portfolio, while diversified, is not protected from downside risks, and would cause the assets to be lower if the portfolio needed to be partially or fully liquidated during a time of market stress.

[5] Convexity is a measure of the curvature in the relationship between bond prices and bond yields that demonstrates how the duration of a bond changes as the interest rate changes.

## Exhibit 8: Additional Optimal Asset Allocation Mixes versus Current Target

| | Xcel Target | Conservative | Moderate | Aggressive | DoC Portfolio |
|---|---|---|---|---|---|
| *Total Equity* | ***60.0%*** | ***40.0%*** | ***70.0%*** | ***75.0%*** | ***80.0%*** |
| US Large Cap | 23.2% | 22.5% | 27.5% | 27.5% | 45.0% |
| US Small Cap | 2.6% | 2.5% | 7.5% | 7.5% | 15.0% |
| Int'l Developed | 14.1% | 15.0% | 15.0% | 15.0% | 0.0% |
| EM Equity | 10.1% | 0.0% | 10.0% | 10.0% | 0.0% |
| Global Equity | 0.0% | 0.0% | 0.0% | 0.0% | 20.0% |
| Private Equity | 10.0% | 0.0% | 10.0% | 15.0% | 0.0% |
| *Total Fixed Income* | ***30.0%*** | ***40.0%*** | ***15.0%*** | ***15.0%*** | ***20.0%*** |
| Investment Grade | 12.1% | 40.0% | 10.0% | 5.0% | 0.0% |
| High Yield | 10.0% | 0.0% | 5.0% | 5.0% | 0.0% |
| EM Debt | 7.9% | 0.0% | 0.0% | 5.0% | 0.0% |
| Long Corporate | 0.0% | 0.0% | 0.0% | 0.0% | 20.0% |
| Private Debt | 0.0% | 10.0% | 10.0% | 5.0% | 0.0% |
| Private Real Estate | 10.0% | 10.0% | 5.0% | 5.0% | 0.0% |
| Commodities | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Hedge FoF | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| CPI | | | | | |
| | **100.0%** | **100.0%** | **100.0%** | **100.0%** | **100.0%** |

**Expected Return and Risk**

Our expectation based on capital market theory is that investors should be compensated for taking on greater risk. Exhibit 9 shows the expected rates of return and historical standard deviation of the additional optimal asset allocation mixes relative to the current target. It can be noted that the Conservative portfolio offers the lowest expected returns both on a 30- and 10-year projected return basis (4.8% and 3.5%, respectively), but it has the lowest standard deviation among the mixes (7.2%). Moving along the risk spectrum, the Moderate allocation offers higher expected returns than the Conservative allocation, but it also has higher volatility (12.6%). Expected returns are 6.0% based on 30-year projections and 4.6% based on 10-year expected returns. The Aggressive allocation has expected rates of return of 6.2% (30-year) and 4.8% (10-year) and a historical standard deviation of 13.2%. Finally, the most aggressive mix, the DoC Portfolio, has the highest standard deviation of the mixes at 14.3%, but the 30- and 10-year expected returns fall between the Conservative and Allocation 4 at 5.7% and 4.0%, respectively.

## Exhibit 9: Expected Return and Risk of Additional Optimal Asset Allocation Mixes

| | Xcel Target | Conservative | Moderate | Aggressive | DoC Portfolio |
|---|---|---|---|---|---|
| 10-Year Expected Return (A/T) | 4.4% | 3.5% | 4.6% | 4.8% | 4.0% |
| 30-Year Expected Return (A/T) | 5.7% | 4.8% | 6.0% | 6.2% | 5.7% |
| 10-Year Historical Return (A/T)[6] | 4.4% | 3.6% | 4.3% | 4.6% | 5.1% |
| Historical Standard Deviation[7] | 11.2% | 7.2% | 12.6% | 13.2% | 14.3% |

While historical market data favors the DoC Portfolio, this has been due to a period of strong equity markets and historically low interest rates. One way that we evaluate the benefit of excess return vs. the amount of risk that an asset class has, is to look at the Sharpe Ratio. This is simply the excess return over a risk free rate (i.e. 90-day T-Bills) divided by the standard deviation of the strategy. The value represents the amount of excess return generated per unit of risk. A higher value is better, but not always the best. A bond heavy portfolio may have a high Sharpe Ratio, but low returns. This is because it is a low risk asset. Sharpe Ratios are most useful when compared to similar risk profile portfolios. When one looks at the Sharpe Ratios in Exhibit 10, one sees that the excess risk of the DoC Portfolio is not compensated by returns, both historically and on an expected basis. Based on this data, we believe that the DoC Portfolio would take too much risk and not deliver enough return over the long-term. The Moderate portfolio and Current Target provide the right balance of downside protection and upside reward for Xcel's NDT based on the current liability profile.

