Over the past few years, officials in Florida and other states that rely primarily on deep wells for drinking water have become aware of a potentially serious problem—the pollution of aquifers by the unrestrained use of fertilizers and pesticides. The results of a study conducted by the United States Geological Survey showed that, while the primary aquifer underlying Florida is not yet contaminated, one chemical commonly found in agricultural pesticides has caused extensive contamination of wells that tap water-bearing strata near the surface. To combat this potentially widespread problem, officials in Florida and elsewhere are lobbying for strict environmental regulation of commercial fertilizers and pesticides that do not adhere to newly proposed safety standards. As a result, companies specializing in agricultural chemicals have been working furiously to supply new products that will not be banned under the proposed regulations.

Environmental Sciences, Inc., a regional producer of agricultural chemicals based in Orlando, recently developed a pesticide that meets the new regulations. Now the firm must acquire the necessary equipment to begin production. The estimated internal rate of return (IRR) of this project is 24 percent, and the project is judged to have low risk. Environmental Sciences uses an after-tax cost of capital of 11 percent for relatively low-risk projects, 13 percent for those of average risk, and 15 percent for high-risk projects; so this low-risk project passed the hurdle rate with flying colors. The production-line equipment has an invoice price of $1,375,000, including delivery and installation charges. It falls into the modified accelerated cost recovery system (MACRS) five-year class, with current allowances of 0.20, 0.32, 0.19, 0.12, 0.11, and 0.06 in Years 1–6, respectively. Assume that if the decision is made to purchase the equipment, it will be sold for its book value on the first day of Year 5, hence a full year’s depreciation can be taken in Year 4. Environmental’s effective tax rate is 40 percent. The manufacturer of the equipment will provide a contract for maintenance and service for $75,000 per year, payable at the beginning of each year, if Environmental Sciences buys the equipment.

Regardless of whether the equipment is purchased or leased, Susan Baker, the firm’s financial manager, does not think it will be used for more than four years, at which time Environmental’s current building lease will expire. Land on which to construct a larger facility has already been acquired, and the building should be ready for occupancy at that time. The new facility will be designed to enable Environmental to use several new production processes that are currently unavailable to it, including one that will duplicate all processes of the equipment now being considered. Hence, the current project is viewed as a “bridge” to serve only until the permanent equipment can become operational in the new facility four years from now. The expected useful life of the equipment is eight years, at which time it should have a zero market value, but the residual value at the end of the fourth year should be well above zero. Susan generally assumes that assets’ salvage values will be equal to their tax book values at any point in time, but she is concerned about that assumption in this instance.

Currently, the company has sufficient capital, in the form of temporary investments in marketable securities, to pay cash for the equipment and the first year’s maintenance. Susan estimates that the interest rate on a four-year secured loan to buy the equipment would be 11 percent, but she has decided to draw down the securities portfolio
and pay cash for the equipment if it is purchased. Oceanside Capital, Inc. (OSC), the leasing subsidiary of a major regional bank, has offered to lease the equipment to Environmental for annual payments of $435,000, with the first payment due upon delivery and installation and additional payments due at the beginning of each succeeding year of the four-year lease term. This price includes a service contract under which the equipment would be maintained in good working order. OSC would buy the equipment from the manufacturer under the same terms that were offered to Environmental, including the maintenance and service contract. Like Environmental, OSC generally assumes that the most likely residual value for equipment of this type is the tax book value at the end of the lease term. Some OSC executives think, however, that the residual value in this case will be much higher because of the expanding nature of the business. OSC is not expected to pay any taxes over the next four years, because the firm has an abundance of tax credits to carry forward. Finally, OSC views lease investments such as this as an alternative to lending, so if it does not write the lease, it will lend the $1,375,000 that would have been invested in the lease to some other party in the form of a term loan that would earn 11 percent before taxes.

