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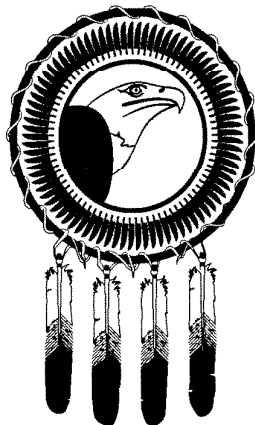
*Apache Cattle: The Reservation as Marketplace, a Sale Yard Feasibility
Study*

by

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John F. Kennedy School of Government
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Executive Summary

APACHE CATTLE: THE RESERVATION AS MARKETPLACE, A Sale Yard Feasibility Study

by

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The San Carlos Apache cattle raising industry is based on a network of five independent ranch associations and two tribally managed ranches. Livestock from all of these ranches are currently trucked to market at distant auction yards and sold to the highest bidder. In contrast, ranchers of the White Mountain Apache reservation to the north auction their cattle from a common sale yard on their reservation. This study examines the economic feasibility of building a sale yard for similar purposes on the San Carlos reservation.

Though traditionally known more for their terrifying raids, the San Carlos Apache, like many other Native American tribes, suffer from a legacy of cultural destruction, economic dependence and general mismanagement on the part of their federal overseers. However, more recently, efforts to regain tribal political authority and promote economic self-sufficiency have prompted examination of the economic resources available on reservation land. At San Carlos, cattle ranching is a mainstay of the local economy.

This study was undertaken at the request of the Business Manager of the San Carlos Apache Reservation. He is interested in exploring the potential for economies of scale in the cattle raising industry to benefit reservation ranchers, and the tribe more generally.

Building a sale yard technically makes economic sense for the tribe. The sale yard would lower annual expenses sufficiently to compensate for initial construction costs and the cost of capital. Indeed, the sale yard would generate savings beyond these returns. For example, the tribe might borrow half of the amount necessary to build the yard at 12% interest, and invest their own money, while stipulating a 15% return on that investment, to pay the other half. Average annual savings, after meeting interest and return requirements, would be \$8,366, or 5.4% of current marketing expenses.

"Payback" in real terms for the \$150,000 capital cost of the sale yard, which is estimated conservatively to last ten years, is five years. Net present valuations of projected cost and revenue streams also favor building the sale yard over maintaining the status quo.

Yet there are clearly other important issues to consider which are not incorporated into formal economic evaluation of this project. Employment (679 additional cowboy/days of employment per year are forecast as a result of sale yard operation) and potential trade considerations suggest additional benefits of building the sale yard. But the critical importance and complexity of a well run auction, and the logistical challenge of driving (ie. herding on horseback) cattle spread widely over the vast and rugged territory of the reservation to a central location, make the decision more difficult.

In addition, in the course of evaluating the economic feasibility of this project, it was necessary to make various economic assumptions. These are all explicitly stated, and naturally open to question. Indeed, assumptions about the cattle market, operating expense levels, and sale yard utilization rates must be carefully considered before a reasonable decision can be made.

Finally, implementation of the sale yard project will require the cooperation of all reservation ranchers, tribal leaders and managers. Strategies to rally this support are not the subject of this report. But without the committment of all of these groups, the sale yard project is bound to be less profitable or even infeasible.

In conclusion, if the assumptions in this study hold, and only given committment to the endeavor by tribal ranchers, managers, and political leaders, then a tribal cattle yard should be built and operated on five acres of reservation land. That sale yard holds great potential for the economic development of the San Carlos Apache Reservation.

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I. INTRODUCTION

The San Carlos Apache reservation is a vast, dry and rugged area of 1.8 million acres in southeastern Arizona. Though sparsely populated with less than 10,000 tribal members, the reservation is also home to more than 15,000 head of cattle and a healthy cattle raising industry.

