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Procedural Guide I
Internal Rate of Return Analysis

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ECONOMIC ANALYSIS FOR INVESTMENT DECISION-MAKING

PROCEDURE GUIDE I

INTERNAL RATE FOR RETURN ANALYSIS

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SECTION I

GUIDE TO MANUAL

The basic purpose of this volume is to facilitate the gathering, organizing, and processing of necessary information and data for undertaking an Internal Rate of Return (IRR) analysis. The step-by-step procedures outlined represent a systematized process for making a realistic analysis and subsequent useful deductions about the economic viability of a project.

This manual covers four major areas: manual budgeting procedures, manual calculation of the IRR, computerized budgeting process, and computerized calculation of the IRR.

Manual Budgeting Process

The manual budgeting process is described in Sections III through VI. These sections also provide a general description of the budgeting process which covers fixed investment, revenues, operating costs, and working capital investment. A series of tables enables the user to perform the budgeting process in an organized manner.

The budgeting process begins with budgeting investment outlays (Section III), in which procedures for fixed investment and working capital budgeting are presented. The user should note that after completing the fixed investment budgeting, the next step is to construct revenue budgets. Working capital budgets cannot be constructed until revenues and operating costs have been calculated, since revenue and operating cost information is needed to develop the working capital requirements.

Sections IV and V contain the procedures for budgeting revenues and operating costs, respectively. Once these have been completed, the user returns to Section III to construct the working capital budgets. When this is completed, the user proceeds to Section VI to summarize the investment, revenue, operating cost, and net revenue schedules.

Manual Calculation of the IRR

Once the budgeting process has been completed, the IRR can be calculated. There are two methods for calculating the IRR. Section VII explains how to derive the IRR by graphical interpretation of the net present values of the capital investment and net revenue schedules. Section VIII explains how to derive the IRR by using a mathematical computation of the present value of net outflows.

If it is necessary to test the base case IRR in order to determine the impact of changing situations, then a sensitivity analysis can be applied. Section IX describes the manual process of conducting a sensitivity analysis to determine the resulting changes to the IRR under different circumstances.

Computerized Budgeting Process

Computerization of the previously-described budgeting process is set forth in Section X. This section develops the budgeting process on a commercial spreadsheet program in order to simplify and speed the budgeting process. The resulting aggregated information is collected in a summary file to be used in computing the IRR.

The user wishing to computerize the budgeting process should first read and become familiar with the design set forth in Sections III through VI. In this manner, the user will gain an understanding of how to structure the computerized process.

Computerized Calculation of the IRR

Section XI describes a computerized IRR program which accepts summarized data from either the manual budgeting process or the computerized budgeting process.

SECTION II

INTERNAL RATE OF RETURN ANALYSIS

The principal measure of economic soundness used in this manual is the annual IRR on investment based on the time flow of money into and out of the enterprise. The IRR is calculated by solving for r in the following equation, hereafter referred to as equation A.

$$I_0 + \frac{I_1}{(I+r)} + \frac{I_2}{(I+r)^2} + \ldots + \frac{I_n}{(I+r)^n} = B_0 + \frac{B_1}{(I+r)} + \frac{B_2}{(I+r)^2} + \ldots + \frac{B_n}{(I+r)^n}$$

where I = net investment each period
B = net benefit each period
0,1,2,n = periods starting with the present

The IRR can be defined as the interest rate that equates the present worth of future returns to the investment outlay. It is that interest rate where the present net worth of benefits is equal to the present net worth of investment, or

$$PW_b = PW_i$$

where PW_b = present net worth of benefits
PW_i = present net worth of investment

The primary objective of IRR analysis is to measure the potential return to capital investment, regardless of how the enterprise is financed and how the earnings are distributed. The accuracy of such an analysis is dependent on the quality of data used in the analysis, as well as the precision with which these data are analyzed and evaluated. In equation A, I is the schedule of total investment, including replacement of assets as needed. B is the schedule of net earnings before depreciation, interest payments, and income tax payments. Depreciation is deleted because salvage value is calculated for capital investment at the end of the planning horizon. Interest costs for borrowed capital and income tax payments are deleted because the purpose of calculating rates of return is to determine the earning power of capital invested. Including interest payments on borrowed capital would understate the rate of return and thereby create an invalid comparison to the opportunity cost of capital. The same applies to income tax payments. The determination of the IRR is not concerned with the cost of capital or with the manner in which the returns to capital will be distributed, only with the earning power of the capital invested.

The IRR is used to measure the rate of return on a project that generates internal revenue, in other words revenue which accrues directly to the project in question. It does not measure any benefits which accrue to other beneficiaries. For example, a rice mill project that generates revenues through sales would be analyzed by the IRR. The benefits measured, in such a case, would be projected net revenue from sales of rice stored and processed by the mill, as well as sales of by-products.

The economic potential for any enterprise under study is determined by comparing the calculated IRR to the relevant opportunity cost of capital. If the calculated IRR is higher than the relevant opportunity cost of capital, this indicates that the venture is feasible. If the calculated IRR is lower than the opportunity cost of capital, this indicates that the venture is infeasible. The greater the differential, the more conclusive the findings.

The relevant opportunity cost of capital is defined by the net earning power of capital in alternative investments. The opportunity cost of equity capital is defined by the earning power of venture capital if placed in alternatives available to the owners of the enterprise under study. The opportunity cost of total capital in the enterprise is the net earning power of capital of alternative investments in the society. It usually is approximated closely by the prevailing market rate of interest on relatively risk-free capital loans, after adjustment for the anticipated rate of inflation in the economy (in order to adjust the market rate of interest to real terms). For example, if the prevailing annual market rate of interest on relatively risk-free loans is 20 percent, and the anticipated annual rate of inflation is 5 percent, then the opportunity cost for total capital investment in the enterprise is approximately 25 percent per year.

Prior Analyses

Before beginning an IRR analysis of any project, three other analyses should have already been performed. These analyses, in their order of execution, are (1) market feasibility, (2) technical feasibility, and (3) project plan. The IRR analysis draws heavily on these prior analyses for data input.

If the data from these analyses have not been assembled, the IRR analysis can still be performed by using assumptions to complete the missing inputs. It should be noted, however, that such an approach weakens the IRR analysis.

Budgeting Process

The basic schedules used to measure the economic feasibility of a project are the schedule of total capital outlay and the schedule of net operating revenue to be generated. Budgeting techniques are used to develop the two schedules period by period over the planning horizon of a project. Budgeting procedures are designed so that the project may be analyzed by operational function. For example, if the project is a rice mill, the functions could be storage, milling, and marketing. These three functions encompass the total project. By structuring the analysis in this manner, the total operation can be analyzed without considering the viability of the separate functions, if so desired. Or each function can be tested individually for economic viability, thus determining if one function of a project could be deleted, with a resulting improvement in the return on investment of the balance of the project. By allowing analysis of the profitability of any one major activity, or of the project as a whole, this approach to the IRR analysis directs itself to "what if" management questions, and to determining the combination of activities, functions, and timing which will generate the greatest return on investment.

Accounting Periods

The IRR analysis, using the discounted rate of return approach, is based on the projection of costs and benefits over predetermined time periods. These time periods represent accounting periods such as a month or a year. The accounting period most often used in IRR analysis is the yearly period. However, IRR analysis can be performed with monthly accounting periods.

The use of manual budgeting procedures and manual calculation of the IRR requires the use of yearly accounting periods for the analysis. If manual or computerized budgeting procedures and computerized calculation of the IRR are used, either annual or monthly accounting periods may be used.

Sensitivity Analysis

The purpose of this additional analysis is to deal with the uncertainty which is inherent in operational enterprises, and the degree of error that is likely to be present in projections used to determine the IRR. Sensitivity analysis is the restructuring of sections of the original analysis to determine what will likely occur to the rate of return under different circumstances. Some of the circumstances that can be addressed are:

1. Different assumptions about future prices and how these assumptions affect project viability

2. Delay in implementation of project activities and the consequence of delay on project feasibility

3. Construction cost overruns and the result of the added investment cost on the rate of return

4. Higher-than-projected operating costs and their effects

SECTION III

BUDGETING INVESTMENT OUTLAYS

Budgeting investment outlays is the beginning point for IRR analysis. It is assumed at this point in time that the market and technical analyses have proven the project viable within the context of these analyses. The schedule of total capital outlays represents the sum of the budgeted capital outlays for facilities, miscellaneous investment outlays, and the working capital requirement. The facility outlays include costs for preconstruction activities, land, buildings, and equipment. Miscellaneous investment outlays include such costs as product research and development, advertising, and market channel development. The working capital requirement includes cash, inventories, accounts receivable, and other current assets needed to operate the project.

The steps involved in developing the schedule of estimated total capital investment for a project are illustrated in Figure 1. The time periods for investment must take into account (1) the project development plan, (2) the construction schedule, and (3) the useful life of buildings and equipment as determined by the technical analysis.

Budgeting Investment Outlays For Fixed Assets

The first element in the development of the capital cost schedules is the budgeting of facility outlays. Table 1 is used to develop preconstruction expenses such as organization and study costs. These costs include such items as legal fees, incorporation costs, insurance, costs of feasibility studies and marketing surveys, and other costs incurred or anticipated prior to the start of construction. Unless such costs can be specifically identified, they are generally constructed for the total operation and allocated by function. Allocation of such costs is usually arbitrary since there may not be an exacting rationale by which to proportion such expenditures. The use of contingencies in Table 1 should be within a 10 to 15 percent range.

The cost estimate for land and buildings is developed by the use of the format illustrated in Table 2. The investment cost for land includes such items as the purchase cost plus site preparation such as clearing, grading, access roads, drainage, parking, fences, sewer outlets, and utility access. The building cost includes such items as construction costs and utilities. Allocating land investment by function may be achieved by using a proportional guide as to the percentage of land area which will be utilized by each function. Building investment per function should be easily extrapolated from engineering or architectural drawings and cost estimates. Contingency percentages in Table 2 should be within a 15 to 20 percent range.

The cost estimate for equipment is developed by using the itemized equipment list for each function as presented in Table 3. The information to be compiled above is drawn from the technical analysis, or if not available in such an analysis, it must be constructed from estimates provided by equipment suppliers and engineers. The installation and replacement periods indicate the time period in which the investment is initially made and the time period in which additional investment must be made to replace obsolete or worn-out

equipment. Contingency percentages in Table 3 should be within a 15 to 20 percent range, as in building investment. When all the data for a function are compiled, then the total cost information for each piece of equipment is aggregated by time period according to the installation and replacement periods. This information is then transfered to Table 4.

The final element of the capital cost schedules is the budgeting of miscellaneous capital outlays, which are projected as described in Table 5. These outlays cover needed preliminary investment in such areas as technical product development, advertising research studies and testing, market tests, dealer development, and market channel improvement. Investment is made in these activities as a basis for future sales of new products or better promotion of current products. Even in projects which can be considered not of advanced technology, there is often a need for investment in market development through provision of money for manpower and materials to perform such activities as market tests, dealer development, market channel improvement, or sales training. Investment for research and development, advertising, and market development activities must be determined by market and technical analysis studies undertaken prior to the economic feasibility study. Since all such expenditures are preliminary to the operation of the project, they must be considered as an investment in fixed assets which can be amortized over time. Contingencies in Table 5 should be in a range of 10 to 15 percent.

The summary of fixed capital investment is developed in Table 6. The normal order of completion for Table 6 is to (1) sum up the total cost data in Tables 1, 2, 4 and 5, (2) transfer this sum to Table 6, and (3) ensure that the sum of the cost data allocated to the functions in Table 6 is equal to the amount in the total column.

Budgeting Working Capital Requirements

The third element in the development of capital cost schedules is the budgeting of working capital. Working capital is a significant component of capital investment. In some projects working capital requirements may equal or exceed fixed facility and equipment investment.

Determining the appropriate level of current assets required for working capital involves a trade-off between profitability and liquidity. Excessive amounts of money tied up in working capital for inventories, accounts receivable, and other current assets will reduce the profitability of the operation, but will increase liquidity. On the other hand, underestimation of working capital will result in higher profitability, but will limit the liquidity of the operation. The objective of working capital budgeting is to achieve a balance between the needs for profitability and liquidity in the enterprise.

Figure 2 is a schematic diagram of the information used to develop the budgeted total working capital requirement. The major current assets for which working capital requirements must be estimated are (1) purchases and inventories of raw material, (2) inventories of processed products, (3) accounts receivable, (4) inventories of supplies and materials, and (5) average cash balances needed to meet payments for operational costs and prepaid expenses. Therefore, prior to constructing working capital budgets, the revenue and operating cost budgets have to be completed.

Working capital requirements are budgeted by calculating the average yearly balance of capital required for each current asset over the planning horizon of the project. The accounting period to be used (month or year) in the IRR analysis is not a determining factor in constructing the average balance of working capital required. If the IRR analysis is to be performed on a monthly basis, average annual working capital requirements are inserted in the first month of each year. This approach to the budgeting of working capital requirements attempts to eliminate any distortions which may occur due to any seasonal differences in the operational process.

In projecting working capital requirements, IRR analysis requires the calculation of gross working capital needs, not net working capital needs. Net working capital needs are current assets less current liabilities. Since the IRR analysis determines the earning power of total investment regardless of the source of the investment, the needs for gross working capital (current asset accounts without consideration of current liability accounts such as accounts payable) are used as the level of working capital to be analyzed.

Generally, project operations begin at less than full capacity. Therefore, working capital requirements must be calculated for each year up to and including the year in which full capacity operation is achieved. This will indicate the increasing levels of working capital that must be acquired or retained within the firm to support operations at given utilization capacities.

Calculation of Working Capital

Projecting working capital needs involves the use of formulas with which to construct working capital requirement by current assets. These formulas, detailed in Table 7, are applied separately for each asset account. The results of all formulas are then totaled to obtain the total average balance of required working capital.

Formulas are used to construct average balances of required working capital because such a procedure provides for a consistent method, from project to project, to calculate working capital. Since the calculations involving the formulas are based on project operations, revenues and operating costs must be completed prior to construction of working capital needs.

If the purpose of the IRR analysis of the project is to determine the viability of different functions of the project, then the formulas should be applied to each specific function as required. The results are then totaled by asset account to arrive at the total working capital needs for each function, as depicted in Table 8. If the project is not being analyzed by function, then the formulas can be directly applied by asset account for the total operation.

The formula for calculating working capital for raw material purchases and inventories is PMI = AP + ((M/RM) x (MV/WD)), as described in Table 7. AP, the average value of monthly purchases, is calculated by taking the total value of annual purchases in Table 12 and dividing by 12.

M, the average monthly ending inventory in units, is taken from Table 10 by summing the 12 monthly ending inventories and dividing by 12. RM, the raw material used (sold) per day in units, is derived from Table 10 by summing the

quantities sold per month and dividing by the number of working days in the year. M/RM is the average number of working days that raw material inventories are carried.

MV, the value of the sum of monthly ending inventories, is taken from Table 12. WD is the number of working days in a year. MV/WD results in the average value of inventory per working day.

The calculation of the formula (M/RM) x (MV/WD) multiplies the average number of working days that raw material inventories are carried times the average value of inventory per working day. This result is added to the value of AP to generate the average annual working capital requirement for purchase and inventories of raw material. If more than one raw material (or commodity) is handled in the operation, then this process must be completed for each. The results for each raw material are added together. The results for each function to which this formula is applicable are entered into Table 8.

The formula for calculation of working capital for processed product inventories is PPI = (G/GS) x (S/WD), as described in Table 7. G, the average monthly ending inventory in units, is taken from Table 17 by summing the monthly ending inventories and dividing by 12. GS, the goods sold per day in units, is derived from Table 17 by summing the quantity sold per month and dividing by the number of working days in the year. G/GS is the average number of working days that processed product inventories are carried.

S, the sum of the value of monthly product sales, is taken from Table 19. WD is the number of working days in a year. S/WD results in the average value of sales per working day.

The calculation of the formula (G/GS) x (S/WD) multiplies the average number of working days that processed product inventories are carried times the average value of sales per day. The result is an average annual level of working capital to be budgeted to meet the requirements for holding processed products in inventory. This calculation of working capital is repeated for each product and by-product produced. The results of each calculation are then summed to arrive at a total working capital requirement for all processed products. The results for each function to which this formula is applicable are entered into Table 8.

The formula for calculation of working capital for accounts receivable is AR = (a/WD) x (A x (R/100)), as described in Table 7. The average number of working days that accounts receivable are outstanding, a, is an arbitrary figure. Possible criteria that can be used for determining the value of a are an industry average or the policies of similar firms or competitors. WD is the number of working days in a year. a/WD calculates the percentage of working days throughout the year in which credit sales are outstanding. a/WD results in a percentage term indicating the carrying time for accounts receivable.

A, the value of total annual sales for all products and by-products, is drawn from Table 20. The percentage of sales on credit terms, R, is also an arbitrary figure. Again, this figure can be based on an industry average or the policies of similar firms or competitors. A x (R/100) calculates the value of total annual credit sales.

The calculation of the formula (a/WD) x (A x (R/100)) multiplies the percentage term indicating the carrying time for accounts receivable times the value of annual credit sales. The result is an average annual amount of working capital to be budgeted to meet the requirements for accounts receivable. The results for each function to which this formula is applicable are entered into Table 8.

The formula for calculation of working capital required to maintain adequate operating funds to support the firm's operations is OF = (CD x C/WD) + PP + (SM x (SP/100)), as described in Table 7. This formula is composed of three basic elements: (1) CD x C/WD, a cash operating fund with which to pay operating costs as required; (2) PP, a level of cash requirement to pay prepaid expenses such as rent, insurance, or taxes; and (3) SM x (SP/100), a level of funding required to carry supplies and material inventories.

CD, the number of days of positive cash balance for normal operation, is an arbitrary figure set by the firm. Again, possible criteria that can be used for determining the value of CD are industry averages or policies of similar firms or competitors. C is the annual operating cost less prepaid expenses. To construct C, the total cost is derived from Table 39 and from the prepaid expenses such as insurance, rent, taxes, and subscriptions from Tables 35 and 36. Total cost - prepaid expenses = C. WD is the number of working days in a year. CD x C/WD calculates the level of working capital required for a cash operating fund.

Prepaid expenses, PP, are taken from Tables 35 and 36, as stated above. To construct PP for use in the formula, each type of prepaid expense must be analyzed for the relative time frame involved. For example, if insurance premiums are paid every 6 months, then the total insurance premium for the year should be divided by 2 to arrive at the average prepaid expense for insurance coverage. If rent is paid quarterly, then the total rent for the year should be divided by 4 to arrive at the average prepaid expense for rent. After these calculations have been finalized, all separate averages of prepaid expenses are added together to construct PP.

If an inventory of supplies is required for operation of any function of the firm, then working capital must be budgeted to maintain this supply inventory. Factors such as availability of supplies, distance from the suppliers, and bulk discounts determine the level of supply inventories maintained by a firm. Calculation of working capital for supply inventory is represented by SM x (SP/100) in the operating fund formula. SM, the total annual cost for supplies and materials, is taken from Table 28. SP, the percentage of the cost of supplies and materials held in inventory, is an arbitrary level set by the firm using criteria previously discussed. SM x (SP/100) calculates the level of working capital required to maintain a supplies and materials inventory.

The calculation of the formula (CD x C/WD) + PP + (SM x (SP/100)) provides the level of working capital required for a cash operating fund, the level of working capital required for prepaid expenses, and the level of working capital required to maintain a supplies and materials inventory. The results for each function to which this formula is applicable are entered into Table 8.

Summarizing Working Capital Requirements

In early periods of the project, before full facility utilization is achieved, increasing amounts of working capital will be needed for such items as purchases of raw materials and supplies, and prepaid expenses. To compute the additional working capital required, formulas 1 through 5 must be applied to each period of operation up to and including the period in which the project reaches full facility utilization. From this point on, the working capital requirement for full operation periods will be the same unless there is a major modification to the operation.

The budgeted working capital requirements are summarized in Table 8. This table must be completed for each year up to and including the year in which the project reaches full facility utilization. If the analysis is to determine the viability of different functions of the project, the working capital requirements for each function must be computed and the result entered in the appropriate row and column. This will determine total working capital requirements per year by function and asset account. This procedure must also be performed through the year in which full facility utilization is achieved.

Once Table 8 is completed for each year, the results are transferred to Table 9 in the following manner. The figures for Year 1 are transfered directly from Table 8 to Table 9. The figures for Year 2 are obtained by subtracting Year 1 in Table 8 from Year 2 in Table 8, and entering the difference (increment) in Year 2, Table 9. The figures for Year 3 are obtained by subtracting Year 2 in Table 8 from Year 3 in Table 8, and entering this difference (increment) in Year 3, Table 9. This process is continued until the figures are obtained for the year in which full utilization is achieved. The purpose of this procedure is to ensure that working capital requirements are inserted into Table 9 in an incremental fashion so as not to overstate needed working capital levels.

Two general points about working capital should be noted. The first is that working capital input occurs in the initial month of the year that project operations begin, with the exception of needed working capital which is added in later years as project operations expand. The second is that working capital is never removed from a project until the last period of time in the IRR analysis. The reason for this is that working capital represents current asset accounts. Even if profits are removed from the project, the current asset accounts must be maintained at the level calculated.

FIGURE 1

Determination of Capital Investment for Fixed Assets

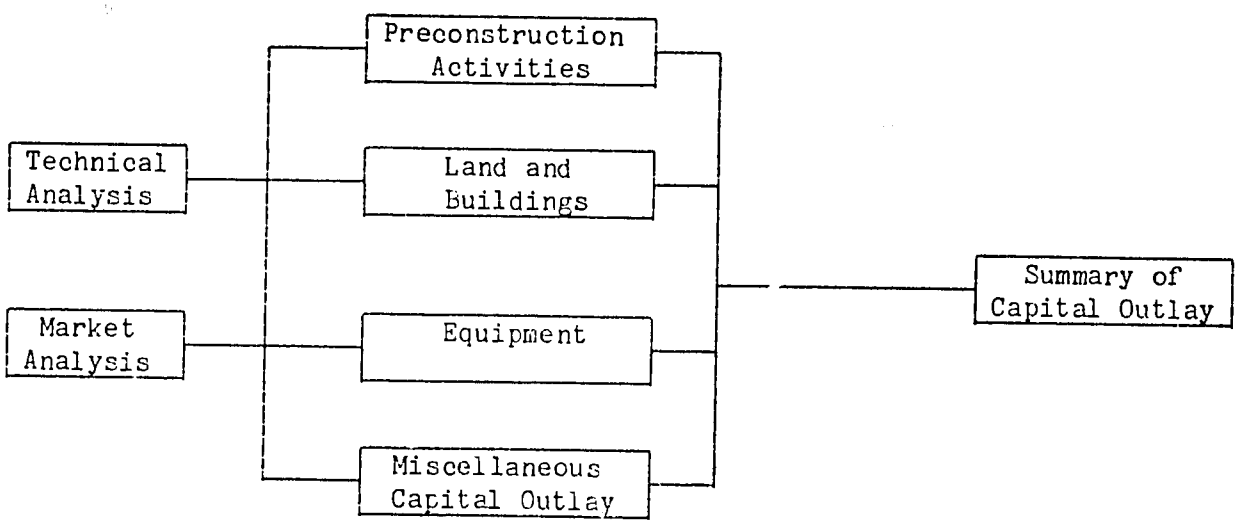


FIGURE 2

Calculation of Working Capital Requirements

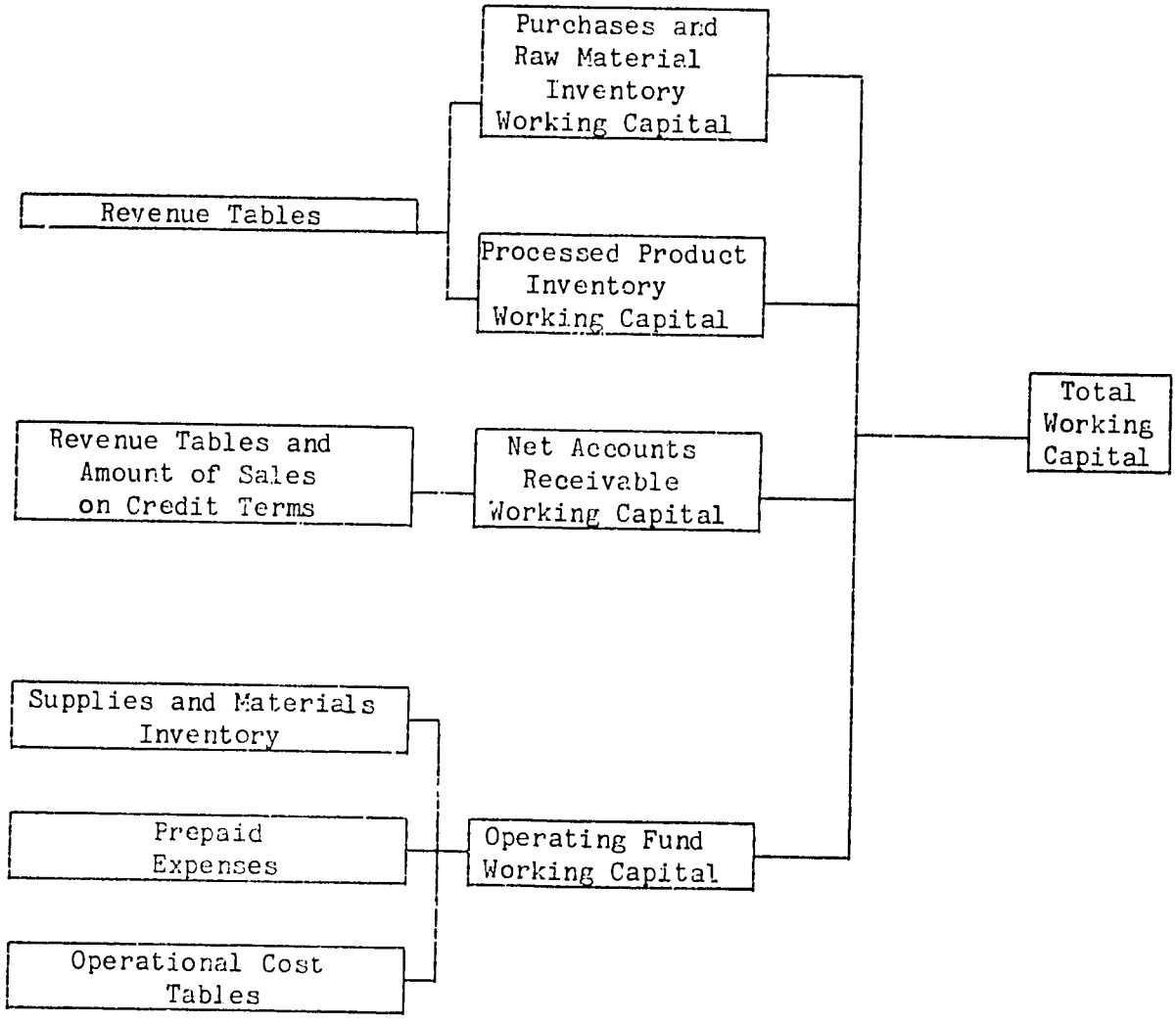


TABLE 1

Preconstruction Expense

( )

Item/Period ( )	Function	Function	Function	Function	Total
Feasibility Studies					
Market Analysis					
1					
2					
3					
Technical Analysis					
1					
2					
3					
Economic Analysis					
1					
2					
3					
Financial Analysis					
1					
2					
3					
Organizational Costs					
Salaries					
1					
2					
3					
Legal					
1					
2					
3					
Insurance					
1					
2					
3					
Other					
1					
2					
3					
Contingency ( )					
1					
2					
3					
TOTAL					
1					
2					
3					

TABLE 2

Land and Buildings Investment
( )

Item/Period ( )	Function	Function	Function	Function	Total
Land					
Purchase Cost					
1					
2					
3					
Site Preparation					
1					
2					
3					
Other					
1					
2					
3					
Buildings					
Construction Cost					
1					
2					
3					
Utilities					
1					
2					
3					
Other					
1					
2					
3					
Contingency ( )					
1					
2					
3					
TOTAL					
1					
2					
3					

TABLE 3

Equipment List

( )

Function/ Equipment/ Period	Estimated Cost: FOB or CIF Source	Delivery	Installation	Contingency ( )	Total Cost	Period ( ): Install	Replace
Period							
1							
2							
3							
4							
5							
Period							
1							
2							
3							
4							
5							
Period							
1							
2							
3							
4							
5							

TABLE 4

Equipment Investment

( )

Period ( )	Function	Function	Function	Function	Total
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

TABLE 5

Miscellaneous Capital Outlay Expenditures

( )

Item/Period ( )	Function	Function	Function	Function	Total
Research and Development					
1					
2					
3					
4					
5					
Market Development					
1					
2					
3					
4					
5					
Contingency ( )					
1					
2					
3					
4					
5					
TOTAL					
1					
2					
3					
4					
5					

TABLE 6

Summary of Fixed Capital Investment

( )

Period ( )	Function	Function	Function	Function	Total
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

TABLE 7

Calculation of Average Annual Working Capital by Account

Working Capital Account	Formula
Purchases and Raw Material Inventory (PMI)	PMI = AP + ((M/RM) x (MV/WD)) Where AP = Average value of monthly purchases M = Average monthly ending inventory in units RM = Raw material used per day in units MV = Value of the sum of monthly ending inventories WD = Number of working days in a year
Processed Products Inventory (PPI)	PPI = (G/GS) x (S/WD) Where G = Average monthly ending inventory in units GS = Goods sold per day in units S = Sum of the value of monthly product sales WD = Number of working days in a year
Accounts Receivable (AR)	AR = (a/WD) x (A x (R/100)) Where a = Average number of working days that accounts receivable are outstanding WD = Number of working days in a year A = Value of total annual sales R = Percentage of sales on credit terms
Operating Fund (OF)	OF = (CD x C/WD) + PP + (SM x (SP/100)) Where CD = Number of days of positive cash balance for normal operation C = Annual operating cost less prepaid expenses WD = Number of working days in a year PP = Average prepaid expenses SM = Total annual cost for supplies and materials SP = Percentage of cost of supplies and materials held in inventory

TABLE 8

Budgeted Working Capital Requirements

Year _____

( )

Working Capital Requirements	Function	Function	Function	Function	Total
Purchases and Raw Material Inventory					
Processed Products Inventory					
Accounts Receivable					
Operating Fund					
Total Working Capital					

TABLE 9

Budgeted Working Capital Requirements
by Time Period

( )

Year	Function	Function	Function	Function	Total
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

SECTION IV

BUDGETING REVENUES

After the fixed capital investment budgets are constructed, the next step is to budget projected revenues of the firm. Figure 3 is the schematic diagram showing how this information is developed with the system of worksheets. In budgeting revenues, as in budgeting capital investment, the procedure will be a process which budgets revenues by function. The system of worksheets set forth in this section encompasses three major functions found in agribusiness operations: storage, processing, and marketing. These functions can be further subdivided if the situation warrants.

The tables presented in this section use a year and month format as well as a time period format. Due to the nature of the product being handled by the project, the purchasing patterns, or the market being served, there may be seasonal fluctuations in amount of raw materials purchased, amount of finished product sold, or amount processed. Therefore, seasonal and monthly variations must be taken into account. Further, calculating the IRR on a monthly basis as well as on an accurate annual basis requires the use of monthly schedules as the point of departure.

The schedule of sales revenue and other income for a project is budgeted from the projected volume of operation and projected sales and purchase prices. The market analysis and project plan are used to draw the projected volumes of purchases, processing and sales; sale prices; and cost of purchases.

Storage Revenues

The beginning point in budgeting revenues is the development of a set of storage revenue worksheets. The purpose of storage is to hold the product for resale or processing. Revenue from the storage function is generated by setting the sale price (or the price charged to the processing function) far enough above the purchase price as to cover all storage costs incurred and give some margin of profit.

Table 10 is used to develop a quantity storage schedule by commodity on a monthly basis. This table includes beginning inventory, purchases, quantity sold, and ending inventory. The quantity sold category may include both internal sales to the processing sector of a business and external sales to other firms or individuals. Such constraints as storage capacities and purchasing plans based on price variability or harvest time periods must be taken into consideration when entering data in this table.

Table 11 is used to list monthly unit purchase prices and sales prices from storage by commodity. Purchase prices can be derived from projected prices based on historical data series. Sales prices can be derived from projections of historical data series or calculated by adding a standard storage and handling margin to the purchase price. When calculating a sales price based on a standard storage and handling margin, specific operational requirements such as cleaning and drying must be taken into consideration.

Table 12 constructs monthly storage revenues by commodity using the data entered into Tables 10 and 11. This table develops the cost of sales using beginning inventory + purchases - ending inventory. The gross revenue is calculated by sales - cost of sales. If more than one commodity is held in storage, Tables 10 through 12 must be completed for each commodity. The gross revenue data compiled in Table 12 are then summarized in Table 13.

Processing Revenues

Processing requires a forecast of the flow of product through the production or processing activity according to purchasing patterns, plant capacity, and processed product marketing programs. Table 14 is used to develop the schedule of product processing by commodity. Quantity of raw product processed x purchase price = total cost of purchases. Quantity of processed product x unit value of processed product = total value of processed product. Total value of processed product - total cost of purchases = gross revenues.

If there is a storage function, the purchase price of the raw commodity is drawn from the sales price in Table 11. If there is no storage function or if the storage function is combined with the processing function, then the purchase price of raw commodities is the purchase price as shown in Table 11. Even if storage is combined with processing to create a single function, Table 10 must still be completed to determine beginning and ending inventories for later computing the working capital requirements for holding raw material inventories.

The sales price for the processed product is constructed from projections of historical data series for processed product prices at plant door or by adding a standard processing margin to raw commodity prices. If there is no marketing function or if the marketing function is combined with the processing function, then the sales price would be constructed from historical data series of market prices for processed products and by-products, or from other market analysis information.

In the completion of Table 14, such factors as plant capacity, market demand, number of working days, and conversion rates for raw to processed product must be taken into consideration. This table must be completed for each primary product which is processed from a raw commodity.

If a by-product such as rice bran, mill feed, or oilseed meal is produced, then the gross revenue for such by-products must be calculated. Table 15 constructs the gross revenue for by-products derived from each major raw commodity processed. Quantity of by-product x sales price of the by-product = gross revenue for the by-product. The rule stated above for prices and factors to be considered in primary product processing also applies to calculating the data for by-product production. Table 15 must be completed for each by-product produced.

Table 16 is used to summarize gross revenues by product and by-product resulting from the processing function.

Marketing Revenues

Gross revenues produced by the marketing function are developed in Tables 17 through 20. Table 17 constructs the quantities held in inventory and marketed, with a separate table being developed for each product and by-product marketed by the firm. Beginning inventory + amount purchased (or produced) - amount sold = ending inventory. The ending inventory is carried forward to the next period to become the beginning inventory. The amount purchased is taken directly from Table 14 or 15. If the marketing function does not procure the total amount utilized in the processing function, then the actual amount purchased is entered in Table 17. Factors such as storage capacity for processed goods and market demand for primary products and by-products must be taken into consideration. This table must be filled out for each product and by-product marketed. If there is no marketing function or if the marketing function is combined with the processing function to create a single function, this table must still be completed so as to compute working capital requirements for holding processed goods inventories.

Table 18 lists the sales price of products and by-products being marketed. The sales price can be constructed from projections of historical data series of market prices for processed products and by-products. If there is no marketing function or if the marketing function is combined with the processing function, then Tables 18, 19, and 20 would be eliminated.

Table 19 develops the gross revenues from marketing products or by-products based on the data in Tables 17 and 18. Beginning inventory + purchases - ending inventory = cost of sales. Sales - cost of sales = gross revenues. The amount purchased is taken directly from Table 14 or 15. As stated above, if the marketing function does not procure the total amount utilized by the processing function, then the actual amount purchased (Table 17) times the purchase price (Table 14 and 15) must be used to construct the needed figure for the amount purchased in Table 19. Ending inventory is constructed from ending inventory in Table 17 x purchase price (Table 14 or 15). Sales are calculated from amount sold in Table 17 x sale prices in Table 18. This table must be completed for each product or by-product marketed.

Table 20 is used to summarize gross revenues by product and by-product resulting from the marketing function as calculated in Table 19.

Other Income

The budgeting of other income which may derived from project operations must be calculated if so required. Such income could be generated by storage or marketing functions. For example, custom storage of commodities for other firms may be undertaken, which would result in storage income not already calculated; other products marketed could be purchased from other firms. To compute such revenues, Table 21 is completed. Projected sales and purchases are entered by period and the gross revenue is calculated by sales - purchases = gross revenue by function.

Summarizing Revenues

The gross revenue data in Tables 13, 16, 20, and 21 are transfered to Table 22. This completes all the necessary steps for computing budgeted revenues.

FIGURE 3

Compilation of Revenues

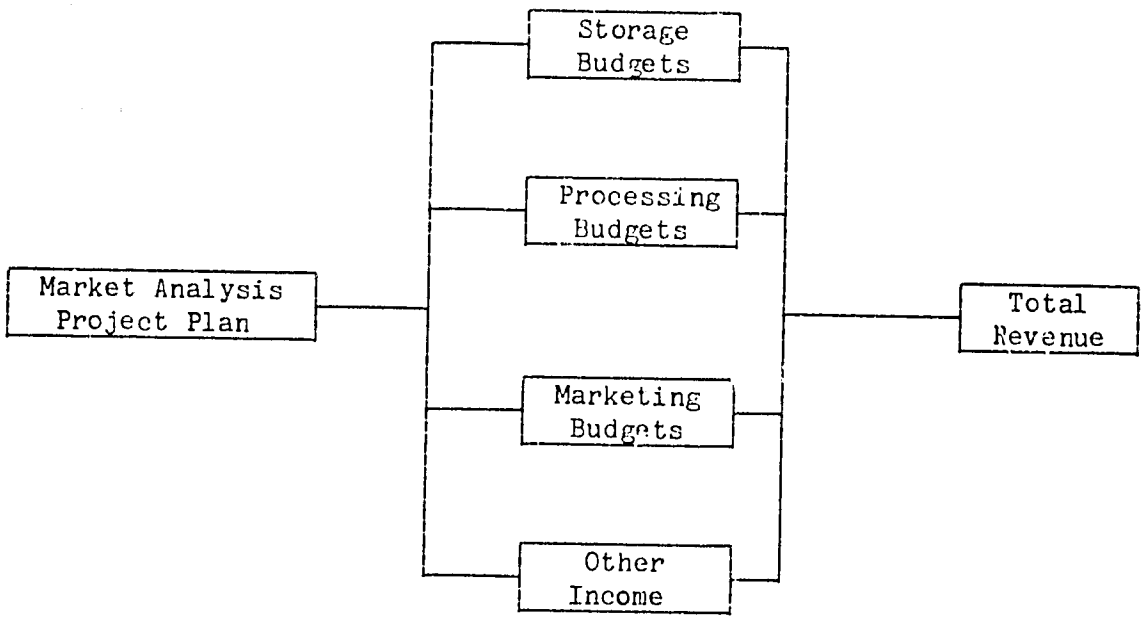


TABLE 10

Raw Product Storage
Quantity

( )

Product: _____

Year/Month	Beginning Inventory	Purchases	Quantity Sold	Ending Inventory
Year:				
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
Year:				
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
Year:				
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				

TABLE 11

Storage Function
Prices

( )

Product: _____

Year/Month	Purchase Price	Sales Price
Year:		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
Year:		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
Year:		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

TABLE 12

Storage Revenues

( )

Product: _____

Year/Month	Sales	Beginning Inventory	Purchases	Ending Inventory	Cost of Sales	Gross Revenue
Year:						
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
Total						
Year:						
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
Total						

TABLE 13

Summary of Storage Gross Revenues

( )

Period ( )	Product	Product	Product	Product	Total
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

TABLE 14

Product Processing

Product:___

Year/Month	Quantity of Raw Product Processed ( )	Quantity of Processed Product ( )	Unit Purchase Price ( )	Unit Sales Price of Processed Product ( )	Total Cost of Purchases ( )	Total Value of Processed Product ( )	Gross Revenues ( )
Year:							
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
Total							
Year:							
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
Total							

Product Conversion Rate_____

TABLE 15

By-Product Processing

By-Product: _____

Year/Month	Quantity of Raw Commodity Processed ( )	Quantity of By-Product ( )	Unit Sales Price By-Product ( )	Gross Revenue By-Product ( )
Year:				
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
Total				
Year:				
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
Total				
Year:				
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
Total				

Product Conversion Rate _____

TABLE 16

Summary of Gross Revenues from Processing

( )

Period ( )	Product and By-Product				Total
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

TABLE 17

Quantities Marketed

(_____)

Product or By-Product: _____

Year/Month	Beginning Inventory	Amount Purchased	Amount Sold	Ending Inventory
Year				
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
Year				
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
Year				
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				

TABLE 18

Sales Prices

Year/Month	Product ( )	Product ( )	Product ( )	By-product ( )	By-product ( )	By-product ( )
Year:						
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
Year:						
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
Year:						
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						

TABLE 19

Marketing Revenues

( )

Product or By-Product: _____

Year/Month	Sales	Beginning Inventory	Purchases	Ending Inventory	Cost of Sales	Gross Revenue
Year:						
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
Total						
Year:						
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
Total						

TABLE 20

Summary of Marketing Gross Revenues

( )

Period ( )	Product and By-Product					Total
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						

TABLE 21

Other Income

( )

Function_____

Period ( ):	Sales	Purchases	Gross Revenue
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

TABLE 22

Total Revenue for the Project

( )

Period ( )	Function	Function	Function	Function	Total
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

SECTION V

BUDGETING OPERATING COSTS

The budgeted operating expenses used to determine net income by period for the analysis should include all anticipated variable and fixed expenses except depreciation, interest payments, and income taxes, as set forth in Section II. Figure 4 is a schematic diagram illustrating the steps used in budgeting operating expenses. These steps include (1) budgeting of variable costs, (2) budgeting of fixed costs, (3) budgeting of annual variable and fixed costs, and (4) budgeting of total annual operating expenses.

Variable costs are those costs incurred based on the volume of material processed, manufactured, or handled. Fixed costs are those costs incurred which have no relationship to volume, but which exist in a given amount regardless of the percentage of capacity at which the facility is operated.

Some of the expenses involved in operations fall into both the variable and fixed cost categories, for example wages and salaries. Common labor which may be hired and fired depending on the level of operations is a variable cost. Skilled labor or management, however, is a fixed cost which must be maintained even through slack periods, because of the continuity needed in day-to-day operations.

Proportioning Costs

Many of the project costs will have to be proportioned to arrive at individual function costs. For example, electric power costs for a building that houses more than one operational function will have to be proportioned across these operational functions. One way to proportion these costs would be on the basis of the projected kilowatt hours (kwh) to be used by each individual function. In the case of building rental cost, where more than one operational function is located within the building, the basis for proportioning costs could be the amount of floor space used by each operational function.

Variable Costs

Variable costs are composed of several different categories of costs. The primary categories are building and equipment maintenance, supplies and materials, fuel and power, wages and salaries, product loss, and marketing costs such as advertising. Other costs which fall into the classification of variable costs are computed under the category of other variable costs.

Variable costs are a function of the amount of product processed, handled, or marketed. Budgeted variable costs are computed by developing a series of tables by cost category. These tables set forth specific variable costs for a typical year of facility operation. Each of the specifications for a typical year is explained in the following paragraphs which describe how Tables 23 through 27 are utilized. The costs are then summed and divided by product volume to calculate a cost-to-volume multiplier. This cost-to-volume multiplier is then multiplied by product volume in a summary table to compute variable costs for the time period. Each of these tables sets forth variable costs by function.

Table 23 constructs building and equipment cost factors. The building and equipment maintenance costs (repair parts and labor) to be entered in the table must be supplied by the technical analysis or engineering estimates. These are costs which are attributable to facility operation and should be based on total plant capacity for a typical operating year. Since buildings and equipment require more maintenance as they become older, engineering estimates should provide an aging factor. As an example, if a specific group of equipment has an average useful life span of 10 years, the engineering estimate may specify that the equipment in question may require 50 percent more maintenance during the last 5 years of useful life than the first 5 years. Therefore, an aging factor would be computed by multiplying the first 5 years times 1.0 and the last 5 years times 1.5, adding these together, and then dividing the sum (12.5) by the 10 years of life span. The aging factor would then be 1.25. If an aging factor is not required or available, then the user would enter the number 1.0 in each of the aging factor columns.

Once the building and equipment maintenance costs for a typical year and the aging factors are entered in the table, the total cost is then calculated by total cost = (building maintenance cost x aging factor) + (equipment maintenance cost x aging factor). The annual product volume (quantity stored, processed, or marketed) is then entered in the product volume column for each function. This information is drawn from Tables 10, 14, and 17 in Section III, depending on the function. The total cost is divided by product volume to calculate a cost-to-volume multiplier.

Supply and material cost factors are calculated in Table 24. Supply and material items required for projected annual operations are listed under the function in which they will be utilized, along with the quantity required and the cost per unit. The user should create this listing based on Year 1 of facility operations or on a year in which the facility operates at full capacity. The quantity which will later be inserted in the product volume column must correspond to the year used to compute required supply and material items.

The total cost for each item is calculated by total cost = cost per unit x quantity. The total costs in each function are then summarized to create an annual cost of supplies and materials by function. The annual product volume (quantity stored, processed, or marketed) is then inserted in the product volume column for each function. This information is drawn from Tables 10, 14, and 17 in Section IV. The total cost is divided by product volume to calculate a cost-to-volume multiplier.

Table 25 computes fuel and power cost factors. Total kwh and total fuel volume requirements by function, as well as the cost per unit for fuel and power, are derived either from the project technical analysis or directly from engineering estimates, and should provide the electric and petroleum fuel requirements for a year's operation. The user should insert data based on a year in which the facility operates at full capacity. The quantity which will later be inserted in the product volume bracket must correspond to the year used in computing power and fuel requirements.

Annual energy use cost factors are computed by function. Total cost for fuel = total fuel volume x cost per unit of fuel. Total cost for power = total kwh x cost per kwh. Total energy cost = total cost of fuel + total cost of power.

The annual product volume (quantity stored, processed, or marketed) is then inserted in the product volume bracket for each function. This information is drawn from Tables 10, 14, and 17 in Section IV. Total energy cost is divided by product volume to calculate a cost-to-volume multiplier for energy use. This is calculated for each function.

Table 26 calculates wages and salary cost factors. Manpower requirements are listed by function and job description. The number of employees and total annual man-hours required for a typical year's operation are inserted. As in the previous tables, the user must ensure that the year for which manpower data is inserted matches the quantity which will later be inserted in the product volume bracket. Wage or salary rates are derived from either the technical analysis or knowledge of wage and salary rates common to the industry in which the project would be classified.

Total annual cost by job description = total annual man-hours (or number of employees) x hourly wage rate (or annual salary rate). Total annual cost by job description is then summarized for each function. The cost-to-volume multiplier is calculated by dividing the summarized total annual costs by product volume derived from Tables 10, 14, and 17 in Section IV. Cost-to-volume multipliers are completed for each function.

Factors for other variable costs are computed in Table 27. Information for such cost construction is derived from marketing analysis, project plans, or standard industrial data. As in the previous tables, the user must ensure that the year for which cost data is inserted matches the quantity which will later be inserted in the product volume bracket.

Each of the categorized costs is summed by function for a total cost. The cost-to-volume multiplier is calculated by dividing total costs by product volume, which is again derived from Tables 10, 14, and 17 in Section IV.

Table 28 computes total variable cost by month and year. Table 28 is completed for each function. The cost-to-volume multipliers which are calculated in Tables 23 through 27 for building and equipment maintenance, supplies and materials, energy, wages and salaries, and other costs are entered into the Cost/Volume Mulitiplier line in Table 28.

Next, a cost-to-product value multiplier is entered into the Cost/Value Multiplier line under the loss column. This multiplier calculates product loss based on a factor which is multiplied times the product value. Product value is required because loss is a function of the volume of product lost times the price of the product. The multiplier used may be based on either an established industry standard for a particular function or experience from similar operational facilities.

The user then enters data under the Product Volume column by month. If the user is constructing an economic feasibility analysis by year, then the month rows in Table 28 would be eliminated and only year rows would be detailed in this table.

The product volume data are taken from Tables 10, 14, and 17, depending on the function involved. Data are next entered under the Product Value column by month. These data are taken from Tables 12, 14, and 19, depending on the function involved.

At this point, the table is finalized by using the following formulas to calculate variable costs by month.

1. Cost/volume multiplier for building and equipment maintenance x product volume for each month = cost of building and equipment maintenance for that month. This cost is inserted in the building and maintenance equipment cost column.

2. Cost/volume multiplier for supplies and materials x product volume for each month = cost of supplies and materials for that month. This cost is inserted in the supplies and materials cost column.

3. Cost/volume multiplier for energy x product volume for each month = cost of energy for that month. This cost is inserted in the energy cost column.

4. Cost/volume multiplier for wages x product volume for each month = cost of wages and salaries for that month. This cost is inserted in the wages cost column.

5. Cost/volume multiplier for other costs x product volume for each month = cost of other variable costs for that month. This cost is inserted in the other cost column.

6. Cost/value multiplier for loss x product value for each month = cost of product loss for that month. This cost is inserted in the loss cost column.

All of the cost columns by line are summed and the result is entered on the same line of the total cost column in Table 28. The resulting total costs by month (or year) for each function are inserted into Table 29 under the appropriate function column. If costs are entered by month, then each function is summed by month to result in a total variable cost by year. Each of the monthly (yearly) costs is summed by function to arrive at a total variable operating cost in Table 29.

Fixed Costs

The primary categories for fixed costs are repairs and maintenance, fuel and power costs, wages and salaries, administrative salaries, office costs, taxes and insurance, and miscellaneous costs. Since fixed costs occur regardless of the volume of operations, these costs will not change from one accounting period to the next. For this reason, one table per category of costs will apply to all periods.

Fixed costs are budgeted in Tables 30 through 36. The results of these tables are then summarized in Tables 37 and 38. The user should note that Tables 30 through 37 are designed to calculate annual costs. To arrive at fixed operating costs per month for Table 38, total annual fixed costs are simply divided by 12.

Table 30 budgets the repair and maintenance costs for building and equipment. These costs will occur even if the facility is not operated, and as such they are usually computed as a function of original investment costs. The original

cost of buildings and equipment is taken from Tables 2 and 3. As in repair and maintenance costs for variable expenses, a standardized rate is used to compute these costs. This standardized rate is drawn from the technical analysis or engineering estimates.

The original cost of buildings and equipment as well as the standardized rate are entered in the appropriate columns. Total cost = (original cost of buildings x standardized rate for buildings) + (original cost of equipment x standardized rate for equipment).

Table 31 budgets fuel and power costs. As in variable costs, electric and petroleum fuel requirements and the unit cost are taken from the technical analysis or engineering estimates.

Total energy costs are computed as follows: total cost for power = total kwh x cost per unit for power. Total cost for fuel = total fuel volume in units x cost per unit for fuel. Total energy costs = total cost for power + total cost for fuel.

Table 32 budgets office expenses. The data inserted in this table concern office support for each function and may include other detailed categories of expenditures beyond those listed in the table. The category columns are summed to arrive at total annual office expenses.

Table 33 budgets the portion of wages and salaries which can be attributed to fixed cost. As such, these costs are linked to the need to retain skilled employees who cannot be laid off and rehired as the volume of operations changes. Manpower requirements are set forth in terms of job description, number of employees, total annual man-hours required, and wage or salary rates. These data are provided by the technical analysis or historical operational information.

Total annual cost by job description = number required (or total annual man-hours) x annual salary rate (or hourly wage rate). Total annual costs by job description are summed for a total by function.

Table 34 calculates salaries for administrative personnel who oversee total facility operations, and as such can not be directly categorized by function in the same manner as personnel listed in Table 33. Job titles, salary, and fringe benefit costs may be taken from the technical analysis, project plans, historical operational information, or industry standards.

Total annual salary by job title = annual salary + fringe benefits. Total annual salaries by job title are summed to generate a total administrative salary cost. Administrative salaries are then allocated by function. Since these administrative personnel oversee total operations, the allocation by function of these costs is an arbitrary process. The user may use any formula that has a solid rationale related to the project being analyzed. The user may allocate total cost evenly across all functions or may allocate total costs based on proportions which equate with volumes handled by each function.

Table 35 budgets the cost of property taxes and insurance. Appraisal values or appraisal formulas and tax rates may be obtained from the government agency responsible for taxation. Insurance rates must be obtained from an insurance

company. The original cost of buildings and equipment (including vehicles) is taken from Tables 2 and 3. Inventory values are taken from Tables 10, 14, and 17.

Tax cost = appraised value x tax rate (if an appraisal formula is used, it must be multiplied times the original cost to arrive at an appraised value). Insurance cost = original cost x insurance rate. Total cost = tax cost + insurance cost. The total costs for each item are summed to arrive at a total cost for each function.

