2010 Review of Financial Security at Equity Silver Mine

BC MEND Metal Leaching and ARD Workshop
November 30 and December 1, 2011

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The Equity Silver mine is in north-west British Columbia

The BC Mines Act requires that mines provide security, which in event the company defaults on its obligation, would provide interest payments equal to predicted future capital and operating costs.

Security cost projections are limited to 100 years, since net present value (NPV) of costs beyond 100 years are negligible.

Previous security reviews for Equity Silver were held in 1991, 1995, 2000 and 2005.

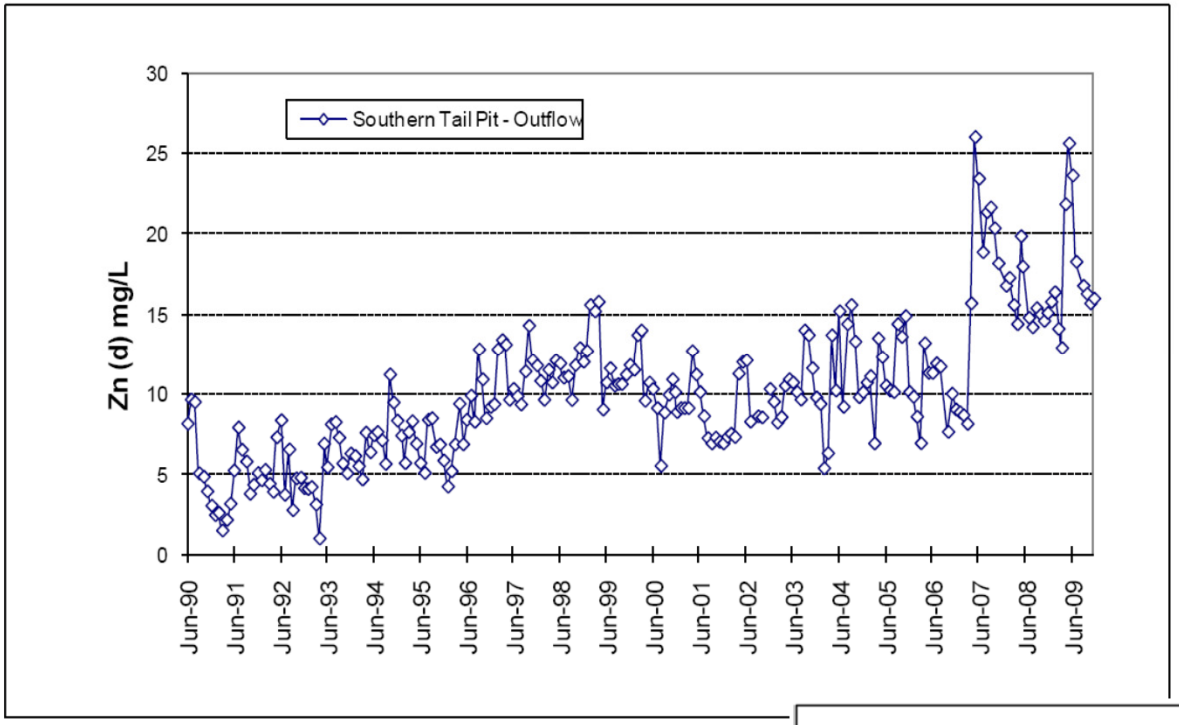
The 2010 security review was conducted by Goldcorp, government, and a member of the public.

The main objective of the security review is to determine environmental protection and reclamation requirements, and estimate the resulting liabilities.

Equity Silver operated between 1980 and 1994, producing silver, gold and copper from three open pits and a small underground operation.

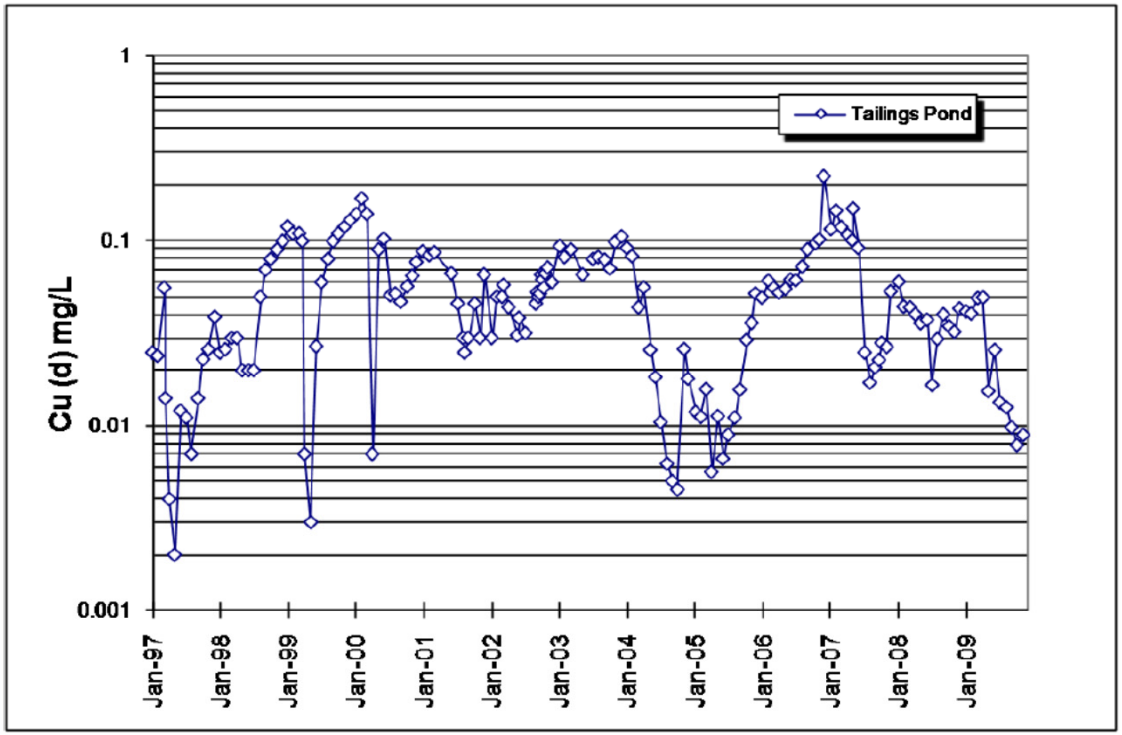
The deposit is subvolvanic.

Much of the rock has a high AP primarily pyrite and pyrrhotite and low NP.



The first step in a security review is examination of the results of monitoring and studies. In part due its complexity, no site has better long-term monitoring than Equity.

These graphs show trends for Zn and Cu in near-neutral pH drainage from a partially flooded pit and the flooded tailings impoundment.



The flooded tailings and partially flooded pits produce drainage with a near-neutral pH.

The waste rock dumps were not flooded and produce acid rock drainage (ARD) which is the largest cost item and the greatest environmental hazard.

Future liability is important at Equity Silver due to the high cost of dealing with ARD.

- 77 million tonnes of waste rock annually produces 500,000 to 950,000 m^3 of ARD.
- Treatment with lime in a high density treatment plant is the primary mitigation measure for ARD.

- Supplemental mitigation measures include a compacted soil cover and upslope ditches to divert clean water.