## Exhibit 10: Expected and Historical Sharpe Ratios

| | Xcel Target | Conservative | Moderate | Aggressive | DoC Portfolio |
|---|---|---|---|---|---|
| 10-Year Expected Sharpe Ratio (A/T)[7] | 0.24 | 0.25 | 0.23 | 0.24 | 0.16 |
| 30-Year Expected Sharpe Ratio (A/T)[8] | 0.28 | 0.32 | 0.28 | 0.28 | 0.23 |
| 10-Year Historical Sharpe Ratio (A/T)[7] | 0.34 | 0.42 | 0.29 | 0.30 | 0.31 |

## Alternative Asset Classes

As mentioned previously, LCG believes that we should try to earn as much as we can, but not at the expense of undue risk. In other words, trying to manage the assets to the current expected liability is fraught with the potential for being underfunded. Given that few, if any, decommissioning projects

[6] From 4/2007 to 3/2017
[7] Based on the expected return for the portfolio and cash and the portfolio's historical standard deviation

have finished on budget, there is precedence for assets not generating enough return to either meet the expected liabilities, or more importantly to meet the unexpected liabilities as mentioned previously.

When looking at the historical Sharpe Ratios (Exhibit 10) for the different allocations, the DoC Portfolio has a Sharpe Ratio similar to the other allocations. This is partially explained by the equity markets being on a near straight upward trajectory since the global financial crisis. However, based on our expectations for the portfolio return in the coming years, as well as the historically high level of market volatility this allocation has exhibited, we do not believe that an investor is rewarded as shown by the lowest Sharpe Ratios in the forecasted periods. Conversely, the Xcel Target and LCG Moderate portfolios have exhibited lower Sharpe Ratios over the last 10 years, but are expected to have better Sharpe Ratios in the coming years relative to the DoC Portfolio. We believe that Xcel should manage this portfolio towards expectations for the future, not what has occurred in the recent past. To do so means incorporating non-traditional asset classes.

As shown previously in Exhibits 6 and 7, LCG expects that the illiquid asset classes should command around a 200 – 300 basis point (bps) premium relative to liquid asset classes. While hedge funds do not command a premium, they are expected to keep pace with the long-only equity markets, and do so with less than half of the risk as shown in Exhibit 11. What is less intuitive is that private equity also has a lower standard deviation than the public equity markets, and yet the asset class is perceived to be riskier. Paradoxically, both assumptions are correct. Private equity has a lower standard deviation because it is valued only once per quarter, vs. every trading day for the public equity markets. The prices of private equity investments tend to be held at cost unless there is a market event such as a sale or markdown of the business (rarely are companies marked up without some sort of event occurring). At the same time, many private equity holdings exhibit greater risk, more similar to small and micro-cap companies that are similar in size. This risk is in the form of going concern risk – can the company survive in a difficult market environment such as a recession. Furthermore, private equity suffers from illiquidity risk – the portfolio can only be sold on the secondary market, and most likely at a discount. We believe the illiquidity premium more than compensates the investors for these risks.

**Exhibit 11: Historical Standard Deviations**

| Asset Class | Standard Deviation[8] |
|---|---|
| Large Cap US Equities | 17.0 |
| Small Cap US Equities | 21.1 |
| Developed International Equities | 19.1 |
| Emerging Market Equities | 25.9 |
| Global Equities | 17.8 |
| Private Equity | 10.8 |
| Core Fixed Income | 3.5 |
| High Yield | 9.9 |
| Emerging Markets Debt | 10.5 |
| Long Corporate Debt | 8.4 |
| Private Debt | 8.3 |
| Hedge Fund of Funds | 7.2 |
| Commodities | 17.7 |
| Private Real Estate | 6.4 |
| Cash | 3.5 |
| Inflation | 1.8 |

A similar conclusion on the benefits of real estate investments can be made. It shares many of the same attributes as private equity – illiquid, value is held low until realized, etc. – but also adds an additional benefit for NDTs – it is a good inflation hedge. NDTs are inflationary assets – the costs go up every year regardless of what happens in the markets. Real estate helps investors keep pace with increases in inflation.