Table 36 budgets other fixed costs. These are costs for expense categories which do not fit into the other fixed cost tables. The expenses by function are summed to generate total cost by function.

The annual costs in Tables 30 through 36 are transferred to Table 37 and summed by function and total columns to create total annual fixed costs by function and for total operations.

If operating costs are being constructed by month for an economic analysis based on monthly periods, then the annual data in Table 37 are divided by 12 and transferred to Table 38.

Total Cost

Total operating cost is budgeted in Table 39. If annual periods are used as the basis for accounting, then total cost is derived by summing Tables 28 and 37 by function. The functions are then summed to arrive at total operational cost. If monthly periods are the basis for accounting, then total cost is derived by summing Tables 28 and 38 by function. The functions are then summed to arrive at total operational cost.

Operating costs have now been budgeted. The next step is to return to Section III and finalize the budgeting process by completing the calculations which will derive working capital requirements.

FIGURE 4

Budgeting of Operating Expenses

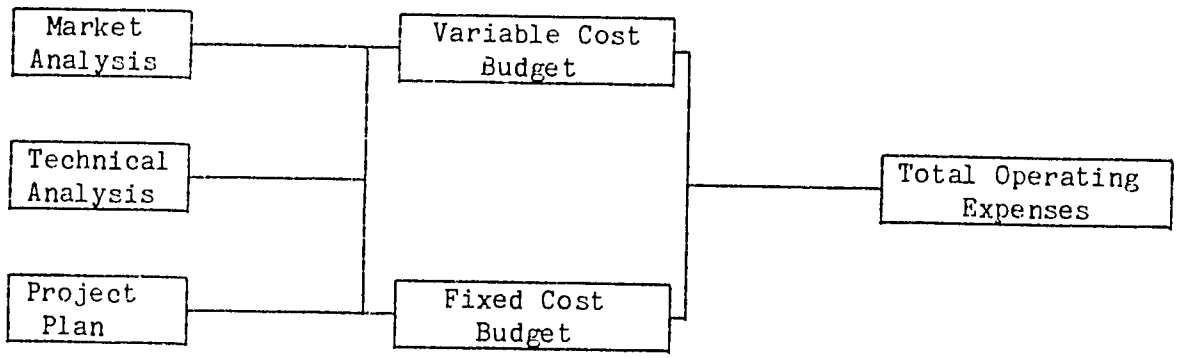


TABLE 23

Variable Cost
Building and Equipment Maintenance

Annual

( )

Function	Building Maintenance	Aging Factor	Equipment Maintenance	Aging Factor	Total
_____					
Product Volume	( )				
Cost-to-Volume Multiplier					
_____					
Product Volume	( )				
Cost-to-Volume Multiplier					
_____					
Product Volume	( )				
Cost-to-Volume Multiplier					
_____					
Product Volume	( )				
Cost-to-Volume Multiplier					

TABLE 24

Variable Cost
Annual Supplies and Materials List

Function/ Item	Quantity ( )	Cost Per Unit ( )	Total Cost ( )	Product Volume ( )	Cost-to-Volume Multi-plier
_____					
_____	_____	_____	_____		
_____	_____	_____	_____		
_____	_____	_____	_____		
_____	_____	_____	_____		
_____	_____	_____	_____		
_____	_____	_____	_____		
_____	_____	_____	_____		
_____	_____	_____	_____		
_____	_____	_____	_____		
_____	_____	_____	_____		
Total			_____	_____	_____
_____					
_____	_____	_____	_____		
_____	_____	_____	_____		
_____	_____	_____	_____		
_____	_____	_____	_____		
_____	_____	_____	_____		
_____	_____	_____	_____		
_____	_____	_____	_____		
_____	_____	_____	_____		
_____	_____	_____	_____		
_____	_____	_____	_____		
Total			_____	_____	_____
_____					
_____	_____	_____	_____		
_____	_____	_____	_____		
_____	_____	_____	_____		
_____	_____	_____	_____		
_____	_____	_____	_____		
_____	_____	_____	_____		
_____	_____	_____	_____		
_____	_____	_____	_____		
_____	_____	_____	_____		
_____	_____	_____	_____		
Total			_____	_____	_____

TABLE 25

Variable Cost
Annual Energy Use

Function	Total kwh	Total Fuel Volume ( )	Cost Per Unit Fuel ( )	Cost Per Unit Power ( )	Total Cost Fuel ( )	Total Cost Power ( )	Total Energy Costs ( )
_____							
Product Volume ( )	_____	_____	_____	_____	_____	_____	_____
Cost-to-Volume Multiplier							_____
							_____
_____							
Product Volume ( )	_____	_____	_____	_____	_____	_____	_____
Cost-to-Volume Multiplier							_____
							_____
_____							
Product Volume ( )	_____	_____	_____	_____	_____	_____	_____
Cost-to-Volume Multiplier							_____
							_____
_____							
Product Volume ( )	_____	_____	_____	_____	_____	_____	_____
Cost-to-Volume Multiplier							_____
							_____

TABLE 26

Variable Cost
Annual Wages and Salaries

Function/ Job Description	Manpower Requirements and Projected Costs: Number Required	Total Annual Man-hours	Rate ( )	Total Annual Cost ( )
_____				
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
Total				_____
Product Volume ( )				_____
Cost-to-Volume Multiplier				_____
				_____
_____				
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
Total				_____
Product Volume ( )				_____
Cost-to-Volume Multiplier				_____
				_____
_____				
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
Total				_____
Product Volume ( )				_____
Cost-to-Volume Multiplier				_____
				_____

TABLE 27

Variable Cost
Other Costs

Annual

( )

Function	Travel	Advertising	Entertainment			Total
_____						
Product Volume	( )					
Cost-to-Volume Multiplier						
_____						
Product Volume	( )					
Cost-to-Volume Multiplier						
_____						
Product Volume	( )					
Cost-to-Volume Multiplier						
_____						
Product Volume	( )					
Cost-to-Volume Multiplier						

TABLE 28

Total Variable Costs

Function_____

Year/ Month	Product Volume ( )	Product Value ( )	Costs ( ) Bldg/Equip Maint	Supplies/ Materials	Energy	Wages	Other	Loss	Total
Cost/ Volume Multiplier>>>									
Cost/ Value Multiplier>>>									
Year:									
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
Total									
Year:									
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
Total									

TABLE 29

Total Variable Costs

( )

Year/Month	Function	Function	Function	Function	Total
Year:					
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
Total					
Year:					
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
Total					
Year:					
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
Total					

TABLE 30

Fixed Cost
Annual Repairs and Maintenance

Function	Buildings: Original Cost ( )	Buildings: Standard-ized Rate ( )	Equipment: Original Cost ( )	Equipment: Standard-ized Rate ( )	Total Cost ( )
Total					

TABLE 31

Fixed Cost
Annual Energy Use

Function	Total kwh	Total Fuel Volume ( )	Cost Per Unit: Fuel ( )	Cost Per Unit: Power ( )	Total Cost: Fuel ( )	Total Cost: Power ( )	Total Energy Costs ( )
Total							

TABLE 32

Fixed Cost
Annual Office Expenses

( )

Function	Office Utilities	Telephone	Office Supplies	Office Equipment		Total
Total						

TABLE 33

Fixed Cost
Annual Wages and Salaries

Function/ Job Description	Manpower Requirements and Projected Costs			
	Number Required	Total Annual Man-hours	Rate ( )	Total Annual Cost ( )
_____				
_____				
_____				
_____				
_____				
_____				
_____				
_____				
_____				
Total				
_____				
_____				
_____				
_____				
_____				
_____				
_____				
_____				
_____				
Total				
_____				
_____				
_____				
_____				
_____				
_____				
_____				
_____				
_____				
Total				

TABLE 34

Fixed Cost
Administrative Salaries

Annual

( )

Job Title	Annual Salary	Annual Fringe Benefits	Total Annual Salary
Total			

Allocation by Function

Total	

TABLE 35

Fixed Cost
Annual Property Taxes and Insurance

Function/ Item	Appraised Value ( )	Tax Rate ( )	Tax Cost ( )	Original Cost ( )	Insurance Rate ( )	Insurance Cost ( )	Total Cost ( )
_____							
Buildings							
Equipment							
Inventories							
Vehicles							
Total							
_____							
Buildings							
Equipment							
Inventories							
Vehicles							
Total							
_____							
Buildings							
Equipment							
Inventories							
Vehicles							
Total							
_____							
Buildings							
Equipment							
Inventories							
Vehicles							
Total							

TABLE 36

Fixed Cost
Other

Annual

( )

Category	Function	Function	Function	Function	Total
Audit					
Legal Services					
Dues and Subscriptions					
Donations					
Travel					
Entertainment					
Total					

TABLE 37

Total Annual Fixed Costs

( )

Year/Category	Function	Function	Function	Function	Total
Year:					
Repairs and Maintenance					
Energy					
Wages and Salaries					
Administrative Salaries					
Office Expenses					
Taxes and Insurance					
Miscellaneous					
Total					

TABLE 38

Total Monthly Fixed Costs

( )

Year/Month	Function	Function	Function	Function	Total
Year:					
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
Total					

TABLE 39

Total Costs

( )

Year/Month	Function	Function	Function	Function	Total
Year:					
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
Total					
Year:					
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
Total					
Year:					
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
Total					

SECTION VI

SUMMARIZING CAPITAL INVESTMENTS AND NET REVENUES

Once the budgeting process for capital investment, income, and operating expenses is completed, the next step is to tabulate the data obtained from this process into a usable format. Figure 5 presents a schematic diagram of this process.

Budgeted costs are formatted by function in Table 40. One table is prepared for each function involved in the enterprise. Once these tables are completed, the numbers are summed by period to provide the information for Table 41. This table summarizes the capital cost and operating schedules for the total operation. If the analysis of the enterprise is not being conducted by function, then Table 40 is omitted and only Table 41 is used. Note that the same measurement unit must be used in all columns.

Capital Cost Schedules

The schedule for capital cost in Table 40 is drawn from Table 6 for fixed assets and Table 9 for working capital. Fixed assets and working capital are summed to provide total capital cost.

Operating Schedules

The schedule of net revenue in Table 40 is the schedule of total revenue minus the schedule of operating expenses. The data for the total revenue column are drawn from Table 22, while the operating cost data are drawn from Table 39.

Analysis Horizon

In completing Tables 40 and 41, it is suggested that data for determining the IRR be projected over a time horizon of at least 10 years. A time horizon of 15 years would be more advantageous since this would allow for the analysis to cover a long enough time span to be able to take into consideration any seasonal or yearly cyclic fluctuations that may occur in the system.

Alternative Summary Table

An alternative summary format is presented in Table 42. In this format, the capital cost and operating schedules are divided into the various elements that constitute each schedule. This type of format may be utilized if the user wishes to apply a sensitivity analysis when calculating the IRR. The table allows the user to adjust the numbers in each component column by some percentage increase or decrease and therefore determine the impact of projected percentage changes in investments, revenues, and costs.

The capital cost schedule is prepared as follows. Preconstruction (column A), land and buildings (column B), equipment (column C), and miscellaneous (column D) investment costs are taken from Tables 1, 2, 4, and 5, respectively. Total I, total fixed investment, is the sum of columns A, B, C, and D. Working capital investment (column E) is derived from Table 9. Total investment (Total II) is the sum of total fixed investment (Total I) and working capital (column E).

The operating schedule is prepared as follows. Product revenue (column F) is taken from Tables 13, 14, or 20, depending on the function being analyzed. By-product revenue (column G) is derived from Table 15 or 20, depending on the function being analyzed. Total revenue (Total III) is the sum of product revenue (column F) and by-product revenue (column G). Variable operating cost (column H) and fixed operating cost (column I) are taken from Tables 29 and 38, respectively. Total operating cost (Total IV) is the sum of variable operating cost (column H) and fixed operating cost (column I).

Net income (Total V) is the result of total revenue (Total III) less total operating cost (Total IV).

Value of Assets at End of Analysis Horizon

As discussed in Section II, depreciation of assets is not included in the analysis of the IRR because a salvage value is calculated for the fixed assets at the end of the analysis horizon. To establish this salvage value, an estimate must be made as to the changes in the efficiency of the buildings, equipment, and operational techniques which may occur over the time horizon being analyzed. This estimate must be based on historical changes in the industry to which the project being analyzed belongs. There is no formula to follow when making this estimate, but rather the estimate is made based on the experience and expertise of market, technical, and economic analysts. The salvage value thus determined is entered into Table 40, 41, or 42 in the time period following the last year in the analysis horizon. The salvage value is always entered as a negative number.

The total amount of working capital put into the project is removed all at once at the end of the analysis horizon. This amount is entered as a negative number in the same time period as the salvage value in Table 40, 41, or 42.

FIGURE 5

Preparation of Data for Analysis

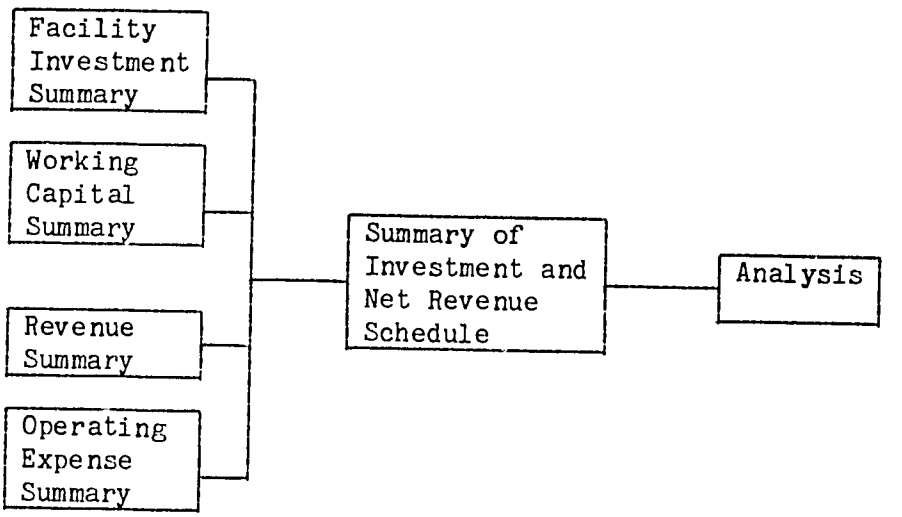


TABLE 40

Summary of Capital Cost, Income, and Expenses by Function
Function:_____

( )

Period	Capital Cost Schedules			Operating Schedules		
	Fixed Assets	Working Capital	Total	Total Revenue	Operating Expenses	Net Revenue
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

TABLE 41

Summary of Capital Cost, Income, and Expenses
Total Operation

( )

Period	Capital Cost Schedules			Operating Schedules		
	Fixed Assets	Working Capital	Total	Total Revenue	Operating Expenses	Net Revenue
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

TABLE 42

Detailed Summary of Capital Cost, Income, and Expenses by Function

Function:_____

( )

Period	Capital Cost Schedules							Operating Schedules						
	A	B	C	D	Total I	E	Total II	F	G	Total III	H	I	Total IV	Total V
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														

A = Preconstruction
B = Land and Buildings
C = Equipment
B = Miscellaneous
Total I = Total fixed investment
E = Working Capital
Total II = Total investment
F = Product revenue
G = By-product revenue
Total III = Total revenue
H = Variable operating costs
I = Fixed operating costs
Total IV = Total operating costs
Total V = Net income (total revenue - total operating costs)

SECTION VII

CALCULATION OF THE ANNUAL RATE OF RETURN
METHOD I

The next step in determining the economic feasibility of the project is to calculate the annual rate of return percentage. The method shown in this section calculates the annual rate of return based on graphic interpretation of investment flows versus net revenue flows. The procedures for calculating the annual rate of return by graphic analysis of investment versus net income is illustrated in Figure 6. Four basic steps are involved in this method: (1) present value calculation of capital investment, (2) present value calculation of net revenues, (3) scheduling of the values for determining the annual rate of return, and (4) graphic determination of the annual rate of return.

Present Value Calculation of Capital Investment

Table 43 is used to calculate the present values of the combined investment schedule in Table 40, 41, or 42, depending on whether the analysis is done by function or in total. The factors for calculating the discounted values are printed in Table 43. These factors have been computed from compound interest formulas. Years from present 0 through 20 are given, with year 0 being equivalent to accounting period 1.

The first step in calculating the present value of the total investment is to transfer the combined capital investment by year or period from either Table 40, 41, or 42 (depending on whether analysis is being done on separate functions or the total operation) to column 2 in Table 43.

The second step is to multiply the annual investment figures in column 2 by the various discount factors for that year, found in columns 3, 5, 7, 9, and 11. The results are then entered as the discounted values in columns 4, 6, 8, 10, and 12. Should negative investment figures occur, such as on the last year of the project, negative discount values should be entered.

Table 43 is completed by summing the discounted values in columns 4, 6, 8, 10, and 12, and entering the total at the bottom of the table in the "present total value" line. The discount factors in Table 43 can not be used if the time period used in the feasibility analysis is anything other than a year. If the periods used in the analysis are quarters or months, the computerized analysis process must be used to determine the IRR.

Present Value Calculation of Net Revenues

Table 44 is used to calculate the present values of the net revenue schedule in Table 40, 41, or 42, depending on whether the analysis is done by function or in total. The same discount factors given in Table 43 also apply in this case.

The first step in calculating the present value of net revenues is to transfer the net revenues by year from either Table 40, 41, or 42 (depending on whether analysis is being done on separate functions or the total operation) to column 2 in Table 44.

The second step is to multiply the annual net revenue figures in column 2 by the various discount factors for that year, found in columns 3, 5, 7, 9, and 11. The results are then entered as the discounted values in columns 4, 6, 8, 10, and 12. Should negative net revenue figures occur, negative discount figures should be entered.

Table 44 is completed by summing the discounted values in columns 4, 6, 8, 10, and 12, and entering the total at the bottom of the table in the "present total value" line. The discount factors in Table 44 can not be used if the time period used in the feasibility analysis is anything other than a year. If the periods used in the analysis are quarters or months, the computerized analysis process must be used to determine the IRR.

Calculation of the Annual Rate of Return

Table 45 and Figure 7 are used to determine the annual rate of return for the project being analyzed. The present total values for each discount rate in the investment schedule in Table 43 and the net revenue schedule in Table 44 are transfered to Table 45.

The present total value of investment and the present total value of net revenue are graphed in Figure 7 by assigning a unit to the vertical axis in such a manner that the largest present value (investment or revenue) falls near the top of the chart. Using this scale, the five present values of investment from Table 45 are plotted. Next, the five present values of net revenue from Table 45 are plotted in the same way. A smooth curve is drawn through the corresponding points for each schedule. The annual rate of return is defined as the discount rate on the horizontal axis at which these two curves intersect.

Benefit/Cost Ratios

Benefit/cost ratios can be constructed for each discount rate shown in Table 45. This is accomplished by using the following formula:

$$BCR_r = PVI_r/PVR_r$$

where BCR = Benefit/cost ratio
PVI = Present value of investment
PVR = Present value of net revenue
r = Discount rate

The result gives a benefit/cost ratio for each of the discount rates listed in Table 45.

FIGURE 6

Determination of the IRR
Method I

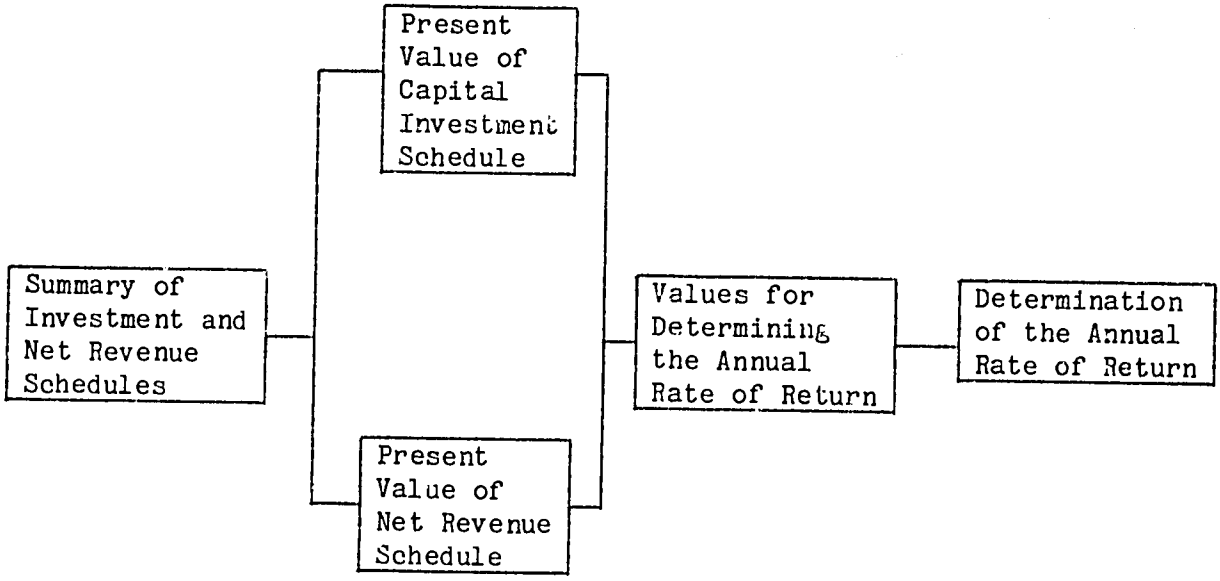


FIGURE 7

Rate of Return Graph

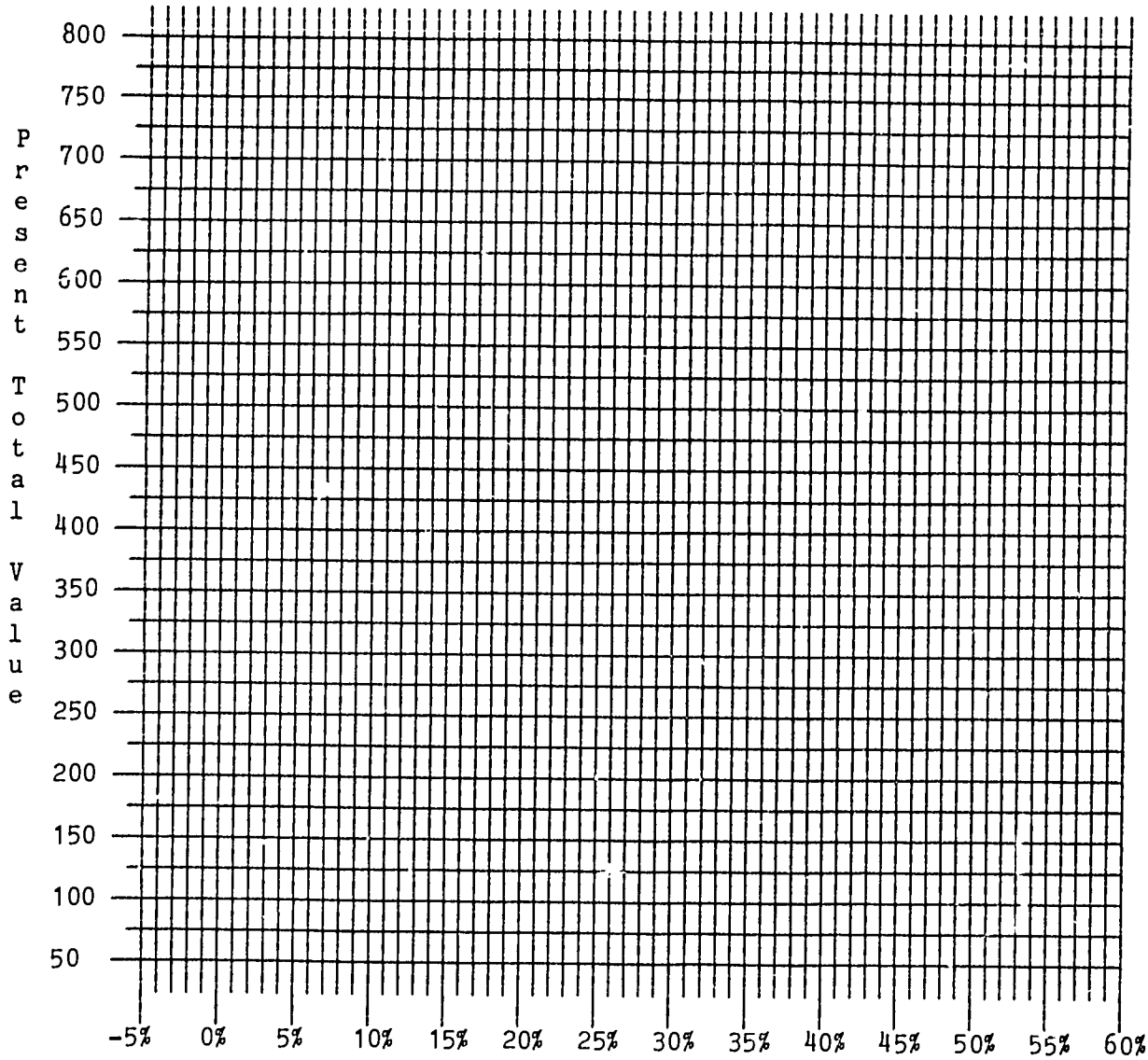


TABLE 43

Present Value of Capital Investment Schedule

( )

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Year From Present	Investment Schedule	5% DISCOUNT FACTOR	5% DISCOUNT VALUE	10% DISCOUNT FACTOR	10% DISCOUNT VALUE	15% DISCOUNT FACTOR	15% DISCOUNT VALUE	25% DISCOUNT FACTOR	25% DISCOUNT VALUE	50% DISCOUNT FACTOR	50% DISCOUNT VALUE
0		1.000		1.000		1.000		1.000		1.000	
1		.952		.909		.870		.800		.667	
2		.907		.826		.756		.640		.444	
3		.864		.751		.658		.512		.296	
4		.823		.683		.572		.410		.198	
5		.784		.621		.497		.328		.132	
6		.746		.564		.432		.262		.088	
7		.711		.513		.376		.210		.059	
8		.677		.467		.327		.168		.039	
9		.645		.424		.284		.134		.026	
10		.614		.386		.247		.107		.017	
11		.585		.350		.215		.086		.012	
12		.557		.319		.187		.069		.008	
13		.530		.290		.163		.055		.005	
14		.505		.263		.141		.044		.003	
15		.481		.239		.123		.035		.002	
16		.458		.218		.107		.028		.001	
17		.436		.198		.093		.023		.001	
18		.416		.180		.081		.018		.001	
19		.396		.164		.070		.014		.000	
20		.377		.149		.061		.012		.000	
Present Total Value											

TABLE 44

Present Value of Net Revenue Schedule

( )

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Year From Present	Net Revenue	5% DISCOUNT		10% DISCOUNT		15% DISCOUNT		25% DISCOUNT		50% DISCOUNT	
		FACTOR	VALUE	FACTOR	VALUE	FACTOR	VALUE	FACTOR	VALUE	FACTOR	VALUE
0		1.000		1.000		1.000		1.000		1.000	
1		.952		.909		.870		.800		.667	
2		.907		.826		.756		.640		.444	
3		.864		.751		.658		.512		.296	
4		.823		.683		.572		.410		.198	
5		.784		.621		.497		.328		.132	
6		.746		.564		.432		.262		.088	
7		.711		.513		.376		.210		.059	
8		.677		.467		.327		.168		.039	
9		.645		.424		.284		.134		.026	
10		.614		.386		.247		.107		.017	
11		.585		.350		.215		.086		.012	
12		.557		.319		.187		.069		.008	
13		.530		.290		.163		.055		.005	
14		.505		.263		.141		.044		.003	
15		.481		.239		.123		.035		.002	
16		.458		.218		.107		.028		.001	
17		.436		.198		.093		.023		.001	
18		.416		.180		.081		.018		.001	
19		.396		.164		.070		.014		.000	
20		.377		.149		.061		.012		.000	
Present Total Value											

TABLE 45

Values for Determining the Annual Rate of Return

( )

Discount Rate	Present Value of Investment	Present Value of Net Revenue
5%		
10%		
15%		
25%		
50%		

SECTION VIII

CALCULATION OF THE ANNUAL RATE OF RETURN METHOD II

The method described in this section calculates the annual rate of return by a mathematical formula based on the net revenue outflow from the project. This method differs from the one used in Section VI in that the calculation process, although it begins with the summary of investment and net revenue schedules, follows a different pattern of steps to determine the annual rate of return. This is illustrated in Figure 8. There are three basic steps involved in this procedure: (1) calculation of net revenue outflow, (2) calculation of the net present value of net revenue outflow, and (3) determination of the annual rate of return by mathematical methods.

Calculation of Net Revenue Outflow

Table 46 is used to calculate the net revenue outflow using the summary investment and revenue schedules in Tables 40, 41, or 42, depending on whether the analysis is done by function or in total. Total investment and net revenues are brought forward from these tables and net revenue outflow is calculated by using the following formula: net revenue - total investment = net revenue outflow.

Present Value Calculation of Net Revenue Outflow

Table 47 is used to calculate the present values of the net revenue outflow. The factors for calculating the discounted values of the net revenue outflow are printed in Table 47. The factors have been computed from compound interest formulas. Years from present 0 through 20 are given, with year 0 equivalent to accounting period 1.

The net outflow data are transfered from Table 46 to Table 47. These figures are then multiplied by the various discount factors for each year and discount rate. The results are entered as the discounted values. Should negative outflow figures occur, negative discounted values should be entered.

Table 47 is completed by summing the discounted values and entering the sum at the bottom of the table on the "present total value" line. The discount factors in Table 47 can not be used if the time period used in the feasibility analysis is anything other than a year. If the periods used in the analysis are quarters or months, the computerized analysis process must be used to determine the IRR.

Calculation of the Annual Rate of Return

The present total values in Table 47 are used to mathematically calculate the annual rate of return. At some point in this table, the present total values will change from negative to positive. According to the formula set forth in Section II, the correct IRR must lead to the condition where the net present value of investments minus the net present values of benefits equals 0. To determine where the correct IRR lies, the limits could be successively narrowed until a discount rate is found that will make the difference between the

net present values exactly 0, but this requires a lot of repetitive calculations, and fractional discount tables do not exist. Instead, interpolation is used to calculate the true value of the IRR (interpolation is simply finding the intermediate value between two discount rates).

The first step is to select two present total values: the one closest to 0 which has a positive sign and the one closest to 0 which has a negative sign. The mathematical formula is:

$$RR = DRTPVP + (DF(TPVP/TPVP+TPVL))$$

where
RR = Annual rate of return
DRTPVP = Discount rate at which positive present total value is closest to 0
DF = Difference between discount rates of TPVP and TPVL
TPVP = Positive present total value closest to 0
TPVL = Absolute value of negative present total value closest to 0

Benefit/Cost Ratios

No benefit/cost ratios can be derived in this procedure because net revenue outflows were used. Without the present total value of investment and the present total value of net revenues, such ratios can not be constructed.

FIGURE 8

Determination of the IRR
Method II

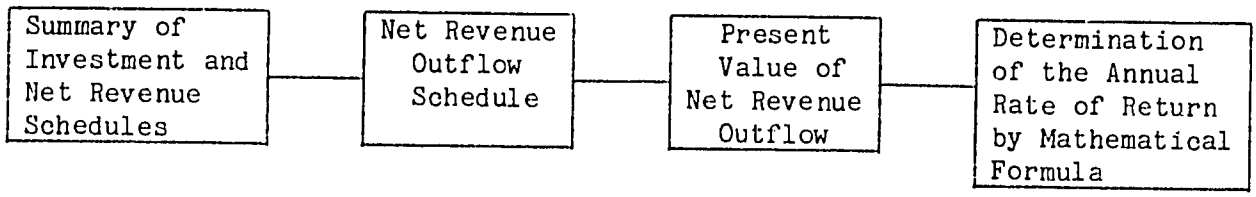


TABLE 46

Net Revenue Outflow

Period	Total Investment	Net Revenue	Net Outflow
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

TABLE 47

Present Value of Net Revenue Outflow

( )

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Year From Present	Net Revenue	5% DISCOUNT FACTOR	5% DISCOUNT VALUE	10% DISCOUNT FACTOR	10% DISCOUNT VALUE	15% DISCOUNT FACTOR	15% DISCOUNT VALUE	25% DISCOUNT FACTOR	25% DISCOUNT VALUE	50% DISCOUNT FACTOR	50% DISCOUNT VALUE
0	_____	1.000	_____	1.000	_____	1.000	_____	1.000	_____	1.000	_____
1	_____	.952	_____	.909	_____	.870	_____	.800	_____	.667	_____
2	_____	.907	_____	.826	_____	.756	_____	.640	_____	.444	_____
3	_____	.864	_____	.751	_____	.658	_____	.512	_____	.296	_____
4	_____	.823	_____	.683	_____	.572	_____	.410	_____	.198	_____
5	_____	.784	_____	.621	_____	.497	_____	.328	_____	.132	_____
6	_____	.746	_____	.564	_____	.432	_____	.262	_____	.088	_____
7	_____	.711	_____	.513	_____	.376	_____	.210	_____	.059	_____
8	_____	.677	_____	.467	_____	.327	_____	.168	_____	.039	_____
9	_____	.645	_____	.424	_____	.284	_____	.134	_____	.026	_____
10	_____	.614	_____	.386	_____	.247	_____	.107	_____	.017	_____
11	_____	.585	_____	.350	_____	.215	_____	.086	_____	.012	_____
12	_____	.557	_____	.319	_____	.187	_____	.069	_____	.008	_____
13	_____	.530	_____	.290	_____	.163	_____	.055	_____	.005	_____
14	_____	.505	_____	.263	_____	.141	_____	.044	_____	.003	_____
15	_____	.481	_____	.239	_____	.123	_____	.035	_____	.002	_____
16	_____	.458	_____	.218	_____	.107	_____	.028	_____	.001	_____
17	_____	.436	_____	.198	_____	.093	_____	.023	_____	.001	_____
18	_____	.416	_____	.180	_____	.081	_____	.018	_____	.001	_____
19	_____	.396	_____	.164	_____	.070	_____	.014	_____	.000	_____
20	_____	.377	_____	.149	_____	.061	_____	.012	_____	.000	_____
Present Total Value	_____		_____		_____		_____		_____		_____

SECTION IX

SENSITIVITY ANALYSIS

As set forth in Section II, the purpose of sensitivity analysis is to deal with the uncertainty which is inherent in operational enterprises, and the degree of error that is likely to be present in projections used to determine the base case IRR. Sensitivity analysis is the restructuring of sections of the base case analysis to determine what will likely occur to the IRR under different sets of circumstances.

Circumstances That Require Analysis

In order to determine how changes will affect the economic viability of the planned enterprise, the following potential business situations should be tested: (1) decrease in prices for products sold or decrease in product output, (2) increase in raw material costs, (3) combination of decrease in prices for products sold or decrease in product output and higher prices for raw materials or supplies purchased, (4) increase or decrease in investment cost of land and buildings, (5) increase or decrease in investment cost of equipment, (6) increase or decrease in total investment cost, (7) increase or decrease in operating costs, (8) delay in achieving operational time target, and (9) a worst-case scenario involving increase in raw material costs, decrease in prices for products sold, increase in total investment costs, and increase in operating costs.

Procedure

To simplify the sensitivity analysis procedure and to eliminate the process of having to repeatedly manually reconstruct Tables 1 through 36, it is recommended that the sensitivity analysis procedure begin with Table 42 as constructed for the summary of investments and revenues. The user can adjust the data by individual category in terms of percentages. A set of target changes in percentage terms should be selected, such as +10.0, +20.0, -10.0, and -20.0 percent. All adjustments made to base case data should be made in these increments. By following such a standard for shifting of values, the comparison of IRR results will be more meaningful and the technique of sensitivity analysis will be simplified.

If Table 42 was not used to summarize investments and revenues, then this table must now be constructed for the purpose of applying sensitivity analysis. The instructions for completing Table 42 are given in Section VI.

Once Table 42 is completed with the appropriate percentage adjustment, a new IRR is calculated using the methods presented in Sections VII or VIII.

Arranging the Results of Sensitivity Analysis

Once the analyses have been conducted on all possible situations which have been selected to be tested, the results of the changes in the IRR are arranged for review. An example of such an arrangement is illustrated in Figure 9.

FIGURE 9

Example of Summary Table for Sensitivity Analysis

IRR Values

Situation	Base Case	Percentage Change From Base Case In Situation Values					
		-20	-15	-10	+10	+15	+20
	____						
Change in Revenues		____	____	____	____	____	____
Change in Operating Costs		____	____	____	____	____	____
Change in Investment Outlay		____	____	____	____	____	____

SECTION X

COMPUTERIZED BUDGET CONSTRUCTION

The manual budgeting process described in Sections III through VI provides an accurate way of preparing data for measuring the IRR, but is very slow and does not have the flexibility of a computerized process. The construction of the baseline data for analysis as described in Tables 1 through 42 can be accomplished by a computerized process.

Application Description

This section describes the adaptation of the budgeting process to a commercial spreadsheet computer program. A spreadsheet program is used because the tabular design of the budgeting process lends itself well to the spreadsheet row and column array, resulting in an easy-to-use visual format. Users can also easily customize the spreadsheet tables to accommodate specific requirements of their analysis. Spreadsheet files as described can become large and therefore may be awkward for use in constructing tables, inputing data, and transferring data. However, a competent user can maneuver through these problems.

The following subsections describe equipment and software requirements; spreadsheet specifications and formulas; flow of information through the budgeting process; construction of files, tables, and formulas; and use of the created files. Appendix I contains a glossary which defines applicable terminology. Appendix II contains actual spreadsheet table printouts to aid the user in table construction. Appendix III contains information for further assistance to users.

This adaptation of the budgeting process to a commercial spreadsheet program requires that the user be familiar and have experience in the use of spreadsheet programs. If the user does not have such a background, then it should be acquired prior to utilizing the computerized budget construction.

Warning to the user: The computerized budgeting process as described in the following subsections is intended merely as a guide for developing a specific system applicable to the task to be undertaken. The user is responsible for adapting the process to fit his needs, with the inclusion of revenues and cost schedules that accurately describe the activity of the enterprise being planned.

Equipment and Software Requirements

The equipment used in the design and testing was a Zenith Z-159 with 640K RAM. While a computer based on MS-DOS operating system was utilized, other microcomputers with different operating systems can be used in conjunction with computer-specific software. It is recommended that a microcomputer with at least 512K of RAM be used.

The budgeting process was designed and tested using the spreadsheet program 1-2-3 Ver. 2.0 from Lotus. While layout design, formulas, and information sharing between files are described in Lotus 1-2-3 terms, they follow basic

spreadsheet principles. The Lotus description can be adapted to fit all spreadsheet programs available on the market.

Spreadsheet Specifications and Formulas

To maintain a common format throughout all spreadsheet files, standard default specifications are used. These specifications are: (1) column width is 10 unless specified differently, (2) format used is (,0) (comma separated without decimal) in most cells unless describing a percentage or cost factor, (3) cell protection is disabled during file construction, and is enabled when the spreadsheet is completed, (4) global recalculation is set on manual to speed file construction and data entry, and (5) data label prefix is aligned on the left.

Cells with specifications that differ from the default values are shown in Lotus terms at the top left corner of the screen and before each cell formula. The specification for example cell T45, a data value, with components that differ from default values, is:

T45:W9 (P3) U .155

Where W9 = different setting for column width
(P3) = percentage format with 3 decimal spaces
U = unprotected range
.155 = data value

Most formulas in Lotus 1-2-3 are self-explanatory, however some formulas contain Lotus terminology that should be explained. For example, the formulas (A10) and +A10 are equivalent. Lotus also has built-in formulas called functions (@ Functions) to shorten formulas. Examples of such functions are: (1) @SUM(A4..C4) returns the summation of values in cells A4 through C4, (2) @INT(A4) returns the integer value of cell A4, and (3) @IF(A4>B4,1,0), which is an if-then-else conditional, returns the value 1 if the condition of A4>B4 is true or returns the value 0 if the condition A4>B4 is false.

In most cases, formulas can be inputted in a single cell and copied to a complete range to speed file construction. The "relative" cell address formulas within the matrix will use data from cells relative to the position of the original cell. Cell specifications within the formula may be locked or made "absolute." Absolute formulas will read from the same column, row, or cell by placing the dollar sign ($) before the cell's column address, row address, or both. Both relative and absolute formulas are used in the files. Instructions for using relative or absolute cell formulas will be given.

Flow of Information

The flow of information through the computerized spreadsheet budgeting tables resembles that of the manual method. Table numbers in the manual method correspond to tables in the computerized method. This is illustrated in Figure 10 with a diagram that shows the flow of data from table to table within each file and from each file to final summary. Because of the large size of the tables in spreadsheet memory, a separate spreadsheet file is used for fixed investment outlays, revenues, variable costs, and fixed costs. A final spreadsheet file aggregates the summarized data from these files, calculates working capital needs, and computes the IRR analysis.

Fixed Investment, File 1, is completed first. Cost and contingency data values are entered in the input cells of Tables 1, 2, 3, and 5, and totals are calculated and collected in the summary areas. Working capital, which is technically an investment, requires data from completed Revenue and Cost tables, and is therefore completed later in a separate summary file.

Revenues, File 2, is completed next. Price and quantity data values are entered in the input cells of Tables 10, 11, 14, 15, 17, and 18. Totals are calculated in remaining cells and collected in the remaining tables and in the summary areas.

Variable Costs, File 3, is completed next. Price volume data from Revenues, File 2, are entered in the input cells of Tables 23 through 27 to calculate cost-to-volume factors. Monthly volume and value data from the Revenues file is combined into Tables 28a through 28d and used in calculating total monthly variable costs for each function. These data are then collected in a summary.

Fixed costs, File 4, is completed next. Cost data for Tables 30 through 36 are entered in the input cells and totaled in Table 37. These are then summarized in Table 38.

Working Capital, Summary, and IRR Analysis, File 5, brings together the budgeting process. Data from the revenues and variable cost sections are entered in the appropriate locations and working capital is calculated. Summary data from each of the other files are combined into the file. The budgeting process is completed by combining working capital with the other summaries by function, then in totals. A final table then calculates IRR using Lotus formulas. An option is described that outputs data to be used by other analysis programs.

File Construction

As illustrated in Figure 10, a separate file is constructed to contain the tables for fixed investment outlays, revenues, variable costs, fixed costs, working capital and final summary, and data input to IRR analysis program. The following subsections describe the construction tables and formulas within each file.

To aid the user in developing the files, the following documentation has been provided: (1) writen description of table construction within each file, (2) table layout illustration for each file, (3) illustration of part of each table with cell formulas shown for highlighted areas, and (4) printouts of each table and summary within a file showing an example run. Please note that these aids are given to help in the development of files. It is up to the user to modify the analysis files to suit his particular needs.

File 1 Construction - Fixed Investment

The fixed investment file layout, Figure 11, shows the arrangement within the spreadsheet of Tables 1 through 6. Column and row specifications are detailed in the layout. Figures 12 through 21 illustrate example tables and give the formulas required within each table. The computer printouts of each table are contained in Appendix II for further references.

The fixed investment table design is a stack of four blocks of formulas representing functions of the firm. Only one block representing a single function of the firm is illustrated in Figures 12 through 21. When laying out a table, it is only necessary to create function blocks for the number of functions being analyzed.

Within each function block, time period is represented along the vertical axis and area of investment is represented on the horizontal axis. Tables 1, 2, and 5 sum line items within each time period and multiply a percentage contingency. Table 3 lists individual pieces of equipment on the vertical axis, with information concerning each piece along the horizontal. Table 3 then allocates the purchases over the planned time period by sorting in a separate area using formulas with "if" Boolean operators. All summary tables arrange the calculated data in a matrix with each function represented on the horizontal axis and time period on the vertical axis.

Construction of File 1, Fixed Investment, begins with setting the global default settings for the entire file. Set the global column width at 10, the global format at (,0), the global recalculation on manual, and global protection disabled until file is completed.

Table 1. Begin Table 1 by referring to Figure 11 for proper location of Table 1 within the spreadsheet and to Figure 12 for table design. Type in the table titles. Create the line dividing title and contents by filling the cell A36 with the equal sign (=), then copying across with the /Copy command. Insert the column headers across the top, then center the column titles using the /Range Label Center command pointing to the headings A38..K39. Type in time period row titles 1. to 10. and Subtotal on the left side of the column under the function title. Formulas and variables are now ready to be entered.

Go to cell J40, the contingency variable. This variable is used in calculating contingency for the whole table. Format the cell for percent with one decimal space by using the /Range Format Percentage command. The percentage factor data will be entered later.

Go to cell B42. Note that the values across the table from column B to column I are data values that are initially 0. Enter a 0 (zero) in cell B42. Copy from B42 across through I42 using the /Copy command. Go to J42. Enter the formula for J42 from Figure 12 which calculates the contingency by taking the integer value of the contingency percent variable times the sum of columns B..I: @INT($J$40*@SUM(B42..I42)+0.05). Go to K42 and enter the formula which sums B42..J42, @SUM(B42..J42). At this point, the formulas for the remainder of the block are ready to be entered by copying. Copy the row of cells B42 through K42 to the range B43 through K50 using the /Copy command. Go to cell K52. Enter the formula to sum the Totals column, @SUM(K42..K51). At this point, the function 1 block is complete.

The difference in relative addresses and absolute addresses shown in the J column of formulas should be recognized. The entire column calculates the contingency by using cell J40. This is because it was made absolute with $ before both J and 40, $J$40. Each row's formula sums the data in columns B through I relative to the position of the formula cell, J. Therefore, this part of the formula (@SUM(B42..I42)+0.05) uses a relative address. This relative address part of the formula can be copied, which allows one row of

cell formulas to be entered and copied to complete the block of function 1 formulas.

The Table 1 printout in Appendix II shows the four functions of the firm created as copies of the function 1 block. Copy the function 1 block of formulas by moving the cursor to A40, and invoking the copy command /Copy, pointing to the range A40..K52 with the arrow keys and pressing return. Move the cursor to cell A54 and press return. Go to A54 and correct the copied function variable from storage to processing. Function 2 block, processing, in the Appendix I example is now complete. Copy block A41..K52 to locations A67..K78 and A80..K91 and correct the block headings to complete the table. This method of copying allows whole tables to be constructed much more easily and accurately than by building each block one at a time.

The user can print the range of Table 1 to check its correctness. Invoke the print menu with the /Print Printer command. Choose Range pointing to A32..K91. Note that the printouts given in Appendix II were printed in compressed print at 17 CPI (characters per inch). Commands for compressed print are printer-specific. Consult the printer manual for the correct code. Choose Options Setup and enter the code for compressed print. Now set margins by choosing Options Margins and entering the correct margins. Quit the options menu and choose GO from the main menu to initiate printing.

Table 2. Table 2, Land and Building Investment, is a variation of Table 1 with fewer columns. Begin Table 2 by referring to Figures 11 and 13 for proper location of Table 2 within the spreadsheet. Type in the table titles. Create the line dividing title and contents by filling the cell M36 with =, then copy across with the /Copy command. Insert the column titles across the top, then center the titles by using the /Range Label Center command pointing to the titles in M37..V39. Type in time period headings 1. to 10. and Total as instructed in Table 1. Formulas and variables are now ready to be entered.

Go to cell U40, the contingency variable. This variable is used in calculating contingency for the total table. Format the cell for percent with one decimal space by using the /Range Format Percent command. A percentage data value will be entered later.

Go to cell N42. Note that the values across the table from column N to column T are data values that are initially 0. Enter a 0 (zero) in cell N42. Copy from N42 across through T42 using the /Copy command. Go to U42. Enter the formula for U42 from Figure 13 which calculates the contingency by taking the integer value of the contingency percentage variable times the sum of columns B..I: @INT($U$40*@SUM(N42..T42)+0.05). Go to V42 and enter the formula which sums N42..U42, @SUM(N42..U42). At this point, the formulas for the remainder of the block are ready to be entered by copying. Copy the row of cells N42 through V42 to the range N43 through V51 using the /Copy command. Go to cell V52. Enter the formula to sum the Totals column, @SUM(V42..V51) At this point, the function 1 block is complete.

The Table 2 printout in Appendix II shows the four functions created as copies of the function 1 block. To copy the function 1 block of formulas, go to cell M40, invoke the copy command /Copy, point to the range M40..V52 with the arrow keys and press return. Move the cursor to cell M54 and press return. Go to

M54 and correct the copied function variable from storage to processing. Function 2 block, processing, in the Appendix II example is now complete. Copy block M41..V52 to locations M67..V78 and M80..V91 and correct the block titles to complete the table.

Table 3. Though Table 3, Equipment Investment, is different from the other fixed investment tables, the creation process is similar. Refer to Figures 11 and 14 for location of Table 3 in the file. Begin by typing the titles. Create the divider line by filling the cell A101 with =, then copying from A101 to B101..J101 using the /Copy command. Type in the column headers across the top from A102..J105, then center the labels with the /Range Label Center command. On the left side of the function/equipment block, type in numbers used as row labels to indicate various pieces of equipment as per the Figure 14 example.

Go to cell B107. Enter 0 (zero), and copy across to cell D107 using the /Copy command. Insert the contingency formula for E107 and the summation formula for F107 as listed in Figure 14. Insert 0 (zero) in cells G107 through J107 to be used in the formulas of the Sort Area for Function 1 in Table 3 (Figure 15) in order to sort the equipment purchases by time. Copy the row of cells from B107..J107 to B108..J114 using the /Copy command to complete the function block.

Create the Function 2 block using the /Copy command from A106..J114 to A116 and press return. Copy function blocks 1 and 2, A107..J124 to create function blocks 3 and 4, A126..J144 The completed table should match the Table 3 printout, found in Appendix II.

The time period sorting area block is completed next. These formulas sort machinery cost [illegible] time period purchased and/or replaced using an @IF function and using the "[illegible]" Boolean operator. The example shown is for t=10 time period and n=8 pieces of machinery per function. The formulas work by placing machinery total cost in a time matrix which can be summed by time period. This process is similar to using a loop in a programming language.

Go to A148 and insert the formula for the Table 3 Sort Area found in Figure 15. Type in formulas B148 across through J148 representing the time periods. Copy the row of formulas using the command /Copy B148..J148 to B149..J155 to complete the function 1 sorting area that corresponds to the function 1 machinery data. The block layout of formulas corresponds to the layout of data in Table 3, therefore the block can be copied to read from function 2 data. Copy the function 1 sorting area to A158..J165 using the /Copy command. Function 1 and 2 sorting areas can then be copied down to create the function 3 and 4 sorting areas shown in the printout in Appendix II.

Table 5. Table 5 is a variation of Tables 1 and 2. Begin Table 5 by referring to Figures 11 and 16 for proper location of Table 5 within the spreadsheet. Type in the table titles. Create the line dividing title and contents by filling the cell M99 with =, then copying across with the /Copy command. Insert the column titles across the top, then center the headers using the /Range Label Center command pointing to the headings M101..R104. Type in time period row titles 1. to 10. and Total on the left side of function column. Formulas and variables are now ready to be entered.

Go to cell Q104, the contingency variable. This variable is used in calculating contingency for the whole table. Format the cell for percent with one decimal space by using the /Range Format Percentage command. A percentage data value will be entered later.

Go to cell N106. Note that the values across the table from column N to column P are data values that are initially 0. Enter a 0 (zero) in cell N106. Copy from N106 across through P106 using the /Copy command. Go to Q106. Enter the formula for Q106 from Figure 16 which calculates the contingency by taking the integer value of the contingency percentage variable times the sum of columns N..P: @INT($Q$104*@SUM(N106..P106)+0.05). Go to R106 and enter the formula which sums N106..Q106, @SUM(N106..Q106). At this point, the formulas for the remainder of the block are ready to be entered by copying. Copy the row of cells N106 through R106 to the range N107 through V115 using the /Copy command. Go to cell R116. Enter the formula to sum the Totals column, @SUM(R106..R115) At this point, the function 1 block is complete.

The Table 5 Printout in Appendix II shows the four functions created as copies of the function 1 block. Go to cell M105, invoke the copy command /Copy, point to the range M105..R116 with the arrow keys and press return. Move the cursor to cell M118 and press return. Go to M118 and correct the copied function variable from storage to processing. Function block 2, processing, in the example is now complete. Copy block M105..R116 to locations M131 and M144 to complete the four function blocks as they appear on the Table 5 printout in Appendix II.

At this point Tables 1, 2, 3, and 5 should be complete. Summary tables divided by time period and function are then created for each table.

Summary tables. Creation of the summary tables proceeds similarly to other tables. Begin with the Table 1 Preconstruction Expense Summary. Refer to Figure 11, Table Layout, for proper layout position, and Figure 18 for table design. Type in titles, divider lines, column and row headings, then center using the /Range Label Center command. Next enter the formulas that draw the totals from each table by function and time period. Go to cell J12. Enter the formula for J12 found in Figure 18. Do the same for cells K12 through N12. Copy this row of cells J12..N12 to J13..N21 using the /Copy command. Notice how these copied relative formulas take advantage of the function/time period layout within the table to draw out correct totals.