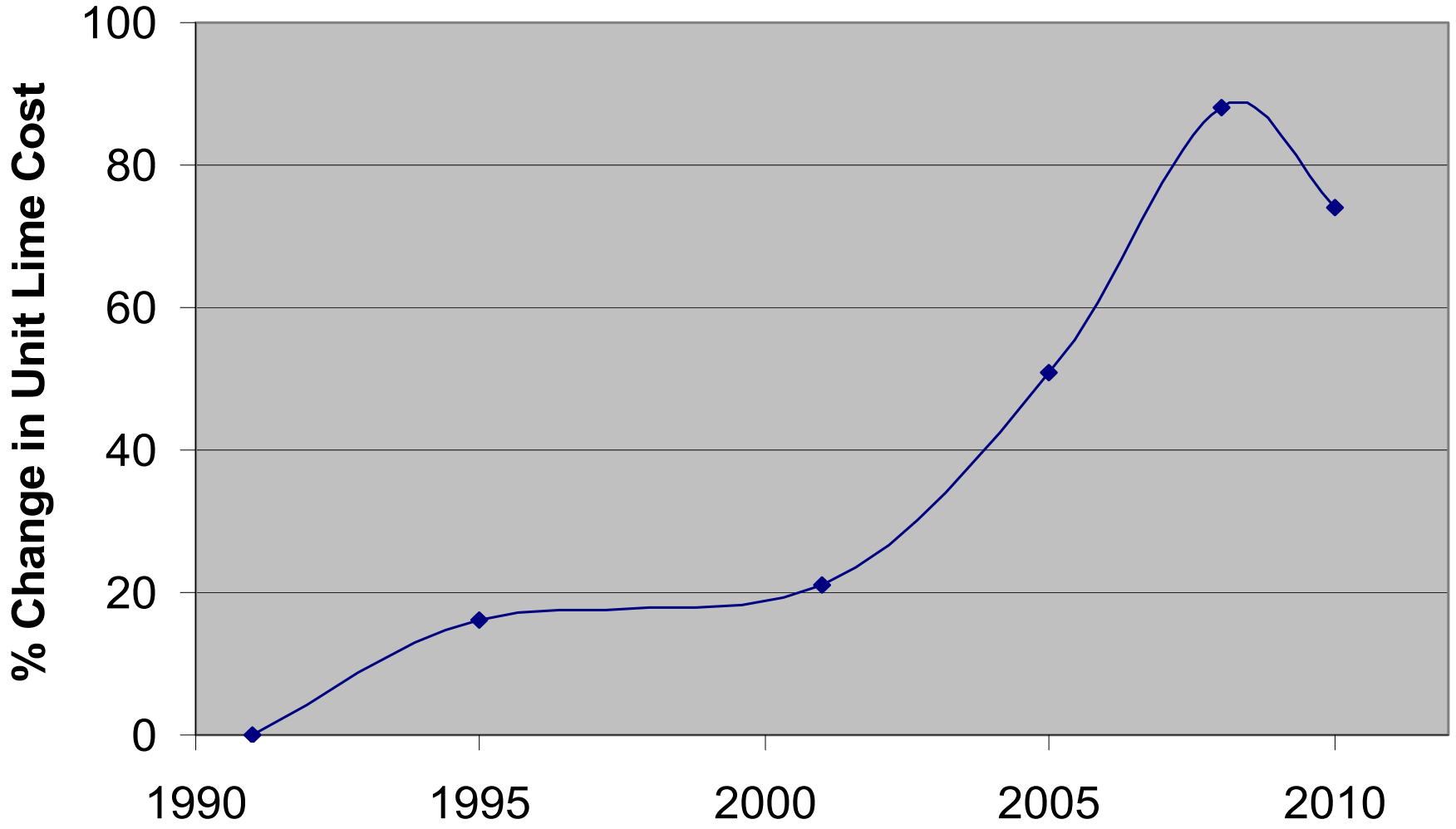
For the financial security review, site costs are divided into four categories.

- Annual Lime Costs
- Other Annual Operating Costs
- Periodic Costs
- Broader Economic and Financial Issues

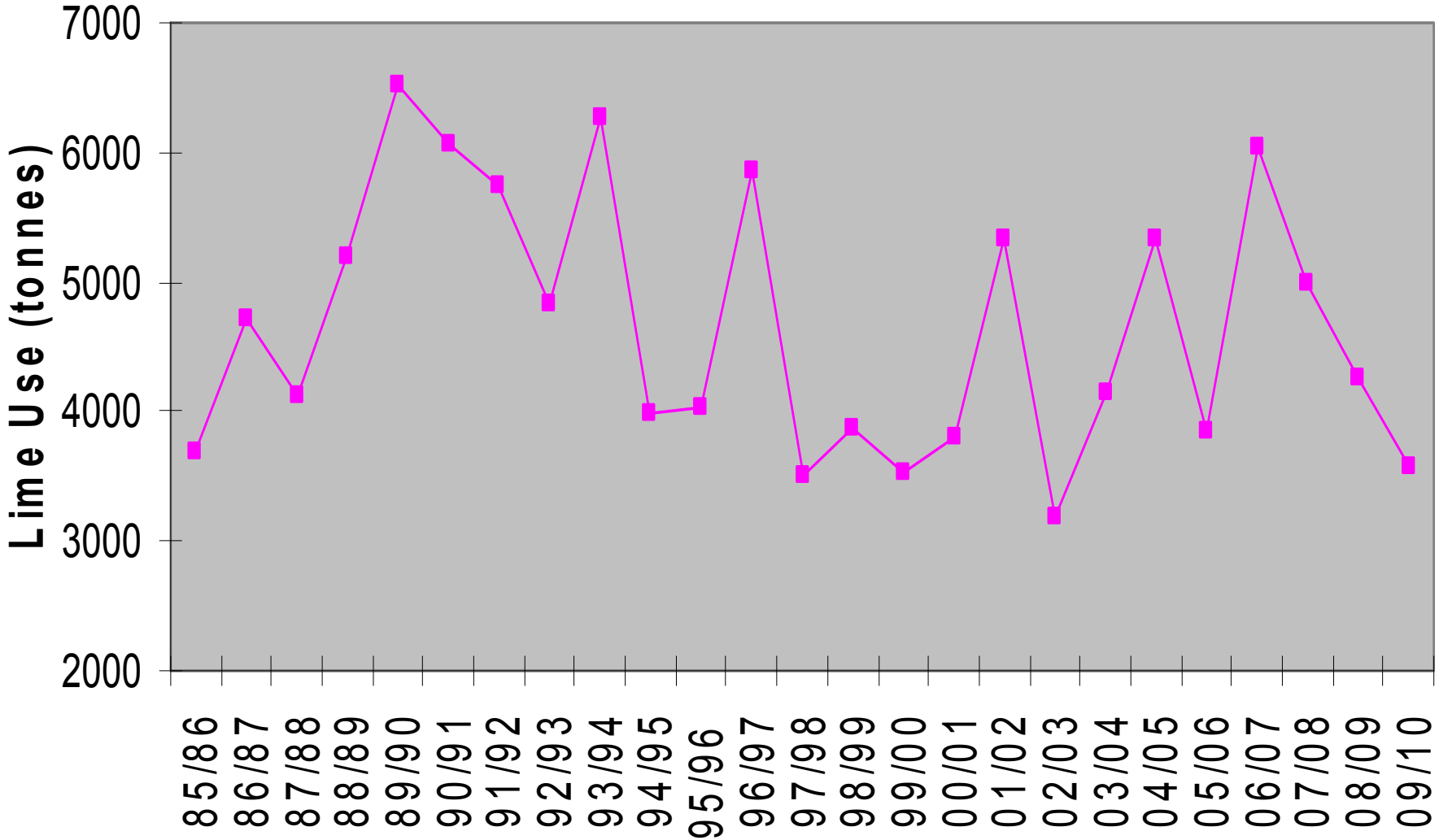
Annual Lime Costs

Lime to treat acidic drainage costs approximately one million C$/yr and is the largest cost item. The unit cost of lime depends on energy and transportation costs and includes energy and transportation surcharges.

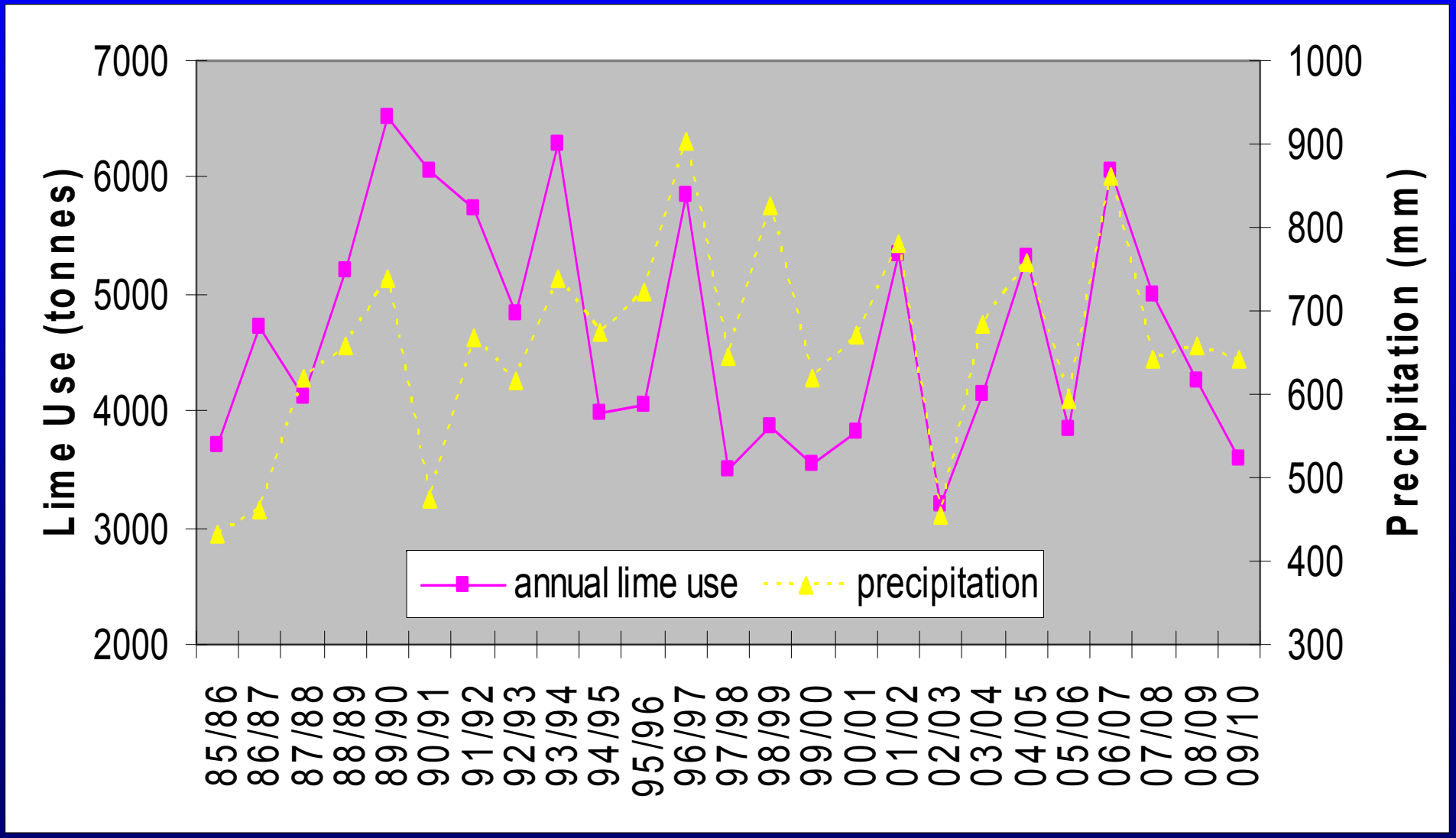
Cost per tonne of lime has increased since 1990 and peaked in August 2008. Since August 2008, decreased energy costs and taxes have reduced the cost per tonne of lime.



