

# NORTHERN ECONOMIC CONSULTING, INC.

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Christine A. Murphy  
Town Administrator  
Underhill, VT  
via email: [underhillvt@comcast.net](mailto:underhillvt@comcast.net)

Dear Chris:

I have taken a look at your spreadsheet for the estimated return on opening a town sand and gravel permit versus continuing to purchase and transport gravel from outside of the town.

I find that the spreadsheet is a reasonable tool to estimate the possible return to the town from this investment. I made a few minor modifications to the spreadsheet (highlighted in light blue) and added a sensitivity analysis to it. With these changes I believe you can see that under all reasonable scenarios, the town gravel pit will yield a positive return to the Town. Of course, as with any investment, that cannot be guaranteed. But based on the reasonable forecasts of material on site, extraction rates, material prices, inflation, interest rates, and other unknowns, the project yields a positive return for the Town.

I am not able to comment on the estimates in the spreadsheet for such things as the cost of pit construction, plantings, time taken to transport materials, etc. I assume those estimates are unbiased and the best available. I am able to comment on such things as the growth rate in costs. I set up the sensitivity analysis to measure the impact of different growth rate and price assumptions.

I discuss each of these issues in turn.

## **Sensitivity Analysis**

The Town, of course, does not know the future costs of purchasing sand and gravel, future labor and trucking costs, and what interest rate it will be able to borrow at. In order to investigate the impact of differing assumptions about these variables, I set up the spreadsheet to perform a sensitivity analysis.

For example, the spreadsheet I received used the following inputs in its projection:

Cost of gravel from Tatro	\$13,50
Cost of gravel from Varin	\$10.00
Cost of sand from Varin	\$ 6.00
Future borrowing cost	5.00%
Future inflation (COLA)	3.00%

With these I estimate the NPV of the investment (if it is operated for 30 years as expected in the Trudell Feasibility Report) to be about \$1.5 million (that has includes subtracting the cost of borrowing funds for the project). However, if we assume the gravel price used is abnormally high, and will fall about \$3.00 at both Tatro's and Varin's ( to the level of two years ago), the NPV drops to \$1.1 million. That result shows two things: first, the forecasted price of sand and gravel has a significant impact on the return to this investment; and, second, even with a large price decline of \$3.00 the project remains clearly in the black.

Similarly we can see that if the interest cost to the Town rises from 5% to 7%, the NPV of the project falls from \$1.5 million to \$0.9 million.

And finally, we can see that the assumed inflation rates do not have a major impact on the return to the investment. A change, up or down by a percent or two, has a small impact on the NPV.

### **A Question About Differing Employee Hours**

You asked how I would explain the differing employee hours assumed in operating the gravel pit versus hauling material from other pits.

The hauling of gravel to the town takes 429 trips of either 45 or 90 minutes duration, depending on where it is purchased. This implies somewhere between 322 to 644 hours of driving time by someone. The hauling of sand takes 429 trips of 90 minutes or 644 hours of driving time. That totals at least 966 to 1,288 hours of time for some employee of Underhill or paid private trucker. With the town's own local pit, the material can be stockpiled on site or taken a short distance to the town garage with minimal driving time involved.

This investment is attractive in large part because so much labor time can be saved.

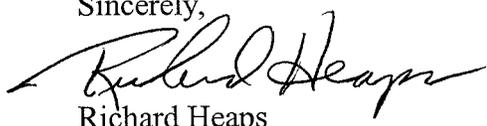
The town foreman estimates that the pit will be operated with 80 hours per year of working time. I can't question this. But if he was off by a factor of 5, that is still only 400 hours, much less than the driving time currently used.

Businesses routinely make investments because it will save labor hours. For example, many of Vermont's large farms have considered installing automated milking machines. The cost is high, and some labor is still needed to monitor the machines. But the alternative is a very labor intensive way of milking. The investment saves the farm owner a great deal of labor. And given that farm help is in very short supply in Vermont, many large farms have made this choice to save on labor costs.

Your project involves much the same reasoning.

I'd be happy to explain any of this in more detail. My modified spreadsheet has been sent by email already.

Sincerely,

A handwritten signature in black ink, appearing to read "Richard Heaps". The signature is fluid and cursive, with a long horizontal stroke at the end.

Richard Heaps  
Vice President