Completion of the other summary tables, Table 2 Land and Buildings Investment Summary, Table 4, and Table 5 Miscellaneous Capital Outlay Summary, is done simply by copying the Table 1 Preconstruction Expense Summary to the other summary locations, as illustrated in Figure 11 (the design for these summary tables is illustrated in Figures 19 through 21). Formulas are then changed to draw the correct totals from the corresponding tables. Copying thus maintains an exact format between the summary tables.

Use the command /Copy I5..N23 to P5..V23 and press return for the Table 2 summary. Input the correct formulas in cells Q12 through U12 found in Figure 19. Use the /Copy command to correct the remaining summary formulas, copying from Q12..U12 to Q13..U21. Complete the summary by changing the title to Land and Buildings Investment Summary.

Use the same procedure copying from I5..N23 to W5..AB23 to create Table 4 Equipment Investment Summary. Correct the title lines. Input each formula in the block found in Figure 20. The arrangement of the summary formulas does not correspond with the sorting formulas, therefore these formulas can not be copied and must be entered one at a time.

Copy from I5..N23 to AD5..AI23 to create the Table 5 Miscellaneous Capital Outlay Summary. Again correct the titles, then enter the correct formulas from Figure 21 in the range AE12..AI12. These formulas can be copied from AE12..AI12 to AE13..AI21. using the /Copy command. The table will now be correct.

The Summary of Fixed Capital Investment, Table 6, is created by following the same steps (Figure 17). Copy Table 2 I5..N23 to A5..F23. Enter the correct range of formulas from Figure 17 into B12..F12. Copy these to B13..F21 and then correct the table titles to complete the summary.

Some final steps in constructing the file will aid the user at later stages. The first step is to name the range of summary data that will be used in the IRR analysis. The named range is used in order to access the summary data while in File 5, Working Capital, Summary, and IRR Analysis. Use the /Range Name Create command to name the range J12..AI21. Use a name that relates to its contents, like Summary. Finally, cell protection specifications must be structured. Use the /Range Unprotect command to unprotect all cells in which data will be entered. This is done one table at a time. Note, do not unprotect cells which contain formulas that generate data. Once all table data cells are unprotected, enable worksheet protection with the /Worksheet Global Protection Enable command. The unprotected cells will be displayed differently from the protected formula cells, allowing easier input of data.

It would be useful to print each table in the file. Follow the instructions given earlier to print out each table. Finally, before exiting the program, save the constructed tables to disk with the /File Save command, using the name INVEST.

File 2 Construction - Revenue

The revenue file layout, Figure 22, shows the arrangement of Tables 10 through 22. Example tables with formulas are shown in Figures 23 through 30. Computer printouts of Tables 10 through 22 are shown in Appendix II.

The revenue file utilizes monthly data, therefore the table design uses one-year units divided into 12 months along the vertical axis with volumes, prices, and values on the horizontal axis. Tables 10, 11, and 12 involve the storage function. These tables are presented in File 2 as a composite table. Tables 14 and 15 involve the processing function and are presented in File 2 as a composite table. Tables 17 through 19B involve marketing functions. Tables 13, 16, and 20, which were utilized in the manual process, are not required in the computerized process. Three functions are shown in the example, but one can customize the revenue file to fit the organization and requirements of the analysis.

Construction of File 2, Revenue, begins with setting the global default settings for the entire file. Set the global column width at 10, the global

format at (,0), the global recalculation on manual, and global protection disabled until file is completed.

Tables 10, 11, and 12. Begin construction of these tables by referring to Figure 22 for the specific location within the worksheet and Figure 23 for table design. Type in titles and divider lines. Type in column and row headings and center these ranges of labels. Enter the formulas for month 1, cells AB13..AM13 found in Figure 23. Because inventory calculations for month 2 are slightly different, enter the formulas for cells AB14..AM14. Copy these formulas from month 2 down to AB15..AM24. Enter the totaling formulas on row 25 for Purchases, Sales, Purchases, Cost of Sales, and Gross Revenues columns. The year 1 function block is now complete. The whole block can now be copied to create the yearly time periods 2 through 10 blocks. One change you must make is correcting the month 1 beginning inventory formula of each time period block. It should read the ending inventory of the previous time period's month 12. Beginning inventory for Table 10 cell AB28 should have the formula $AE$24. Beginning inventory for Table 12 cell AI28 should have the formula $AK$24. Make the changes to the year 2 formula block, then copy the year 2 block to the other locations, AA42..AA55, AA57..AM70, AA72..AM85, AA87..AM100, AA102..AM115, AA117..AM130, AA132.AM145, and AA147..AM160. Correct the headings. The copied year's 3 through 10 blocks will now calculate correctly. Finally, names should be given to two columns of data used in the variable cost file that represent the volume and value, respectively, of product stored. Name the range AC13..AC160 VOLUMEA using the /Range Name Create command. Name the range AJ13..AJ160 VALUEA using the /Range Name Create command.

Tables 14 and 15. Tables 14 and 15 represent function 2, processing, for one product and one by-product. Begin construction by referring to Figure 22 for spreadsheet location and Figure 24 for table design. Type the table titles and dividing lines. Type in and center the column and row labels. Tables 14 and 15 calculate yield of product from processing through a standard conversion percentage. This conversion factor is shown at cells AT5 and AZ5. Format the cells AT5 and AZ5 for percentage with one decimal place. Enter the formulas for month 1, cells AP13..AZ13 found in Figure 24. In this case, formulas for each month in the time period are similar. Copy the month 1 row of cells AP13..AZ13 down to AP14..AZ24 to complete the year 1 block of formulas. Enter the totalling formulas at row 25 for columns AT, AU, AV, and BA. Copy the completed year 1 formula block to years 2 through 10 to complete the processing function tables. Finally, names should be given to two columns of data used in the variable cost file that represent the volume and value, respectively, of product processed. Name the range AP13..AP160 VOLUMEB using the /Range Name Create command. Name the range AT13..AT160 VALUEB using the /Range Name Create command.

Tables 17A, 17B, and 18. The marketing function tables are divided into two table formats with Tables 17A, 17B, and 18 representing quantity and price, and 19A and 19B representing values. Begin the first table format by referring to Figures 22 and 25 for proper placement and design of the tables. Type in the titles and divider lines. Type in and center column and row titles. Enter the formulas for month 1, cells AB177..AM177 found in Figure 25. Because inventories are involved, month 2 formulas are different. Enter the formulas for month 2, AB178..AM178. Copy these down to AB179..AM188. Copy the entire year 1 formula block, AB177..AM188, to year 2 AB191..AM203. Change

the month 1 of year 2 beginning inventory formulas to read the ending inventory of the previous month. Copy this correct year 2 block of formulas to create years 3 through 10. Finally, name the range that will be used in the variable cost file that represents product volume marketed. Name range AC177..AC324 VOLUMEC using the /Range Name Create command.

Tables 19A and 19B. Tables 19A and 19B complete the revenue section calculations. Begin this table format by referring to Figures 22 and 26 for proper placement and design of tables. Type in titles and divider lines. Type in and center the column and row headings. Insert the formulas for month 1, cells AP177-BA177. Because inventories are involved, month 2 formulas are different. Enter the formulas for month 2, AP178..BA178 found in Figure 26. Copy this row of formulas to AP189..BA189. Enter the totalling formulas on row 189 for columns AP, AR, AT, AU, AV, AX, AZ, and BA. Copy the year 1 block to create year 2. Change the month 1 beginning inventory formulas for each time period block to read the ending inventory of the previous month. Copy year 2 formulas to years 3 through 10. Name the range that will be used in the variable cost file that represents product value marketed. Name the range AR177..AR324 VALUEC using the /Range Name Create command.

Summary tables. Construction of the revenue summaries begins with the Product Revenue Summary. Refer to Figures 22 and 28 for the location and design of the summary file. Begin by typing in titles and divider lines. Type in and center the column and row titles. This summary format should be an exact copy of the summary formats used in File 1. Enter the formulas exactly as listed in Figure 28. Because of the layout of the revenue tables, each formula in the summary must be entered individually.

Follow the same routine for constructing the By-Product Revenue Summary in Figure 29 and the Other Income in Figure 30. Other income does not draw information from any of the other tables, but is included to record any miscellaneous sources of marketing income in the project.

The Total Revenue Summary is constructed last. It is similar to other summaries in layout design except for the addition of the Other Income column. Refer to Figures 22 and 27 for table layout and design. Type in titles and divider lines. Type in and center the column and row titles. Enter the formulas from Figure 27 for B11..G11. The formulas in the Total Revenue Summary draw information from Product Summary, By-Product Summary, and Other Income, therefore formulas can be copied. Copy B11..G11 to B12..G20. Enter the totalling formulas B22..G22. The revenue summaries will now be complete.

The final steps in constructing the file are to name the range of summary data that will be used in the IRR analysis and unprotect the data input cells. Use the /Range Name Create command to name the range J11..Z20. Use a name that relates to its contents, like Summary. Again, cell protection specifications must be structured. Use the /Range Unprotect command to unprotect all cells in which data will be entered. This is done one table at a time. Note, do not unprotect cells that contain formulas that generate data. When all table data cells are unprotected, enable worksheet protection with the /Worksheet Global Protection Enable command. The unprotected cells will be displayed differently from the protected formula cells, allowing easier input of data.

Print out each table in the file using instructions given earlier. Before exiting, save the file with the /File Save command using the name REVENUES.

File 3 Construction - Variable Cost

The variable cost file layout, Figure 31, shows the arrangement of Tables 23 through 29. Example tables with formulas are shown in Figures 32 through 48. The table printouts of Tables 23 through 29 are included in Appendix II. Continuous reference will be made to these different aids.

The variable cost file utilizes three different table designs. Variable cost factors are calculated in the first set of tables, 23-27. These tables are designed with firm functions grouped on the vertical axis and costs on the horizontal axis. Tables 28A through 28D calculate variable costs by month by combining the cost multipliers with product volumes and values. Month and time period are located on the vertical axis and cost area on the horizontal axis. Finally, the summary tables draw totals by time period and function in the different cost areas. These are totaled in the Total Variable Cost summary.

Construction of File 3, Variable Cost, begins as before with setting the global default settings for the entire file. Set the global column width at 10, the global format at (,0), the global recalculation on manual, and global protection disabled until file is completed.

Tables 23-27. Begin constuction of Table 23 by referring to the Variable Cost File Layout, Figure 31, for the position within the spreadsheet, and Figure 32 for the table design. Type titles and divider lines. Type and center the column headers and row headers for first function. Input 0 (zero) in cells C39 and E39 as these values will be inputted later. Format these cells in the fixed two-decimal format (F2). Enter the formulas for G39. Enter the formula that calculates the multiplier, G41 listed in Figure 35. The value for cell G40 will be inputted later in analysis, currently enter 0 (zero.) Complete the table by copying the function 1 range of cells A39..G41 to create functions 2, 3, and 4.

Table 24 includes a list of articles that are priced then totaled for each function. Other than that difference, it calculates the multiplier similarly to Table 23. Construct Table 24 like previous tables, typing in titles, dividing lines, and row and column headers. Enter the formulas found in Figure 33. Note the different cell format for column C, fixed two-decimal (F2). Copy the function 1 range of formulas and headings to create functions 2, 3, and 4.

Table 25 resembles Table 23. Refer to Variable Cost File Layout, Figure 31, and Figure 34 for proper location within the spreadsheet and formulas.

Table 26 is similar to Table 24. Again refer to the File Layout, Figure 31, and Figure 35 for proper layout within the spreadsheet and formulas.

Table 27 resembles Table 23. Refer to the File Layout, Figure 31, and Figure 36 for proper layout within the spreadsheet and formulas.

Tables 28A-28D. Tables 28A through 28D calculate variable cost per month within each time period by multiplying the calculated cost-to-volume multiplier from Tables 23-27 times product volumes or values from the Revenue File.

Begin construction of Table 28A by locating its position within the spreadsheet by referring to Figure 31, File Layout, and Figure 37. Type titles, dividing lines, and column and row headers. Format the multiplier cells V40..Z40 and AA42 in fixed, three-decimal format (F3). Enter the absolute formulas for the multipliers found in Figure 37. Input 0 (zero) in the month 1 Product Volume and Product Value locations T44 and U44. Input the month 1 formulas in cells V44..AB44. Copy the row of cells T44..AB44 to T45..AB55. Input the period totals formulas V56..AB56. Copy the period 1 block S43..AB56 to create the time period blocks 2 through 10.

Create Tables 28B, 28C, and 28D representing the different functions by copying the complete Table 28A S30..AB191 to the ranges AD30..AM191, AO30..AX191, and AZ30..BI191. Change each of the Table 28B-28D multiplier formulas to read from their respective function in Tables 23-27. These formulas are found in Figures 38 through 40.

Table 29. Total Variable Cost, Table 29, is created next. This table draws monthly totals by function from Tables 28A-28D. Type in title, dividing lines, and column and row headings. Input formulas from Figure 41 in cells BM44..BQ44. Copy this row of formulas down to BM45..BQ55. Copy the yearly time period 1 block to periods 2 through 10. Monthly rows in Table 29 must correspond with monthly rows in Tables 28A-28D.

Summary tables. Create summary tables next. Refer to the variable cost file layout, Figure 31, and the example tables, Figures 42 through 48, for correct placement of summary tables within the spreadsheet. Construct the summaries in exactly the same format as used for previous summaries. Begin with Figure 43, Building and Equipment Maintenance Summary, located in the range I5..N25. Type the titles, dividing lines, and column and row headings. Because the summary function/period block does not correspond to Tables 28A-28D, formulas for each function and period must be inputted individually.

Create the remaining summaries by copying the Building and Equipment Maintenance Summary format for Supplies and Materials, Energy, Wages, Other, and Loss summaries. At each summary, input the correct formulas found in corresponding Figures 43 through 48.

When those summaries are complete, copy the Building and Equipment Maintenance layout to the Total Variable Cost Summary range B5..G25. Insert the correct formulas into the range C14..G14. Because these formulas correspond to the cost area summaries to the right, these can be copied. Copy to range C15..G23. Insert the column totaling formulas C25..G25.

The final steps in constructing the file are to name the range of summary data that will be used in the IRR analysis, and unprotect the data input cells. Use the /Range Name Create command to name the range C14..G23. Use a name that relates to its contents, like Summary. Again, cell protection specifications must be structured. Use the /Range Unprotect command to unprotect all cells in which data will be entered. This is done one table at a time. Note, do not unprotect cells that contain formulas that generate data. When all table data cells have been unprotected, enable worksheet protection with the /Worksheet Global Protection Enable command. The unprotected cells will be displayed differently from the protected formula cells, allowing easier input of data.

Print out each table in the file. Finally, before exiting the file, save the constructed tables to disk with the /File Save Command using the name VARCOST.

File 4 Construction - Fixed Cost

The fixed cost file layout, Figure 49, shows the arrangement of Tables 30 through 38. Example tables with formulas are shown in Figures 50 through 59. The table printouts of Tables 30 through 38 are included in Appendix II. Continuous reference will be made to these different aids.

The fixed cost file uses a variety of table designs. One general theme among Tables 30-36 is that functions are grouped vertically and different cost areas or totalling formulas are grouped horizontally. These are drawn together in a summary in Table 37, allocated by month in Table 38, then summarized.

Construction of File 4, Fixed Cost, begins as before with setting the global default settings for the entire file. Set the global column width at 10, the global format at (,0), the global recalculation on manual, and global protection disabled until file is completed.

Tables 30-36. The construction of Tables 30-36 begins as before. Refer to Figure 49, fixed cost file layout, and Figures 50 through 56 as guides in placement of tables in the spreadsheet. Begin the tables by typing in the titles, dividing lines, and column and row headings. Type in the data input cells as 0 (zero), and formulas for each function block. If a column of formulas requires a different format such as Table 35, columns Z and AC, format these cells before copying the formulas, and cell format will also be copied. In the case of Tables 33-35, insert the formulas in the first row and copy down to complete the block. Copy each function 1 block to functions 2, 3, and 4 to complete each table.

Table 37. Table 37 draws together Table 30-36 function totals. Create Table 37 as previous tables. Type titles, dividing lines, and column and row headers. Insert the formulas from Figure 57 separately for each cell, as the layouts do not correspond and do not allow copying.

Table 38. Table 38 allocates the function totals from Table 37 evenly over time. Create the table similarly as others. Input the formulas as listed in Figure 58. Copy these through month 12. Input the totaling formulas.

Summary table. Refer to Figures 49 and 59 for correct placement of the summary table within the spreadsheet. Construct the summaries in exactly the same format as used for previous files' summaries. Type the titles, dividing lines, and column and row headings. Because the fixed cost does not change over time, formulas refer to the same cell. Insert formulas listed in Figure 59.

The final steps in constructing the file are to name the range of summary data that will be used in the IRR analysis, and unprotect the data input cells. Use the /Range Name Create command to name the range B9..Z18. Use a name that relates to its content, like Summary. Again, cell protection specifications must be structured. Use the /Range Unprotect command to unprotect all cells in which data will be entered. This is done one table at a time. Note, do not unprotect cells that contain formulas that generate data. When all table

data cells have been unprotected, enable worksheet protection with the /Worksheet Global Protection Enable command. The unprotected cells will be displayed differently from the protected formula cells, allowing easier input of data.

Print out each table in the file. Finally, before exiting, save the spreadsheet file with the /File Save command using the name FIXCOST.

File 5 Construction - Working Capital, Summary, and IRR Analysis

The working capital, summary, and IRR analysis file layout, Figure 60, shows the arrangement of tables that calculate working capital, aggregate summary data, and compute the internal rate of return (IRR). Example tables with formulas are shown in Figures 61 through 70. The table printouts of each table used in Figures 61 through 70 are included in Appendix II.

This file combines many different operations. Data from revenue and variable cost files are entered into the file at a specific location and used to compute working capital needs by function and time period. Summary ranges from the fixed investment, revenue, variable cost, and fixed cost files are combined into the file in specific locations. These are joined with the calculated working capital in function summaries. The function summaries are aggregated into a total summary table. Within this table, totals are multiplied by an inputted percentage factor allowing sensitivity analysis. This table is used as input to a Lotus IRR calculation table and to a data block for the Phillips IRR program.

Construction of File 5, working capital, summary, and IRR analysis file, begins with setting the global default settings for the entire file differently from previous files. Set the global column width at 9, the global format at fixed and no decimal (F0), the global recalculation on manual, and global protection disabled until file is complete.

The first step is to create the working capital variable blocks. These are variables used as data for working capital calculations in Table 9 and do not contain formulas. Refer to Figures 60 and 61 for proper location within the file. Type in block titles, row and column headings, and dividing lines for block 1. Enter a 0 (zero) at cell B32. Copy across from B32 to P32. Format cells K32 and P32 for percentage one-decimal format (P1). Format cells E32 and K32 in fixed no-decimal format (F0). Copy the row of cells B32..P32 down to B33..B42. The function 1 block of input cells is now complete. Copy the entire function 1 block A26..P42 to create function blocks 2 through 4.

Next construct Table 9, Budgeted Working Capital Requirements. Refer to Figures 60 and 62 for proper location within the file. Type in titles, dividing lines, and column and row headings. Go to cell C9. Type in the C9 formula listed on two lines in Figure 62 as one formula.

Input the formulas for cells C9..K9 and cells C10..K10 exactly as shown in Figure 62. Copy the range of cells C10..K10 to C11..K18. Type in the dividing line and enter the formulas listed for row 20. The working capital calculation block is complete at this point.

Create the file combining blocks next. In these blocks, data are combined from the fixed investment, revenue, variable cost, and fixed cost files into the summary file using the Lotus /File Combine command. If this sharing of data between files cannot be done by the spreadsheet used, this process will have to occur manually. Refer to Figures 60 and 63 for proper location within the file. Type in the dividing lines and row and column headings in the locations exactly as they appear in Figure 63. No formulas are entered. Data will be combined later upon completion of the file.

Create the function total summaries. Refer to Figure 60 and Figures 64 through 67 for proper location within the spreadsheet file. Begin construction with function block titles, dividing lines, and column headings. Set the column width of column AI at 3 and AJ at 5. The time period and year variables are entered as values, not as labels. Enter the time period 1 formulas found in Figures 64-67 for each of the functions at rows 82 for function 1, 102 for function 2, 122 for function 3, and 142 for function 4. Copy these down through time period 10 to complete each of the function blocks. These formulas, which take advantage of the layout of the combined summary blocks, are copied to complete the function summaries.

The total summary is completed next. This table draws together the function total summaries and multiplies the total by a percentage factor to allow sensitivity analysis on these totals by the IRR table. Refer to Figures 60 and Figure 68 for proper location within the worksheet. Type in the titles, dividing lines, and column headings. Enter the formulas that draw together the function summary totals in row 10, AK10..AX10, then copy these down through time period 10, AK19..AX19. Enter the percentage factors for the sensitivity analysis section. First, format the range that includes the cells AK28..AW29. Enter the row of formulas that calculate the factored totals in row 31, AK31..AX31, then copy down through time period 10. Enter the recovery formulas in row 41, cells AK41..AX41. Type in the footnotes that explain the column headings.

The Phillips format block is an option designed to create a data file for the IRR Feasibility Analysis Program for the MS-DOS Microcomputer developed by Dr. Richard Phillips of the Food and Feed Grains Institute (FFGI) of Kansas State University. More information on this program can be found in the program manual available from FFGI. The block is set in the Fortran format specified for the program, I3, 1X, A4, 8F9.0. and 5F9.0. Columns AI and AJ are set with column widths at 3 and 5, respectively. The remaining columns are 9 spaces wide in a fixed no-decimal format (F0) like the default. Enter the formulas from Figure 69 in cells AI169..AR169. Copy these to AI170..AR179. Enter the formulas for cells AI181..AL181. Copy these to AI190..AL190.

The IRR calculation table is created next. Refer to Figures 60 and 70 for proper location in the spreadsheet file. Notice the arrangement of small spacer columns four spaces wide between formula columnns. Set the column width of the spacing columns using the /Worksheet Column Set-Width command on columns BB, BD, BF, BH, BJ, BL, BN, BP, and BR. Type in titles, column headings, and divider lines. Format the cells BM16 and BM17 in percentage three-decimal format (P3). Enter the formulas for BM16. BM17 is a data variable used in the Lotus IRR calculation. Now enter the formulas in the body of the table. Enter the formulas that draw row headings, AX23 and BA23. Enter the formulas that calculate investment totals, BC23, BE23, and BG23. Enter the

formulas that calculate operating expenses, BI23, BK23, BM23. Enter the formula used in calculating a value for the IRR formula at BN23. This column is later set in a hidden format. Input the formula for BO23 that calculates the present value factor, and the columns BQ23 and BS23 which calculate present values. Copy the entire row of formulas, AZ23..BS23 to AZ24..BS33. Because these draw from the sensitivity-factored total summary which has a similar period format, these can be copied from the top row. Type in the dividing lines under the columns, then insert the row 35 formulas. Type in the headings for the Benefit/Cost Ratio analysis and insert the formulas for row 45. Copy this row down from BC45..BS45 to BC50..BS50. Format the range BN23..BN33 using the /Range Format Hidden command.

The IRR analysis table is now complete. Save the file to disk using the /File Save command, naming the file ANALYSIS. The various parts of the spreadsheet file should be printed out at this time to be used as reference. Use the instructions given earlier.

Using the Spreadsheet Files

This subsection describes the use of the spreadsheet files 1 through 5 developed as instructed in the previous subsection. Specific instructions are given. The user who customizes the spreadsheets to fit particular needs can still use this section as a general guide that helps in organization.

Review Sections III through VI describing the manual budgeting process. These sections describe the base data required, develop the methodology, and explain the results. The spreadsheets constructed in the previous subsection follow the manual method. Arranging the base data in a tabular format that resembles the manual method will speed data entry into the spreadsheets. Other aids that will help organize data entry are the Appendix II table printouts as guides within each table, and the spreadsheet table layouts, File 1 Figure 11, File 2 Figure 22, File 3 Figure 31, File 4 Figure 49, and File 5 Figure 60, that act as guides within each spreadsheet file.

File 1 INVEST. Begin data entry for File 1 by retrieving the file into memory using the Lotus /File Retrieve command. The worksheet global recalculation should have been set on manual. This will speed data entry. Worksheet global protection should now be enabled. This will disallow changes to any part of the spreadsheet other than data entry cells. Use Figure 11 and Tables 1 through 5 printouts from Appendix II as guides in moving around the spreadsheet and individual tables. Refer also to Section III describing the manual method of the budgeting process for a description of base data used in the analysis.

Move the cursor with the arrow keys to Table 1. Go to cell J40 and enter the contingency calculating percentage. Move back to cell A32 then to A52. Row titles should appear on the left of the screen, column titles should appear of the top of the screen. Move to cell B40. Invoke the /Worksheet Titles Both command. Row and column titles will now be locked on the top and left margins. When the cursor is moved down, the spreadsheet will move up, but titles will remain fixed on the top. When the cursor is moved to the right, the spreadsheet will move to the left, but row titles will remain fixed on the left. This /Worksheet Titles command aids the user tremendously when entering data in large spreadsheet tables. Another useful command is the related

/Worksheet Window command that allows the user to see two different parts of the worksheet at the same time.

Within the body of Table 1, input the preconstruction expense figures with respect to function and time period. The data entry columns are: column B Market Analysis, column C Technical Analysis, column D Economic Analysis, column F Salaries, column G Legal, column H Insurance, and column I Other. Columns J and K are formula cells that should be protected from changing. When data entry for Table 1 is complete, remove the row and column titles with the /Worksheet Titles Clear command. Press F9 to calculate the formulas. Review Table 1 to see the results of calculations. At this point, the Preconstruction Summary I5..N23 should contain the summarized Table 1 data.

Go to Table 2, Land and Buildings Expense. Proceed as before with Table 1. Enter the contingency variable percentage. Go to the top left part of Table 2 and fix the row and column titles with the /Worksheet Titles Both command. Enter the data in the unprotected data cells. Data entry columns are: column N Purchase Cost, column O Site Preparation, column P Other, column Q Construction Cost, column R Utilities, column S Other, column T Other. Columns U and V are formula columns. When finished, clear the titles from the screen using the /Worksheet Titles Clear command, then press F9 to calculate the formulas. Review the results. The Table 2 summary will contain the summarized Table 2 data.

Begin entering data in Table 3, Equipment Investment Worksheet, with the contingency variable at cell E105. Fix row and column titles, then enter data. Data on equipment items are listed in column B Price, column C Delivery Expense, and column D Installation Expense. Time period of installation should be entered in column G, and replacement periods in columns H, I, and J. When finished entering data, clear the titles from the screen, calculate the formulas by pressing F9, and review the results. Table 4 should summarize the results of Table 3.

In Table 5, Miscellaneous Capital Outlay Expenditures, data is entered similarly to Tables 1, 2, and 3. Enter the contingency percentage at cell Q104. Fix the row and column titles and enter the data in column N Research and Development, column O Market Development, and column P Other. Remove the titles, calculate the formulas, and review the results.

When data entry for File 1 is complete, save the file with the /File Save command. Use a unique name that can be easily identified as the data for file 1, such as INVDATA. Before exiting the file, print the tables and summaries using the /Print Printer command and selecting ranges and setting options as before.

File 2 REVENUE. Begin the data entry process by retrieving the file into memory using the /File Retrieve command. Again, worksheet global recalculation should have been set on manual and worksheet global protection should be enabled. Use Figure 22 and Table 10 through 19 printouts from Appendix II as guides in moving around the spreadsheet and individual tables. Refer also to Section IV describing the manual method of the budgeting process for a description of base data used in the analysis.

The revenue tables constructed previously utilize four types of data: quantity purchased, quantity sold, conversion percentage, and prices arranged in yearly blocks of 12 months. The storage function represented by Tables 10 through 12 has data entry cells in columns AC Purchases, AD Quantity Sold, AF Purchase Price, and AG Sale Price. The processing function represented by Tables 14 and 15 has data entry cells at AT5 and BA5 for conversion percentage, and in the body of the tables at columns AQ Quantity Raw Product Processed, AS Unit Purchase Price, AT Unit Value, BA Unit Value. The marketing function represented by Tables 17A through 18 includes the data entry cells in columns AD Amount Sold, AI Amount Sold, and Prices in columns AL and AM. The remaining columns are calculated based upon these entered data values.

For each function group of tables, fix the function group titles at the top and left using the /Worksheet Titles Both command, as the tables are very long and maintaining orientation is difficult. Enter the data in the body of the table, remove the titles on the top and left, then calculate the formulas by pressing F9. Review the results in the table summaries at the top of the file.

When finished, save the file using a name that will be identified as the data for File 3, such as REVDATA. Print out the different tables and summaries for reference using the /Print Printer command as before.

File 3 VARCOST. Begin the data entry process by retrieving the file into memory using the /File Retrieve command. Again, worksheet global recalculation should have been set on manual and worksheet global protection should be enabled. Use Figure 31 and Table 23 through 29 printouts from Appendix II as guides in moving around the spreadsheet and individual tables. Refer also to Section V describing the manual method of the budgeting process for a description of the variable cost base data used in the analysis.

The variable cost file utilizes two very different table arrangements requiring a two-step data entry process. The first group of tables, 23 through 27, calculate multipliers used in Tables 28A through 28D by dividing the calculated function totals by the function product volumes drawn from the revenue file. Table 23 data cells are in columns C Building Maintenance, D Aging Factor, E Equipment Maintenance, and F Aging Factor. Total product volume for each function taken from the revenue file is then entered in a row titled Product Volume under the totals column for each function. Table 24 works similarly, but totals a list of supplies and materials for each function. Data entry cells are in columns A Item, B Quantity Required, and C Price per Unit. Table 25 works similarly with data cells in columns K Total Fuel Volume, L Total Kwh, M Fuel, and N Power. Table 26 is similar to Table 24 with the exception of inputting a value for yearly total man-hours at cell L70. Other data cells include columns J Description, K Number Required, and M Rate. In Table 27, data cells include columns C Travel, D Advertising, E Entertainment, and F, G, and H as Other.

The next group of Tables 28A through 28D have only two columns of data cells per table. These data cells can be inputted manually, but because the month/year arrangement of these tables is similar to the revenue tables, whole columns of data can be combined into the file from the revenue file utilizing the /File Combined Named Range command. In Table 28A this is accomplished by moving the cursor to the top data cell of the column Product Volume, cell T44.

Invoke the /File Combine Add Named Range command using the previously-named column VOLUMEA from the completed revenue file REVDATA and press return. The data should fill the column. Complete 28A by combining the product volume column of data from the revenue file. Move to cell U44. Invoke the /File Combine Add Named Range command using the previously-named column VALUEA from completed revenue file REVDATA and press return. All data cells for Table 28A are now complete. Use the same method to combine the previously-named ranges from the revenue file to complete 28B columns AE Product Volume and AF Product Value, and to complete 28C columns AP Product Volumn and AQ Product Value. Upon completion of data entry, press F9 to calculate the formulas. Review the results of calcuation in the tables and in the summary areas. Save the file using a unique name that can be remembered as the variable cost data, such as VARDATA. Print the various tables and summaries as instructed earlier.

File 4 FIXCOST. Begin the data entry process by retrieving the file into memory. Again, worksheet global recalculation should have been set on manual and worksheet global protection should be enabled. Use Figure 49 and Table 30 through 38 printouts from Appendix II as guides in moving around the spreadsheet and individual tables. Refer also to Section VI describing the manual method of the budgeting process for a description of base data used in the analysis.

The fixed cost tables require simple data entry. In Table 30, data cells are located in columns B Original Cost, C Standardized Rate, E Original Cost, and F Standardized Cost. Table 31 data cells are located in columns C Total Fuel Volume, D Total kwh, E Fuel Cost, and F Power Cost. In Table 32, data cells are located in columns C Office Utilities, D Telephone, E Office Supplies, F Office Equipment, G Other, and H Other. Table 33 includes a data cell at N32 and has data cells located below in columns K Job Description, M Number Required, and O Rate/Hr. Table 34 also includes a data cell above the body of the table at cell U32. Below, data are inputted in columns R Job Title and S Annual salary. Table 35 has data cells located in columns Y Appraised Value, Z Tax Rate, AB Original Cost, and AC Insurance Rate. Table 36 has data in cells located in columns Z Audit, AA Legal Services, AB Dues & Subscriptions, AC Donations, AD Travel, AE Entertainment, and AF Other. The remaining cells are formula cells.

Press F9 to calculate the formulas upon completion of the data entry. Review the results of calculation in the tables and in the summary. Save the file using a unique name that can be remembered as the fixed cost data, such as FIXDATA. Print the various tables and the summary as instructed earlier.

File 5 ANALYSIS. Table 5 computes and combines working capital to complete the budgeting process. Results are summarized and the IRR is computed. Retrieve the file into memory. Again, worksheet global recalculation should have been set on manual and worksheet global protection should be enabled. Use Figure 60 and printouts for File 5 found in Appendix II as guides in moving around the spreadsheet and the individual tables. This section deviates somewhat from the manual method in order to take advantage of the spreadsheet's abilities.

Begin by entering the data for working capital calculations. Refer to Figure 7 found in Section III for explanations of the working capital variables, and Figure 61 for a layout of the working capital variable blocks. The values for

these variables are taken manually from the computed revenue and variable and fixed cost sections. Some simple computation is necessary before these variables can be entered. The input cells are located in columns B Working Days, C Average Purchase, D Average Monthly Ending Inventory, E Raw Materials Used Per Day, F Value of the Sum of Monthly Ending Inventories, G Average Monthly Ending Inventory in Units, H Goods Sold Per Day in Units, I Sum of the Value of Monthly Product Sales, J Average Number of Working Days Accounts Receivable Outstanding, K Value of Total Annual Sales, L Percentage of Sales on Credit Terms, M Number of Days Cash Balance, N Annual Operating Costs Less Prepaid Expenses, O Average Prepaid Expenses, P Total Annual Supplies and Materials Used, and Q Percentage of Supplies and Materials Held in Inventory. After these variables are entered, press F9 to calculate the working capital needs.

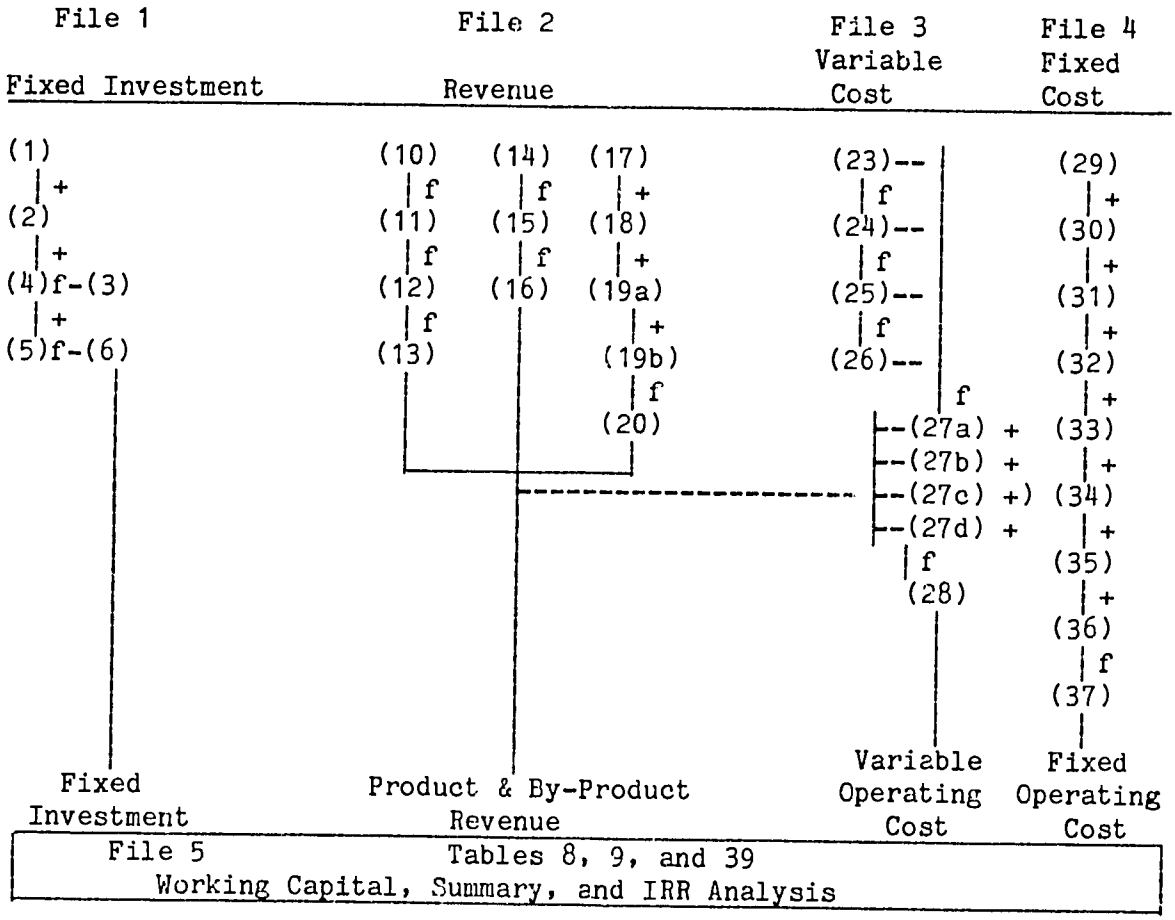
The next step in data entry is to draw together the summaries of the previously computed files into the spreadsheet. The process is similar to combining columns of data as done in File 3 VARCOST. Once again, the summary ranges have been specified and named within their respective files. Begin by combining the calculated File 1 summary. Go to cell B105. Initiate the /File Combine Add Named Range command. Specify the range SUMMARY from file INVDATA. The File 1 summary will now be drawn into the spreadsheet. Repeat this process at location B125 specifying the range SUMMARY from file REVDATA, at location B145 specifying the range SUMMARY from file VARDATA, and at location B165 specifying the range SUMMARY from file FIXDATA. The bulk of the data entry for the file is now complete.

Press F9 to calculate the formula cells. Review the results of calculation within the function summary tables, the total summary table, and the IRR analysis table. Print these tables as described earlier. Now go to the total summary table and insert new percentage variables to adjust amounts of investment, revenue, and cost. Press F9 to calculate the formulas with new percentage factors. Again move to the IRR analysis table and review the results of the changes. Print the IRR analysis table and compare it with the first printout results.

Before exiting, print the tables desired as described earlier. Save the data to diskette again using a name that can uniquely identify the data-filled spreadsheet, such as RUN1.

FIGURE 10

Computerization of Tables 1 Through 39



(1) Table number
+ Addition of tables
= Total of addition
-- Transfer of data
f Formula required to schedule values by time period or results of previous table must be entered manually

FIGURE 11

Fixed Investment File Layout

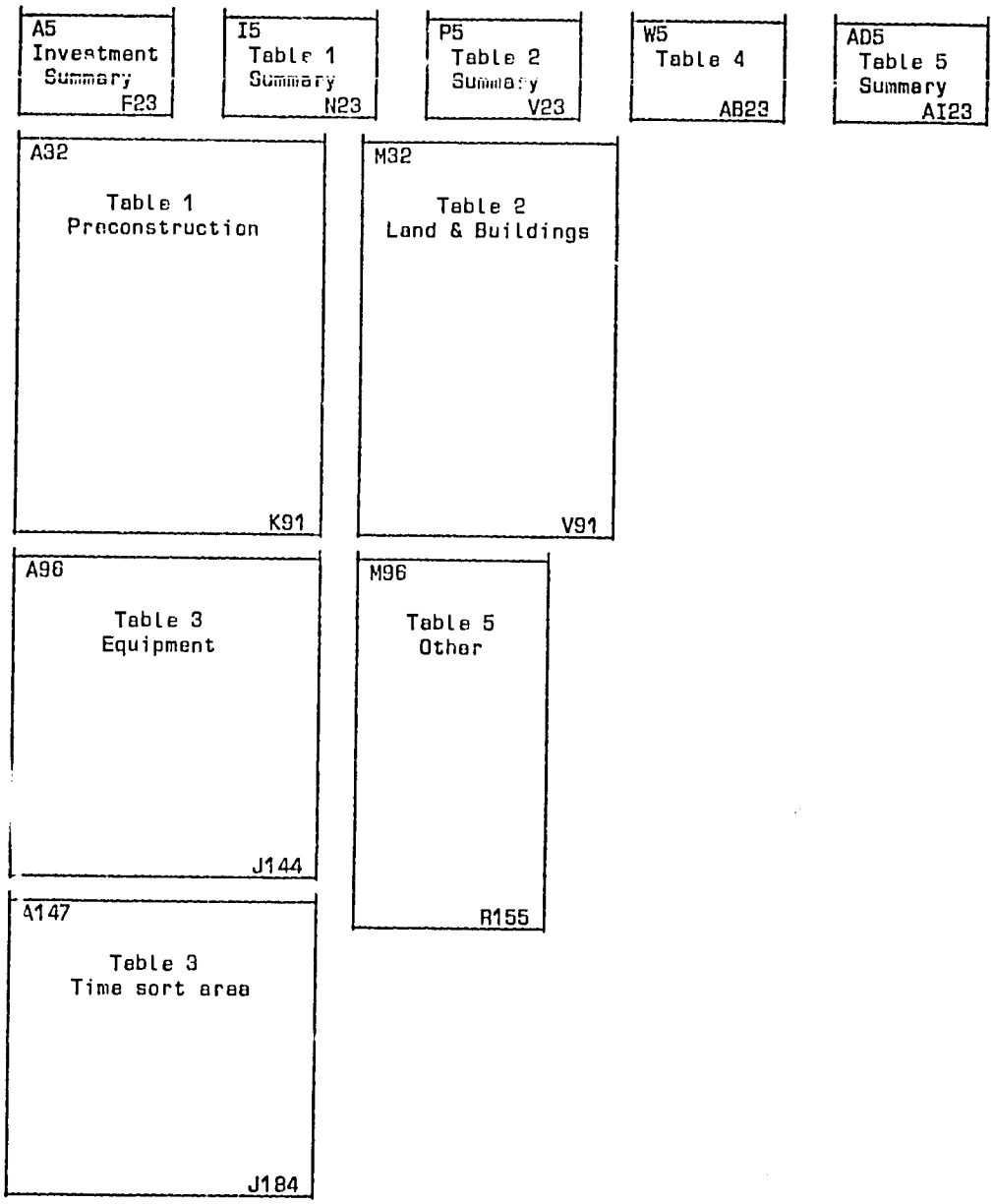


FIGURE 12

Example Table: Preconstruction Expense

PRECONSTRUCTION EXPENSE
(Table 1)

	A	B	C	D	E	F	G	H	I	J	K
32											
33											
34											
35		Feasibility Studies:				Organizational Cost:					
36											
37											
38	Function/	Market	Technical	Economic	Financial					Contin-	
39	Period	Analysis	Analysis	Analysis	Analysis	Salaries	Legal	Insurance	Other	gency 10.0%	Total
40											
41	Function Storage										
42	1.	0	3,075	1,000	1,000	3,860	1,000	0	0	994	10,929
43	2.	0	0	0	0	0	0	0	0	0	0
44	3.	0	0	0	0	0	0	0	0	0	0
45	4.	0	0	0	0	0	0	0	0	0	0
46	5.	0	0	0	0	0	0	0	0	0	0
47	6.	0	0	0	0	0	0	0	0	0	0
48	7.	0	0	0	0	0	0	0	0	0	0
49	8.	0	0	0	0	0	0	0	0	0	0
50	9.	0	0	0	0	0	0	0	0	0	0
51	10.	0	0	0	0	0	0	0	0	0	0
52	Subtotal										10,929

B42: U 0
C42: U 3075
D42: U 1000
E42: U 1000
F42: U 3860
G42: U 1000

H42: U 0
I42: U 0
J42: @INT(\$J\$40*@SUM(B42..I42)+0.5)
K42: @SUM(B42..J42)
K52: @SUM(K42..K51)

FIGURE 13

Example Table: Land and Buildings Investment

LAND AND BUILDINGS INVESTMENT
(Table 2)

	M	N	O	P	Q	R	S	T	U	V
32										
33										
34										
35		Land:			Buildings:					
36										
37										
38	Function		Site		Construc-				Contin-	
39	Period	Purchase Cost	Prepa- ration	Other	tion Cost	Utilities	Other	Other	gency 10.0%	Total
40										
41	Function Storage									
42	1.	14,685	0	0	0	0	0	0	1,469	16,154
43	2.	0	19,100	0	285,000	28,590	0	0	33,269	365,959
44	3.	0	0	0	0	0	0	0	0	0
45	4.	0	0	0	0	0	0	0	0	0
46	5.	0	0	0	0	0	0	0	0	0
47	6.	0	0	0	0	0	0	0	0	0
48	7.	0	0	0	0	0	0	0	0	0
49	8.	0	0	0	0	0	0	0	0	0
50	9.	0	0	0	0	0	0	0	0	0
51	10.	0	0	0	0	0	0	0	0	0
52	Subtotal									382,113

N42: U 14685
O42: U 0
P42: U 0
Q42: U 0
R42: U 0

S42: U 0
T42: U 0
U42: @INT([\$U\$40*@SUM(N42..T42)]+0.5)
V42 @SUM(N42..U42)
V52: @SUM(V42..V51)

FIGURE 14

Example Table: Equipment Investment Worksheet

	A	B	C	D	E	F	G	H	I	J
102		EQUIPMENT INVESTMENT WORKSHEET								
101			(Table 3)							
100										
101	==========									
102					Contin-					
103	Fuction/	FOB/CIF		Instal-	gency	Total	Install	Replace		
104	Equipment	Source	Delivery	lation		Cost				
105					15.0%			A	B	C
106	Function Storage									
107	1.	**3000**	**250**	**600**	**578**	**4428**	**2**	**15**	**0**	**0**
108	2.	**8000**	**400**	**1600**	**1500**	**11500**	**2**	**15**	**0**	**0**
109	3.	14000	600	2800	2610	20010	2	15	0	0
110	4.	28000	750	5600	5153	39503	2	15	0	0
111	5.	11000	800	2200	2100	16100	2	15	0	0
112	6.	22000	750	4400	4073	31223	2	15	0	0
113	7.	15000	600	3000	2790	21390	2	15	0	0
114	8.	0	0	0	0	0	0	0	0	0

```
B107: (F0) U 3000
C107: (F0) U 250
D107: (F0) U 600
E107: (F0) @INT((@SUM(B107..D107)*$E$105)+0.5)
F107: (F0) @SUM(B107..E107)
G107: U 2
H107: U 15
I107: U 0
J107: U 0
```

```
B108: (F0) U 8000
C108: (F0) U 400
D108: (F0) U 1600
E108: (F0) @INT((@SUM(B108..D108)*$E$105)+0.5)
F108: (F0) @SUM(B108..E108)
G108: U 2
H108: U 15
I108: U 0
J108: U 0
```

FIGURE 15

Example Table: Equipment Investment Sort Table

	A	B	C	D	E	F	G	H	I	J
144		Table 3 Sort Area for Function 1				1 of 4				
145										
146	1	2	3	4	5	6	7	8	9	10
147	**0**	**4428**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
148	**0**	**11500**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
149	0	20010	0	0	0	0	0	0	0	0
150	0	39503	0	0	0	0	0	0	0	0
151	0	16100	0	0	0	0	0	0	0	0
152	0	31223	0	0	0	0	0	0	0	0
153	0	21390	0	0	0	0	0	0	0	0
154	0	0	0	0	0	0	0	0	0	0

```
A148: (F0) @IF($G107=1#OR#$H107=1#OR#$I107=1#OR#$J107=1,$F107,0)
B148: (F0) @IF($G107=2#OR#$H107=2#OR#$I107=2#OR#$J107=2,$F107,0)
C148: (F0) @IF($G107=3#OR#$H107=3#OR#$I107=3#OR#$J107=3,$F107,0)
D148: (F0) @IF($G107=4#OR#$H107=4#OR#$I107=4#OR#$J107=4,$F107,0)
E148: (F0) @IF($G107=5#OR#$H107=5#OR#$I107=5#OR#$J107=5,$F107,0)
F148: (F0) @IF($G107=6#OR#$H107=6#OR#$I107=6#OR#$J107=6,$F107,0)
G148: (F0) @IF($G107=7#OR#$H107=7#OR#$I107=7#OR#$J107=7,$F107,0)
H148: (F0) @IF($G107=8#OR#$H107=8#OR#$I107=8#OR#$J107=8,$F107,0)
I148: (F0) @IF($G107=9#OR#$H107=9#OR#$I107=9#OR#$J107=9,$F107,0)
J148: (F0) @IF($G107=10#OR#$H107=10#OR#$I107=10#OR#$J107=10,$F107,0)
A149: (F0) @IF($G108=1#OR#$H108=1#OR#$I108=1#OR#$J108=1,$F108,0)
B149: (F0) @IF($G108=2#OR#$H108=2#OR#$I108=2#OR#$J108=2,$F108,0)
C149: (F0) @IF($G108=3#OR#$H108=3#OR#$I108=3#OR#$J108=3,$F108,0)
D149: (F0) @IF($G108=4#OR#$H108=4#OR#$I108=4#OR#$J108=4,$F108,0)
E149: (F0) @IF($G108=5#OR#$H108=5#OR#$I108=5#OR#$J108=5,$F108,0)
F149: (F0) @IF($G108=6#OR#$H108=6#OR#$I108=6#OR#$J108=6,$F108,0)
G149: (F0) @IF($G108=7#OR#$H108=7#OR#$I108=7#OR#$J108=7,$F108,0)
H149: (F0) @IF($G108=8#OR#$H108=8#OR#$I108=8#OR#$J108=8,$F108,0)
I149: (F0) @IF($G108=9#OR#$H108=9#OR#$I108=9#OR#$J108=9,$F108,0)
J149: (F0) @IF($G108=10#OR#$H108=10#OR#$I108=10#OR#$J108=10,$F108,0)
```

FIGURE 16

Example Table: Miscellaneous Capital Outlay

	M	N	O	P	Q	R
96		MISCELLANEOUS CAPITAL OUTLAY EXPENDITURES				
97		(Table 5)				
98						
99	==========	==========	==========	==========	==========	==========
101					Contin-	
102	Function/	Research &	Market		gency	
103	Period	Develop	Develop	Other	————	Total
104					10.0%	
105	Function	Storage				
106	1.	0	0	0	0	0
107	2.	0	0	0	0	0
108	3.	0	0	0	0	0
109	4.	0	0	0	0	0
110	5.	0	0	0	0	0
111	6.	0	0	0	0	0
112	7.	0	0	0	0	0
113	8.	0	0	0	0	0
114	9.	0	0	0	0	0
115	10.	0	0	0	0	0
116	Subtotal:					0

```
N106:  U 0
O106:  U 0
P106:  U 0
Q106:  @INT(($Q$104*@SUM(N106..P106))+0.5)
R106:  @SUM(N106..Q106)
R116:  @SUM(R106..R115)
```