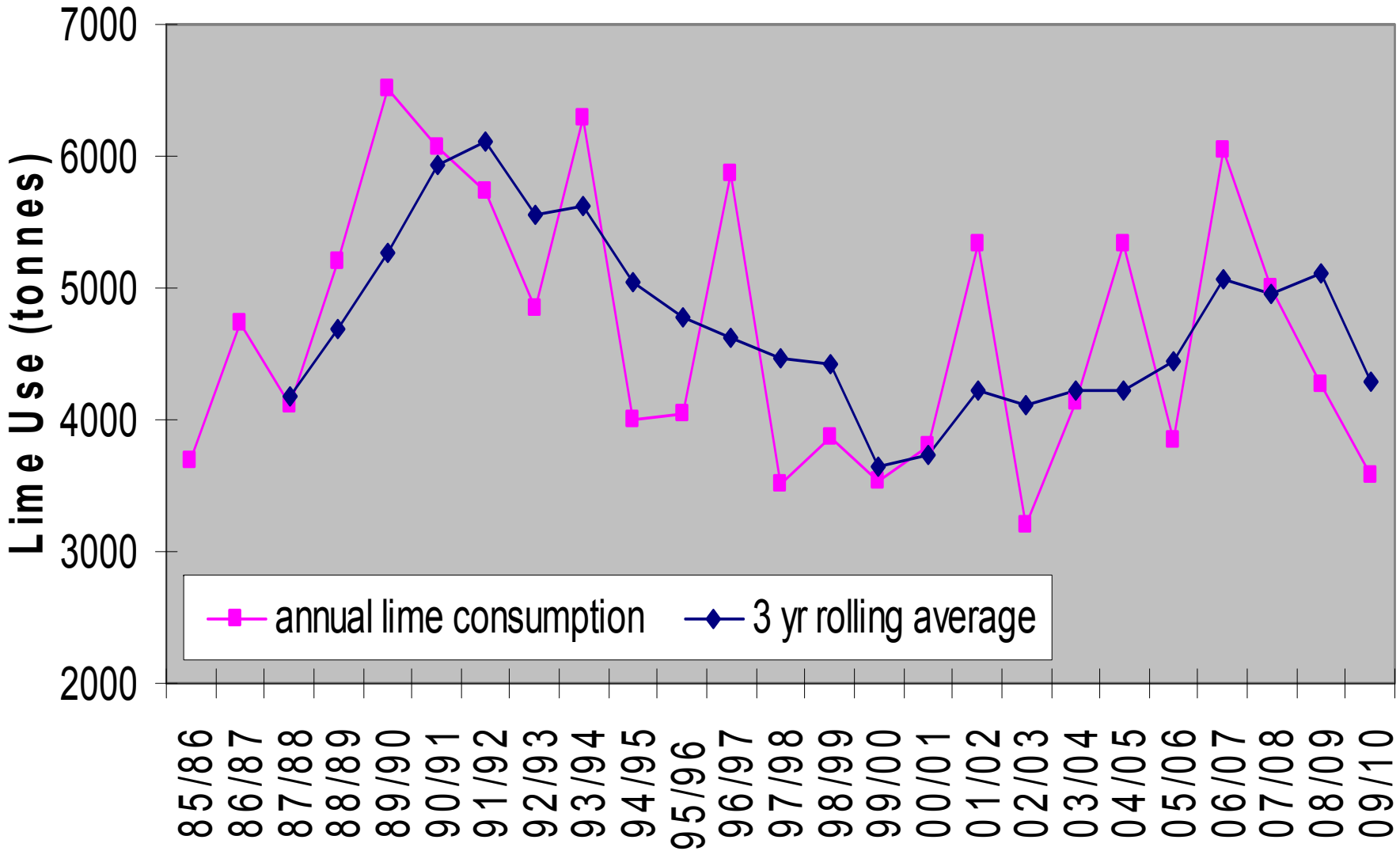
Annual lime use depends on drainage acidity and volume, and has varied from 3000 and 7000 tonnes/year. July-June is used to include snow fall and snow melt in the same year.



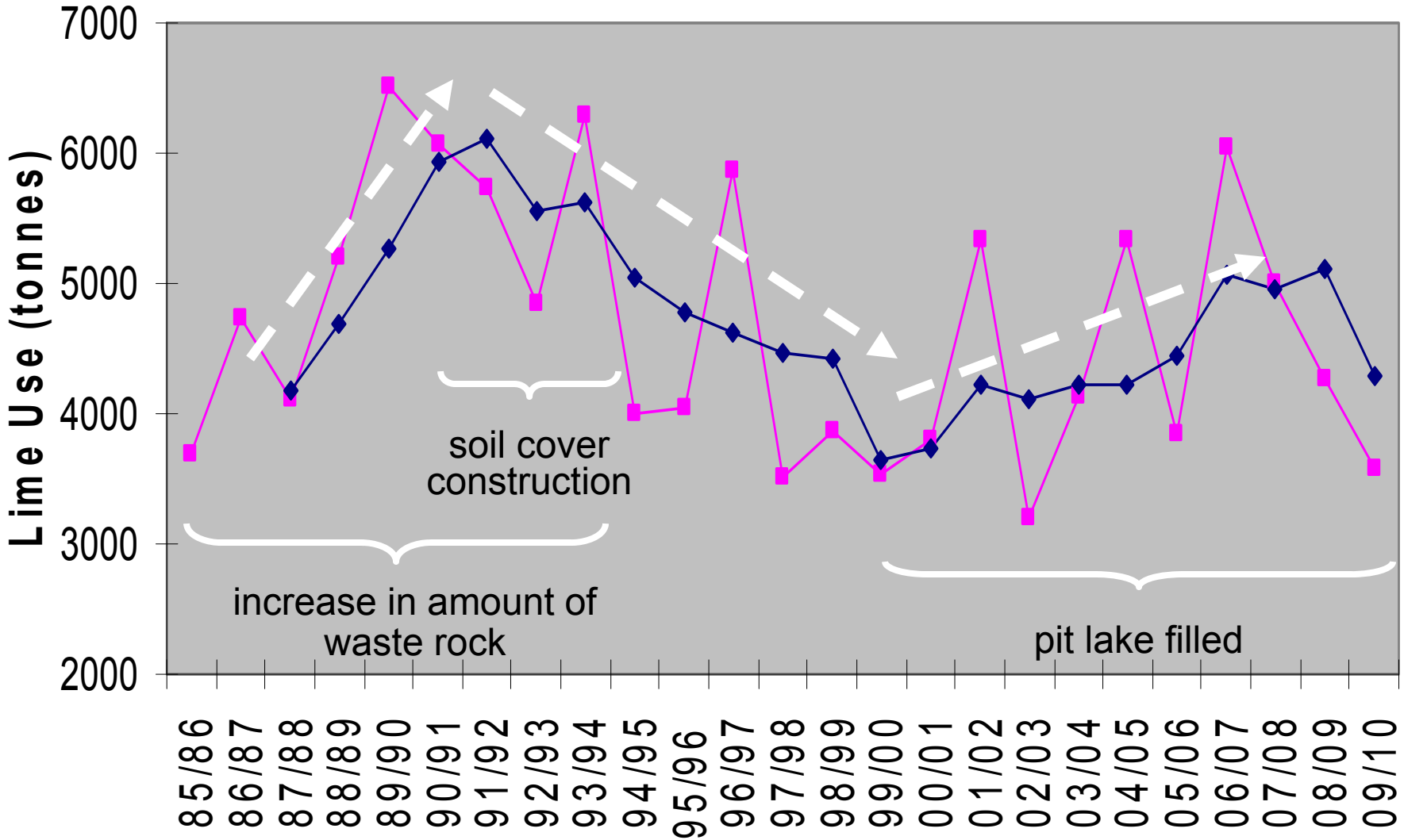
Lime use is correlated with precipitation, especially snow melt. Large fluctuations in precipitation result in large fluctuations in lime use making it difficult to identify trends.