Finally, private debt is a more recent strategy to help combat the expectation of rising interest rates. Private debt investments tend to be floating rate in structure; as interest rates increase, so to do the interest rates of the loans. With the Bloomberg Barclays Aggregate currently at a duration of 6 years, the 0-year duration of private debt makes a lot of sense in a rising environment. As an example, if interest rates were to increase by 1 percent, this would translate to a 6% principal loss in fixed income over that period of time. Given the low interest rate environment, that could mean a loss in the fixed income portfolio assuming the yield is not high enough to offset that loss. Private debt does not face this issue, but it does have another risk that is much higher than in a traditional fixed income portfolio – credit risk. Private debt is invested in small and medium sized entities (SMEs) that are more prone to economic downturn risk. Historically, credit defaults for similar loans at the top of the capital structure have averaged around 2% with historical recovery rates of a defaulted loan averaging around 70%.

[8] From 1/1997 to 3/2017

This translates to an expected annual loss rate of 0.6%[9]. Still, because these investments are expected to yield around 7.5% on a pre-tax basis, we believe that the return far outweighs the credit risk when considering that traditional fixed income is only expected to return around 4.5% over the next 30 years.

While private equity, real estate and private debt are common investments in NDTs, hedge funds have been overlooked in our opinion. Hedge funds serve the role of lowering the risk in the portfolio because they tend to have about half of the beta[10] of the public equity market. However, expected returns are greater than half of the market. This is because we expect hedge funds to protect more during down markets. As an example, if the S&P is down 10%, it will need to increase by 11.1% to get back to zero. Under that same scenario, we would expect a hedge fund to be down 5%, and would increase by 5.5% on the recovery. This would translate to a positive return of 0.2% ((1-.05)*(1+.055) = 0.2%). If the manager can add alpha through their stock picking capabilities, both longs and shorts, we would expect an increase on top of this. An additional benefit of hedge funds for NDTs is the downside protection, especially during decommissioning as well as mitigating the risk that occurs due to an early shut down. By helping to protect during a market down turn, the principal balance remains higher than if it was not hedged during a period when spending needs to occur. None of our recommended allocations included hedge funds; however, it is because we believe that they are most useful in an NDT allocation during the decommissioning phase.

All of these strategies add value over time whether it be through higher expected returns, lower volatility, or both. While the expected returns in Exhibits 6 and 7 are net of fees, investors frequently complain about the high fees of alternative investments, and in many cases for good reasons. We have been an active proponent of negotiating fees down wherever possible and we are starting to see the fruits of our and other investors labor.

## Active versus Passive

One of the most popular topics in investing today is the use of indexed strategies, or passive investing. Passive investing is defined as a process whereby a manager follows a strategy that mimics the performance of an index. This can be accomplished one of two ways, 1. full replication – the manager purchases the same number of securities and at the same weightings as the index, or 2. optimization – the manager purchases fewer holdings than the index but matches the characteristics of the index such that the performance is very similar. The idea is if a manager cannot beat the index, they should mimic it, and do it as inexpensively as possible. On the flip side, active management is defined as a process whereby a manager holds companies where they have certain convictions such that the combined holdings of this portfolio should outperform the index, net of investment management fees.

Our research has found that passive investing does well for a period of time, typically five years, and then underperforms as fundamentals matter again, typically for a period of five years. The cycle continues over time. However, as we dive deeper into the data, and for taxable portfolios such as

