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ABSTRACT

This research used a linear programming model of the agricultural and energy sectors of Utah to examine the economically efficient allocation of water between agriculture and energy. Data were collected for agricultural returns, costs, and water requirements; energy returns, costs, and water requirements; and water supply costs. Results indicate that if large scale energy development occurs in the Colorado River Basin in Utah, most of irrigated agriculture will be eliminated, given Utah's consumptive use constraint under the Upper Colorado River Compact. On the other hand, for two more "probable" levels of energy development, including the Energy Research and Development Administration's projections for the year 2000, only minor reductions in irrigated acreages would be expected. Under conditions of severe, prolonged drought, energy demands would consume almost all the water currently used in agriculture, given either of the "probable" scenarios.

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TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

LIST OF FIGURES

LIST OF TABLES

LIST OF TABLES (CONTINUED)

LIST OF TABLES (CONTINUED)

LIST OF TABLES (CONTINUED)

THE IMPACT OF ENERGY RESOURCE DEVELOPMENT ON WATER RESOURCE ALLOCATIONS

Introduction

Utah contains relatively large deposits of energy resources, including crude petroleum, natural gas, coal, oil shale, and tar sands. The development of these resources to produce crude petroleum, natural and synthetic gas, synthetic crude oil, and electrical power has been discussed as a potential way in which to partially alleviate the impact of energy demand exceeding domestic supply. However, development of each of the energy resources will require relatively large amounts of water for production and/or cooling. Given that Utah's energy resources are found mostly in the Colorado River Basin and that water rights to most of Utah's portion of the Colorado River are currently allocated or applied for mainly for agriculture, the potential effects of energy development on water allocations among uses is of great interest to Utah water users and administrators. The research reported herein is an attempt to analyze impacts of selected range of energy developments.

The Region and Problem

Utah has been divided into ten hydrologic study units (HSU's), each of which comprises a major drainage system (see Figure 1). Within each of these units, water demands have been divided into four major uses (agricultural, municipal, industrial, and wetland). The water resources of these units are interrelated either by natural drainage patterns or by proposed inter-basin transfers, such as the Central Utah Project. The eastern hydrologic units, Uintah (7), West Colorado (8), South and East Colorado (9), and Lower Colorado (10) units, drain into the Colorado River, and are part of the Upper Colorado River Basin. The western units, Great Salt Lake Desert (1), Bear River (2), Weber River (3), Jordan River (4), Sevier River (5), and Cedar-Beaver (6) units are in the Great Basin. The first four units drain into the Great Salt Lake Basin. Utah does contain a small, sparsely populated hydrologic unit which drains into the Snake River of the Columbia River Basin, but the size and isolation of that unit is such that the study ignores its effects on Utah water planning (Division of Water Resources, 1970).

The water planning agencies are faced with water allocation problems as a result of both physical and institutional constraints. Many of the HSU's are physically water-short in the sense that all otherwise feasible economic developments cannot take place given the in-basin water supplies. Water transfers from one HSU to another may provide for additional development of some water-short areas. Allocations between uses are critical in these areas.

The major institutional constraints are imposed by Colorado River and Upper Colorado River Basin Compacts. The Colorado River Compact requires that an average of 7,550,000 acre feet per year flow out from the Upper Colorado Basin states of Wyoming, Utah, Colorado, and New Mexico. The Upper Colorado River Basin states have allocated the remaining flow in the Colorado River water among themselves. Utah's portion of the flow is 1,532,000 acre feet. Thus, the water

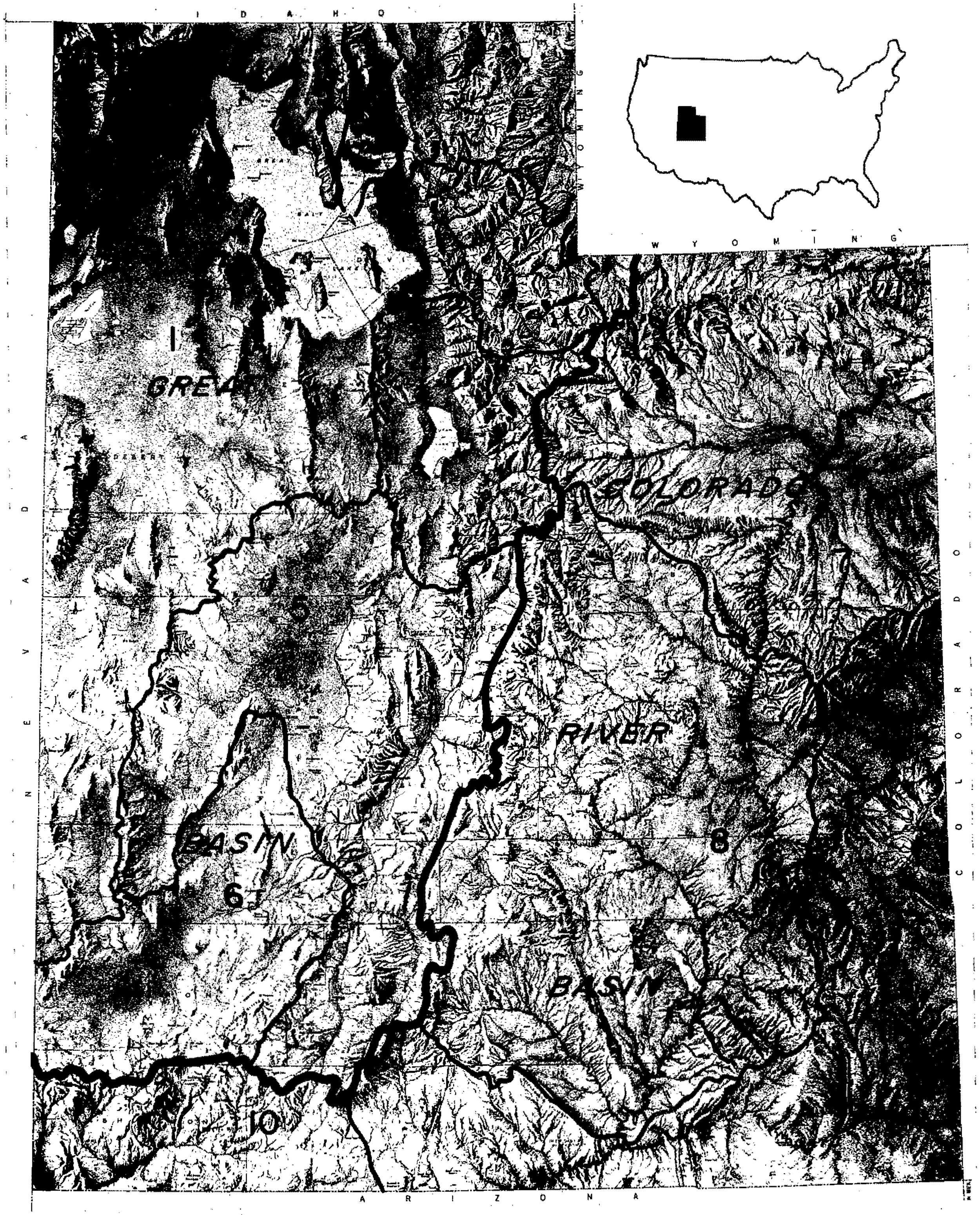

Figure 1. Map of hydrologic study units of Utah.

use in the Colorado River Basin in Utah, plus any transfers from the Colorado River to other HSU's in Utah, must not exceed 1,532,000 acre feet in an average water year. Since all of Utah's water rights have been filed on by various water users, the reallocation among users and HSU's may become more critical as Utah's growth continues. Given the large potential water use in the production of various forms of energy, the reallocation of water rights is of paramount consideration.

For this study, the demands for water in each HSU have been divided into four categories: agricultural, municipal and industrial (M&I), energy, and wetlands. Agricultural demand arises from the application of water to produce crops and livestock. M&I demand is a conglomerate of the requirements for culinary, industrial, and other urban uses. Energy demands are based upon the requirements are extraction, processing, and cooling associated with the various kinds of energy resource development and production currently under consideration in Utah with the exception of low head hydropower. Environmental requirements are less precisely defined, but include recreation, aesthetics, waste sink, and wetlands uses; much of the water is wastewater or agricultural runoff which collects in marshes, lakes, and other areas. This category is termed wetland demand. The allocation of water among these various demands in all HSU's is a major problem in state policy. This study provides some of the information on which to base those allocation decisions.

Study Objectives

The study was undertaken to examine the economically efficient allocation of water among uses in Utah, given various assumptions about water availability, current use, and energy development. Economic efficiency may not be the only goal of water planning, however. For example, distribution of income, maintenance of the agricultural sector, and minimization of social impacts and public finance problems may be part of the planning objectives. Thus, results from this model must be evaluted with the study limitations in mind.

Several sub-objectives were identified as part of the study.

1. To determine the optimum water use patterns for the agricultural and energy sectors independently;

2. To determine the optimum water use pattern for a combined agricultural and special energy sectors; and

3. To examine the effects on water allocations in both sectors given various alternatives for energy development.

Procedure

The steps required to perform the analysis were: first, to establish a theoretical approach to the analysis; second, to formulate a linear programming model to conform with the theoretical model; and third, to analyze the results of the programming model for alternative assumptions.

The Theoretical Model

A graphical discussion of the theory of allocation of a resource among users with different demands may be found in Keith et al. (1973). For economic efficiency net returns are maximized subject to the availability of the resource. For this application, mathematically:[1]

[1]The notation used for the theoretical model, and Figures 2 and 3 are meant to be consistent with the programming structure on pages - .

$$\text{Maximize} \sum_{v=1}^{B} \sum_{r=1}^{N} (R_v^r W_v^r - C_v^r W_v^r)$$

$$\text{Subject to} \sum_{v=1}^{B} \sum_{r=1}^{N} W_v^r \leq WT^r$$

in which

W_v^r is water used by the vth activity in the rth HSU;

$R_{v,n}$ is the return (or revenue) function for the use of water for the vth use in the rth region;

$C_{v,r}$ are the cost functions for the vth use in the rth region, and WT^r is the maximum water availability in the rth region.

The maximum can be found by forming the Lagarangian function, differentiating, and setting the differential equal to zero.

$$L = \sum_{v=1}^{B} \sum_{r=1}^{N} (R_v^r W_v^r - C_v^r W_v^r) - \lambda_{ij} \sum_{v=1}^{B} \sum_{r=1}^{N} W_v^r - \sum_{r=1}^{N} WT^r$$

$$\frac{\partial L}{\partial W_v^r} = \frac{\partial \sum_{v=1}^{B} \sum_{r=1}^{N} (R_v^r W_v^r - C_v^r W_v^r)}{\partial W_v^r} - \lambda_v^r \frac{\partial \left(\sum_{v=1}^{B} \sum_{r=1}^{N} - \sum_{r=1}^{N} WT^r \right)}{\partial W_v^r} = 0$$

$$\frac{\partial \sum_{v=1}^{B} \sum_{r=1}^{N} (R_v^r W_v^r - C_v^r W_v^r)}{\partial W_v^r} = \lambda_v^r$$

The result indicates that at the optimum the marginal revenues must be equal among uses within a given region and equal to marginal cost. In addition, if water is transferred from one region to another, marginal revenues net of transportation costs in the receiving region must be as high or higher than those in the supplying region for the transfer to be efficient. This efficiency condition applies to natural, zero-cost transfers, such as outflows to downstream areas, as well as to structurally implemented transfers. Clearly, if water availability is limited, those users who generate the greatest marginal net revenue should obtain the resources.

The effects of institutional structure and other constraints can also be examined using the theory. First, the most efficient allocation would occur in a perfectly competitive market for water or water rights, in that the uses which generate the greater net revenue could purchase the water or water rights held by low-net-revenue users. However, if restrictions were placed on minimal outflows (or other transfers) from region to region, or if the water rights market were restricted, allocations other than the most efficient will result. Using the classical programming approach, net returns will still be maximized subject to the additional constraints. The constrained allocations can be compared to the unconstrained case in order to examine foregone marginal net returns attributable to the institutional constraints. The critical problem in the analysis is to formulate the empirical models to conform to the classical optimization approach which uses revenue and cost functions.

The Linear Programming Model

The empirical model is formulated as using a linear programming approach because previous modeling is available and because a direct estimation of supply and demand curves is infeasible due to data lacks. Each category of water users (agriculture, M&I, energy, and environmental) is taken into account in the programming model. However, water uses in two categories are treated as fixed requirements. These sectors are municipal and industrial uses, exclusive of energy, and wetland maintenance. The demands for M&I uses are relatively inelastic and the amount of water used in this sector constitutes a very small fraction of the total water use. Therefore, treating the water use in M&I as a requirement should introduce negligible distortions in resource allocation. The demand for water for M&I uses, then, is assumed to be perfectly inelastic.

The wetland water uses in the state were previously described. These wetlands are often habitat for various game and non-game species. Generally, the quality of water going for this use is poor, and may be unsuitable or undesirable for other uses. In addition, any attempt to reallocate water to other users could invite serious criticism from environmentalists and other pressure groups. In view of this institutional constraint, the quantity of water for wetlands also is treated as a requirement, with a perfectly inelastic demand.

Current M&I requirements are subtracted from total water availability for the sources which are currently used by municipalities and industrial water systems in each HSU. Population growth, and the concommitant increase in water use, has been ignored in the study for two reasons. First, additional water requirements are expected to be relatively small within the foreseeable future, except for the Wasatch Front (HSU's 3 and 6). Analyses of water transfers to the front have already been completed (Keith et al., 1973), and the economically efficient allocations suggest that the increased M&I use along the Wasatch Front can be met from locally available sources. Second, the impact of energy development will be the major contributor to population growth in the relevant HSU's. Wetland requirements, however, are explicitly included in the model and can be supplied from any source. Current depletions will be allocated to wetlands in such a way as to maximize the return to water use in agriculture and energy.

The model is essentially in three parts: the agricultural sector, the energy sector, and the water supply sector. The water supply sector consists of water availability and the costs of delivering available water to the user. It does not include treatment or distribution costs for particular uses. For example, on-farm distribution costs are not included in the supply model. Water costs are separated into two categories: presently developed water sources which have only operation and maintenance costs, and new water developments, which incorporate an average cost for development. The assessment for annualized investment charges on an average per acre foot basis does not conform to marginal cost pricing. However, much of the pricing of water delivery for new developments is based on average-cost-pricing, so that the model results will conform reasonably well to current practice. The water supply model for the rth region is represented in Figure 2.

Several alternatives, such as recharge of aquifers, are not included in the diagram, but are included in the model. A description may be found in Keith et al. (1973). Detailed variable and constraint descriptions are listed in Appendix A. The supply model can generate supply curves by parameterizing incrementally increasing water use given a minimum cost objective function. As water requirements increase. the lower cost water sources are exhausted and higher cost sources

	Surface Water		Groundwater		Transfers		Outflow		Total Availability
	Present	New	Present	New	In	Out	In	Out	
	C_{pis}	C_{Nis}	C_{pig}	C_{Nig}	C_{Tmi}				
Surface Water	LSW_i				LSW_m + SW_i	LSW_j - SW_j	$+ OF_{smi}$	$-OF_{sij}$	Σ
Groundwater			LGW_i				$+ OF_{gmi}$	$-OF_{gij}$	Σ
Right Hand Side (Limits)	Maximum LSW_i		Maximum LGW_i		Maximum Transfers In	Maximum Transfers Out	Minimum Outflow In	Minimum Outflow Out	

C is cost where
- p = presently developed
- N = new developments
- i,m,d = region
- s = surface
- g = groundwater
- T = transferred water
- OF = outflow
- LSW = locally produced surface water
- LGW = locally produced groundwater
- $LSW_j SW_m$ = water transferred from surface water in region j to surface water in region m

Note: no water transfer facilitates for groundwater is considered in the model, since more is currently planned.

Figure 2. Water supply submodel.

are used until the highest cost source is exhausted. Further, institutional constraints on water use, such as limits on groundwater pumping or minimum outflow requirements, can be easily modeled by changing the limits for any variable or sums of variables [using the "bounds" or right-hand-side (RHS), respectively].

The water demand for the energy and agricultural sectors are generated indirectly within the model by the use of activity analysis. Both sectors are modeled as HSU-wide, multiproduct firms. The outputs are sold in reasonably competitive markets, so that the total revenue from production is assumed to be a linear function of the prices. The supply of labor and capital are assumed to be perfectly elastic and have fixed proportions to the outputs. The value added in agricultural sector accrues to water and land. Varying returns to quality of land are incorporated by specifying productivities for different classes of land. The value added in energy accrues to water and the energy resource. Figure 3 is an illustration of the water demand model.

The agricultural sub-model is a profit-maximizing model which involves alternative crops and rotations for land classes of varying productivity. Note that net revenue (R_1) is total revenue (price times quantity) for each crop less all variable costs associated with crop production, by crop and land class, excluding water costs. These costs include an "average" component, made up of costs which are incurred irrespective of the amount and/or type of crop produced, such as leveling, clearing, and fertilization, and a "variable" component which varies with amount and type of output, such as harvesting costs and transport costs. The "RHS" limits the amount of land available by land class, including the amount of currently irrigated land, and potentially irrigable land which is either currently dry-farmed or out of production.

The energy sub-model is quite similar to the agriculturalsub-model. The returns, R_3, are gross returns net of all variable costs of production, except water costs, for each energy product. The energy sector includes extraction, conversion, and transportation of the energy materials as principal activities. The right-hand sides limit both the resource availability, by type, and the plant capacities, by type, so that efficiencies of production can be estimated with respect to plant capacities. The amount of water required for each activity on the energy and agriculture sectors is assumed constant per unit of output from that activity. In addition, increased M&I requirements associated with popular changes due to energy development are included. These requirements can be satisfied from any source, just as the wetland requirements.

The "b" vector in each model represents restrictions on production activities for both energy and agriculture. For example, certain crops may be limited to specific land classes in a given HSU, or be excluded from production in some HSU's. Limits on the production of specific energy products may be imposed by demand, transportation, capacity, or other constraints.

Demand curves for water for agriculture and energy can be derived from each of these models by incrementally reducing (parameterizing) the water availability. For any level of water availability, the shadow price for water is equivalent to the net return of the marginal product for a particular sector at a particular level of water use.

The water supply and the two demand sub-models are linked by including water costs in the objective function of the programming model, and using the availabilities by source

$R_{.1}$[a] Net Revenue to Ag. (Net of Av. variable cost of production)	$R_{.2}$ Variable Water Costs to Ag.	$R_{.3}$ Net Revenue to Energy (Net of Av. variable costs of energy products production)	$R_{.4}$ Variable Water Costs to Energy	"b vector" RHS
X_{11} Ag Production Activities	WA_{22} Variable Water Activities (Water Supplied to Ag.)	Y_{13} Energy Production Activities	WE_{24} Variable Water Activities (Water Supplied to Energy)	
X_{21} Ag. Water Requirements		Y_{23} Energy Water Requirements		WT_2 Water Availability
X_{31} Land Inputs		Y_{33} Energy Resource Inputs		X_3 and I_3 Land & Energy Resource Availability
X_{41} Rotation Constraints		Y_3 Efficiency of Conversion Process from Raw to Final Energy Products		I_4 Energy Product Plant Capacity

[a]Capital letters refer to vectors or matrices of coefficients.

Figure 3. Illustrative linear programming model for energy and agricultural scenarios.

to define RHS's for water. Production requirements determine the water costs, and therefore, net profit. Since all the constraints have been constructed as either linear or strictly convex, a separable programming approach will generate a global optimum. The solution to this linear programming problem yields water allocation among users that satisfy economic efficiency criteria. The difference between the optimal allocation and present water use in each sector suggest the water transfers that would take place if water rights are allowed to be freely marketed. In addition, the returns to agricultural land, reflecting land quality and the marginal product of water, are indicated by shadow prices which are indicated (values of the dual variables). The model results indicate economically efficient energy development, including mining, transportation of raw energy materials to specific existing or proposed plant sites for conversion, and production of final energy products.