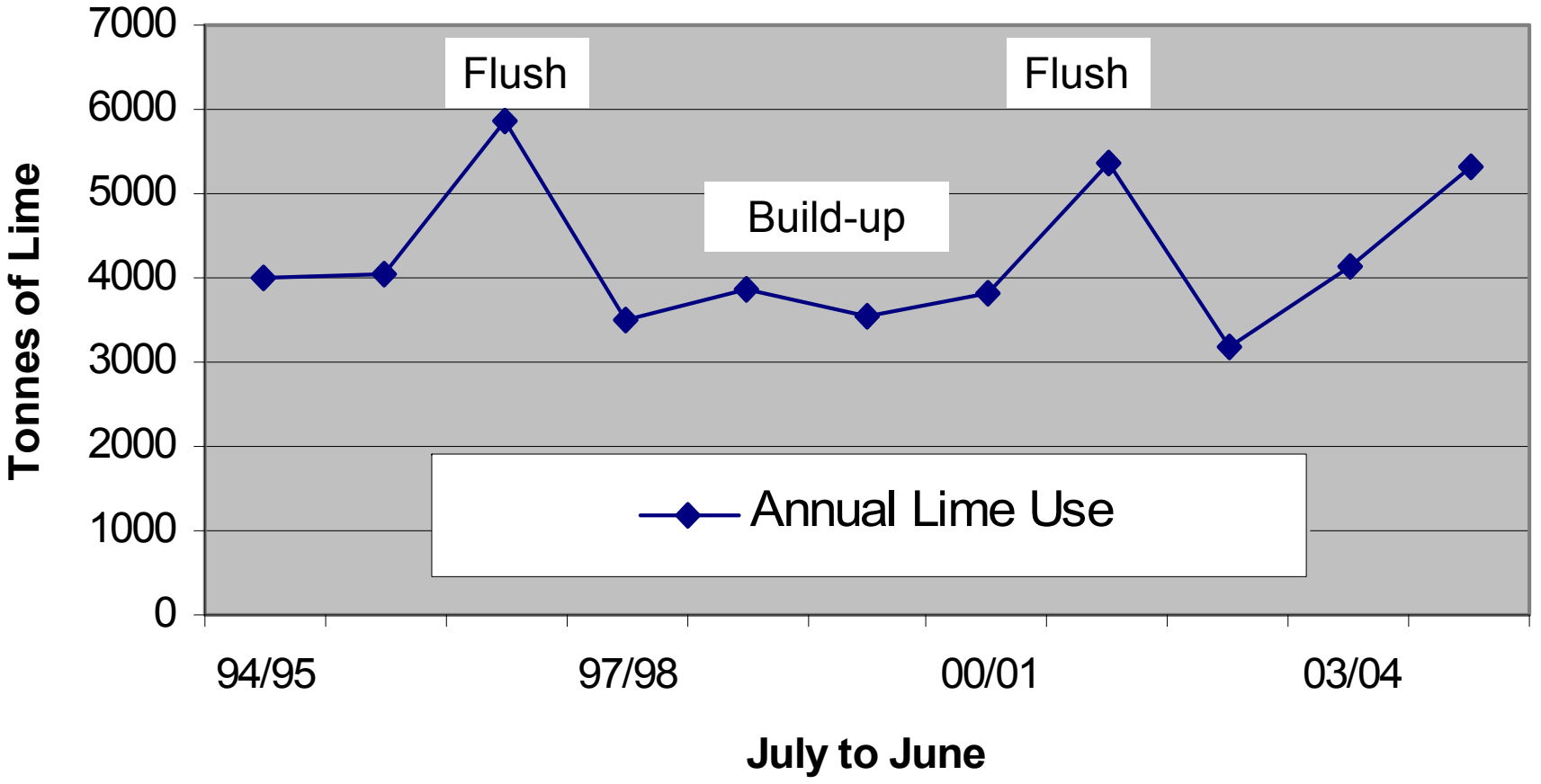
A statistic used to lessen year to year variability and track trends in annual lime use is the three year rolling average.



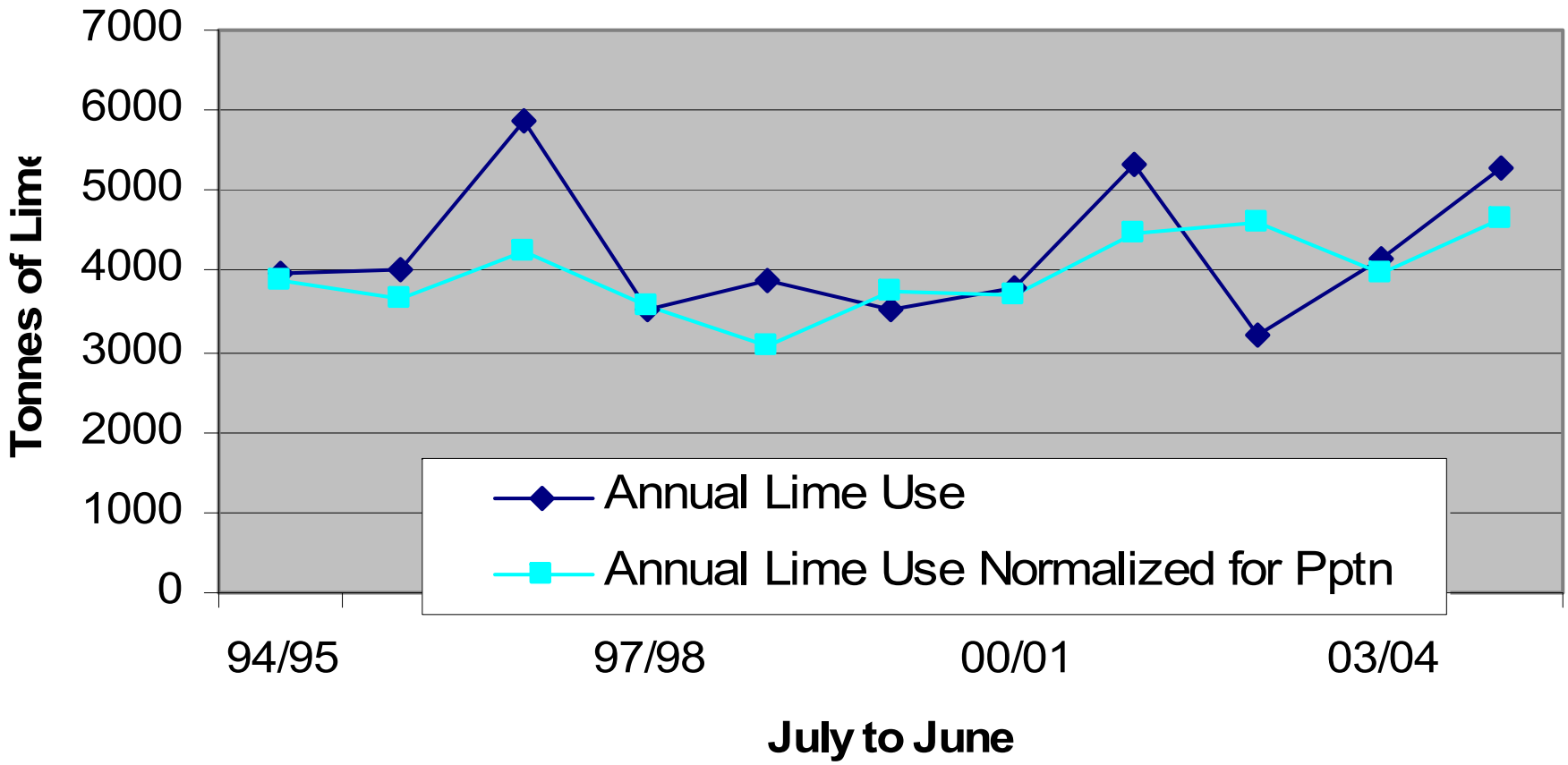
Annual lime use increased with waste rock production, decreased after soil cover construction and increased after the Main Zone pit lake reached its present height and the rebound in the water table.



