Simulation assignment

History, American History

SLIP is a privately held investment corporation founded in 1961. It had become a diversified company consisting of a total of 9 subsidiaries. The oldest three were In the home products business: a Virginia-based brass software company, an outdoor lantern company based In Maine, and an antique reproduction furniture company in Maryland. A second group of four subsidiaries formed in the sass’s was focused on research in the fields of consumer product marketing, computer software, tax research, and investment financial analysis.

Hoping to capitalize on their tax and investment expertise, they recently armed Spring Lane Development Corporation and Spring Lane Natural Resources, which were Involved In real estate development natural resource exploration, respectively. Spring Lane employed a total of 525 people and had revenues of $30 million in 1987. Spring Lane Natural Resources was formed to pursue natural resource exploration because SLIP management felt that favorable tax laws provided them opportunities to achieve significant profits In this arena.

Their primary goal was to find and produce natural gas from shale, to capture the so-called “ Section 29” tax credits associated with such gas. Ingress passed this tax credit In 1978 as part of the Natural Gas Policy Act in order to stimulate drilling for natural gas found in shale. Although natural gas exploration was clearly riskier than their other investments, SLIP felt the risks could be managed by drilling only sites that were surrounded on three or four sides by existing wells. To date, SLUR had drilled four wells.

It wasn’t difficult operationally to drill the wells, but It was challenging to find enough high- quality investment opportunities. In the first five months of production, one of the wells had already paid back 52 percent of its initial investment well ahead of the argue payout. The other wells were also doing quite well and all were on schedule for meeting their target return on investment. SLUR hopes to drill 20 more wells in 1988. Formed. This gave SLUR full responsibility for choosing the sites and managing the well if gas was found. SLUR would retain about 25 percent ownership and sell the rest to several general partners.

As managing general partner, SLUR was responsible for hiring a general contractor who would do the drilling. Slur’s geologist, Brad Thomas, would determine whether there was enough gas to make it worth completing the well. If he decided to go ahead, the general contractor would be in charge of the day-to-day operations of the well. SLUR had entered into a Joint venture with Excel Energy of Bridgeport, West Virginia, in which it was agreed that Excel would act as the general contractor for all of Slur’s wells in West Virginia. Excel also agreed to take a small ownership interest in each of these wells.

The Bailey Prospect: Base Case Analysis Exhibit 1 is a copy of the spreadsheet developed by Lisa Weatherboard to analyze the Bailey Prospect. The Bailey Prospect is surrounded by four producing wells from the target gas formation. Thus, SLUR was pretty confident that they would hit the gas formation, but they were mindful that there is always a possibility that due to geological anomalies (e. G. , drilling into a fault), a well might fail and result

in zero production. Brad Thomas (the geologist) estimated the probability of this kind of failure at the Bailey Prospect to be about 10 percent.

If they were successful, SLUR would sell the gas to pipeline distributors who would pay a price for the gas that depends on the BTU content of the gas. [2] The BTU content of the gas would not be known until the well was producing, but once reducing, the BTU content would not change over the lifetime of the well. Brad Thomas estimated the BTU content of the gas to be 55 BTU per cubic foot; this was the average of the BTU contents at the nearby wells. The current price paid by the pipeline is $1. 90 per AMBIT (million BTU); the price paid by the pipeline would be tied to the market prices for gas and, hence, might change over time. 3] Lisa assumed that prices would grow with inflation over time. [4] The rate at which gas would flow from the well would not be known until the well was completed. Brad estimated that the gas would initially flow at a rate of 33, 000 Mac thousand cubic feet) per year and then decline following the schedule shown in Exhibit 1. The spreadsheet shown in Exhibit 1 is essentially an income statement over the life of the well. (The spreadsheet goes out 25 years; only the first 13 years are shown in the exhibit.) The gross revenue is the price per Mac of gas times the Mac of gas produced in a given year.