FIGURE 17

Example Table: Summary of Fixed Capital Investment

	A	B	C	D	E	F
5		SUMMARY OF FIXED CAPITAL INVESTMENT				
6		(Table 6)				
7						
8						
9		Function	Function	Function	Function	
10		1.	2.	3.	4.	Total
11	Period					
12	1.	27,083	39,183	43,989	0	110,255
13	2.	510,113	1,005,441	422,547	0	1,938,101
14	3.	0	7,700	0	0	7,700
15	4.	0	0	0	0	0
16	5.	0	0	12,880	0	12,880
17	6.	0	0	23,000	0	23,000
18	7.	0	0	12,880	0	12,880
19	8.	0	0	135,700	0	135,700
20	9.	0	0	35,880	0	35,880
21	10.	0	0	0	0	0
22						
23		537,196	1,052,324	686,876	0	2,276,396

```
B12: @SUM(J12,Q12,X12,AE12)
C12: @SUM(K12,R12,Y12,AF12)
D12: @SUM(L12,S12,Z12,AG12)
E12: @SUM(M12,T12,AA12,AH12)
F12: @SUM(B12..E12)
B13: @SUM(J13,Q13,X13,AE13)
C13: @SUM(K13,R13,Y13,AF13)
D13: @SUM(L13,S13,Z13,AG13)
E13: @SUM(M13,T13,AA13,AH13)
F13: @SUM(B13..E13)
B14: @SUM(J14,Q14,X14,AE14)
C14: @SUM(K14,R14,Y14,AF14)
D14: @SUM(L14,S14,Z14,AG14)
E14: @SUM(M14,T14,AA14,AH14)
F14: @SUM(B14..E14)
B15: @SUM(J15,Q15,X15,AE15)
C15: @SUM(K15,R15,Y15,AF15)
D15: @SUM(L15,S15,Z15,AG15)
E15: @SUM(M15,T15,AA15,AH15)
F15: @SUM(B15..E15)
B16: @SUM(J16,Q16,X16,AE16)
C16: @SUM(K16,R16,Y16,AF16)
D16: @SUM(L16,S16,Z16,AG16)
E16: @SUM(M16,T16,AA16,AH16)
F16: @SUM(B16..E16)
```

```
B17: @SUM(J17,Q17,X17,AE17)
C17: @SUM(K17,R17,Y17,AF17)
D17: @SUM(L17,S17,Z17,AG17)
E17: @SUM(M17,T17,AA17,AH17)
F17: @SUM(B17..E17)
B18: @SUM(J18,Q18,X18,AE18)
C18: @SUM(K18,R18,Y18,AF18)
D18: @SUM(L18,S18,Z18,AG18)
E18: @SUM(M18,T18,AA18,AH18)
F18: @SUM(B18..E18)
B19: @SUM(J19,Q19,X19,AE19)
C19: @SUM(K19,R19,Y19,AF19)
D19: @SUM(L19,S19,Z19,AG19)
E19: @SUM(M19,T19,AA19,AH19)
F19: @SUM(B19..E19)
B20: @SUM(J20,Q20,X20,AE20)
C20: @SUM(K20,R20,Y20,AF20)
D20: @SUM(L20,S20,Z20,AG20)
E20: @SUM(M20,T20,AA20,AH20)
F20: @SUM(B20..E20)
B21: @SUM(J21,Q21,X21,AE21)
C21: @SUM(K21,R21,Y21,AF21)
D21: @SUM(L21,S21,Z21,AG21)
E21: @SUM(M21,T21,AA21,AH21)
F21: @SUM(B21..E21)
```

```
B23: @SUM(B12..B21)
C23: @SUM(C12..C21)
D23: @SUM(D12..D21)
E23: @SUM(E12..E21)
F23: @SUM(F12..F21)
```

FIGURE 18

Example Table: Table 1 Preconstruction Expense Summary

	I	J	K	L	M	N
5		PRECONSTRUCTION EXPENSE				
6		Summary				
7						
8						
9		Function	Function	Function	Function	
10		1.	2.	3.	4.	Total
11	Period					
12	1.	10,929	10,929	20,196	0	42,054
13	2.	0	0	0	0	0
14	3.	0	0	0	0	0
15	4.	0	0	0	0	0
16	5.	0	0	0	0	0
17	6.	0	0	0	0	0
18	7.	0	0	0	0	0
19	8.	0	0	0	0	0
20	9.	0	0	0	0	0
21	10.	0	0	0	0	0
22						
23		10,929	10,929	20,196	0	42,054

```
J12: [K42]
K12: [K55]
L12: [K68]
M12: [K81]
N12: @SUM[J12..M12]
J13: [K43]
K13: [K56]
L13: [K69]
M13: [K82]
N13: @SUM[J13..M13]
J14: [K44]
K14: [K57]
L14: [K70]
M14: [K83]
N14: @SUM[J14..M14]
J15: [K45]
K15: [K58]
L15: [K71]
M15: [K84]
N15: @SUM[J15..M15]
J16: [K46]
K16: [K59]
L16: [K72]
M16: [K85]
N16: @SUM[J16..M16]
```

```
J17: [K47]
K17: [K60]
L17: [K73]
M17: [K86]
N17: @SUM[J17..M17]
J18: [K48]
K18: [K61]
L18: [K74]
M18: [K87]
N18: @SUM[J18..M18]
J19: [K49]
K19: [K62]
L19: [K75]
M19: [K88]
N19: @SUM[J19..M19]
J20: [K50]
K20: [K63]
L20: [K76]
M20: [K89]
N20: @SUM[J20..M20]
J21: [K51]
K21: [K64]
L21: [K77]
M21: [K90]
N21: @SUM[J21..M21]
```

```
J23: @SUM[J12..J21]
K23: @SUM[K12..K21]
L23: @SUM[L12..L21]
M23: @SUM[M12..M21]
N23: @SUM[N12..N21]
```

FIGURE 19

Example Table: Table 2 Land and Buildings Investment Summary

	Q	R	S	T	U	V
5		LAND AND BUILDINGS INVESTMENT				
6		Summary				
7						
8						
9		Function	Function	Function	Function	
10		1.	2.	3.	4.	Total
11	Period					
12	1.	16,154	16,154	3,993	0	36,301
13	2.	365,959	743,622	144,254	0	1,253,835
14	3.	0	0	0	0	0
15	4.	0	0	0	0	0
16	5.	0	0	0	0	0
17	6.	0	0	0	0	0
18	7.	0	0	0	0	0
19	8.	0	0	0	0	0
20	9.	0	0	0	0	0
21	10.	0	0	0	0	0
22						
23		382,113	759,776	148,247	0	1,290,136

```
Q12: [V42]
R12: [V55]
S12: [V68]
T12: [V79]
U12: @SUM[Q12..T12]
Q13: [V43]
R13: [V56]
S13: [V69]
T13: [V80]
U13: @SUM[Q13..T13]
Q14: [V44]
R14: [V57]
S14: [V70]
T14: [V81]
U14: @SUM[Q14..T14]
Q15: [V45]
R15: [V58]
S15: [V71]
T15: [V82]
U15: @SUM[Q15..T15]
Q16: [V46]
R16: [V59]
S16: [V72]
T16: [V83]
U16: @SUM[Q16..T16]
```

```
Q17: [V47]
R17: [V60]
S17: [V73]
T17: [V84]
U17: @SUM[Q17..T17]
Q18: [V48]
R18: [V61]
S18: [V74]
T18: [V85]
U18: @SUM[Q18..T18]
Q19: [V49]
R19: [V62]
S19: [V75]
T19: [V86]
U19: @SUM[Q19..T19]
Q20: [V50]
R20: [V63]
S20: [V76]
T20: [V87]
U20: @SUM[Q20..T20]
Q21: [V51]
R21: [V64]
S21: [V77]
T21: [V88]
U21: @SUM[Q21..T21]
```

```
Q23: @SUM[Q12..Q21]
R23: @SUM[R12..R21]
S23: @SUM[S12..S21]
T23: @SUM[T12..T21]
U23: @SUM[U12..U21]
```

FIGURE 20

Example Table: Equipment Investment Summary

	W	X	Y	Z	AA	AB
5			EQUIPMENT INVESTMENT			
6			(Table 4)			
7						
8						
9		Function	Function	Function	Function	
10		1.	2.	3.	4.	Total
11	Period					
12	1.	0	0	0	0	0
13	2.	144,154	242,019	254,093	0	640,266
14	3.	0	0	0	0	0
15	4.	0	0	0	0	0
16	5.	0	0	12,880	0	12,880
17	6.	0	0	23,000	0	23,000
18	7.	0	0	12,880	0	12,800
19	8.	0	0	135,700	0	135,700
20	9.	0	0	35,880	0	35,880
21	10.	0	0	0	0	0
22						
23		144,154	242,019	474,433	0	860,606

```
X12: @SUM(A$147..A$154)
Y12: @SUM(A$157..A$164)
Z12: @SUM(A$167..A$174)
AA12: @SUM(A$177..A$184
AB12: @SUM(X12..AA12)
X13: @SUM(B$147..B$154)
Y13: @SUM(B$157..B$164)
Z13: @SUM(B$167..B$174)
AA13: @SUM(B$177..B$184
AB13: @SUM(X13..AA13)
X14: @SUM(C$147..C$154)
Y14: @SUM(C$157..C$164)
Z14: @SUM(C$167..C$174)
AA14: @SUM(C$177..C$184
AB14: @SUM(X14..AA14)
X15: @SUM(D$147..D$154)
Y15: @SUM(D$157..D$164)
Z15: @SUM(D$167..D$174)
AA15: @SUM(D$177..D$184
AB15: @SUM(X15..AA15)
X16: @SUM(E$147..E$154)
Y16: @SUM(E$157..E$164)
Z16: @SUM(E$167..E$174)
AA16: @SUM(E$177..E$184
AB16: @SUM(X16..AA16)
```

```
X17: @SUM(F$147..F$154)
Y17: @SUM(F$157..F$164)
Z17: @SUM(F$167..F$174)
AA17: @SUM(F177..F184)
AB17: @SUM(X17..AA17)
X18: @SUM(G$147..G$154)
Y18: @SUM(G$157..G$164)
Z18: @SUM(G$167..G$174)
AA18: @SUM(G$177..G$184)
AB18: @SUM(X18..AA18)
X19: @SUM(H$147..H$154)
Y19: @SUM(H$157..H$164)
Z19: @SUM(H$167..H$174)
AA19: @SUM(H$177..H$184)
AB19: @SUM(X19..AA19)
X20: @SUM(I$147..I$154)
Y20: @SUM(I$157..I$164)
Z20: @SUM(I$167..I$174)
AA20: @SUM(I$177..I$184)
AB20: @SUM(X20..AA20)
X21: @SUM(J$147..J$154)
Y21: @SUM(J$157..J$164)
Z21: @SUM(J$167..J$174)
AA21: @SUM(J$177..J$184)
AB21: @SUM(X21..AA21)
```

```
X23: @SUM(X12..X21)
Y23: @SUM(Y12..Y21)
Z23: @SUM(Z12..Z21)
AA23: @SUM(AA12..AA21)
AB23: @SUM(AB12..AB21)
```

FIGURE 21

Example Table: Table 5 Miscellaneous Capital Outlay Summary

	AD	AE	AF	AG	AH	AI
5		MISCELLANEOUS CAPITAL OUTLAY EXPENDITURES				
6			Summary			
7						
8	==========	==========	==========	==========	==========	==========
9		Function	Function	Function	Function	
10		1.	2.	3.	4.	Total
11	Period					
12	1.	0	12,100	19,800	0	31,900
13	2.	0	19,800	24,200	0	44,000
14	3.	0	7,700	0	0	7,700
15	4.	0	0	0	0	0
16	5.	0	0	0	0	0
17	6.	0	0	0	0	0
18	7.	0	0	0	0	0
19	8.	0	0	0	0	0
20	9.	0	0	0	0	0
21	10.	0	0	0	0	0
22	==========	==========	==========	==========	==========	==========
23		0	39,600	44,000	0	83,600

AE12: [R106]
AF12: [R119]
AG12: [R132]
AH12: [R145]
AI12: @SUM[AE12..AH12]
AE13: [R107]
AF13: [R120]
AG13: [R133]
AH13: [R146]
AI13: @SUM[AE13..AH13]
AE14: [R108]
AF14: [R121]
AG14: [R134]
AH14. [R147]
AI14: @SUM[AE14..AH14]
AE15: [R109]
AF15: [R122]
AG15: [R135]
AH15: [R148]
AI15: @SUM[AE15..AH15]
AE16: [R110]
AF16: [R123]
AG16: [R136]
AH16: [R149]
AI16: @SUM[AE16..AH16]

AE17: [R111]
AF17: [R124]
AG17: [R137]
AH17: [R150]
AI17: @SUM[AE17..AH17]
AE18: [R112]
AF18: [R125]
AG18: [R138]
AH18: [R151]
AI18: @SUM[AE18..AH18]
AE19: [R113]
AF19: [R126]
AG19: [R139]
AH19: [R152]
AI19: @SUM[AE19..AH19]
AE20: [R114]
AF20: [R127]
AG20: [R140]
AH20: [R153]
AI20: @SUM[AE20..AH20]
AE21: [R115]
AF21: [R128]
AG21: [R141]
AH21: [R154]
AI21: @SUM[AE21..AH21]

AE23: @SUM[AE12..AE21]
AF23: @SUM[AF12..AF21]
AG23: @SUM[AG12..AG21]
AH23: @SUM[AH12..AH21]
AI23: @SUM[AI12..AI21]

FIGURE 22

Revenue File Layout

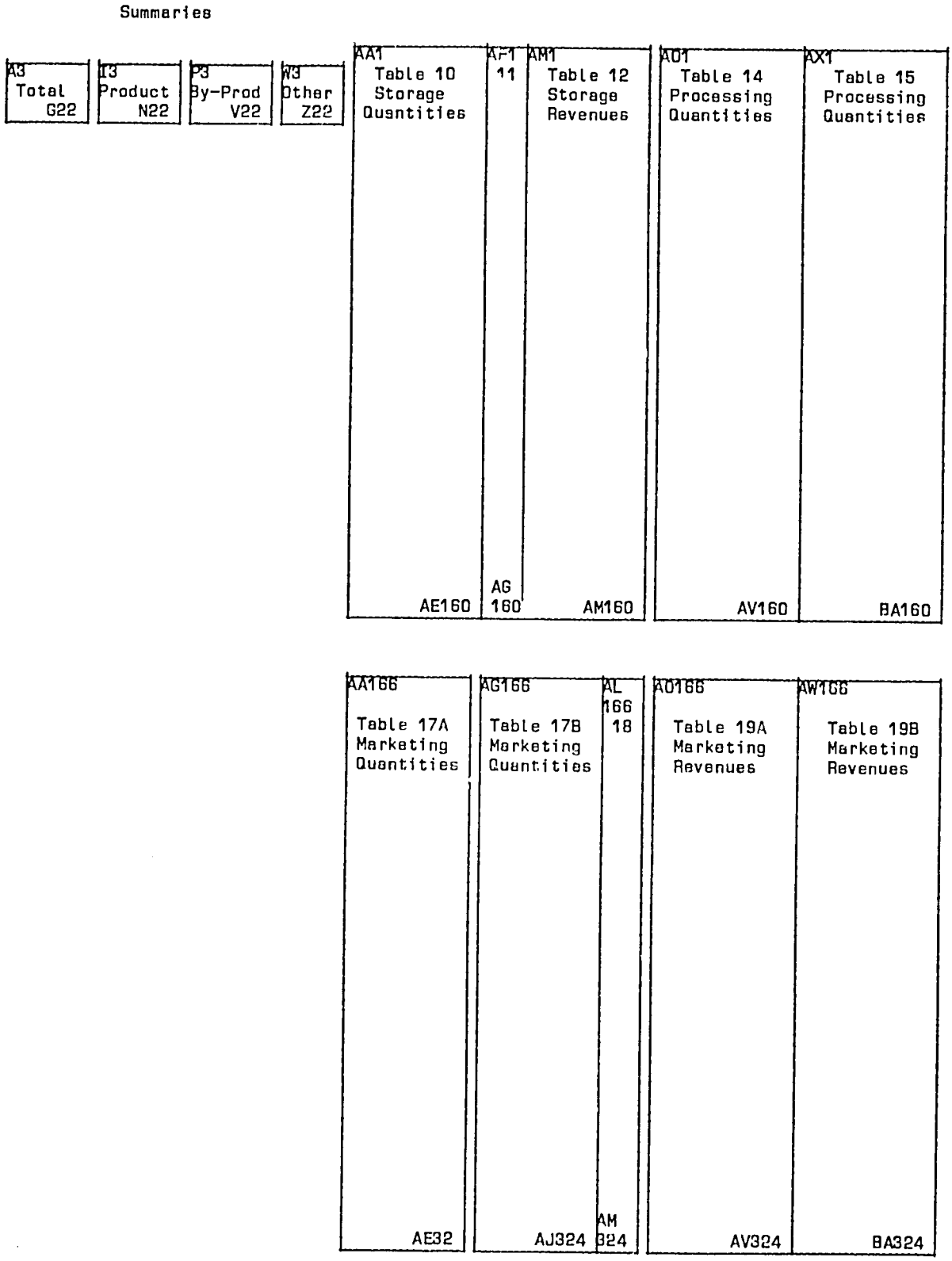


FIGURE 23

Example Table: Storage Revenues

	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM
3		RAW PRODUCT STORAGE				STORAGE PRICE/UNIT					STORAGE REVENUE		
4		(Table 10)				(Table 11)					(Table 12)		
5		Product: Rough Rice				Product: Rough Rice					Product: Rough Rice		
6		Unit: MT				Unit: US$					Unit: US$		
7													
8		Begin-						Begin-				Cost	
9	Year/	ning		Quant.	Ending	Purchase	Sale		ning		Ending	of	Gross
10	Month	Invntry	Purch.	Sold	Invntry	Price	Price	Sales	Invntry	Purch.	Invntry	Sales	Rev.
11													
12	Year 1												
13	1.	0	0	0	0	0	0	0	0	0	0	0	0
14	2.	0	0	0	0	0	0	0	0	0	0	0	0
15	3.	0	0	0	0	0	0	0	0	0	0	0	0
16	4.	0	0	0	0	0	0	0	0	0	0	0	0
17	5.	0	0	0	0	0	0	0	0	0	0	0	0
18	6.	0	0	0	0	0	0	0	0	0	0	0	0
19	7.	0	0	0	0	0	0	0	0	0	0	0	0
20	8.	0	0	0	0	0	0	0	0	0	0	0	0
21	9.	0	0	0	0	0	0	0	0	0	0	0	0
22	10.	0	0	0	0	0	0	0	0	0	0	0	0
23	11.	0	0	0	0	0	0	0	0	0	0	0	0
24	12.	0	0	0	0	0	0	0	0	0	0	0	0
25	Total		0					0		0		0	0

```
AB13:  0
AC13:  U 0
AD13:  U 0
AE13:  @SUM($AB13,$AC13)-$AD13
AF13:  U 0
AG13:  U 0
AH13:  ($AG13*$AD13)
AI13:  0
AJ13:  ($AC13*$AF13)
AJ13:  ($AC13*$AF13)
AK13   (AE13*AF13)
AL13:  @IF(AH13=0,0,($AI13+AJ13)-$AK13)
AM13:  ($AH13-$AL13)
AC25:  @SUM(AC13..AC24)
AH25:  @SUM(AH13..AH24)
AJ25:  @SUM(AJ13..AJ24)
AL25:  @SUM(AL13..AL24)
AM25:  @SUM(AM13..AM24)

AB14:  ($AE13)
AC14:  U 0
AD14:  U 0
AE14:  @SUM($AB14,$AC14)-$AD14
AF14:  U 0
AG14:  U 0
AH14:  ($AG14*$AD14)
AI14:  ($AK13)
AJ14:  ($AC14*$AF14)
AJ14:  ($AC14*$AF14)
AK14   @IF(AE14>AC14,(AE14-AC14)*AF13+AC14*AF14),AE14*AF14)
AL14:  @IF(AH14=0,0,($AI14+AJ14)-$AK14)
AM14:  ($AH14-$AL14)
AC25:  @SUM(AC13..AC24)
AH25:  @SUM(AH13..AH24)
AJ25:  @SUM(AJ13..AJ24)
AL25:  @SUM(AL13..AL24)
AM25:  @SUM(AM13..AM24)
```

FIGURE 24

Example Table: Processing Revenues

	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	B
2					PRODUCT PROCESSING						By-product Processing		
3					(Table 14)						(Table 15)		
4					Product: Rice						Product: Bran		
5					Conversion:	72.0%					Conversion:		8.
6	==========												
7		Quant.	Quantity		Unit		T. Value			Quant.	Quant.		Tota
8		Raw	of		Value of		Process			Raw	of	Unit	Valu
9	Year/	Product	Process	Unit	Process	Cost of	Product	Gross		Product	Process	Value	Proce
10	Month	Process	Product	Purchase Price	Product	Purch.	(Sales)	Revenue		Process	By-prod.	Process By-prod.	By-pr
11													
12	Year 1												
13	1.	0	0	0	0	0	0	0		0	0	88	
14	2.	0	0	0	0	0	0	0		0	0	78	
15	3.	0	0	0	0	0	0	0		0	0	68	
16	4.	0	0	0	0	0	0	0		0	0	73	
17	5.	0	0	0	0	0	0	0		0	0	83	
18	6.	0	0	0	0	0	0	0		0	0	96	
19	7.	0	0	0	0	0	0	0		0	0	101	
20	8.	0	0	0	0	0	0	0		0	0	91	
21	9.	0	0	0	0	0	0	0		0	0	88	
22	10.	0	0	0	0	0	0	0		0	0	86	
23	11.	0	0	0	0	0	0	0		0	0	85	
24	12.	0	0	0	0	0	0	0		0	0	83	
25	Total:					0	0	0					

```
AP13:  U 0
AQ13:  @INT[(($AS$5*$AP13)+0.5)
AR13:  0
AS13:  U 0
AT13:  ($AP13*$AR13)
AU13:  ($AQ13*$AS13)
AV13:  ($AU13-$AT13)
AX13:  0
AY13:  @INT[(AX13*$AZ$5)+0.5)
AZ13:  U 78
BA13:  ($AY13*$AZ13)
AT25:  @SUM(AT13..AT24)
AU25:  @SUM(AU13..AU24)
AV25:  @SUM(AV13..AV24)
BA25:  @SUM(BA13..BA24)
```

```
AP14:  U 0
AQ14:  @INT[(($AS$5*$AP14)+0.5)
AR14:  ($AG14)
AS14:  U 0
AT14:  ($AP14*$AR14)
AU14:  ($AQ14*$AS14)
AV14:  ($AU14-$AT14)
AX14:  (AP14)
AY14:  @INT[(AX14*$AZ$5)+0.5)
AZ14:  U 78
BA14:  ($AY14*$AZ14)
AT25:  @SUM(AT13..AT24)
AU25:  @SUM(AU13..AU24)
AV25:  @SUM(AV13..AV24)
BA25:  @SUM(BA13..BA24)
```

FIGURE 25

Example Table: Quantities and Price Marketing Function

	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM
167													
168				QUANTITIES MARKETED				QUANTITIES MARKETED				SALE PRICES	
169				(Table 17A)				(Table 17A)				(Table 18)	
170				Product: Rice				By-Product: Bran				Unit: Mt	
171				Unit: Mt				Unit: Mt				Price: US$	
172		Begin-											
173		ning											
174		Invntry	Amount Purchase	Amount Sold	Ending Inventory		Beginning Inventory	Amount Purchased	Amount Sold	Ending Inventory		Product	By-Prod.
175													
176	Year 1.												
177	1.	0	0	0	0		0	0	0	0		0	0
178	2.	0	0	0	0		0	0	0	0		0	0
179	3.	0	0	0	0		0	0	0	0		0	0
180	4.	0	0	0	0		0	0	0	0		0	0
181	5.	0	0	0	0		0	0	0	0		0	0
182	6.	0	0	0	0		0	0	0	0		0	0
183	7.	0	0	0	0		0	0	0	0		0	0
184	8.	0	0	0	0		0	0	0	0		0	0
185	9.	0	0	0	0		0	0	0	0		0	0
186	10.	0	0	0	0		0	0	0	0		0	0
187	11.	0	0	0	0		0	0	0	0		0	0
188	12.	0	0	0	0		0	0	0	0		0	0
189													

```
AB177:  0
AC177:  ($AQ13)
AD177:  U 0
AE177:  ($AB178+$AC178)-$AD178
AG177:  0
AH177:  ($AY14)
AI177:  U 0
AJ177:  ($AG177+$AH177)-$AI177
AL177:  U 0
AM177:  U 0

AB178:  ($AE177)
AC178:  ($AQ14)
AD178:  U 0
AE178:  ($AB178+$AC178)-$AD178
AG178:  ($AJ177)
AH178:  ($AY14)
AI178:  U 0
AJ178:  ($AG178+$AH178)-$AI178
AL178:  U 0
AM178:  U 0
```

FIGURE 26

Example Table: Marketing Revenues

	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA
167													
168				MARKETING REVENUE						MARKETING REVENUE			
169				(Table 19)						(Table 19)			
170				Product: Rice						Product: Bran			
171													
172			Begin-			Cost			Begin-			Cost	
173			ning	Purch-	Ending	of	Gross		ning	Purch-	Ending	of	Gros
174		Sales	Invntry	ases	Invntry	Sales	Revenue	Sales	Invntry	ases	Invntry	Sales	Roven
175													
176	Year 1.												
177	1.	0	0	0	0	0	0	0	0	0	0	0	
178	2.	0	0	0	0	0	0	0	0	0	0	0	
179	3.	0	0	0	0	0	0	0	0	0	0	0	
180	4.	0	0	0	0	0	0	0	0	0	0	0	
181	5.	0	0	0	0	0	0	0	0	0	0	0	
182	6.	0	0	0	0	0	0	0	0	0	0	0	
183	7.	0	0	0	0	0	0	0	0	0	0	0	
184	8.	0	0	0	0	0	0	0	0	0	0	0	
185	9.	0	0	0	0	0	0	0	0	0	0	0	
186	10.	0	0	0	0	0	0	0	0	0	0	0	
187	11.	0	0	0	0	0	0	0	0	0	0	0	
188	12.	0	0	0	0	0	0	0	0	0	0	0	
189		0		0		0	0	0		0		0	

```
AP177:  ($AD177*$AL177)
AQ177:  ($AB177*$AS13)
AR177:  ($AC177*$AS13)
AS177:  @IF(AE177>AC177,(AE177-AC177)*AS13+(AC177*AS14),AE177*AS14)
AT177:  ($AQ177+$AR177)-$AS177
AU177:  ($AP177-$AT177)
AV177:  ($AI177*$AM177)
AW177:  ($AG177*$AM118)
AX177:  ($AH177*$AZ14)
AY177:  @IF(AJ177>AH177,(AJ177-AH177)*AZ13+(AH177*AZ14),AJ177*AZ14)
AZ177:  ($AW177+$AX177)-$AY177
BA177:  ($AV177-$AZ177)
AP189:  @SUM(AP177..AP188)
AR189:  @SUM(AR177..AR188)
AT189:  @SUM(AT177..AT188)
AU189:  @SUM(AU177..AU188)
AV189:  @SUM(AV177..AV188)
AX189:  @SUM(AX177..AX188)
AZ189:  @SUM(AZ177..AZ188)
BA189:  @SUM(BA177..BA188)

AP178   ($AD178*$AL178)
AQ178:  ($AB178*$AS14)
AR178:  ($AC178*$AS14)
AS178:  @IF(AE178>AC178,(AE178-AC178)*AS13+(AC178*AS14),AE178*AS14)
AT178:  ($AQ178+$AR178)-$AS178
AU178:  ($AP178-$AT178)
AV178:  ($AI178*$AM178)
AW178:  ($AY177)
AX178:  ($AH178*$AZ14)
AY178:  @IF(AJ178>AH178,(AJ178-AH178)*AZ13+(AH178*AZ14),AJ178*AZ14)
AZ178:  ($AW178+$AX178)-$AY178
BA178:  ($AV178-$AZ178)
AP189:  @SUM(AP177..AP188)
AR189:  @SUM(AR177..AR188)
AT189:  @SUM(AT177..AT188)
AU189:  @SUM(AU177..AU188)
AV189:  @SUM(AV177..AV188)
AX189:  @SUM(AX177..AX188)
AZ189:  @SUM(AZ177..AZ188)
BA189:  @SUM(BA177..BA188)
```

FIGURE 27

Example Table: Total Revenue Summary

	A	B	C	D	E	F	G
4			REVENUE SUMMARY				
5							
6							
7							
8		Function	Function	Function	Function		
9	Period	1.	2.	3.	4.	Other	Total
10							
11	1.	0	0	0	0	0	0
12	2.	0	0	0	0	0	0
13	3.	86,600	400,115	202,448	0	0	689,163
14	4.	87,510	418,587	200,081	0	0	706,178
15	5.	86,180	400,115	201,240	0	0	687,535
16	6.	87,930	418,587	199,666	0	0	706,183
17	7.	82,260	400,115	201,240	0	0	683,615
18	8.	87,750	418,587	199,666	0	0	706,003
19	9.	82,440	400,115	201,240	0	0	683,795
20	10.	86,610	418,587	200,291	0	0	705,488
21							
22		687,280	3,274,808	1,605,872	0	0	5,567,960

```
B11: +J11+Q11
C11: +K11+R11
D11: +L11+S11
E11: +M11+T11
F11: +Z11
G11: @SUM(B11..F11)
B12: +J12+Q12
C12: +K12+R12
D12: +L12+S12
E12: +M12+T12
F12: +Z12
G12: @SUM(B12..F12)
B13: +J13+Q13
C13: +K13+R13
D13: +L13+S13
E13: +M13+T13
F13: +Z13
G13: @SUM(B13..F13)
B14: +J14+Q14
C14: +K14+R14
D14: +L14+S14
E14: +M14+T14
F14: +Z14
G14: @SUM(B14..F14)
B15: +J15+Q15
C15: +K15+R15
D15: +L15+S15
E15: +M15+T15
F15: +Z15
G15: @SUM(B15..F15)
```

```
B16: +J16+Q16
C16: +K16+R16
D16: +L16+S16
E16: +M16+T16
F16: +Z16
G16: @SUM(B16..F16)
B17: +J17+Q17
C17: +K17+R17
D17: +L17+S17
E17: +M17+T17
F17: +Z17
G17: @SUM(B17..F17)
B18: +J18+Q18
C18: +K18+R18
D18: +L18+S18
E18: +M18+T18
F18: +Z18
G18: @SUM(B18..F18)
B19: +J19+Q19
C19: +K19+R19
D19: +L19+S19
E19: +M19+T19
F19: +Z19
G19: @SUM(B19..F19)
B20: +J20+Q20
C20: +K20+R20
D20: +L20+S20
E20: +M20+T20
F20: +Z20
G20: @SUM(B20..F20)
```

```
B22: @SUM(B11..B20)
C22: @SUM(C11..C20)
D22: @SUM(D11..D20)
E22: @SUM(E11..E20)
F22: @SUM(F11..F20)
G22: @SUM(G11..G20)
```

FIGURE 28

Example Table: Product Revenue Summary

	I	J	K	L	M	N
4			PRODUCT REVENUE			
5						
6						
7						
8		Function	Function	Function	Function	
9	Period	1.	2.	3.	4.	Total
10						
11	1.	0	0	0	0	0
12	2.	0	0	0	0	0
13	3.	86,600	348,055	192,930	0	625,585
14	4.	87,510	364,315	182,875	0	634,700
15	5.	89,180	346,055	191,425	0	623,660
16	6.	87,930	364,315	182,875	0	635,120
17	7.	82,260	348,055	191,425	0	619,740
18	8.	87,750	364,315	182,875	0	634,940
19	9.	82,440	348,055	191,425	0	619,920
20	10.	86,610	364,315	183,340	0	634,265
21						
22		687,280	2,841,480	1,499,170	0	5,027,930

```
J11: ($AM$25)
K11: ($AV$25)
L11: ($AU$189)
M11: 0
N11: @SUM(J11..M11)
J12: ($AM$40)
K12: ($AV$40)
L12: ($AU$204)
M12: 0
N12: @SUM(J12..M12)
J13: ($AM$55)
K13: ($AV$55)
L13: ($AU$219)
M13: 0
N13: @SUM(J13..M13)
J14: ($AM$70)
K14: ($AV$70)
L14: ($AU$234)
M14: 0
N14: @SUM(J14..M14)
J15: ($AM$85)
K15: ($AV$85)
L15: ($AU$249)
M15: 0
N15: @SUM(J15..M15)
```

```
J16:  ($AM$100)
K16:  ($AV$100)
L16:  ($AU$264)
M16: 0
N16: @SUM(J16..M16)
J17:  ($AM$115)
K17:  ($AV$115)
L17:  ($AU$279)
M17: 0
N17: @SUM(J17..M17)
J18:  ($AM$130)
K18:  ($AV$130)
L18:  ($AU$294)
M18: 0
N18: @SUM(J18..M18)
J19:  ($AM$145)
K19:  ($AV$145)
L19:  ($AU$309)
M19: 0
N19: @SUM(J19..M19)
J20:  ($AM$160)
K20:  ($AV$160)
L20:  ($AU$324)
M20: 0
N20: @SUM(J20..M20)
```

```
J22: @SUM(J11..J20)
K22: @SUM(K11..K20)
L22: @SUM(L11..L20)
M22: @SUM(M11..M20)
N22: @SUM(N11..N20)
```

FIGURE 29

Example Table: By-Product Revenue Summary

	P	Q	R	S	T	U
4			BY-PRODUCT REVENUE			
5						
6						
7						
8		Function	Function	Function	Function	
9	Period	1.	2.	3.	4.	Total
10						
11	1.	0	0	0	0	0
12	2.	0	0	0	0	0
13	3.	0	54,060	9,518	0	63,578
14	4.	0	54,272	17,206	0	71,478
15	5.	0	54,060	9,815	0	63,875
16	6.	0	54,272	16,791	0	71,063
17	7.	0	54,060	9,815	0	63,875
18	8.	0	54,272	16,791	0	71,063
19	9.	0	54,060	9,815	0	63,875
20	10.	0	54,272	16,951	0	71,223
21						
22		0	433,328	106,702	0	540,030

```
Q11:  0
R11:  [$BA$25]
S11:  [$BA$189]
T11:  [W11] [R119]
U11:  @SUM[Q11..T11]
Q12:  0
R12:  [$BA$40]
S12:  [$BA$204]
T12:  [W11] [R120]
U12:  @SUM[Q12..T12]
Q13:  0
R13:  [$BA$55]
S13:  [$BA$219]
T13:  [W11] [R121]
U13:  @SUM[Q13..T13]
Q14:  0
R14:  [$BA$70]
S14:  [$BA$234]
T14:  [W11] [R122]
U14:  @SUM[Q14..T14]
Q15:  0
R15:  [$BA$85]
S15:  [$BA$249]
T15:  [W11] [R123]
U15:  @SUM[Q15..T15]
```

```
Q16:  0
R16:  [$BA$100]
S16:  [$BA$264]
T16:  [W11] [R124]
U16:  @SUM[Q16..T16]
Q17:  0
R17:  [$BA$115]
S17:  [$BA$279]
T17:  [W11] [R125]
U17:  @SUM[Q17..T17]
Q18:  0
R18:  [$BA$130]
S18:  [$BA$294]
T18:  [W11] [R126]
U18:  @SUM[Q18..T18]
Q19:  0
R19:  [$BA$145]
S19:  [$BA$309]
T19:  [W11] [R127]
U19:  @SUM[Q19..T19]
Q20:  0
R20:  [$BA$160]
S20:  [$BA$324]
T20:  [W11] [R128]
U20:  @SUM[Q20..T20]
```

```
Q22:  @SUM[Q11..Q20]
R22:  @SUM[R11..R20]
S22:  @SUM[S11..S20]
T22:  [W11] @SUM[T11..T20]
T22:  @SUM[U11..U20]
```

FIGURE 30

Example Table: Other Income

	W	X	Y	Z
4		OTHER INCOME		
5		(Table 21)		
6				
7				
8				Gross
9	Period	Sales	Purchases	Income
10				
11	1.	0	0	0
12	2.	0	0	0
13	3.	0	0	0
14	4.	0	0	0
15	5.	0	0	0
16	6.	0	0	0
17	7.	0	0	0
18	8.	0	0	0
19	9.	0	0	0
20	10.	0	0	0
21				
22		0	0	0

```
X11:  0
Y11:  0
Z11:  (X11-Y11)
X12:  0
Y12:  0
Z12:  (X12-Y12)
X13:  0
Y13:  0
Z13:  (X13-Y13)
X14:  0
Y14:  0
Z14:  (X14-Y14)
X15:  0
Y15:  0
Z15:  (X15-Y15)
```

```
X16:  0
Y16:  0
Z16:  (X16-Y16)
X17:  0
Y17:  0
Z17:  (X17-Y17)
X18:  0
Y18:  0
Z18:  (X18-Y18)
X19:  0
Y19:  0
Z19:  (X19-Y19)
X20:  0
Y20:  0
Z20:  (X20-Y20)
```

```
X22:  @SUM(X11..X20)
Y22:  @SUM(Y11..Y20)
Z22:  @SUM(Z11..Z20)
```

FIGURE 31

Variable Cost File Layout

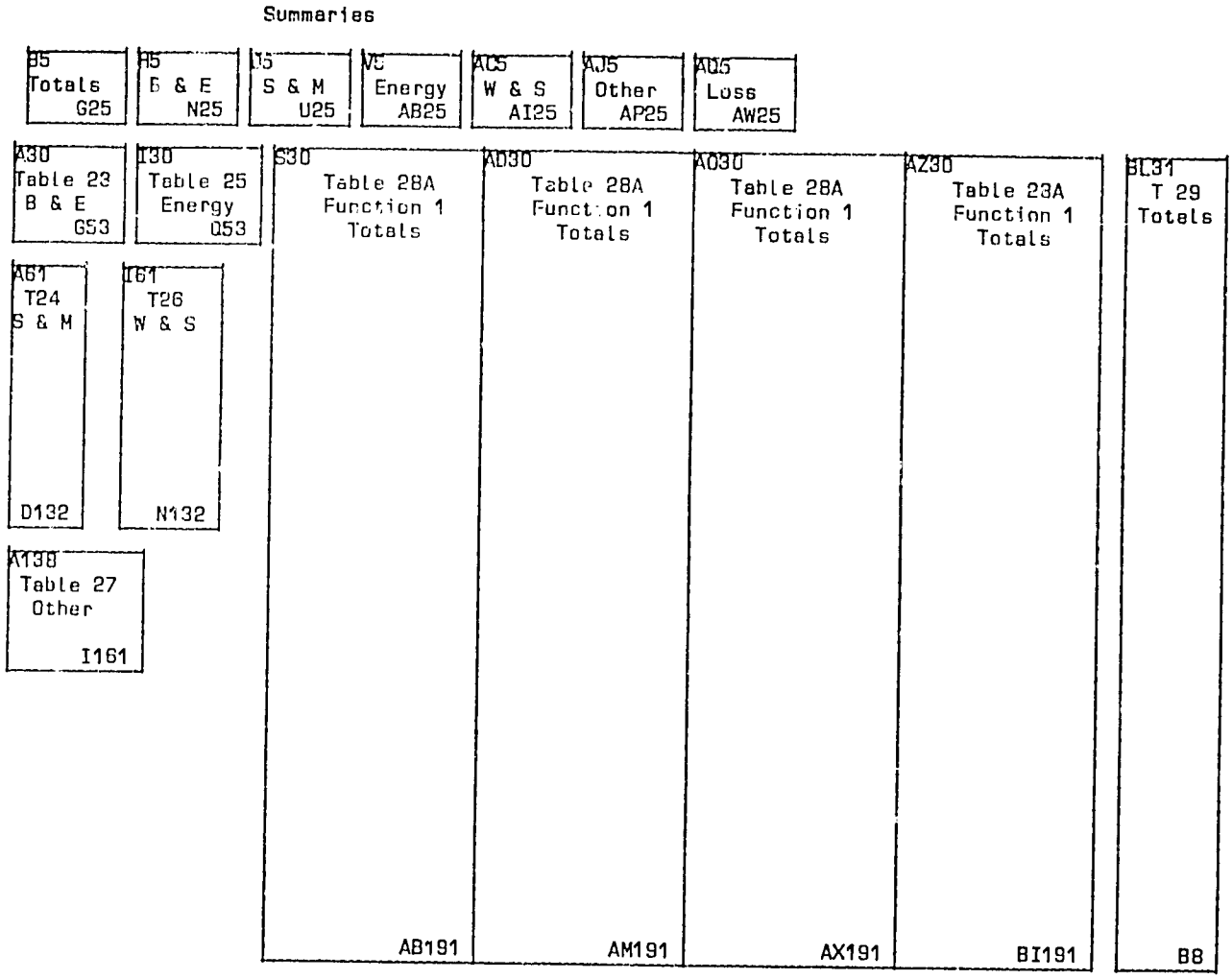


FIGURE 32

Example Table: Building and Equipment Variable Cost

	A	B	C	D	E	F	G
31			BUILDING AND EQUIPMENT MAINTENANCE				
32			Variable Cost				
33			(Table 23)				
34							
35	==========	==========	==========	==========	==========	==========	==========
36							
37	Function		Building Maint.	Aging Factor	Equip. Maint.	Aging Factor	Total
38							
39	Storage		1,500	1.00	2,500	1.25	4,625
40	Product Volume						8,100
41	Product Volume Multiplier						0.571

```
C39: U 1500
D39: (F2) 1
E39: U 2500
F39: (F2) 1.25
G39: (C39*D39)+(E39*F39)
G40: U 8100
G41: (F3) @IF(G39=0,0,G39/G40)
```

FIGURE 33

Example Table: Supplies and Materials Variable Cost

	A	B	C	D
62		SUPPLIES AND MATERIALS		
63		Variable Cost		
64		(Table 24)		
65				
66	==========	==========	==========	==========
67				
68		Quantity	Price	Total
69		Required	Per Unit	Cost
71	Function: Storage			
72	brooms	20	7.50	150
73	oil/lube	100	5.25	525
74	fumigant	100	13.50	1,350
75	_____	0	0.00	0
76	_____	0	0.00	0
77	_____	0	0.00	0
78	_____	0	0.00	0
79	_____	0	0.00	0
80	_____	0	0.00	0
81	_____	0	0.00	0
82	Total:			2,025
83	Product Volume			8,100
84	Cost to Volume Multiplier			0.250

```
A73: U 'oil/lube
B73: U 100
C73: (F2) 5.25
D73: @INT((B73*C73)+0.5)
D82: @SUM(D72..D81)
D83: U 8100
D84: (F3) @IF(D83<>0,D82/D83,0)
```

FIGURE 34

Example Table: Energy Variable Cost

ANNUAL ENERGY USE
Variable Cost
(Table 25)

Function	Total Fuel Volume	Total kwh	Cost/Unit Fuel	Cost/Unit Power	Total Cost Fuel	Total Cost Power	Total Energy Cost
Storage	900	180,000	0.50	0.07	450	12,600	13,050
Product Volume							8,100
Cost to Volume Multiplier							1.611

```
K40:  U 900
L40:  U 180000
M40:  U (F2) 0.5
N40:  U (F2) 0.07
O40:  (M40*K40)
P40:  (N40*L40)
Q40:  @SUM(O40,P40)
Q41:  U 8100
Q42:  (F3) @IF(Q41<>0,Q40/Q41,0)
```

FIGURE 35

Example Table: Wages and Salaries Variable Cost

WAGES AND SALARIES
Variable Cost
(Table 26)

Function	Storage	Number Required	Total Annual Man-hours 2080	Rate	Total Annual Cost
1.	Man I	2	4,160	4.00	16,640
2.	ManII	1	2,080	6.00	12,480
3.	_____	0	0	0.00	0
4.	_____	0	0	0.00	0
5.	_____	0	0	0.00	0
6.	_____	0	0	0.00	0
7.	_____	0	0	0.00	0
8.	_____	0	0	0.00	0
9.	_____	0	0	0.00	0
10.	_____	0	0	0.00	0
Total:					29,120
Product Volume					8,100
Cost to Volume Multiplier					3.595

```
J72:  U 'Man I
K72:  U 1
L72:  +$L$70*K72
M72:  U (F2) 6
N72:  (L72*$M72)
N82:  @SUM(N72..N81)
N83:  U 8100
N84:  @IF(N83<>0,N82/N83,0)
```

FIGURE 36

Example Table: Other Variable Cost

	A	B	C	D	E	F	G	H	I
139					ANNUAL OTHER COST				
140					Fixed Cost				
141					[Table 27]				
142									
143	==========	==========	==========	==========	==========	==========	==========	==========	==========
144				Adver-	Enter-				
145	Function		Travel	tising	tainment	Other	Other	Other	Total
146									
147	Storage		1,000	1,000	0	0	0	0	2,000
148	Product Volume								8,100
149	Product Volume Multiplier								0.247

```
C147: U 1000
D147: U 1000
E147: U 0
F147: U 0
G147: U 0
H147: U 0
I147: @SUM(C147..H147)
I148: U 8100
I149: [F3] @IF(I148<>0,I147/I148,U)
```

FIGURE 37

Example Table: Total Variable Cost Function 1

	S	T	U	V	W	X	Y	Z	AA	AB
32				TOTAL VARIABLE COST						
33				(Table 28A)						
34				Function Storage						
35	==========									
36	Year/	Product	Product	——————C O S T S——						
37	Month	Volume	Value	Bld/Equip	Supplies/					
38				Maint.	Materials	Energy	Wages	Other	Loss	Total
39										
40	Cost-to-Volume Multiplier >>>			0.571	0.250	1.611	3.595	0.247		
41										
42	Cost-to-Value Multiplier >>>								0.25%	
43	Year									
44	1.	0	0	0	0	0	0	0	0	0
45	2.	0	0	0	0	0	0	0	0	0
46	3.	0	0	0	0	0	0	0	0	0
47	4.	0	0	0	0	0	0	0	0	0
48	5.	0	0	0	0	0	0	0	0	0
49	6.	0	0	0	0	0	0	0	0	0
50	7.	0	0	0	0	0	0	0	0	0
51	8.	0	0	0	0	0	0	0	0	0
52	9.	0	0	0	0	0	0	0	0	0
53	10.	0	0	0	0	0	0	0	0	0
54	11.	0	0	0	0	0	0	0	0	0
55	12.	0	0	0	0	0	0	0	0	0
56	Total	0	0	0	0	0	0	0	0	0

```
V40: (F3) +$G$41
W40: (F3) +$D$84
X40: (F3) +$Q$42
Y40: (F3) +$N$84
Z40: (F3) +$I$149
AA42: U (P2) 0.0025

T44: U 0
U44: U 0
V44: +$V$40*T44
W44: +$W$40*T44
X44: +$X$40*T44
Y44: +$Y$40*T44
Z44: +$Z$40*T44
AA44: +$AA$42*U44
AB44: @SUM(V44..AA44)

T56:  U 0
U56:  U 0
V56: @SUM(V44..V55)
W56: @SUM(W44..W55)
X56: @SUM(X44..X55)
Y56: @SUM(Y44..Y55)
Z56: @SUM(Z44..Z55)
AA56: @SUM(AA44..AA55)
AB56: @SUM(V56..AA56)
```

FIGURE 38

Example Table: Total Variable Cost

	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM
32				TOTAL VARIABLE COST						
33				(Table 29B)						
34				Function Storage						
35	==========									
36	Year/	Product	Product	——————————C O S T S——————————						
37	Month	Volume	Value	Bld/Equip	Supplies/					
38				Maint.	Materials	Energy	Wages	Other	Loss	Total
39										
40	Cost-to-Volume Multiplier >>>			0.979	0.961	4.848	6.513	0.247		
41										
42	Cost-to-Value Multiplier >>>								0.25%	
43	Year									
44	1.	0	0	0	0	0	0	0	0	0
45	2.	0	0	0	0	0	0	0	0	0
46	3.	0	0	0	0	0	0	0	0	0
47	4.	0	0	0	0	0	0	0	0	0
48	5.	0	0	0	0	0	0	0	0	0
49	6.	0	0	0	0	0	0	0	0	0
50	7.	0	0	0	0	0	0	0	0	0
51	8.	0	0	0	0	0	0	0	0	0
52	9.	0	0	0	0	0	0	0	0	0
53	10.	0	0	0	0	0	0	0	0	0
54	11.	0	0	0	0	0	0	0	0	0
55	12.	0	0	0	0	0	0	0	0	0
56	Total	0	0	0	0	0	0	0	0	0

```
AG40: (F3) +$G$45
AH40: (F3) +$D$100
AI40: (F3) +$Q$46
AJ40: (F3) +$N$100
AK40: (F3) +$I$149
AL42: (P2) 0.0025

AE44: U 0
AF44: U 0
AG44: +$AG$40*AE44
AH44: +$AH$40*AE44
AI44: +$AI$40*AE44
AJ44: +$AJ$40*AE44
AK44: +$AK$40*AE44
AL44: +$AL$42*AF44
AM44: [W10] @SUM(AG44..AL44)

AE56: U 0
AF56: U 0
AG56: @SUM(AG44..AG55)
AH56: @SUM(AH44..AH55)
AI56: @SUM(AI44..AI55)
AJ56: @SUM(AJ44..AJ55)
AK56: @SUM(AK44..AK55)
AL56: @SUM(AL44..AL55)
AM56: [W10] @SUM(AG56..AL56)
```

FIGURE 39

Example Table: Total Variable Cost

	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX
32				TOTAL VARIABLE COST						
33				(Table 28C)						
34				Function Storage						
35	==========									
36	Year/	Product	Product	——————C O S T S——						
37	Month	Volume	Value	Bld/Equip	Supplies/					
38				Maint.	Materials	Energy	Wages	Other	Loss	Total
39										
40	Cost-to-Volume Multiplier >>>			2.368	0.667	1.877	10.801	4.388		
41										
42	Cost-to-Value Multiplier >>>								0.25%	
43	Year									
44	1.		0	0	0	0	0	0	0	0	0
45	2.		0	0	0	0	0	0	0	0	0
46	3.		0	0	0	0	0	0	0	0	0
47	4.		0	0	0	0	0	0	0	0	0
48	5.		0	0	0	0	0	0	0	0	0
49	6.		0	0	0	0	0	0	0	0	0
50	7.		0	0	0	0	0	0	0	0	0
51	8.		0	0	0	0	0	0	0	0	0
52	9.		0	0	0	0	0	0	0	0	0
53	10.		0	0	0	0	0	0	0	0	0
54	11.		0	0	0	0	0	0	0	0	0
55	12.		0	0	0	0	0	0	0	0	0
56	Total		0	0	0	0	0	0	0	0	0

```
AR40: (F3) +$G$49
AS40: (F3) +$D$116
AT40: (F3) +$Q$50
AU40: (F3) +$N$116
AV40: (F3) +$I$157
AW42: (P2) 0.0025

AP44: U 0
AQ44: U 0
AR44: +$AR$40*AP44
AS44: +$AS$40*AP44
AT44: +$AT$40*AP44
AU44: +$AU$40*AP44
AV44: +$AV$40*AP44
AW44: +$AW$42*AQ44
AX44: @SUM(AR44..AW44)

AP56: U 0
AQ56: U 0
AR56: @SUM(AR44..AR55)
AS56: @SUM(AS44..AS55)
AT56: @SUM(AT44..AT55)
AU56: @SUM(AU44..AU55)
AV56: @SUM(AV44..AV55)
AW56: @SUM(AW44..AW55)
AX56: @SUM(AR56..AW56)
```

FIGURE 40

Example Table: Total Variable Cost

	AZ	BA	BB	BC	BE	BF	BG	BH	BI	BJ
32				TOTAL VARIABLE COST						
33				(Table 2BD)						
34				Function Storage						
35	==========									
36	Year/	Product	Product	——————————C O S T S——————————						
37	Month	Volume	Value	Bld/Equip	Supplies/					
38				Maint.	Materials	Energy	Wages	Other	Loss	Total
39										
40	Cost-to-Volume Multiplier >>>			0.000	0.000	1.000	3.000	0.000		
41										
42	Cost-to-Value Multiplier >>>								0.00%	
43	Year									
44	1.	0	0	0	0	0	0	0	0	0
45	2.	0	0	0	0	0	0	0	0	0
46	3.	0	0	0	0	0	0	0	0	0
47	4.	0	0	0	0	0	0	0	0	0
48	5.	0	0	0	0	0	0	0	0	0
49	6.	0	0	0	0	0	0	0	0	0
50	7.	0	0	0	0	0	0	0	0	0
51	8.	0	0	0	0	0	0	0	0	0
52	9.	0	0	0	0	0	0	0	0	0
53	10.	0	0	0	0	0	0	0	0	0
54	11.	0	0	0	0	0	0	0	0	0
55	12.	0	0	0	0	0	0	0	0	0
56	Total	0	0	0	0	0	0	0	0	0

```
BC40: (F3) +$G$53
BD40: (F3) +$D$132
BE40: (F3) +$Q$54
BF40: (F3) +$N$132
BG40: (F3) +$I$161
BH42: (P2) 0.0025

BA44: U 0
BB44: U 0
BC44: +$BC$40*BA44
BD44: +$BD$40*BA44
BE44: +$BE$40*BA44
BF44: +$BF$40*BA44
BG44: +$BG$40*BA44
BH44: +$BH$42*BB44
BI44: @SUM(BC44..BH44)

BA56: U 0
BB56: @SUM(BB44..BB55)
BC56: @SUM(BC44..BC55)
BD56: @SUM(BD44..BD55)
BE56: @SUM(BE44..BE55)
BF56: @SUM(BF44..BF55)
BG56: @SUM(BG44..BG55)
BH56: @SUM(BH44..BH55)
BI56: @SUM(BC56..BH56)
```

FIGURE 41

Example Table: Total Variable Cost

	BL	BM	BN	BO	BP	BQ
33			TOTAL VARIABLE COSTS			
34			(Table 29)			
35						
36	==========	==========	==========	==========	==========	==========
37						
38		Function	Function	Function	Function	
29	Year/	Storage	Processing	Marketing		Total
40						
41						
42						
43	Month					
44						
45	1.	0	0	0	0	0
45	2.	0	0	0	0	0
46	3.	0	0	0	0	0
47	4.	0	0	0	0	0
48	5.	0	0	0	0	0
49	6.	0	0	0	0	0
50	7.	0	0	0	0	0
51	8.	0	0	0	0	0
52	9.	0	0	0	0	0
53	10.	0	0	0	0	0
54	11.	0	0	0	0	0
55	12.	0	0	0	0	0
56		0	0	0	0	0

```
BM44: +AB44
BN44: +AM44
BO44: +AX44
BP44: +BI44
BQ44: @SUM(BM44..BP44)

BM56: @SUM(BM44..BM55)
BN56: @SUM(BN44..BN55)
BO56: @SUM(BO44..BO55)
BP56: @SUM(BP44..BP55)
BQ56: @SUM(BQ44..BQ55)
```