Yet the San Carlos people were not traditionally ranchers. Once a proud network of competing bands of hunter/gatherers, the Apache acquired a reputation for ferocity from raiding their neighbors in times of scarcity. This reputation was reinforced by their tenacious fighting with the Sonoran Mexicans between 1820 and 1847, and then with encroaching American forces and settlers from 1850 to 1863. "Pacification" by war and deliberate strategies to encourage dependency culminated in the establishment of the San Carlos reservation in 1871.

Since the turn of this century increasing emphasis has been placed by federal overseers on restoring the initiative and self-reliance of the Apache tribe. A governing tribal council was created in 1936. Economically, this effort eventually led to the development of farming, ranching and logging enterprises on the reservation. However, the sense of powerlessness resulting from dependency on federal funds and the erosion of tribal authority during the early reservation period, have slowed progress

in achieving greater economic self-sufficiency (Gil 1987). Nevertheless, efforts of the tribe to regain control of their destiny have become increasingly successful.

The establishment of increased tribal authority and economic growth suggest the opportunity for a resurgence of communal economic activity in the form of cooperative cattle marketing practices for tribal benefit. This type of cooperation is today a precondition for the construction of a cattle sale yard.

II. BACKGROUND: SAN CARLOS CATTLE RANCHING

In 1923, tribal cattle raising was introduced on the reservation by James B. Kitch, an innovative (but appointed) Reservation Superintendent, as a means to increase tribal economic independence and self-sufficiency. A Tribal Ordinance passed in 1956 reformed the structure of the cattle industry by eliminating Bureau of Indian Affairs agents from the direct management of the cattle industry.

Since then the cattle industry has grown more quickly and today provides full-time or seasonal employment for approximately 200 tribal members. The estimated size of total cattle holdings on the reservation is 15,000. Of that total, approximately 9,000 are sold each year, amounting to approximately \$2.8 million in gross sales in recent years. Though presently only a small fraction of total tribal income (which is made up primarily of federal transfer payments and off-reservation employment), cattle raising and timber operations are the mainstays of local production and employment.

The San Carlos Reservation is home to five independent ranches

owned by groups of tribal members and managed by separate "ranch associations". The association ranches range in size from 95,562 to 485,811 acres. Cattle are herded on the open range in traditional style by cowboys on horseback.

Two more ranches are managed by the tribal Business Office on behalf of the entire tribe. One of these has a small "registered" (closed range grazing and pedigreed) herd of approximately 1400 cattle.

These substantial volume and sales figures have prompted examination of potential economies of scale that might be exploited collectively by tribal cattle owners. The focus of this study is in this vein: it compares costs and benefits of current and alternative cattle marketing strategies.

III. OPTION 1: CONTINUE CURRENT MARKETING PRACTICES

III.A. The Roundup and Sales Process

Cattle are currently marketed independently by each ranch, according to the wishes of individual owners and ranch association management. The process begins with "roundups" by the cowboys of segments of the cattle population on a particular ranch. Large roundups currently last approximately one month, ususally in the spring and fall. During the roundup cattle are branded, dehorned, castrated and inoculated, as necessary. The scheduling of roundups and sales of cattle is currently largely uncoordinated amongst the different ranches. Once the cattle are "rounded up", large trucks are leased to transport cattle from the ranches to periodically scheduled sales at auction houses in other parts of Arizona. Often a few cattle die en route due to

the stresses of the journey. At the auction houses, the cattle are tagged for ownership, and frequently kept overnight in corrals. On the day of the auction the animals are led out in groups and sold as lots to the highest bidder.

III.B. Current Marketing Expenses

Recent data provided by the tribe shows that marketing expenses consistently amount to approximately six percent of gross sales, or \$153,957 annually. Shipping costs make up approximately 30% of this annual total, while 50% goes to the auction house as a commission on gross sales. The remainder is split between feed costs (7%), Beef Counsel fees (5%), yardage fees (5%), mandatory state inspection fees (2%), and insurance fees (1%). Chart 1. summarizes current annual marketing expenses.

Chart 1.