The mathematical structure of the programming model is as follows:

$$\text{Max. } Z = \sum_{i=1}^{L} \sum_{j=1}^{M} \sum_{r=1}^{N} b_{ij}^{r} X_{ij}^{r}$$

(net crop revenue)

$$- \sum_{q=1}^{S} \sum_{r=1}^{N} \theta_{q}^{r} WA_{q}^{r}$$

(in-basin agricultural water costs)

$$- \sum_{q=1}^{S} \sum_{\substack{k=1 \\ k \neq r}}^{N} d_{qk}^{r} MA_{qk}^{r}$$

(water transfer costs to agriculture)

$$+ \sum_{t=1}^{H} \sum_{r=1}^{N} W_{t}^{r} F_{t}^{r}$$

(net energy final product revenue)

$$- \sum_{h=1}^{G} \sum_{t=1}^{H} \sum_{k=1}^{T} \sum_{r=1}^{N} (\phi_{h}^{r} + \Pi_{ht}^{kr}) Y_{ht}^{kr}$$

(costs of extracting, transporting, and converting energy resources)

$$- \sum_{q=1}^{S} \sum_{r=1}^{N} \sigma_{q}^{r} WE_{q}^{r}$$

(in-basin water costs to energy)

$$- \sum_{q=1}^{S} \sum_{\substack{k=1 \\ k \neq r}}^{N} \mu_{qk}^{r} ME_{qk}^{r}$$

(water transfer costs to energy)

s.t. (Constraints):

1. Land $\sum_{j=1}^{M} X_{ij}^{r} \leq PIL_{i}^{r}$ (presently irrigated land)

$i = 1, \ldots, L$
$r = 1, \ldots, N$

$$\sum_{j=1}^{M} X_{ij}^{r} \leq PCDL_{i}^{r} \qquad i = 1, \ldots, L \quad r = 1, \ldots, N$$

(presently cultivated land)

$$\sum_{j=1}^{M} X_{ij}^{r} \leq POIL_{i}^{r} \qquad i = 1, \ldots, L \quad r = 1, \ldots, N$$

(potentially irrigable land)

$$\sum_{j=1}^{M} X_{ij}^{r} \leq POCDL_{i}^{r} \qquad i = 1, \ldots, L \quad r = 1, \ldots, N$$

(potentially cultivated land)

2. Crop Rotations
(Average rotation periods for each crop per acre)

$$\sum_{j=1}^{M} \epsilon^{r}_{ij} X^{r}_{ij} \gtrless 0 \qquad i = 1, \ldots, L \quad r = 1, \ldots, N$$

3. Wet Land Requirements
(Supply of wetland requirements from surface and groundwater)

$$\sum_{q=1}^{S} J^{r}_{q} WTLS^{r}_{q} + \sum_{q=S+1}^{B} \gamma^{r}_{q} WTLG^{r}_{q} = WLREQ^{r} \qquad r = 1, \ldots, N$$

4. Intermediate Energy Flow and Final Outputs
(Flow of raw resources and final product cannot exceed capacity constraints)

$$\sum_{t=1}^{H} \sum_{k=1}^{T} e^{kr}_{ht} Y^{kr}_{ht} P^{r}_{h} F^{r}_{h} - f^{r}_{h} I^{r}_{h} = 0$$

$h = 1, \ldots, G$
$r = 1, \ldots, N$

5. Efficiency of Conversion Process
(Efficiency of conversion of energy to final products)

$$\sum_{t=1}^{H} \sum_{k=1}^{T} \beta^{kr}_{ht} Y^{kr}_{ht} - M^{r}_{h} F^{r}_{h} = 0$$

$h = 1, \ldots, G$
$r = 1, \ldots, N$

6. Capacity of the Plants
(Resource availability and plant capacity)

$$n^{r}_{h} I^{r}_{h} \leq EMA^{r}_{h} \qquad h = 1, \ldots, G \quad r = 1, \ldots, N$$

7. Agriculture Water Requirements
(Water use in agriculture determined by production)

$$\sum_{i=1}^{L} \sum_{j=1}^{M} \delta^{r}_{ij} X^{r}_{ij} - \sum_{q=1}^{S} \eta^{r}_{q} WA^{r}_{q} - \sum_{\substack{k=1 \\ k \neq r}}^{N} \sum_{q=1}^{S} \eta^{r}_{qk} MA^{r}_{qk} = 0$$

$r = 1, \ldots, N$

8. Energy Water Requirement
(Water use in energy determined by production)

$$\sum_{h=1}^{G} U^{r}_{h} I^{r}_{h} - \sum_{q=1}^{S} P^{r}_{q} WE^{r}_{q} - \sum_{q=1}^{S} \sum_{k=1}^{T} q^{r}_{qk} ME^{r}_{qk} = 0$$

$r = 1, \ldots, N$

9. Return Flow from Agriculture
(Water returned to surface pool)

$$\sum_{q=1}^{S} (1-\eta)^{r}_{q} WA^{r}_{q} + \sum_{q=1}^{S} \sum_{\substack{k=1 \\ k \neq r}}^{T} (1-\eta)^{r}_{qk} MA^{r}_{qk} - (1-\lambda^{r}) RFA^{r} = 0 \qquad r = 1, \ldots, N$$

10. Return Flow From Energy
(Water returned to surface pool)

$$\sum_{q=1}^{S} (1-\rho)^{r}_{q} WE^{r}_{q} + \sum_{q=1} \sum_{k=1}^{T} (1-\rho)^{r}_{qk} ME^{r}_{qk} - FRE^{r} = 0$$

11. Groundwater Availability
(Groundwater availability including recharge from return flows)

$$\sum_{q=1}^{S} P^{r}_{q} (WA^{r}_{q} + WE^{r}_{q}) + \sum_{q=1}^{S} \partial^{r}_{q} WTLG^{r}_{q} - \lambda^{r} (RFA^{r}) \leq GW^{r} \qquad r = 1, \ldots, N$$

12. Surface Water Availability

$$\sum_{q=1}^{S} W^{r}_{t} (WA^{r}_{q} + WE^{r}_{q})$$

$$- \sum_{q=1}^{S} \sum_{\substack{k=1 \\ k \neq r}}^{N} V_{qk}^{r} \left(MA_{qk}^{r} + ME_{qk}^{r}\right)$$

$$+ \sum_{q=1}^{S} \Gamma_{q}^{r} \, WTLS_{q}^{r} + S_{k}^{r} \, OF_{k}^{r}$$

$$+ \sum_{q=1}^{S} \sum_{\substack{k=1 \\ k \neq r}}^{N} O_{qk}^{r} \left(EXA_{qk}^{r} + EXE_{qk}^{r}\right)$$

$$- (1-\lambda)^{r} \left(RFA^{r} + RFE^{r}\right) \leq SW^{r}$$

$$r = 1, \ldots, N$$

Definition of Variables and Terms[2]

i Class of land (I, II, III, IV, ...)

j Type of crop grown

r,k Study regions

q Source of water (present surface and groundwater and new development surface and groundwater, etc.)

b_{ij}^{r} Net revenue associated with one acre of the j^{th} crop grown in the i^{th} class of land in region r excluding water costs

X_{ij}^{r} j^{th} crop acreage grown in i^{th} land class in region r

θ_{q}^{r} Unit cost of delivering water from q^{th} source in region r to agriculture use

WA_{q}^{r} Amount of water used by agriculture from q^{th} source in region r to agriculture use

d_{qk}^{r} Unit cost of transferring water from region k to region r of q^{th} type (present and new transfer for agriculture use)

MA_{qk}^{r} Amount of imported water from region k to region r of q^{th} type for agriculture use

PIL_{i}^{r} Available total acres of presently cultivated dry land i in region r

$PCDL_{i}^{r}$ Available total acres of presently cultivated dry land i in region r

$POIL_{i}^{r}$ Available total acres of potentially irrigable land i in region r

$POCDL_{i}^{r}$ Available total acres of potentially cultivable dry land i in region r

E_{ij}^{r} The rotational coefficient of the j^{th} crop with i^{th} land class in region r (the maximum proportion of each acre which can be grown in a particular crop)

$WTLS_{q}^{r}$ Wetland water requirements met from surface water of q^{th} source in region r

$WTLG_{q}^{r}$ Wetland water requirements met from groundwater of q^{th} source in region r

$WLREQ^{r}$ Wetland water requirements in region r

h The raw energy product (coal, crude oil, tar sands, oil shale, and natural gas, etc.)

t The converted energy product (gasified coal, liquified coal, coal slurry, electricity and refined oil, etc.)

W_{t}^{r} Price of the t^{th} final product in region r

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[2]Definitions for specific variables names as listed in Appendix A.

F_t^r Amount of the t^{th} final product in region r

ϕ_h^r Unit cost of extraction and conversion of the h^{th} energy product in region r

Π_{ht}^{kr} Unit cost of transporting h^{th} product to the t^{th} conversion process plant from region r to region k

Y_{ht}^{kr} Amount of transporting h^{th} product to the t^{th} conversion process plant from region r to region k

σ_q^r Unit cost of delivering water from source q to energy use in region r

WE_q^r Amount of water used from source q to energy use in region r

μ_{qk}^r Unit cost of transferring water from source q in region k to energy use in region r

ME_{qk}^r Amount of imported water from source q in region k to energy use in region r

I_h^r Total amount of h^{th} output in region r

β_{ht}^{kr} The efficiency of the t^{th} conversion process for the h^{th} raw product in region r

EMA_h^r Amount of the h^{th} energy material available in region r

ℓ_{ht}^{kr} The coefficient associated with Y_{ht}^{kr}

α_i The augmented M&I water requirements

δ_{ij}^r Consumptive use water requirement per acre in acre feet of j^{th} crop in the i^{th} land class in region r

η_q^r, η_{qk}^r Efficiency parameter of water use by agriculture in region r

n_h^r Efficiency parameter of resource use by energy

g_h^r Consumptive use water requirement in acre feet to produce one unit of the h^{th} energy product

RFA^r, FRE^r Return flows from agriculture and energy in region r, respectively

GW^r Total amount of groundwater available in region r

SW^r Total amount of local surface water available in region r

OF^r Stream outflow of local surface water from region r to k

$WTLG_q^r$ Wetland requirement taken from groundwater availability in region r

$WTLS_q^r$ Wetland requirement taken from local surface water availability in region r

A_{qk}^r, EXE_{qk}^r Amount of water exported from source q in region r to agriculture and energy production in region k, respectively

λ^r The portion of surface return flow which recharges groundwater in region r

$(1-\lambda)^r$ The portion of surface return turn flows augmenting surface availability

$(1-\eta)^r, (1-p)^r$ Are the return flows from diversions of water to agriculture and energy in region r, respectively

J_q^r, Y_q^r, f_h^r, M_h^r, N_h^r, U_h^r, 1^r, C^r, P_q^r, ∂_q^r,

W_q^r, V_{qk}^r, Γ_q^r, S_k^r, Q_{qk}^r

are the coefficients associated with the given variable in region r.

Quantification of the Programming Model

The programming model was based on an existing model of Utah water allocations (Keith et al., 1973). Extensive data collection was required to add the energy sub-model, and substantially update the existing base model. Appendix A, BCDOUT, lists the entire model with a description of the variables used.

Objective Function Coefficients

Per acre foot variable water costs for agriculture and energy activities such as diversions, import transportation, storage, present and new distribution, etc., were obtained from King et al. (1972) and updated to 1974 using Engineering News Record Cost Index (1974). (See Table 1.)

Agriculture coefficients which appear in the objective function are revenues net of all but water costs. Agricultural data were different for different products and resources employed. Data sources for crop yields, costs of production (other than water) and cost of new land development were derived from Christensen et al. (1973); Davis et al. (1975); Anderson et al. (1973); Wright et al. (1972); and U.S. Department of Commerce (1974). The productivity data are reported in Table 2. The available 1972 cost data were updated using 1974 appropriate price index numbers for inputs. The final costs are listed in Table 3. Average yearly prices for different crops were obtained from data published in Utah Agricultural Statistics (Utah State Department of Agriculture, 1976). Average prices were used in

Table 1. Cost for supplying water in Utah for the year 1974. (Annual cost in dollars per ac-ft).

Cost Components for Supplying Water to Agriculture

Hydrologic Study Unit	Local Surface Water		Groundwater		Surface Water Transfers Between HSUS			
	Present Development	New Development	Present Development	New Development	To HSU	Present Transfer	To HSU	New Development
1.	$1.55	$10.75	$2.55	$3.10	4	$3.80		
2.	1.55	9.75	3.60	4.10			1 3	$41.49 52.86
3.	1.55	11.25	4.10	4.60	2 4	3.80 2.56	4	45.60
4.	1.55	10.75	5.60	6.15			5	37.60
5.	1.55	9.75	3.60	4.10	9	3.80	6	46.10
6.	1.55	9.25	4.60	5.10				
7.	1.55	10.75	2.10	2.55	4	2.56	From-To 7 Ute - 3 7 Ute - 4 7 Bonn.-4 7 Ute - 5 7 Bonn.-5	 65.16 57.88 51.74 53.99 47.84
8.	1.55	10.75	--	—	5	3.80	4 5	53.79 35.55
9.	1.55	10.75	–	—				
10.	1.55	10.75	2.55	3.10	6	2.56	6	46.10

Table 1. Continued.

Cost components for Supplying Water to Energy (Annual Cost in Dollars Per ac-ft).

Hydrologic Study Unit	M & I Distribution Costs[a]				M & I Supply Treatment Costs[b]				Total Supply Costs in 1965[c]				Total Supply Costs in 1974[d]			
	Present Diversions (O & M)		New Diversions		Present Diversions (O & M)		New Diversions		Present Diversions (O & M)		New Diversions		Present Diversions (O & M)		New Diversions	
	Local Surface Water	Groundwater	Local Surface Water	Groundwater	Local Surface Water	Groundwater	Local Surface Water	Groundwater	Local Surface Water	Groundwater	Local Surface Water	Groundwater	Local Surface Water	Groundwater	Local Surface Water	Groundwater
1	16.00	23.80	42.00	42.00	1.00	0.20	5.00	0.25	17.00	24.00	47.00	42.25	34.826	49.166	96.283	86.553
2	16.00	23.80	42.00	42.00	1.00	0.20	5.00	0.25	17.00	24.00	47.00	42.25	34.826	49.166	96.283	86.553
3	16.00	29.50	42.00	49.00	4.00	0.50	17.00	0.65	20.00	30.00	59.00	49.65	40.972	61.457	120.866	101.712
4	16.00	29.50	42.00	49.00	4.00	0.50	17.00	0.65	20.00	30.00	59.00	49.65	40.972	61.457	120.866	101.712
5	16.00	23.80	42.00	42.00	2.00	0.20	10.00	0.25	18.00	24.00	52.00	42.25	36.874	49.166	106.526	86.553
6	16.00	23.80	42.00	42.00	2.00	0.20	10.00	0.25	18.00	24.00	52.00	42.25	36.874	49.166	106.526	86.553
7	16.00	23.80	42.00	42.00	2.00	0.20	10.00	0.25	18.00	24.00	52.00	42.25	36.874	49.166	106.526	86.553
8	16.00	-	42.00	-	6.00	-	25.00	-	22.00	-	67.00	-	45.069	-	137.255	-
9	16.00	-	42.00	-	4.00	-	17.00	-	20.00	-	59.00	-	40.972	-	120.866	-
10	16.00	23.80	42.00	42.00	4.00	0.20	17.00	0.25	20.00	24.00	59.00	42.25	40.972	49.166	120.866	86.553

Source: King et al., 1972.

[a]These costs pertain to newly developed water supplies. They do not include storage costs.

[b]Treatment costs for surface water vary according to the amount of filtration and other measures required. Treatment of groundwater is only chlorination.

[c]Total supply costs equals to M & I distribution costs plus M & I supply treatment costs.

[d]Use Engineering News Record Cost Index (in construction) to adjust cost for 1965 to 1974. Coefficient Index is 417.05/203.58 = 2.049.

Table 2. Productivity per acre of various crops in different regions by land class in Utah.

Crops		Land Class I	Land Class II	Land Class III	Land Class IV	Land Class I	Land Class II	Land Class III	Land Class IV
		HSU 1				HSU 2			
Alfalfa Full	Tons	4.75	4.03	3.34		5.18	4.40	3.48	
Alfalfa Partial	Tons	3.66	2.98	2.46		3.98	3.37	2.79	
Barley	Bushels	91.81	73.89	62.47		95.51	80.00	66.93	
Nurse Crop	Bushels	71.81	55.89	46.47		75.51	62.00	50.93	
Corn Grain	Bushels	120.00	100.78	80.01		120.00	102.00	80.50	
Corn Silage	Tons	22.00	19.36	15.80		23.42	20.07	16.53	
Dry Wheat	Bushels				21.65				19.52
Nurse Apples	Bushels	192.00	172.80	155.52		192.00	172.80	155.52	
Mature Apples	Bushels	600.00	510.00	459.00		600.00	510.00	459.00	
Nurse Peaches	Bushels	114.00	96.90	87.21		114.00	96.90	87.21	
Mature Peaches	Bushels	342.00	294.75	267.98		342.00	294.75	267.98	
Nurse Sweet Cherries	cwt.	18.90	16.10	14.50		18.90	16.10	14.50	
Mature Sweet Cherries	cwt.	125.00	105.00	90.00		125.00	105.00	90.00	
Nurse Sour Cherries	cwt.	37.90	32.20	28.90		37.90	32.20	28.90	
Mature Sour Cherries	cwt.	135.40	115.10	103.50		135.40	115.10	103.50	
Dry Beans	cwt.				4.11				
Sugar Beets	Tons	21.00	19.00	16.50		20.92	18.33	16.02	
		HSU 3				HSU 4			
Alfalfa Full	Tons	5.30	4.62	3.38		5.34	4.63	3.63	
Alfalfa Partial	Tons	4.10	3.47	2.73		4.14	3.53	2.67	
Barley	Bushels	96.00	83.16	64.74		96.00	82.91	67.67	
Nurse Crop	Bushels	76.00	65.16	48.79		76.00	64.91	51.67	
Corn Grain	Bushels	120.00	102.00	80.50		127.43	100.53	83.73	
Corn Silage	Tons	23.50	20.32	17.00		23.50	20.30	16.54	
Dry Wheat	Bushels				20.57				19.76
Nurse Apples	Bushels	192.00	172.80	155.52		192.00	172.80	155.52	
Mature Apples	Bushels	600.00	510.00	459.00		600.00	510.00	459.00	
Nurse Peaches	Bushels	114.00	96.90	87.21		114.00	96.90	87.21	
Mature Peaches	Bushels	342.00	294.75	267.98		342.00	294.75	267.98	
Nurse Sweet Cherries	cwt.	18.90	16.10	14.50		18.90	16.10	14.50	
Mature Sweet Cherries	cwt.	125.00	105.00	90.00		125.00	105.00	90.00	
Nurse Sour Cherries	cwt.	37.90	32.20	28.90		37.90	32.20	28.90	
Mature Sour Cherries	cwt.	135.40	115.10	103.50		135.40	115.10	103.50	
Dry Beans	cwt.				4.42				6.50
Sugar Beets	Tons	22.60	20.30	17.00		21.69	19.20	16.61	
		HSU 5				HSU 6			
Alfalfa Full	Tons		4.22	3.44		4.90	4.30	3.61	
Alfalfa Partial	Tons		3.17	2.49		3.80	3.39	2.88	
Barley	Bushels		72.87	59.32		88.00	73.27	60.76	
Nurse Crop	Bushels		54.87	43.32		68.00	55.27	44.76	
Corn Grain	Bushels		97.33	75.66		120.00	95.83	73.98	
Corn Silage	Tons		19.75	16.55		23.00	19.75	17.28	
Dry Wheat	Bushels				20.34				20.51
Nurse Apples	Bushels								
Mature Apples	Bushels								
Nurse Peaches	Bushels								
Mature Peaches	Bushels								
Nurse Sweet Cherries	cwt.								
Mature Sweet Cherries	cwt.								
Nurse Sour Cherries	cwt.								
Mature Sour Cherries	cwt.								
Dry Beans	cwt.				4.11				3.76
Sugar Beets	Tons								

Table 2. Continued.

Crops		Land Class I	Land Class II	Land Class III	Land Class IV	Land Class I	Land Class II	Land Class III	Land Class IV
		HSU 7				HSU 8			
Alfalfa Full	Tons		3.80	3.19		4.70	4.17	3.49	
Alfalfa Partial	Tons		3.00	2.10		3.64	3.25	2.85	
Barley	Bushels		69.92	61.62		85.60	73.09	60.33	
Nurse Crop	Bushels		51.92	40.47		65.60	55.09	44.33	
Corn Grain	Bushels		95.00	70.00		109.00	89.50	72.24	
Corn Silage	Tons		18.96	15.57		21.15	18.89	15.91	
Dry Wheat	Bushels				20.05				20.08
Nurse Apples	Bushels								
Mature Apples	Bushels								
Nurse Peaches	Bushels								
Mature Peaches	Bushels								
Nurse Sweet Cherries	cwt.								
Mature Sweet Cherries	cwt.								
Nurse Sour Cherries	cwt.								
Mature Sour Cherries	cwt.								
Dry Beans	cwt.								
Sugar Beets	Tons								
		HSU 9				HSU 10			
Alfalfa Full	Tons	5.00	4.13	3.38		7.30	5.92	4.56	
Alfalfa Partial	Tons	3.90	2.90	2.08		4.90	3.97	3.01	
Barley	Bushels	90.00	70.57	56.49		96.00	80.99	66.27	
Nurse Crop	Bushels	70.00	52.57	40.49		76.00	62.99	50.27	
Corn Grain	Bushels	100.00	85.00	70.00		130.00	105.00	85.00	
Corn Silage	Tons	21.00	19.20	16.00		30.00	26.90	22.00	
Dry Wheat	Bushels				19.20				21.00
Nurse Apples	Bushels					192.00	172.80	155.52	
Mature Apples	Bushels					600.00	510.00	459.00	
Nurse Peaches	Bushels	114.00	96.90	87.21		114.00	96.90	87.21	
Mature Peaches	Bushels	342.00				342.00	294.75	267.98	
Nurse Sweet Cherries	cwt.								
Mature Sweet Cherries	cwt.								
Nurse Sour Cherries	cwt.								
Mature Sour Cherries	cwt.								
Dry Beans	cwt.								
Sugar Geets	Tons								

order to reduce the variability of prices received by farmers during the 7 year period (1970-76). These average prices are reported in Table 4. A FORTRAN program was written to compute the net revenue coefficients on presently cultivated land for a specific crop, class of land, and region. These net revenue coefficients are reported in Appendix A in the column section of BCDOUT.

The new land development and on-farm water distribution costs and price indices were obtained from Anderson et al. (1973) and Agricultural Statistics, U.S. Department of Agriculture (1976), respectively. The 1974 index of input cost was used to update the land development cost estimates (see listed in Table 5). These costs were subtracted from the net revenue of presently cultivated land to estimate the net revenue coefficients for the potentially cultivable land (see Appendix A in the column section of BCDOUT).