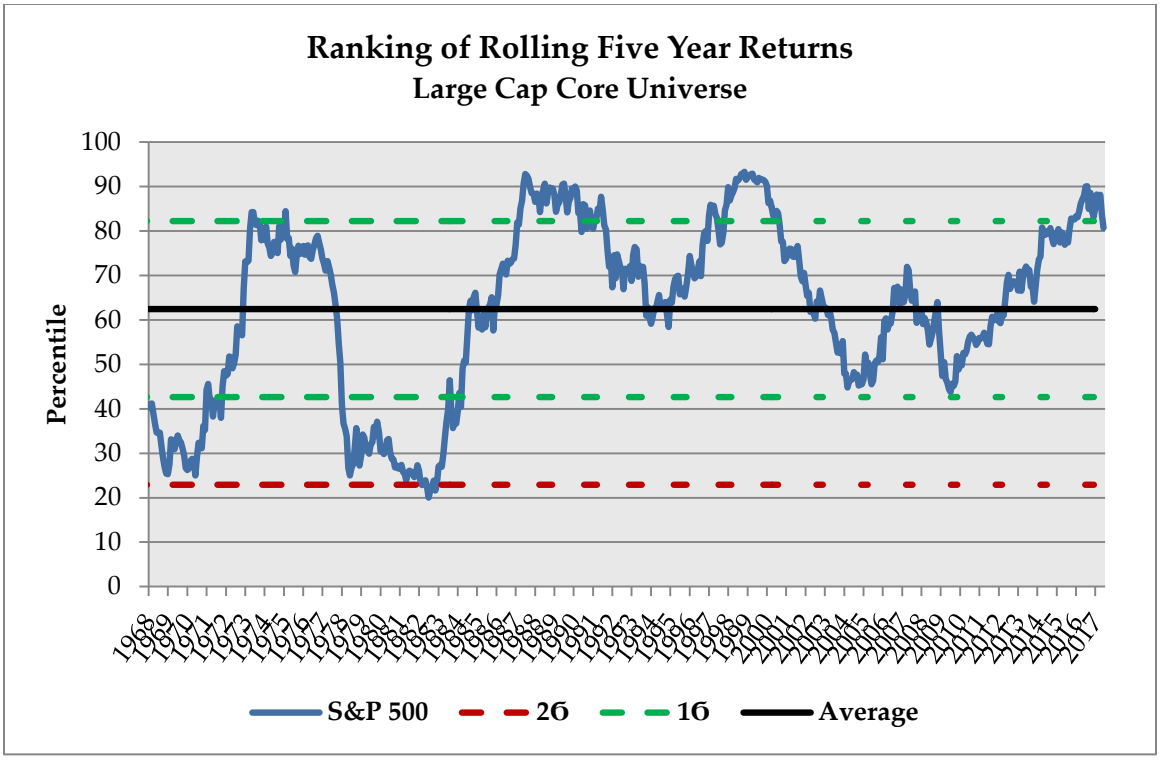
[9] Loss rate = Default Rate * (1- Recovery rate), or 2% * (1 – 70%).
[10] Beta is the measure of risk of an investment relative to the market. A beta of 1.0 means that the investment has a similar level of risk as the market.

NDTs, we are able to find additional support for when and where to do passive management or active management of a particular sleeve of a portfolio.

Passive strategies offer simplicity to a portfolio: Market-like returns, style consistency, lower expenses, can be tax advantaged, and can streamline the investment management process. However, passive strategies have some faults: no possibility for alpha, lack of control in market sell offs and can be hamstrung by the index construction process. Active strategies provide some benefits not found in passive strategies: possibility for alpha, expert analysis and oversight, defensive posturing in down markets and complement the weakness in index construction. Like passive strategies, active management has its share of faults: possibility of underperforming the index, higher fees and operating expenses and style issues within a strategy. It is because of these various pros and cons that we need to assess for which asset classes it makes sense to use passive or active strategies.