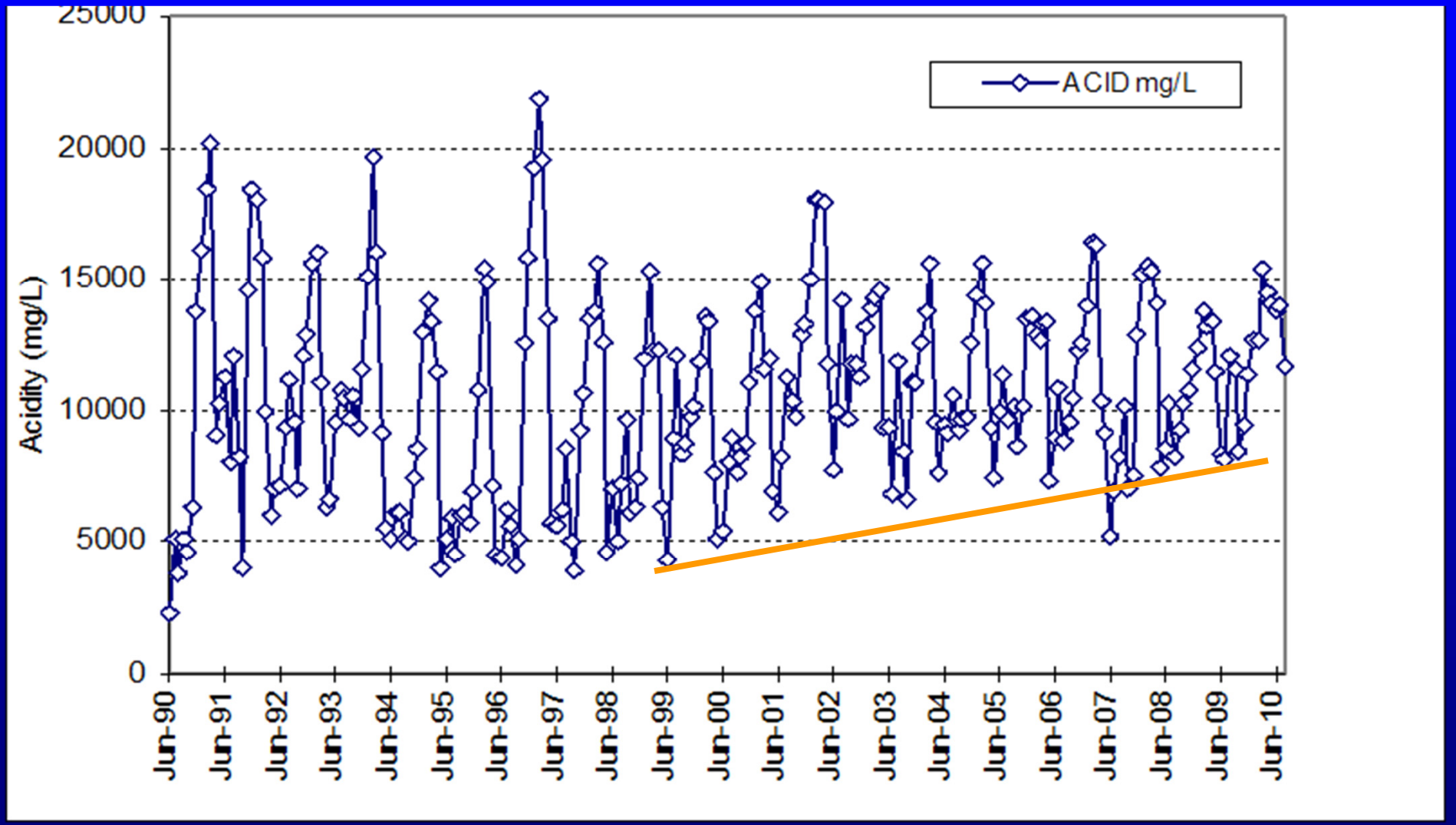
Evidence from studies at other sites suggests that only a portion of the dump is being leached. Equity monitoring results suggests that within flow paths, acid weathering products build up during dry years and flush out during large leaching events.



Evidence of slightly increasing acidity is provided by normalizing annual lime use for differences from the long-term average precipitation (655.3 mm/yr).



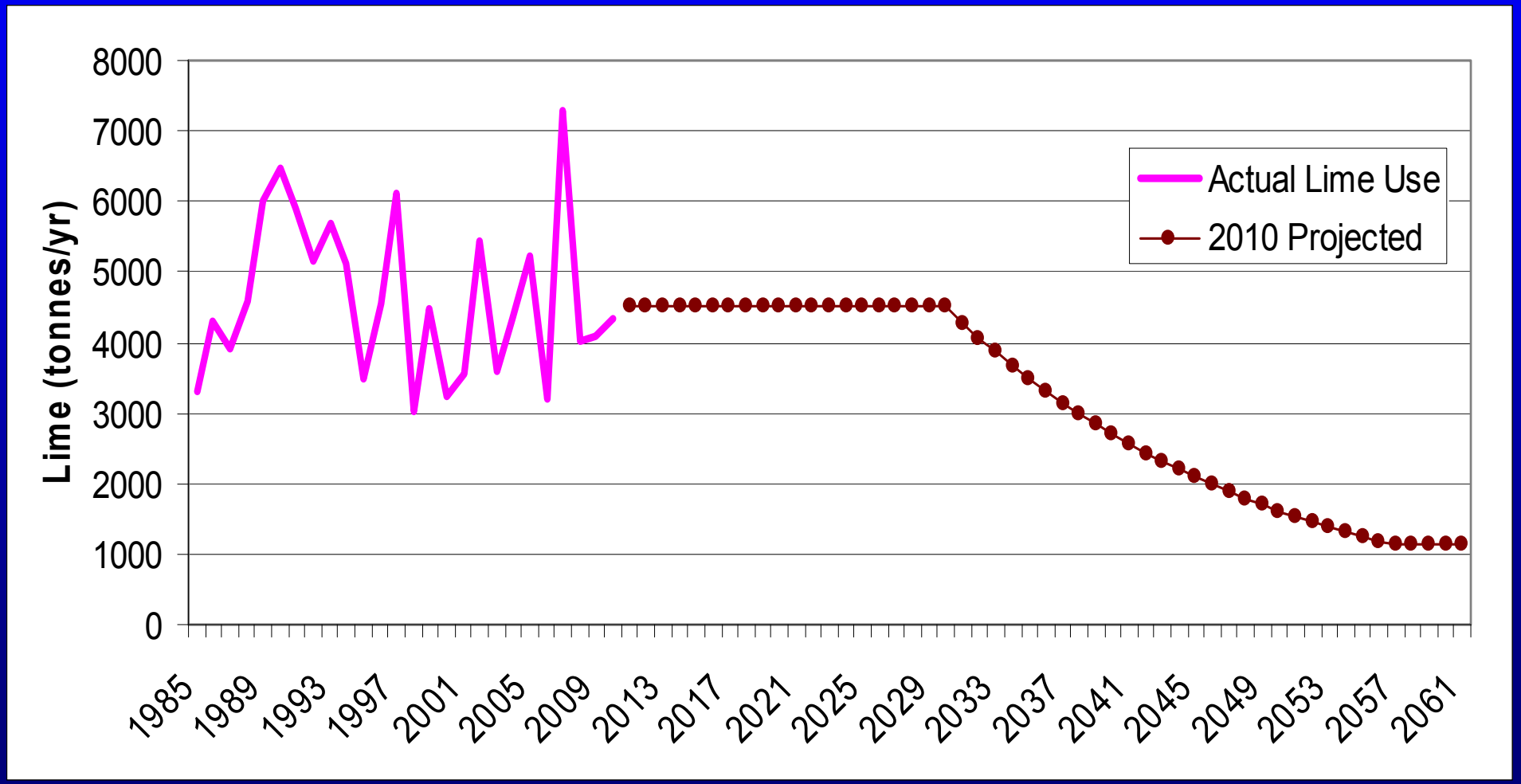
Other evidence is increasing acidity during snow melt, the period with lowest acidity but highest acid loads and lime use.



A decline in dump acidity will eventually occur.