Option 1 - Current Marketing Expenses

\$ 48,253	Trucking
72,947	Auction Commission
10,644	Feed
9,070	Yardage Fee
9,070	Beef Counsel Fee
2,838	Inspection
1,135	Insurance
\$ 153,957	Total

IV. OPTION 2: SALEYARD CONSTRUCTION AND USE

IV.A. The New Roundup and Sale

Option 2 calls for the coordination of cattle roundups in order to hold two major auctions totaling five sale days (three in the spring, two in the fall). The sales would have roughly equal daily volume of 1750 head. This plan requires ranchers to

"drive" (ie. walk - the reservation does not have the trucking capacity to transport all cattle to be sold to the saleyard) the animals twice yearly to a central reservation location, probably in Calva or Dripping Spring, where the sale yard is to be built. Arrivals at the sale yard would be staggered, since the sales will last more than one day, and the yard will not be able to hold all the reservation's cattle at one time. The drive to the sale yard will add an average of three days to the roundup.

Once at the sale yard, the process would be similar to the current process. A contracted professional auctioneer from an outside auction would manage and publicize the sale. The tribe would provide the labor, feed and capital to build and run the sale yard.

IV.B. The Capital Costs of Building

The cost of building a sale yard capable to handle the volume projected at San Carlos turned up figures substantially lower than expected. Total costs excluding land amount to \$150,000 (see Chart 2. below).

The issue of land cost is ambiguous, since tribal land is likely to be leased at very preferential rates or granted outright, considering the communal nature of its prospective use. Approximately 5 acres are necessary for the yard. Several possible sites are available; prospects for alternative economic uses are low.

Chart 2. Capital Cost Estimate of Building Sale Yard

\$ 51,000	Panels, Gates, Posts
25,000	Scales
12,000	Bleachers
10,000	Water System
8,000	Canopy/Sale Shed
5,000	Additional Equipment (eg. lighting, etc.)
39,000	Outside Labor
\$ 150,000	Total

IV.C. Operating Expenses

The most significant differences between the operational expenses of the two options are the elimination of trucking and yardage fees and the addition of labor costs if a saleyard is built and operated. Three additional days of roundup are required of 105 cowboys, and seven days operating the sale yard itself for seven cowboys, all at prevailing wages of \$20 plus food (estimated at \$5) per day. A slight increase in auction commissions (from 2.57% to 3% of the gross sales, when the auctioneer is "bonded" and assumes the risk of non or false payment by buyers), and new electricity and maintainance charges also distinguish the "build" option.

Potential weight loss by the cattle and deaths from the stress of being driven to the yard is not incorporated into the operational cost calculations outlined in Chart 3. These issues need further study.

Chart 3.

\$ 85,152	Auction Contract
13,580	Tribal Labor
10,644	Feed
9,070	Beef Counsel Fee
2,838	Inspection Fee
1,135	Insurance
475	Electricity & Maintenance (painting)
\$ 123,140	Subtotal

Discount rates in essence represent the "cost" of capital invested either as interest paid on borrowing or as the foregone yield of a chunk of investment capital. In this study, three alternative debt to equity proportions were used to calculate discount rates and to amortize capital costs. Under financing Alternative 1, the tribe borrows half (\$75,000) of the capital necessary to build the sale yard from a commercial bank at 12%, and pays the other half while requiring a yield of 15% after tax (reservation ranching income is not taxed). Under Alternative 2 the tribe pays the full capital cost. Finally, under Alternative 3 the tribe borrows the full amount of the capital costs.

At a stable 5% inflation rate, these options result in average real costs of capital after inflation of eight, ten and seven percent, respectively. At 10% inflation over the ten year period, however, the corresponding percentages and amortized capital costs are much lower (see Appendix 1a.) results in a cost of capital of 7% after inflation. Chart 4. shows the effect of these three options on annualized cost of capital calculations, and their subsequent impact on operating expenses.

Chart 4.