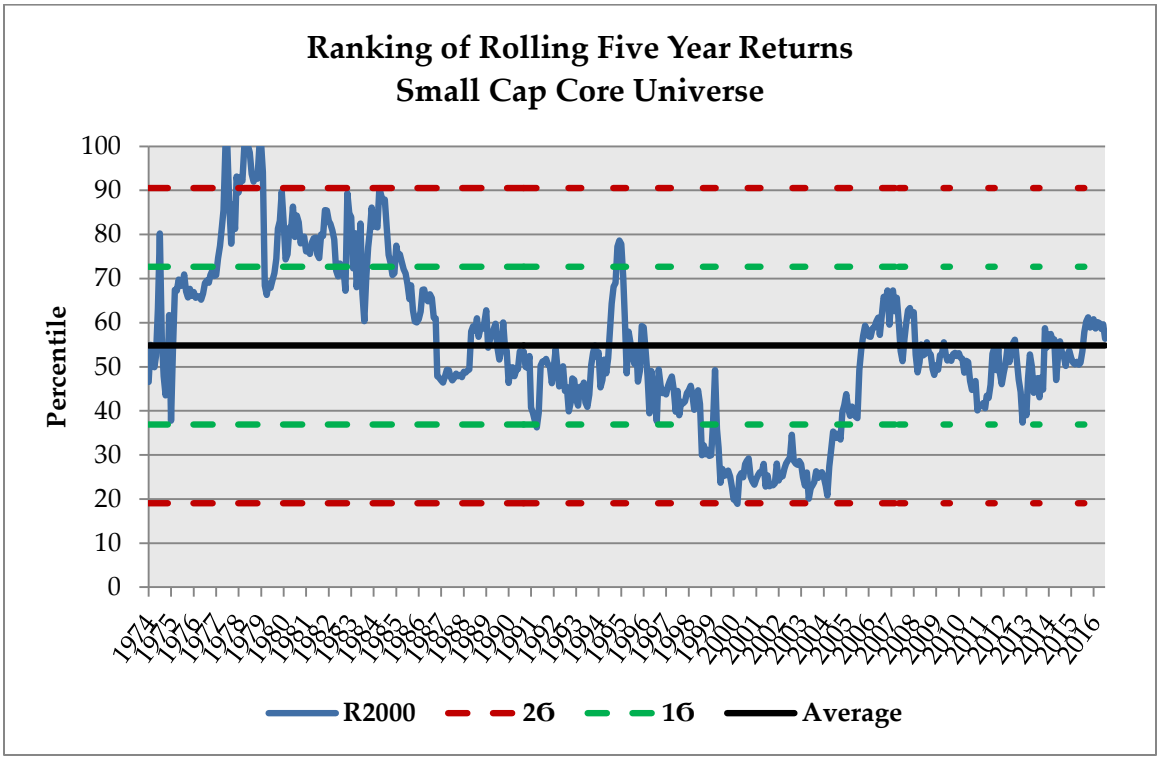
Within U.S large cap equities, we believe that there is little value to having active management when taxes are involved. Occasionally, an active manager can be added for a portion of the assets, but usually, there are too many tax consequences involved to make this worthwhile. In Exhibit 12, we show the pre-tax universe of U.S. large cap equity managers, with the blue line showing where the S&P 500 ranks relative to the universe. Historically, it has been in the 62nd percentile (100 = best, 0 = worst; universe is created by LCG Associates and is net of management fees), and most recently it has been in the 81st percentile. Add taxes to the mix and it becomes even harder to beat the index. Xcel follows this philosophy and is passive in their U.S. large cap equity holdings.

**Exhibit 12: U.S. Large Cap Peer Ranking**



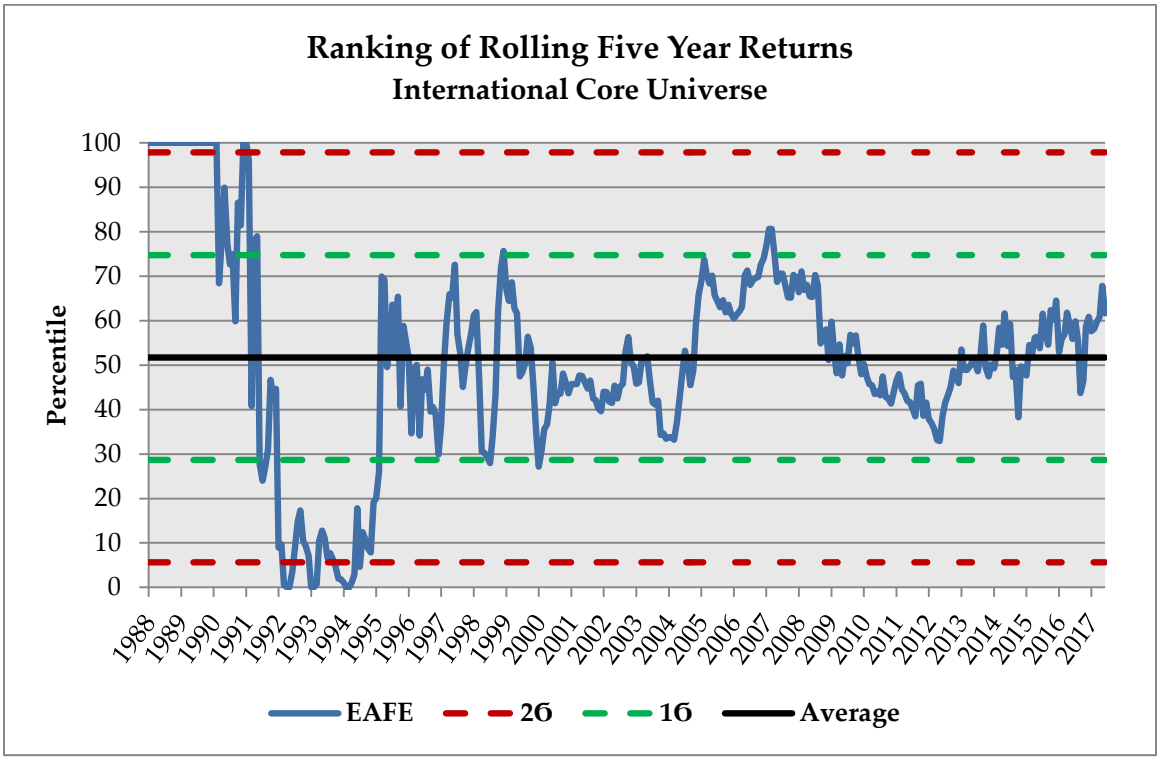
With U.S. small cap securities, the decision to be passive or active is less clear. Historically, the index has been in the 55th percentile, but over the past 30 years as shown in Exhibit 13, it has been mostly below the 50th percentile, indicating that the market is not efficient and active managers can add value. With taxes, it becomes a little bit more of a challenge, but we believe that active management can add value in small cap strategies. Xcel chooses to be passive with their U.S. small cap holdings.