To get to net cash flows, royalties, expenses, and taxes must be deducted: 1) From gross revenue, a 12. 5 percent royalty payment to the owner of the mineral rights is deducted, leaving net revenue. This royalty rate was the standard argental pall to ten property owners In ten west Valhalla area. 2) Excel Energy would be paid approximately $300 per month to operate the

well. Lisa had budgeted an additional $3, 000 per year for other expenses associated with the lease that might be incurred but couldn't now be accurately forecast. These costs were increased annually to reflect inflation. 3) Local taxes of 4. Percent times the gross revenue would be paid to the county and a severance tax[5] of 3. 4 percent would be paid to the state of West Virginia. 4) Depreciation expense for year O equaled the intangible drilling cost[6], which as 72. 5 percent times the total well cost. The remainder of the drilling cost would be depreciated on a straight-line basis over seven years. 5) To compute profit after tax, depletion[7], and state and federal income taxes were subtracted from profit before tax. Numerically, depletion was the smaller of 50 percent times the profit before tax or 1 5 percent times the revenue.) The state income tax equaled the tax rate multiplied by the difference between profit before tax and depletion. This tax was then reduced by a credit equal to one- half of the severance tax paid to the state.) Federal income tax was calculated by multiplying the tax rate times the profit before tax less depletion and state tax paid. The federal tax was then reduced by an energy tax credit as allowed in Section 29 of the tax code: the tax credit was determined by multiplying the current tax credit rate ($0. 76 per AMBIT in year 1) by the amount of qualifying production that year.

The tax credit rate was increased each year with inflation, but its future value was in the hands of Congress and far from certain. The after-tax cash flow is given by adding back depreciation and depletion to the after-tax profit. Finally, there is the issue of the lease bonus. A lease bonus is a cash payment or bonus paid too landowner in exchange for the drilling and

mineral rights. The proposed drilling area at the Bailey Prospect lies on a farm where the owners Mr.. And Mrs.. Bryan Cotter had been reluctant to allow drilling on their land; this is why the surrounding areas were developed and this property was not.

Mr.. Cotter had recently passed away and Mrs.. Cotter (at the urging of her children) was now willing to allow drilling and production on her land. Though no offer had yet been made, SLUR had proposed offering Mrs.. Cotter a bonus of $40, 000; the lease bonuses for similar properties in the area had been in this range. Financially, if the well is successful, the lease bonus comes directly off the bottom line, providing no tax deductions or depreciation. [8] on ten Dad’s AT tense mummers, ten prospect looked good It NAS an rater-tax equity payback period of about 35 months and an internal rate of return of about 29%.

To calculate the net present value (NP), Lisa discounted the cash flows using a discount rate of 15 percent, which was Slice’s hurdle rate for projects like this. The result was an NP of approximately $79, 000. Your Assignment Your boss, Steve Bodily, had presented the results of Alias’s analysis to Henry Oysters, a potential general partner. Oysters was impressed with the base-case scenario, but was very concerned about the potential downside risks. “ What if the well doesn’t work? How do you know that it will produce that much gas? What if gas prices continue their recent decline?

Just about every number in here is a guess. ” Bodily was prepared for the first question and knew that, if the well failed, the pretax loss would be approximately $170, 000 the cost of drilling the well plus the lease bonus or

a net after-tax loss of Bodily was not prepared for the other questions but promised Oysters that he would get back to him with a complete description of the risks associated with the Bailey Prospect. The goal wasn't Just to evaluate the Bailey Prospect but, more generally, to get a better understanding of the risks associated with the kinds of investments SLUR was pursuing.

Since Lisa Weatherboard is out of town, Bodily came to you and asked you to examine the risks associated with the Bailey Prospect. Your report will go to SLIP as well as to Oysters. In your conversation with Bodily, he posed the following questions:) What are the key risks here? 2) What is the project's expected NP taking into account all of these risks? 3) How risky is this project? What is the chance that we have a negative NP on this? 4) How big lease bonus can we afford? Not that I plan to offer Mrs.. Cotter more than $40, 000, but it would be good to know how far we can go and still make money.) What if the Section 29 credit goes away? Congress has been making some noise about that lately. 6) What if the well fails? While we've got the crew out there, should we drill another well? 7) Finally, I know that you don't have time to run numbers for our whole portfolio f properties, but suppose we had 20 opportunities Just like the Bailey Prospect, how risky would this portfolio be? Which would the key uncertainties be? A qualitative discussion will suffice: we don't need hard numbers on this, but we should be prepared Tort ten question.