Amortized Capital Costs
5% projected inflation

Alternative 1 (borrow 1/2, pay 1/2)	Alternative 2 (pay all)	Alternative 3 (borrow all)
\$ 22,451	\$ 23,915	\$ 21,029
Adding other annual operational expenses of \$ 153,957 results in total annual operating expenses of:		
\$ 145,591	\$ 147,055	\$ 144,169

V. COMPARISON & RESULTS

V.A. Assumptions

In evaluating the possibility of building a sale yard on the reservation certain assumptions were made in order to allow comparison with the present marketing system. In the most recent composite^{*} year for which data was available, 9,070 head of cattle were sold for a total of approximately \$2.8 million. The analysis in this study takes this to be a stable average annual sales figure, representative of the mean of sales for the foreseeable future. This assumption is open to question, considering the historic volatility of agricultural commodities.

Additional assumptions are that the costs of feed, insurance, Beef Council fees, and inspection fees will be roughly the same for both marketing options. Variation in these expenses does not have great impact on the results of this analysis, since they make up a very small proportion of total operating expenses.

The saleyard itself is assumed conservatively to last 10 years. Survival beyond the ten year horizon will generate increased cost savings, making results more favorable to choosing option 2 (see appendices 1 and 2 for data assuming a 15 year sale yard "life").

Finally, for the purpose of this report it is assumed that, if built, all reservation ranches and owners will choose to sell their cattle exclusively at the reservation sales and that sale prices at reservation auctions will match those held off-reservation.

* Sales and expense data provided by the tribal ranch was from different years for different ranches. Useful information was extrapolated nevertheless, since expenses formed a relatively constant proportion of gross sales.

V.B. Savings and payback

Although building a sale yard adds substantial one-time capital costs, if the tribe pays half of the costs and borrows the rest at prevailing commercial rates, it will save \$8,366 per year in operating expenses, after projected inflation of 5% is taken into account. Savings are higher at higher projected inflation rates (see Appendix 1a.) Chart 5. compares operating costs of Options 1 and 2, under all three financing alternatives described in section IV.C., above.

Chart 5. Annual Operating Cost Savings Under Option 2.

Financing Alternative	1	2	3
Option 1. Op. Expenses	\$153,957	\$153,957	\$153,957
Option 2. " "	145,591	147,055	144,169
Difference (Savings from Option 2)	8,366	6,902	9,788

Under any of the financing schemes, Option 2, the option to build and operate the sale yard, generates savings, on top of the assured rate of return incorporated into the financing alternatives. The general decisionmaking rule concerning this type of comparison is to choose the option with the lower annual operating cost (including amortized capital costs). But the comparison of options in this study includes uncertainties, hence risk, and other non-financial effects.

Another way to evaluate the "build" option is to consider the "pay back" period, or time over which the initial cost of building the sale yard is "paid back" in savings over the current alternative. By this type of analysis, the real cost of con-

struction (\$150,000) will be paid back in five years (at \$30,817 per year). Total savings after inflation of Option 2 over Option 1 amounts to \$281,438 (see appendix B for the streams of savings figures). Amortized costs are not incorporated into this calculation, since they include the notion of payback internally, in the cost of money and return investment calculations.

V.C. Comparison of Net Present Values

Present value is the sum which, if invested today at a certain interest (discount) rate, will yield a given amount in the future. Calculation of the net present value of the stream of costs or net revenue of the two options over a given time period, here ten years, is helpful in judging which option is more attractive. The basic decision rule in these types of calculations is that projects with a higher net present value of revenue, and correspondingly lower net present value of costs, should be chosen over their competitors. In this case, Option 2 has higher net present value of revenues and lower net present value of costs over ten years than Option 1, at any real discount rates up to 14%. (Seven, eight and 10% were the discount rates of the different financing options outlined above.) The cost savings of Option 2 has a present value of \$39,362 at a real discount rate of 8% (financing alternative 1). This means that to achieve the total savings associated with Option 2 in ten years, one would have to invest \$39,362 today at a nominal rate of interest of 14%. Thus savings are obviously substantial under Option 2.