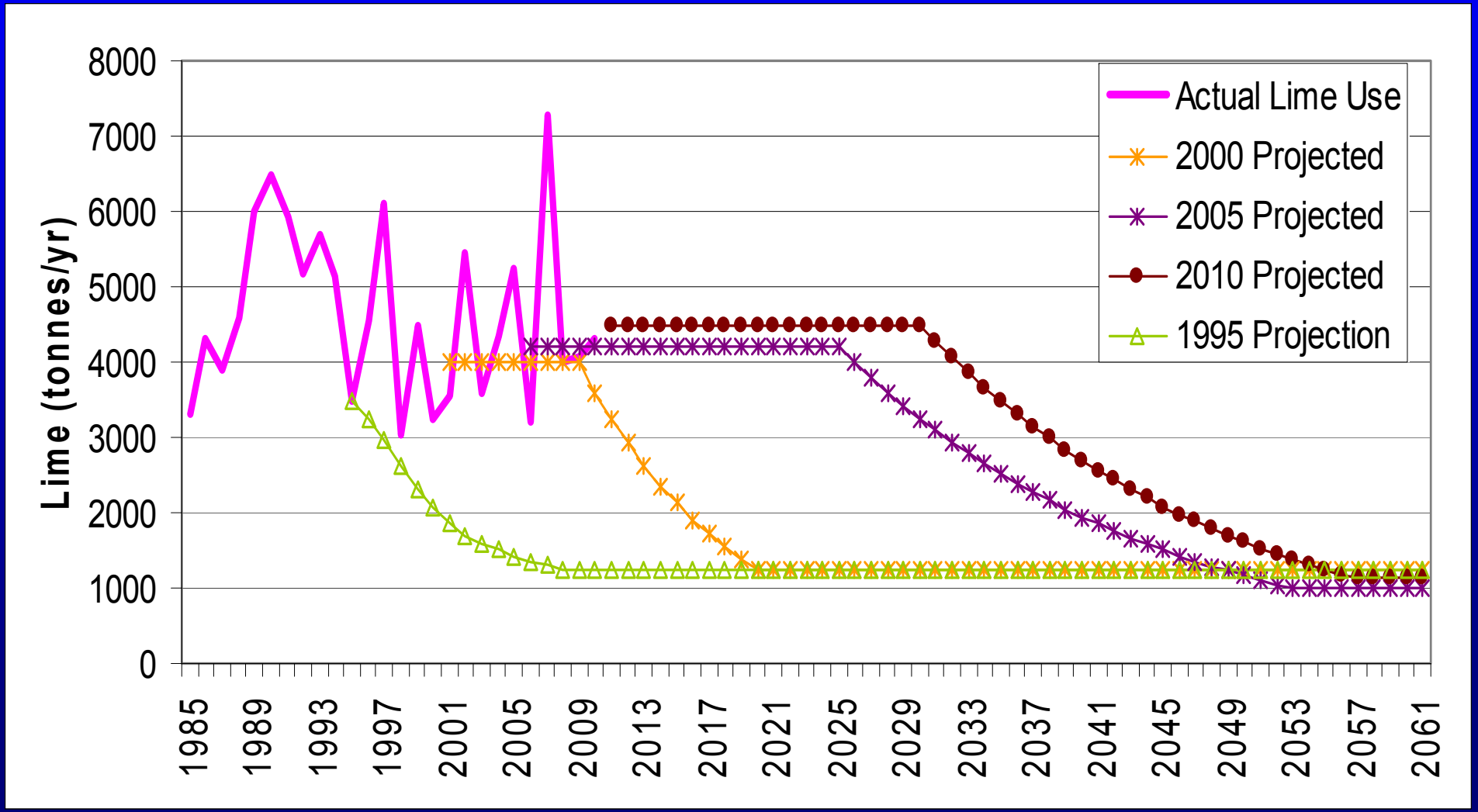
However, the timing and form of the decrease and whether this is preceded by an increase is uncertain.

Projection used in 2010 to calculate future lime costs was that present average lime use would continue at 4500 t/yr for 20 years, then decrease 5% per year to 1125 t/yr (25% of 4500 t) and remain at 1125 t/yr for rest of 100 year period.



Since 1995, model parameters have steadily increased:

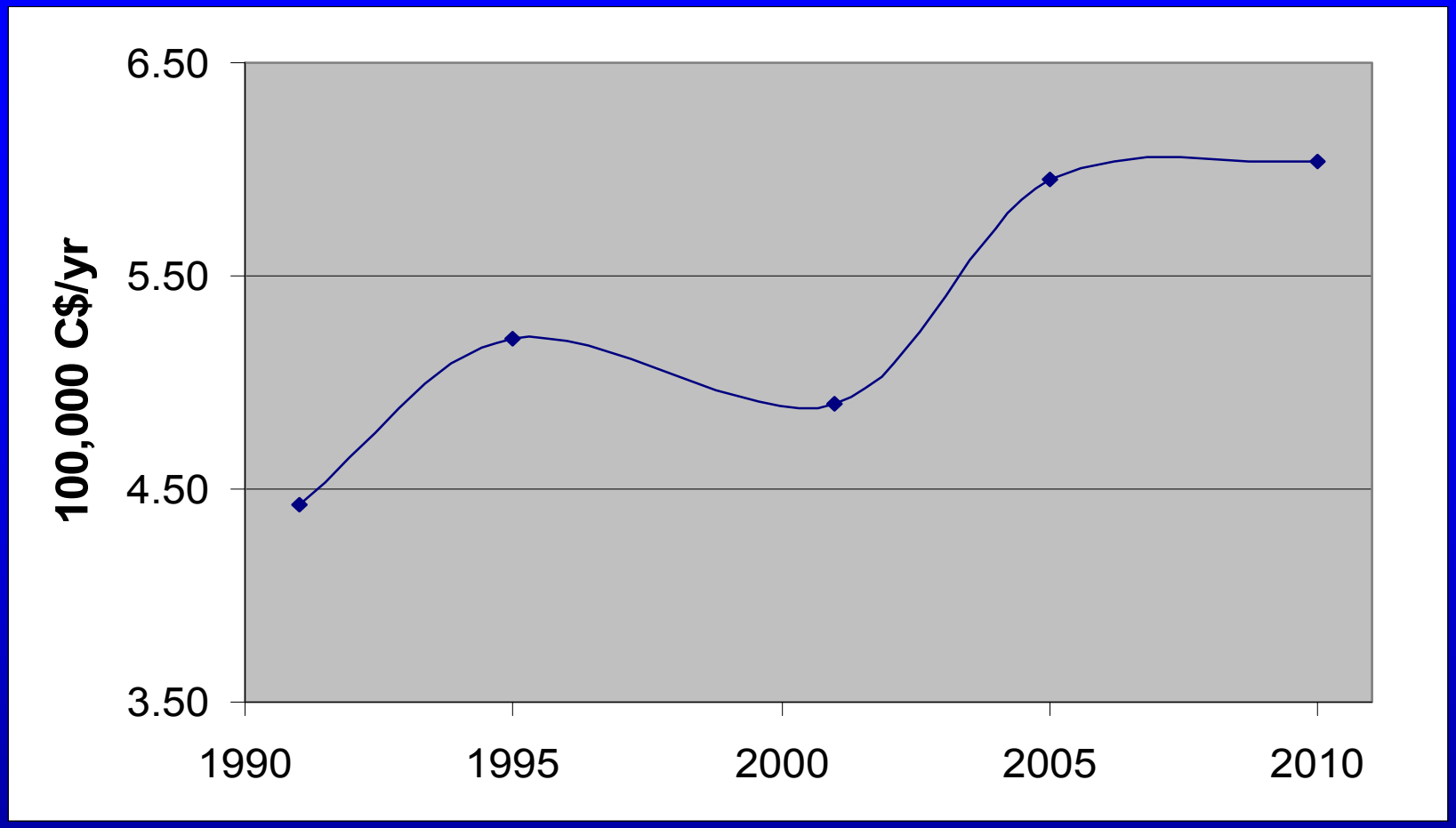
- present lime use has increased from 3500 t/yr to 4500 t/yr;
- period at present rate of lime use increased from 0 to 20 yrs &
- rate of future decline decreased from 10 to 5% /yr.



Annual Non-Lime Costs

- Annual non-lime costs are the other large cost item.
- Includes cost of operating, monitoring, and maintaining dams, roads, buildings, ditches, pumps, pipes, treatment plant and sludge removal.
- Largest cost items are salaries (~ $250k) and power (~$130k).

- There are 3.5 employees. The manager works half time on other projects.
- The number of personnel has remained the same despite an increasing number of tasks due to increased automation and ease of operating the collection and treatment systems.
- A standardized wage scale was used in the 2010 security so as to not penalize the company for keeping long term employees with higher wages or providing training for new employees.