**Exhibit 13: U.S. Small Cap Peer Ranking**



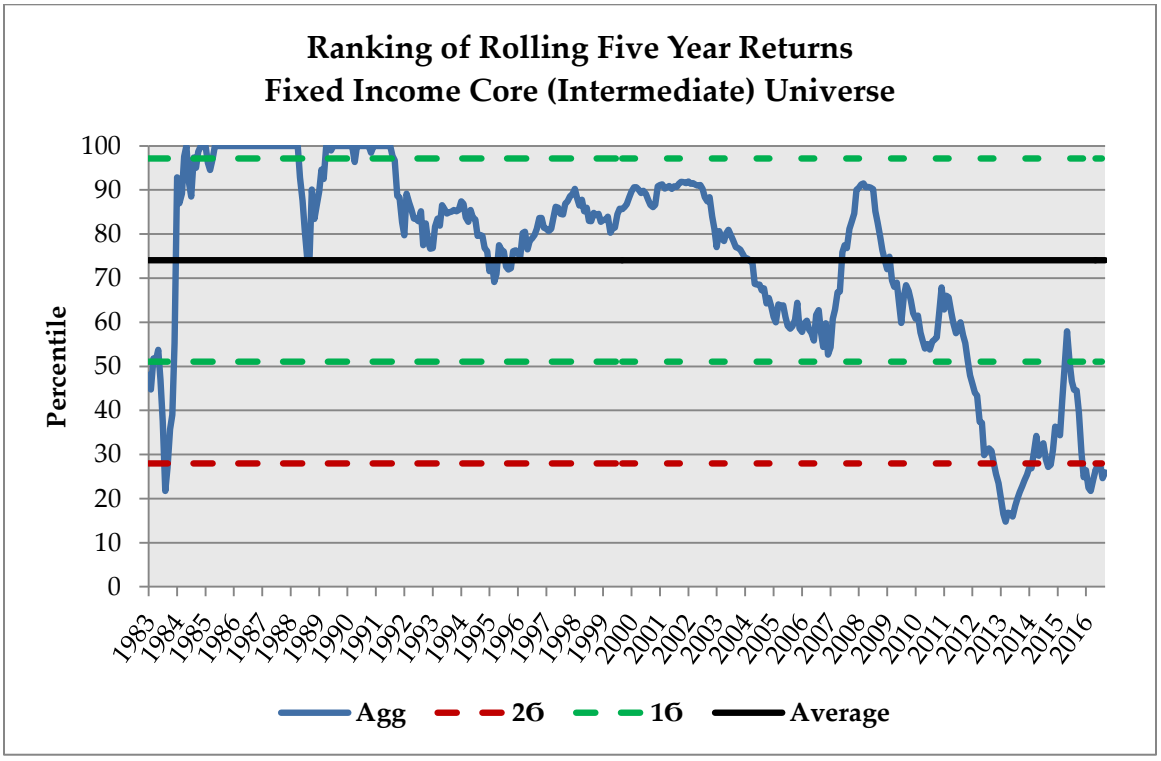

We believe that there is a benefit to active managers for international equities, assuming that there will not be a significant tax cost to set this up such as to move from a passive portfolio that has a large amount of unrealized gains. The index has historically been in the 52nd percentile and as shown in Exhibit 14, has hugged that average for the past 20 years. This indicates that about half of active managers can and have outperformed the benchmark net of fees. Taxes will have some effect in dampening this benefit; however, our experience has shown that good manager selection has led to fairly consistent outperformance. Xcel utilizes a combination of passive and active management with its developed market holdings, and is active with its emerging markets holdings. Emerging markets tend to be more inefficient than developed markets.