Net present value data supports the conclusion that if the conditions outlined hold, it makes economic sense to build and

operate the saleyard (see Appendix 2).

VI. OTHER SIGNIFICANT COSTS & EFFECTS OF OPTION 2

Formal analysis and discounting techniques are useful tools with which to evaluate the alternatives. But attention must also be given to factors not taken into account by these methods. For example, building and operating the saleyard will provide additional employment on the reservation. In total, if the assumptions of this study hold, 679 cowboy days per year of additional labor is required if the sale yard is built and operated (This is an annual operating employment figure. Additional local labor might be necessary during construction, if the job were not contracted out completely.) In an area where unemployment is extremely high, additional employment represents a significant benefit beyond that represented in simple cost calculations.

Building the sale yard will also bring reservation ranchers together in a way that could lead to further productive collaboration. The success of the sale yard may eventually stimulate other plans to exploit other economies of scale in the cattle industry. For example, the construction and operating of a cattle "finishing" (slaughter) plant or other forms of vertical integration may become practical.

In addition, reservation sales will draw a regular group of buyers on to the reservation for the auctions. Over the long term this could help stimulate the development of export-oriented retail, tourist and hotel services on the reservation.

On the other hand, while the construction and operation of the sale yard has positive effects not reflected in the formal cost/

benefit figures outlined above, it also has its drawbacks. Most notably, the time, effort and uncertainty involved in planning a successful sale must be weighed as potential costs before a decision can be reached on whether to build.

VII. IMPLEMENTATION CONSIDERATIONS

Implementation strategies and consideration of how to divide capital costs among potential sale yard users is not the subject of this report. However, brief mention of some such considerations is called for.

By all accounts, a well run auction is crucial to the long-term viability of a saleyard. The many steps of the sales process demand careful planning on site. Fortunately, contracted auctioneers provide valuable publicity. In addition, the advice of experienced Indian cattle sales coordinators should be solicited, such as Bill Perez, tribal herd manager at White Mountain. The Navajo and Hopi tribes are also reportedly conducting on-reservation sales.

In addition, close attention must be given to scheduling decisions, to avoid conflicts with other major sales and to assure maximum participation by reservation ranchers. Pressure exists at the ranch level for frequent sales in order to maintain the cash flow of individual owners. But in order to draw the major buyers to the reservation, enough cattle (1500-2000 head, by most estimates) must be offered for sale.

The assumption of full participation of reservation ranchers in the reservation auction is important. One way to add incentive for full participation is to spread the costs of construction

evenly among all cattle owners. But the primary attraction of the sale yard to cattle sellers will be the cost savings achieved, and thus higher profits to be made, provided auctions are run successfully.

VIII. CONCLUSION

Formal analysis of economic costs and benefits suggest that building and operating a cattle sale yard on the San Carlos Reservation is preferable to continuing the current cattle marketing system. The net present value of the "build" option is higher, and when capital costs are amortized at different financing rates, this option consistently generates added savings, even beyond reasonable rates of return integrated in these functions. "Payback" of investment in real terms takes five years, just half the estimated life of the yard.

These calculations do not tell the whole story, however. Significant uncertainty and risk is associated with such a large, complex undertaking. Assumptions were made and stated in this report which need to be carefully considered. Significant additional impacts, both positive and negative, do not show up in the figures. They too must be discussed and weighed by the tribe before an ultimate decision is reached. If the assumptions hold, and only given the commitment of tribal ranchers, managers and leaders, then a tribal cattle sale yard should be built and operated. It has great potential for the economic development of the San Carlos Apache reservation.

APPENDIX 1.

San Carlos Apache Sale Yard

AMORTIZED CAPITAL COST CALCULATIONS

All Calculations After Tax (Tribal ranching is untaxed)

Inflation assumed at 5%/yr.