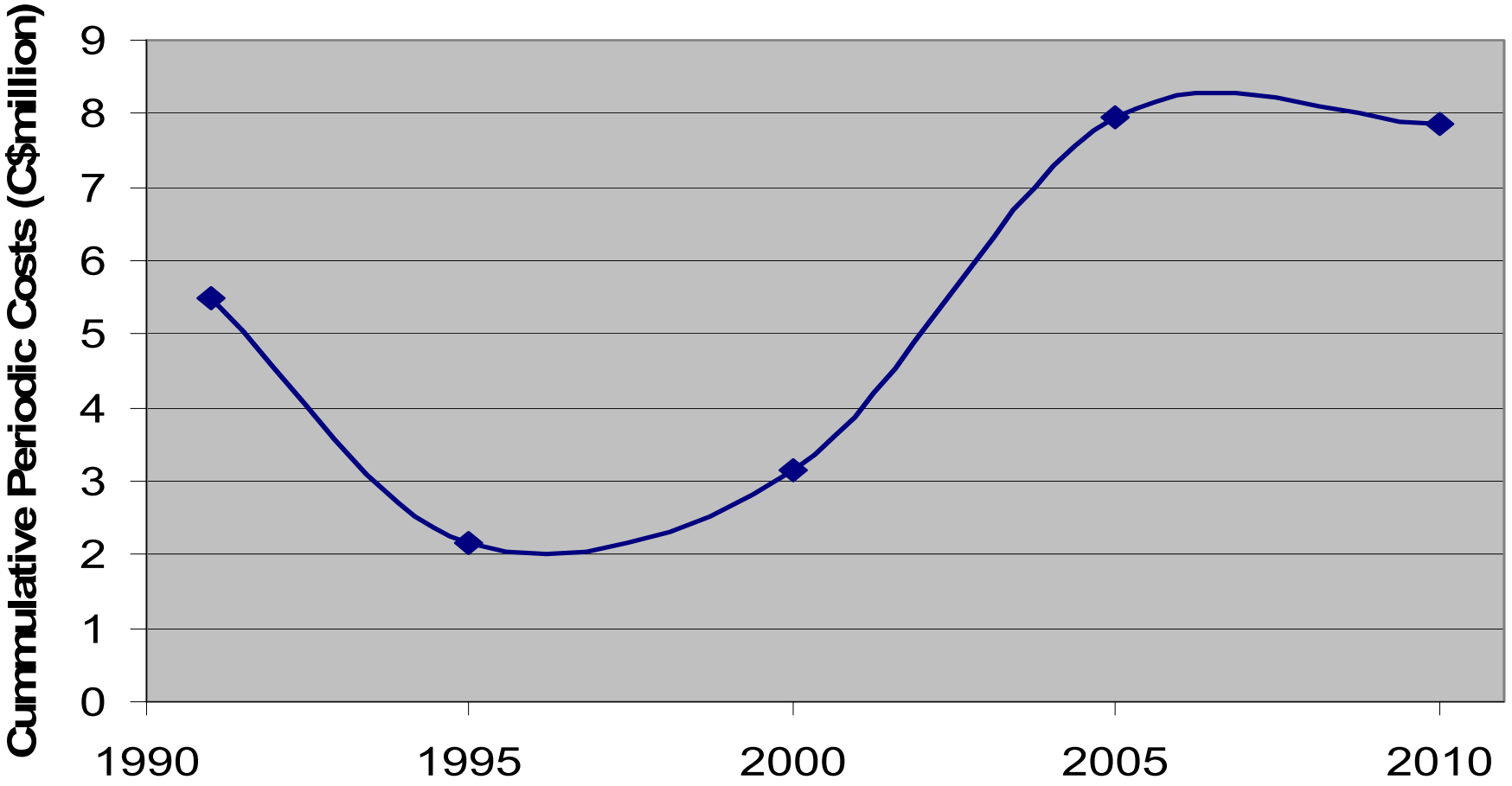
- Non-lime annual operating costs have increased, except for an unsuccessful attempt to reduce staff in 2001.
- Increases have resulted from increased power and heating costs, additional toxicity tests and recognition that the cost should include private rather than government insurance costs.

Periodic Costs

Periodic costs are costs of one time or infrequent activities.

Past periodic costs included:

- removal of buildings,
- construction of soil cover,
- revegetation and
- improvements to drainage collection and diversion.



Reduction in periodic costs from 1991 to 1995 resulted from completion of reclamation activities when the mine closed.

The subsequent increase is due to increased concerns about the cost of maintenance and replacement of the soil cover and collection and treatment system.

Cost predictions for previously occurring periodic activities have been relatively accurate:

- $50,000 every 5 yrs to repair heavy equipment
- $15,000 every 5 yrs for lime to maintain pH 7.5 tailings pond.
- $100,000 every 4 yrs to monitor receiving environment.

Cost estimates for major improvements to collection and treatment infrastructure have been less accurate.

The cost of improvements following large snow melt events in 1997 and 2002 greatly exceeded security projections.

Following a 1-in-40 year flood in 2002, $15 million not predicted in calculation of the security was spent on:

- construction of much larger emergency ARD storage pond;
- construction of high density sludge treatment plant; and
- purchase of new pumps, pipelines, silo and genset.

Improvements following snow melt event in 2002 successfully handled a 1 in 50 year flood in 2007 and even larger event in 2011.

Lack of information about measures to sustain performance of soil covers and collection and treatment systems results in large uncertainty about long-term periodic costs.

Past maintenance costs for dump cover have been minimal:

- 1,000 C$/yr to remove woody shrubs,
- several 1,000s C$/yr for ice removal from ditches and
- 80,000 C$ to repair a single instance of ditch damage.

2010 projected security cover repair costs were C$250,000 in 2020 followed by C$100,000 every ten years thereafter.

2010 projected security costs for general infrastructure repair:

- $50,000 every 10 years; and
- $500,000 every 20 years.

Detailed monitoring is in place to provide early warning of potential problems and inform corrective measures.

Considerable money is also spent on studies.

Study costs are not included in the security because studies reduce the overall risk and the committee did not want to the security to discourage this activity.

Broader Economic and Financial Issues

- discount rates
- inflation and
- financial health of company

Discount rates used to calculate NPV are based on 30 year Government of Canada real rate of return bonds (rrb).

Expectation is that rates will remain low.

Discount rates used in 2010 security:

- 1.5 % until next review in 2015;
- 2.0 % from 2016 until 2044 when rrb mature; and
- 3.0% from 2044 onwards.

	Discount Rate (%)		
	Initial	Second	Third
1995	4.25	3.5	
2000	4.0	3.5	
2005	2.0	2.5	3.0
2010	1.5	2.0	3.0

Triggers for Recalculation of Security before Next 5 Year Review

Security will be recalculated if:

- unit lime cost changes by > 10%
- 3 year rolling average lime use changes from 4500 t/a by > 1000 t/a
- 2 year rolling average electricity costs change by > 50%.

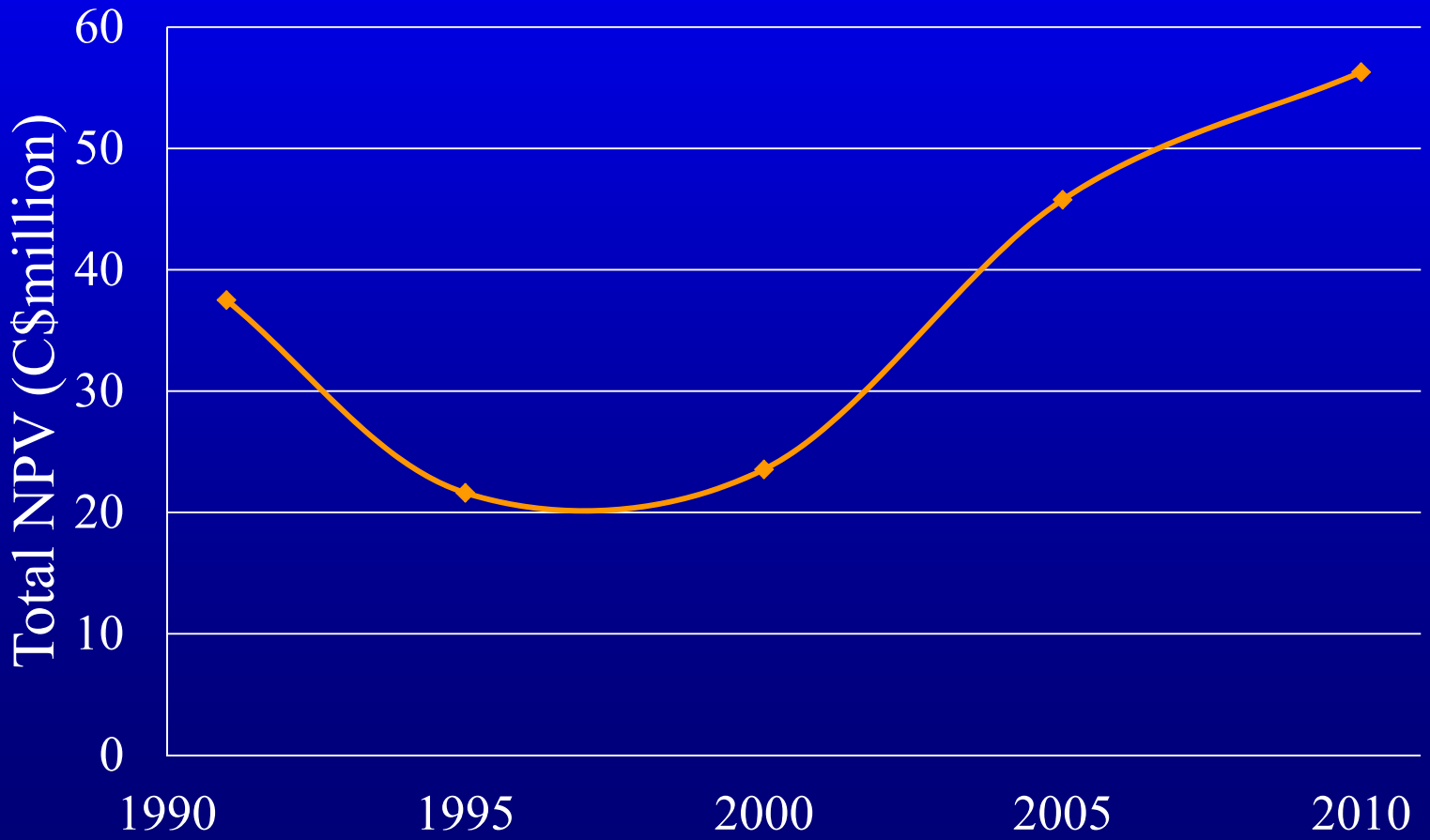
There will only be a reduction in the security due to a decrease in lime use if there is evidence that reduced acid release has not resulted in a build-up of acid weathering products in the dump, increasing the likelihood of a large future flushing event

Triggers were also included for changes in bond yields, inflation and financial status of parent company.