Energy

Energy revenue and cost data are discussed below by type of development.

Coal

Description data for coal mining operations are reported in the annual Bureau of Mines Minerals Yearbook.

Table 3. Cost of cultivation of various crops grown in dollars per acre: variable cost excluding water cost for 1974 in different regions by land class in Utah.

Crop	Land Class I	Land Class II	Land Class III	Land Class IV	Land Class I	Land Class II	Land Class III	Land Class IV
	HSU 1				HSU 2			
Alfalfa Full	$ 96.31	$ 86.07	$ 70.09		$100.64	$ 89.96	$ 72.02	
Alfalfa Partial	78.62	67.86	51.79		77.79	67.12	49.72	
Barley	65.46	54.14	46.25		70.01	58.25	48.86	
Nurse Crop	74.97	63.26	54.77		75.48	63.72	54.24	
Corn Grain	139.48	131.21	120.91		144.57	135.80	124.74	
Corn Silage	99.94	78.61	62.09		123.52	88.22	65.76	
Dry Wheat				$ 37.88				$ 33.68
Nurse Apples	803.99	724.63	677.75		810.36	729.33	679.93	
Mature Apples	1587.70	1429.26	1213.98		1593.17	1433.85	1218.76	
Nurse Peaches	566.28	510.92	480.56		568.96	512.07	485.25	
Mature Peaches	986.70	891.44	757.78		994.34	894.88	760.65	
Nurse Sweet Cherries	397.04	347.02	324.76		400.86	350.78	326.67	
Mature Sweet Cherries	1122.90	1015.16	962.35		1132.74	1019.47	966.55	
Nurse Sour Cherries	358.84	327.49	296.82		364.67	328.21	299.00	
Mature Sour Cherries	674.36	608.10	514.23		678.44	610.60	519.02	
Dry Beans				43.42				43.42
Sugar Beets	276.55	260.44	228.27		289.27	268.46	233.14	
	HSU 3				HSU 4			
Alfalfa Full	$100.64	$ 85.75	$ 58.02		$100.64	$ 89.36	$ 68.15	
Alfalfa Partial	77.79	64.05	39.53		77.79	67.10	47.14	
Barley	70.01	56.32	43.08		70.01	57.72	47.10	
Nurse Crop	75.48	61.78	47.81		75.48	63.55	52.52	
Corn Grain	144.57	135.80	124.74		144.57	135.20	124.41	
Corn Silage	123.52	85.97	60.82		123.52	86.96	64.13	
Dry Wheat				$ 33.08				$ 36.37
Nurse Apples	810.36	729.33	679.93		810.36	729.33	679.93	
Mature Apples	1593.17	1433.85	1218.76		1593.17	1433.85	1218.76	
Nurse Peaches	568.96	512.07	485.25		568.96	512.07	485.25	
Mature Peaches	994.34	894.88	760.65		994.34	894.88	760.65	
Nurse Sweet Cherries	400.86	350.78	326.67		400.86	350.78	326.67	
Mature Sweet Cherries	1132.74	1019.47	966.55		1132.74	1019.47	966.55	
Nurse Sour Cherries	364.67	328.21	299.00		364.67	328.21	299.00	
Mature Sour Cherries	678.44	610.60	519.02		678.44	610.60	519.02	
Dry Beans				43.42				43.42
Sugar Beets	289.27	268.46	233.14		289.27	268.46	233.14	
	HSU 5				HSU 6			
Alfalfa Full		$ 84.28	$ 67.14		$ 95.06	$ 84.39	$ 68.44	
Alfalfa Partial		66.87	49.73		77.66	66.98	51.03	
Barley		53.31	44.00		65.14	53.38	44.81	
Nurse Crop		62.17	53.09		73.98	62.22	53.65	
Corn Grain		130.26	118.18		139.13	130.36	119.30	
Corn Silage		76.48	59.37		98.31	76.55	60.23	
Dry Wheat				$ 37.88				$ 37.88
Nurse Apples		729.33	679.93		810.36	729.33	679.93	
Mature Apples		1433.85	1218.76		1593.17	1433.85	1218.76	
Nurse Peaches		512.07	485.25		568.96	512.07	485.25	
Mature Peaches		894.88	760.65		994.34	894.88	760.65	
Nurse Sweet Cherries		350.78	326.67		400.86	350.78	326.67	
Mature Sweet Cherries		1019.47	966.55		1132.74	1019.47	966.55	
Nurse Sour Cherries		328.21	299.00		364.67	328.21	299.00	
Mature Sour Cherries		610.60	519.02		678.44	610.60	519.02	
Dry Beans				42.93				43.42
Sugar Beets		268.46	233.14		289.27	268.46	233.14	

Table 3. Continued.

Crop	Land Class I	Land Class II	Land Class III	Land Class IV	Land Class I	Land Class II	Land Class III	Land Class IV
	HSU 7				HSU 8			
Alfalfa Full		$ 73.75	$ 57.80		$ 84.43	$ 73.75	$ 75.80	
Alfalfa Partial		56.34	40.39		67.02	56.34	40.39	
Barley		46.70	38.13		58.47	46.70	38.13	
Nurse Crop		57.60	49.03		69.36	57.60	49.03	
Corn Grain		121.11	110.11		129.88	121.11	110.11	
Corn Silage		69.48	53.16		91.24	69.48	53.16	
Dry Wheat				$ 37.88				$ 37.88
Nurse Apples		729.33	679.93		810.36	729.33	679.93	
Mature Apples		1433.85	1218.76		1593.17	1433.85	1218.76	
Nurse Peaches		512.07	485.25		568.96	512.07	485.25	
Mature Peaches		894.88	760.65		994.34	894.88	760.65	
Nurse Sweet Cherries		350.78	326.67		400.86	350.78	326.67	
Mature Sweet Cherries		1019.47	966.55		1132.74	1019.47	966.55	
Nurse Sour Cherries		328.21	299.00		364.67	328.21	299.00	
Mature Sour Cherries		610.60	519.02		678.44	610.60	519.02	
Dry Beans				35.50				35.50
Sugar Beets		268.46	233.14		289.27	268.46	233.14	
	HSU 9				HSU 10			
Alfalfa Full	$ 84.43	$ 73.75	$ 57.80		$137.73	$122.57	$101.87	
Alfalfa Partial	67.02	56.34	40.39		114.88	100.18	79.97	
Barley	58.47	46.70	38.13		82.32	68.55	57.86	
Nurse Crop	69.36	57.60	49.03		94.56	80.68	69.87	
Corn Grain	129.88	121.11	110.11		129.88	121.11	110.11	
Corn Silage	91.24	69.48	53.16		153.24	113.88	97.60	
Dry Wheat				$ 37.88				$ 37.88
Nurse Apples	810.36	729.33	679.93		850.87	762.72	705.56	
Mature Apples	1593.17	1433.85	1218.76		1625.72	1499.50	1269.16	
Nurse Peaches	568.96	512.07	485.25		597.41	535.52	503.24	
Mature Peaches	994.34	894.88	760.65		1044.06	935.86	792.10	
Nurse Sweet Cherries	400.86	350.78	326.67		400.86	350.78	326.67	
Mature Sweet Cherries	1132.74	1019.47	966.55		1132.74	1019.47	966.55	
Nurse Sour Cherries	364.67	328.21	299.00		364.67	328.21	299.00	
Mature Sour Cherries	678.44	610.60	519.02		678.44	610.60	519.02	
Dry Beans				35.50				42.29
Sugar Beets	289.27	268.46	233.14		289.27	268.46	233.14	

In the 1974 (Bureau of Mines, 1974) report, average value per ton, f.o.b. mines, of Utah bituminous coal was $12.24. This price represented an average value per ton of coal for all HSU's.

Coal mining operating cost data for Utah have not been published. Estimations for hypothetical mines, reported in Bureau of Mines Information Circulars, are available, however. Underground mining is the method used presently in producing Utah coal. Strip mining is expected to be developed in some counties. Two of Bureau of Mines Information Circulars (1975 and 1976) provide operating costs for underground bituminous coal mines. (See Table 6.)

Operating cost varies from mine to mine. Zimmerman (1977) attempted to estimate costs for various types of coal deposits by using econometric techniques. He regressed cost per ton of coal against coal seam thickness, water conditions, roof conditions, floor conditions, gas conditions, and amount of output. As depth increases, holding seam thickness constant, less coal can be produced per unit of coal seam mined. However, the thicker the seam, the more coal a mining unit can remove per unit of time. Data for depth and thickness of beds in Utah were obtained from USGS (1969) and Doelling (1972). Mining costs were adjusted for averge seam depth and thickness, by HSU, using the results from Zimmerman's study.

Table 4. Seven years (1970-1976) average prices of different crops in Utah.

S. No.	Crops	Price in Dollars Per Unit
1.	Alfalfa Hay	$40.18/Ton
2.	Barley	$ 1.85/Bushel
3.	Corn Grain	$ 2.51/Bushel
4.	Corn Silage	$13.75/Ton
5.	Sugar Beets	$17.29/Ton
6.	Apples	$ 3.15/Bushel
7.	Peaches	$ 3.50/Bushel
8.	Sweet Cherries	$16.73/cwt.
9.	Sour Cherries	$10.32/cwt.
10.	Wheat	$ 2.62/Bushel
11.	Beans	$ 2.00/cwt.

Table 5. Yearly costs of preparing potententially irrigable land for irrigated production by land class, Utah. (Total cost in dollars per acre.)

HSU or Region	Land Class			
	I	II	III	IV
1. Great Salt Lake	$13.35	$15.60	$17.30	$19.74
2. Bear River	15.23	17.48	19.18	21.62
3. Weber River	17.11	19.36	21.06	23.50
4. Jordan River	18.99	21.24	22.94	25.38
5. Sevier River	-	17.48	19.18	21.62
6. Cedar-Beaver	17.11	19.36	21.06	23.50
7. Uintah	-	15.60	17.30	19.74
8. West Colorado	13.35	15.60	17.30	19.74
9. Southeast Colo.	13.35	15.60	17.30	19.74
10. Lower Colorado	13.35	15.60	17.30	19.74

Table 6. Price and estimated operating cost of Utah coal unit: $1/ton.

HSU	Average Value	Cost	Net Revenue
7	12.24	8.22	4.02
8	12.24	7.30	4.94
9	12.24	7.43	4.81
10	12.24	7.01	5.23

Crude Oil and Natural Gas

Data for average prices of crude oil and natural gas were obtained from the State of Utah Division of Oil, Gas and Mining (1974). Prices were different in each oil and gas field in each county. Old oil prices for 1974 ($5.25 per barrel) were not considered appropriate for the study since new wells would be needed for production. The average price per barrel for each oil and gas field from each county was used.

The estimated drilling costs for oil and gas wells, including dry holes, were obtained from the Federal Energy Administration (1977). The average drilling cost per well was estimated from these data. These averages may be significantly different from any specific well field, but should be reasonably accurate for the whole HSU.

Estimated Drilling Costs for Oil and Gas Wells in Utah, 1974

Oil Wells

Wells Drilled	129
Total Footage	1,309,170
Cost	84,389,535

Gas Wells

Wells Drilled	9
Total Footage	49,689
Cost	1,606,947

The estimated average cost of crude oil was $2.597 per barrel, $0.031 per thousand cubic feet (mscf) for processed natural gas. (See Table 7.)

Synthetic Natural Gas from Coal Gasification

Presently there is no commercial coal gasification in the United States. The processes currently being evaluated at pilot plants are "second-generation" processes and may be ready for commercial use sometime after 1980.

It is difficult to determine accurate prices and costs for coal gasification processes. The price must be competitive with natural gas and provide enough profit to induce production on a commercial scale. In lieu of government subsidies the capital investment and operating costs determine the minimum price at which manufactured gas can be sold at the plant site. The cost of coal is

Table 7. Price and estimated cost of crude oil ($/bbl) and natural gas ($/Mscf).

HSU	Oil			Natural Gas		
	Price	Cost	Net Revenue	Price	Cost	Net Revenue
3	5.07	2.60	2.47	0.21	0.031	0.179
7	7.96	2.60	5.36	0.23	0.031	0.199
8	8.15	2.60	5.55	0.02	0.031	-0.011[a]
9	8.17	2.60	5.57	0.24	0.031	0.208

[a]The negative profitability is due to a low gross revenue to production ratio in HSU8 for 1974. Figures for 1975 again indicates a much lower price for gas in HSU8 compared to the rest of the state, but the profitability is slightly positive.

the most important operating cost. Wasp and Thompson (1973) estimated gasification costs ranging from $1.00 to $1.50 per million BTU, excluding the cost of coal and transportation. Stroup and Thurman (1975) estimated costs for capital investment of $800 million for a 23 billion BTU/day plant (approximately 250 million cubic feet per day). Using a coal cost of $4.50 per ton, and 1974 operating costs, they suggested cost of $2.18 per million (approximately 1,000 cubic feet) BTU in 1974 dollars. Lindquist (1977) estimated 1975 costs for the Lurgi process were between $2.40 and $3.00 per thousand standard cubic feet.

Cost estimates, in 1972 dollars, for specific conversion technologies in various areas were also reported by the Science and Public Policy Program (1975). These data assume a 25-year life on capital equipment, 10 percent fixed charge rate on investment, and 90 percent utilization of capacity. Because the technologies for processing coal are not fully developed, their cost data were unreliable and subject to frequent revision. The quality of the economic data was described as fair (an error of less than 50 percent) for all processing technologies except for Solvent Refined Coal Process.

The Science and Public Policy Program estimates of average costs of $1.03 per thousand cubic feet for Lurgi processes given a cost of $6 per ton, is used, as is a hypothetical price of $1.15 per thousand cubic feet also estimated by the Science and Public Policy Program. All figures are updated to 1974 dollars, using the GNP deflator. (See Table 8.)

Synthetic Crude Oil from Coal Liquefaction

Coal liquefaction also has not been commercialized in the United States so that the data problems are similar to those of coal gasification. It has been reported (Oil and Gas Journal, 1974) that direct liquefaction costs are roughly $1.60 per million BTU, or about $10 per barrel in 1973 dollars. The cost of liquid fuels synthesized after coal gasification ranges from $2 to $2.80 per million BTU, or about $12.17 per barrel.

Table 8. Estimated price and cost of synthetic natural gas (by Lurgi process with coal at $6 per ton) unit: $/Mscf.

HSU	Price	Cost	Net Revenue
7	1.35	1.21	0.14
8	1.35	1.21	0.14
9	1.35	1.21	0.14

Mscf = thousand standard cubic feet.

More details on both coal gasification and coal liquefaction can be drawn from the Technology Review (1974). For 40,000 barrels per day of synthetic crude, given $8 per ton coal costs and an annual 15 percent capital cost, the average cost per barrel is $7.70 (or $1.33 per million BTU) in 1973 dollars.

Schurr (1971) indicates that a plant producing 250,000 barrels per day of syncrude by Consol Synthetic Crude process would have costs averaging $3.25 per barrel from western coal, at $1.25 per ton. The per barrel cost of oil is increased approximately 33 cents for every dollar-per-ton increase in coal cost.

Another estimate can be found in the report of the Science and Public Policy Program (1975). Given a coal cost of $6 per ton, synthetic crude will cost 86 cents per million BTU ($6.069 per barrel) from the Censol Synthetic Fuel (CSF) process or $1.29 per million BTU ($9.10 per barrel) from Solvent Refined Coal (SRC) process. Suggested selling price is $7.283 per barrel, leaving net revenue at $1.21 per barrel for the CSF process. (See Table 9.)

Synthetic Crude Oil from Oil Shale

Katell et al. (1974) estimated the capital investment, operating costs, and selling price for both 50,000 and 100,000 barrel-per-day oil shale plants. A breakdown of capital and operating cost charges in 1973 dollars was estimated for the major processing systems, including mining, retorting, solid waste disposal, hydrogen sulfide removal, and refining.

For this study, costs were based on a 100,000 barrel-per-day plant since that plant size is anticipated by most shale developers. The total estimated capital investment required to develop the mine is $522,375,400. Plant life is 20 years. The estimated annual operation cost is $114,152,400. Excluding costs of water, average total cost per barrel of crude oil from oil shale is $3.84. A selling price for the oil of $5.15 per barel is required to balance the present value of the positive cash flows, using a 12 percent discount rate. These figures are updated by the GNP deflator. (See Table 10.)

Synthetic Crude Oil from Tar Sands

No oil has ever been extracted in any quantity from tar sands in Utah. The only available data on price and cost come from the report of the Science Policy Research Division and the Foreign Affairs Division (1974).

The task force study assumes a world crude-oil price of $11 per barrel would be necessary before significant production of oil from domestic tar sands will occur. The average selling price is estimated at $9.19 (normal development range is from $9 to $10). Average operating costs, including capital depreciation, are estimated at $7.05 per barrel (ranging

Table 9. Estimated price and cost of synthetic crude petroleum (with $6 per ton cost of coal). Unit: $/bbl.

HSU	Price	Cost	Net Revenue
7	7.283	6.069	1.214
8	7.283	6.069	1.214
9	7.283	6.069	1.214

Table 10. Estimated price and cost of crude oil from oil shale. Unit: $/bbl.

HSU	Price	Cost	Net Revenue
7	5.70	4.25	1.45

from \$6.66 to \$7.88) leaving an average profit of 30 percent. The largest plant expected in the U.S. is 10,000 barrels per day. Capital investment for such a plant is estimated at \$70 million or \$7,000 per barrel per day of productive capacity. (See Table 11.)

Refined Products

Cost analysis for refineries is complicated by the fact that several hundred different products may be produced from one basic raw material. The composition of fixed and variable costs will differ in some respects for different oil companies and different products. Oil refiners may report different percentages for the components of their fixed costs, depending on the degree of integration and capital structure. The data for average cost and prices are unavailable for Utah refineries. Russell (1973) estimates average refinery costs and receipts as indicated in Table 12. Crude oil accounts for over 80 percent of total costs for refinery. The next most costly item, processing plants, is about one-eighth as expensive on a per-barrel basis. The Science and Public Policy Program (1975) estimated refinery production costs for 1972 in controlled refineries (for which the weight of dissolved solids is much larger than that of suspended solids) as \$85,600 per 10^{12} BTU's in fixed cost and \$248,000 per 10^{12} BTU's operating costs. (See Table 13.)

Table 11. Estimated price and cost of crude oil from tar sands. Unit: \$/bbl.

HSU	Price	Cost	Net Revenue
7	9.19	7.05	2.14
8	9.19	7.05	2.14
9	9.19	7.05	2.14

The fixed costs represent a flat rate of 10 percent on a total investment of \$856,000 per 10^{12} BTU's per year. A total cost of \$334,000 per 10^{12} BTU's per year is used in the study. Given an approximate value of 6 million BTU/bbl, the average refinery cost is \$2.004/bbl in 1972 dollars, or \$2.701/bbl in 1974 dollars (adjusted by the Nelson operating indexes for refineries).

A petroleum refinery is designed to convert crude oil into various products. The principal products of U.S. refineries are gasoline, jet fuels and kerosene, diesel and fuel oils. Lubricants, waxes and solvents, petrochemical feedstocks, and asphalt (oil) are also produced. The proportions of the principal products vary with refinery design, location, and time of the year. Kolstad (1975) estimated the price of petroleum products which are used for the State of Utah. The 1976 consumer price of \$18.45 per barrel was deflated to \$17.62 by the crude oil price index for 1974. This leaves \$14.919 net revenue. Refinery cost excludes the purchase cost of crude oil. (See Table 15.)

Coal Slurry

The 273-mile, 18-inch Black Mesa slurry line is currently the only operating line. Plans exist for Utah to Nevada and Wyoming to Arkansas lines. Economic data for slurry lines are taken from actual and planned pipeline estimates. Coal pipeline costs include the capital and operating costs of coal cleaning, slurry preparation, transportation and dewatering. The pipeline systems comtemplated for Utah are complete operating entities with maintenance, communications and storage facilities as required for the operation of the system (Wasp, 1976).

Transportation costs include direct operation cost plus an annual allowance of capital to cover debt, taxes, depreciation and payment of

Table 12. Average refinery costs and receipts.

	Costs/bbl of Crude ($)	Percent of Total Average Cost	Receipts/bbl of Crude ($)	Percent of Total Receipts
Purchased Inputs (Crude Oil + n-butane)	3.636	82.3		
Process Units Exclusive of Utilities	0.505	11.4		
Utilities	0.134	3.0		
Gasoline Blending	0.131	3.0		
Miscellaneous	0.013	0.3		
Total Average Cost	4.419	100.0		
Products and By-Products Sold in Model			0.940	17.6
Products Constrained Values at Approximately Oil Un-refinery Prices				
Premium Gasoline ($6.22/bbl)			1.458	27.2
Regular Gasoline ($5.38/bbl)			1.834	34.3
Kerosene ($4.96/bbl)			0.524	9.8
Distillate Fuel Oil ($4.60/bbl)			0.534	10.0
Residual Fuel Oil ($3.10/bbl)			0.062	1.1
Total Receipts/bbl Crude			5.352	100.0
Net Income/bbl, or 17.4% of Sales			0.933	

profit to the equity owners. The capital cost of the system includes the direct cost of materials and installation, plus indirect costs for engineering, management of construction, contingency, startup and owners' costs.