1a. 10 years, Tribe Pays Half, Borrows Half

	NOMINAL	
	Equity Proportion	
	50%	
	Return	
	After Tax	
Equity	15%	
Debt	12%	
	Weighted Average	14%
	Inflation Rate	5%
	REAL Average	8%

Cap. Cost	\$150,000	
Term	10	
Annualized		
Capital	\$22,451	
Operating	\$123,140	
	Current Difference	
Total	\$145,591	\$153,957 \$8,366

1b. 15 years, Tribe Pays Half, Borrows Half

Cap. Cost	\$150,000	
Term	15	
Annualized		
Capital	\$17,626	
Operating	\$123,140	
	Current Difference	
Total	\$140,766	\$153,957 \$13,191

2a. 10 years, Tribe Pays All

	NOMINAL	
	Equity Proportion	
	100%	
	Return	
	After Tax	
Equity	15%	
Debt	12%	
	Average	15%
	Inflation Rate	5%
	REAL Average	10%

Cap. Cost	\$150,000	
Term	10	
Annualized		
Capital	\$23,915	
Operating	\$123,140	
	Current Difference	
Total	\$147,055	\$153,957 \$6,902

2b. 15 years, Tribe Pays All

Cap. Cost	\$150,000	
Term	15	
Annualized		
Capital	\$19,188	
Operating	\$123,140	
	Current Difference	
Total	\$142,328	\$153,957 \$11,629

3a. 10 years, Tribe Borrows All

	NOMINAL	
	Equity Proportion	
	0%	
	Return	
	After Tax	
Equity	15%	
Debt	12%	
	Average	12%
	Inflation Rate	5%
	REAL Average	7%

Cap. Cost	\$150,000	
Term	10	
Annualized		
Capital	\$21,029	
Operating	\$123,140	
	Current Difference	
Total	\$144,169	\$153,957 \$9,788

3b. 15 years, Tribe Borrows All

Cap. Cost	\$150,000	
Term	15	
Annualized		
Capital	\$16,124	
Operating	\$123,140	
	Current Difference	
Total	\$139,264	\$153,957 \$14,693

APPENDIX 1A.

San Carlos Apache Sale Yard

AMORTIZED CAPITAL COST CALCULATIONS

All Calculations After Tax (Tribal ranching is untaxed)

Inflation assumed at 10%/yr

1a. 10 years, Tribe Pays Half, Borrows Half

2a. 10 years, Tribe Pays All

3a. 10 years, Tribe Borrows All

	NOMINAL	
	Equity Proportion	
	50%	
	Return	
	After Tax	
Equity	15%	
Debt	12%	
	Weighted Average	14%
	Inflation Rate	
	10%	
	REAL Average	3%

	NOMINAL	
	Equity Proportion	
	100%	
	Return	
	After Tax	
Equity	15%	
Debt	12%	
	Average	15%
	Inflation Rate	
	10%	
	REAL Avg.	5%

	NOMINAL	
	Equity Proportion	
	0%	
	Return	
	After Tax	
Equity	15%	
Debt	12%	
	Average	12%
	Inflation Rate	
	10%	
	REAL Avg.	2%

Cap. Cost	\$150,000	
Term	10	
Annualized		
Capital	\$17,748	
Operating	\$123,140	
	Current Difference	
Total	\$140,888	\$153,957 \$13,069

Cap. Cost	\$150,000	
Term	10	
Annualized		
Capital	\$18,999	
Operating	\$123,140	
	Current Difference	
Total	\$142,139	\$153,957 \$11,818

Cap. Cost	\$150,000	
Term	10	
Annualized		
Capital	\$16,541	
Operating	\$123,140	
	Current Difference	
Total	\$139,681	\$153,957 \$14,276

1b. 15 years, Tribe Pays Half, Borrows Half

2b. 15 years, Tribe Pays All

3b. 15 years, Tribe Borrows All

Cap. Cost	\$150,000	
Term	15	
Annualized		
Capital	\$12,731	
Operating	\$123,140	
	Current Difference	
Total	\$135,871	\$153,957 \$18,086

Cap. Cost	\$150,000	
Term	15	
Annualized		
Capital	\$14,011	
Operating	\$123,140	
	Current Difference	
Total	\$137,151	\$153,957 \$16,806

Cap. Cost	\$150,000	
Term	15	
Annualized		
Capital	\$11,516	
Operating	\$123,140	
	Current Difference	
Total	\$134,656	\$153,957 \$19,301

APPENDIX 2.