FIGURE 42

Example Table: Total Variable Cost (Summary)

	B	C	D	E	F	G
6		TOTAL VARIABLE COST				
7		(Summary)				
8						
9						
10		Function	Function	Function	Function	
11						
12	Period	1.	2.	3.	4.	Total
13						
14	1.	0	0	0	0	0
15	2.	0	0	0	0	0
16	3.	55,304	111,902	120,092	0	287,297
17	4.	54,283	111,909	120,144	0	286,336
18	5.	55,304	111,902	120,092	0	287,297
19	6.	54,283	111,909	120,144	0	286,336
20	7.	53,261	111,902	120,092	0	285,254
21	8.	54,283	111,909	120,144	0	286,336
22	9.	53,261	111,902	120,092	0	285,254
23	10.	52,643	111,909	120,144	0	284,696
24						
25		432,622	895,243	960,941	0	2,288,806

```
C14: +J14-114+X14+AE14+AL14+AS14
D14: +K14+R14+Y14+AF14+AM14+AT14
E14: +L14+S14+Z14+AG14+AN14+AU14
F14: +M14+T14+AA14+AH14+AO14+AV14
G14: @SUM(C14..F14)
C15: +J15+Q15+X15+AE15+AL15+AS15
D15: +K15+R15+Y15+AF15+AM15+AT15
E15: +L15+S15+Z15+AG15+AN15+AU15
F15: +M15+T15+AA15+AH15+AO15+AV15
G15: @SUM(C15..F15)
C16: +J16+Q16+X16+AE16+AL16+AS16
D16: +K16+R16+Y16+AF16+AM16+AT16
E16: +L16+S16+Z16+AG16+AN16+AU16
F16: +M16+T16+AA16+AH16+AO16+AV16
G16: @SUM(C16..F16)
C17: +J17+Q17+X17+AE17+AL17+AS17
D17: +K17+R17+Y17+AF17+AM17+AT17
E17: +L17+S17+Z17+AG17+AN17+AU17
F17: +M17+T17+AA17+AH17+AO17+AV17
G17: @SUM(C17..F17)
C18: +J18+Q18+X18+AE18+AL18+AS18
D18: +K18+R18+Y18+AF18+AM18+AT18
E18: +L18+S18+Z18+AG18+AN18+AU18
F18: +M18+T18+AA18+AH18+AO18+AV18
G18: @SUM(C18..F18)
```

```
C19: +J19+Q19+X19+AE19+AL19+AS19
D19: +K19+R19+Y19+AF19+AM19+AT19
E19: +L19+S19+Z19+AG19+AN19+AU19
F19: +M19+T19+AA19+AH19+AO19+AV19
G19: @SUM(C19..F19)
C20: +J20+Q20+X20+AE20+AL20+AS20
D20: +K20+R20+Y20+AF20+AM20+AT20
E20: +L20+S20+Z20+AG20+AN20+AU20
F20: +M20+T20+AA20+AH20+AO20+AV20
G20: @SUM(C20..F20)
C21: +J21+Q21+X21+AE21+AL21+AS21
D21: +K21+R21+Y21+AF21+AM21+AT21
E21: +L21+S21+Z21+AG21+AN21+AU21
F21: +M21+T21+AA21+AH21+AO21+AV21
G21: @SUM(C21..F21)
C22: +J22+Q22+X22+AE22+AL22+AS22
D22: +K22+R22+Y22+AF22+AM22+AT22
E22: +L22+S22+Z22+AG22+AN22+AU22
F22: +M22+T22+AA22+AH22+AO22+AV22
G22: @SUM(C22..F22)
C23: +J23+Q23+X23+AE23+AL23+AS23
D23: +K23+R23+Y23+AF23+AM23+AT23
E23: +L23+S23+Z23+AG23+AN23+AU23
F23: +M23+T23+AA23+AH23+AO23+AV23
G23: @SUM(C23..F23)
```

```
C25: @SUM(C14..C23)
D25: @SUM(D14..D23)
E25: @SUM(E14..E23)
F25: @SUM(F14..F23)
G25: @SUM(G14..G23)
```

FIGURE 43

Example Table: Building and Equipment Maintenance

	I	J	K	L	M	N
6		BUILDING & EQUIPMENT MAINTENANCE				
7			(Summary)			
8						
9						
10		Function	Function	Function	Function	
11						
12	Period	1.	2.	3.	4.	Total
13						
14	1.	0	0	0	0	0
15	2.	0	0	0	0	0
16	3.	4,625	7,750	13,500	0	25,875
17	4.	4,539	7,750	13,500	0	25,789
18	5.	4,625	7,750	13,500	0	25,875
19	6.	4,539	7,750	13,500	0	25,789
20	7.	4,454	7,750	13,500	0	25,704
21	8.	4,539	7,750	13,500	0	25,789
22	9.	4,454	7,750	13,500	0	25,704
23	10.	4,432	7,750	13,500	0	25,652
24						
25		36,178	62,000	108,000	0	206,178

```
J14: +V56
K14: +AG56
L14: +AR56
M14: +BC56
N14: @SUM(J14..M14)
J15: +V71
K15: +AG71
L15: +AR71
M15: +BC71
N15: @SUM(J15..M15)
J16: +V86K16: +AG86
L16: +AR86
M16: +BC86
N16: @SUM(J16..M16)
J17: +V101
K17: +AG101
L17: +AR101
M17: +BC101
N17: @SUM(J17..M17)
J18: +V116
K18: +AG116
L18: +AR116
M18: +BC116
N18: @SUM(J18..M18)
```

```
J19: +V131
K19: +AG131
L19: +AR131
M19: +BC131
N19: @SUM(J19..M19)
J20: +V146
K20: +AG146
L20: +AR146
M20: +BC146
N20: @SUM(J20..M20)
J21: +V161
K21: +AG161
L21: +AR161
M21: +BC161
N21: @SUM(J21..M21)
J22: +V176
K22: +AG176
L22: +AR176
M22: +BC176
N22: @SUM(J22..M22)
J23: +V191
K23: +AG191
L23: +AR191
M23: +BC191
N23: @SUM(J23..M23)
```

```
J25: @SUM(J14..J23)
K25: @SUM(K14..K23)
L25: @SUM(L14..L23)
M25: @SUM(M14..M23)
N25: @SUM(N14..N23)
```

FIGURE 44

Example Table: Supplies and Materials (Summary)

	P	Q	R	S	T	U
6		SUPPLIES AND MATERIALS				
7		(Summary)				
8						
9						
10		Function	Function	Function	Function	
11						
12	Period	1.	2.	3.	4.	Total
13						
14	1.	0	0	0	0	0
15	2.	0	0	0	0	0
16	3.	2,025	7,614	3,860	0	13,499
17	4.	1,988	7,614	3,860	0	13,461
18	5.	2,025	7,614	3,860	0	13,499
19	6.	1,988	7,614	3,860	0	13,461
20	7.	1,950	7,614	3,860	0	13,424
21	8.	1,988	7,614	3,860	0	13,461
22	9.	1,950	7,614	3,860	0	13,424
23	10.	1,928	7,614	3,860	0	13,401
24						
25		15,840	60,912	30,879	0	107,631

```
Q14: +W56
R14: +AH56
S14: +AS56
T14: +BD56
U14: @SUM(Q14..T14)
Q15: +W71
R15: +AH71
S15: +AS71
T15: +BD71
U15: @SUM(Q15..T15)
Q16: +W86
R16: +AH86
S16: +AS86
T16: +BD86
U16: @SUM(Q16..T16)
Q17: +W101
R17: +AH101
S17: +AS101
T17: +BD101
U17: @SUM(Q17..T17)
Q18: +W116
R18: +AH116
S18: +AS116
T18: +BD116U18: @SUM(Q18..T18)
```

```
Q19: +W131
R19: +AH131
S19: +AS131
T19: +BD131
U19: @SUM(Q19..T19)
Q20: +W146
R20: +AH146
S20: +AS146
T20: +BD146
U20: @SUM(Q20..T20)
Q21: +W161
R21: +AH161
S21: +AS161
T21: +BD161
U21: @SUM(Q21..T21)
Q22: +W176
R22: +AH176
S22: +AS176
T22: +BD176
U22: @SUM(Q22..T22)
Q23: +W191
R23: +AH191
S23: +AS191
T23: +BD191
U23: @SUM(Q23..T23)
```

```
Q25: @SUM(Q14..Q23)
R25: @SUM(R14..R23)
S25: @SUM(S14..S23)
T25: @SUM(T14..T23)
U25: @SUM(U14..U23)
```

FIGURE 45

Example Table: Energy (Summary)

	W	X	Y	Z	AA	AB
6			ENERGY			
7			[Summary]			
8						
9						
10		Function	Function	Function	Function	
11						
12	Period	1.	2.	3.	4.	Total
13						
14	1.	0	0	0	0	0
15	2.	0	0	0	0	0
16	3.	13,050	38,400	10,700	0	62,150
17	4.	12,808	38,400	10,700	0	61,908
18	5.	13,050	38,400	10,700	0	62,150
19	6.	12,808	38,400	10,700	0	61,908
20	7.	12,567	38,400	10,700	0	61,667
21	8.	12,808	38,400	10,700	0	61,908
22	9.	12,567	38,400	10,700	0	61,667
23	10.	12,422	38,400	10,700	0	61,522
24						
25		102,080	307,200	85,600	0	494,880

```
X14: [X56]
Y14: +AI56
Z14: +AT56
AA14: +BE56
AB14: @SUM[X14..AA14]
X15: [X71]
Y15: +AI71
Z15: +AT71
AA15: +BE71
AB15: @SUM[X15..AA15]
X16: [X86]
Y16: +AI86
Z16: +AT86
AA16: +BE86
AB16: @SUM[X16..AA16]
X17: [X101]
Y17: +AI101
Z17: +AT101
AA17: +BE101
AB17: @SUM[X17..AA17]
X18: [X116]
Y18: +AI116
Z18: +AT116
AA18: +BE116
AB18: @SUM[X18..AA18]
```

```
X19: [X131]
Y19: +AI131
Z19: +AT131
AA19: +BE131
AB19: @SUM[X19..AA19]
X20: [X146]
Y20: +AI146
Z20: +AT146
AA20: +BE146
AB20: @SUM[X20..AA20]
X21: [X161]
Y21: +AI161Z21: +AT161
AA21: +BE161
AB21: @SUM[X21..AA21]
X22: [X176]
Y22: +AI176
Z22: +AT176
AA22: +BE176
AB22: @SUM[X22..AA22]
X23: [X191]
Y23: +AI191
Z23: +AT191
AA23: +BE191
AB23: @SUM[X23..AA23]
```

```
X25: @SUM[X14..X23]
Y25: @SUM[Y14..Y23]
Z25: @SUM[Z14..Z23]
AA25: @SUM[AA14..AA23]
AB25: @SUM[AB14..AB23]
```

FIGURE 46

Example Table: Wages (Summary)

	AD	AE	AF	AG	AH	AI
6			WAGES			
7			[Summary]			
8						
9						
10		Function	Function	Function	Function	
11						
12	Period	1.	2.	3.	4.	Total
13						
14	1.	0	0	0	0	0
15	2.	0	0	0	0	0
16	3.	29,120	51,584	61,568	0	142,272
17	4.	28,581	51,584	61,568	0	141,733
18	5.	29,120	51,584	61,568	0	142,272
19	6.	28,581	51,584	61,568	0	141,733
20	7.	28,041	51,584	61,568	0	141,193
21	8.	28,581	51,584	61,568	0	141,733
22	9.	28,041	51,584	61,568	0	141,193
23	10.	27,718	51,584	61,568	0	140,870
24						
25		227,783	412,672	492,544	0	1,132,999

```
AE14: [Y56]
AF14: +AJ56
AG14: +AU56
AH14: +BF56
AI14: @SUM(AE14..AH14)
AE15: [Y71]
AF15: +AJ71
AG15: +AU71
AH15: +BF71
AI15: @SUM(AE15..AH15)
AE16: [Y86]
AF16: +AJ86
AG16: +AU86
AH16: +BF86
AI16: @SUM(AE16..AH16)
AE17: [Y101]
AF17: +AJ101
AG17: +AU101
AH17: +BF101
AI17: @SUM(AE17..AH17)
AE18: [Y116]
AF18: +AJ116
AG18: +AU116
AH18: +BF116
AI18: @SUM(AE18..AH18)
```

```
AE19: [Y131]
AF19: +AJ131
AG19: +AU131
AH19: +BF131
AI19: @SUM(AE19..AH19)
AE20: [Y146]
AF20: +AJ146
AG20: +AU146
AH20: +BF146
AI20: @SUM(AE20..AH20)
AE21: [Y161]
AF21: +AJ161
AG21: +AU161
AH21: +BF161
AI21: @SUM(AE21..AH21)
AE22: [Y176]
AF22: +AJ176
AG22: +AU176
AH22: +BF176
AI22: @SUM(AE22..AH22)
AE23: [Y191]
AF23: +AJ191
AG23: +AU191
AH23: +BF191
AI23: @SUM(AE23..AH23)
```

```
AE25: @SUM(AE14..AE23)
AF25: @SUM(AF14..AF23)
AG25: @SUM(AG14..AG23)
AH25: @SUM(AH14..AH23)
AI25: @SUM(AI14..AI23)
```

FIGURE 4"

Example Table: Other (Summary)

	AL	AM	AN	AO	AP	AQ
6			OTHER			
7			(Summary)			
8						
9						
10		Function	Function	Function	Function	
11						
12	Period	1.	2.	3.	4.	Total
13						
14	1.	0	0	0	0	0
15	2.	0	0	0	0	0
16	3.	2,000	1,956	25,000	0	28,956
17	4.	1,963	1,956	25,000	0	28,919
18	5.	2,000	1,956	25,000	0	28,956
19	6.	1,963	1,956	25,000	0	28,919
20	7.	1,926	1,956	25,000	0	28,881
21	8.	1,963	1,956	25,000	0	28,919
22	9.	1,926	1,956	25,000	0	28,881
23	10.	1,904	1,956	25,000	0	28,859
24						
25		15,644	15,644	200,000	0	231,289

```
AL14: (Z56)
AM14: [W10] +AK56
AN14: [W10] +AV56
AO14: +BG56
AP14: @SUM(AL14..AO14)
AL15: (Z71)
AM15: [W10] +AK71
AN15: [W10] +AV71
AO15: +BG71
AP15: @SUM(AL15..AO15)
AL16: (Z86)
AM16: [W10] +AK86
AN16: [W10] +AV86
AO16: +BG86
AP16: @SUM(AL16..AO16)
AL17: (Z101)
AM17: [W10] +AK101
AN17: [W10] +AV101
AO17: +BG101
AP17: @SUM(AL17..AO17)
AL18: (Z116)
AM18: [W10] +AK116
AN18: [W10] +AV116
AO18: +BG116
AP18: @SUM(AL18..AO18)
```

```
AL19: (Z131)
AM19: [W10] +AK131
AN19: [W10] +AV131
AO19: +BG131
AP19: @SUM(AL19..AO19)
AL20: (Z146)
AM20: [W10] +AK146
AN20: [W10] +AV146
AO20: +BG146
AP20: @SUM(AL20..AO20)
AL21: (Z161)
AM21: [W10] +AK161
AN21: [W10] +AV161
AO21: +BG161
AP21: @SUM(AL21..AO21)
AL22: (Z176)
AM22: [W10] +AK176
AN22: [W10] +AV176
AO22: +BG176
AP22: @SUM(AL22..AO22)
AL23: (Z191)
AM23: [W10] +AK191
AN23: [W10] +AV191
AO23: +BG191
AP23: @SUM(AL23..AO23)
```

```
AL25: @SUM(AL14..AL23)
AM25: [W10] @SUM(AM14..AM23)
AN25: [W10] @SUM(AN14..AN23)
AO25: @SUM(AO14..AO23)
AP25: @SUM(AP14..AP23)
```

FIGURE 48

Example Table: Loss (Summary)

	AR	AS	AT	AU	AV	AW
6			LOSS			
7			(Summary)			
8						
9						
10		Function	Function	Function	Function	
11						
12	Period	1.	2.	3.	4.	Total
13						
14	1.	0	0	0	0	0
15	2.	0	0	0	0	0
16	3.	4,484	4,599	5,464	0	14,546
17	4.	4,404	4,605	5,516	0	14,525
18	5.	4,484	4,599	5,464	0	14,546
19	6.	4,404	4,605	5,516	0	14,525
20	7.	4,323	4,599	5,484	0	14,365
21	8.	4,404	4,605	5,516	0	14,525
22	9.	4,323	4,599	5,464	0	14,385
23	10.	4,270	4,605	5,516	0	14,391
24						
25		35,097	36,815	43,919	0	115,830

```
AS14: (AA56)
AT14: +AL56
AU14: +AW56
AV14: +BH56
AW14: @SUM(AS14..AV14)
AS15: (AA71)
AT15: +AL71
AU15: +AW71
AV15: +BH71
AW15: @SUM(AS15..AV15)
AS16: (AA86)
AT16: +AL86
AU16: +AW86
AV16: +BH86
AW16: @SUM(AS16..AV16)
AS17: (AA101)
AT17: +AL101
AU17: +AW101AV17: +BH10
AW17: @SUM(AS17..AV17)
AS18: (AA116)
AT18: +AL116
AU18: +AW116
AV18: +BH116
AW18: @SUM(AS18..AV18)
```

```
AS19: (AA131)
AT19: +AL131
AU19: +AW131
AV19: +BH131
AW19: @SUM(AS19..AV19)
AS20: (AA146)
AT20: +AL146
AU20: +AW146
AV20: +BH146
AW20: @SUM(AS20..AV20)
AS21: (AA161)
AT21: +AL161
AU21: +AW161
AV21: +BH161
AW21: @SUM(AS21..AV21)
AS22: (AA176)
AT22: +AL176
AU22: +AW176
AV22: +BH176
AW22: @SUM(AS22..AV22)
AS23: (AA191)
AT23: +AL191
AU23: +AW191
AV23: +BH191
AW23: @SUM(AS23..AV23)
```

```
AS25: @SUM(AS14..AS23)
AT25: @SUM(AT14..AT23)
AU25: @SUM(AU14..AU23)
AV25: @SUM(AV14..AV23)
IW25: @SUM(AW14..AW23)
```

FIGURE 49

Example Table: Fixed Cost File Layout

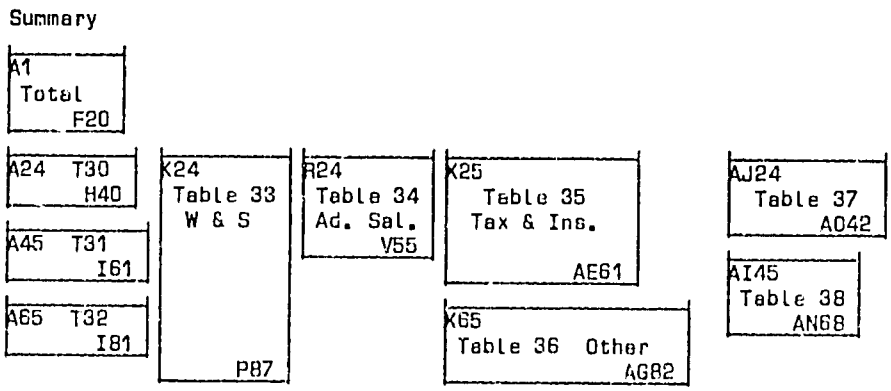


FIGURE 50

Example Table: Annual Repairs and Maintenance (Fixed Cost)

ANNUAL REPAIRS AND MAINTENANCE
Fixed Cost
(Table 30)

	A	B	C	D	E	F	G	H
25								
26								
27								
28								
29								
30		Buildings			Equipment			
31		Original	Standard-		Original	Standard-		Total
32	Function	Cost	ized Rate	Subtotal	Cost	ized Rate	Subtotal	Cost
33								
34	Storage	**285,000**	**0.40%**	**1,140**	**144,154**	**0.50%**	**721**	**1,861**
35								
36	Processing	564,000	0.40%	2,256	242,019	0.50%	1,210	3,466

B34: U 285000
C34: (P2) U 0.004
D34: +B34*C34
E34: U 144154

F34: (P2) U 0.005
G34: +E34*F34
H34: +D34+G34

FIGURE 51

Example Table: Energy (Fixed Cost)

ENERGY
Fixed Cost
(Table 31)

	A	B	C	D	E	F	G	H	I
46									
47									
48									
49									
51									
52									
53			Total		Cost/Unit		Total Cost		Total
54			Fuel	Total					Energy
55	Function		Volume	kwh	Fuel	Power	Fuel	Power	Costs
56									
57	Storage		**300**	**8,000**	**0.75**	**0.07**	**225**	**560**	**785**
58									
59	Processing		300	8,000	0.75	0.07	225	560	785

C57: U 300
D57: U 8000
E57: (F2) U 0.75
F57: (F2) U 0.07

G57: U (E57*C57)
H57: U (F57*D57)
I57: @SUM(G57,H57)

FIGURE 52

Example Table: Office Expenses (Fixed Cost)

	A	B	C	D	E	F	G	H	I
68					OFFICE EXPENSES				
69					Fixed Cost				
70					(Table 32)				
71									
72	==========								
73									
74			Office	Tele-	Office	Office			
75	Function		Utilities	phone	Supplies	Equipment	Other	Other	Total
76									
77	Storage		**1,200**	**1,800**	**600**	**500**	**0**	**0**	**4,100**
78									
79	Processing		1,200	1,400	600	500	0	0	3,700

C77: (,0) U 1200
D77: (,0) U 1400
E77: (,0) U 600
F77: (,0) U 500

G77: (,0) U 0
H77: (,0) U 0
I77: (,0) @SUM(C77..H77)

FIGURE 53

Example Table: Wages and Salaries (Fixed Cost)

	K	L	M	N	O	P
25				WAGES AND SALARIES		
26				Fixed Cost		
27				(Table 33)		
28						
29	==========					
30				Total		
31	Function/		Number	Annual	Rate/	Total Annual
32	Job Description		Required	Man-Hours	Hr.	Cost
33				2,080		
34	Storage					
35	Manager		**1**	**2,080**	**8.00**	**16,640**
36	Secretary		1	2,080	4.00	8,320
37	_____		0	0	0.00	0
38	_____		0	0	0.00	0
39	_____		0	0	0.00	0
40	_____		0	0	0.00	0
41	_____		0	0	0.00	0
42	_____		0	0	0.00	0
43	_____		0	0	0.00	0
44	_____		0	0	0.00	0
45	Total					**24,960**

M35: U 1
N35: +N$33*M36
O35: (F2) U 4

P35: (N36*O36)

P45: @SUM(P35..P44)

FIGURE 54

Example Table: Administrative Salaries (Fixed Cost)

	R	S	T	U	V
24		ADMINISTRATEVE SALARIES			
25			Fixed Cost		
26			(Table 34)		
27					
28	==========				
29				Annual	
30			Annual	Fringe	Total
31	Job Title		Salary	Benefits	Salary
32				10.0%	
33	Owner		**20,000**	**2,000**	**22,000**
34	General Manager		15,500	1,550	17,050
35	_____		0	0	0
.	.		.	.	.
.	.		.	.	.
.	.		.	.	.
43	_____		0	0	0
44	_____		0	0	0
45	Total				**39,050**
46					
47					
48					
49	Allocation by Function				
50			Formulas		
51	Storage		.33 * Total		**13,004**
52	Processing		.33 * Total		**13,004**
53	Marketing		.33 * Total		**13,004**
54	_____		( )		**0**

T35: U 15500
U35: +$U$33*T35
V35: +T35+U35
V46: @SUM(V34..V45)

V51: @INT(@SUM($V$34..$V$45)*0.333+0.5)
V52: @INT(@SUM($V$34..$V$45)*0.333+0.5)
V53: @INT(@SUM($V$34..$V$45)*0.333+0.5)
V54: 0

FIGURE 55

Example Table: Annual Property Taxes and Insurance (Fixed Cost)

	X	Y	Z	AA	AB	AC	AD	AE
27				ANNUAL PROPERTY TAXES AND INSURANCE				
28				Fixed Cost				
29				(Table 35)				
30								
31	==========							
32				Total			Total	
33	Period/	Appraised	Tax	Tax	Original	Ins.	Ins.	Total
34	Item	Value	Rate	Cost	Cost	Rate	Cost	Cost
35	Storage							
36	Building	**285,000**	**1.00%**	**2,850**	**285,000**	**2.00%**	**5,700**	**8,550**
37	Equipment	144,154	1.00%	1,442	144,154	2.00%	2,883	4,325
38	Inventory	125,000	1.00%	1,250	125,000	2.00%	2,500	3,750
39	Vehicle	0	0.00%	0	0	0.00%	0	0
40	Subtotal			**5,542**			**11,083**	**16,625**

Y36: U 285000
Z36: (P2) U 0.01
AA36: (Y37*Z37)
AB36: U 285000
AC36: (P2) U 0.02
AD36: (AB36*AC36)AE36: +AA36+AD36

AA40: @SUM(AA36..AA39)
AD40: @SUM(AD36..AD39)
AE40: @SUM(AE36..AE39)

FIGURE 56

Example Table: Other Cost (Fixed Cost)

	X	Y	Z	AA	AB	AC	AD	AE	AF	AG
68					OTHER COST					
69					Fixed Cost					
70					(Table 36)					
71										
72	==========									
73										
74					Dues &					
75	Function			Legal	Subscrip-			Enter-		
76			Audit	Services	tions	Donations	Travel	tainment	Other	Total
77										
78	Storage		500	650	0	0	0	0	0	1,150
79										
80	Processing		500	650	0	0	0	0	0	1,150

Z78: U 500
AA78: U 650
AB78: U 0
AC78: U 0
AD78: U 0
AE78: U 0
AF78: U 0
AG78: @SUM(Z78..AF78)

FIGURE 57

Example Table: Total Fixed Cost (Table 37)

	AI	AJ	AK	AL	AM	AN	AO
27				TOTAL FIXED COST			
28				(Table 37)			
29							
30	==========						
31							
32			Function	Function	Function	Function	
33	Category						Total
34							
35	Repairs/Maintenance		1,861	3,466	2,792	0	8,119
36	Energy		785	785	1,010	0	2,580
37	Wages and Salaries		24,960	24,960	60,320	0	110,240
38	Admin. Salaries		13,004	13,004	13,004	0	39,012
39	Office Expense		4,100	3,700	5,800	0	13,600
40	Tax/Incurance		16,625	24,181	21,430	0	62,235
41	Other		1,150	1,150	1,650	0	3,950
42	Total		62,484	71,246	106,008	0	239,736

AK35: +$H$34
AL35: +$H$36
AM35: +$H$38
AN35: +$H$40
AO35: @SUM(AK35..AN35)
AK36: +$I$55
AL36: +$I$57
AM36: +$I$59
AN36: +$I$61
AO36: @SUM(AK36..AN36)
AK37: +$P$45
AL37: +$P$59
AM37: +$P$73
AN37: +$P$87
AO37: @SUM(AK37..AN37)
AK38: +$V$51
AL38: +$V$52
AM38: +$V$53
AN38: +$V$54
AO38: @SUM(AK38..AN38)

AK39: +$I$75
AL39: +$I$77
AM39: +$I$79
AN39: +$I$81
AO39: @SUM(AK39..AN39)
AK40: +$AE$40
AL40: +$AE$47
AM40: +$AE$54
AN40: +$AE$61
AO40: @SUM(AK40..AN40)
AK41: +AG76
AL41: +AG78
AM41: +AG80
AN41: +AG82
AO41: @SUM(AK41..AN41)

AK42: @SUM(AK35..AK41)
AL42: @SUM(AL35..AL41)
AM42: @SUM(AM35..AM41)
AN42: @SUM(AN35..AN41)
AO42: @SUM(AO35..AO41)

FIGURE 58

Example Table: Total Fixed Cost (Table 38)

	AI	AJ	AK	AL	AM	AN
47			TOTAL FIXED COST			
48			(Table 38)			
49			Monthly			
50						
51	==========	==========	==========	==========	==========	==========
52						
53		Function	Function	Function	Function	Total
54						
55						
56	1.	5,207	5,937	8,834	0	19,978
57	2.	5,207	5,937	8,834	0	19,978
58	3.	5,207	5,937	8,834	0	19,978
59	4.	5,207	5,937	8,834	0	19,978
60	5.	5,207	5,937	8,834	0	19,978
61	6.	5,207	5,937	8,834	0	19,978
62	7.	5,207	5,937	8,834	0	19,978
63	8.	5,207	5,937	8,834	0	19,978
64	9.	5,207	5,937	8,834	0	19,978
65	10.	5,207	5,937	8,834	0	19,978
66	11.	5,207	5,937	8,834	0	19,978
67	12.	5,207	5,937	8,834	0	19,978
68		62,484	71,248	106,009	0	239,736

```
AJ56: +AK$42/12
AK56: +AL$42/12
AL56: +AM$42/12
AM56: +AN$42/12
AN56: @SUM(AJ56..AM56)
AJ57: +AK$42/12
AK57: +AL$42/12
AL57: +AM$42/12
AM57: +AN$42/12
AN57: @SUM(AJ57..AM57)

AJ68: @SUM(AJ56..AJ67)
AK88: @SUM(AK56..AK67)
AL68: @SUM(AL56..AL67)
AM68: @SUM(AM56..AM67)
AN68: @SUM(AN56..AN67)
```

FIGURE 59

Example Table: Fixed Cost (Summary - Annually)

	O	P	Q	R	S	T
1			FIXED COST			
2			(Summary)			
3			Annually			
4						
5	==========					
6						
7		Function	Function	Function	Function	
8	Year					Total
9	1.	0	0	0	0	0
10	2.	0	0	0	0	0
11	3.	62,484	71,246	106,006	0	239,736
12	4.	62,484	71,246	106,006	0	239,736
13	5.	62,484	71,246	106,006	0	239,736
14	6.	62,484	71,246	106,006	0	239,736
15	7.	62,484	71,246	106,006	0	239,736
16	8.	62,484	71,246	106,006	0	239,736
17	9.	62,484	71,246	106,006	0	239,736
18	10.	62,484	71,246	106,006	0	239,736
19	==========					
20		499,875	569,965	848,048	0	1,917,889

```
P9: 0
Q9: 0
R9: 0
S9: +AN$42
T9: @SUM(P9..S9)
P10: 0
Q10: 0
R10: 0
S10: +AN$42
T10: @SUM(P10..S10)
P11: +AK$42
Q11: +AL$42
R11: +AM$42
S11: +AN$42
T11: @SUM(P11..S11)
P12: +AK$42
Q12: +AL$42
R12: +AM$42
S12: +AN$42
T12: @SUM(P12..S12)
P13: +AK$42
Q13: +AL$42
R13: +AM$42
S13: +AN$42
T13: @SUM(P13..S13)

P20: @SUM(P9..P18)
Q20: @SUM(Q9..Q18)
R20: @SUM(R9..R18)
S20: @SUM(S9..S18)
```

```
P14: +AK$42
Q14: +AL$42
R14: +AM$42
S14: +AN$42
T14: @SUM(P14..S14)
P15: +AK$42
Q15: +AL$42
R15: +AM$42
S15: +AN$42
T15: @SUM(P15..S15)
P16: +AK$42
Q16: +AL$42
R16: +AM$42
S16: +AN$42
T16: @SUM(P16..S16)
P17: +AK$42
Q17: +AL$42
R17: +AM$42
S17: +AN$42
T17: @SUM(P17..S17)
P18: +AK$42
Q18: +AL$42
R18: +AM$42
S18: +AN$42
T18: @SUM(P18..S18)
```

FIGURE 60

Working Capital, Summary, and IRR Analysis File Layout

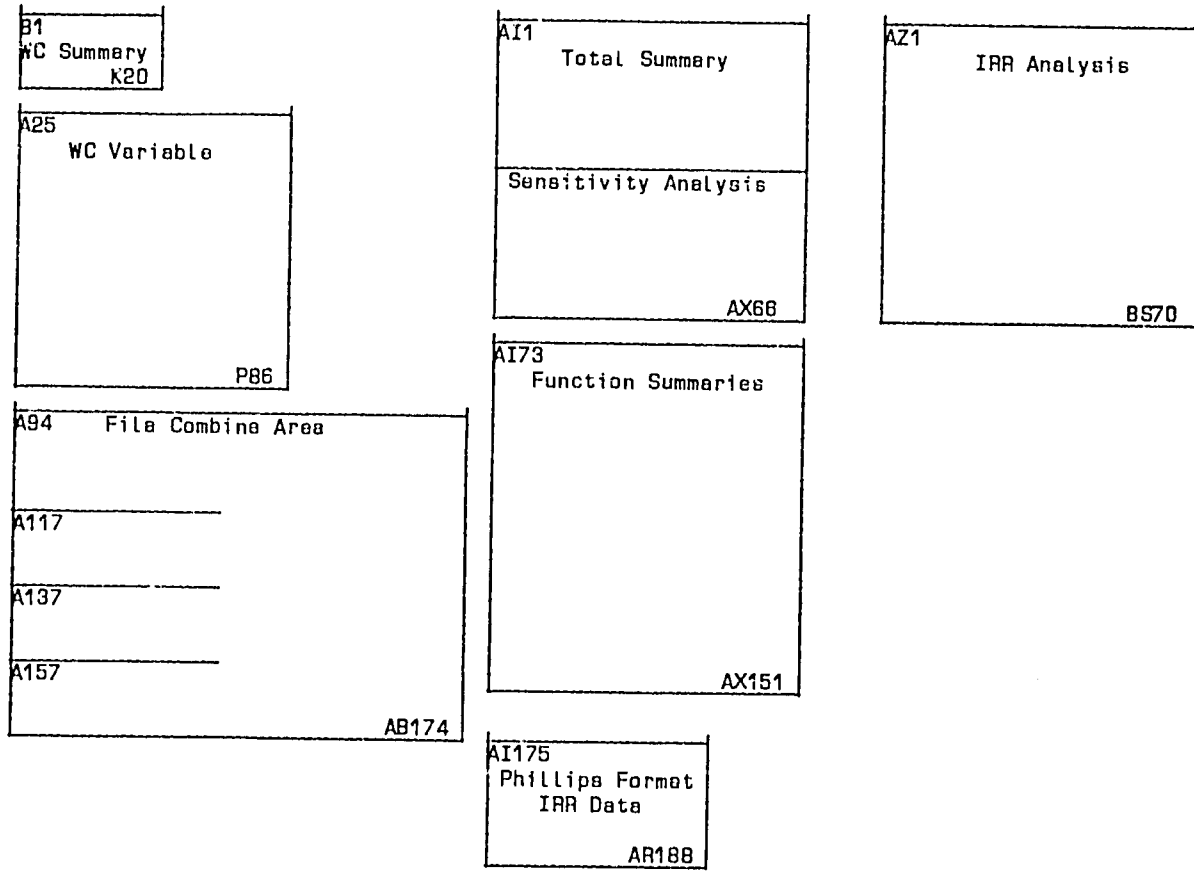


FIGURE 61

Example Table: Working Capital Variable Blocks

WORKING CAPITAL VARIABLE BLOCKS

Function: Storage

Year	WD	AP	M	RM	MV	GS	S	a	A	R	CD	C	PP	SM	SP
1.	0	0	0	0.0	0	0	0	0	0	0%	0.0	0	0	0	0%
2.	0	0	0	0.0	0	0	0	0	0	0%	0.0	0	0	0	0%
3.	312	149458	577	25.4	1532440	0	0	0	0	0%	30.0	106705	11083	2025	30%
4.	312	146812	648	25.4	1720560	0	0	0	0	0%	30.0	105685	11083	2025	30%
5.	312	149458	787	25.4	2040590	0	0	0	0	0%	30.0	106705	11083	2025	30%
6.	312	146812	858	25.4	2280000	0	0	0	0	0%	30.0	105685	11083	2025	30%
7.	312	149458	697	25.4	1853100	0	0	0	0	0%	30.0	106705	11083	2025	30%
8.	312	146812	768	25.4	2040120	0	0	0	0	0%	30.0	105685	11083	2025	30%
9.	312	149458	607	25.4	1613180	0	0	0	0	0%	30.0	106705	11083	2025	30%
10.	312	146812	618	25.4	1638210	0	0	0	0	0%	30.0	104044	11083	2025	30%

Function: Processing

Year	WD	AP	M	RM	MV	GS	S	a	A	R	CD	C	PP	SM	SP
1.	0	0	0	0	0	0	0	0	0	0%	0	0	0	0	0%
2.	0	0	0	0	0	0	0	0	0	0%	0	0	0	0	0%
3.	312	0	0	0	0	0	0	0	0	0%	30	167028	16120	7614	30%
4.	312	0	0	0	0	0	0	0	0	0%	30	167034	16120	7614	30%
5.	312	0	0	0	0	0	0	0	0	0%	30	167028	16120	7614	30%
6.	312	0	0	0	0	0	0	0	0	0%	30	167034	16120	7614	30%
7.	312	0	0	0	0	0	0	0	0	0%	30	167028	6120	7614	30%
8.	312	0	0	0	0	0	0	0	0	0%	30	167034	16120	7614	30%
9.	312	0	0	0	0	0	0	0	0	0%	30	167028	1612[illegible]	7614	30%
10.	312	0	0	0	0	0	0	0	0	0%	30	167034	16120	7614	30%

Function: Marketing

Year	WD	AP	M	RM	MV	GS	S	a	A	R	CD	C	PP	SM	SP
1.	0	0	0	0	0	0	0	0	0	0%	0	0	0	0	0%
2.	0	0	0	0	0	0	0	0	0	0%	0	0	0	0	0%
3.	312	0	0	0	0	0	0	42	2440765	50%	30	211311	14787	5485	30%
4.	312	0	0	0	0	0	0	42	2460323	50%	30	211362	14787	5485	30%
5.	312	0	0	0	0	0	0	42	2440765	50%	30	211311	14787	5485	30%
6.	312	0	0	0	0	0	0	42	2460323	50%	30	211362	14787	5485	30%
7.	312	0	0	0	0	0	0	42	2440765	50%	30	211311	14787	5485	30%
8.	312	0	0	0	0	0	0	42	2460323	50%	30	211362	14787	5485	30%
9.	312	0	0	0	0	0	0	42	2440765	50%	30	211311	14787	5485	30%
10.	312	0	0	0	0	0	0	42	2467223	50%	30	211362	14787	5485	30%

Function:

Year	WD	AP	M	RM	MV	GS	S	a	A	R	CD	C	PP	SM	SP
1.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

WD = Working days
AP = Average purchases
M = Average monthly ending inventory
RM = Raw material units/day
MV = Value of monthly ending inventory
GS = Goods sold per day units
S = Sum of value monthly sales
a = Average days A/P outstanding

A = Value of total annual sales
R = Percentage of sales on credit
CD = Number days cash balance
C = Annual operating cost less prepaid expense
PP = Average prepaid expense
SM = Total annual supplies and materials
SP = Percent of supplies and materials inventory

FIGURE 62

Example Table: Budgeted Working Capital Requirements (Table 9)

	B	C	D	E	F	G	H	I	J	K
2			BUDGETED WORKING CAPITAL REQUIREMENTS							
3			(Table 9)							
4										
5										
6	Function	1.		2.		3.		4.		Total
7		Total	Needed	Total	Needed	Total	Needed	Total	Needed	Need
8	Period	Usage	Increase	Usage	Increase	Usage	Increase	Usage	Increase	
9	1.	0	0	0	0	0	0	0	0	0
10	2.	0	0	0	0	0	0	0	0	0
11	3.	282377	282377	34465	34465	201033	201033	0	0	517875
12	4.	308745	26368	34465	0	202354	1321	0	0	27689
13	5.	374057	65312	34465	0	201033	0	0	0	65312
14	6.	415515	41458	34465	0	202354	1321	0	0	42779
15	7.	334392	0	34465	0	201033	0	0	0	0
16	8.	366375	31983	34465	0	202354	1321	0	0	33304
17	9.	294970	0	34465	0	201033	0	0	0	0
18	10.	296259	1289	34465	0	202819	1786	0	0	3075
19										
20			448787		34465		206782		0	690034

```
C9: @IF(@ISERR(@INT((C32+(D32/E32)*(F32/B32))+(L32*(M32/B32)+N32+(O32*P32))+0.5))=1,0,
    @INT((C32+(D32/E32)*(F32/B32))+(L32*(M32/B32)+N32+(O32*P32))+0.5))
D9: (C9)
E9:                    @IF(@ISERR(@INT(L47*(M47/B47)+N47+(O47*P47)+0.5))=1,0,@INT(L47*(M47/B47)+N47-
    +(O47*P47)+0.5))
F9: (E9)
G9: @IF(@ISERR(@INT((I62/B62)*(J62*K62)+(L62*(M62/B62)+N62+(O62*P62))+0.5))=1,0,
    @INT((I62/B62)*(J62*K62)+(L62*(M62/B62)+N62+(O62*P62))+0.5))
H9: (G9)
I9: (U47)
J9: (I9)
K9: @SUM(D9,F9,H9,J9)

C10: @IF(@ISERR(@INT((C33+(D33/E33)*(F33/B33))+(L33*(M33/B33)+N33+(O33*P33))+0.5))=1,0,
     @INT((C33+(D33/E33)*(F33/B33))+(L33*(M33/B33)+N33+(O33*P33))+0.5))
D10: @IF(C10-C9<=0,0,C10-C9)
E10:                    @IF(@ISERR(@INT(L48*(M48/B48)+N48+(O48*P48)+0.5))=1,0,@INT(L48*(M48/B48)+N48-
     +(O48*P48)+0.5))
F10: @IF(E10-E9<=0,0,E10-E9)
G10: @IF(@ISERR(@INT((I63/B63)*(J63*K63)+(L63*(M63/B63)+N63+(O63*P63))+0.5))=1,0,
     @INT((I63/B63)*(J63*K63)+(L63*(M63/B63)+N63+(O63*P63))+0.5))
H10: @IF(G10-G9<=0,0,G10-G9)
I10: 0
J10: @IF(I10-I9<=0,0,I10-I9)
K10: @SUM(D10,F10,H10,J10)


D20: @SUM(D9..D18)
F20: @SUM(F9..F18)
H20: @SUM(H9..H18)
J20: @SUM(J9..J18)
K20: @SUM(K9..K18)
```

FIGURE 63

Example Table: File Combine Area

A B C D E F G H I J K L M

File Combine Area

99 1. Fixed Capital Investment

100 PRECONSTRUCTION EXPENSE — LAND AND BUILDINGS INVESTMENT

101

	Function						Function				
Period	1.	2.	3.	4.	Total		1.	2.	3.	4.	Total
1.	10929	10929	20196	0	42054		16154	16154	3993	0	36301
2.	0	0	0	0	0		365959	743622	144254	0	1253835
3.	0	0	0	0	0		0	0	0	0	0
4.	0	0	0	0	0		0	0	0	0	0
5.	0	0	0	0	0		0	0	0	0	0
6.	0	0	0	0	0		0	0	0	0	0
7.	0	0	0	0	0		0	0	0	0	0
8.	0	0	0	0	0		0	0	0	0	0
9.	0	0	0	0	0		0	0	0	0	0
10.	0	0	0	0	0		0	0	0	0	0

///

119 2. Product Revenues

120 PRODUCT REVENUE — BY-PRODUCT REVENUE

121

	Function						Function				
Period	1.	2.	3.	4.	Total		1.	2.	3.	4.	Total
1.	0	0	0	0	0		0	0	0	0	0
2.	0	0	0	0	0		0	0	0	0	0
3.	86,600	346,055	191,425	0	624080		0	54,060	9,805	0	63865
4.	87,510	364,315	182,875	0	634700		0	54,272	16,801	0	71073
5.	86,180	346,055	191,425	0	623660		0	54,060	9,805	0	63865
6.	87,930	364,315	182,875	0	635120		0	54,272	16,801	0	71073
7.	82,260	346,055	191,425	0	619740		0	54,060	9,805	0	63865
8.	87,750	364,315	182,875	0	634940		0	54,272	16,801	0	71073
9.	82,440	346,055	191,425	0	619920		0	54,060	9,805	0	63865
10.	86,610	364,315	182,875	0	633800		0	54,272	16,801	0	71073

///

139 3. Variable Cost

140 VARIABLE COST

141

	Function				
Period	1.	2.	3.	4.	Total
1.	0	0	0	0	0
2.	0	0	0	0	0
3.	55304	111902	120092	0	287297
4.	54283	111909	120144	0	286336
5.	55304	111902	120092	0	287297
6.	54283	111909	120144	0	286336
7.	53261	111902	120092	0	285254
8.	54283	111909	120144	0	286336
9.	53261	111902	120092	0	285254
10.	52643	111909	120144	0	284696

///

159 4. Fixed Cost

160 FIXED COST

161

	Function				
Period	1.	2.	3.	4.	Total
1.	62484	71246	106006	0	239736
2.	62484	71246	106006	0	239736
3.	62484	71246	106006	0	239736
4.	62484	71246	106006	0	239736
5.	62484	71246	106006	0	239736
6.	62484	71246	106006	0	239736
7.	62484	71246	106006	0	239736
8.	62484	71246	106006	0	239736
9.	62484	71246	106006	0	239736
10.	62484	71246	106006	0	239736

FIGURE 63 (continued)

P	Q	R	S	T	U	V	W	X	Y	Z	AA
EQUIPMENT INVESTMENT							MISCELLANEOUS CAPITAL OUTLAY EXPENDITURE				
Function							Function				
1.	2.	3.	4.	Total			1.	2.	3.	4.	Total
0	0	0	0	0			0	12100	19800	0	31900
144154	242019	254093	0	640266			0	19800	24200	0	44000
0	0	0	0	0			0	7700	0	0	7700
0	0	0	0	0			0	0	0	0	0
0	0	12880	0	12880			0	0	0	0	0
0	0	23000	0	23000			0	0	0	0	0
0	0	12880	0	12880			0	0	0	0	0
0	0	135700	0	135700			0	0	0	0	0
0	0	35880	0	35880			0	0	0	0	0
0	0	0	0	0			0	0	0	0	0

OTHER REVENUE

Revenue	Purchase	Net
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0

FIGURE 64

Example Table: Summary of Capital Cost, Income, and Expense (Function 1)

AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX
76						SUMMARY OF CAPITAL COST, INCOME, AND EXPENSE									
77						Function: 1									
78															
79						Total		Total				Total			Total
80	Period	A	B	C	D	I	E	II	F	G	H	III	I	J	IV
81															
82	1 1988	**10929**	**16154**	**0**	**0**	**27083**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
83	2 1989	**0**	**365959**	**144154**	**0**	**510113**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
84	3 1990	0	0	0	0	0	282377	282377	86600	0	0	86600	55304	62484	117788
85	4 1991	0	0	0	0	0	26368	26368	87510	0	0	87510	54283	62484	116768
86	5 1992	0	0	0	0	0	65312	65312	86180	0	0	86180	55304	62484	117788
87	6 1993	0	0	0	0	0	41458	41458	87930	0	0	87930	54283	62484	116768
88	7 1994	0	0	0	0	0	0	0	82260	0	0	82260	53261	62484	115745
89	8 1995	0	0	0	0	0	31983	31983	87750	0	0	87750	54283	62484	116768
90	9 1996	0	0	0	0	0	0	0	82440	0	0	82440	53261	62484	115745
91	10 1997	0	0	0	0	0	1289	1289	86610	0	0	86610	52643	62484	

AK82: +B105
AL82: +I105
AM82: +P105
AN82: +W105
AO82: @SUM(AK82..AN82)
AP82: +D9
AQ82: +AP82

AR82: +B125
AS82: +I125
AT82: +S125
AU82: @SUM(AR82..AT82)
AV82: +B145
AW82: 0
AX82: @SUM(AV82..AW82)

AK83: +B106
AL83: +I106
AM83: +P106
AN83: +W106
AO83: @SUM(AK83..AN83)
AP83: +D10
AQ83: +AP83

AR83: +B126
AS83: +I126
AT83: +S126
AU83: @SUM(AR83..AT83)
AV83: +B146
AW83: 0
AX83: @SUM(AV83..AW83)

FIGURE 65

Example Table: Summary of Capital Cost, Income, and Expense (Function 2)

AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX
96						SUMMARY OF CAPITAL COST, INCOME, AND EXPENSE									
97						Function: 2									
98															
99						Total		Total				Total			Total
100	Period	A	B	C	D	I	E	II	F	G	H	III	I	J	IV
101															
102	1 1988	**10929**	**16154**	**0**	**12100**	**39183**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
103	2 1989	**0**	**743622**	**254093**	**19800**	**1017515**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
104	3 1990	0	0	0	7700	7700	34465	34465	346055	54060	0	400115	111902	71246	183148
105	4 1991	0	0	0	0	0	0	0	364315	54272	0	418587	111909	71246	183154
106	5 1992	0	0	12880	0	12880	0	0	346055	54060	0	400115	111902	71246	183148
107	6 1993	0	0	23000	0	23000	0	0	364315	54272	0	418587	111909	71246	183154
108	7 1994	0	0	12880	0	12880	0	0	346055	54060	0	400115	111902	71246	183148
109	8 1995	0	0	135700	0	135700	0	0	364315	54272	0	418587	111909	71246	183154
110	9 1996	0	0	35880	0	35880	0	0	346055	54060	0	400115	111902	71246	183148
111	10 1997	0	0	0	0	0	0	0	364315	54272	0	418587	111909	71246	183154

AK102: +C105
AL102: +J105
AM102: +R105
AN102: +X105
AO102: @SUM(AK102..AN102)
AP102: +F9
AQ102: +AP102

AR102: +C125
AS102: +J125
AT102: +S125
AU102: @SUM(AR102..AT102)
AV102: +C145
AW102: 0
AX102: @SUM(AV102..AW102)

AK103: +C106
AL103: +J106
AM103: +R106
AN103: +X106
AO103: @SUM(AK103..AN103)
AP103: +F10
AQ103: +AP103

AR103: +C126
AS103: +J126
AT103: +S126
AU103: @SUM(AR103..AT103)
AV103: +C146
AW103: 0
AX103: @SUM(AV103..AW103)

FIGURE 66

Example Table: Summary of Capital Cost, Income, and Expense (Function: 3)

AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX
116								SUMMARY OF CAPITAL COST, INCOME, AND EXPENSE							
117								Function: 3							
118															
119						Total		Total				Total			Tota
120	Period	A	B	C	D	I	E	II	F	G	H	III	I	J	IV
121															
122	1 1988	20196	3993	0	19800	43989	0	0	0	0	0	0	0	0	[illegible]
123	2 1989	0	144254	0	24200	168454	0	0	0	0	0	0	0	0	[illegible]
124	3 1990	0	0	0	0	0	201033	201033	0	0	0	0	120092	106006	226098
125	4 1991	0	0	0	0	0	1321	1321	0	0	0	0	120144	106006	226150
126	5 1992	0	0	0	0	0	0	0	0	0	0	0	120092	106006	226098
127	6 1993	0	0	0	0	0	1321	1321	0	0	0	0	120144	106006	226150
128	7 1994	0	0	0	0	0	0	0	0	0	0	0	120092	106006	226098
129	8 1995	0	0	0	0	0	1321	1321	0	0	0	0	120144	106006	226150
130	9 1996	0	0	0	0	0	0	0	0	0	0	0	120092	106006	226098
131	10 1997	0	0	0	0	0	1786	1786	0	0	0	0	120144	106006	226150

AK122: +D105
AL122: +K105
AM122: +S105
AN122: +Y105
AO122: @SUM(AK122..AN122)
AP122: +H9
AQ122: +AP122
AR122: +D125
AS122: +K125
AT122: 0
AU122: @SUM(AR122..AT122)
AV122: +D145
AW122: 0
AX122: @SUM(AV122..AW122)

AK123 +D106
AL123: +K106
AM123: +S106
AN123: +Y106
AO123: @SUM(AK123..AN123)
AP123: +H10
AQ123: +AP123
AR123: +AG229
AS123: +AF229
AT123: 0
AU123: @SUM(AR123..AT123)
AV123: +D146
AW123: 0
AX123: @SUM(AV123..AW123)

FIGURE 67

Example Table: Summary of Capital Cost, Income, and Expense (Function: 4)

AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX
136								SUMMARY OF CAPITAL COST, INCOME, AND EXPENSE							
137								Function: 4							
138															
139						Total		Total				Total			Total
140	Period	A	B	C	D	I	E	II	F	G	H	III	I	J	IV
141															
142	1 1988	0	0	0	0	0	0	0	0	0	0	0	0	0	0
143	2 1989	0	0	0	0	0	0	0	0	0	0	0	0	0	0
144	3 1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0
145	4 1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0
146	5 1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0
147	6 1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0
148	7 1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0
149	8 1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	9 1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0
151	10 1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AK142: +E105
AL142: +L105
AM142: +U105
AN142: +Z105
AO142: @SUM(AK142..AN142)
AP142: +I9
AQ142: +AP142
AR142: +E125
AS142: +L125
AT142: 0
AU142: @SUM(AR142..AT142)
AV142: +E145
AW142: +E165
AX142: @SUM(AV142..AW142)

AK143: +E106
AL143: +L106
AM143: +U106
AN143: +Z106
AO143: @SUM(AK143..AN143)
AP143: +I10
AQ143: +AP143
AR143: +E126
AS143: +L126
AT143: 0
AU143: @SUM(AR143..AT143)
AV143: +E146
AW143: +E166
AX143: @SUM(AV143..AW143)

FIGURE 68

Example Table: Summary of Capital Cost, Income, and Expense

SUMMARY OF CAPITAL COST, INCOME, AND EXPENSE
Function Totals:

AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX
Period		A	B	C	D	Total I	E	Total II	F	G	H	Total III	I	J	Total IV
1	1988	42054	36301	0	31900	110255	0	0	0	0	0	0	0	0	0
2	1989	01253835		398247	44000	1696082	0	0	0	0	0	0	0	0	0
3	1990	0	0	0	7700	7700	517875	517875	432655	54060	0	486715	287297	239736	527033
4	1991	0	0	0	0	0	27689	27689	451825	54272	0	506097	286336	239736	526072
5	1992	0	0	12880	0	12880	65312	65312	432235	54060	0	486295	287297	239736	527033
6	1993	0	0	23000	0	23000	42779	42779	452245	54272	0	506517	286336	239736	528072
7	1994	0	0	12880	0	12880	0	0	428315	54060	0	482375	285254	239736	524990
8	1995	0	0	135700	0	135700	33304	33304	452065	54272	0	506337	286336	239736	526072
9	1996	0	0	35880	0	35880	0	0	428495	54060	0	482555	285254	239736	524990
10	1997	0	0	0	0	0	3075	3075	450925	54272	0	505197	284696	239736	524432

Sensitivity Analysis

Period	A	B	C	D	Total I	E	Total II	F	G	H	Total III	I	J	Total IV
Percent														
Original	75.0	75.0	75.0%	75.0%		75.0%		110.0%	110.0%	100.0%		75.0%	75.0%	
Recovery	100.0	66.7	66.7%	66.7%		66.7%								
1 1988	31541	27226	0	23925	82692	0	0	0	0	0	0	0	0	0
2 1989	0	940376	298665	33000	1272061	0	0	0	0	0	0	0	0	0
3 1990	0	0	0	5775	5775	388406	388406	475921	59466	0	535387	215473	179802	395275
4 1991	0	0	0	0	0	20767	20767	497008	59699	0	556707	214752	179802	394554
5 1992	0	0	9660	0	9660	48984	48984	475459	59466	0	534925	215473	179802	395275
6 1993	0	0	17250	0	17250	32084	32084	497470	59699	0	557169	214752	179802	394554
7 1994	0	0	9660	0	9660	0	0	471147	59466	0	530613	213941	179802	393743
8 1995	0	0	101775	0	101775	24978	24978	497272	59699	0	556971	214752	179802	394554
9 1996	0	0	26910	0	26910	0	0	471345	59466	0	530811	213941	179802	393743
10 1997	0	0	0	0	0	2306	2306	496018	59699	0	555717	213522	179802	393324
11 1998	31541	-645391	-309448	-41821	-1028200	-345189	-345189	0	0	0	0	0	0	0

A = Preconstruction expense
B = Land and buildings
C = Equipment
D = Other
Total I = Total fixed investment
E = Working capital
Total II = Total investment
F = Product revenue
G = By-product revenue
Total III = Total revenue
H = Variable operating cost
I = Fixed operating cost
Total IV = Total operating cost
Total V = Net income (Total revenue - Total operating cost)

FIGURE 68 (continued)

```
AK10: @SUM(AK82,AK102,AK122,AK142)
AL10: @SUM(AL82,AL102,AL122,AL142)
AM10: @SUM(AM82,AM102,AM122,AM142)
AN10: @SUM(AN82,AN102,AN122,AN142)
AO10: @SUM(AK10..AN10)
AP10: @SUM(AP82,AP102,AP122,AP142)
AQ10: +AP10
AR10: @SUM(AR82,AR102,AR122,AR142)
AS10: @SUM(AS82,AS102,AS122,AS142)
AT10: @SUM(AT82,AT102,AT122,AT142)
AU10: @SUM(AR10..AT10)
AV10: @SUM(AV82,AV102,AV122,AV142)
AW10: @SUM(AW82,AW102,AW122,AW142)
AX10: @SUM(AV10..AW10)

AK11: @SUM(AK83,AK103,AK123,AK143)
AL11: @SUM(AL83,AL103,AL123,AL143)
AM11: @SUM(AM83,AM103,AM123,AM143)
AN11: @SUM(AN83,AN103,AN123,AN143)
AO11: @SUM(AK11..AN11)
AP11: @SUM(AP83,AP103,AP123,AP143)
AQ11: +AP11
AR11: @SUM(AR83,AR103,AR123,AR143)
AS11: @SUM(AS83,AS103,AS123,AS143)
AT11: @SUM(AT83,AT103,AT123,AT143)
AU11: @SUM(AR11..AT11)
AV11: @SUM(AV83,AV103,AV123,AV143)
AW11: @SUM(AW83,AW103,AW123,AW143)
AX11: @SUM(AV11..AW11)

AK41: @SUM(AK31..AK40)*$AK$29
AL41: @SUM(AL31..AL40)*$AL$29
AM41: @SUM(AM31..AM40)*$AM$29
AN41: @SUM(AN31..AN40)*$AN$29
AO41: @SUM(AK41..AN40)
AP41: @SUM(AP31..AP40)*$AP$29
AQ41: [AP41]
AR41: U 0
AS41: U 0
AT41: U 0
AU41: U 0
AV41: U 0
AW41: U 0
AX41: U 0

AK31: @INT((+AK10*$AK$28)+0.5)
AL31: @INT((+AL10*$AL$28)+0.5)
AM31: @INT((+AM10*$AM$28)+0.5)
AN31: @INT((+AN10*$AN$28)+0.5)
AO31: @SUM(AK31..AN31)
AP31: @INT((+AP10*$AP$28)+0.5)
AQ31: [AP31]
AR31: @INT((+AR10*$AR$28)+0.5)
AS31: @INT((+AS10*$AS$28)+0.5)
AT31: @INT((+AT10*$AT$28)+0.5)
AU31: @SUM(AR31..AT31)
AV31: @INT((+AV10*$AV$28)+0.5)
AW31: @INT((+AW10*$AW$28)+0.5)
AX31: @SUM(AV31,AW31)

AK32: @INT((+AK11*$AK$28)+0.5)
AL32: @INT((+AL11*$AL$28)+0.5)
AM32: @INT((+AM11*$AM$28)+0.5)
AN32: @INT((+AN11*$AN$28)+0.5)
AO32: @SUM(AK32..AN32)
AP32: @INT((+AP11*$AP$28)+0.5)
AQ32: [AP32]
AR32: @INT((+AR11*$AR$28)+0.5)
AS32: @INT((+AS11*$AS$28)+0.5)
AT32: @INT((+AT11*$AT$28)+0.5)
AU32: @SUM(AR32..AT32)
AV32: @INT((+AV11*$AV$28)+0.5)
AW32: @INT((+AW11*$AW$28)+0.5)
AX32: @SUM(AV32,AW32)
```

FIGURE 69

Example Table: Summary File for Phillips IRR

	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR
165										
166	Summary File for Phillips IRR									
167										
168										
169	1	1988	**31541**	**27226**	**0**	**23925**	**0**	**0**	**0**	**0**
170	2	1989	**0**	**940376**	**298665**	**33000**	**0**	**0**	**0**	**0**
171	3	1990	0	0	0	5775	388406	475921	59466	0
172	4	1991	0	0	0	0	20767	497008	59699	0
173	5	1992	0	0	9660	0	48984	475459	59466	0
174	6	1993	0	0	17250	0	32084	497470	59699	0
175	7	1994	0	0	9660	0	0	471147	59466	0
176	8	1995	0	0	101775	0	24978	497272	59699	0
177	9	1996	0	0	26910	0	0	471345	59466	0
178	10	1997	0	0	0	0	2306	496018	59699	0
179	11	1998	31541	-645391	-309448	-41821	-1028200	-345189	-345189	0
180	1	1988	**0**	**0**						
181	2	1989	**0**	**0**						
182	3	1990	215473	179802						
183	4	1991	214752	179802						
184	5	1992	215473	179802						
185	6	1993	214752	179802						
186	7	1994	213941	179802						
187	8	1995	214752	179802						
188	9	1996	213941	179802						
189	10	1997	213522	179802						
190	11	1998	0	0						

AK169: [AK31]
AL169: [AL31]
AM169: [AM31]
AN169: [AN31]
AO169: [AP31]
AP169: [AR31]
AQ169: [AS31]
AR169: [AT31]
AK170: [AK32]
AL170: [AL32]
AM170: [AM32]
AN170: [AN32]
AO170: [AP32]
AP170: [AR32]
AQ170: [AS32]
AR170: [AT32]

AK180: [AV31]
AL180: [AW31]
AK181: [AV32]
AL181: [AW32]

FIGURE 70

Example Table: Investment Feasibility Analysis

AZ BA BB BC BD BE BF BG BH BI BJ BK BL BM BN BO BP BQ BR BS

11 I N V E S T M E N T F E A S I B I L I T Y A N A L Y S I S

14 IRR ANALYSIS

INTERNAL RETURN ON TOTAL CAPI 3.960%
Guess Range 10.00%

21 NO	ID	INVESTMENT (DOLLARS) FACILITIES	WORKING CAPITAL	TOTAL	OPERATING (DOLLARS) TOTAL REVENUE	OPERATING EXPENSES	NET REVENUE	PRESENT VALUE FACTOR	PRESENT VALUE TOTAL INVESTMENT	NET REVENUE
23 1	1988	82692	0	82692	0	0	0	0.9619	79542	0
24 2	1989	1272061	0	1272061	0	0	0	0.9253	1176990	0
25 3	1990	5775	388406	394181	535387	395275	140112	0.8900	350827	124702
26 4	1991	0	20767	20767	556707	394554	162153	0.8561	17779	138821
27 5	1992	9660	48984	58644	534925	395275	139650	0.8235	48293	115001
28 6	1993	17250	32084	49334	557169	394554	162615	0.7921	39079	128812
29 7	1994	9660	0	9660	530613	393743	138870	0.7620	7360	104288
30 8	1995	101775	24978	126753	556971	394554	162417	0.7329	92901	119040
31 9	1996	26910	0	26910	530811	393743	137068	0.7050	18972	98634
32 10	1997	0	2306	2306	555717	393324	162393	0.6781	1564	110127
33 11	1998	-1028200	-345189	-1373390	0	0	0	0.6523	-895883	0
35		497583	172336	669918	4358300	3155022	1203278		937424	937424

INTEREST PER CENT	BENEFIT/COST RATIO	PRESENT VALUE IN DOLLARS REVENUE	OUTLAY	BALANCE
45 5.0%	0.897	880455	981334	-100879
46 10.0%	0.603	661269	1096089	-434820
47 15.0%	0.458	508224	1113392	-605168
48 25.0%	0.308	318331	1031926	-713595
49 35.0%	0.233	212523	910917	-698394
50 50.0%	0.171	126941	743812	-616871

FIGURE 70 (continued)

```
BQ23: (F4) 1/(1+$BM$16)ÅZ23
BQ23: (F0) (BG23*BQ23)
BS23: (BM23*BQ23)
BQ24: (F4) 1/(1+$BM$16)ÅZ24
BQ24: (F0) (BG24*BQ24)
BS24: (BM24*BQ24)
BQ25: (F4) 1/(1+$BM$16)ÅZ25
BQ25: (F0) (BG25*BQ25)
BS25: (BM25*BQ25)
BQ26: (F4) 1/(1+$BM$16)ÅZ26
BQ26: (F0) (BG26*BQ26)
BS26: (BM26*BQ26)
BQ27: (F4) 1/(1+$BM$16)ÅZ27
BQ27: (F0) (BG27*BQ27)
BS27: (BM27*BQ27)
BQ28: (F4) 1/(1+$BM$16)ÅZ28
BQ28: (F0) (BG28*BQ28)
BS28: (BM28*BQ28)
BQ29: (F4) 1/(1+$BM$16)ÅZ29
BQ29: (F0) (BG29*BQ29)
BS29: (BM29*BQ29)
```

```
BQ30: (F4) 1/(1+$BM$16)ÅZ30
BQ30: (F0) (BG30*BQ30)
BS30: (BM30*BQ30)
BQ31: (F4) 1/(1+$BM$16)ÅZ31
BQ31: (F0) (BG31*BQ31)
BS31: (BM31*BQ31)
BQ32: (F4) 1/(1+$BM$16)ÅZ32
BQ32: (F0) (BG32*BQ32)
BS32: (BM32*BQ32)
BQ33: (F4) 1/(1+$BM$16)ÅZ33
BQ33: (F0) (BG33*BQ33)
BS33: (BM33*BQ33)
BQ34: ' ————————
BS34: ' ————————
BQ35: @SUM(BQ23..BQ33)
BS35: @SUM(BS23..BS33)
```

```
BQ45: @NPV($BC45,$BM$23..$BM$33)
BQ45: @NPV($BC45,$BG$23..$BG$33)
BS45: (BQ45-BQ45)
BQ46: @NPV($BC46,$BM$23..$BM$33)
BQ46: @NPV($BC46,$BG$23..$BG$33)
BS46: (BQ46-BQ46)
BQ47: @NPV($BC47,$BM$23..$BM$33)
BQ47: @NPV($BC47,$BG$23..$BG$33)
BS47: (BQ47-BQ47)
```

```
BQ48: @NPV($BC48,$BM$23..$BM$33)
BQ48: @NPV($BC48,$BG$23..$BG$33)
BS48: (BQ48-BQ48)
BQ49: @NPV($BC49,$BM$23..$BM$33)
BQ49: @NPV($BC49,$BG$23..$BG$33)
BS49: (BQ49-BQ49)
BQ50: @NPV($BC50,$BM$23..$BM$33)
BQ50: @NPV($BC50,$BG$23..$BG$33)
BS50: (BQ50-BQ50)
```

```
BI45: (F3) (BQ45/BQ45)
BI46: (F3) (BQ46/BQ46)
BI47: (F3) (BQ47/BQ47)
BI48: (F3) (BQ48/BQ48)
BI49: (F3) (BQ49/BQ49)
BI50: (F3) (BQ50/BQ50)
```

FIGURE 70 (continued)

```
BM16: [P3] @IRR(BM17,BN22..BN33)
BM17: [P2] 0.1

BC23: @SUM(AK31..AN31)
BE23: [AP31]
BG23: @SUM(BC23+BE23)
BC24: @SUM(AK32..AN32)
BE24: [AP32]
BG24: @SUM(BC24+BE24)
BC25: @SUM(AK33..AN33)
BE25: [AP33]
BG25: @SUM(BC25+BE25)
BC26: @SUM(AK34..AN34)
BE26: [AP34]
BG26: @SUM(BC26+BE26)
BC27: @SUM(AK35..AN35)
BE27: [AP35]
BG27: @SUM(BC27+BE27)
BC28: @SUM(AK36..AN36)
BE28: [AP36]
BG28: @SUM(BC28+BE28)
BC29: @SUM(AK37..AN37)
BE29: [AP37]
BG29: @SUM(BC29+BE29)
BC30: @SUM(AK38..AN38)
BE30: [AP38]
BG30: @SUM(BC30+BE30)
BC31: @SUM(AK39..AN39)
BE31: [AP39]
BG31: @SUM(BC31+BE31)
BC32: @SUM(AK40..AN40)
BE32: [AP40]
BG32: @SUM(BC32+BE32)
BC33: @SUM(AK41..AN41)
BE33: [AP41]
BG33: @SUM(BC33+BE33)
BC35: @SUM(BC23..BC33)
BE35: @SUM(BE23..BE33)
BG35: @SUM(BG23..BG33)

BI23: @SUM(AR31..AT31)
BK23: @SUM(AV31..AW31)
BM23: [BI23-BK23]
BI24: @SUM(AR32..AT32)
BK24: @SUM(AV32..AW32)
BM24: [BI24-BK24]
BI25: @SUM(AR33..AT33)
BK25: @SUM(AV33..AW33)
BM25: [BI25-BK25]
BI26: @SUM(AR34..AT34)
BK26: @SUM(AV34..AW34)
BM26: [BI26-BK26]
BI27: @SUM(AR35..AT35)
BK27: @SUM(AV35..AW35)
BM27: [BI27-BK27]
BI28: @SUM(AR36..AT36)
BK28: @SUM(AV36..AW36)
BM28: [BI28-BK28]
BI29: @SUM(AR37..AT37)
BK29: @SUM(AV37..AW37)
BM29: [BI29-BK29]
BI30: @SUM(AR38..AT38)
BK30: @SUM(AV38..AW38)
BM30: [BI30-BK30]
BI31: @SUM(AR39..AT39)
BK31: @SUM(AV39..AW39)
BM31: [BI31-BK31]
BI32: @SUM(AR40..AT40)
BK32: @SUM(AV40..AW40)
BM32: [BI32-BK32]
BI33: @SUM(AR41..AT41)
BK33: @SUM(AV41..AW41)
BM33: [BI33-BK33]
BI34: ' ---------
BK34: ' ---------
BM34: ' ---------
BI35: @SUM(BI23..BI33)
BK35: @SUM(BK23..BK33)
BM35: @SUM(BM23..BM33)
```

APPENDIX I

COMPUTER AND SPREADSHEET TERMINOLOGY

Absolute Cell Address - A cell address that always refers to the same cell even if copied to another location. An absolute cell address is created by placing the dollar sign ($) before the column letter and row number. $A$16 is an example of an absolute cell address.

Boolean or Logical Operators - The "and" "or" statements used in computer programming statements to direct the flow of processing. In Lotus 123 these statements are used in formulas with the notation #AND# and #OR#.

Cell - The smallest unit of the spreadsheet. It is the designation of the intersection of a row and a column.

Cell Address - The column letter, row number designation of a cell describing where it is located within the spreadsheet, for example G24.

Cell Pointer - The highlighted area used in pointing out cells and ranges.

Cell Protection - A feature used in spreadsheets that disallows changes to the cell. In Lotus 123 this is accomplished by the command /Worksheet Global Protection Enable.

Column - The vertical block of cells one cell wide in the spreadsheet.

Column Width - The number of character spaces wide of a column displayed on the screen and printed by the printer. This can be set from 1 to 240.

Command - An instruction the user gives to the program. Lotus 123 commands are initiated with a slash (/). A menu appears at the top of the screen from which command choices can be made.

Copy Command - The Lotus /Copy command is used to copy a cell or a range of cells from one location in the spreadsheet to another.

Cursor - The underline character (_) shown when entering data, or editing a cell.

Default Setting - The settings that are automatically in effect when a file is retrieved. These settings concern cell and range formats, column widths, label prefixes, recalculation, and cell or range protection and can be changed.

Directory - A subdivision within a disk drive.

Disable - The Lotus 123 term used to describe if Global Protection is off.

Disk - A medium for permanent storage of data including floppy disks, hard disks.

Disk Drive - A device that writes data to and reads data from the disk.

Edit - The mode of operaton in which you can change cell entries. This is accomplished by going to the cell to edit, and pressing F2. Use the arrow keys to move within the cell entry to change it to desired entry.

Enable - The Lotus 123 term used to describe if Global Protection is on.

File - A name of a set of related data under which data is stored on disk.

File Commands - The Lotus /File group of commands that are used to save data to and read data from disk.

Filename and Extension - The names given to files saved to and read from disk. The MS-DOS format is Filename.Ext Filename can be eight characters, letters, numbers, or the underscore (_). The extension can be three characters, letters, numbers, or the underscore (_).

Formula - A mathmatical expression that in spreadsheet terms explains the relationship between two or more cells.

Format - The way in which the screen and printer displays numerical data. Formats can be set for single cells or a range of cells. The nine different formats for numbers to be represented include fixed, percentage, currency, scientific notation, and five others.

@Functions - Automatic calculation formulas built into Lotus 123 used to simplify complex formulas. These can be used within formulas.

Global - Refers to the whole spreadsheet. If settings such as column width, cell protection, cell format, or label prefix are global, they affect the entire spreadsheet.

Global Recalculation - The recalculation of the entire spreadsheet formulas. The global recalculation of the worksheet can be set to recalculate automatically after each change in a cell or manually with the F9 function key.

Highlight a Range - Ranges are highlighted with a bright or colored background by anchoring the corner of a range with the period (.) and pointing to another cell with the cell pointer.

If Statements - The logical conditional used in Lotus 123 formulas that directs the flow of formula calculation. In Lotus notation this in written as @IF(condition to be tested, value if true, value if false).

Label - Word or letter data entries. These are automatically given the default label prefix by Lotus. Label prefixes can be typed before any entry to make it a label. Label prefixes adjust alignment within the cell. The ' left aligns entry within the cell, ^ centers the label, and " right aligns the label entry.

Matrix - A rectangular array of data.

Mixed Cell Address - A cell adress combining relative address and absolute address attributes. In mixed addresses, the dollar sign $, precedes either the column letter specification or the row number specification.

Move Command - The Lotus /Move command moves data within a cell or range of cells from one location in the spreadsheet to another.

Print Commands - The Lotus /Print command gives a menu with command choices to print a range of the spreadsheet to the printer or to a file on disk.

Protection - Cell protection is a command setting enabled to prevent changes to a cell or range of cells in the spreadsheet. In Lotus this is a two-step process. First a cell or range of cells is identified as protected. Then the /Worksheet Global Protection is enables for the entire spreadsheet.

RAM - Random Access Memory, the electronic memory of a computer.

Range - A cell or rectangular arrangement of cells denoted in Lotus terms for example by A5..B5. This describes the block of cells between A5 and B5.

Range Commands - The Lotus /Range commands are used in affecting changes to ranges within the spreadsheet.

Range Name - A setting in which a cell or group of cells can be given a specific name.

Recalculation - The resolving of cell formulas. The default setting is commonly automatic which solves all spreadsheet formulas every time any cell in the spreadsheet is changed. This can be set to manual to make data input much quicker.

Relative Cell Address - A cell address that instead of referring to a specific cell, refers to its position. When relative cell addresses used in a formula are copied, the formulas in the copied cells will read from the cell addresses relative to its position.

Spreadsheet - A computerized electronic spreadsheet simply referred to as spreadsheet, is a computer program that electronically represents the relationship of numbers and formulas arranged in a rectangular array of rows and columns.

Value - The numerical data entered into a cell or cell formula.

Worksheet Commands - The Lotus /Worksheet commands are used to adjust settings for the entire spreadsheet.

APPENDIX II

COMPUTER OUTPUT EXAMPLE

SUMMARY AREA

SUMMARY OF FIXED CAPITAL INVESTMENT
(Table 6)

Period	Function 1.	Function 2.	Function 3.	Function 4.	Total
1.	27,083	39,183	43,989	0	110,255
2.	510,113	1,005,441	422,547	0	1,938,101
3.	0	7,700	0	0	7,700
4.	0	0	0	0	0
5.	0	0	12,880	0	12,880
6.	0	0	23,000	0	23,000
7.	0	0	12,880	0	12,880
8.	0	0	135,700	0	135,700
9.	0	0	35,880	0	35,880
10.	0	0	0	0	0
	537,196	1,052,324	686,876	0	2,276,396

PRECONSTRUCTION EXPENSE
Summary

Period	Function 1.	Function 2.	Function 3.	Function 4.	Total
1.	10,929	10,929	20,196	0	42,054
2.	0	0	0	0	0
3.	0	0	0	0	0
4.	0	0	0	0	0
5.	0	0	0	0	0
6.	0	0	0	0	0
7.	0	0	0	0	0
8.	0	0	0	0	0
9.	0	0	0	0	0
10.	0	0	0	0	0
	10,929	10,929	20,196	0	42,054

LAND AND BUILDINGS INVESTMENT
Summary

Period	Function 1.	Function 2.	Function 3.	Function 4.	Total
1.	16,154	16,154	3,993	0	36,301
2.	365,959	743,622	144,254	0	1,253,835
3.	0	0	0	0	0
4.	0	0	0	0	0
5.	0	0	0	0	0
6.	0	0	0	0	0
7.	0	0	0	0	0
8.	0	0	0	0	0
9.	0	0	0	0	0
10.	0	0	0	0	0
	382,113	759,776	148,247	0	1,290,136

EQUIPMENT INVESTMENT
(Table 4)

Period	Function 1.	Function 2.	Function 3.	Function 4.	Total
1.	0	0	0	0	0
2.	144154	242019	254093	0	640266
3.	0	0	0	0	0
4.	0	0	0	0	0
5.	0	0	12880	0	12880
6.	0	0	23000	0	23000
7.	0	0	12880	0	12880
8.	0	0	135700	0	135700
9.	0	0	35880	0	35880
10.	0	0	0	0	0
	144154	242019	474433	0	860606

MISCELLANEOUS CAPITAL OUTLAY EXPENDITURES
Summary

Period	Function 1.	Function 2.	Function 3.	Function 4.	Total
1.	0	12,100	19,800	0	31,900
2.	0	19,800	24,200	0	44,000
3.	0	7,700	0	0	7,700
4.	0	0	0	0	0
5.	0	0	0	0	0
6.	0	0	0	0	0
7.	0	0	0	0	0
8.	0	0	0	0	0
9.	0	0	0	0	0
10.	0	0	0	0	0
	0	39,600	44,000	0	83,600

ANNUAL REPAIRS AND MAINTENANCE
FIXED COST
(Table 30)

Function	Buildings Original Cost	Buildings Standard-ized Rate	Buildings Subtotal	Equipment Original Cost	Equipment Standard-ized Rate	Equipment Subtotal	Total Cost
Storage	285,000	0.40%	1,140	144,154	0.50%	721	1,861
Processing	564,000	0.40%	2,256	242,019	0.50%	1,210	3,466
Marketing	104,900	0.40%	420	474,433	0.50%	2,372	2,792
----------	0	0.00%	0	0	0.00%	0	0

ENERGY
Fixed Cost
(Table 31)

Function	Total Fuel Volume	Total kwh	Cost/Unit Fuel	Cost/Unit Power	Total Cost Fuel	Total Cost Power	Total Energy Costs
Storage	300	8,000	0.75	0.07	225	560	785
Processing	300	8,000	0.75	0.07	225	560	785
Marketing	600	8,000	0.75	0.07	450	560	1,010
----------	0	0	0.00	0.00	0	0	0

OFFICE EXPENSES
Fixed Cost
(Table 32)

Function	Office Utilities	Tele-phone	Office Supplies	Office Equipment	Other	Other	Total
Storage	1,200	1,800	600	500	0	0	4,100
Processing	1,200	1,400	600	500	0	0	3,700
Marketing	1,200	2,600	1,000	1,000	0	0	5,800
----------	0	0	0	0	0	0	0

WAGES AND SALARIES
Fixed Cost
(Table 33)

Function/ Job Description	Number Required	Total Annual Man-hours	Rate /Hr.	Total Annu Cost
		2,080		
Storage				
Manager ----------	1	2,080	8.00	16,640
Secretary ----------	1	2,080	4.00	8,320
----------	0	0	0.00	0
----------	0	0	0.00	0
----------	0	0	0.00	0
----------	0	0	0.00	0
----------	0	0	0.00	0
----------	0	0	0.00	0
----------	0	0	0.00	0
----------	0	0	0.00	0
Total				24,960
Processing				
Manager ----------	1	2,080	8.00	16,640
Secretary ----------	1	2,080	4.00	8,320
----------	0	0	0.00	0
----------	0	0	0.00	0
----------	0	0	0.00	0
----------	0	0	0.00	0
----------	0	0	0.00	0
----------	0	0	0.00	0
----------	0	0	0.00	0
----------	0	0	0.00	0
Total				24,960
Marketing				
Manager ----------	1	2,080	8.00	16,640
Sales 1 ----------	2	4,160	6.50	27,040
Secretary ----------	1	2,080	4.00	8,320
Bookkeeper----------	1	2,080	4.00	8,320
----------	0	0	0.00	0
----------	0	0	0.00	0
----------	0	0	0.00	0
----------	0	0	0.00	0
----------	0	0	0.00	0
----------	0	0	0.00	0
Total				60,320

----------	0	0	0.00	0
----------	0	0	0.00	0
----------	0	0	0.00	0
----------	0	0	0.00	0
----------	0	0	0.00	0
----------	0	0	0.00	0
----------	0	0	0.00	0
----------	0	0	0.00	0
----------	0	0	0.00	0
----------	0	0	0.00	0
Total				0

ADMINISTRATEVE SALARIES
Fixed Cost
(Table 34)

Job Title	Annual Salary	Annual Fringe Benefits 10.0%	Total Salary
Owner	20,000	2,000	22,000
General Manager	15,500	1,550	17.050
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
Total:			39,050

Allocation by Function

	Formulas	
Storage	.33 * Total	13,004
Processing	.33 * Total	13,004
Marketing	.33 * Total	13,004
	( )	0

ANNUAL PROPERTY TAXES AND INSURANCE
Fixed Cost
(Table 35)

Period/ Item	Appraised Value	Tax Rate	Total Tax Cost	Original Cost	Ins. Rate	Total Ins. Cost	Total Cost
Storage							
Building	285,000	1.00%	2,850	285,000	2.00%	5,700	8,550
Equipment	144,154	1.00%	1,442	144,154	2.00%	2,883	4,325
Inventory	125,000	1.00%	1,250	125,000	2.00%	2,500	3,750
Vehicle	0	0.00%	0	0	0.00%	0	0
Subtotal:			5,542			11,083	16,625
Processing							
Building	564,000	1.00%	5,640	564,000	2.00%	11,280	16,920
Equipment	242,019	1.00%	2,420	242,019	2.00%	4,840	7,261
Inventory	0	0.00%	0	0	0.00%	0	0
Vehicle	0	0.00%	0	0	0.00%	0	0
Subtotal:			8,060			16,120	24,181
Marketing							
Building	104,900	1.00%	1,049	104,900	2.00%	2,098	3,147
Equipment	474,443	1.00%	4,744	474,443	2.00%	9,489	14,233
Inventory	15,000	1.00%	150	15,000	2.00%	300	450
Vehicle	120,000	1.00%	1,200	120,000	2.00%	2,400	3,600
Subtotal:			7,143			14,287	21,430
_____							
Building	0	0.00%	0	0	0.00%	0	0
Equipment	0	0.00%	0	0	0.00%	0	0
Inventory	0	0.00%	0	0	0.00%	0	0
Vehicle	0	0.00%	0	0	0.00%	0	0
Subtotal:			0			0	0

OTHER COSTS
Fixed Cost
(Table 36)

Function	Audit	Legal Services	Dues & Subscrip-tions	Donations	Travel	Enter-tainment	Other
Storage _____	500	650	0	0	0	0	0
Processing_____	500	650	0	0	0	0	0
Marketing _____	500	650	500	0	0	0	0
_____	0	0	0	0	0	0	0

TOTAL FIXED COSTS
(Table 37)

Category	Function	Function	Function	Function
Repairs/Maintenance	1,861	3,466	2,792	0
Energy	785	785	1,010	0
Wages and Salaries	24,960	24,960	60,320	0
Admin. Salaries	13,004	13,004	13,004	0
Office Expense	4,100	3,700	5,800	0
Tax/Insurance	16,625	24,181	21,430	0
Other	1,150	1,150	1,650	0
Total	62,484	71,246	106,006	0

TOTAL FIXED COSTS
(Table 38)
MONTHLY

Month	Function	Function	Function	Function	Total
1.	5,207	5,937	8,834	0	19,978
2.	5,207	5,937	8,834	0	19,978
3.	5,207	5,937	8,834	0	19,978
4.	5,207	5,937	8,834	0	19,978
5.	5,207	5,937	8,834	0	19,978
6.	5,207	5,937	8,834	0	19,978
7.	5,207	5,937	8,834	0	19,978
8.	5,207	5,937	8,834	0	19,978
9.	5,207	5,937	8,834	0	19,978
10.	5,207	5,937	8,834	0	19,978
11.	5,207	5,937	8,834	0	19,978
12.	5,207	5,937	8,834	0	19,978
Total:	62,484	71,246	106,006	0	239,736

TOTAL REVENUE FOR THE PROJECT
(Table 22)

Period	Function 1.	Function 2.	Function 3.	Function 4.	Other	Total
1.	0	0	0	0	0	0
2.	0	0	0	0	0	0
3.	86,600	400,115	202,448	0	0	689,163
4.	87,510	418,587	200,081	0	0	706,178
5.	86,180	400,115	201,240	0	0	687,535
6.	87,930	418,587	199,666	0	0	706,183
7.	82,260	400,115	201,240	0	0	683,615
8.	87,750	418,587	199,666	0	0	706,003
9.	82,440	400,115	201,240	0	0	683,795
10.	86,610	418,587	200,291	0	0	705,488
	687,280	3,274,808	1,605,872	0	0	5,567,960

PRODUCT REVENUES

Period	Function 1.	Function 2.	Function 3.	Function 4.	Total
1.	0	0	0	0	0
2.	0	0	0	0	0
3.	86,600	346,055	192,930	0	625,585
4.	87,510	364,315	182,875	0	634,700
5.	86,180	346,055	191,425	0	623,660
6.	87,930	364,315	182,875	0	635,120
7.	82,260	346,055	191,425	0	619,740
8.	87,750	364,315	182,875	0	634,940
9.	82,440	346,055	191,425	0	619,920
10.	86,610	364,315	183,340	0	634,265
	687,280	2,841,480	1,499,170	0	5,027,930

BY-PRODUCT REVENUES

Period	Function 1.	Function 2.	Function 3.	Function 4.	Total
1.	0	0	0	0	0
2.	0	0	0	0	0
3.	0	54,060	9,518	0	63,578
4.	0	54,272	17,206	0	71,478
5.	0	54,060	9,815	0	63,875
6.	0	54,272	16,791	0	71,063
7.	0	54,060	9,815	0	63,875
8.	0	54,272	16,791	0	71,063
9.	0	54,060	9,815	0	63,875
10.	0	54,272	16,951	0	71,223
	0	433,328	106,702	0	540,030

OTHER INCOME
(Table 21)

Period	Sales	Purchases	Gross Income
1.	0	0	0
2.	0	0	0
3.	0	0	0
4.	0	0	0
5.	0	0	0
6.	0	0	0
7.	0	0	0
8.	0	0	0
9.	0	0	0
10.	0	0	0
	0	0	0

RAW PRODUCT STORAGE (Table 10) Product: Rough Rice Unit: MT					STORAGE PRICE/UNIT (Table 11) Product:Rough Rice Unit: US$			STORAGE REVENUES (Table 12) Product: Rough Rice Unit: US$				
Year/ Month	Beginning Inventory	Purchases	Quantity Sold	Ending Inventory	Purchase Price	Sale Price	Sales	Beginning Inventory	Purchases	Ending Inventory	Cost of Sales	Gross Revenue
Year 1.												
1.	0	0	0	0	0	0	0	0	0	0	0	0
2.	0	0	0	0	0	0	0	0	0	0	0	0
3.	0	0	0	0	0	0	0	0	0	0	0	0
4.	0	0	0	0	0	0	0	0	0	0	0	0
5.	0	0	0	0	0	0	0	0	0	0	0	0
6.	0	0	0	0	0	0	0	0	0	0	0	0
7.	0	0	0	0	0	0	0	0	0	0	0	0
8.	0	0	0	0	0	0	0	0	0	0	0	0
9.	0	0	0	0	0	0	0	0	0	0	0	0
10.	0	0	0	0	0	0	0	0	0	0	0	0
11.	0	0	0	0	0	0	0	0	0	0	0	0
12.	0	0	0	0	0	0	0	0	0	0	0	0
Total:		0					0		0		0	0
Year 2.												
1.	0	0	0	0	0	0	0	0	0	0	0	0
2.	0	0	0	0	0	0	0	0	0	0	0	0
3.	0	0	0	0	0	0	0	0	0	0	0	0
4.	0	0	0	0	0	0	0	0	0	0	0	0
5.	0	0	0	0	0	0	0	0	0	0	0	0
6.	0	0	0	0	0	0	0	0	0	0	0	0
7.	0	0	0	0	0	0	0	0	0	0	0	0
8.	0	0	0	0	0	0	0	0	0	0	0	0
9.	0	0	0	0	0	0	0	0	0	0	0	0
10.	0	0	0	0	0	0	0	0	0	0	0	0
11.	0	0	0	0	0	0	0	0	0	0	0	0
12.	0	0	0	0	0	0	0	0	0	0	0	0
Total:		0					0		0		0	0
Year 3.												
1.	0	1,000	660	340	220	229	151,140	0	220,000	74,800	145,200	5,940
2.	340	1,000	660	680	217	226	149,160	74,800	217,000	147,560	144,240	4,920
3.	680	300	660	320	231	240	158,400	147,560	69,300	73,640	143,220	15,180
4.	320	600	660	260	229	238	157,080	73,640	137,400	59,540	151,500	5,580
5.	260	600	660	200	227	236	155,760	59,540	136,200	45,400	150,340	5,420
6.	200	600	660	140	221	230	151,800	45,400	132,600	30,940	147,060	4,740
7.	140	1,000	660	480	219	228	150,480	30,940	219,000	105,120	144,820	5,660
8.	480	1,000	660	820	220	229	151,140	105,120	220,000	180,400	144,720	6,420
9.	820	1,000	660	1,160	218	227	149,820	180,400	218,000	253,200	145,200	4,620
10.	1,160	1,000	660	1,500	224	233	153,780	253,200	224,000	333,000	144,200	9,580
11.	1,500	0	660	840	226	235	155,100	333,000	0	188,160	144,840	10,260
12.	840	0	660	180	227	236	155,760	188,160	0	40,680	147,480	8,280
Total:		8,100					1,839,420		1,793,500		1,752,820	86,600
Year 4.												
1.	180	1,000	660	520	221	230	151,800	40,680	221,000	114,920	146,760	5,040
2.	520	800	660	660	218	227	149,820	114,920	174,400	143,880	145,440	4,380
3.	660	300	660	300	231	241	159,060	143,880	69,300	69,300	143,880	15,130
4.	300	500	660	140	230	239	157,740	69,300	115,000	32,200	152,100	5,640
5.	140	550	660	30	227	236	155,760	32,200	124,850	6,810	150,240	5,520
6.	30	1,000	660	370	221	230	151,800	6,810	221,000	81,770	146,040	5,760
7.	370	1,000	660	710	219	229	151,140	81,770	219,000	155,490	145,280	5,860
8.	710	1,000	660	1,050	219	229	151,140	155,490	219,000	229,950	144,540	6,600
9.	1,050	1,000	660	1,390	219	229	151,140	229,950	219,000	304,410	144,540	6,600
10.	1,390	800	660	1,530	224	231	152,460	304,410	179,200	339,070	144,540	7,920
11.	1,530	0	660	870	228	232	153,120	339,070	0	194,880	144,190	8,930
12.	870	0	660	210	229	238	157,080	194,880	0	47,880	147,000	10,080
Total:		7,950					1,842,060		1,761,750		1,754,550	87,510
Year 5.												
1.	210	1,000	660	550	220	229	151,140	47,880	220,000	121,000	146,880	4,260
2.	550	1,000	660	890	217	226	149,160	121,000	217,000	193,130	144,870	4,290
3.	890	300	660	530	231	240	158,400	193,130	69,300	119,210	143,220	15,180
4.	530	600	660	470	229	238	157,080	119,210	137,400	107,630	148,980	8,100
5.	470	600	660	410	227	236	155,760	107,630	136,200	93,070	150,760	5,000
6.	410	600	660	350	221	230	151,800	93,070	132,600	77,350	148,320	3,480
7.	350	1,000	660	690	219	228	150,480	77,350	219,000	151,110	145,240	5,240
8.	690	1,000	660	1,030	220	229	151,140	151,110	220,000	226,570	144,540	6,600
9.	1,030	1,000	660	1,370	218	227	149,820	226,570	218,000	299,400	145,170	4,650

10.	1,370	1,000	660	1,710	224	233	153,780	299,400	224,000	378,780	144,620	9,160
11.	1,710	0	660	1,050	226	235	155,100	378,780	0	235,200	143,580	11,520
12.	1,050	0	660	390	227	236	155,760	235,200	0	88,140	147,060	8,700
Total:		8,100					1,839,420		1,793,500		1,753,240	86,180
Year 6.												
1.	390	1,000	660	730	221	230	151,800	88,140	221,000	161,330	147,810	3,990
2.	730	800	660	870	218	227	149,320	161,330	174,400	189,870	145,860	3,960
3.	870	300	660	510	231	241	159,060	189,870	69,300	115,080	144,090	14,970
4.	510	500	660	350	230	239	157,740	115,080	115,000	80,500	149,580	8,160
5.	350	550	660	240	227	236	155,760	80,500	124,850	54,480	150,870	4,830
6.	240	1,000	660	580	221	230	151,800	54,480	221,000	128,180	147,300	4,500
7.	580	1,000	660	920	219	229	151,140	128,180	219,000	201,480	145,700	5,440
8.	920	1,000	660	1,260	219	229	151,140	201,480	219,000	275,940	144,540	6,600
9.	1,260	1,000	660	1,600	219	229	151,140	275,940	219,000	350,400	144,540	6,600
10.	1,600	800	660	1,740	224	231	152,460	350,400	179,200	385,060	144,540	7,920
11.	1,740	0	660	1,080	228	232	153,120	385,060	0	241,920	143,140	9,980
12.	1,080	0	660	420	229	238	157,080	241,920	0	95,760	146,160	10,920
Total:		7,950					1,842,060		1,761,750		1,754,130	87,930
Year 7.												
1.	420	800	660	560	220	229	151,140	95,760	176,000	123,200	148,560	2,580
2.	560	800	660	700	217	226	149,160	123,200	173,600	151,900	144,900	4,260
3.	700	400	660	440	231	240	158,400	151,900	92,400	101,080	143,220	15,180
4.	440	600	660	380	229	238	157,080	101,080	137,400	87,020	151,460	5,620
5.	380	600	660	320	227	236	155,760	87,020	136,200	72,640	150,580	5,180
6.	320	600	660	260	221	230	151,800	72,640	132,600	57,460	147,780	4,020
7.	260	1,000	660	600	219	228	150,480	57,460	219,000	131,400	145,060	5,420
8.	600	1,000	660	940	220	229	151,140	131,400	220,000	206,800	144,600	6,540
9.	940	1,000	660	1,280	218	227	149,820	206,800	218,000	279,600	145,200	4,620
10.	1,280	1,000	660	1,620	224	233	153,780	279,600	224,000	359,160	144,440	9,340
11.	1,620	0	660	960	226	235	155,100	359,160	0	215,040	144,120	10,980
12.	960	0	660	300	227	236	155,760	215,040	0	67,800	147,240	8,520
Total:		7,800					1,839,420		1,729,200		1,757,160	82,260
Year 8.												
1.	300	1,000	660	640	221	230	151,800	67,800	221,000	141,440	147,360	4,440
2.	640	800	660	780	218	227	149,820	141,440	174,400	170,040	145,800	4,020
3.	780	300	660	420	231	241	159,060	170,040	69,300	95,460	143,880	15,180
4.	420	500	660	260	230	239	157,740	95,460	115,000	59,800	150,660	7,080
5.	260	550	660	150	227	236	155,760	59,800	124,850	34,050	150,600	5,160
6.	150	1,000	660	490	221	230	151,800	34,050	221,000	108,290	146,760	5,040
7.	490	1,000	660	830	219	229	151,140	108,290	219,000	181,770	145,520	5,620
8.	830	1,000	660	1,170	219	229	151,140	181,770	219,000	256,230	144,540	6,600
9.	1,170	1,000	660	1,510	219	229	151,140	256,230	219,000	330,690	144,540	6,600
10.	1,510	800	660	1,650	224	231	152,460	330,690	179,200	365,350	144,540	7,920
11.	1,650	0	660	990	228	232	153,120	365,350	0	221,760	143,590	9,530
12.	990	0	660	330	229	238	157,080	221,760	0	75,240	146,520	10,560
Total:		7,950					1,842,060		1,761,750		1,754,310	87,750
Year 9.												
1.	330	800	660	470	220	229	151,140	75,240	176,000	103,400	147,840	3,300
2.	470	800	660	610	217	226	149,160	103,400	173,600	132,370	144,630	4,530
3.	610	400	660	350	231	240	158,400	132,370	92,400	80,850	143,920	14,480
4.	350	600	660	290	229	238	157,080	80,850	137,400	66,410	151,840	5,240
5.	290	600	660	230	227	236	155,760	66,410	136,200	52,210	150,400	5,360
6.	230	600	660	170	221	230	151,800	52,210	132,600	37,570	147,240	4,560
7.	170	1,000	660	510	219	228	150,480	37,570	219,000	111,690	144,880	5,600
8.	510	1,000	660	850	220	229	151,140	111,690	220,000	187,000	144,690	6,450
9.	850	1,000	660	1,190	218	227	149,820	187,000	218,000	259,800	145,200	4,620
10.	1,190	1,000	660	1,530	224	233	153,780	259,800	224,000	339,540	144,260	9,520
11.	1,530	0	660	870	226	235	155,100	339,540	0	194,880	144,660	10,440
12.	870	0	660	210	227	236	155,760	194,880	0	47,460	147,420	8,340
Total:		7,800					1,839,420		1,729,200		1,756,980	82,440
Year 10.												
1.	210	1,000	660	550	221	230	151,800	47,460	221,000	121,550	146,910	4,390
2.	550	800	660	690	218	227	149,820	121,550	174,400	150,420	145,530	4,290
3.	690	300	660	330	231	241	159,060	150,420	69,300	75,840	143,880	15,180
4.	330	500	660	170	230	239	157,740	75,840	115,000	39,100	151,740	6,000
5.	170	550	660	60	227	236	155,760	39,100	124,850	13,620	150,330	5,430
6.	60	1,000	660	400	221	230	151,800	13,620	221,000	88,400	146,220	5,580
7.	400	1,000	660	740	219	229	151,140	88,400	219,000	162,060	145,340	5,800
8.	740	1,000	660	1,080	219	229	151,140	162,060	219,000	236,520	144,540	6,600
9.	1,080	1,000	660	1,420	219	229	151,140	236,520	219,000	310,980	144,540	6,600
10.	1,420	560	660	1,320	224	231	152,460	310,980	125,440	291,880	144,540	7,920
11.	1,320	0	660	660	228	232	153,120	291,880	0	147,840	144,040	9,080
12.	660	0	660	0	229	238	157,080	147,840	0	0	147,840	9,240
Total:		7,710					1,842,060		1,707,990		1,755,450	86,610

PRODUCT PROCESSING
(Table 14)
Product: Rice
Conversion: 72.0%

BY-PRODUCT PROCESSING
(Table 15)
Product: Bran
Conversion: 8.0%

	Quantity Raw Product Processed	Quantity of Processed Product	Unit Purchase Price	Unit Value of Processed Product	Cost of Purchases	Total Value Processed Product (Sales)	Gross Revenue	Quantity Raw Product Processed	Quantity of Processed By-Prod.	Unit Value of Processed By-Prod.	Total Value of Processed By-Prod.
Year 1.											
1.	0	0	0	0	0	0	0	0	0	88	0
2.	0	0	0	0	0	0	0	0	0	78	0
3.	0	0	0	0	0	0	0	0	0	68	0
4.	0	0	0	0	0	0	0	0	0	73	0
5.	0	0	0	0	0	0	0	0	0	83	0
6.	0	0	0	0	0	0	0	0	0	96	0
7.	0	0	0	0	0	0	0	0	0	101	0
8.	0	0	0	0	0	0	0	0	0	91	0
9.	0	0	0	0	0	0	0	0	0	88	0
10.	0	0	0	0	0	0	0	0	0	86	0
11.	0	0	0	0	0	0	0	0	0	85	0
12.	0	0	0	0	0	0	0	0	0	83	0
Total:					0	0	0				0
Year 2.											
1.	0	0	0	0	0	0	0	0	0	82	0
2.	0	0	0	0	0	0	0	0	0	76	0
3.	0	0	0	0	0	0	0	0	0	71	0
4.	0	0	0	0	0	0	0	0	0	73	0
5.	0	0	0	0	0	0	0	0	0	82	0
6.	0	0	0	0	0	0	0	0	0	97	0
7.	0	0	0	0	0	0	0	0	0	104	0
8.	0	0	0	0	0	0	0	0	0	99	0
9.	0	0	0	0	0	0	0	0	0	92	0
10.	0	0	0	0	0	0	0	0	0	86	0
11.	0	0	0	0	0	0	0	0	0	81	0
12.	0	0	0	0	0	0	0	0	0	61	0
Total:					0	0	0				0
Year 3.											
1.	660	475	229	380	151,140	180,500	29,360	660	53	88	4,664
2.	660	475	226	380	149,160	180,500	31,340	660	53	78	4,134
3.	660	475	240	381	158,400	180,975	22,575	660	53	68	3,604
4.	660	475	238	387	157,080	183,825	26,745	660	53	73	3,869
5.	660	475	236	388	155,760	184,300	28,540	660	53	83	4,399
6.	660	475	230	379	151,800	180,025	28,225	660	53	96	5,088
7.	660	475	228	379	150,480	180,025	29,545	660	53	101	5,353
8.	660	475	229	380	151,140	180,500	29,360	660	53	91	4,823
9.	660	475	227	380	149,820	180,500	30,680	660	53	88	4,664
10.	660	475	233	387	153,780	183,825	30,045	660	53	86	4,558
11.	660	475	235	389	155,100	184,775	29,675	660	53	85	4,505
12.	660	475	236	391	155,760	185,725	29,965	660	53	83	4,399
Total:					1,839,420	2,185,475	346,055				54,060
Year 4.											
1.	660	475	230	383	151,800	181,925	30,125	660	53	82	4,346
2.	660	475	227	382	149,820	181,450	31,630	660	53	76	4,028
3.	660	475	241	382	159,060	181,450	22,390	660	53	71	3,763
4.	660	475	239	390	157,740	185,250	27,510	660	53	73	3,869
5.	660	475	236	391	155,760	185,725	29,965	660	53	82	4,346
6.	660	475	230	387	151,800	183,825	32,025	660	53	97	5,141
7.	660	475	229	384	151,140	182,400	31,260	660	53	104	5,512
8.	660	475	229	386	151,140	183,350	32,210	660	53	99	5,247
9.	660	475	229	386	151,140	183,350	32,210	660	53	92	4,876
10.	660	475	231	390	152,460	185,250	[illegible] 790	660	53	86	4,558
11.	660	475	232	391	153,120	185,725	32,605	660	53	81	4,293
12.	660	475	238	393	157,080	186,675	29,595	660	53	81	4,293
Total:					1,842,060	2,206,375	364,315				54,272
Year 5.											
1.	660	475	229	380	151,140	180,500	29,360	660	53	88	4,664
2.	660	475	226	380	149,160	180,500	31,340	660	53	78	4,134
3.	660	475	240	381	158,400	180,975	22,575	660	53	68	3,604
4.	660	475	238	387	157,080	183,825	26,745	660	53	73	3,869
5.	660	475	236	388	155,760	184,300	28,540	660	53	83	4,399
6.	660	475	230	379	151,800	180,025	28,225	660	53	96	5,088
7.	660	475	228	379	150,480	180,025	29,545	660	53	101	5,353
8.	660	475	229	380	151,140	180,500	29,360	660	53	91	4,823
9.	660	475	227	380	149,820	180,500	30,680	660	53	88	4,664