The pipeline is capital, rather than labor, intensive as are most transport systems. For example, the Black Mesa pipeline requires only 55 men for its operation and maintenance. The following is a summary of the slurry pipeline cost breakdown between fixed and variable costs (Monfort, 1977, and Wasp, 1976).

Fixed cost	84%
Variable cost	
Power	6%
Labor	5%
Supplies	5%
Total	100%

Another estimated breakdown of costs by function for a 1,000-mile system from Wyoming to the middle south area is given below (Wasp et al., 1976):

Water supply	4%
Coal cleaning	5%
Feed preparation	10%
Slurry transportation	72%
Dewatering terminal	9%
Total	100%

Table 13. Crude oil refining cost (1972).

National Average Refinery	Fixed Cost (Dollars Per 10^{12} Btu's Input)	Operating Cost (Dollars Per 10^{12} Btu's Input)	Total (Dollars Per 10^{12} Btu's Input)
Uncontrolled National Oil	76,800	242,000	319,000
Controlled National Oil	85,600	248,000	334,000

Source: The Science and Public Policy Program, p. 3-36.

The cost of transportation of coal slurry by pipeline is a function of the tonnage transported, distance, physical characteristics of the coal, terrain, and the annual capital charges for the pipeline. The two most significant factors are the annual tonnages and the distance transported. The costs of coal slurry systems include both the costs of slurry preparation and pipeline transportation, but exclude any allowance for utilization at the delivery terminal (Wasp et al., 1976). These costs total approximately 0.50 cents to 1.20 cents per ton-mile for a 100-mile system transporting between 3 and 18 million tons per year. For a 1,000-mile system costs range

Table 14. 1975 prices of crude oil and petroleum products ($/bbl).

	Well Head Crude Oil	Crude Oil at Refinery	Oil Products at Refinery	Price Paid by Distributor	Consumer Price
Utah	7.78	9.56	11.74	14.08	18.45

Table 15. Estimated price and cost of refined products. Unit: $/bbl.

HSU	Price	Cost	Net Revenue
3	17.62	2.701	14.919
4	17.62	2.701	14.919
7	17.62	2.701	14.919
8	17.62	2.701	14.919

from approximately 0.25 to 0.60 cents per ton-mile. Estimates for the Utah-Nevada line for a 25-million ton, 1,036 mile, 38-inch pipeline are $7.90 per ton (Oil and Gas Journal, 1975) or 0.76 cents per ton-mile. Cost per ton-mile on Black Mesa pipeline is about 1.1 cents/T. mile, given 1969 capital costs and 1977 operating costs (Montfort, 1977).

Transport and preparation cost curves which show costs in cents per ton-mile are given in Figure 4 (Wasp and Thompson, 1973). This includes operating costs and an allowance for capital charges as a function of distance and throughput in million tons per year.

For projected Utah coal slurry pipelines, the 164-mile, 22-inch pipeline from Alton coalfield to Arron Canyon, Nevada, is used as a base to estimate the average cost of coal slurry. For an annual production of approximately 10 million tons, average cost is estimated at 1.2 cents per ton-mile, or $1.97 per ton of coal. If projected cost of dewatering is 2 percent of total, average cost of coal slurry at destination will be $2 per ton. Since coal extraction cost in Alton field (HSU 10) is expected to be $7.01 per ton, final average cost figure used in this model for coal slurry is $9.01 per ton. The estimated price per ton of coal in Nevada is $14.39, using a 1974 average value per ton coal sold (Bureau of Mines, 1974), yielding a profit of $5.38 per ton for coal slurried out of Utah.

Electricity

Of the eight coal-fired electric generating plants in Utah, Utah Power and Light owns seven. They are Gadsby #2 and #3 at Salt Lake City, Hale #1 and #2 at Orem, Carbon #1 and #2 and the Huntington Plant. California-Pacific Utilities Company owns one plant at Cedar City.

Cost data are derived from the required annual reports from these utilities to the Federal Power Commission (1974). Because statements of a company operating in more than one state are included in the report for the state from which the company received most of its revenues, there is no single account for the plant at Cedar City. Price and cost data were obtained for the Utah Power and Light plants from the annual report.

Average price of electricity is calculated from electric operating revenues by dividing total revenues

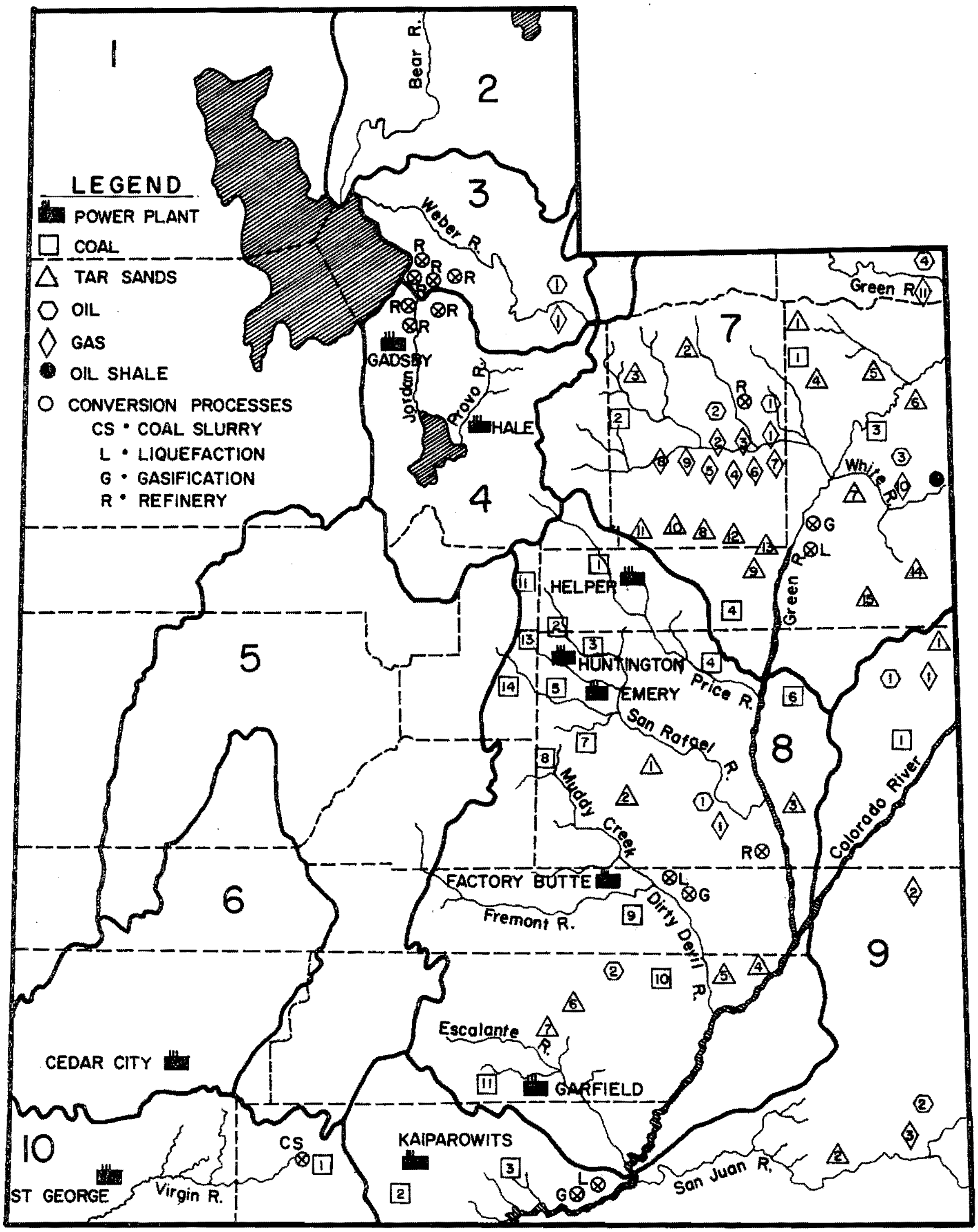

Figure 4. Energy resource and conversion plant location map (from Bishop et al., 1975).

from sales of electricity by total kilowatt-hour (kwh) sales. Costs considered in the model are annual production expenses. Each company submits an annual report for steam-electric power construction cost and annual production expenses per net kilowatt hour.

The production expenses per net kwh vary from plant to plant. The selected data from steam-electric generating plant statistics (large plants) is shown in Table 16. By adding the production costs per net kwh of Gadsby and Hale plants, the average cost of producing electricity in HSU 4 was calculated to be approximately $10.78 per megawatt-hour. An average production cost of $5.30 per megawatt-hour for the Carbon and Huntington plants was used for the electricity cost in HSU 8. The Kaiparowits power plant and Nevada power plant have not been constructed, and no data are currently available. Since Huntington plant number two has the largest installed capacity, its production expenses per net kwh are used to represent HSU 9 and HSU 10 electricity cost. Net revenue appeared very large because other costs, such as transmission, distribution, and customer accounts expenses for the planned plants are unknown and therefore, excluded. (See Table 17.) Actual profitably would probably be little greater than that for HSU 4.

Transportation Cost

In this study, the two energy raw materials which require transportation are crude oil and coal. Crude oil can be transported by tank lines or pipelines. Clark Tank Lines, P.I.E., W. S. Hatch Company, and Western Gillette are the trucking companies authorized for intrastate hauling in Utah. These companies have terminals in Salt Lake City. Amoco Pipeline Company and Chevron Pipeline Company service intrastate transportation of crude oil into the Salt Lake area. The rate charge on pipeline transportation is unavailable from either company. Data on truck transportation cost per barrel of crude oil were obtained from Western Gillette, Inc. The rate varies depending on the quantity of crude oil, length of haul, and other conditions. Some selected transportation costs for petroleum crude oil in bulk, in tank vehicles are given in Table 18. Rates for trucking crude oil can be found in Table 19.

Coal is shipped by railroad, truck, or slurry line. The latter is treated separately in the model. The Union Pacific Railroad Company and the Denver and Rio Grande Western Railroad Company transport coal intrastate in Utah. Various truckers transport coal.

From a recently completed analysis of 1976 statistics, the Rio Grande Railroad's average price to customers

Table 16. Comparison of capacity and production expenses of steam-electric plants.

Item	Carbon #1	Carbon #2	Gadsby #2	Gadsby #3	Hale #1	Hale #2	Huntington #2
Total installed capacity (maximum generater name plate ratings in kw)	75,000	113,636	69,000	113,636	15,000	44,000	446,400
Net peak demand on plant-kw (60 minutes)	71,000	104,000	73,000	100,000	0	49,000	416,400
Cost per kw of installed capacity	$210.06	$126.44	206.42	121.74	81.76	158.36	305.20
Production expenses per net kwh (milles--2 places)	5.98	5.71	8.35	5.88	–	13.74	4.21

Type of plant construction: O.D. Boiler.
Source: The annual report of Utah Power and Light Company, year ended December 31, 1974.

Table 17. Average price and cost of electricity. Unit: $/mwh.

HSU	Price	Cost	Net Revenue
4	16.12	10.78	5.34
6	18.676	10.097	8.379
8	16.12	5.3	10.82
9	16.12	4.21	11.91
10	16.12	4.21	11.91

on coal traffic averaged 1.5 cents per ton-mile. Rio Grande Tariff 7545 contains a rate of 88 cents per ton for a movement of 16 miles, or 5.5 cents per ton-mile. Rio Grande Tariff 7558 provides a rate of $15.74 for 1240 miles, or 1.3 cents per ton-mile. On the average, the range of rates may be from just under 1 cent per ton-mile for long distance shipments, to well over 3 cents per ton-mile for short distances.

For the specific location, from Acco, Price, and East Carbon City to Gadsby, Salt Lake City, by unit train, the Union Pacific Railroad rate is $3.77 per net ton, or approximately 2.5 cents per ton-mile, based on 3000 tons per train, and 740,000 tons of coal per year. If the amount of coal is approximately 850,000 tons per year, the rate is $3.49 per net ton. The car load rate is $6.74 per net ton.

Under normal conditions, the truck rate is 3.5 cents per ton mile.

Detailed information on varying distances and tonnages were not available from the trucking industry. The normal rate, therefore, was used in this study.

Matrix A Coefficients

Agriculture

The coefficients of the agriculture portion of the A matrix may be

Table 18. Cost per barrel of transporting crude oil.

Tank Transport Tariff No. 6-C, Section 3 Commodity Rates in Cents Per Barrel of 42 U.S. Gallons				
Condition	From	To	Rates	Item No.
—	Pan American No. 3 Ferron Unit Wild Cat, Emery County	Salt Lake City or Woods Cross	100.96	720
Minimum 190 barrels	Blaze "A" Well, Floy Wash, Grand County and Points Within 5 Miles	Salt Lake City or Woods Cross	115.54	730
Minimum 200 barrels	Altamont and Blue Bell Pipeline Station, Duchesne County	Salt Lake City or Woods Cross	57	740
Actual scale weight to govern.	Red Wash and Points and Places Within 5 Miles Thereof	Salt Lake City or Woods Cross	49.5	
Minimum shipment 200 barrels	Central Battery Located 12 Miles West of Escalante	North Salt Lake, Salt Lake City and Woods Cross	174.	
Minimum 175 barrels	Altamont Field, Duchesne County	Salt Lake City or Woods Cross	93.8	830
The estimated weight of the	Bluebell Field, Duchesne County		107.4	
crude oil moving under the	Cedar Rim No. 2, Duchesne County		82.65	
provisions of this item will be	Blue Bench		93.8	
285.6 pounds per barrel	Starvation Field, Duchesne County		82.65	

Table 19. Truckload distance commodity rates applying on petroleum crude oil, in bulk, in tank vehicles from Altamont, Bluebell, or Starvation Field, Duchesne County to Myton Station of Salt Lake Pipeline and Plateau Inc., Roosevelt.

Distance in Miles		Rates Columns		Distance in Miles		Rates Columns	
Over	Not Over	(A)	(B)	Over	Not Over	(A)	(B)
0	8	23	24	53	56	59	61
8	11	26	27	56	59	61	64
11	14	29	30	59	62	64	66
14	17	30	31	62	65	66	69
17	20	31	32	65	68	69	72
20	23	33	34	68	71	71	74
23	26	34	35	71	74	74	77
26	29	36	37	74	77	76	79
29	32	38	40	77	80	79	82
32	35	41	42	80	83	81	85
35	38	43	45	83	86	84	87
38	41	46	48	86	89	87	90
41	44	48	50	89	92	89	93
44	47	51	53	92	95	92	95
47	50	53	56	95	98	94	98
50	53	56	58	98	100	97	101

Column (A) rates apply on gross barrels as determined from origin run tickets.
Column (B) rates apply on net barrels as determined from meter readings at destination.
Exception: If meters are not operational at destination the net barrels will be determined from origin run tickets temperature corrected to 60 degrees fahrenheit.

divided into four major types: rotation constraints, crop water requirements, return flows, and miscellaneous.

Rotational constraints

The rotational constraints for all crops but fruit crops are reported by Keith et al. (June 1973 and July 1973); Anderson et al. (1973); and Anderson (April 1972).[3] For this model, these data were elaborated to make them more specific and detailed. The fruit crops constraints are derived from Christensen et al. (1973), and consultation with the Department of Plant Science and Extension Services personnel, Utah State University. All these rotational constraints can explicitly be written in terms of crop acreage grown, where r is the HSU, s is presently irrigated (1) or new (2) land; and i is land class (1, 2, or 3).

$[\text{Alfalfa full} + \text{Alfalfa partial} \geq \text{Barley}]_r^s$ r = 1, ... 10; s = 1,2.

$[\text{Barley} \leq \text{Nurse crop}]_r^s$ r = 1, ... 10; s = 1,2.

$[\text{Alfalfa full} + \text{Alfalfa partial} \leq 5\ (\text{Nurse crop})]_{ri}^s$ r = 1, ... 10; s = 1, 2; i = 1, ... 3.

$[\text{Alfalfa full} + \text{Alfalfa partial} + \text{Barley} + \text{Nurse crop} \geq 7\ (\text{Sugar beets})]_r^s$ r = 1, ..., 10; s = 1,2.

$[\text{Alfalfa full} + \text{Alfalfa partial} + \text{Barley} + \text{Nurse crop} \geq 7\ (\text{Corn grain} + \text{Corn silage})]_r^s$ r = 1, ..., 10; s = 1,2.

$[\text{Alfalfa full} + \text{Alfalfa partial} + \text{Barley} + \text{Nurse crop} \geq 9\ (\text{Corn grain} + \text{Corn silage} + \text{Sugar beets})]_r^s$ r = 1, ..., 10; s = 1,2.

$[\text{Mature apples} \geq 2.3\ (\text{Nurse apples})]_{ri}^s$ r = 1,..., 10; s = 1,2; i=1,... 3.

---

[3]Rotational constraints are based on the normal or average crop rotations for each HSU in terms of the proportion of the acreage allotted to each crop. Barley is used as a nurse crop to establish alfalfa.

$[\text{Mature peaches} \geq 2.0 \text{ (Nurse peaches)}]^{s}_{ri}$
$r = 1, \ldots 10;\ s = 1,2;$
$i = 1, \ldots 3.$

$[\text{Mature sweet cherries} \geq 2.0 \text{ (Nurse sweet cherries)}]^{s}_{ri}$
$r = 1, \ldots 10;\ s = 1,2;$
$i = 1, \ldots 3.$

$[\text{Mature sour cherries} \geq 2.6 \text{ (Nurse sour cherries)}]^{s}_{ri}$
$r = 1, \ldots, 10;\ s = 1,2;$
$i = 1, \ldots, 3.$

$[\text{Alfalfa full + Alfalfa partial + Barley + Nurse crop + Corn grain + Corn silage + Sugar beets} \geq 30 \text{ (Mature apples)}]^{s}_{r}$
$r = 1, \ldots, 10;\ s = 1, 2.$

$[\text{Alfalfa full + Alfalfa partial + Barley + Nurse crop + Corn grain + Corn silage + Sugar beets} \geq 15 \text{ (Mature peaches)}]^{s}_{r}$
$r = 1, \ldots, 10;\ s = 1,2.$

$[\text{Alfalfa full + Alfalfa partial + Barley + Nurse crop + Corn grain + Corn silage + Sugar beets} \geq 27 \text{ (Mature sweet cherries)}]^{s}_{r}$
$r = 1, \ldots, 10;\ s = 1,2.$

$[\text{Alfalfa full + Alfalfa partial + Barley + Nurse crop + Corn grain + Corn silage + Sugar beets} \geq 25 \text{ (Mature sour cherries)}]^{s}_{r}$
$r = 1, \ldots, 10;\ s = 1,2.$

Depending on the availability of water, alfalfa is grown either fully or partially irrigated; once sown, alfalfa will not be grown more than five years without replanting. Similarly, apples, peaches, and sweet and sour cherries, will not be grown more than 30, 15, 27, and 25 years in succession, respectively. Mature crops of apples, peaches, and sweet and sour cherries, should be greater than or equal to 2.3, 2.0, 2.0, and 2.6 times the acres of respective nurse crops. Wherever corn grains and/or silage are grown, the amount of each crop was limited to one-seventh (1/7) of the irrigated acreage grown. Similarly, if corn grain, corn silage, and/or sugar beets are grown, the amount of each crop was limited to one-ninth (1/9) of the irrigated acreage grown. These acreages correspond to current rotation patterns in Utah. A lower limit on acreage under all fruit crops grown was set at present levels (shown in Table 20).

Crop water requirements

Data for consumptive use of water by crops were obtained from Anderson et al. (1973), and reviewed by Hargreaves (1976). The final consumptive water use figures are reported in Table 21. Computation of diversions was performed explicitly in the model itself, using consumptive use ratios and irrigation system efficiency factors both taken from King et al. (1972), reproduced in Table 22.

Return flow coefficients

Part of the water diverted by agriculture is consumptively used. The remaining part runs off the agricultural land as surface flow or seeps into the groundwater. This return flow becomes available for reuse either from surface or groundwater supplies. These coefficients, expressing return flow as a proportion of diversions are listed in Table 23.

Table 20. Current land acreage under fruit crops.

HSU	Acres
1.	630.0
2.	1,633.0
3.	1,422.0
4.	8,021.0
10.	383.0
Total	12,089.0

Table 21. Consumptive use of water by crops in ac-ft/acre in Utah.

HSU or Region	Crops														
	Alfalfa Full	Alfalfa Partial	Barley	Nurse Crop	Corn Grain	Corn Silage	Sugar Beets	Nurse Apples	Mature Apples	Nurse Peaches	Mature Peaches	Nurse Sweet Cherries	Mature Sweet Cherries	Nurse Sour Cherries	Mature Sour Cherries
1. Great Salt Lake	2.0	1.5	1.2	1.6	1.4	1.3	1.6	2.5	3.6	2.8	3.9	2.7	3.8	2.7	3.8
2. Bear River	1.6	1.0	0.7	1.2	1.1	1.0	1.4	2.4	3.5	2.7	3.8	2.6	3.7	2.6	3.7
3. Weber River	1.6	1.0	0.7	1.1	1.2	1.1	1.6	2.4	3.5	2.7	3.8	2.6	3.7	2.6	3.7
4. Jordan River	2.0	1.3	0.9	1.5	1.5	1.4	1.8	2.7	3.8	3.0	4.2	2.9	4.1	2.9	4.1
5. Sevier River	2.2	1.1	1.2	1.6	1.5	1.4	-	-	-	-	-	-	-	-	-
6. Cedar-Beaver	2.1	1.5	1.0	1.6	1.5	1.4	-	-	-	-	-	-	-	-	-
7. Uintah	2.1	1.1	1.3	1.6	1.6	1.5	-	-	-	-	-	-	-	-	-
8. West Colorado	2.0	1.1	1.2	1.6	1.5	1.4	-	-	-	-	-	-	-	-	-
9. Southeast Colorado	2.3	1.3	1.4	1.8	2.0	1.9	-	-	-	-	-	-	-	-	-
10. Lower Colorado	3.7	3.0	1.5	2.0	2.4	2.3	-	3.0	4.0	3.4	4.4	-	-	-	-

Table 22. Irrigation efficiency coefficients by regions in Utah.