Bodily concluded, " Those are the kinds of things that come to mind. Of course, I haven't had much time to think about it and could be missing some

important issues. I've scheduled a meeting with Oysters and some of the SLIP partners for next Thursday. Could you prepare a 20-minute presentation on this for then? Good. Thanks. I'll be out of town until then. If you have any questions about doing these kinds of analyses, you might try Jack Grayson. He's done a lot of these risk analyses and will be at the meeting on Thursday. You might want to talk to Brad Thomas as well. Additional Information Fortunately, Brad Thomas (the geologist) was available and offered to help. As far as drilling another well in the event the first one fails, Thomas said, " Yeah, that might be a good idea. A second well would be cheaper to drill. Of course, it would also be less likely to succeed. If the second one fails too, it would be pointless to drill a third ell. " He estimated the cost of drilling the second well to be roughly 75% of the cost of drilling the first well " you don't have to truck all the drilling equipment out again and you don't have to pay another lease bonus. The cost of completing a second well (if successful) would be the same as the cost of completing the first. Thomas estimated the probability of the second well succeeding (given that the first fails) to be . 50. He also indicated that, if the first well fails, he would revise his estimated initial flow rate down by a third. The decline rate would remain the same. Thomas also indicated that it would not make sense to drill a second well if the first is successful since the two wells would be draining the same area. A second well would speed production you'd get roughly twice as much production at first but you probably double the decline rate as well and end up with about the same total amount of gas (maybe slightly more) and be stuck with twice the drilling cost. " On the other issues Thomas said, " Yeah, this business is pretty much a crap shoot.

I’m a geologist. I can’t tell you much about Congress or natural gas prices, but I did work up some ranges on the estimates I gave Lisa. See Exhibit 2.) I’ve found that I give better estimates if I think about the ranges before I give a particular value.

I actually keep track of my estimates and then later see how I did. While I don’t always get the right answer, my ranges are pretty good. ” These ranges, Thomas says, can be interpreted as 10th and 90th percentiles numbers such that there is a I-in-10 chance that the true value will be below and above these amounts. The base case numbers used in Alias’s spreadsheet can be interpreted as 50th percentiles or medians. “ Let me know if you need anything else. ” Jack Grayson at SLIP could only offer general advice. As far as developing ranges for the other uncertainties, use your Judgment.

I can send you some historical data on inflation and natural gas prices (see Exhibit 3), but looking forward we’ll have to guess. If it is important, I may be able to get you more information next week. I know a consultant won may De addle to Nell us Walt ten gas price Toreros t. He could probably get us more on inflation too. I also know a lawyer in D. C. Who has been working with the IRS on Section 29 issues. She might be able to tell us more about that. But I don’t want to call these people unless it is important.

Let’s talk on Monday ND we can decide then whether to call them. ” Grayson also suggested that you should be careful about the discount rate. “ The 15 percent rate that Lisa used is risk adjusted – it informally adjusts for the possibility that the well fails, uncertainty about operating costs, etc. Since

you are going to explicitly model these risks, you should use a lower discount rate. Because all of these risks with this investment – including natural gas prices – are pretty much uncorrelated with the market as a whole, I would suggest using a risk-free discount rate.

The yield of 5- to 10-year treasury bonds is currently around 9 percent why onto you use that rate instead. See you on Monday. ” [pick] [pick] *Note: The production decline rates – shown near the top of the spreadsheet – are highly correlated. If you have rapid decline in the first year, you are likely to have rapid decline in subsequent years as well. Similarly, if you have slow decline in the first year, you are likely to have slow decline in subsequent years. To capture this dependence, we need to vary all of the decline rates together.