## Exhibit 14: International Equity Peer Ranking




For fixed income, the historical peer ranking has been the 74th percentile. However, as shown in Exhibit 15, that ranking is heavily skewed higher during a period of falling interest rates. It is not until the past 5 years where rates have been low and feared to be headed back higher that active management has shown its strength. When rates are rising, having the ability to manage duration, sector rotation and liquidity is paramount to being able to outperform the benchmark in our opinion. We do not recommend passive management for fixed income in this current environment. Xcel is active with all of their fixed income holdings.

**Exhibit 15: Fixed Income Peer Ranking**




While we do not have charts on the alternative asset classes, because there are no passive options, it goes without saying that active management makes sense for these types of strategies.

Our analysis considers performance on a net of fee basis. As such, we believe that an NDT should pay as little as possible, to get a passively managed U.S. equity portfolio, so long as that portfolio meets the regulatory requirements. Fees for these strategies can range from high single digit bps to low teens depending on the size of the mandate. For active international strategies, fees should be in the 40 – 75 bps range, and higher if including emerging market equities. Active core fixed income should cost anywhere from 10 – 25 bps, again depending on the mandate size. High yield and emerging market debt will have a fee premium associated with these strategies. Alternative investments cost more, typically 1 - 2% management fee plus some sort of incentive fee when performance hurdles are met (typically 10 – 20% of profits). Again, we review these asset classes on a net of fee basis, and see the benefit in their inclusion through the excess return or risk management characteristics that they provide.

One topic that has been frequently discussed at NDT conferences is the concept of Liability Driven Investing (LDI) for NDTs. LDI is a strategy whereby an investor tries to match the duration of the fixed income portfolio with the duration of the liabilities. This was originally created for defined benefit pension plans. Defined benefit pension plans are interest rate sensitive – when interest rates increase, the present value of the liabilities decreases. An increase in interest rates is a negative for bonds, but

this negative is equally offset by the decrease in the liability obligation. However, NDTs are not interest rate sensitive – the liabilities increase by the escalation rate regardless of the change in interest rates. When interest rates increase, the fixed income assets will decrease as they would in a defined benefit plan, but the liabilities will still continue to increase. It is because of this mismatch that we do not believe that it is prudent for NDTs to follow an LDI strategy as hedging an NDT with long-dated bonds just because an NDT is a long-dated liability does nothing but lock in low interest rates for long durations. This is a harmful technique that causes a utility to forgo better-returning strategies at a time when the focus needs to be on return-seeking or risk-reducing assets.

## Conclusions

It is in our opinion that Xcel is following a prudent process in managing their NDT assets. We believe that the Xcel NDT portfolio is properly diversified amongst a reasonable amount of non-correlated asset classes. While we have highlighted two potential portfolios that could improve their expected after-tax returns, it is at the expense of additional risk, and is ultimately a judgement call for Xcel and its regulators to have a lower volatility portfolio. We believe that they are accounting for the future growth rate of their liabilities in a conservative manner by using an escalation rate that is higher than many of their peers. We believe that their use of passive and active managers is appropriate in the respective asset classes. Based on all of our analysis of the processes and strategies that Xcel is using in the management of their NDT, we do not recommend that they make any immediate changes. However, we do recommend that they continue to evaluate their investment approach over time as new cost studies are performed and as they get closer to the start of decommissioning. The approach that is reasonable today may not work in the future as decommissioning liabilities and investment strategies evolve over time.

## CERTIFICATE OF SERVICE

I, Jim Erickson, hereby certify that I have this day served copies of the foregoing document on the attached list of persons.

xx by depositing a true and correct copy thereof, properly enveloped with postage paid in the United States mail at Minneapolis, Minnesota

xx electronic filing

**Docket Nos. E002/M-14-761**

Dated this 25th day of August 2017

/s/

Jim Erickson
Regulatory Administrator

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