10.	660	475	233	387	153,780	183,825	30,045	660	53	86	4,558
11.	660	475	235	389	155,100	184,775	29,675	660	53	85	4,505
12.	660	475	236	391	155,760	185,725	29,965	660	53	83	4,399
Total:					1,839,420	2,185,475	346,055				54,060
Year 4.											
1.	660	475	230	383	151,800	181,925	30,125	660	53	82	4,346
2.	660	475	227	382	149,820	181,450	31,630	660	53	76	4,028
3.	660	475	241	382	159,060	181,450	22,390	660	53	71	3,763
4.	660	475	239	390	157,740	185,250	27,510	660	53	73	3,869
5.	660	475	236	391	155,760	185,725	29,965	660	53	82	4,346
6.	660	475	230	387	151,800	183,825	32,025	660	53	97	5,141
7.	660	475	229	384	151,140	182,400	31,260	660	53	104	5,512
8.	660	475	229	386	151,140	183,350	32,210	660	53	99	5,247
9.	660	475	229	386	151,140	183,350	32,210	660	53	92	4,876
10.	660	475	231	390	152,460	185,250	32,790	660	53	86	4,558
11.	660	475	232	391	153,120	185,725	32,605	660	53	81	4,293
12.	660	475	238	393	157,080	186,675	29,595	660	53	81	4,293
Total:					1,842,060	2,206,375	364,315				54,272
Year 7.											
1.	660	475	229	380	151,140	180,500	29,360	660	53	88	4,664
2.	660	475	226	380	149,160	180,500	31,340	660	53	78	4,134
3.	660	475	240	381	158,400	180,975	22,575	660	53	68	3,604
4.	660	475	238	387	157,080	183,825	26,745	660	53	73	3,869
5.	660	475	236	388	155,760	184,300	28,540	660	53	83	4,399
6.	660	475	230	379	151,800	180,025	28,225	660	53	96	5,086
7.	660	475	228	379	150,480	180,025	29,545	660	53	101	5,353
8.	660	475	229	380	151,140	180,500	29,360	660	53	91	4,823
9.	660	475	227	380	149,820	180,500	30,680	660	53	88	4,664
10.	660	475	233	387	153,780	183,825	30,045	660	53	86	4,558
11.	660	475	235	389	155,100	184,775	29,675	660	53	85	4,505
12.	660	475	236	391	155,760	185,725	29,965	660	53	83	4,399
Total:					1,839,420	2,185,475	346,055				54,060
Year 4.											
1.	660	475	230	383	151,800	181,925	30,125	660	53	82	4,346
2.	660	475	227	382	149,820	181,450	31,630	660	53	76	4,028
3.	660	475	241	382	159,060	181,450	22,390	660	53	71	3,763
4.	660	475	239	390	157,740	185,250	27,510	660	53	73	3,869
5.	660	475	236	391	155,760	185,725	29,965	660	53	82	4,346
6.	660	475	230	387	151,800	183,825	32,025	660	53	97	5,141
7.	660	475	229	384	151,140	182,400	31,260	660	53	104	5,512
8.	660	475	229	386	151,140	183,350	32,210	660	53	99	5,247
9.	660	475	229	386	151,140	183,350	32,210	660	53	92	4,876
10.	660	475	231	390	152,460	185,250	32,790	660	53	86	4,558
11.	660	475	232	391	153,120	185,725	32,605	660	53	81	4,293
12.	660	475	238	393	157,080	186,675	29,595	660	53	81	4,293
Total:					1,842,060	2,206,375	364,315				54,272
Year 5.											
1.	660	475	229	380	151,140	180,500	29,360	660	53	88	4,664
2.	660	475	226	380	149,160	180,500	31,340	660	53	78	4,134
3.	660	475	240	381	158,400	180,975	22,575	660	53	68	3,604
4.	660	475	238	387	157,080	183,825	26,745	660	53	73	3,869
5.	660	475	236	388	155,760	184,300	28,540	660	53	83	4,399
6.	660	475	230	379	151,800	180,025	28,225	660	53	96	5,088
7.	660	475	228	379	150,480	180,025	29,545	660	53	101	5,353
8.	660	475	229	380	151,140	180,500	29,360	660	53	91	4,823
9.	660	475	227	380	149,820	180,500	30,680	660	53	88	4,664
10.	660	475	233	387	153,780	183,825	30,045	660	53	86	4,558
11.	660	475	235	389	155,100	184,775	29,675	660	53	85	4,505
12.	660	475	236	391	155,760	185,725	29,965	660	53	83	4,399
Total:					1,839,420	2,185,475	346,055				54,060
Year 4.											
1.	660	475	230	383	151,800	181,925	30,125	660	53	82	4,346
2.	660	475	227	382	149,820	181,450	31,630	660	53	76	4,028
3.	660	475	241	382	159,060	181,450	22,390	660	53	71	3,763
4.	660	475	239	390	157,740	185,250	27,510	660	53	73	3,869
5.	660	475	236	391	155,760	185,725	29,965	660	53	82	4,346
6.	660	475	230	387	151,800	183,825	32,025	660	53	97	5,141
7.	660	475	229	384	151,140	182,400	31,260	660	53	104	5,512
8.	660	475	229	386	151,140	183,350	32,210	660	53	99	5,247
9.	660	475	229	386	151,14	183,350	32,210	660	53	92	4,876
10.	660	475	231	390	152,460	185,250	32,790	660	53	86	4,558
11.	660	475	232	391	153,120	185,725	32,605	660	53	81	4,293
12.	660	475	238	393	157,080	186,675	29,595	660	53	81	4,293
Total:					1,842,060	2,206,375	364,315				54,272

	QUANTITIES MARKETED (Table 17A) Product: Rice Unit: MT				QUANTITIES MARKETED (Table 17) By-product: Bran Unit: MT				SALE PRICES (Table 18) Unit: Mt Price: US$	
	Beginning Inventory	Amount Purchased	Amount Sold	Ending Inventory	Beginning Inventory	Amount Purchased	Amount Sold	Ending Inventory	Product	Byproduct
Year 1.										
1.	0	0	0	0	0	0	0	0	0	0
2.	0	0	0	0	0	0	0	0	0	0
3.	0	0	0	0	0	0	0	0	0	0
4.	0	0	0	0	0	0	0	0	0	0
5.	0	0	0	0	0	0	0	0	0	0
6.	0	0	0	0	0	0	0	0	0	0
7.	0	0	0	0	0	0	0	0	0	0
8.	0	0	0	0	0	0	0	0	0	0
9.	0	0	0	0	0	0	0	0	0	0
10.	0	0	0	0	0	0	0	0	0	0
11.	0	0	0	0	0	0	0	0	0	0
12.	0	0	0	0	0	0	0	0	0	0
Total:										
Year 2.										
1.	0	0	0	0	0	0	0	0	0	0
2.	0	0	0	0	0	0	0	0	0	0
3.	0	0	0	0	0	0	0	0	0	0
4.	0	0	0	0	0	0	0	0	0	0
5.	0	0	0	0	0	0	0	0	0	0
6.	0	0	0	0	0	0	0	0	0	0
7.	0	0	0	0	0	0	0	0	0	0
8.	0	0	0	0	0	0	0	0	0	0
9.	0	0	0	0	0	0	0	0	0	0
10.	0	0	0	0	0	0	0	0	0	0
11.	0	0	0	0	0	0	0	0	0	0
12.	0	0	0	0	0	0	0	0	0	0
Total:										
Year 3.										
1.	0	475	400	75	0	53	18	35	406	98
2.	75	475	410	140	35	53	38	50	407	81
3.	140	475	440	175	50	53	49	54	408	81
4.	175	475	485	165	54	53	75	32	422	81
5.	165	475	505	135	32	53	75	10	422	90
6.	135	475	505	105	10	53	58	5	420	101
7.	105	475	520	60	5	53	53	5	419	118
8.	60	475	520	15	5	53	53	5	419	111
9.	15	475	475	15	5	53	53	5	419	111
10.	15	475	475	15	5	53	53	5	420	111
11.	15	475	475	15	5	53	53	5	421	111
12.	15	475	475	15	5	53	53	5	421	111
Total:										
Year 4.										
1.	15	475	475	15	5	53	53	5	417	109
2.	15	475	475	15	5	53	53	5	408	109
3.	15	475	475	15	5	53	53	5	408	106
4.	15	475	475	15	5	53	53	5	419	108
5.	15	475	475	15	5	53	53	5	425	113
6.	15	475	475	15	5	53	53	5	425	113
7.	15	475	475	15	5	53	53	5	421	113
8.	15	475	475	15	5	53	53	5	420	118
9.	15	475	475	15	5	53	53	5	420	113
10.	15	475	475	15	5	53	53	5	421	113
11.	15	475	475	15	5	53	53	5	423	113
12.	15	475	475	15	5	53	53	5	423	113
Total:										
Year 5.										
1.	15	475	475	15	5	53	53	5	406	98
2.	15	475	475	15	5	53	53	5	407	81
3.	15	475	475	15	5	53	53	5	408	81
4.	15	475	475	15	5	53	53	5	422	81
5.	15	475	475	15	5	53	53	5	422	90
6.	15	475	475	15	5	53	53	5	420	101
7.	15	475	475	15	5	53	53	5	419	118
8.	15	475	475	15	5	53	53	5	419	111
9.	15	475	475	15	5	53	53	5	419	111
10.	15	475	475	15	5	53	53	5	420	111

11.	15	475	475	15	5	53	53	5	421	111
12.	15	475	475	15	5	53	53	5	421	111
Total:										
Year 6.										
1.	15	475	475	15	5	53	53	5	417	109
2.	15	475	475	15	5	53	53	5	408	109
3.	15	475	475	15	5	53	53	5	408	106
4.	15	475	475	15	5	53	53	5	419	108
5.	15	475	475	15	5	53	53	5	425	113
6.	15	475	475	15	5	53	53	5	425	113
7.	15	475	475	15	5	53	53	5	421	113
8.	15	475	475	15	5	53	53	5	420	118
9.	15	475	475	15	5	53	53	5	420	113
10.	15	475	475	15	5	53	53	5	421	113
11.	15	475	475	15	5	53	53	5	423	113
12.	15	475	475	15	5	53	53	5	423	113
Total:										
Year 7.										
1.	15	475	475	15	5	53	53	5	406	98
2.	15	475	475	15	5	53	53	5	407	81
3.	15	475	475	15	5	53	53	5	408	81
4.	15	475	475	15	5	53	53	5	422	81
5.	15	475	475	15	5	53	53	5	422	90
6.	15	475	475	15	5	53	53	5	420	101
7.	15	475	475	15	5	53	53	5	419	118
8.	15	475	475	15	5	53	53	5	419	111
9.	15	475	475	15	5	53	53	5	419	111
10.	15	475	475	15	5	53	53	5	420	111
11.	15	475	475	15	5	53	53	5	421	111
12.	15	475	475	15	5	53	53	5	421	111
Total:										
Year 8.										
1.	15	475	475	15	5	53	53	5	417	109
2.	15	475	475	15	5	53	53	5	408	109
3.	15	475	475	15	5	53	53	5	408	106
4.	15	475	475	15	5	53	53	5	419	108
5.	15	475	475	15	5	53	53	5	425	113
6.	15	475	475	15	5	53	53	5	425	113
7.	15	475	475	15	5	53	53	5	421	113
8.	15	475	475	15	5	53	53	5	420	118
9.	15	475	475	15	5	53	53	5	420	113
10.	15	475	475	15	5	53	53	5	421	113
11.	15	475	475	15	5	53	53	5	423	113
12.	15	475	475	15	5	53	53	5	423	113
Total:										
Year 9.										
1.	15	475	475	15	5	53	53	5	406	98
2.	15	475	475	15	5	53	53	5	407	81
3.	15	475	475	15	5	53	53	5	408	81
4.	15	475	475	15	5	53	53	5	422	81
5.	15	475	475	15	5	53	53	5	422	90
6.	15	475	475	15	5	53	53	5	420	101
7.	15	475	475	15	5	53	53	5	419	118
8.	15	475	475	15	5	53	53	5	419	111
9.	15	475	475	15	5	53	53	5	419	111
10.	15	475	475	15	5	53	53	5	420	111
11.	15	475	475	15	5	53	53	5	421	111
12.	15	475	475	15	5	53	53	5	421	111
Total:										
Year 10.										
1.	15	475	475	15	5	53	53	5	417	109
2.	15	475	475	15	5	53	53	5	408	109
3.	15	475	475	15	5	53	53	5	408	106
4.	15	475	475	15	5	53	53	5	419	108
5.	15	475	475	15	5	53	53	5	425	113
6.	15	475	475	15	5	53	53	5	425	113
7.	15	475	475	15	5	53	53	5	421	113
8.	15	475	475	15	5	53	53	5	420	118
9.	15	475	475	15	5	53	53	5	420	113
10.	15	475	480	10	5	53	55	3	421	113
11.	10	475	480	5	3	53	55	1	423	113
12.	5	475	480	0	1	53	54	0	423	113

MARKETING REVENUES
(Table 19A)
Product: Rice

	Sales	Beginning Inventory	Purchases	Ending Inventory	Cost of Sales	Gross Revenue
Year 1.						
1.	0	0	0	0	0	0
2.	0	0	0	0	0	0
3.	0	0	0	0	0	0
4.	0	0	0	0	0	0
5.	0	0	0	0	0	0
6.	0	0	0	0	0	0
7.	0	0	0	0	0	0
8.	0	0	0	0	0	0
9.	0	0	0	0	0	0
10.	0	0	0	0	0	0
11.	0	0	0	0	0	0
12.	0	0	0	0	0	0
	0		0		0	0
Year 2.						
1.	0	0	0	0	0	0
2.	0	0	0	0	0	0
3.	0	0	0	0	0	0
4.	0	0	0	0	0	0
5.	0	0	0	0	0	0
6.	0	0	0	0	0	0
7.	0	0	0	0	0	0
8.	0	0	0	0	0	0
9.	0	0	0	0	0	0
10.	0	0	0	0	0	0
11.	0	0	0	0	0	0
12.	0	0	0	0	0	0
	0		0		0	0
Year 3.						
1.	162,400	0	180,500	28,500	152,000	10,400
2.	166,870	28,500	180,500	53,200	155,800	11,070
3.	179,520	53,340	180,975	66,675	167,640	11,880
4.	204,670	67,725	183,825	63,855	187,695	16,975
5.	213,110	64,020	184,300	52,380	195,940	17,170
6.	212,100	51,165	180,025	39,795	191,395	20,705
7.	217,880	39,795	180,025	22,740	197,080	20,800
8.	217,880	22,800	180,500	5,700	197,600	20,280
9.	199,025	5,700	180,500	5,700	180,500	18,525
10.	199,500	5,805	183,825	5,805	183,825	15,675
11.	199,975	5,835	184,775	5,835	184,775	15,200
12.	199,975	5,865	185,725	5,865	185,725	14,250
	2,372,905		2,185,475		2,179,975	192,930
Year 4.						
1.	198,075	5,745	181,925	5,745	181,925	16,150
2.	193,800	5,730	181,450	5,730	181,450	12,350
3.	193,800	5,730	181,450	5,730	181,450	12,350
4.	199,025	5,850	185,250	5,850	185,250	13,775
5.	201,875	5,865	185,725	5,865	185,725	16,150
6.	201,875	5,805	183,825	5,805	183,825	18,050
7.	199,975	5,760	182,400	5,760	182,400	17,575
8.	199,500	5,790	183,350	5,790	183,350	16,150
9.	199,500	5,790	183,350	5,790	183,350	16,150
10.	199,975	5,850	185,250	5,850	185,250	14,725
11.	200,925	5,865	185,725	5,865	185,725	15,200
12.	200,925	5,895	186,675	5,895	186,675	14,250
	2,389,250		2,206,375		2,206,375	182,875
Year 5.						
1.	192,850	5,700	180,500	5,700	180,500	12,350
2.	193,325	5,700	180,500	5,700	180,500	12,825
3.	193,800	5,715	180,975	5,715	180,975	12,825
4.	200,450	5,805	183,825	5,805	183,825	16,625
5.	200,450	5,820	184,300	5,820	184,300	16,150
6.	199,500	5,685	180,025	5,685	180,025	19,475
7.	199,025	5,685	180,025	5,685	180,025	19,000
8.	199,025	5,700	180,500	5,700	180,500	18,525
9.	199,025	5,700	180,500	5,700	180,500	18,525
10.	199,500	5,805	183,825	5,805	183,825	15,675

MARKETING REVENUES
(Table 19B)
Product: Bran

	Sales	Beginning Inventory	Purchases	Ending Inventory	Cost of Sales	Gross Revenue
Year 1.						
1.	0	0	0	0	0	0
2.	0	0	0	0	0	0
3.	0	0		0	0	0
4.	0	0	0	0	0	0
5.	0	0	0	0	0	0
6.	0	0	0	0	0	0
7.	0	0	0	0	0	0
8.	0	0	0	0	0	0
9.	0	0	0	0	0	0
10.	0	0	0	0	0	0
11.	0	0	0	0	0	0
12.	0	0	0	0	0	0
	0		0		0	0
Year 2.						
1.	0	0	0	0	0	0
2.	0	0	0	0	0	0
3.	0	0	0	0	0	0
4.	0	0	0	0	0	0
5.	0	0	0	0	0	0
6.	0	0	0	0	0	0
7.	0	0	0	0	0	0
8.	0	0	0	0	0	0
9.	0	0	0	0	0	0
10.	0	0	0	0	0	0
11.	0	0	0	0	0	0
12.	0	0	0	0	0	0
	0		0		0	0
Year 3.						
1.	1,764	0	4,664	3,080	1,584	180
2.	3,078	3,080	4,134	3,900	3,314	(236)
3.	3,969	3,900	3,604	3,682	3,822	147
4.	6,075	3,682	3,369	2,336	5,215	860
5.	6,750	2,336	4,399	830	5,905	845
6.	5,858	830	5,088	480	5,438	420
7.	6,254	480	5,353	505	5,328	926
8.	5,883	505	4,823	455	4,873	1,010
9.	5,883	455	4,664	440	4,679	1,204
10.	5,883	440	4,558	430	4,568	1,315
11.	5,883	430	4,505	425	4,510	1,373
12.	5,883	425	4,399	415	4,409	1,474
	63,163		54,060		53.645	9,518
Year 4.						
1.	5,777	0	4,346	410	3,936	1,841
2.	5,777	410	4,028	380	4,058	1,719
3.	5,618	380	3,763	355	3,788	1,830
4.	5,724	355	3,869	365	3,859	1,865
5.	5,989	365	4,346	410	4,301	1,688
6.	5,989	410	5,141	485	5,066	923
7.	5,989	485	5,512	520	5,477	512
8.	6,254	520	5,247	495	5,272	982
9.	5,989	495	4,876	460	4,911	1,078
10.	5,989	460	4,558	430	4,588	1,401
11.	5,989	430	4,293	405	4,318	1,671
12.	5,989	405	4,293	405	4,293	1,696
	71,073		54,272		53,867	17,206
Year 5.						
1.	5,194	405	4,664	440	4,629	565
2.	4,293	440	4,134	390	4,184	109
3.	4,293	390	3,604	340	3,654	639
4.	4,293	340	3,869	365	3,844	449
5.	4,770	365	4,399	415	4,349	421
6.	5,353	415	5,088	480	5,023	330
7.	6,254	480	5,353	505	5,328	926
8.	5,883	505	4,823	455	4,873	1,010
9.	5,883	455	4,664	440	4,679	1,204
10.	5,883	440	4,558	430	4,568	1,315

11.	199,975	5,835	184,775	5,835	184,775	15,200	5,883	430	4,505	425	4,510	1,373
12.	199,975	5,865	185,725	5,865	185,725	14,250	5,883	425	4,399	415	4,409	1,474
	2,376,900		2,185,475		2,185,475	191,425	63,865		54,060		54,050	9,815
Year 4.												
1.	198,075	5,745	181,925	5,745	181,925	16,150	5,777	415	4,346	410	4,351	1,426
2.	193,800	5,730	181,450	5,730	181,450	12,350	5,777	410	4,028	380	4,058	1,719
3.	193,800	5,730	181,450	5,730	181,450	12,350	5,618	380	3,763	355	3,788	1,830
4.	199,025	5,850	185,250	5,850	185,250	13,775	5,724	355	3,869	365	3,859	1,865
5.	201,875	5,865	185,725	5,865	185,725	16,150	5,989	365	4,346	410	4,301	1,688
6.	201,875	5,805	183,825	5,805	183,825	18,050	5,989	410	5,141	485	5,066	923
7.	199,975	5,760	182,400	5,760	182,400	17,575	5,989	485	5,512	520	5,477	512
8.	199,500	5,790	183,350	5,790	183,350	16,150	6,254	520	5,247	495	5,272	982
9.	199,500	5,790	183,350	5,790	183,350	16,150	5,989	495	4,876	460	4,911	1,078
10.	199,975	5,850	185,250	5,850	185,250	14,725	5,989	460	4,558	430	4,588	1,401
11.	200,925	5,865	185,725	5,865	185,725	15,200	5,989	430	4,293	405	4,318	1,671
12.	200,925	5,895	186,675	5,895	186,675	14,250	5,989	405	4,293	405	4,293	1,696
	2,389,250		2,206,375		2,206,375	182,875	71,073		54,272		54,282	16,791
Year 7.												
1.	192,850	5,700	180,500	5,700	180,500	12,350	5,194	405	4,664	440	4,629	565
2.	193,325	5,700	180,500	5,700	180,500	12,825	4,293	440	4,134	390	4,184	109
3.	193,800	5,715	180,975	5,715	180,975	12,825	4,293	390	3,604	340	3,654	639
4.	200,450	5,805	183,825	5,805	183,825	16,625	4,293	340	3,869	365	3,844	449
5.	200,450	5,820	184,300	5,820	184,300	16,150	4,770	365	4,399	415	4,349	421
6.	199,500	5,685	180,025	5,685	180,025	19,475	5,353	415	5,088	480	5,023	330
7.	199,025	5,685	180,025	5,685	180,025	19,000	6,254	480	5,353	505	5,328	926
8.	199,025	5,700	180,500	5,700	180,500	18,525	5,883	505	4,823	455	4,873	1,010
9.	199,025	5,700	180,500	5,700	[illegible]	18,525	5,883	455	4,664	440	4,679	1,204
10.	199,500	5,805	183,825	5,805	[illegible]	15,675	5,883	440	4,558	430	4,568	1,315
11.	199,975	5,835	184,775	5,835	184,775	15,200	5,883	430	4,505	425	4,510	1,373
12.	199,975	5,865	185,725	5,865	185,725	14,250	5,883	425	4,399	415	4,409	1,474
	2,376,900		2,185,475		2,185,475	191,425	63,865		54,060		54,050	9,815
Year 4.												
1.	198,075	5,745	181,925	5,745	181,925	16,150	5,777	415	4,346	410	4,351	1,426
2.	193,800	5,730	181,450	5,730	181,450	12,350	5,777	410	4,028	380	4,058	1,719
3.	193,800	5,730	181,450	5,730	181,450	12,350	5,618	380	3,763	355	3,788	1,830
4.	199,025	5,850	185,250	5,850	185,250	13,775	5,724	355	3,869	365	3,859	1,865
5.	201,875	5,865	185,725	5,865	185,725	16,150	5,989	365	4,346	410	4,301	1,688
6.	201,875	5,805	183,825	5,805	183,825	18,050	5,989	410	5,141	485	5,066	923
7.	199,975	5,760	182,400	5,760	182,400	17,575	5,989	485	5,512	520	5,477	512
8.	199,500	5,790	183,350	5,790	183,350	16,150	6,254	520	5,247	495	5,272	982
9.	199,500	5,790	183,350	5,790	183,350	16,150	5,989	495	4,876	460	4,911	1,078
10.	199,975	5,850	185,250	5,850	185,250	14,725	5,989	460	4,558	430	4,588	1,401
11.	200,925	5,865	185,725	5,865	185,725	15,200	5,989	430	4,293	405	4,318	1,671
12.	200,925	5,895	186,675	5,895	186,675	14,250	5,989	405	4,293	405	4,293	1,696
	2,389,250		2,206,375		2,206,375	182,875	71,073		54,272		54,282	16,791
Year 5.												
1.	192,850	5,700	180,500	5,700	180,500	12,350	5,194	405	4,664	440	4,629	565
2.	193,325	5,700	180,500	5,700	180,500	12,825	4,293	440	4,134	390	4,184	109
3.	193,800	5,715	180,975	5,715	180,975	12,825	4,293	390	3,604	340	3,654	639
4.	200,450	5,805	183,825	5,805	183,825	16,625	4,293	340	3,869	365	3,844	449
5.	200,450	5,820	184,300	5,820	184,300	16,150	4,770	365	4,399	415	4,349	421
6.	199,500	5,685	180,025	5,685	180,025	19,475	5,353	415	5,088	480	5,023	330
7.	199,025	5,685	180,025	5,685	180,025	19,000	6,254	480	5,353	505	5,328	926
8.	199,025	5,700	180,500	5,700	180,500	18,525	5,883	505	4,823	455	4,873	1,010
9.	199,025	5,700	180,500	5,700	180,500	18,525	5,883	455	4,664	440	4,679	1,204
10.	199,500	5,805	183,825	5,805	183,825	15,675	5,883	440	4,558	430	4,568	1,315
11.	199,975	5,835	184,775	5,835	184,775	15,200	5,883	430	4,505	425	4,510	1,373
12.	199,975	5,865	185,725	5,865	185,725	14,250	5,883	425	4,399	415	4,409	1,474
	2,376,900		2,185,475		2,185,475	191,425	63,865		54,060		54,050	9,815
Year 4.												
1.	198,075	5,745	181,925	5,745	181,925	16,150	5,777	415	4,346	410	4,351	1,426
2.	193,800	5,730	181,450	5,730	181,450	12,350	5,777	410	4,028	380	4,058	1,719
3.	193,800	5,730	181,450	5,730	181,450	12,350	5,618	380	3,763	355	3,788	1,830
4.	199,025	5,850	185,250	5,850	185,250	13,775	5,724	355	3,869	365	3,859	1,865
5.	201,875	5,865	185,725	5,865	185,725	16,150	5,989	365	4,346	410	4,301	1,688
6.	201,875	5,805	183,825	5,805	183,825	18,050	5,989	410	5,141	485	5,066	923
7.	199,975	5,760	182,400	5,760	182,400	17,575	5,989	485	5,512	520	5,477	512
8.	199,500	5,790	183,350	5,790	183,350	16,150	6,254	520	5,247	495	5,272	982
9.	199,500	5,790	183,350	5,790	183,350	16,150	5,989	495	4,876	460	4,911	1,078
10.	202,080	5,850	185,250	3,900	187,200	14,880	6,215	460	4,558	258	4,760	1,455
11.	203,040	3,910	185,725	1,955	187,680	15,360	6,215	258	4,293	81	4,470	1,745
12.	203,040	1,965	186,675	0	188,640	14,400	6,102	81	4,293	0	4,374	1,728
	2,395,585		2,206,375		2,212,245	183,340	71,638		54,272		54,687	16,951

FILE 3 VARCOST

TOTAL VARIABLE COST
SUMMARY

Period	Function 1.	Function 2.	Function 3.	Function 4.	Total
1.	0	0	0	0	0
2.	0	0	0	0	0
3.	55,304	111,902	120,092	0	287,297
4.	54,283	111,909	120,144	0	286,336
5.	55,304	111,902	120,092	0	287,297
6.	54,283	111,909	120,144	0	286,336
7.	53,261	111,902	120,092	0	285,254
8.	54,283	111,909	120,144	0	286,336
9.	53,261	111,902	120,092	0	285,254
10.	52,643	111,909	120,144	0	284,696
	432,622	895,243	960,941	0	2,288,806

Builiding & Equipment Maintenance
SUMMARY

Period	Function 1.	Function 2.	Function 3.	Function 4.	Total
1.	0	0	0	0	0
2.	0	0	0	0	0
3.	4,625	7,750	13,500	0	25,875
4.	4,539	7,750	13,500	0	25,789
5.	4,625	7,750	13,500	0	25,875
6.	4,539	7,750	13,500	0	25,789
7.	4,454	7,750	13,500	0	25,704
8.	4,539	7,750	13,500	0	25,789
9.	4,454	7,750	13,500	0	25,704
10.	4,402	7,750	13,500	0	25,652
	36,178	62,000	108,000	0	206,178

Supplies and Materials
SUMMARY

Period	Function 1.	Function 2.	Function 3.	Function 4.	Total
1.	0	0	0	0	0
2.	0	0	0	0	0
3.	2,025	7,614	3,860	0	13,499
4.	1,988	7,614	3,860	0	13,461
5.	2,025	7,614	3,860	0	13,499
6.	1,988	7,614	3,860	0	13,461
7.	1,950	7,614	3,860	0	13,424
8.	1,988	7,614	3,860	0	13,461
9.	1,950	7,614	3,860	0	13,424
10.	1,928	7,614	3,860	0	13,401
	15,840	60,912	30,879	0	107,631

Energy
SUMMARY

Period	Function 1.	Function 2.	Function 3.	Function 4.	Total
1.	0	0	0	0	0
2.	0	0	0	0	0
3.	13,050	38,400	10,700	0	62,150
4.	12,808	38,400	10,700	0	61,908
5.	13,050	38,400	10,700	0	62,150
6.	12,808	38,400	10,700	0	61,908
7.	12,567	38,400	10,700	0	61,667
8.	12,808	38,400	10,700	0	61,908
9.	12,567	38,400	10,700	0	61,667
10.	12,422	38,400	10,700	0	61,522
	102,080	307,200	85,600	0	494,880

Wages
SUMMARY

Period	Function 1.	Function 2.	Function 3.	Function 4.	Total
1.	0	0	0	0	0
2.	0	0	0	0	0
3.	29,120	51,584	61,568	0	142,272
4.	28,581	51,584	61,568	0	141,733
5.	29,120	51,584	61,568	0	142,272
6.	28,581	51,584	61,568	0	141,733
7.	28,041	51,584	61,568	0	141,193
8.	28,581	51,584	61,568	0	141,733
9.	28,041	51,584	61,568	0	141,193
10.	27,718	51,584	61,568	0	140,870
	227,783	412,672	492,544	0	1,132,999

Other
SUMMARY

Period	Function 1.	Function 2.	Function 3.	Function 4.	Total
1.	0	0	0	0	0
2.	0	0	0	0	0
3.	2,000	1,956	25,000	0	28,956
4.	1,963	1,956	25,000	0	28,919
5.	2,000	1,956	25,000	0	28,956
6.	1,963	1,956	25,000	0	28,919
7.	1,926	1,956	25,000	0	28,881
8.	1,963	1,956	25,000	0	28,919
9.	1,926	1,956	25,000	0	28,881
10.	1,904	1,956	25,000	0	28,859
	15,644	15,644	200,000	0	231,289

Loss
SUMMARY

Period	Function 1.	Function 2.	Function 3.	Function 4.	Total
1.	0	0	0	0	0
2.	0	0	0	0	0
3.	4,484	4,599	5,464	0	14,5[illegible]
4.	4,404	4,605	5,516	0	14,[illegible]
5.	4,484	4,599	5,464	0	14,546
6.	4,404	4,605	5,516	0	14,525
7.	4,323	4,599	5,464	0	14,385
8.	4,404	4,605	5,516	0	14,525
9.	4,323	4,599	5,464	0	14,385
10.	4,270	4,605	5,516	0	14,391
	35,097	36,815	43,919	0	115,830

PRECONSTRUCTION EXPENSE
(Table 1)

Function/ Period	Feasibility Studies: Market Analysis	Technical Analysis	Economic Analysis	Financial Analysis	Organizational Cost: Salaries	Legal	Insurance	Other	Contingency 10.0%	Total
Function__Storage										
1.	0	3,075	1,000	1,000	3,860	1,000	0	0	994	10,929
2.	0	0	0	0	0	0	0	0	0	0
3.	0	0	0	0	0	0	0	0	0	0
4.	0	0	0	0	0	0	0	0	0	0
5.	0	0	0	0	0	0	0	0	0	0
6.	0	0	0	0	0	0	0	0	0	0
7.	0	0	0	0	0	0	0	0	0	0
8.	0	0	0	0	0	0	0	0	0	0
9.	0	0	0	0	0	0	0	0	0	0
10.	0	0	0	0	0	0	0	0	0	0
Subtotal:										10,929
Function__Processing										
1.	0	3,075	1,000	1,000	3,860	1,000	0	0	994	10,929
2.	0	0	0	0	0	0	0	0	0	0
3.	0	0	0	0	0	0	0	0	0	0
4.	0	0	0	0	0	0	0	0	0	0
5.	0	0	0	0	0	0	0	0	0	0
6.	0	0	0	0	0	0	0	0	0	0
7.	0	0	0	0	0	0	0	0	0	0
8.	0	0	0	0	0	0	0	0	0	0
9.	0	0	0	0	0	0	0	0	0	0
10.	0	0	0	0	0	0	0	0	0	0
Subtotal:										10,929
Function__Marketing										
1.	11,500	0	1,000	1,000	3,860	1,000	0	0	1,836	20,196
2.	0	0	0	0	0	0	0	0	0	0
3.	0	0	0	0	0	0	0	0	0	0
4.	0	0	0	0	0	0	0	0	0	0
5.	0	0	0	0	0	0	0	0	0	0
6.	0	0	0	0	0	0	0	0	0	0
7.	0	0	0	0	0	0	0	0	0	0
8.	0	0	0	0	0	0	0	0	0	0
9.	0	0	0	0	0	0	0	0	0	0
10.	0	0	0	0	0	0	0	0	0	0
Subtotal:										20,196
Function_____										
1.	0	0	0	0	0	0	0	0	0	0
2.	0	0	0	0	0	0	0	0	0	0
3.	0	0	0	0	0	0	0	0	0	0
4.	0	0	0	0	0	0	0	0	0	0
5.	0	0	0	0	0	0	0	0	0	0
6.	0	0	0	0	0	0	0	0	0	0
7.	0	0	0	0	0	0	0	0	0	0
8.	0	0	0	0	0	0	0	0	0	0
9.	0	0	0	0	0	0	0	0	0	0
10.	0	0	0	0	0	0	0	0	0	0
Subtotal:										0

LAND AND BUILDINGS INVESTMENT
(Table 2)

Function/ Period	Land: Purchase Cost	Site Preparation	Other	Buildings: Construction Cost	Utilities	Other	Other	Contingency 10.0%	Total
Function__Storage									
1.	14,685	0	0	0	0	0	0	1,469	16,154
2.	0	19,100	0	285,000	28,590	0	0	33,269	365,959
3.	0	0	0	0	0	0	0	0	0
4.	0	0	0	0	0	0	0	0	0
5.	0	0	0	0	0	0	0	0	0
6.	0	0	0	0	0	0	0	0	0
7.	0	0	0	0	0	0	0	0	0
8.	0	0	0	0	0	0	0	0	0
9.	0	0	0	0	0	0	0	0	0
10.	0	0	0	0	0	0	0	0	0
Subtotal:									382,113
Function__Processing									
1.	14,685	0	0	0	0	0	0	1,469	16,154
2.	0	19,100	0	564,000	92,920	0	0	67,602	743,622
3.	0	0	0	0	0	0	0	0	0
4.	0	0	0	0	0	0	0	0	0
5.	0	0	0	0	0	0	0	0	0
6.	0	0	0	0	0	0	0	0	0
7.	0	0	0	0	0	0	0	0	0
8.	0	0	0	0	0	0	0	0	0
9.	0	0	0	0	0	0	0	0	0
10.	0	0	0	0	0	0	0	0	0
Subtotal:									759,776
Function__Marketing									
1.	3,630	0	0	0	0	0	0	363	3,993
2.	0	4,800	0	104,900	21,440	0	0	13,114	144,254
3.	0	0	0	0	0	0	0	0	0
4.	0	0	0	0	0	0	0	0	0
5.	0	0	0	0	0	0	0	0	0
6.	0	0	0	0	0	0	0	0	0
7.	0	0	0	0	0	0	0	0	0
8.	0	0	0	0	0	0	0	0	0
9.	0	0	0	0	0	0	0	0	0
10.	0	0	0	0	0	0	0	0	0
Subtotal:									148,247
Function_____									
1.	0	0	0	0	0	0	0	0	0
2.	0	0	0	0	0	0	0	0	0
3.	0	0	0	0	0	0	0	0	0
4.	0	0	0	0	0	0	0	0	0
5.	0	0	0	0	0	0	0	0	0
6.	0	0	0	0	0	0	0	0	0
7.	0	0	0	0	0	0	0	0	0
8.	0	0	0	0	0	0	0	0	0
9.	0	0	0	0	0	0	0	0	0
10.	0	0	0	0	0	0	0	0	0
Subtotal:									0

EQUIPMENT INVESTMENT WORKSHEET
(Table 3)

Function/ Equipment	FOB/CIF Source	Delivery	Instal- lation	Contin- gency 15.0%	Total Cost	Period Install	Period Replace A	Period Replace B	Period Replace C
Function__Storage									
1.	3000	250	600	578	4428	2	15	0	0
2.	8000	400	1600	1500	11500	2	15	0	0
3.	14000	600	2800	2610	20010	2	15	0	0
4.	28000	750	5600	5153	39503	2	15	0	0
5.	11000	800	2200	2100	16100	2	15	0	0
6.	22000	750	4400	4073	31223	2	15	0	0
7.	15000	600	3000	2790	21390	2	15	0	0
8.	0	0	0	0	0	0	0	0	0
Function__Processing									
1.	28000	1100	5600	5205	39905	2	15	0	0
2.	35000	1200	7000	6480	49680	2	15	0	0
3.	14000	750	2800	2633	20183	2	15	0	0
4.	48000	1300	9600	8835	67735	2	15	0	0
5.	26000	2150	5200	5003	38353	2	15	0	0
6.	18000	1150	3600	3413	26163	2	15	0	0
7.	0	0	0	0	0	0	0	0	0
8.	0	0	0	0	0	0	0	0	0
Function__Marketing									
1.	10000	1200	0	1680	12880	2	5	7	9
2.	18000	0	0	2700	20700	2	8	0	0
3.	45000	4900	9000	8835	67735	2	16	0	0
4.	100000	0	0	15000	115000	2	8	0	0
5.	20000	0	0	3000	23000	2	6	9	0
6.	10000	850	2000	1928	14778	2	15	0	0
7.	0	0	0	0	0	0	0	0	0
8.	0	0	0	0	0	0	0	0	0
Function_____									
1.	0	0	0	0	0	0	0	0	0
2.	0	0	0	0	0	0	0	0	0
3.	0	0	0	0	0	0	0	0	0
4.	0	0	0	0	0	0	0	0	0
5.	0	0	0	0	0	0	0	0	0
6.	0	0	0	0	0	0	0	0	0
7.	0	0	0	0	0	0	0	0	0
8.	0	0	0	0	0	0	0	0	0

MISCELLANEOUS CAPITAL OUTLAY EXPENDITURES
(Table 5)

Function/ Period	Research & Develop	Market Develop	Other	Contin-gency 10.0%	Total
Function__Storage					
1.	0	0	0	0	0
2.	0	0	0	0	0
3.	0	0	0	0	0
4.	0	0	0	0	0
5.	0	0	0	0	0
6.	0	0	0	0	0
7.	0	0	0	0	0
8.	0	0	0	0	0
9.	0	0	0	0	0
10.	0	0	0	0	0
Subtotal:					0
Function__Processing					
1.	11,000	0	0	1,100	12,100
2.	18,000	0	0	1,800	19,800
3.	7,000	0	0	700	7,700
4.	0	0	0	0	0
5.	0	0	0	0	0
6.	0	0	0	0	0
7.	0	0	0	0	0
8.	0	0	0	0	0
9.	0	0	0	0	0
10.	0	0	0	0	0
Subtotal:					39,600
Function__Marketing					
1.	0	18,000	0	1,800	19,800
2.	0	22,000	0	2,200	24,200
3.	0	0	0	0	0
4.	0	0	0	0	0
5.	0	0	0	0	0
6.	0	0	0	0	0
7.	0	0	0	0	0
8.	0	0	0	0	0
9.	0	0	0	0	0
10.	0	0	0	0	0
Subtotal:					44,000
Function_____					
1.	0	0	0	0	0
2.	0	0	0	0	0
3.	0	0	0	0	0
4.	0	0	0	0	0
5.	0	0	0	0	0
6.	0	0	0	0	0
7.	0	0	0	0	0
8.	0	0	0	0	0
9.	0	0	0	0	0
10.	0	0	0	0	0
Subtotal:					0

TOTAL VARIABLE COSTS
(Table 28A)
Function__Storage

Year/ Month	Product Volume	Product Value	C O S T S Bld/Equip Maint.	Supplies/ Materials	Energy	Wages	Other	Loss	Total
Cost-to-Volu. Multiplier >>>			0.571	0.250	1.611	3.595	0.247		
Cost-to-Value Multiplier >>>								0.25%	
Year: 1									
1.	0	0	0	0	0	0	0	0	0
2.	0	0	0	0	0	0	0	0	0
3.	0	0	0	0	0	0	0	0	0
4.	0	0	0	0	0	0	0	0	0
5.	0	0	0	0	0	0	0	0	0
6.	0	0	0	0	0	0	0	0	0
7.	0	0	0	0	0	0	0	0	0
8.	0	0	0	0	0	0	0	0	0
9.	0	0	0	0	0	0	0	0	0
10.	0	0	0	0	0	0	0	0	0
11.	0	0	0	0	0	0	0	0	0
12.	0	0	0	0	0	0	0	0	0
Total:	0	0	0	0	0	0	0	0	0
Year: 2									
1.	0	0	0	0	0	0	0	0	0
2.	0	0	0	0	0	0	0	0	0
3.	0	0	0	0	0	0	0	0	0
4.	0	0	0	0	0	0	0	0	0
5.	0	0	0	0	0	0	0	0	0
6.	0	0	0	0	0	0	0	0	0
7.	0	0	0	0	0	0	0	0	0
8.	0	0	0	0	0	0	0	0	0
9.	0	0	0	0	0	0	0	0	0
10.	0	0	0	0	0	0	0	0	0
11.	0	0	0	0	0	0	0	0	0
12.	0	0	0	0	0	0	0	0	0
Total:	0	0	0	0	0	0	0	0	0
Year: 3									
1.	1,000	220,000	571	250	1,611	3,595	247	550	6,824
2.	1,000	217,000	571	250	1,611	3,595	247	543	6,817
3.	300	69,300	171	75	483	1,079	74	173	2,055
4.	600	137,400	343	150	967	2,157	148	344	4,108
5.	600	136,200	343	150	967	2,157	148	341	4,105
6.	600	132,600	343	150	967	2,157	148	332	4,096
7.	1,000	219,000	571	250	1,611	3,595	247	548	6,822
8.	1,000	220,000	571	250	1,611	3,595	247	550	6,824
9.	1,000	218,000	571	250	1,611	3,595	247	545	6,819
10.	1,000	224,000	571	250	1,611	3,595	247	560	6,834
11.	0	0	0	0	0	0	0	0	0
12.	0	0	0	0	0	0	0	0	0
Total:	8,100	1,793,500	4,625	2,025	13,050	29,120	2,000	4,484	55,304
Year: 4									
1.	1,000	221,000	571	250	1,611	3,595	247	553	6,827
2.	800	174,400	457	200	1,289	2,876	198	436	5,455
3.	300	69,300	171	75	483	1,079	74	173	2,055
4.	500	115,000	285	125	806	1,798	123	288	3,425
5.	550	124,850	314	138	886	1,977	136	312	3,763
6.	1,000	221,000	571	250	1,611	3,595	247	553	6,827
7.	1,000	219,000	571	250	1,611	3,595	247	548	6,822
8.	1,000	219,000	571	250	1,611	3,595	247	548	6,822
9.	1,000	219,000	571	250	1,611	3,595	247	548	6,822
10.	800	179,200	457	200	1,289	2,876	198	448	5,467
11.	0	0	0	0	0	0	0	0	0
12.	0	0	0	0	0	0	0	0	0
Total:	7,950	1,761,750	4,539	1,988	12,808	28,581	1,963	4,404	54,283
Year: 5									
1.	1,000	220,000	571	250	1,611	3,595	247	550	6,824
2.	1,000	217,000	571	250	1,611	3,595	247	543	6,817
3.	300	69,300	171	75	483	1,079	74	173	2,055
4.	600	137,400	343	150	967	2,157	148	344	4,108
5.	600	136,200	343	150	967	2,157	148	341	4,105
6.	600	132,600	343	150	967	2,157	148	332	4,096
7.	1,000	219,000	571	250	1,611	3,595	247	548	6,822
8.	1,000	220,000	571	250	1,611	3,595	247	550	6,824
9.	1,000	218,000	571	250	1,611	3,595	247	545	6,819

10.	1,000	224,000	571	250	1,611	3,595	247	560	6,834
11.	0	0	0	0	0	0	0	0	0
12.	0	0	0	0	0	0	0	0	0
Total:	8,100	1,793,500	4,625	2,025	13,050	29,120	2,000	4,484	55,304
Year: 6									
1.	1,000	221,000	571	250	1,611	3,595	247	553	6,827
2.	800	174,400	457	200	1,289	2,876	198	436	5,455
3.	300	69,300	171	75	483	1,079	74	173	2,055
4.	500	115,000	285	125	806	1,798	123	288	3,425
5.	550	124,850	314	138	886	1,977	136	312	3,763
6.	1,000	221,000	571	250	1,611	3,595	247	553	6,827
7.	1,000	219,000	571	250	1,611	3,595	247	548	6,822
8.	1,000	219,000	571	250	1,611	3,595	247	548	6,822
9.	1,000	219,000	571	250	1,611	3,595	247	548	6,822
10.	800	179,200	457	200	1,289	2,876	198	448	5,467
11.	0	0	0	0	0	0	0	0	0
12.	0	0	0	0	0	0	0	0	0
Total:	7,950	1,761,750	4,539	1,988	12,808	28,581	1,963	4,404	54,283
Year: 7									
1.	800	176,000	457	200	1,289	2,876	198	440	5,459
2.	800	173,600	457	200	1,289	2,876	198	434	5,453
3.	400	92,400	228	100	644	1,438	99	231	2,741
4.	600	137,400	343	150	967	2,157	148	344	4,108
5.	600	136,200	343	150	967	2,157	148	341	4,105
6.	600	132,600	343	150	967	2,157	148	332	4,096
7.	1,000	219,000	571	250	1,611	3,595	247	548	6,822
8.	1,000	220,000	571	250	1,611	3,595	247	550	6,824
9.	1,000	218,000	571	250	1,611	3,595	247	545	6,819
10.	1,000	224,000	571	250	1,611	3,595	247	560	6,834
11.	0	0	0	0	0	0	0	0	0
12.	0	0	0	0	0	0	0	0	0
Total:	7,800	1,729,200	4,454	1,950	12,567	28,041	1,926	4,323	53,261
Year: 8									
1.	1,000	221,000	571	250	1,611	3,595	247	553	6,827
2.	800	174,400	457	200	1,289	2,876	198	436	5,455
3.	300	69,300	171	75	483	1,079	74	173	2,055
4.	500	115,000	285	125	806	1,798	123	288	3,425
5.	550	124,850	314	138	886	1,977	136	312	3,763
6.	1,000	221,000	571	250	1,611	3,595	247	553	6,827
7.	1,000	219,000	571	250	1,611	3,595	247	548	6,822
8.	1,000	219,000	571	250	1,611	3,595	247	548	6,822
9.	1,000	219,000	571	250	1,611	3,595	247	548	6,822
10.	800	179,200	457	200	1,289	2,876	198	448	5,467
11.	0	0	0	0	0	0	0	0	0
12.	0	0	0	0	0	0	0	0	0
Total:	7,950	1,761,750	4,539	1,988	12,808	28,581	1,963	4,404	54,283
Year: 9									
1.	800	176,000	457	200	1,289	2,876	198	440	5,459
2.	800	173,600	457	200	1,289	2,876	198	434	5,453
3.	400	92,400	228	100	644	1,438	99	231	2,741
4.	600	137,400	343	150	967	2,157	148	344	4,108
5.	600	136,200	343	150	967	2,157	148	341	4,105
6.	600	132,600	343	150	967	2,157	148	332	4,096
7.	1,000	219,000	571	250	1,611	3,595	247	548	6,822
8.	1,000	220,000	571	250	1,611	3,595	247	550	6,824
9.	1,000	218,000	571	250	1,611	3,595	247	545	6,819
10.	1,000	224,000	571	250	1,611	3,595	247	560	6,834
11.	0	0	0	0	0	0	0	0	0
12.	0	0	0	0	0	0	0	0	0
Total:	7,800	1,729,200	4,454	1,950	12,567	28,041	1,926	4,323	53,261
Year: 10									
1.	1,000	221,000	571	250	1,611	3,595	247	553	6,827
2.	800	174,400	457	200	1,289	2,876	198	436	5,455
3.	300	69,300	171	75	483	1,079	74	173	2,055
4.	500	115,000	285	125	806	1,798	123	288	3,425
5.	550	124,850	314	138	886	1,977	136	312	3,763
6.	1,000	221,000	571	250	1,611	3,595	247	553	6,827
7.	1,000	219,000	571	250	1,611	3,595	247	548	6,822
8.	1,000	219,000	571	250	1,611	3,595	247	548	6,822
9.	1,000	219,000	571	250	1,611	3,595	247	548	6,822
10.	560	125,440	320	140	902	2,013	138	314	3,827
11.	0	0	0	0	0	0	0	0	0
12.	0	0	0	0	0	0	0	0	0
Total:	7,710	1,707,990	4,402	1,928	12,422	27,718	1,904	4,270	52,643

TOTAL VARIABLE COSTS
(Table 28B)
Function_Storage

Year/ Month	Product Volume	Product Value	C O S T S Bld/Equip Maint.	Supplies/ Materials	Energy	Wages	Other	Loss	Total
Cost-to-Volume Multiplier)))			0.979	0.961	4.848	6.513	0.247		
Cost-to-Value Multiplier)))								0.25%	
Year: 1									
1.	0	0	0	0	0	0	0	0	0
2.	0	0	0	0	0	0	0	0	0
3.	0	0	0	0	0	0	0	0	0
4.	0	0	0	0	0	0	0	0	0
5.	0	0	0	0	0	0	0	0	0
6.	0	0	0	0	0	0	0	0	0
7.	0	0	0	0	0	0	0	0	0
8.	0	0	0	0	0	0	0	0	0
9.	0	0	0	0	0	0	0	0	0
10.	0	0	0	0	0	0	0	0	0
11.	0	0	0	0	0	0	0	0	0
12.	0	0	0	0	0	0	0	0	0
Total:	0	0	0	0	0	0	0	0	0
Year: 2									
1.	0	0	0	0	0	0	0	0	0
2.	0	0	0	0	0	0	0	0	0
3.	0	0	0	0	0	0	0	0	0
4.	0	0	0	0	0	0	0	0	0
5.	0	0	0	0	0	0	0	0	0
6.	0	0	0	0	0	0	0	0	0
7.	0	0	0	0	0	0	0	0	0
8.	0	0	0	0	0	0	0	0	0
9.	0	0	0	0	0	0	0	0	0
10.	0	0	0	0	0	0	0	0	0
11.	0	0	0	0	0	0	0	0	0
12.	0	0	0	0	0	0	0	0	0
Total:	0	0	0	0	0	0	0	0	0
Year: 3									
1.	660	151,140	646	635	3,200	4,299	163	378	9,320
2.	660	149,160	646	635	3,200	4,299	163	373	9,315
3.	660	158,400	646	635	3,200	4,299	163	396	9,338
4.	660	157,080	646	635	3,200	4,299	163	393	9,335
5.	660	155,760	646	635	3,200	4,299	163	389	9,331
6.	660	151,800	646	635	3,200	4,299	163	380	9,321
7.	660	150,480	646	635	3,200	4,299	163	376	9,318
8.	660	151,140	646	635	3,200	4,299	163	378	9,320
9.	660	149,820	646	635	3,200	4,299	163	375	9,317
10.	660	153,780	646	635	3,200	4,299	163	384	9,326
11.	660	155,100	646	635	3,200	4,299	163	388	9,330
12.	660	155,760	646	635	3,200	4,299	163	389	9,331
Total:	0	1,839,420	7,750	7,614	38,400	51,584	1,956	4,599	111,902
Year: 4									
1.	660	151,800	646	635	3,200	4,299	163	380	9,321
2.	660	149,820	646	635	3,200	4,299	163	375	9,317
3.	660	159,060	646	635	3,200	4,299	163	398	9,340
4.	660	157,740	646	635	3,200	4,299	163	394	9,336
5.	660	155,760	646	635	3,200	4,299	163	389	9,331
6.	660	151,800	646	635	3,200	4,299	163	380	9,321
7.	660	151,140	646	635	3,200	4,299	163	378	9,320
8.	660	151,140	646	635	3,200	4,299	163	378	9,320
9.	660	151,140	646	635	3,200	4,299	163	378	9,320
10.	660	152,460	646	635	3,200	4,299	163	381	9,323
11.	660	153,120	646	635	3,200	4,299	163	383	9,325
12.	660	157,080	646	635	3,200	4,299	163	393	9,335
Total:	0	1,842,060	7,750	7,614	38,400	51,584	1,956	4,605	111,909
Year: 5									
1.	660	151,140	646	635	3,200	4,299	163	378	9,320
2.	660	149,160	646	635	3,200	4,299	163	373	9,315
3.	660	158,400	646	635	3,200	4,299	163	396	9,338
4.	660	157,080	646	635	3,200	4,299	163	393	9,335
5.	660	155,760	646	635	3,200	4,299	163	389	9,331
6.	660	151,800	646	635	3,200	4,299	163	380	9,321
7.	660	150,480	646	635	3,200	4,299	163	376	9,318
8.	660	151,140	646	635	3,200	4,299	163	378	9,320
9.	660	149,820	646	635	3,200	4,299	163	375	9,317