Conclusion

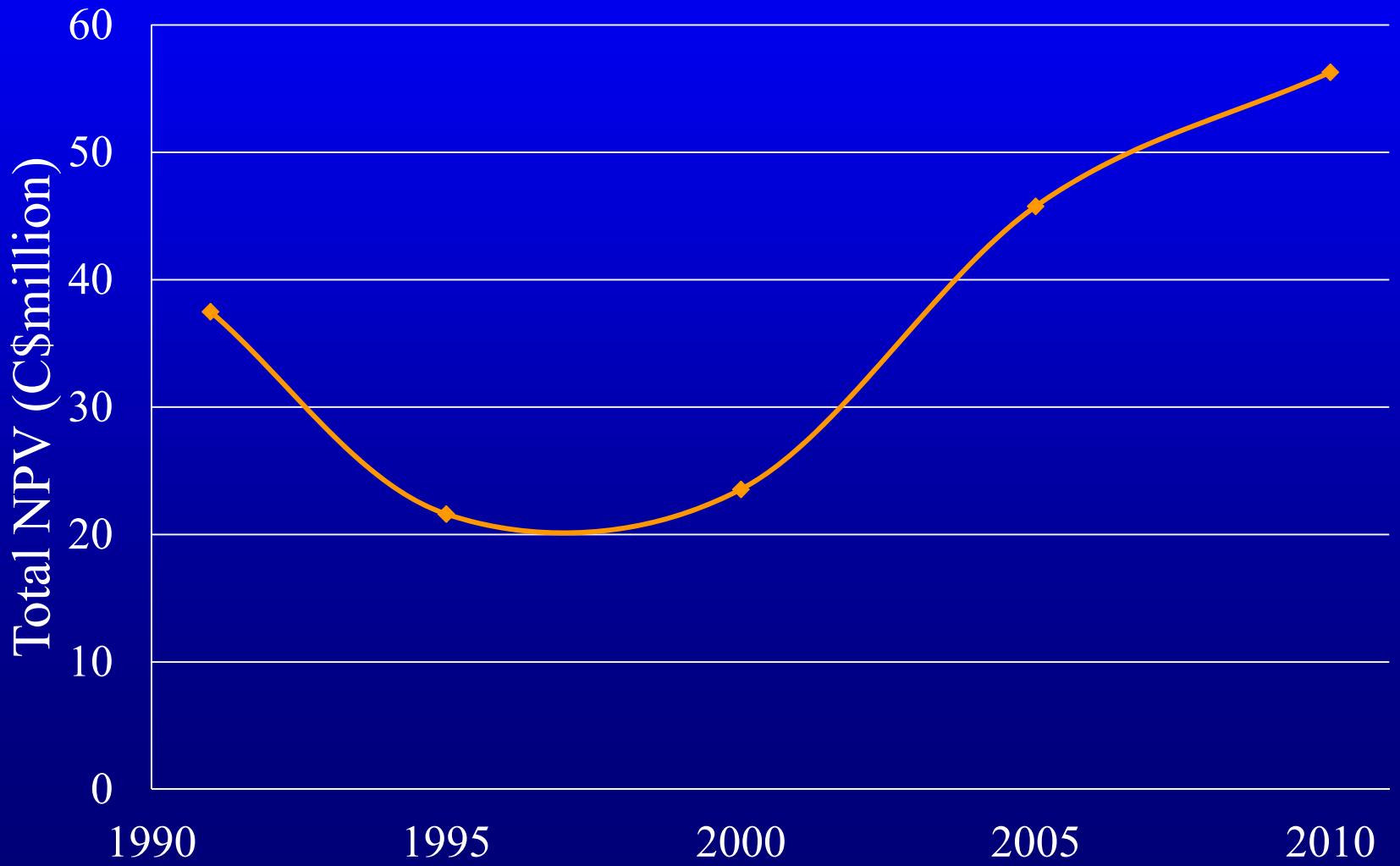
Size of financial security at Equity Silver decreased immediately after mine closure when cover was first built and lime use decreased, but has subsequently increased.

Major factors contributing to security increase since 2000 have been increased lime use and decreased discount rates.



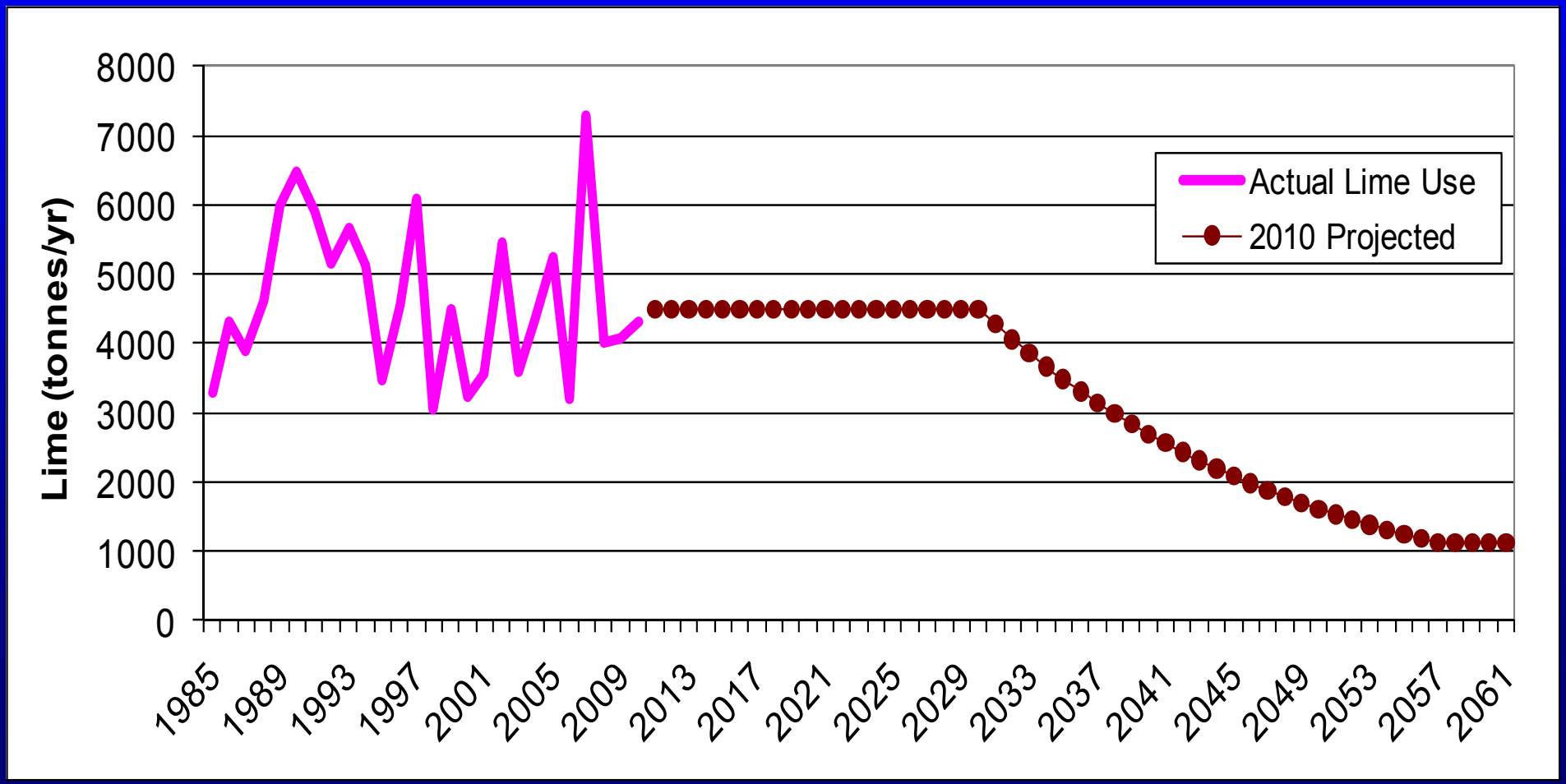
Total NPV of predicted liability in 2010 was $56.3 million;

- $29.2 million for annual lime use,
- $24.1 million for annual non-lime costs and
- $3.0 million for periodic costs.



2010 security review included a detailed review of past costs and some educated guess work about future loadings from large waste rock dumps and future repair costs for the soil cover and collection and treatment systems.

Next scheduled security review is in 2015.



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