Susan Baker has always had the final say on all of Environmental’s lease-versus-purchase decisions, but the actual analysis of the relevant data is conducted by Environmental’s assistant treasurer, Tom Linenberger. Traditionally, Environmental’s method of evaluating lease decisions has been to calculate the “present value cost” of the lease payments versus the present value of the total charges if the equipment is purchased. However, in a recent evaluation, Susan and Tom got into a heated discussion about the appropriate discount rate to use in determining the present value costs of leasing and of purchasing. The following points of view were expressed:

1. Susan argued that the discount rate should be the firm’s weighted-average cost of capital. She believes that a lease-versus-purchase decision is in effect a capital budgeting decision, and as such it should be evaluated at the company’s cost of capital. In other words, one method or the other will provide a net cash savings in any year, and the dollars saved using the most advantageous method will be invested to yield the firm’s cost of capital. Therefore, the average cost of capital is the appropriate opportunity rate to use in evaluating lease-versus-purchase decisions.

2. Tom, on the other hand, believes that the cash flows generated in a lease-versus-purchase situation are more certain than are the cash flows generated by the firm’s average project. Consequently, these cash flows should be discounted at a lower rate because of their lower risk. At the present time, the firm’s cost of secured debt reflects the lowest risk rate to Environmental Sciences. Therefore, 11 percent should be used as the discount rate in the lease-versus-purchase decision.

To settle the debate, Susan and Tom asked Environmental’s CPA firm to review the situation and to advise them on which discount rate was appropriate. This led to even more confusion, because the firm’s accountants, Michelle Nobelitt and Bill Orr, were also unable to reach agreement on which rate to use. Michelle agreed with Susan that the discount rate should be based on the average cost of capital, but on the grounds that leasing is simply an alternative to other means of financing. Leasing is a substitute for “financing,” which is a mix of debt and equity, and it saves the cost of raising capital; this
cost is the firm’s weighted-average cost of capital. Bill, however, thought that none of the
discount rates mentioned so far adequately accounted for the tax effects inherent in any
capital budgeting decision and suggested using the after-tax cost of secured debt.

In the last lease-versus-purchase decision, the weighted-average cost of capital (13 percent) was used, but now Susan is uncertain about the validity of this procedure. She is beginning to lean toward Bill’s alternative, but she wonders if it would be appropriate to use a low-risk discount rate for evaluating all the cash flows in the analysis. Susan is also concerned that using a discount rate based on the after-tax cost of a secured loan might be inappropriate when the funds used to purchase the equipment would come from internal sources, specifically marketable securities. Perhaps the discount rate should reflect the seven percent return earned on the firm’s marketable securities portfolio. Conversely, the cost of equity capital might also deserve consideration, because the funds used to buy the equipment could alternatively be used to increase the next quarterly dividend payment.

Susan is particularly concerned about the risk of the expected residual value. While the company is almost certain of the other cash flows and the tax shelters, the salvage value at the end of the fourth year is relatively uncertain, having a distribution of possible outcomes that makes its risk comparable to that of the average capital budgeting project undertaken by the firm. The Production Department head estimates that the equipment’s residual value could be as low as $0 when dismantling charges are considered or as high as $467,500. Further, he believes that the probability of occurrence of the extreme values is 0.25 each while the probability of the most likely residual value, $233,750, is 0.50.

To settle all the disputes, the parties to the lease-versus-buy analysis agreed that an outside consultant should be hired to conduct the analysis. Assume you are that consultant. You have been asked to conduct a thorough analysis of the lease decision. At a minimum, you should address all of the issues being debated by the company’s staff. In addition, Bob Ramy, a prominent member of the board, believes that the lease should be characterized as an operating lease and not shown on the balance sheet in order to make the firm look better to outside investors. He asks you to comment on the lease’s accounting classification.

Ramy also asks you to evaluate the lease from the point of view of the lessor, Oceanside Capital, in order to gain an understanding of the lease’s profitability to them. Such information will be useful to Environmental Sciences when negotiating the final terms of the lease. Thus, based on the original case assumptions, determine the range of lease payments that would be acceptable to both the lessor and the lessee. Susan is also considering asking Oceanside to include a cancellation clause in the lease agreement, and Ramy is concerned about the impact of such a clause on the riskiness to the parties, hence on the terms of the lease. Susan is also considering negotiating end-of-year rather than beginning-of-year lease payments, and Ramy wonders what effect that might have on the size of the lease payments. Lastly, Ramy is concerned about the effect of Environmental’s tax rate on its lease-versus-purchase decision. The firm may have substantial tax credits available over the next few years, which would bump it down into a much lower tax bracket.