10.	660	153,780	646	635	3,200	4,299	163	384	9,326
11.	660	155,100	646	635	3,200	4,299	163	388	9,330
12.	660	155,760	646	635	3,200	4,299	163	389	9,331
Total:	0	1,839,420	7,750	7,614	38,400	51,584	1,956	4,599	111,902
Year: 6									
1.	660	151,800	646	635	3,200	4,299	163	380	9,321
2.	660	149,820	646	635	3,200	4,299	163	375	9,317
3.	660	159,060	646	635	3,200	4,299	163	398	9,340
4.	660	157,740	646	635	3,200	4,299	163	394	9,336
5.	660	155,760	646	635	3,200	4,299	163	389	9,331
6.	660	151,800	646	635	3,200	4,299	163	380	9,321
7.	660	151,140	646	635	3,200	4,299	163	378	9,320
8.	660	151,140	646	635	3,200	4,299	163	378	9,320
9.	660	151,140	646	635	3,200	4,299	163	378	9,320
10.	660	152,460	646	635	3,200	4,299	163	381	9,323
11.	660	153,120	646	635	3,200	4,299	163	383	9,325
12.	660	157,080	646	635	3,200	4,299	163	393	9,335
Total:	0	1,842,060	7,750	7,614	38,400	51,584	1,956	4,605	111,909
Year: 7									
1.	660	151,140	646	635	3,200	4,299	163	378	9,320
2.	660	149,160	646	635	3,200	4,299	163	373	9,315
3.	660	158,400	646	635	3,200	4,299	163	396	9,338
4.	660	157,080	646	635	3,200	4,299	163	393	9,335
5.	660	155,760	646	635	3,200	4,299	163	389	9,331
6.	660	151,800	646	635	3,200	4,299	163	380	9,321
7.	660	150,480	646	635	3,200	4,299	163	376	9,318
8.	660	151,140	646	635	3,200	4,299	163	378	9,320
9.	660	149,820	646	635	3,200	4,299	163	375	9,317
10.	660	153,780	646	635	3,200	4,299	163	384	9,326
11.	660	155,100	646	635	3,200	4,299	163	388	9,330
12.	660	155,760	646	635	3,200	4,299	163	389	9,331
Total:	0	1,839,420	7,750	7,614	38,400	51,584	1,956	4,599	111,902
Year: 8									
1.	660	151,800	646	635	3,200	4,299	163	380	9,321
2.	660	149,820	646	635	3,200	4,299	163	375	9,317
3.	660	159,060	646	635	3,200	4,299	163	398	9,340
4.	660	157,740	646	635	3,200	4,299	163	394	9,336
5.	660	155,760	646	635	3,200	4,299	163	389	9,331
6.	660	151,800	646	635	3,200	4,299	163	380	9,321
7.	660	151,140	646	635	3,200	4,299	163	378	9,320
8.	660	151,140	646	635	3,200	4,299	163	378	9,320
9.	660	151,140	646	635	3,200	4,299	163	378	9,320
10.	660	152,460	646	635	3,200	4,299	163	381	9,323
11.	660	153,120	646	635	3,200	4,299	163	383	9,325
12.	660	157,080	646	635	3,200	4,299	163	393	9,335
Total:	0	1,842,060	7,750	7,614	38,400	51,584	1,956	4,605	111,909
Year: 9									
1.	660	151,140	646	635	3,200	4,299	163	378	9,320
2.	660	149,160	646	635	3,200	4,299	163	373	9,315
3.	660	158,400	646	635	3,200	4,299	163	396	9,338
4.	660	157,080	646	635	3,200	4,299	163	393	9,335
5.	660	155,760	646	635	3,200	4,299	163	389	9,331
6.	660	151,800	646	635	3,200	4,299	163	380	9,321
7.	660	150,480	646	635	3,200	4,299	163	376	9,318
8.	660	151,140	646	635	3,200	4,299	163	378	9,320
9.	660	149,820	646	635	3,200	4,299	163	375	9,317
10.	660	153,780	646	635	3,200	4,299	163	384	9,326
11.	660	155,100	646	635	3,200	4,299	163	388	9,330
12.	660	155,760	646	635	3,200	4,299	163	389	9,331
Total:	0	1,839,420	7,750	7,614	38,400	51,584	1,956	4,599	111,902
Year: 10									
1.	660	151,800	646	635	3,200	4,299	163	380	9,321
2.	660	149,820	646	635	3,200	4,299	163	375	9,317
3.	660	159,060	646	635	3,200	4,299	163	398	9,340
4.	660	157,740	646	635	3,200	4,299	163	394	9,336
5.	660	155,760	646	635	3,200	4,299	163	389	9,331
6.	660	151,800	646	635	3,200	4,299	163	380	9,321
7.	660	151,140	646	635	3,200	4,299	163	378	9,320
8.	660	151,140	646	635	3,200	4,299	163	378	9,320
9.	660	151,140	646	635	3,200	4,299	163	378	9,320
10.	660	152,460	646	635	3,200	4,299	163	381	9,323
11.	660	153,120	646	635	3,200	4,299	163	383	9,325
12.	660	157,080	646	635	3,200	4,299	163	393	9,335
Total:	0	1,842,060	7,750	7,614	38,400	51,584	1,956	4,605	111,909

TOTAL VARIABLE COSTS
(Table 28C)
Function__Storage

Year/ Month	Product Volume	Product Value	Bld/Equip Maint.	Supplies/ Materials	Energy	Wages	Other	Loss	Total
			C O S T S						
Cost-to-Volume Multiplier)))			2.368	0.677	1.877	10.801	4.306		
Cost-to-Value Multiplier)))								0.25%	
Year: 1									
1.	0	0	0	0	0	0	0	0	0
2.	0	0	0	0	0	0	0	0	0
3.	0	0	0	0	0	0	0	0	0
4.	0	0	0	0	0	0	0	0	0
5.	0	0	0	0	0	0	0	0	0
6.	0	0	0	0	0	0	0	0	0
7.	0	0	0	0	0	0	0	0	0
8.	0	0	0	0	0	0	0	0	0
9.	0	0	0	0	0	0	0	0	0
10.	0	0	0	0	0	0	0	0	0
11.	0	0	0	0	0	0	0	0	0
12.	0	0	0	0	0	0	0	0	0
Total:	0	0	0	0	0	0	0	0	0
Year: 2									
1.	0	0	0	0	0	0	0	0	0
2.	0	0	0	0	0	0	0	0	0
3.	0	0	0	0	0	0	0	0	0
4.	0	0	0	0	0	0	0	0	0
5.	0	0	0	0	0	0	0	0	0
6.	0	0	0	0	0	0	0	0	0
7.	0	0	0	0	0	0	0	0	0
8.	0	0	0	0	0	0	0	0	0
9.	0	0	0	0	0	0	0	0	0
10.	0	0	0	0	0	0	0	0	0
11.	0	0	0	0	0	0	0	0	0
12.	0	0	0	0	0	0	0	0	0
Total:	0	0	0	0	0	0	0	0	0
Year: 3									
1.	475	180,500	1,125	322	892	5,131	2,083	451	10,004
2.	475	180,500	1,125	322	892	5,131	2,083	451	10,004
3.	475	180,975	1,125	322	892	5,131	2,083	452	10,005
4.	475	183,825	1,125	322	892	5,131	2,083	460	10,012
5.	475	184,300	1,125	322	892	5,131	2,083	461	10,013
6.	475	180,025	1,125	322	892	5,131	2,083	450	10,002
7.	475	180,025	1,125	322	892	5,131	2,083	450	10,002
8.	475	180,500	1,125	322	892	5,131	2,083	451	10,004
9.	475	180,500	1,125	322	892	5,131	2,083	451	10,004
10.	475	183,825	1,125	322	892	5,131	2,083	460	10,012
11.	475	184,775	1,125	322	892	5,131	2,083	462	10,014
12.	475	185,725	1,125	322	892	5,131	2,083	464	10,017
Total:	0	2,185,475	13,500	3,860	10,700	61,568	25,000	5,464	120,092
Year: 4									
1.	475	181,925	1,125	322	892	5,131	2,083	455	10,007
2.	475	181,450	1,125	322	892	5,131	2,083	454	10,006
3.	475	181,450	1,125	322	892	5,131	2,083	454	10,006
4.	475	185,250	1,125	322	892	5,131	2,083	463	10,015
5.	475	185,725	1,125	322	892	5,131	2,083	464	10,017
6.	475	183,825	1,125	322	892	5,131	2,083	460	10,012
7.	475	182,400	1,125	322	892	5,131	2,083	456	10,008
8.	475	183,350	1,125	322	892	5,131	2,083	458	10,011
9.	475	183,350	1,125	322	892	5,131	2,083	458	10,011
10.	475	185,250	1,125	322	892	5,131	2,083	463	10,015
11.	475	185,725	1,125	322	892	5,131	2,083	464	10,017
12.	475	186,675	1,125	322	892	5,131	2,083	467	10,019
Total:	0	2,206,375	13,500	3,860	10,700	61,568	25,000	5,516	120,144
Year: 5									
1.	475	180,500	1,125	322	892	5,131	2,083	451	10,004
2.	475	180,500	1,125	322	892	5,131	2,083	451	10,004
3.	475	180,975	1,125	322	892	5,131	2,083	452	10,005
4.	475	183,825	1,125	322	892	5,131	2,083	460	10,012
5.	475	184,300	1,125	322	892	5,131	2,083	461	10,013
6.	475	180,025	1,125	322	892	5,131	2,083	450	10,002
7.	475	180,025	1,125	322	892	5,131	2,083	450	10,002
8.	475	180,500	1,125	322	892	5,131	2,083	451	10,004
9.	475	180,500	1,125	322	892	5,131	2,083	451	10,004

10.	475	183,825	1,125	322	892	5,131	2,083	460	10,012
11.	475	184,775	1,125	322	892	5,131	2,083	462	10,014
12.	475	185,725	1,125	322	892	5,131	2,083	464	10,017
Total:	0	2,185,475	13,500	3,860	10,700	61,568	25,000	5,464	120,092
Year: 6									
1.	475	181,925	1,125	322	892	5,131	2,083	455	10,007
2.	475	181,450	1,125	322	892	5,131	2,083	454	10,006
3.	475	181,450	1,125	322	892	5,131	2,083	454	10,006
4.	475	185,250	1,125	322	892	5,131	2,083	463	10,015
5.	475	185,725	1,125	322	892	5,131	2,083	464	10,017
6.	475	183,825	1,125	322	892	5,131	2,083	460	10,012
7.	475	182,400	1,125	322	892	5,131	2,083	456	10,008
8.	475	183,350	1,125	322	892	5,131	2,083	458	10,011
9.	475	183,350	1,125	322	892	5,131	2,083	458	10,011
10.	475	185,250	1,125	322	892	5,131	2,083	463	10,015
11.	475	185,725	1,125	322	892	5,131	2,083	464	10,017
12.	475	186,675	1,125	322	892	5,131	2,083	467	10,019
Total:	0	2,206,375	13,500	3,860	10,700	61,568	25,000	5,516	120,144
Year: 7									
1.	475	180,500	1,125	322	892	5,131	2,083	451	10,004
2.	475	180,500	1,125	322	892	5,131	2,083	451	10,004
3.	475	180,975	1,125	322	892	5,131	2,083	452	10,005
4.	475	183,825	1,125	322	892	5,131	2,083	460	10,012
5.	475	184,300	1,125	322	892	5,131	2,083	461	10,013
6.	475	180,025	1,125	322	892	5,131	2,083	450	10,002
7.	475	180,025	1,125	322	892	5,131	2,083	450	10,002
8.	475	180,500	1,125	322	892	5,131	2,083	451	10,004
9.	475	180,500	1,125	322	892	5,131	2,083	451	10,004
10.	475	183,825	1,125	322	892	5,131	2,083	460	10,012
11.	475	184,775	1,125	322	892	5,131	2,083	462	10,014
12.	475	185,725	1,125	322	892	5,131	2,083	464	10,017
Total:	0	2,185,475	13,500	3,860	10,700	61,568	25,000	5,464	120,092
Year: 8									
1.	475	181,925	1,125	322	892	5,131	2,083	455	10,007
2.	475	181,450	1,125	322	892	5,131	2,083	454	10,006
3.	475	181,450	1,125	322	892	5,131	2,083	454	10,006
4.	475	185,250	1,125	322	892	5,131	2,083	463	10,015
5.	475	185,725	1,125	322	892	5,131	2,083	464	10,017
6.	475	183,825	1,125	322	892	5,131	2,083	460	10,012
7.	475	182,400	1,125	322	892	5,131	2,083	456	10,008
8.	475	183,350	1,125	322	892	5,131	2,083	458	10,011
9.	475	183,350	1,125	322	892	5,131	2,083	458	10,011
10.	475	185,250	1,125	322	892	5,131	2,083	463	10,015
11.	475	185,725	1,125	322	892	5,131	2,083	464	10,017
12.	475	186,675	1,125	322	892	5,131	2,083	467	10,019
Total:	0	2,206,375	13,500	3,860	10,700	61,568	25,000	5,516	120,144
Year: 9									
1.	475	180,500	1,125	322	892	5,131	2,083	451	10,004
2.	475	180,500	1,125	322	892	5,131	2,083	451	10,004
3.	475	180,975	1,125	322	892	5,131	2,083	452	10,005
4.	475	183,825	1,125	322	892	5,131	2,083	460	10,012
5.	475	184,300	1,125	322	892	5,131	2,083	461	10,013
6.	475	180,025	1,125	322	892	5,131	2,083	450	10,002
7.	475	180,025	1,125	322	892	5,131	2,083	450	10,002
8.	475	180,500	1,125	322	892	5,131	2,083	451	10,004
9.	475	180,500	1,125	322	892	5,131	2,083	451	10,004
10.	475	183,825	1,125	322	892	5,131	2,083	460	10,012
11.	475	184,775	1,125	322	892	5,131	2,083	462	10,014
12.	475	185,725	1,125	322	892	5,131	2,083	464	10,017
Total:	0	2,185,475	13,500	3,860	10,700	61,568	25,000	5,464	120,092
Year: 10									
1.	475	181,925	1,125	322	892	5,131	2,083	455	10,007
2.	475	181,450	1,125	322	892	5,131	2,083	454	10,006
3.	475	181,450	1,125	322	892	5,131	2,083	454	10,006
4.	475	185,250	1,125	322	892	5,131	2,083	463	10,015
5.	475	185,725	1,125	322	892	5,131	2,083	464	10,017
6.	475	183,825	1,125	322	892	5,131	2,083	460	10,012
7.	475	182,400	1,125	322	892	5,131	2,083	456	10,008
8.	475	183,350	1,125	322	892	5,131	2,083	458	10,011
9.	475	183,350	1,125	322	892	5,131	2,083	458	10,011
10.	475	185,250	1,125	322	892	5,131	2,083	463	10,015
11.	475	185,725	1,125	322	892	5,131	2,083	464	10,017
12.	475	186,675	1,125	322	892	5,131	2,083	467	10,019
Total:	0	2,206,375	13,500	3,860	10,700	61,568	25,000	5,516	120,144

TOTAL VARIABLE COSTS
(Table 28D)
Function_Storage

Year/ Month	Product Volume	Product Value	COSTS Bld/Equip Maint.	Supplies/ Materials	Energy	Wages	Other	Loss	Total
Cost-to-Volume Multiplier >>>			0.000	0.000	0.000	0.000	0.000		
Cost-to-Value Multiplier >>>								0.25%	
Year:_____									
1.	0	0	0	0	0	0	0	0	0
2.	0	0	0	0	0	0	0	0	0
3.	0	0	0	0	0	0	0	0	0
4.	0	0	0	0	0	0	0	0	0
5.	0	0	0	0	0	0	0	0	0
6.	0	0	0	0	0	0	0	0	0
7.	0	0	0	0	0	0	0	0	0
8.	0	0	0	0	0	0	0	0	0
9.	0	0	0	0	0	0	0	0	0
10.	0	0	0	0	0	0	0	0	0
11.	0	0	0	0	0	0	0	0	0
12.	0	0	0	0	0	0	0	0	0
Total:	0	0	0	0	0	0	0	0	0
Year:_____									
1.	0	0	0	0	0	0	0	0	0
2.	0	0	0	0	0	0	0	0	0
3.	0	0	0	0	0	0	0	0	0
4.	0	0	0	0	0	0	0	0	0
5.	0	0	0	0	0	0	0	0	0
6.	0	0	0	0	0	0	0	0	0
7.	0	0	0	0	0	0	0	0	0
8.	0	0	0	0	0	0	0	0	0
9.	0	0	0	0	0	0	0	0	0
10.	0	0	0	0	0	0	0	0	0
11.	0	0	0	0	0	0	0	0	0
12.	0	0	0	0	0	0	0	0	0
Total:	0	0	0	0	0	0	0	0	0
Year:_____									
1.	0	0	0	0	0	0	0	0	0
2.	0	0	0	0	0	0	0	0	0
3.	0	0	0	0	0	0	0	0	0
4.	0	0	0	0	0	0	0	0	0
5.	0	0	0	0	0	0	0	0	0
6.	0	0	0	0	0	0	0	0	0
7.	0	0	0	0	0	0	0	0	0
8.	0	0	0	0	0	0	0	0	0
9.	0	0	0	0	0	0	0	0	0
10.	0	0	0	0	0	0	0	0	0
11.	0	0	0	0	0	0	0	0	0
12.	0	0	0	0	0	0	0	0	0
Total:	8,100	0	0	0	0	0	0	0	0
Year:_____									
1.	0	0	0	0	0	0	0	0	0
2.	0	0	0	0	0	0	0	0	0
3.	0	0	0	0	0	0	0	0	0
4.	0	0	0	0	0	0	0	0	0
5.	0	0	0	0	0	0	0	0	0
6.	0	0	0	0	0	0	0	0	0
7.	0	0	0	0	0	0	0	0	0
8.	0	0	0	0	0	0	0	0	0
9.	0	0	0	0	0	0	0	0	0
10.	0	0	0	0	0	0	0	0	0
11.	0	0	0	0	0	0	0	0	0
12.	0	0	0	0	0	0	0	0	0
Total:	7,950	0	0	0	0	0	0	0	0
Year:_____									
1.	0	0	0	0	0	0	0	0	0
2.	0	0	0	0	0	0	0	0	0
3.	0	0	0	0	0	0	0	0	0
4.	0	0	0	0	0	0	0	0	0
5.	0	0	0	0	0	0	0	0	0
6.	0	0	0	0	0	0	0	0	0
7.	0	0	0	0	0	0	0	0	0
8.	0	0	0	0	0	0	0	0	0
9.	0	0	0	0	0	0	0	0	0

10.	0	0	0	0	0	0	0	0	0
11.	0	0	0	0	0	0	0	0	0
12.	0	0	0	0	0	0	0	0	0
Total:	0	0	0	0	0	0	0	0	0
Year:_____									
1.	0	0	0	0	0	0	0	0	0
2.	0	0	0	0	0	0	0	0	0
3.	0	0	0	0	0	0	0	0	0
4.	0	0	0	0	0	0	0	0	0
5.	0	0	0	0	0	0	0	0	0
6.	0	0	0	0	0	0	0	0	0
7.	0	0	0	0	0	0	0	0	0
8.	0	0	0	0	0	0	0	0	0
9.	0	0	0	0	0	0	0	0	0
10.	0	0	0	0	0	0	0	0	0
11.	0	0	0	0	0	0	0	0	0
12.	0	0	0	0	0	0	0	0	0
Total:	0	0	0	0	0	0	0	0	0
Year:_____									
1.	0	0	0	0	0	0	0	0	0
2.	0	0	0	0	0	0	0	0	0
3.	0	0	0	0	0	0	0	0	0
4.	0	0	0	0	0	0	0	0	0
5.	0	0	0	0	0	0	0	0	0
6.	0	0	0	0	0	0	0	0	0
7.	0	0	0	0	0	0	0	0	0
8.	0	0	0	0	0	0	0	0	0
9.	0	0	0	0	0	0	0	0	0
10.	0	0	0	0	0	0	0	0	0
11.	0	0	0	0	0	0	0	0	0
12.	0	0	0	0	0	0	0	0	0
Total:	0	0	0	0	0	0	0	0	0
Year:_____									
1.	0	0	0	0	0	0	0	0	0
2.	0	0	0	0	0	0	0	0	0
3.	0	0	0	0	0	0	0	0	0
4.	0	0	0	0	0	0	0	0	0
5.	0	0	0	0	0	0	0	0	0
6.	0	0	0	0	0	0	0	0	0
7.	0	0	0	0	0	0	0	0	0
8.	0	0	0	0	0	0	0	0	0
9.	0	0	0	0	0	0	0	0	0
10.	0	0	0	0	0	0	0	0	0
11.	0	0	0	0	0	0	0	0	0
12.	0	0	0	0	0	0	0	0	0
Total:	0	0	0	0	0	0	0	0	0
Year:_____									
1.	0	0	0	0	0	0	0	0	0
2.	0	0	0	0	0	0	0	0	0
3.	0	0	0	0	0	0	0	0	0
4.	0	0	0	0	0	0	0	0	0
5.	0	0	0	0	0	0	0	0	0
6.	0	0	0	0	0	0	0	0	0
7.	0	0	0	0	0	0	0	0	0
8.	0	0	0	0	0	0	0	0	0
9.	0	0	0	0	0	0	0	0	0
10.	0	0	0	0	0	0	0	0	0
11.	0	0	0	0	0	0	0	0	0
12.	0	0	0	0	0	0	0	0	0
Total:	0	0	0	0	0	0	0	0	0
Year:_____									
1.	0	0	0	0	0	0	0	0	0
2.	0	0	0	0	0	0	0	0	0
3.	0	0	0	0	0	0	0	0	0
4.	0	0	0	0	0	0	0	0	0
5.	0	0	0	0	0	0	0	0	0
6.	0	0	0	0	0	0	0	0	0
7.	0	0	0	0	0	0	0	0	0
8.	0	0	0	0	0	0	0	0	0
9.	0	0	0	0	0	0	0	0	0
10.	0	0	0	0	0	0	0	0	0
11.	0	0	0	0	0	0	0	0	0
12.	0	0	0	0	0	0	0	0	0
Total:	0	0	0	0	0	0	0	0	0

TOTAL VARIABLE COSTS
(Table 29)

Year/ Month	Function Storage	Function Processing	Function Marketing	Function	Total
1.	0	0	0	0	0
2.	0	0	0	0	0
3.	0	0	0	0	0
4.	0	0	0	0	0
5.	0	0	0	0	0
6.	0	0	0	0	0
7.	0	0	0	0	0
8.	0	0	0	0	0
9.	0	0	0	0	0
10.	0	0	0	0	0
11.	0	0	0	0	0
12.	0	0	0	0	0
Total:	0	0	0	0	0
Year:_____					
1.	0	0	0	0	0
2.	0	0	0	0	0
3.	0	0	0	0	0
4.	0	0	0	0	0
5.	0	0	0	0	0
6.	0	0	0	0	0
7.	0	0	0	0	0
8.	0	0	0	0	0
9.	0	0	0	0	0
10.	0	0	0	0	0
11.	0	0	0	0	0
12.	0	0	0	0	0
Total:	0	0	0	0	0
Year:_____					
1.	6,824	9,320	10,004	0	26,147
2.	6,817	9,315	10,004	0	26,135
3.	2,055	9,338	10,005	0	21,398
4.	4,108	9,335	10,012	0	23,454
5.	4,105	9,331	10,013	0	23,449
6.	4,096	9,321	10,002	0	23,420
7.	6,822	9,318	10,002	0	26,142
8.	6,824	9,320	10,004	0	26,147
9.	6,819	9,317	10,004	0	26,139
10.	6,834	9,326	10,012	0	26,172
11.	0	9,330	10,014	0	19,344
12.	0	9,331	10,017	0	19,348
Total:	55,304	111,902	120,092	0	287,297
Year:_____					
1.	6,827	9,321	10,007	0	26,155
2.	5,455	9,317	10,006	0	24,778
3.	2,055	9,340	10,006	0	21,401
4.	3,425	9,336	10,015	0	22,773
5.	3,763	9,331	10,017	0	23,111
6.	6,827	9,321	10,012	0	26,160
7.	6,822	9,320	10,008	0	26,150
8.	6,822	9,320	10,011	0	26,152
9.	6,822	9,320	10,011	0	26,152
10.	5,467	9,323	10,016	0	24,806
11.	0	9,325	10,017	0	19,341
12.	0	9,335	10,019	0	19,354
Total:	54,283	111,909	120,144	0	286,336
Year:_____					
1.	6,824	9,320	10,004	0	26,147
2.	6,817	9,315	10,004	0	26,135
3.	2,055	9,338	10,005	0	21,398
4.	4,108	9,335	10,012	0	23,454
5.	4,105	9,331	10,013	0	23,449
6.	4,096	9,321	10,002	0	23,420
7.	6,822	9,318	10,002	0	26,142
8.	6,824	9,320	10,004	0	26,147
9.	6,819	9,317	10,004	0	26,139
10.	6,834	9,326	10,012	0	26,172

11.	0	9,330	10,014	0	19,344
12.	0	9,331	10,017	0	19,348
Total:	55,304	111,902	120,092	0	287,297

Year:_____

1.	6,827	9,321	10,007	0	26,155
2.	5,455	9,317	10,006	0	24,778
3.	2,055	9,340	10,006	0	21,401
4.	3,425	9,336	10,015	0	22,776
5.	3,763	9,331	10,017	0	23,111
6.	6,827	9,321	10,012	0	26,160
7.	6,822	9,320	10,008	0	26,150
8.	6,822	9,320	10,011	0	26,152
9.	6,822	9,320	10,011	0	26,152
10.	5,467	9,323	10,015	0	24,806
11.	0	9,325	10,017	0	19,341
12.	0	9,335	10,019	0	19,354
Total:	54,283	111,909	120,144	0	286,336

Year:_____

1.	5,459	9,320	10,004	0	24,783
2.	5,453	9,315	10,004	0	24,772
3.	2,741	9,338	10,005	0	22,083
4.	4,108	9,335	10,012	0	23,454
5.	4,105	9,331	10,013	0	23,449
6.	4,096	9,321	10,002	0	23,420
7.	6,822	9,318	10,002	0	26,142
8.	6,824	9,320	10,004	0	26,147
9.	6,819	9,317	10,004	0	26,139
10.	6,834	9,326	10,012	0	26,172
11.	0	9,330	10,014	0	19,344
12.	0	9,331	10,017	0	19,348
Total:	53,261	111,902	120,092	0	285,254

Year:_____

1.	6,827	9,321	10,007	0	26,155
2.	5,455	9,317	10,006	0	24,778
3.	2,055	9,340	10,006	0	21,401
4.	3,425	9,336	10,015	0	22,776
5.	3,763	9,331	10,017	0	23,111
6.	6,827	9,321	10,012	0	26,160
7.	6,822	9,320	10,008	0	26,150
8.	6,822	9,320	10,011	0	26,152
9.	6,822	9,320	10,011	0	26,152
10.	5,467	9,323	10,015	0	24,806
11.	0	9,325	10,017	0	19,341
12.	0	9,335	10,019	0	19,354
Total:	54,283	111,909	120,144	0	286,336

Year:_____

1.	5,459	9,320	10,004	0	24,783
2.	5,453	9,315	10,004	0	24,772
3.	2,741	9,338	10,005	0	22,083
4.	4,108	9,335	10,012	0	23,454
5.	4,105	9,331	10,013	0	23,449
6.	4,096	9,321	10,002	0	23,420
7.	6,822	9,318	10,002	0	26,142
8.	6,824	9,320	10,004	0	26,147
9.	6,819	9,317	10,004	0	26,139
10.	6,834	9,326	10,012	0	26,172
11.	0	9,330	10,014	0	19,344
12.	0	9,331	10,017	0	19,348
Total:	53,261	111,902	120,092	0	285,254

Year:_____

1.	6,827	9,321	10,007	0	26,155
2.	5,455	9,317	10,006	0	24,778
3.	2,055	9,340	10,006	0	21,401
4.	3,425	9,336	10,015	0	22,776
5.	3,763	9,331	10,017	0	23,111
6.	6,827	9,321	10,012	0	26,160
7.	6,822	9,320	10,008	0	26,150
8.	6,822	9,320	10,011	0	26,152
9.	6,822	9,320	10,011	0	26,152
10.	3,827	9,323	10,015	0	23,166
11.	0	9,325	10,017	0	19,341
12.	0	9,335	10,019	0	19,354
Total:	52,643	111,909	120,144	0	284,696

Summary
FIXED COSTS
Annually

Year	Function	Function	Function	Function	Total
1.	0	0	0	0	0
2.	0	0	0	0	0
3.	62,484	71,246	106,006	0	239,736
4.	62,484	71,246	106,006	0	239,736
5.	62,484	71,246	106,006	0	239,736
6.	62,484	71,246	106,006	0	239,736
7.	62,484	71,246	106,006	0	239,736
8.	62,484	71,246	106,006	0	239,736
9.	62,484	71,246	106,006	0	239,736
10.	62,484	71,246	106,006	0	239,736
Total:	499,875	569,965	848,048	0	1,917,889

BUILDING AND EQUIPMENT MAINTENANCE
Variable Costs
(Table 23)

Function	Building Maint.	Aging Factor	Equip. Maint.	Aging Factor	Total
Storage	1,500	1.00	2,500	1.25	4,625
Product Volume					8,100
Product Volume Multiplier					0.571
Processing	1,500	1.00	5,000	1.25	7,750
Product Volume					7,920
Product Volume Multiplier					0.979
Marketing	1,000	1.00	10,000	1.25	13,500
Product Volume					5,700
Product Volume Multiplier					2.368
	0	0.00	0	0.00	0
Product Volume					0
Product Volume Multiplier					0.000

SUPPLIES AND MATERIALS
Variable Cost
(Table 24)

	Quantity Required	Price Per Unit	Total Cost
Function: Storage			
brooms	20	7.50	150
oil/lube	100	5.25	525
fumigant	100	13.50	1,350
----------	0	0.00	0
----------	0	0.00	0
----------	0	0.00	0
----------	0	0.00	0
----------	0	0.00	0
----------	0	0.00	0
----------	0	0.00	0
Total:			2,025
Product Volume			8,100
Cost to Volume Multiplier			0.250
Function: Processing			
oil/lube	100	5.25	525
Ing. 1	22	185.00	4,089
Ing. 2	40	75.00	3,000
----------	0	0.00	0
----------	0	0.00	0
----------	0	0.00	0
----------	0	0.00	0
----------	0	0.00	0
----------	0	0.00	0
----------	0	0.00	0
Total:			7,614
Product Volume			7,920
Cost to Volume Multiplier			0.961
Function: Marketing			
Bags	40,000	0.05	2,000
Bags	40,000	0.05	2,000
wrap	80	12.00	960
oil/lube	100	5.25	525
----------	0	0.00	0
----------	0	0.00	0
----------	0	0.00	0
----------	0	0.00	0
----------	0	0.00	0
----------	0	0.00	0
Total:			5,485
Product Volume			8,100
Cost to Volume Multiplier			0.677
Function: ----------			
----------	0	0.00	0
----------	0	0.00	0
----------	0	0.00	0
----------	0	0.00	0
----------	0	0.00	0
----------	0	0.00	0
----------	0	0.00	0
----------	0	0.00	0
----------	0	0.00	0
----------	0	0.00	0
Total:			0
Product Volume			7,920
Cost to Volume Multiplier			0.000

ANNUAL ENERGY USE
Variable Cost
(Table 25)

Function	Total Fuel Volume	Total kwh	Cost/Unit Fuel	Cost/Unit Power	Total Cost Fuel	Total Cost Power	Total Energy Costs
Storage	900	180,000	0.50	0.07	450	12,600	13,050
Product Volume							8,100
Cost to Volume Multiplier							1.611
Processing	1,200	540,000	0.50	0.07	600	37,800	38,400
Product Volume							7,920
Cost to Volume Multiplier							4.848
Marketing	6,000	110,000	0.50	0.07	3,000	7,700	10,700
Product Volume							5,700
Cost to Volume Multiplier							1.877
	0	0	0.00	0.00	0	0	0
Product Volume							0
Cost to Volume Multiplier							0.000

WAGES AND SALARIES
Variable Cost
(Table 26)

		Number Required	Total Annual Man-hours 2,080	Rate	Total Annual Cost
Function__Storage					
1.	Man I	2	4,160	4.00	16,640
2.	ManII	1	2,080	6.00	12,480
3.	----------	0	0	0.00	0
4.	----------	0	0	0.00	0
5.	----------	0	0	0.00	0
6.	----------	0	0	0.00	0
7.	----------	0	0	0.00	0
8.	----------	0	0	0.00	0
9.	----------	0	0	0.00	0
10.	----------	0	0	0.00	0
Total:					29,120
Product Volume					8,100
Cost to Volume Multiplier					3.595
Function__Processing					
1.	Man III	3	6,240	4.10	25,584
2.	Man IV	1	2,080	5.50	11,440
3.	Man V	1	2,080	7.00	14,560
4.	----------	0	0	0.00	0
5.	----------	0	0	0.00	0
6.	----------	0	0	0.00	0
7.	----------	0	0	0.00	0
8.	----------	0	0	0.00	0
9.	----------	0	0	0.00	0
10.	----------	0	0	0.00	0
Total					51,584
Product Volume					7,920
Cost to Volume Multiplier					6.513
Function__Marketing					
1.	Man VI	2	4,160	4.80	19,968
2.	Man VII	2	4,160	10.00	41,600
3.	----------	0	0	0.00	0
4.	----------	0	0	0.00	0
5.	----------	0	0	0.00	0
6.	----------	0	0	0.00	0
7.	----------	0	0	0.00	0
8.	----------	0	0	0.00	0
9.	----------	0	0	0.00	0
10.	----------	0	0	0.00	0
Total					61,568
Volume					5,700
Cost to Volume Multiplier					10.801
Function----------					
1.	----------	0	0	0.00	0
2.	----------	0	0	0.00	0
3.	----------	0	0	0.00	0
4.	----------	0	0	0.00	0
5.	----------	0	0	0.00	0
6.	----------	0	0	0.00	0
7.	----------	0	0	0.00	0
8.	----------	0	0	0.00	0
9.	----------	0	0	0.00	0
10.	----------	0	0	0.00	0
Total					0
Volume					0
Cost to Volume Multiplier					0.000

ANNUAL OTHER COSTS
Fixed Cost
(Table 27)

Function	Travel	Adver-tising	Enter-tainment	Other	Other	Other	Total
Storage	1,000	1,000	0	0	0	0	2,000
Product Volume							8,100
Product Volume Multiplier							0.247
Processing	1,000	0	0	0	0	0	1,000
Product Volume							7,920
Product Volume Multiplier							0.126
Marketing	5,000	15,000	5,000	0	0	0	25,000
Product Volume							5,700
Product Volume Multiplier							4.386
_____	0	0	0	0	0	0	0
Product Volume							0
Product Volume Multiplier							0.000

WORKING CAPITAL VARIABLE MATRICES

FILE 5 ANALYSIS

Funct Storage

Year	WD	Variable AP	M	RM	MV	GS	S	a	A	R	CD	C	PP	SM	SP
1.	0	0	0	0.0	0	0	0	0	0	0%	0.0	0	0	0	0%
2.	0	0	0	0.0	0	0	0	0	0	0%	0.0	0	0	0	0%
3.	312	149458	577	25.4	1532440	0	0	0	0	0%	30.0	106705	11083	2025	30%
4.	312	146812	648	25.4	1720560	0	0	0	0	0%	30.0	105685	11083	2025	30%
5.	312	149458	787	25.4	2040590	0	0	0	0	0%	30.0	106705	11083	2025	30%
6.	312	146812	858	25.4	2280000	0	0	0	0	0%	30.0	105685	11083	2025	30%
7.	312	149458	697	25.4	1853100	0	0	0	0	0%	30.0	106705	11083	2025	30%
8.	312	146812	768	25.4	2040120	0	0	0	0	0%	30.0	105685	11083	2025	30%
9.	312	149458	607	25.4	1613180	0	0	0	0	0%	30.0	106705	11083	2025	30%
10.	312	146812	618	25.4	1638210	0	0	0	0	0%	30.0	104044	11083	2025	30%

Funct Processing

Year	WD	Variable AP	M	RM	MV	GS	S	a	A	R	CD	C	PP	SM	SP
1.	0	0	0	0	0	0	0	0	0	0%	0	0	0	0	0%
2.	0	0	0	0	0	0	0	0	0	0%	0	0	0	0	0%
3.	312	0	0	0	0	0	0	0	0	0%	30	167028	16120	7614	30%
4.	312	0	0	0	0	0	0	0	0	0%	30	167034	16120	7614	30%
5.	312	0	0	0	0	0	0	0	0	0%	30	167028	16120	7614	30%
6.	312	0	0	0	0	0	0	0	0	0%	30	167034	16120	7614	30%
7.	312	0	0	0	0	0	0	0	0	0%	30	167028	16120	7614	30%
8.	312	0	0	0	0	0	0	0	0	0%	30	167034	16120	7614	30%
9.	312	0	0	0	0	0	0	0	0	0%	30	167028	16120	7614	30%
10.	312	0	0	0	0	0	0	0	0	0%	30	167034	16120	7614	30%

Funct Marketing

Year	WD	Variable AP	M	RM	MV	GS	S	a	A	R	CD	C	PP	SM	SP
1.	0	0	0	0	0	0	0	0	0	0%	0	0	0	0	0%
2.	0	0	0	0	0	0	0	0	0	0%	0	0	0	0	0%
3.	312	0	0	0	0	0	0	42	2440765	50%	30	211311	14787	5485	30%
4.	312	0	0	0	0	0	0	42	2460323	50%	30	211362	14787	5485	30%
5.	312	0	0	0	0	0	0	42	2440765	50%	30	211311	14787	5485	30%
6.	312	0	0	0	0	0	0	42	2460323	50%	30	211362	14787	5485	30%
7.	312	0	0	0	0	0	0	42	2440765	50%	30	211311	14787	5485	30%
8.	312	0	0	0	0	0	0	42	2460323	50%	30	211362	14787	5485	30%
9.	312	0	0	0	0	0	0	42	2440765	50%	30	211311	14787	5485	30%
10.	312	0	0	0	0	0	0	42	2467223	50%	30	211362	14787	5485	30%

Function:

Year	WD	Variable AP	M	RM	MV	GS	S	a	A	R	CD	C	PP	SM	SP
1.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 9
Budgeted Working Capital Requirements

Function	1.		2.		3.		4.		Total
Period	Total Usage	Needed Increase	Total Usage	Needed Increase	Total Usage	Needed Increase	Total Usage	Needed Increase	Need
1.	0	0	0	0	0	0	0	0	0
2.	0	0	0	0	0	0	0	0	0
3.	282377	282377	34465	34465	201033	201033	0	0	517875
4.	308745	26368	34465	0	202354	1321	0	0	27689
5.	374057	65312	34465	0	201033	0	0	0	65312
6.	415515	41458	34465	0	202354	1321	0	0	42779
7.	334392	0	34465	0	201033	0	0	0	0
8.	366375	31983	34465	0	202354	1321	0	0	33304
9.	294970	0	34465	0	201033	0	0	0	0
10.	296259	1289	34465	0	202819	1786	0	0	3075
		448787		34465		206782		0	690034

File Combine Area

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1. Fixed Capital Investment

Period	PRECONSTRUCTION EXPENSE Function 1.	2.	3.	4.	Total	LAND AND BUILDINGS INVESTMENT Function 1.	2.	3.	4.	Total
1.	10929	10929	20196	0	42054	16154	16154	3993	0	36301
2.	0	0	0	0	0	365959	743622	144254	0	1253835
3.	0	0	0	0	0	0	0	0	0	0
4.	0	0	0	0	0	0	0	0	0	0
5.	0	0	0	0	0	0	0	0	0	0
6.	0	0	0	0	0	0	0	0	0	0
7.	0	0	0	0	0	0	0	0	0	0
8.	0	0	0	0	0	0	0	0	0	0
9.	0	0	0	0	0	0	0	0	0	0
10.	0	0	0	0	0	0	0	0	0	0

****

2. Product Revenues

Period	PRODUCT REVENUES Function 1.	2.	3.	4.	Total	BY-PRODUCT REVENUEWS Function 1.	2.	3.	4.	Total
1.	0	0	0	0	0	0	0	0	0	0
2.	0	0	0	0	0	0	0	0	0	0
3.	86,600	346,055	191,425	0	624080	0	54,060	9,805	0	63865
4.	87,510	364,315	182,875	0	634700	0	54,272	16,801	0	71073
5.	86.180	346,055	191,425	0	623660	0	54,060	9,805	0	63865
6.	87,930	364,315	182,875	0	635120	0	54,272	16,801	0	71073
7.	82,260	346,055	191,425	0	619740	0	54,060	9,805	0	63865
8.	87,750	364,315	182,875	0	634940	0	54,272	16,801	0	71073
9.	82,440	346,055	191,425	0	619920	0	54,060	9,805	0	63865
10.	86,610	364,315	182,875	0	633800	0	54,272	16,801	0	71073

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3. Variable Costs

Period	VARIABLE COSTS Function 1.	2.	3.	4.	Total
1.	0	0	0	0	0
2.	0	0	0	0	0
3.	55304	111902	120092	0	287297
4.	54283	111909	120144	0	286336
5.	55304	111902	120092	0	287297
6.	54283	111909	120144	0	286336
7.	53261	111902	120092	0	285254
8.	54283	111909	120144	0	286336
9.	53261	111902	120092	0	285254
10.	52643	111909	120144	0	284696

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4. Fixed Costs

Period	FIXED COSTS Function 1.	2.	3.	4.	Total
1.	62484	71246	106006	0	239736
2.	62484	71246	106006	0	239736
3.	62484	71246	106006	0	239736
4.	62484	71246	106006	0	239736
5.	62484	71246	106006	0	239736
6.	62484	71246	106006	0	239736
7.	62484	71246	106006	0	239736
8.	62484	71246	106006	0	239736
9.	62484	71246	106006	0	239736
10.	62484	71246	106006	0	239736

EQUIPMENT INVESTMENT					MISCELLANEOUS CAPITAL OUTLAY EXPENDITURES				
Function					Function				
1.	2.	3.	4.	Total	1.	2.	3.	4.	Total
0	0	0	0	0	0	12100	19800	0	31900
144154	242019	254093	0	640266	0	19800	24200	0	44000
0	0	0	0	0	0	7700	0	0	7700
0	0	0	0	0	0	0	0	0	0
0	0	12880	0	12880	0	0	0	0	0
0	0	23000	0	23000	0	0	0	0	0
0	0	12880	0	12880	0	0	0	0	0
0	0	135700	0	135700	0	0	0	0	0
0	0	35880	0	35880	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0

OTHER REVENUES

Revenues	Purchases	Net
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0

SUMMARY OF CAPITAL COST, INCOME, AND EXPENSE
Function Totals:

Period	A	B	C	D	Total I	E	Total II	F	G	H	Total III	I	J	Total IV
1 1988	42054	36301	0	31900	110255	0	0	0	0	0	0	0	0	0
2 1989	0	1253835	398247	44000	1696082	0	0	0	0	0	0	0	0	0
3 1990	0	0	0	7700	7700	517875	517875	432655	54060	0	486715	287297	239736	527033
4 1991	0	0	0	0	0	27689	27689	451825	54272	0	506097	286336	239736	526072
5 1992	0	0	12880	0	12880	65312	65312	432235	54060	0	486295	287297	239736	527033
6 1993	0	0	23000	0	23000	42779	42779	452245	54272	0	506517	286336	239736	526072
7 1994	0	0	12880	0	12880	0	0	428315	54060	0	482375	285254	239736	524990
8 1995	0	0	135700	0	135700	33304	33304	452065	54272	0	506337	286336	239736	526072
9 1996	0	0	35880	0	35880	0	0	428495	54060	0	482555	285254	239736	524990
10 1997	0	0	0	0	0	3075	3075	450925	54272	0	505197	284696	239736	524432

Sensitivity Analysis

Period	A	B	C	D	Total I	E	Total II	F	G	H	Total III	I	J	Total IV
Percent														
Original	75.0%	75.0%	75.0%	75.0%		75.0%		110.0%	110.0%	100.0%		75.0%	75.0%	
Recovery	100.0%	66.7%	66.7%	66.7%		66.7%								
1 1988	31541	27226	0	23925	82692	0	0	0	0	0	0	0	0	0
2 1989	0	940376	298685	33000	1272061	0	0	0	0	0	0	0	0	0
3 1990	0	0	0	5775	5775	388406	388406	475921	59466	0	535387	215473	179802	395275
4 1991	0	0	0	0	0	20767	20767	497008	59699	0	556707	214752	179802	394554
5 1992	0	0	9660	0	9660	48984	48984	473459	59466	0	534925	215473	179802	395275
6 1993	0	0	17250	0	17250	32084	32084	497470	59699	0	557169	214752	179802	394554
7 1994	0	0	9660	0	9660	0	0	471147	59466	0	530613	213941	179802	393743
8 1995	0	0	101775	0	101775	24978	24978	497272	59699	0	556971	214752	179802	394554
9 1996	0	0	26910	0	26910	0	0	471345	59466	0	530811	213941	179802	393743
10 1997	0	0	0	0	0	2306	2306	496018	59699	0	555717	213522	179802	393324
11 1998	-31541	-845391	-309448	-41821	-1028200	-345189	-345189	0	0	0	0	0	0	0

A = Preconstruction expense
B = Land and buildings
C = Equipment
D = Other
Total I = Total fixed investment
E = Working capital
Total II = Total investment
F = Product revenue
G = By-product revenue
Total III = Total revenue
H = Variable operating cost
I = Fixed operating cost
Total IV = Total operating cost
Total V = Net income (Total revenue - Total operating cost)

SUMMARY OF CAPITAL COST, INCOME, AND EXPENSE
Function: 1

Period	A	B	C	D	Total I	E	Total II	F	G	H	Total III	I	J	Total IV
1 1988	10929	16154	0	0	27083	0	0	0	0	0	0	0	0	0
2 1989	0	365959	144154	0	510113	0	0	0	0	0	0	0	0	0
3 1990	0	0	0	0	0	282377	282377	86600	0	0	86600	55304	62484	117788
4 1991	0	0	0	0	0	26368	26368	87510	0	0	87510	54283	62484	116768
5 1992	0	0	0	0	0	65312	65312	86180	0	0	86180	55304	62484	117788
6 1993	0	0	0	0	0	41458	41458	87930	0	0	87930	54283	62484	116768
7 1994	0	0	0	0	0	0	0	82260	0	0	82260	53261	62484	115745
8 1995	0	0	0	0	0	31983	31983	87750	0	0	87750	54283	62484	116768
9 1996	0	0	0	0	0	0	0	82440	0	0	82440	53261	62484	115745
10 1997	0	0	0	0	0	1289	1289	86610	0	0	86610	52643	62484	115127

SUMMARY OF CAPITAL COST, INCOME, AND EXPENSE
Function: 2

0

Period	A	B	C	D	Total I	E	Total II	F	G	H	Total III	I	J	Total IV
1 1988	10929	16154	0	12100	39183	0	0	0	0	0	0	0	0	0
2 1989	0	743622	254093	19800	1017515	0	0	0	0	0	0	0	0	0
3 1990	0	0	0	7700	7700	34465	34465	346055	54060	0	400115	111902	71246	183148
4 1991	0	0	0	0	0	0	0	364315	54272	0	418587	111909	71246	183154
5 1992	0	0	12880	0	12880	0	0	346055	54060	0	400115	111902	71246	183148
6 1993	0	0	23000	0	23000	0	0	364315	54272	0	418587	111909	71246	183154
7 1994	0	0	12880	0	12880	0	0	346055	54060	0	400115	111902	71246	183148
8 1995	0	0	135700	0	135700	0	0	364315	54272	0	418587	111909	71246	183154
9 1996	0	0	35880	0	35880	0	0	346055	54060	0	400115	111902	71246	183148
10 1997	0	0	0	0	0	0	0	364315	54272	0	418587	111909	71246	183154

SUMMARY OF CAPITAL COST, INCOME, AND EXPENSE
Function: 3

Period	A	B	C	D	Total I	E	Total II	F	G	H	Total III	I	J	Total IV
1 1988	20196	3993	0	19800	43989	0	0	0	0	0	0	0	0	0
2 1989	0	144254	0	24200	168454	0	0	0	0	0	0	0	0	0
3 1990	0	0	0	0	0	201033	201033	0	0	0	0	120092	106006	226098
4 1991	0	0	0	0	0	1321	1321	0	0	0	0	120144	106006	226150
5 1992	0	0	0	0	0	0	0	0	0	0	0	120092	106006	226098
6 1993	0	0	0	0	0	1321	1321	0	0	0	0	120144	106006	226150
7 1994	0	0	0	0	0	0	0	0	0	0	0	120092	106006	226098
8 1995	0	0	0	0	0	1321	1321	0	0	0	0	120144	106006	226150
9 1996	0	0	0	0	0	0	0	0	0	0	0	120092	106006	226098
10 1997	0	0	0	0	0	1786	1786	0	0	0	0	120144	106006	226150

SUMMARY OF CAPITAL COST, INCOME, AND EXPENSE
Function: 4

Period	A	B	C	D	Total I	E	Total II	F	G	H	Total III	I	J	Total IV
1 1988	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2 1989	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3 1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4 1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6 1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7 1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9 1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10 1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Summary File for Phillips IRR

1	1988	31541	27226	0	23925	0	0	0	0
2	1989	0	940376	298685	33000	0	0	0	0
3	1990	0	0	0	5775	388406	475921	59466	0
4	1991	0	0	0	0	20767	497008	59699	0
5	1992	0	0	9660	0	48984	475459	59466	0
6	1993	0	0	17250	0	32084	497470	59699	0
7	1994	0	0	9660	0	0	471147	59466	0
8	1995	0	0	101775	0	24978	497272	59699	0
9	1996	0	0	26910	0	0	471345	59466	0
10	1997	0	0	0	0	2306	496018	59699	0
1	1988	0	0						
2	1989	0	0						
3	1990	215473	179802						
4	1991	214752	179802						
5	1992	215473	179802						
6	1993	214752	179802						
7	1994	213941	179802						
8	1995	214752	179802						
9	1996	213941	179802						
10	1997	213522	179802						

INVESTMENT FEASIBILITY ANALYSIS

IRR ANALYSIS

INTERNAL RETURN ON TOTAL CAPIT 3.960%
Guess Range 10.00%

NO	IDENT	INVESTMENT (DOLLARS) FACILITIES	WORKING CAPITAL	TOTAL	OPERATING (DOLLARS) TOTAL REVENUE	OPERATING EXPENSES	NET REVENUES	PRESENT VALUE FACTOR	PRESENT VALUE TOTAL INVESTMENT	NET REVENUE
1	1988	82692	0	82692	0	0	0	0.9619	79542	0
2	1989	1272061	0	1272061	0	0	0	0.9253	1176990	0
3	1990	5775	388406	394181	535387	395275	140112	0.8900	350827	124702
4	1991	0	20767	20767	556707	394554	162153	0.8561	17779	138821
5	1992	9660	48984	58644	534925	395275	139650	0.8235	48293	115001
6	1993	17250	32084	49334	557169	394554	162615	0.7921	39079	128812
7	1994	9660	0	9660	530613	393743	136870	0.7620	7360	104288
8	1995	101775	24978	126753	556971	394554	162417	0.7329	92901	119040
9	1996	26910	0	26910	530811	393743	137068	0.7050	18972	96634
10	1997	0	2306	2306	555717	393324	162393	0.6781	1564	110127
11	1998	-1028200	-345189	-1373390	0	0	0	0.6523	-895803	0
TOTAL		497583	172336	669918	4358300	3155022	1203278		937424	937424

INTEREST PER CENT	BENEFIT/COST RATIO	PRESENT VALUE IN DOLLARS REVENUES	OUTLAY	BALANCE
5.0%	0.897	880455	981334	-100879
10.0%	0.603	661269	1096089	-434820
15.0%	0.456	508224	1113392	-605168
25.0%	0.308	319331	1031926	-713595
35.0%	0.233	212523	910917	-698394
50.0%	0.171	126941	743812	-616871

APPENDIX III

USER ASSISTANCE

Any questions by users are to be directed to:

Roe Borsdorf
or
Maurice Baalman
Kansas State University
Food and Feed Grains Institute
Shellenberger Hall, Room 203
Manhattan, Kansas 66506

If the user wishes a computer disk containing the files and tables shown in Appendix II, please direct inquiries to the above individuals.