HSU	Irrigation Efficiency Coefficients
1.	0.4758
2.	0.3423
3.	0.3667
4.	0.3891
5.	0.3250
6.	0.4553
7.	0.3712
8.	0.3750
9.	0.2000
10.	0.5000

Table 23. Return flow coefficients.

HSU	Agricultural Use	
	To Surface	To Ground
1.	0.4742	0.0500
2.	0.6077	0.0500
3.	0.5833	0.0500
4.	0.5609	0.0500
5.	0.6250	0.0500
6.	0.4947	0.0500
7.	0.6288	0.0000
8.	0.6250	0.0000
9.	0.8000	0.0000
10.	0.5000	0.0000

Remaining coefficients

The coefficients which do not come under any of the above listed categories are termed "remaining coefficients." The coefficients are usually those which establish a relationship between the variables discussed above and the right-hand side values. In most cases, these variables are sums of other variables or definitial variables to translate demands for water into divisions. Often, the coefficients are unity.

Energy

The A matrix for energy includes the water and other resource requirements for each type of energy activity, including mining, processing, and final product generation. Levels of production of the final products determine the intermediate energy inputs and water requirements, computed from a conversion efficiency factor.

The efficiency of the k^{th} energy conversion process is

$$\text{Efficiency } (n_k) = \frac{\text{units of energy output}}{\text{units of energy input}} \quad . . (1)$$

This efficiency ratio can be calculated from data available from Bishop et al. (1975).

When raw energy products are converted, energy losses occur due to conversion process inefficiencies. The loss coefficient, L_K, can be derived in the following way:

$$\text{Energy loss}_k = \text{energy}_{in} - \text{energy}_{out} \text{ for a given process } k \quad . . . (2)$$

Hence, from (1)

$$BTU_{in} = \frac{BTU\ out}{n_k}$$

Substituting in (2)

$$Loss_k = \frac{BTU\ out}{n_k} - BTU\ out$$

$$= BTU_{out} \left[\frac{1}{n_k} - 1\right]$$

Thus, the loss coefficient is:

$$L_K = \frac{1}{n_k} - 1 = \frac{1 - n_k}{n_k}$$

If C_K is the efficiency coefficient for a unit of energy output of process K in BTU per acre foot of water, then for a conversion process k, the energy loss (ξ_k) in terms of BTU/AF can be written:

$$L_K C_K \text{ or } \left[\frac{1 - n_k}{n}\right] C_K = \xi_K \quad . . . (3)$$

The values of C_K and ξ_K can be found in Bishop et al. (1975) and are listed in Table 24. A simple mathematical calculation will yield n_K:

$$\left[\frac{1 - n_K}{n_K}\right] = \frac{\xi}{C_K}$$

$$n_K = \frac{1}{1 + \frac{\xi}{C_K}}$$

Table 24. Water energy coefficients (C_k) and total energy loss (E).

Process	C_k[a] (BTU x 10^9/AF)	E[b] (BTU x 10^9/AF)
Coal Gasification	2.83	1.81
Coal Liquefaction	3.259	2.17
Electric Generation	1.993	2.98
Coal Slurry	$1.253 \times 10^3 \times \frac{BTU}{ton}$/AF	18.04
Oil Refining	42.99	0.0232

[a]Source: Bishop et al., June 1975, p. 75.
[b]Source: Bishop et al., June 1975, p. 22.

The ratios n_k used in the model are expressed in conventional units, i.e., barrels per ton, megawatt hours per ton, etc. Table 25 lists these efficiency coefficients. Water use requirements per unit outputs are listed in Table 26.

Table 25. Coefficients of efficiency.

Process	BTU_{out}/BTU_{in}	Expressed in Conventional Unit
Coal Gasification	0.609913	15247.825 cu ft/ton
Coal Liquefaction	0.60029	2.5012 bbls/ton
Electrical Generation	0.40076	2.93612 mwh/ton
Coal Slurry	0.634558	0.634558 tons/ton
Oil Refining	0.50065	0.50065 bbls/bbl

Table 26. Unit water requirements of producing energy (g_i).

Process	Gallons of Water Needed	Water in AF/Year
Coal	17 gallons/ton[a]	0.52×10^{-4} AF/ton
Crude Oil	17.3 gallons/bbl[a]	0.53×10^{-4} AF/bbl
Tar Sands	20 gallons/bbl[a]	0.61×10^{-4} AF/bbl
Oil Shale	148.68 gallons/bbl[a]	0.456×10^{-3} AF/bbl
Natural Gas	1.67 gallons/MSCF[a]	0.5×10^{-12} AF/CF
Coal Gasification	158 gallons/MSCF[b]	0.4×10^{-9} AF/CF
Coal Liquefaction	175 gallons/bbl[b]	0.537×10^{-3} AF/bbl
Coal Slurry	260 gallons/ton[a]	0.79×10^{-3} AF/ton
Electricity	0.41 gallon/kwh[b]	0.1258×10^{-2} AF/mwh
Refinery	43 gallons/bbl[a]	0.13×10^{-3} AF/bbl

[a]Source: Bishop et al., June 1975, p. 73-74.
[b]Source: American Water Resources Association, 1975, p. 14.

RHS (Right-hand Side) Constant Values (or bj)

The constant values establish limits for each of the constraints. Unless otherwise discussed, RHS values were set at zero.

Water Resources

Water availabilities and wetland and M&I requirements were obtained from King et al. (June 1972); Clyde et al. (September 1971); Water Resources Council (June 1971); Department of Natural Resources (December 1974); Utah Board of Water Resources (January 1974); and Utah Division of Water Resources (November 1968). In-basin surface and groundwater availabilities (net of existing municipal and industrial uses) and wetland requirements are reported in Table 27.

Agriculture Resources

The land availabilities were derived from U.S. Department of Agriculture (October 1970); Anderson (September 1973); and Wilson et al. (February 1968). Land was categorized into two types: presently cultivated and potentially cultivatable. Each of these categories was further divided into four classes. The first three classes were irrigated and irrigable land. The fourth class was defined as presently cultivated and potentially cultivatable land, minus the presently irrigated and potentially irrigable land. This definition was used in order to allow dry land crops to be grown on irrigated and irrigable land which was not economically efficiently irrigated. The land availabilities are listed in Table 28.

The energy sector has both resources and conversion processes which are constrained. Figure 4 indicates the location of each energy activity for the state.

Energy Resources

Coal

Coal survey quadrangle sheets from the U.S. Bureau of Mines were used as the basic data for the model. The specific location of these quadrangles are given in Figure 5. Reserves

Table 27. Surface and groundwater availabilities and wet land requirements in (1000) ac-ft.

HSU	Local Surface Water (ac-ft. x 10^3)	Groundwater (ac-ft. x 10^3)	Wet Land Requirements: Local Surface Water (ac-ft. x 10^3)	Wet Land Requirements: Groundwater (ac-ft. x 10^3)	Wet Land Requirements: Total (ac-ft. x 10^3)
1	613	184	551	164	715
2	933	94	166	74	240
3	768	62	116	27	143
4	539	127	220	56	276
5	410	335	128	205	333
6	79	127	66	64	130
7	1,336 (3,826)[a]	40	315	0	315
8	636 (5,066.4)[b]	–	36	0	36
9	425 (1,955)[c]	–	8	0	8
10	249	10	14	5	19

Note: Figure in the parenthesis are (a) flow of White River near Watson (522), and flow of Green River near Colorado-Utah state line (3,304); (b) flow of Colorado River near Colorado-Utah state line; and (c) flow of San Juan River near Bluff. These flows were added to respective region's water availability in the model allowing interregional flows and finally 7.55 million ac-ft. minimum was allowed to flow out to lower Colorado as agreed under the compact of Colorado River at Lee Ferry.

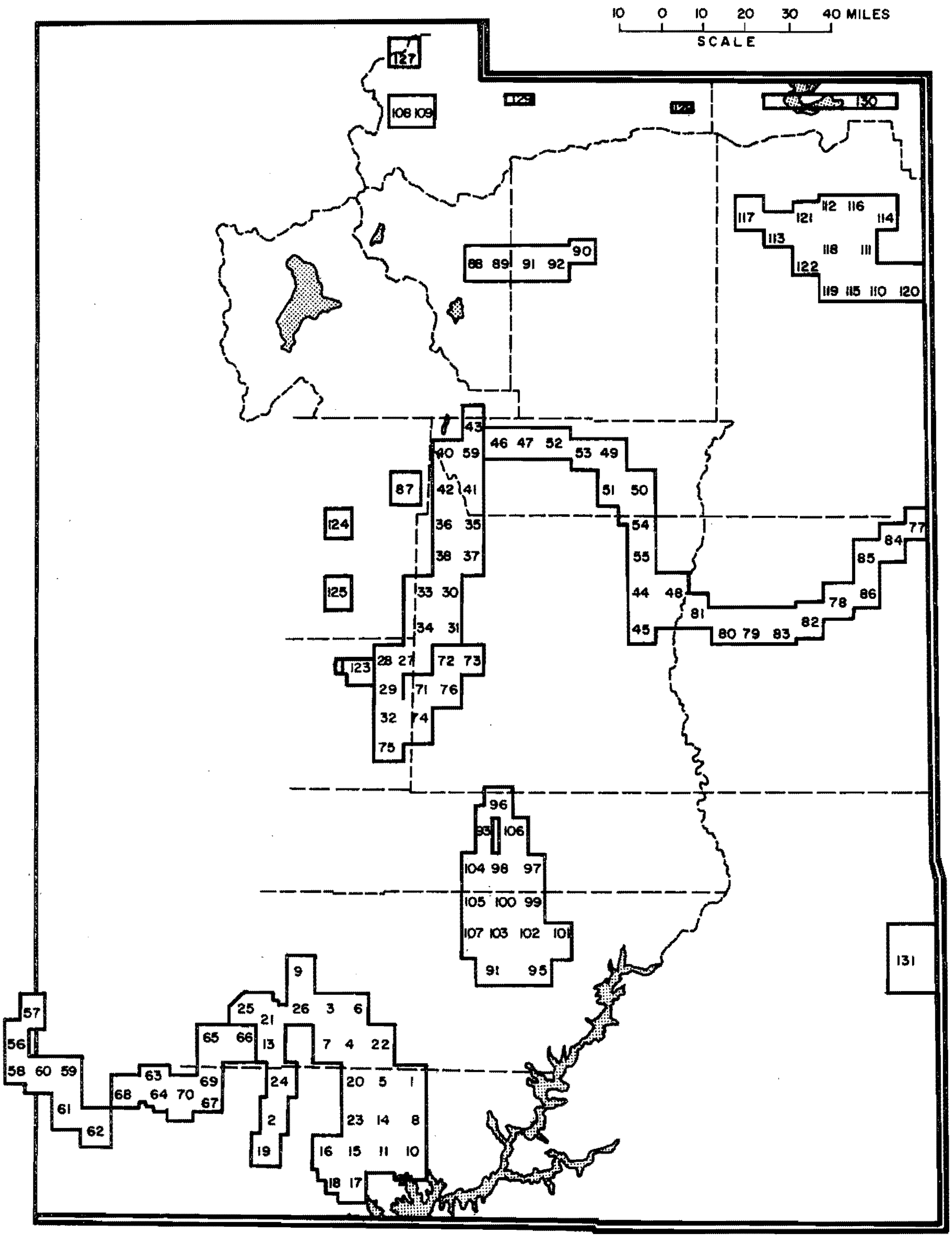

Figure 5. Coal quadrangle map (from Bishop et al., 1975).

Table 28. Presently cultivated and potentially cultivable land acreage available in hydrologic sub-regions in Utah.

HSU	Presently Cultivated Land				Potentially Cultivable Land			
	Irrigated			Unirrigated	Irrigated			Unirrigated
	I	II	III	IV	I	II	III	IV
1	3,100	15,300	21,600	7,600	98,900	487,300	611,000	479,200
2	13,600	75,000	78,400	79,000	14,900	78,000	68,400	127,700
3	29,400	51,900	56,200	32,200	700	8,000	21,800	26,200
4	17,500	58,900	88,400	59,800	24,500	92,400	100,600	79,200
5	0.0	186,300	85,900	25,800	0.0	221,900	308,100	446,000
6	300	49,300	21,900	8,500	200	233,500	274,100	344,700
7	0.0	56,100	83,000	78,700	0.0	99,300	133,400	87,500
8	1,000	28,700	42,100	23,100	2,500	112,800	118,800	65,800
9	1,000	2,100	12,700	3,200	5,400	132,000	290,000	106,000
10	3,200	11,900	5,200	700	7,800	37,600	103,400	95,300

are listed by quadrangles in Table 29 for the following Bureau of Mines categories:

Class I: Measured reserves based on adequate exploration and development data; properly correlated; control no more than 0.5 mile apart.

Class II: Indicated reserves based on geologic measurement supplemented by united drill-hole information and limited to 1.5 miles from a control point.

Class III: Inferred reserves based on geologic inference and projection of the habit of coal beyond 1.5 miles from control points.

The three reserve classes constitute the principal reserves and reflect the immediate potential of a quadrangle or area. At least one-third to one-half of the reserve will be recoverable with current technology. The recoverability percentage depends on amount of overburden, seam thickness, degree of fracturing present in the seam, the need to leave some coal intact for roof support in underground mines, and other factors. Recoverability will vary considerably in different coal fields. As technology improves and demand increases, so might the total recoverable percentage increase. Table 29 lists reserves, the recovery percentage and annual production based on a 20-year mining period.

Oil and natural gas

Utah was ranked twelfth in oil production in the nation at the end of 1975 by the American Petroleum Institute (API). Utah's oil reserves were estimated at 208,318,000 barrels, approximately 0.6 percent of the U.S. total. Presently, Utah is ranked seventeenth in the nation in natural gas reserves by the Office of Legislative Research (1976). Total oil-in-place reserves for Utah are estimated at 3.57 billion barrels with 21.3 percent, or 0.76 billion, recoverable barrels. Recovery percentages vary from one field to another, depending on the type of geologic formation which contains the reservoir, and other factors which affect secondary or tertiary recovery.

In 1974, 55 percent of oil, and 28 percent of natural gas, produced

Table 29. Coal resources--principal (Classes I, II, and III).

HSU	Quadrangle Numbers	Principal (tons x 10^6)	Estimate % Recoverable	Total Recoverable (tons x 10^6)	Yearly Output[a] (tons x 10^6)
7	117,113	44.2	30	13.26	0.663
	88,89,91,92,90	231.2	30	69.36	3.468
	110,111,112,118,119,120,121	133.0	30	39.90	1.995
	49,50,51,53,54	1587.2	35	562.52	28.126
	Total	1995.6		685.04	34.252
8	39,40,43,47,52,46	3466.1	30,35	1129.845	56.492
	35,36,42,41	1995	30	598.50	29.925
	38,37	648.2	30	194.46	9.723
	44,48,55	72.0	35	25.2	1.26
	33,30	435.4	30	130.62	6.531
	80,81,79,83,82	285.7	45	128.565	6.42825
	34,31	416.5	30	124.95	6.2475
	27,28,29,32,71,72,73,74,75,76,123	2303.9	30,35	695.49	34.7745
	93,96,97,98,99,100,104,105,106	154.4	20	30.88	1.544
	94,95,101,102,103,107	76.6	20	15.32	0.766
	3,4,5,6,7,9,13,20,21,22,25,26	5135.4	30	1540.62	77.031
	87	249.1	40	99.64	4.982
	124	12.2	30	3.66	0.183
	125	2.0	30	0.60	0.03
	Total	15,252.5		4718.35	235.91725
9	77,78,84,85,86	7.9	45	3.555	0.17775
	2,24,19	0.9	30	0.27	0.0135
	8,10,11,14,15,16,17,18,23	2735.1		820.53	41.0265
	Total	2743.9		824.355	41.21775
10	63,64,65,66,67,68,69,70	1509.4	50	754.7	37.735

[a]Yearly output assumes 20 year development life.

in Utah came from Duchesne County. Altamont, Bluebell, Blue Bench, Cedar Rim, and Starvation fields are among the larger fields in that county. The remainder of Utah's production came from San Juan, Uintah, Garfield, Emery, Grand, Summit, Carbon, and Daggett County fields.

The estimated recoverable resources in Utah amount to 218 million barrels of oil and 1,526,140,000 mcf of natural gas. Most of these reserves are located in the Paradise Basin. Some natural gas deposits also occur in the Green River Basin and the Wasatch Plateau--Castle Valley area. The estimated recoverable oil and gas resources of the state are listed according to field in Tables 30, 31, and 32.

Oil shale

Oil shale is a fine-grained, sedimentary rock containing a solid, largely insoluble organic material called kerogen. When this shale is heated, it releases the kerogen both as gas and a heavy oil that can be upgraded to a synthetic crude oil (syncrude) equivalent to a high-grade crude oil.

Oil shale resources are potentially a large crude oil source, with the richest and most extensive oil shale beds in Utah found in the Uintah Basin in the east central part of the state. The U.S. Bureau of Mines has assayed the shale; oil yields of samples from the Green River formation range from a fraction of a gallon per

Table 30. Oil reserves of Utah (1,000's of barrels).

	1974 Production	Cumulative Production	Estimated Reserves	Est. Number of Wells (1974)
Greater Altamont	21,898	46,197	228,435	223
Greater Aneth	7,927	259,554	55,558	403
Greater Red Wash	3,364	90,433	46,541	215

Source: A. Bruce Bishop, Water as a Factor in Energy Resources Development, p. 38.

Table 31. Crude oil resources.

HSU	Deposit Names	Total Reserve (Barrel x 10^6)	Yearly Output[a] (Barrels)
3	Summit County Fields	-	736,419
7	Altamont-Blue Bell Red Wash and Clay Basin	274.96	13,754,000
8	Emery County Fields and Upper Valley (Garfield County Fields)	-	1,699,526
9	Grand County and Aneth Fields	55.56	2,864,000

[a]Yearly output in 1974 production and plus yearly output of 20 year development life assumption.

Table 32. Natural gas resources (1974 production).

HSU	Deposit Names	Yearly Output MSCF (or 10^3 x ft^3)
3	Summit County Fields	3,290,197
7	Altamont, Blue Bell, Blue Bench Cedar Rim, Duchesne, Monument Butte, Nutter Canyon, Cottonwood Wash, Starvation, Uintah County and Daggett County Fields	38,310,208
8	Emery County Field	411,757
9	Grand County Field and Aneth	35,992,643

ton to 92 gallons per ton of shale rock. Much of the shale is both low-yield and overlain by deep overburden. The most economically explorable shale beds are 15 feet or more thick and yield 25 gallons of oil per ton, containing an estimated 120 billion barrels of oil. Table 33 lists oil shale reserves and estimated annual output.

Tar sands

Tar sands, oil sands, bitumen-bearing rocks, oil impregnated rocks, and bituminous sands, are terms used interchangeably to describe hydrocarbon bearing deposits distinguishable from conventional oil and gas reservoirs by the high viscosity of the hydrocarbon, which is not recoverable by conventional oil production techniques. Oils from tar sands are chemically similar to some crude oils; upgrading is required to convert them to a refinery feedstock. Many Utah tar sands oils, particularly those from the Uintah Basin, are similar to good grade parafinnic oils.

Table 33. Oil shale resources (deposits of 15' thick or more yielding 25 gallons/ton).

HSU	Deposit Name	Total Reserve (Million Barrels)	Yearly Output[a] (Million Barrels)
7	Green River Formation, Uinta Basin	120,000	6,000

[a]Yearly output assumes 20 year development life.

Estimates of the quantity of oil in the tar sands deposits in Utah range from one billion barrels to as much as 16 billion barrels of oil. All of these deposits outcrop, but most of the deposits are under overburden too thick to be strip-mined economically. Only 10 to 20 percent of Utah tar sands are projected to be strip-mined.

The specific geographical distribution and geological characteristics of the Utah tar sands deposits have been studied in detail by the Utah Geological and Mineral Survey. Many of the deposits have been mapped (Figure 4), and estimates made of their reserves. Table 34 gives a list of the major deposits, an estimate of the oil equivalent in place in those deposits, and annual production based on a 20-year exhaustion.

Processing activities

Coal slurry pipeline. Projected Utah coal slurry pipelines include two parallel pipelines owned by Nevada Power Company. One pipeline, a 68-mile 12-inch pipe, will run from Alton Coalfield, Kane County, to Warner Valley, Washington County. Completion date is expected in 1979. It will have a capacity of 2.5 million tons of coal annually, or 8,000 tons daily. The other pipeline runs from the Alton field to Arrow Canyon, Nevada, and is a 164-mile, 22-inch diameter line. The expected completion date is 1982. Annual capacity will be 9.1 million tons, or about 30,000 tons daily. Figure 6 shows the location of the coal mine and destination areas.

Oil refinery. Utah's petroleum refineries can process as much as 104,500 barrels of crude oil daily. These products are marketed in Utah, Idaho, and Washington, with lesser markets in other western states. Table 35 gives the size and location of the oil refineries in the State of Utah.