OPTION 1: Status Quo (sell off-reservation)
 OPTION 2: Build Saleyard (assume lasts 10 years)

Annual Costs		Annual Costs	Capital Cost Estimate		
48253	Trucking	175	Electricity	51000	Panels,Gates,Posts
72947	Auction Commission	13825	Labor	25000	Scales
9070	Yardage Fee	85152	Auction Contract	12000	Bleachers
10644	Feed	300	Maintenance	10000	Water System
2838	Inspection	10644	Feed	8000	Canopy/Sale Shed
9070	Beef Counsel	2838	Inspection	5000	Additional Equip.
1135	Insurance	9070	Beef Counsel	39000	Labor
		1135	Insurance		
153957	Total	123140	Total	150000	Total

COMPARISON OF NET PRESENT VALUES - Over 10 years

COMPARISON OF NET PRESENT VALUES - Over 15 Years

gross revenue = \$2,838,400/yr.

Year	Real Dollar Streams of:				
	Net Revenue		Costs		
	Option 1	Option 2	Option 1	Option 2	opt1-opt2
1	2684443	2534443	153957	303957	-150000
2	2684843	2715260	153957	123140	30817
3	2684843	2715260	153957	123140	30817
4	2684843	2715260	153957	123140	30817
5	2684843	2715260	153957	123140	30817
6	2684843	2715260	153957	123140	30817
7	2684843	2715260	153957	123140	30817
8	2684843	2715260	153957	123140	30817
9	2684843	2715260	153957	123140	30817
10	2684843	2715260	153957	123140	30817
total	26848030	26971783	1539570	1412217	127353

Year	Real Dollar Streams of:				
	Net Revenue		Costs		
	Option 1	Option 2	Option 1	Option 2	opt1-opt2
1	2684443	2534443	153957	303957	-150000
2	2684843	2715260	153957	123140	30817
3	2684843	2715260	153957	123140	30817
4	2684843	2715260	153957	123140	30817
5	2684843	2715260	153957	123140	30817
6	2684843	2715260	153957	123140	30817
7	2684843	2715260	153957	123140	30817
8	2684843	2715260	153957	123140	30817
9	2684843	2715260	153957	123140	30817
10	2684843	2715260	153957	123140	30817
11	2684843	2715260	153957	123140	30817
12	2684843	2715260	153957	123140	30817
13	2684843	2715260	153957	123140	30817
14	2684843	2715260	153957	123140	30817
15	2684843	2715260	153957	123140	30817
total	40272245	40548083	2309355	2027917	281438

Real Discount Rate	Net Present Value				
	Net Revenue:		Costs:		
	Option 1	Option2	Option1	Option2	opt1-opt2
7%	18856839	18901862	1081330	1033872	47458
8%	18015144	18052192	1033064	993703	39362
10%	16496834	16519718	946000	921021	24978
14%	14004100	14004499	803058	800924	2134
15%	13474258	13470029	772675	775244	-2569

Real Discount Rate	Net Present Value				
	Net Revenue:		Costs:		
	Option 1	Option2	Option1	Option2	opt1-opt2
7%	24452945	24561367	1402228	1290537	111631
8%	22980486	23073787	1317792	1221438	96355
10%	20420765	20488104	1171010	1100992	70018
15%	15698922	15719898	900244	877278	22966
18%	13669747	13671722	783884	780212	3673
19%	13090590	13087288	750674	752361	-1687

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