Coal-fired electric generating plants. There are seven existing coal-fired, steam-powered electric generating plants in Utah. The largest plant is at Huntington Canyon, operated by Utah Power and Light Company. Market area for these plants is the Mountain West and Southern Utah. Location, company operating and installed capacity are given in Table 36.

More plants are planned by several electric companies. The plants which

Table 34. Tar sands resources.

HSU	Deposit Names	Total Reserves (Million Barrels)	Reserve Per Year (Million Barrels)
7	White Rocks, Lake Fork, Tabiona, Little Water Hills, Alphalt Ridge, Raven Ridge and Chapita Wells.	1188.9	59.445
	Minnie Maud Creek, Sunny Side, Argyle Canyon, Willow Creek, Nine Mile Canyon and Cottonwood Jack Canyon.	3315	165.75
	2/3 P.R. Spring and Hill Creek.	3310	165.5
	Total	7813.9	390.695
8	San Rafeal Swell (1) and (2), Ten Mile Wash, Tar Sands Triangle (1) and (2), Circle Cliffs (East and West).	448.75 7239.7	22.437 361.985
	Total	7688.45	384.422
9	1/3 P.R. Spring and Mexican Hat.	1850.4	92.52

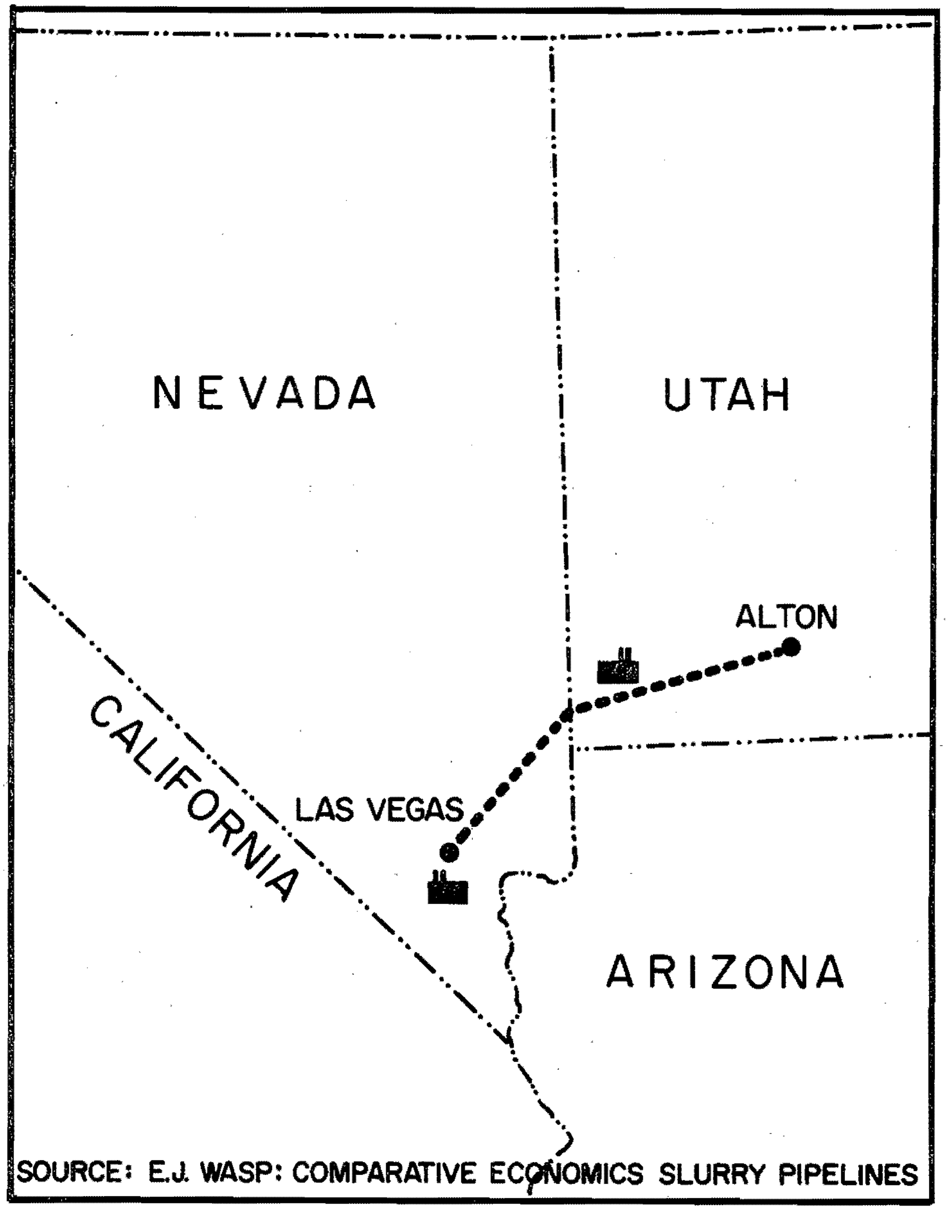

Figure 6. Projected coal slurry pipelines.

are in planning construction stages are Huntington Canyon in Emery County, Factory Butte in Wayne County, the Garfield Plant in Garfield County, which may use an alternate site, the Emery Plant in Emery County, Warner Valley in Washington County, and the large Kaiparowits Plant in Kane County. Table 37 lists the existing and planned plants and their yearly output by HSU. A brief description of each follows:

Huntington Canyon power plant. The plant is presently under construction. A 430 megawatt unit of the plant was completed in 1974. Another unit of the same size is presently under construction and expected to be in production in 1977. Ultimately, the plant could expand to 1860 megawatts, but it is not expected to do so for 10-15 years after the second unit is installed.

Factory Butte power plant. The Factory Butte, or Wayne County, plant will be owned by the Los Angeles Water and Power Board in conjunction with the Intermountain Power Project.

Table 35. Capacity of oil refineries.

HSU	Company	Rated Capacity (BPD)	Yearly Capacity (BBL)
3	Phillips Petroleum Co.	24,000	8,760,000
	Caribou-Four Corners, Inc.	10,000	3,650,000
	Western Refining Co.	10,000	3,650,000
	Morrison Petroleum Co.	1,500	547,000
	Total	41,500	16,607,000
4	Chevron Oil Co.	45,000	16,425,000
	Amoco Oil Co.	39,000	14,235,000
	Husky Oil Co. of Delaware	24,000	8,760,000
	Total	108,000	39,420,000
7	Plateau Inc.	7,500	2,737,500

Table 37. Existing and planned generator plants.

HSU	Plant Name	Installed Capacity (MW)	Yearly Output (MWH)
4	Gadsby No. 2 and No. 3	175	1,533,000
	Hale No. 1 and No. 2	59	516,000
	Total	234	2,049,000
6	California-Pacific Utilities Co.	7.5	65,700
8	Huntington	1275	11,169,000
	Emery	860	7,533,600
	Factory Butte	3000	26,280,000
	Garfield	2000	17,520,000
	Helper	166	1,454,160
	Total	7301	63,956,760
9	Kaiparowitz	3000	26,280,000
10	Warner Valley	500	4,380,000

The ultimate capacity of this plant will be approximately 3,000 megawatts. Four 750 megawatt units will be completed from 1983 to 1986.

Garfield power plant. The Garfield plant will consist of two 415 megawatt units. This plant has had serious water procurement problems, and alternate plant sites in Juab and Sanpete Counties have been considered by Utah Pwer and Light.

Emery power plant. This plant, like the Garfield plant, is to be built in two 415 megawatt units. The estimated completion dates for the two units are 1978 and 1979.

Warner Valley power plant. This plant is to be built by the Nevada Power Company near St. George in Washington County. It will be built in two 250 megawatt units, expected to be completed in 1981 and 1982. The coal will come from the slurry line discussed previously.

Kaiparowits power plant. This project will be located in Kane County and will include a 3,000 megawatt plant of four 750 megawatt units.[4] The

[4]Air quality considerations have caused several of the participants to suspend construction plans indefinitely, and this project may not be developed.

Table 36. Operational coal-fired electric generating plants.

Location	Company Operating	Installed Capacity (kw)
Cedar City	California-Pacific Utilities Co.	7,500
Price River, Helper	Utah Power and Light–2 Units	166,000
Huntington Canyon	Utah Power and Light	415,000[a]
Gadsby No. 2, Salt Lake City	Utah Power and Light	75,000
Gadsby No. 3, Salt Lake City	Utah Power and Light	100,000
Hale No. 1, Orem[b]	Utah Power and Light	15,000
Hale No. 2, Orem	Utah Power and Light	44,000

[a]Currently expanding to 815,000 kw.

[b]Emergency stand-by.

Source: Utah Department of Natural Resources, Utah Energy Resource Data, p.11.

project will have several participants, including Southern California Edison Company, San Diego Gas and Electric Company, and Arizona Public Service Company.

The locations of existing and proposed coal-fired electric generating plants are shown in Figure 4. All the plants are scheduled to be built in specific size-staging units. Many of the planned developments have not been finalized and are still subject to change. There is a rapidly expanding market for electrical energy and the vast high quality coal reserves of the study area will likely be developed in an effort to meet the demands of that market (Bishop et al., 1975).

Coal Gasification and Liquefaction

Coal gasification and liquefaction technologies have advanced in recent years. Although construction of gasification and liquefaction plants in the study area have been considered, none of the development companies have announced definite construction plans.

Coal gasification and liquefaction plants may be built in HSU's 7, 8, and 9. The capacity of a gasification plant is assumed to be 250 million cubic feet per day. The capacity of a liquefaction plant is assumed to be 100,000 barrels per day.

Model Results

The model was used to generate economically efficient water allocations under a number of varying assumptions. In every case, the results represent a competitive market solution, given the institutional or economic constraints imposed.

The alternative assumptions were: (1) no energy development with and without the consumptive use in the Colorado River Basin;[5] (2) energy developments constrained to economically feasible near term development, but consumptive use constraint; (3) economically feasible energy development with the consumptive use constraint; (4) economically feasible energy development plus coal gasification, liquefaction, slurry and natural gas at full capacity with the consumptive use constraint; (5) two "probable" energy development alternatives with the consumptive use constraint; and (6) these two "probable" energy developments given 10, 20, 40, and 60 percent reductions in water availability and consumptive use constraints. For all energy development, an associated increase in municipal and industrial water consumption is added to the water demands to represent the increase in population and associated economic activity.

The results of the model for the alternative assumptions are discussed below. In each case, the model was constructed so that water currently used on Class IV and pasture land would be applied to new irrigation on Class III, or better, land, if economically feasible. It was assumed that water would be readily available from the Class IV and pasture land uses, since the average value of the marginal product of that water is less than $3.00 per acre foot (Anderson et al., 1973).[6]

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[5]The initial compact restricted consumptive use in Utah to 1,532,000 acre feet. Recent adjustments have reduced this figure to 1,332,000 acre feet. The model used water availability levels consistent with the higher consumptive use constraint.

[6]New irrigation projects are optimistic, in that capital costs for new machinery and buildings is not included.

Alternative 1: No Energy Development, With and Without the Consumptive Use Constraint

These two scenarios generated identical results, because agricultural consumptive use was smaller than the consumptive use limitations. These results were the benchmarks to which energy alternatives could be compared. Table 38 indicates the acreages under irrigation and dry land production (cultivation) by land class. One implication of these results is that water could efficiently be transferred from current irrigation of Class IV land and pasture to crop production on potentially irrigable lands. In addition, acreages by crop were also calculated, and changes in cropping patterns were analyed for each alternative. Cropping did not differ significantly from current practice, except for the new irrigation.

Alternative 2: Optimal Energy Development With No Consumptive Use Constraint

Table 39 lists the various kinds of energy development which are economically efficient given no consumptive use constraint. In only HSU's 8 and 9 were either liquefaction or gasification of coal indicated, and no major coal export by slurry is indicated in the optimal solution. The associated agricultural production was only slightly changed from the basic agricultural model (see Table 40). There is sufficient water in Utah to provide for energy development and almost all agricultural production, provided Utah's consumptive use constraint is abrogated in some fashion.

Liquefaction on a very small scale was indicated for HSU's 8 and 9. It is doubtful that such a small scale development is economically feasible. Both oil shale and tar sands were extensively used as energy sources in HSU's 7, 8, and 9. The shadow price of water was, of course, zero for this alternative, since excess water is available for use, but no use is economically feasible.

Alternative 3: Optimal Energy Development With The Consumptive Use Constraint

Table 41 lists the optimal energy developments given that Utah's use of the Colorado River water is constrained to compact amounts. The only significant changes are decreases in oil shale mining in HSU 7, coal liquefaction and the associated synthetic crude oil production in HSU's 8 and 9, oil refining in HSU 8, and the

Table 38. Land under production in acres of different types in each HSU without energy development.

Land Classification	HSU 1	2	3	4	5	6	7	8	9	10
Presently irrigated land:										
I	3,100	13,600	29,400	17,500	-	300	-	1,000	1,000	3,200
II	0,000	75,000	51,900	58,900	186,300	49,300	56,100	28,700	2,100	11,900
III	0,000	78,400	56,200	18,590	0,000	0,000	83,000	42,100	0,000	5,200
Presently cultivated land:										
IV	47,600	246,000	169,700	224,600	298,000	80,000	217,800	94,900	19,000	21,000
Potentially irrigable land:										
I	38,844	14,900	700	24,500	-	200	-	2,500	5,400	7,800
II	0,000	78,000	8,000	92,400	118,624	6,928	99,300	112,800	11,630	37,600
III	0,000	68,400	21,800	0,000	0,000	0,000	133,400	118,800	0,000	12,556
Potentially cultivable land:										
IV	38,844	161,300	30,500	116,900	118,624	7,128	232,700	234,100	17,030	57,956

Table 39. Energy resources development as dictated by the model without consumptive water use constraint on the Colorado River's water in Utah.

Source	From HSU	Measurement Unit	To → HSU 3	4	6	7	8	9	10
1. Coal		tons x 10^3	–	–	–	34,252.0	2,134,360.0	32,267.1	36,216.1
2. Crude oil		bbls x 10^3	0.0	–	–	13,748.0	1,699.5	2,864.0	–
3. Tar sands		bbls x 10^3	–	–	–	385,227.0	384,422.0	92,520.0	–
4. Oil shale		bbls x 10^3	–	–	–	5,888,820.0	–	–	–
5. Natural gas		cu.ft. x 10^3	3,290,200.0	–	–	38,310,200.0	0.0	35,992,600.0	–
6. Electricity		mwh x 10^3	–	2,049.0	65.70	–	63,956.7	26,280.0	4,380.0
7. Synthetic natural gas (SNG)		cu.ft. x 10^3	–	–	–	0.0	0.0	0.0	–
8. Syn-crude oil		bbls x 10^3	–	–	–	0.0	0.0	36,500.0	–
9. Refined oil		bbls x 10^3	16,607.0	39,420.0	–	2,737.5	18,271.9	–	–
10. Coal slurry		tons x 10^3	–	–	–	–	–	–	0.0
11. Total coal		tons x 10^3	–	–	–	34,252.0	235,917.0	41,217.7	37,735.0
12. Total crude oil		bbls x 10^3	736.42	–	–	13,748.0	1,699.5	2,864.0	–
13. Total tar sands		bbls x 10^3	–	–	–	390,695.0	384,422.0	92,520.0	–
14. Total oil shale		bbls x 10^3	–	–	–	6,000,000.0	–	–	–
15. Total syn-crude oil		bbls x 10^3	–	–	–	0.0	36,500.0	36,500.0	–
16. Crude oil to refinery	3	bbls x 10^3	736.42	0.0	–	0.0	0.0	–	–
17. Coal to electricity	7	tons x 10^3	–	0.0	0.0	0.0	0.0	–	–
18. Coal to gasification	7	tons x 10^3	–	–	–	0.0	0.0	–	–
19. Coal to liquefaction	7	tons x 10^3	–	–	–	0.0	0.0	–	–
20. Crude oil to refinery	7	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
21. Tar sands to refinery	7	bbls x 10^3	0.0	0.0	–	5,468.44	0.0	–	–
22. Oil shale to refinery	7	bbls x 10^3	32,437.8	78,745.5	–	0.0	0.0	–	–
23. Syn-crude oil to refinery	7	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
24. Coal to electricity	8	tons x 10^3	–	697.86	0.0	–	21,782.9	0.0	–
25. Coal to gasification	8	tons x 10^3	–	–	–	0.0	0.0	0.0	–
26. Coal to liquefaction	8	tons x 10^3	–	–	–	0.0	0.0	0.0	–
27. Crude oil to refinery	8	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
28. Tar sands to refinery	8	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
29. Syn-crude oil to refinery	8	bbls x 10^3	0.0	0.0	–	0.0	36,500.0	–	–
30. Coal to electricity	9	tons x 10^3	–	0.0	0.0	–	0.0	8,950.65	0.0
31. Coal to gasification	9	tons x 10^3	–	–	–	0.0	0.0	0.0	–
32. Coal to liquefaction	9	tons x 10^3	–	–	–	0.0	0.0	0.0	–
33. Crude oil to refinery	9	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
34. Tar sands to refinery	9	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
35. Syn-crude oil to refinery	9	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
36. Coal to electricity	10	tons x 10^3	–	0.0	22.38	–	0.0	0.0	1,491.78
37. Coal to gasification	10	tons x 10^3	–	–	–	–	0.0	0.0	–
38. Coal to liquefaction	10	tons x 10^3	–	–	–	–	2.39	2.39	–
39. Coal to slurry	10	tons x 10^3	–	–	–	–	–	–	0.0

Table 40. Changes in land acreage under production of different types in each HSU, attributed to energy resource development as dictated by the model with no consumptive use constraint.

Land Classification	HSU 1	2	3	4	5	6	7	8	9	10
Presently irrigated land:										
I	0.0	0.0	0.0	0.0	-	0.0	-	0.0	0.0	0.0
II	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III	0.0	0.0	0.0	-6871.0	0.0	0.0	0.0	0.0	0.0	0.0
Presently cultivated land:										
IV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Potentially irrigable land:										
I	0.0	0.0	0.0	0.0	-	0.0	-	0.0	0.0	0.0
II	0.0	0.0	0.0	0.0	0.0	-53.0	0.0	0.0	-8346.0	0.0
III	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-2481.0
Potentially cultivable land:										
IV	0.0	0.0	0.0	0.0	0.0	-53.0	0.0	0.0	-8346.0	-2481.0

introduction of small-scale natural gas production in HSU 8.

In this case, energy development does have very significant impacts on agricultural production, particularly in the Colorado River Basin. The model results indicate that all agricultural land in production in HSU 7 and 8 in the agricultural model will be retired, and a significant proportion will be retired in HSU 9. Reductions will also occur in HSU's 4 and 5 as a result of decreased interbasin transfers from the Colorado River. The major reduction in these HSU's is in potentially irrigable land, which corresponds to currently irrigated Class IV and pasture land. Table 42 lists these changes.

The model results indicate, then, that full economically efficient development of Utah's energy resources, coupled with the Colorado River Compact's consumptive use constraint leads to almost total reduction of irrigated agricultural production in the Colorado River Basin. There would be a shift of over 200,000 acres to dry farming wheat and beans in the region, although dry farming is a marginal activity in the region.[7] The shadow price generated by the model for water for energy in HSU 7 is over $3,000 per consumptive acre foot; the shadow price for uses along the Wasatch Front is only $4 to $12 per acre foot, which accounts for the reductions in water transferred from HSU's 7 and 8 to HSU's 3, 4, and 5.

Alternative 4: Economically Feasible Energy Development Including Coal Gasification, Liquefaction, and Slurry and Natural Gas Production at Full Capacity

If gasification and liquefaction are to take place with or without governmental support, reallocation of water between energy uses will occur, given the consumptive use

[7]Dry farming activities included reducing productivity in half to account for fallowing. However, the average productivity values do not account for the variability in rainfall and the high risk involved with dry farming in the Colorado River Basin.

Table 41. Energy resources development as dictated by the model with consumptive water use constraint on Colorado River's waters in Utah.

Source	From HSU	Measurement Unit	To → HSU 3	4	6	7	8	9	10
1. Coal		tons x 10^3	–	–	–	34,252.0	213,436.0	32,267.1	36,220.8
2. Crude oil		bbls x 10^3	0.0	–	–	13,748.0	1,699.5	2,864.0	–
3. Tar sands		bbls x 10^3	–	–	–	385,227.0	384,422.0	92,520.0	–
4. Oil shale		bbls x 10^3	–	–	–	2,149,050.0	–	–	–
5. Natural gas		cu.ft. x 10^3	3,290,200.0	–	–	38,310,200.0	411,700.0	35,992,600.0	–
6. Electricity		mwh x 10^3	–	2,049.0	65.70	–	63,956.7	26,280.0	4,380.0
7. Synthetic natural gas (SNG)		cu.ft. x 10^3	–	–	–	0.0	0.0	0.0	–
8. Syn-crude oil		bbls x 10^3	–	–	–	0.0	0.0	0.0	–
9. Refined oil		bbls x 10^3	16,607.0	39,420.0	–	2,737.5	0.0	–	–
10. Coal slurry		tons x 10^3	–	–	–	–	–	–	0.0
11. Total coal		tons x 10^3	–	–	–	34,252.0	235,917.0	41,217.7	37,735.0
12. Total crude oil		bbls x 10^3	736.42	–	–	13,748.0	1,699.5	2,864.0	–
13. Total tar sands		bbls x 10^3	–	–	–	390,695.0	384,422.0	92,520.0	–
14. Total oil shale		bbls x 10^3	–	–	–	2,260,230.0	–	–	–
15. Total syn-crude oil		bbls x 10^3	–	–	–	0.0	0.0	0.0	–
16. Crude oil to refinery	3	bbls x 10^3	736.42	0.0	–	0.0	0.0	–	–
17. Coal to electricity	7	tons x 10^3	–	0.0	0.0	0.0	0.0	–	–
18. Coal to gasification	7	tons x 10^3	–	–	–	0.0	0.0	–	–
19. Coal to liquefaction	7	tons x 10^3	–	–	–	0.0	0.0	–	–
20. Crude oil to refinery	7	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
21. Tar sands to refinery	7	bbls x 10^3	0.0	0.0	–	5,468.44	0.0	–	–
22. Oil shale to refinery	7	bbls x 10^3	32,437.8	78,745.5	–	0.0	0.0	–	–
23. Syn-crude oil to refinery	7	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
24. Coal to electricity	8	tons x 10^3	–	697.86	0.0	–	21,782.9	0.0	–
25. Coal to gasification	8	tons x 10^3	–	–	–	0.0	0.0	0.0	–
26. Coal to liquefaction	8	tons x 10^3	–	–	–	0.0	0.0	0.0	–
27. Crude oil to refinery	8	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
28. Tar sands to refinery	8	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
29. Syn-crude oil to refinery	8	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
30. Coal to electricity	9	tons x 10^3	–	0.0	0.0	–	0.0	8,950.65	0.0
31. Coal to gasification	9	tons x 10^3	–	–	–	0.0	0.0	0.0	–
32. Coal to liquefaction	9	tons x 10^3	–	–	–	0.0	0.0	0.0	–
33. Crude oil to refinery	9	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
34. Tar sands to refinery	9	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
35. Syn-crude oil to refinery	9	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
36. Coal to electricity	10	tons x 10^3	–	0.0	22.38	–	0.0	0.0	1,491.78
37. Coal to gasification	10	tons x 10^3	–	–	–	–	0.0	0.0	–
38. Coal to liquefaction	10	tons x 10^3	–	–	–	–	0.0	0.0	–
39. Coal to slurry	10	tons x 10^3	–	–	–	–	–	–	0.0

Table 42. Change in land acreage under production of different types in each HSU, attributed to energy resource development, as dictated by the model with consumptive water use constraint on Colorado River's water in Utah.

Land Classification	HSU 1	2	3	4	5	6	7	8	9	10
Presently irrigated land:										
I	0.0	0.0	0.0	0.0	-	0.0	-	-1,000.0	-505.0	0.0
II	0.0	0.0	0.0	0.0	0.0	0.0	-56,100.0	-28,700.0	-2,100.0	0.0
III	0.0	0.0	0.0	-18,590.0	0.0	0.0	-83,000.0	-42,100.0	0.0	0.0
Presently cultivated land:										
IV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Potentially irrigable land:										
I	0.0	0.0	0.0	0.0	-	0.0	-	-2,500.0	-5,400.0	0.0
II	0.0	0.0	0.0	-65,161.0	-35,278.0	-53.0	-99,300.0	-112,800.0	-11,630.0	0.0
III	0.0	0.0	0.0	0.0	0.0	0.0	-133,400.0	-118,800.0	0.0	-2,481.0
Potentially cultivable land:										
IV	0.0	0.0	0.0	-65,161.0	-35,278.0	-53.0	-232,700.0	-234,100.0	-17,030.0	-2,481.0

constraint, and the fact that agricultural water would no longer be available. Table 43 lists the energy activities for this alternative. The results indicate that with only a small reduction in shale activity, slightly over 80,000 barrels per day, liquefaction, gasification, slurry, and maximum natural gas production can be achieved. If no consumptive use constraint is in effect, not only will full production of energy be accomplished, but there will be only slight reductions in agriculture production in the state (Tables 44 and 45). Given the model's coefficients, gasification is not economically feasible: even so, the shadow price for water in slurry in HSU 7 is almost $50 per acre foot.

Alternative 5: "Probable" Energy Development With The Consumptive Use Constraint

Because the unrestricted model generated large amounts of energy production which appear to be institutionally impractical, two "probable" energy development scenarios were also examined. The first included no oil shale, tar sands, gasification or liquefaction in Utah. Table 46 lists the energy activities and Table 47 lists the changes in irrigated agricultural acreages for this scenario. With the absence of the heaviest water users, oil shale and tar sands, the only significant reductions in agricultural acreages were in the new irrigated land for HSU's 9 and 10. If technological change allows significant reduction in water use by shale and tar sands, it appears that, under these assumptions, little agricultural dislocation would occur. The reduction in acreage in HSU 9 did, however, allow sufficient water for energy and the transfer of the excess water from HSU 8 to HSU 5, resulting in a net increase in agricultural acreage in the latter HSU.

The second alternative was the Energy Research and Development Administration (ERDA) projection of 450,000 barrels per day oil shale, and a total of 6,500 megawatt installed capacity in HSU's 8, 9, and 10 by the year 2000. Table 48 lists the energy activities for the ERDA projections, and Table 49 lists the associated agricultural acreage changes. There appears to be

Table 43. Energy resources development as dictated by the model except coal gasification, coal liquefaction, coal slurry and natural gas are produced at full capacity and with consumptive water use constraint on Colorado River's water in Utah.

Source	From HSU	Measurement Unit	To → HSU 3	4	6	7	8	9	10
1. Coal		tons x 10^3	–	–	–	13,674.5	207,452.0	26,282.6	20,462.9
2. Crude oil		bbls x 10^3	0.0	–	–	13,748.0	1,699.5	2,864.0	–
3. Tar sands		bbls x 10^3	–	–	–	385,227.0	384,422.0	92,520.0	–
4. Oil shale		bbls x 10^3	–	–	–	2,105,340.0	–	–	–
5. Natural gas		cu.ft. x 10^3	3,290,200.0	–	–	38,310,200.0	411,700.0	35,992,600.0	–
6. Electricity		mwh x 10^3	–	2,049.0	65.70	–	63,956.7	26,280.0	4,380.0
7. Synthetic natural gas (SNG)		cu.ft. x 10^3	–	–	–	91,250,000.0	91,250,000.0	91,250,000.0	–
8. Syn-crude oil		bbls x 10^3	–	–	–	36,500.0	0.0	0.0	–
9. Refined oil		bbls x 10^3	16,607.0	39,420.0	–	2,737.5	0.0	–	–
10. Coal slurry		tons x 10^3	–	–	–	–	–	–	10,000.0
11. Total coal		tons x 10^3	–	–	–	34,252.0	235,917.0	41,217.7	37,735.0
12. Total crude oil		bbls x 10^3	736.42	–	–	13,748.0	1,699.5	2,864.0	–
13. Total tar sands		bbls x 10^3	–	–	–	390,695.0	384,422.0	92,520.0	–
14. Total oil shale		bbls x 10^3	–	–	–	2,216,530.0	–	–	–
15. Total syn-crude oil		bbls x 10^3	–	–	–	36,500.0	0.0	0.0	–
16. Crude oil to refinery	3	bbls x 10^3	736.42	0.0	–	0.0	0.0	–	–
17. Coal to electricity	7	tons x 10^3	–	0.0	0.0	0.0	0.0	–	–
18. Coal to gasification	7	tons x 10^3	–	–	–	5,984.46	0.0	–	–
19. Coal to liquefaction	7	tons x 10^3	–	–	–	14,593.0	0.0	–	–
20. Crude oil to refinery	7	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
21. Tar sands to refinery	7	bbls x 10^3	0.0	0.0	–	5,468.44	0.0	–	–
22. Oil shale to refinery	7	bbls x 10^3	32,437.8	78,745.5	–	0.0	0.0	–	–
23. Syn-crude oil to refinery	7	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
24. Coal to electricity	8	tons x 10^3	–	697.86	0.0	–	21,782.9	0.0	–
25. Coal to gasification	8	tons x 10^3	–	–	–	0.0	5,984.46	0.0	–
26. Coal to liquefaction	8	tons x 10^3	–	–	–	0.0	0.0	0.0	–
27. Crude oil to refinery	8	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
28. Tar sands to refinery	8	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
29. Syn-crude oil to refinery	8	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
30. Coal to electricity	9	tons x 10^3	–	0.0	0.0	–	0.0	8,950.65	0.0
31. Coal to gasification	9	tons x 10^3	–	–	–	0.0	0.0	5,984.46	–
32. Coal to liquefaction	9	tons x 10^3	–	–	–	0.0	0.0	0.0	–
33. Crude oil to refinery	9	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
34. Tar sands to refinery	9	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
35. Syn-crude oil to refinery	9	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
36. Coal to electricity	10	tons x 10^3	–	0.0	22.38	–	0.0	0.0	1,491.78
37. Coal to gasification	10	tons x 10^3	–	–	–	–	0.0	0.0	–
38. Coal to liquefaction	10	tons x 10^3	–	–	–	–	0.0	0.0	–
39. Coal to slurry	10	tons x 10^3	–	–	–	–	–	–	15,758.0

Table 44. Energy resources development as dictated by the model except coal gasification, coal liquefaction, coal slurry and natural gas are produced at full capacity and without consumptive water use constraint on Colorado River's water in Utah.

Source	From HSU	Measurement Unit	To → HSU						
			3	4	6	7	8	9	10
1. Coal		tons x 10^3	–	–	–	13,674.5	207,452.0	26,282.6	20,458.1
2. Crude oil		bbls x 10^3	0.0	–	–	13,748.0	1,699.5	2,864.0	–
3. Tar sands		bbls x 10^3	–	–	–	385,227.0	384,422.0	92,520.0	–
4. Oil shale		bbls x 10^3	–	–	–	5,888,820.0	–	–	–
5. Natural gas		cu.ft. x 10^3	3,290,200.0	–	–	38,310,200.0	411,700.0	35,992,600.0	–
6. Electricity		mwh x 10^3	–	2,049.0	65.70	–	63,956.7	26,280.0	4,380.0
7. Synthetic natural gas (SNG)		cu.ft. x 10^3	–	–	–	91,250,000.0	91,250,000.0	91,250,000.0	–
8. Syn-crude oil		bbls x 10^3	–	–	–	36,500.0	0.0	36,500.0	–
9. Refined oil		bbls x 10^3	16,607.0	39,420.0	–	2,737.5	18,271.9	–	–
10. Coal slurry		tons x 10^3	–	–	–	–	–	–	10,000.0
11. Total coal		tons x 10^3	–	–	–	34,252.0	235,917.0	41,217.7	37,735.0
12. Total crude oil		bbls x 10^3	736.42	–	–	13,748.0	1,699.5	2,864.0	–
13. Total tar sands		bbls x 10^3	–	–	–	390,695.0	384,422.0	92,520.0	–
14. Total oil shale		bbls x 10^3	–	–	–	6,000,000.0	–	–	–
15. Total syn-crude oil		bbls x 10^3	–	–	–	36,500.0	36,500.0	36,500.0	–
16. Crude oil to refinery	3	bbls x 10^3	736.42	0.0	–	0.0	0.0	–	–
17. Coal to electricity	7	tons x 10^3	–	0.0	0.0	0.0	0.0	–	–
18. Coal to gasification	7	tons x 10^3	–	–	–	5,984.46	0.0	–	–
19. Coal to liquefaction	7	tons x 10^3	–	–	–	14,593.0	0.0	–	–
20. Crude oil to refinery	7	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
21. Tar sands to refinery	7	bbls x 10^3	0.0	0.0	–	5,468.44	0.0	–	–
22. Oil shale to refinery	7	bbls x 10^3	32,437.8	78,745.5	–	0.0	0.0	–	–
23. Syn-crude oil to refinery	7	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
24. Coal to electricity	8	tons x 10^3	–	697.86	0.0	–	21,782.9	0.0	–
25. Coal to gasification	8	tons x 10^3	–	–	–	0.0	5,984.46	0.0	–
26. Coal to liquefaction	8	tons x 10^3	–	–	–	0.0	0.0	0.0	–
27. Crude oil to refinery	8	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
28. Tar sands to refinery	8	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
29. Syn-crude oil to refinery	8	bbls x 10^3	0.0	0.0	–	0.0	36,500.0	–	–
30. Coal to electricity	9	tons x 10^3	–	0.0	0.0	–	0.0	8,950.65	0.0
31. Coal to gasification	9	tons x 10^3	–	–	–	0.0	0.0	5,984.46	–
32. Coal to liquefaction	9	tons x 10^3	–	–	–	0.0	0.0	0.0	–
33. Crude oil to refinery	9	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
34. Tar sands to refinery	9	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
35. Syn-crude oil to refinery	9	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
36. Coal to electricity	10	tons x 10^3	–	0.0	22.38	–	0.0	0.0	1,491.78
37. Coal to gasification	10	tons x 10^3	–	–	–	–	0.0	0.0	–
38. Coal to liquefaction	10	tons x 10^3	–	–	–	–	2.39	2.39	–
39. Coal to slurry	10	tons x 10^3	–	–	–	–	–	–	15,758.0

Table 45. Change in land acreage under production of different types in each HSU attributed to energy resource development as dictated by the model except coal gasification, coal liquefaction, coal slurry and natural gas are produced at full capacity, with no consumptive use constraint.

Land Classification	HSU 1	2	3	4	5	6	7	8	9	10
Presently irrigated land:										
I	0.0	0.0	0.0	0.0	-	0.0	-	0.0	0.0	0.0
II	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III	0.0	0.0	0.0	-6,871.0	0.0	0.0	0.0	0.0	0.0	0.0
Presently cultivated land:										
IV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Potentially irrigable land:										
I	0.0	0.0	0.0	0.0	-	0.0	-	0.0	0.0	0.0
II	0.0	0.0	0.0	0.0	0.0	-53.0	0.0	0.0	-8,352.0	0.0
III	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-5,132.0
Potentially cultivable land:										
IV	0.0	0.0	0.0	0.0	0.0	-53.0	0.0	0.0	-8,352.0	-5,132.0

little difference in allocation between the two alternative scenarios. Neither exhibits very significant reductions in agricultural production, except in HSU's 4, 9, and 10. The shadow price of water is quite low (approximately $2.50) in both models, since the value of water in the least profitable enterprise in agriculture is the determining factor.

Alternative 6: Probable Energy Development Given 10, 20, 40, and 60 Percent Reductions in Water Availability

The advent of the recent drought episodes, as well as the long-term trend toward lower water yields in the Colorado River Basin, suggest an analysis of the impact of long-term reductions in water availabilities on energy and agricultural production. Reductions of 10, 20, 40, and 60 percent were examined for each of the two "probable" and the full energy alternatives. The energy solution is fixed for both "probable" alternatives. The unrestricted energy development model does not change until a 60 percent reduction in water availability (see Table 50). At that point the shale production is reduced to about 405,000 barrels per day, which is only slightly less than the ERDA projections for 2000. The relatively small agricultural production in HSU 9 is reduced to zero at a 60 percent reduction in water availability.

The agricultural parameterizations show similar patterns between the two "probable" development alternatives (see Table 51, a through d, and Table 52, a through d). Production from agriculture tends to be higher for the ERDA projections than for the no-shale alternative. As water availability becomes very restrictive, at the 60 percent reduction level, the ERDA projections alternative indicates a significantly higher reduction in irrigated agriculture in HSU 8, compared to the no-shale option. An anomaly appears in HSU's 1 and 4 in the parameterization results. In order to achieve a feasible solution, the wetland requirement for HSU 1 had to be relaxed, and, as a result, the model increased irrigation in both HSU 1, from the released water, and HSU 4,

Table 46. Energy resource production dictated by the model, except coal slurry at full capacity and no exception of oil shale to sands and coal liquefaction with the consumptive water use constraints on Colorado River water in Utah.

Source	From HSU	Measurement Unit	To → HSU 3	4	6	7	8	9	10
1. Coal		tons x 10^3	–	–	–	34,252.0	213,436.0	32,267.1	20,462.9
2. Crude oil		bbls x 10^3	0.0	–	–	13,748.0	1,699.5	2,864.0	–
3. Tar sands		bbls x 10^3	–	–	–	0.0	0.0	0.0	–
4. Oil shale		bbls x 10^3	–	–	–	0.0	–	–	–
5. Natural gas		cu. ft. x 10^3	3,290,200.0	–	–	38,310,200.0	411,700.0	35,992,600.0	–
6. Electricity		mwh x 10^3	–	2,049.0	65.7	–	63,956.7	26,280.0	4,380.0
7. Synthetic natural gas (SNG)		cu.ft. x 10^3	–	–	–	0.0	0.0	0.0	–
8. Syn-crude oil		bbls x 10^3	–	–	–	0.0	0.0	0.0	–
9. Refined oil		bbls x 10^3	368.65	0.0	–	0.0	0.0	–	–
10. Coal slurry		tons x 10^3	–	–	–	–	–	–	10,000.0
11. Total coal		tons x 10^3	–	–	–	34,252.0	235,917.0	41,217.7	37,735.0
12. Total crude oil		bbls x 10^3	736.42	–	–	13,748.0	1,699.5	0.0	–
13. Total tar sands		bbls x 10^3	–	–	–	0.0	0.0	0.0	–
14. Total oil shale		bbls x 10^3	–	–	–	0.0	–	–	–
15. Total syn-crude oil		bbls x 10^3	–	–	–	0.0	0.0	0.0	–
16. Crude oil to refinery	3	bbls x 10^3	736.42	0.0	–	0.0	0.0	–	–
17. Coal to electricity	7	tons x 10^3	–	0.0	0.0	0.0	0.0	–	–
18. Coal to gasification	7	tons x 10^3	–	–	–	0.0	0.0	–	–
19. Coal to liquefaction	7	tons x 10^3	–	–	–	0.0	0.0	–	–
20. Crude oil to refinery	7	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
21. Tar sands to refinery	7	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
22. Oil shale to refinery	7	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
23. Syn-crude oil to refinery	7	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
24. Coal to electricity	8	tons x 10^3	–	697.86	0.0	–	21,782.9	0.0	–
25. Coal to gasification	8	tons x 10^3	–	–	–	0.0	0.0	0.0	–
26. Coal to liquefaction	8	tons x 10^3	–	–	–	0.0	0.0	0.0	–
27. Crude oil to refinery	8	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
28. Tar sands to refinery	8	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
29. Syn-crude oil to refinery	8	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
30. Coal to electricity	9	tons x 10^3	–	0.0	0.0	0.0	0.0	8,950.65	0.0
31. Coal to gasification	9	tons x 10^3	–	–	–	0.0	0.0	0.0	–
32. Coal to liquefaction	9	tons x 10^3	–	–	–	0.0	0.0	0.0	–
33. Crude oil to refinery	9	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
34. Tar sands to refinery	9	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
35. Syn-crude oil to refinery	9	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
36. Coal to electricity	10	tons x 10^3	–	0.0	22.38	–	0.0	0.0	1,491.78
37. Coal to gasification	10	tons x 10^3	–	–	–	–	0.0	0.0	–
38. Coal to liquefaction	10	tons x 10^3	–	–	–	–	0.0	0.0	–
39. Coal to slurry	10	tons x 10^3	–	–	–	–	–	–	15,758.0

Table 47. Change in land acreage under production of different types in each HSU attributed to energy resource development as dictated by the model except coal slurry at full capacity and no exploitation of oil-shale, tar sands and coal liquefaction and with consumptive water use constraint on Colorado River's water in Utah.

Land Classification		HSU									
		1	2	3	4	5	6	7	8	9	10
Presently irrigated land:											
	I	0.0	0.0	0.0	0.0	-	0.0	-	0.0	0.0	0.0
	II	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	III	0.0	0.0	0.0	-1852.0	0.0	0.0	0.0	0.0	0.0	0.0
Presently cultivated land:											
	IV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Potentially irrigable land:											
	I	0.0	0.0	0.0	0.0	-	0.0	-	0.0	0.0	0.0
	II	0.0	0.0	0.0	0.0	7109.0	-53.0	0.0	0.0	-4870.0	0.0
	III	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-5132.0
Potentially cultivable land:											
	IV	0.0	0.0	0.0	0.0	7109.0	-53.0	0.0	0.0	-4870.0	-5132.0

from reduced inflow to the Great Salt Lake requirements. These results are likely not to be representative of the actual conditions. The more likely event would be that the Great Salt Lake level would fall slightly below current levels. However, as the water availability is reduced by 40 percent and 60 percent, irrigated acreages will fall considerably below current levels, not only in HSU's 1 and 4, but in all other HSU's as well.

As water becomes more constraining, shadow prices rise. For the 10 and 20 percent reductions, shadow prices rise from $2.00 to about $2.50 per acre foot. At 60 percent reduction, the shadow price rises to approximately $50 per acre foot for the least profitable energy enterprises. As water becomes constraining on energy in the unrestricted model, the shadow price increases to $3,000.00 per acre foot. The difference in shadow prices for energy is due to the restricted nature of the energy production in the two "probable" alternatives.

Summary and Conclusions

The results from the modeling indicate that there is sufficient water in Utah's allocation of the Colorado River to provide for moderate energy development, including moderate levels of oil shale, with only minimal loss in irrigated agriculture. In addition, most of the reduction in irrigated acreage would optimally be in the less productive Class IV and pasture lands, or in the reduced development of new irrigation projects indicated in the model results. Only during severe prolonged drought would these moderate energy developments constrain current prime irrigation (Class I through III lands presently irrigated). Substantial temporary reduction in these acreages would likely occur with even minimal energy production under those circumstances.

On the other hand, substantial energy development could take place only at the expense of almost all irrigation in the Colorado River Basin in Utah, given Utah's consumptive

Table 48. Energy resources development as dictated by the model except coal slurry at full capacity and oil shale at the predicted level for the year 2000, and tar sands, coal liquefaction and coal gasification are not developed with consumptive water use constraint on the Colorado River's water in Utah.

Source	From HSU	Measurement Unit	To → HSU						
			3	4	6	7	8	9	10
1. Coal		tons x 10^3	–	–	–	34,252.0	213,436.0	32,267.1	20,462.9
2. Crude oil		bbls x 10^3	0.0	–	–	13,748.0	1,699.5	2,864.0	–
3. Tar sands		bbls x 10^3	–	–	–	0.0	0.0	0.0	–
4. Oil shale		bbls x 10^3	–	–	–	47,598.3	–	–	–
5. Natural gas		cu.ft. x 10^3	3,290,200.0	–	–	38,310,200.0	411,700.0	35,992,600.0	–
6. Electricity		mwh x 10^3	–	2,049.0	65.7	–	63,956.7	26,280.0	4,380.0
7. Synthetic natural gas (SNG)		cu.ft. x 10^3	–	–	–	0.0	0.0	0.0	–
8. Syn-crude oil		bbls x 10^3	–	–	–	0.0	0.0	0.0	–
9. Refined oil		bbls x 10^3	16,607.0	0.0	–	0.0	0.0	–	–
10. Coal slurry		tons x 10^3	–	–	–	–	–	–	10,000.0
11. Total coal		tons x 10^3	–	–	–	34,252.0	235,917.0	41,217.7	37,735.0
12. Total crude oil		bbls x 10^3	736.42	–	–	13,748.0	1,699.5	0.0	–
13. Total tar sands		bbls x 10^3	–	–	–	0.0	0.0	0.0	–
14. Total oil shale		bbls x 10^3	–	–	–	164,250.0	–	–	–
15. Total syn-crude oil		bbls x 10^3	–	–	–	0.0	0.0	0.0	–
16. Crude oil to refinery	3	bbls x 10^3	736.42	0.0	–	0.0	0.0	–	–
17. Coal to electricity	7	tons x 10^3	–	0.0	0.0	0.0	0.0	–	–
18. Coal to gasification	7	tons x 10^3	–	–	–	0.0	0.0	–	–
19. Coal to liquefaction	7	tons x 10^3	–	–	–	0.0	0.0	–	–
20. Crude oil to refinery	7	bbls x 10^3	0.0	0.0	–	2,737.5	0.0	–	–
21. Tar sands to refinery	7	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
22. Oil shale to refinery	7	bbls x 10^3	32,437.8	78,745.5	–	5,468.4	0.0	–	–
23. Syn-crude oil to refinery	7	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
24. Coal to electricity	8	tons x 10^3	–	697.86	0.0	–	21,782.9	0.0	–
25. Coal to gasification	8	tons x 10^3	–	–	–	0.0	0.0	0.0	–
26. Coal to liquefaction	8	tons x 10^3	–	–	–	0.0	0.0	0.0	–
27. Crude oil to refinery	8	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
28. Tar sands to refinery	8	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
29. Syn-crude oil to refinery	8	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
30. Coal to electricity	9	tons x 10^3	–	0.0	0.0	0.0	0.0	8,950.65	0.0
31. Coal to gasification	9	tons x 10^3	–	–	–	0.0	0.0	0.0	–
32. Coal to liquefaction	9	tons x 10^3	–	–	–	0.0	0.0	0.0	–
33. Crude oil to refinery	9	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
34. Tar sands to refinery	9	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
35. Syn-crude oil to refinery	9	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
36. Coal to electricity	10	tons x 10^3	–	0.0	22.38	–	0.0	0.0	1,491.78
37. Coal to gasification	10	tons x 10^3	–	–	–	–	0.0	0.0	–
38. Coal to liquefaction	10	tons x 10^3	–	–	–	–	0.0	0.0	–
39. Coal to slurry	10	tons x 10^3	–	–	–	–	–	–	15,758.0

Table 49. Change in land acreage under production of different types in each HSU, attributed to energy resource development with ERDA projections for 2000.

Land Classification	HSU 1	2	3	4	5	6	7	8	9	10
Presently irrigated land:										
I	0.0	0.0	0.0	0.0	-	0.0	-	0.0	0.0	0.0
II	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III	0.0	0.0	0.0	-3414.0	0.0	0.0	0.0	0.0	0.0	0.0
Presently cultivated land:										
IV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Potentially irrigable land:										
I	0.0	0.0	0.0	0.0	-	0.0	-	0.0	0.0	0.0
II	0.0	0.0	0.0	0.0	0.0	-5073.0	0.0	0.0	-4870.0	-5132.0
III	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Potentially cultivable land:										
IV	0.0	0.0	0.0	0.0	0.0	-5073.0	0.0	0.0	-4870.0	-5132.0

use constraints. Large scale oil shale and tar sands operations will require reallocation of the largest quantities of water currently used in agriculture. Liquefaction, gasification, and electrical generation at high levels would also be expected to retire some cropland from irrigation by taking water from the relatively low-valued agriculture use. However, a high percentage of the retired land may be used for dryland crops, if the productivity coefficients in the model are representative of actual conditions. Furthermore, the large-scale development of most of the energy resources in the Colorado River Basin might be expected to substantially reduce water available for transfer to Wasatch Front and Sevier River Basin agricultural users. Given the high shadow price of water for the various energy sectors, and the relatively low shadow price for current marginal agricultural production, the use of water in energy is economically sensible. On the other hand, retention of water in agricultural pursuits at the expense of energy production is grossly inefficient. Even the municipal users along the Wasatch Front would not have a sufficiently high demand to bid significant amounts of water from the Colorado River Basin energy producers, assuming the current estimates of M&I demand curves for water.

For the near future, the quantity of water appears not to be the constraining factor on energy or agricultural production. Only in the distant future, 25 to 50 years hence, will water become scarce, relative to demand, in Utah. If a severe prolonged drought should occur, however, water scarcity may substantially reduce agricultural production to provide water for energy.

Several factors have been disregarded in this model, any one of which may be critical to the optimal allocations of water. Air and water quality standards may be of paramount importance, particularly as they affect the cost of profitability of energy production. The probabilities of drought episodes are major considerations in the arid west, and may have important implications for the quantity of water which is transferred from agriculture to energy production. The allocation of water among the Upper Basin States, or states of the entire Colorado River Basin, may be inefficient if energy resources are to be developed fully. Finally, the social desirability of severely reducing

Table 50. Energy resources development as dictated by the model along with consumptive water use constraints on Colorado River's water in Utah and 60 percent decrease in local surface water availability.

Source	From HSU	Measurement Unit	To → HSU						
			3	4	6	7	8	9	10
1. Coal		tons x 10^3	–	–	–	34,252.0	213,436.0	32,267.1	36,220.8
2. Crude oil		bbls x 10^3	0.0	–	–	13,748.0	1,699.5	2,864.0	–
3. Tar sands		bbls x 10^3	–	–	–	385,227.0	384,422.0	92,520.0	–
4. Oil shale		bbls x 10^3	–	–	–	36,693.2	–	–	–
5. Natural gas		cu.ft. x 10^3	3,290,200.0	–	–	38,310,200.0	411,700.0	35,992,600.0	–
6. Electricity		mwh x 10^3	–	0.0	65.70	–	63,956.7	26,280.0	4,380.0
7. Synthetic natural gas (SNG)		cu.ft. x 10^3	–	–	–	0.0	0.0	0.0	–
8. Syn-crude oil		bbls x 10^3	–	–	–	0.0	0.0	0.0	–
9. Refined oil		bbls x 10^3	16,607.0	39,420.0	–	2,737.5	0.0	–	–
10. Coal slurry		tons x 10^3	–	–	–	–	–	–	0.0
11. Total coal		tons x 10^3	–	–	–	34,252.0	235,917.0	41,217.7	37,735.0
12. Total crude oil		bbls x 10^3	736.42	–	–	13,748.0	1,699.5	2,864.0	–
13. Total tar sands		bbls x 10^3	–	–	–	390,695.0	384,422.0	92,520.0	–
14. Total oil shale		bbls x 10^3	–	–	–	147,876.0	–	–	–
15. Total syn-crude oil		bbls x 10^3	–	–	–	0.0	0.0	0.0	–
16. Crude oil to refinery	3	bbls x 10^3	736.42	0.0	–	0.0	0.0	–	–
17. Coal to electricity	7	tons x 10^3	–	0.0	0.0	0.0	0.0	–	–
18. Coal to gasification	7	tons x 10^3	–	–	–	0.0	0.0	–	–
19. Coal to liquefaction	7	tons x 10^3	–	–	–	0.0	0.0	–	–
20. Crude oil to refinery	7	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
21. Tar sands to refinery	7	bbls x 10^3	0.0	0.0	–	5,468.44	0.0	–	–
22. Oil shale to refinery	7	bbls x 10^3	32,437.8	78,745.5	–	0.0	0.0	–	–
23. Syn-crude oil to refinery	7	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
24. Coal to electricity	8	tons x 10^3	–	0.0	0.0	–	21,782.9	0.0	–
25. Coal to gasification	8	tons x 10^3	–	–	–	0.0	0.0	0.0	–
26. Coal to liquefaction	8	tons x 10^3	–	–	–	0.0	0.0	0.0	–
27. Crude oil to refinery	8	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
28. Tar sands to refinery	8	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
29. Syn-crude oil to refinery	8	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
30. Coal to electricity	9	tons x 10^3	–	0.0	0.0	–	0.0	8,950.65	0.0
31. Coal to gasification	9	tons x 10^3	–	–	–	0.0	0.0	0.0	–
32. Coal to liquefaction	9	tons x 10^3	–	–	–	0.0	0.0	0.0	–
33. Crude oil to refinery	9	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
34. Tar sands to refinery	9	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
35. Syn-crude oil to refinery	9	bbls x 10^3	0.0	0.0	–	0.0	0.0	–	–
36. Coal to electricity	10	tons x 10^3	–	0.0	22.38	–	0.0	0.0	1,491.78
37. Coal to gasification	10	tons x 10^3	–	–	–	–	0.0	0.0	–
38. Coal to liquefaction	10	tons x 10^3	–	–	–	–	0.0	0.0	–
39. Coal to slurry	10	tons x 10^3	–	–	–	–	–	–	0.0

irrigation along the Upper Colorado River in order to produce relatively expensive energy, compared to energy costs in other regions, may be doubtful. Further research, refinement of this model, and application of the modeling approach to the entire Colorado River Basin should be instructive to water planners if energy production becomes critical to the nation.

Table 51a. Change in land acreage under production of different types in each HSU, attributed to energy resource development, given coal slurry at full capacity, and no oil shale or tar sands development with 10 percent reduction in water.

Land Classification	HSU 1	2	3	4	5	6	7	8	9	10
Presently irrigated land:										
I	0.0	0.0	0.0	0.0	-	0.0	-	0.0	0.0	0.0
II	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III	0.0	0.0	0.0	+69,809.9	0.0	0.0	0.0	0.0	0.0	-827.0
Presently cultivated land:										
IV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Potentially irrigable land:										
I	+60,055.85	0.0	0.0	0.0	-	0.0	-	0.0	0.0	0.0
II	0.0	0.0	0.0	0.0	+17,073.9	-5,072.9	0.0	0.0	-4,869.6	0.0
III	0.0	0.0	0.0	+33,200.0	0.0	0.0	0.0	0.0	0.0	-12,556.5
Potentially cultivable land:										
IV	+60,055.85	0.0	0.0	+33,200.0	+17,073.9	-5,072.9	0.0	0.0	-4,869.6	-12,556.5

Table 51b. Change in land acreage under production of different types in each HSU, attributed to energy resource development, given coal slurry at full capacity and no oil shale or tar sands development with 20 percent reduction in water.

Land Classification	HSU 1	2	3	4	5	6	7	8	9	10
Presently irrigated land:										
I	0.0	0.0	0.0	0.0	-	0.0	-	0.0	0.0	0.0
II	0.0	0.0	0.0	0.0	0.0	-3,347.7	0.0	0.0	0.0	-3,878.3
III	0.0	0.0	0.0	-14,270.0	0.0	0.0	0.0	0.0	0.0	-5,200.0
Presently cultivated land:										
IV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Potentially irrigable land:										
I	+282.55	0.0	0.0	0.0	-	0.0	-	0.0	0.0	0.0
II	0.0	0.0	0.0	0.0	-5,042.3	-6,745.8	0.0	0.0	-4,869.6	0.0
III	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-12,556.5
Potentially cultivable land:										
IV	+282.55	0.0	0.0	0.0	-5,042.3	-6,745.8	0.0	0.0	-4,869.6	-12,556.5

Table 51c. Change in land acreage under production of different types in each HSU, attributed to energy development given coal slurry at full capacity and no oil shale or tar sands development with 40 percent reduction in water.

Land Classification	HSU 1	2	3	4	5	6	7	8	9	10
Presently irrigated land:										
I	+35.4	0.0	0.0	0.0	-	0.0	-	0.0	0.0	0.0
II	0.0	0.0	0.0	-28,907.7	-4,735.2	-13,489.0	0.0	0.0	0.0	-6,708.8
III	0.0	-78,400.0	-31,254.0	-18,590.1	0.0	0.0	0.0	0.0	0.0	-5,200.0
Presently cultivated land:										
IV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Potentially irrigable land:										
I	-389,848.2	0.0	0.0	0.0	-	0.0	-	0.0	0.0	0.0
II	0.0	0.0	0.0	-92,400.0	-118,623.8	-6,745.4	0.0	0.0	-4,869.6	-13,672.0
III	0.0	-68,400.0	-14,785.7	0.0	0.0	0.0	0.0	0.0	0.0	-12,556.5
Potentially cultivable land:										
IV	-389,848.2	-68,400.0	-14,785.7	-92,400.0	-118,623.8	-6,745.4	0.0	0.0	-4,869.6	-26,228.5

Table 51d. Change in land acreage under production of different types in each HSU, attributed to energy development given coal slurry at full capacity and no oil shale or tar sands development with 60 percent reduction in water.

Land Classification	HSU 1	2	3	4	5	6	7	8	9	10
Presently irrigated land:										
I	+35.4	0.0	-22,482.7	0.0	-	0.0	-	0.0	-1,000.0	0.0
II	0.0	-49,387.6	-51,900.0	0.0	-69,952.5	-25,674.9	-38,506.7	0.0	-2,100.0	-7,834.0
III	0.0	-78,400.0	-56,200.0	-16,347.8	0.0	0.0	-83,000.0	-42,100.0	0.0	-5,200.0
Presently cultivated land:										
IV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Potentially irrigable land:										
I	-38,844.2	0.0	-700.0	0.0	-	0.0	-	0.0	-5,400.0	0.0
II	0.0	-56,477.8	-8,000.0	0.0	-118,623.8	-6,745.5	-99,300.0	-80,289.1	-11,630.0	-29,057.1
III	0.0	-68,400.0	-21,800.0	0.0	0.0	0.0	-133,400.0	-118,800.0	0.0	-12,556.5
Potentially cultivable land:										
IV	-38,844.2	-124,877.8	-30,500.0	0.0	-118,623.8	-6,745.5	-232,700.0	-199,089.1	-17,030.0	-41,613.6

Table 52a. Change in agricultural land given ERDA energy projections for 2000, and 10 percent reduction in water.

Land Classification	HSU 1	2	3	4	5	6	7	8	9	10
Presently irrigated land:										
I	0.0	0.0	0.0	0.0	-	0.0	-	0.0	0.0	0.0
II	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III	0.0	0.0	0.0	+69,810.0	0.0	0.0	0.0	0.0	0.0	-827.0
Presently cultivated land:										
IV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Potentially irrigable land:										
I	+60,055.85	0.0	0.0	0.0	-	0.0	-	0.0	0.0	0.0
II	0.0	0.0	0.0	0.0	-31,537.5	-5,073.0	0.0	0.0	-4,869.6	0.0
III	0.0	0.0	0.0	+33,200.0	0.0	0.0	0.0	0.0	0.0	-12,556.5
Potentially cultivable land:										
IV	+60,055.85	0.0	0.0	+33,200.0	-31,537.5	-5,073.0	0.0	0.0	-4,869.6	-12,556.5

Table 52b. Change in agricultural land given ERDA energy projects for 2000, and 20 percent reduction in water.

Land Classification	HSU 1	2	3	4	5	6	7	8	9	10
Presently irrigated land:										
I	0.0	0.0	0.0	0.0	-	0.0	-	0.0	0.0	0.0
II	0.0	0.0	0.0	0.0	0.0	+3,347.7	0.0	0.0	0.0	-3,878.3
III	0.0	0.0	0.0	-18,590.1	0.0	0.0	0.0	0.0	0.0	-5,200.0
Presently cultivated land:										
IV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Potentially irrigable land:										
I	+282.6	0.0	0.0	0.0	-	0.0	-	0.0	0.0	0.0
II	0.0	0.0	0.0	-1,016.7	-57,505.3	-6,745.5	0.0	0.0	-4,869.6	0.0
III	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-12,556.5
Potentially cultivable land:										
IV	+282.6	0.0	0.0	-1,016.7	-57,505.3	-6,745.5	0.0	0.0	-4,869.6	-12,556.5

Table 52c. Change in agricultural land given ERDA energy projects for 2000, and 40 percent reduction in water.

Land Classification	HSU 1	2	3	4	5	6	7	8	9	10
Presently irrigated land:										
I	-35.4	0.0	0.0	0.0	-	0.0	-	0.0	0.0	0.0
II	0.0	0.0	0.0	-37,381.9	-10,353.3	-13,489.0	0.0	0.0	0.0	-60,708.8
III	0.0	-78,400.0	-56,200.0	-18,590.1	0.0	0.0	0.0	0.0	0.0	-5,200.0
Presently cultivated land:										
IV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Potentially irrigable land:										
I	-38,844.2	0.0	0.0	-14,717.3	-	0.0	-	0.0	0.0	0.0
II	0.0	-9,868.8	0.0	-92,400.0	-118,623.8	-6,745.4	0.0	0.0	-4,869.6	-13,672.0
III	0.0	-68,400.0	-21,800.0	0.0	0.0	0.0	0.0	0.0	0.0	-12,556.5
Potentially cultivable land:										
IV	-38,844.2	-78,268.8	-21,800.0	-107,117.3	-118,623.8	-6,745.4	0.0	0.0	-4,869.6	-26,228.5

Table 52d. Change in agricultural land given ERDA energy projects for 2000, and 60 percent reduction in water.

Land Classification	HSU 1	2	3	4	5	6	7	8	9	10
Presently irrigated land:										
I	-35.4	0.0	-22,482.7	0.0	-	0.0	-	0.0	-505.0	0.0
II	0.0	-49,387.6	-51,900.0	0.0	-72,460.6	-25,674.9	-44,402.4	-16,378.7	-2,100.0	-7,834.0
III	0.0	-78,400.0	-56,200.0	-15,175.3	0.0	0.0	-83,000.0	-42,100.0	0.0	-5,200.0
Presently cultivated land:										
IV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Potentially irrigable land:										
I	-38,844.2	0.0	-700.0	0.0	-	0.0	-	0.0	-5,400.0	0.0
II	0.0	-56,477.8	-8,000.0	0.0	-118,623.8	-6,745.5	-99,300.0	-110,517.4	-11,630.0	-29,057.0
III	0.0	-68,400.0	-21,800.0	0.0	0.0	0.0	-133,400.0	-118,800.0	0.0	-12,556.5
Potentially cultivable land:										
IV	-38,844.2	-124,877.8	-30,500.0	0.0	-118,623.8	-6,745.5	-232,700.0	-229,317.4	-17,030.0	-41,613.6

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Appendix A

ROWS

Code	Name
$TALFAF_i$	Total acreage of alfalfa full grown in region i (i = 1, ..., 10)
$TALFAP_i$	Total acreage of alfalfa partially grown in region i (i = 1, ..., 10)
$TBARLY_i$	Total acreage of barley grown in region i (i = 1, ..., 10)
$TNURSC_i$	Total acreage of nurse crop grown in region i (i = 1, ..., 10)
$TCORNG_i$	Total acreage of corn grain grown in region i (i = 1, ..., 10)
$TCORNS_i$	Total acreage of corn silage grown in region i (i = 1, ..., 10)
$TSBEET_i$	Total acreage of sugar beets grown in region i (i = 1, ..., 10)
$TAPPLE_i$	Total acreage of apples grown in region i (i = 1, ..., 10)
$TPEACH_i$	Total acreage of peaches grown in region i (i = 1, ..., 10)
$TSTCH_i$	Total acreage of sweet cherries grown in region i (i = 1, ..., 10)
$TSRCH_i$	Total acreage of sour cherries grown in region i (i = 1, ..., 10)
$PILND_{ji}$	Presently irrigated land of j^{th} class in region i (j = 1, ..., 3; i = 1, ..., 10)
$PCLND_{ji}$	Presently cultivated land of j^{th} class in region i (j = 4; i = 1, ..., 10)
$POILND_{ji}$	Potentially irrigable land of j^{th} class in region i (j = 1, ..., 3; i = 1, ..., 10)
$POCLND_{ji}$	Potentially cultivable land of j^{th} class in region i (j = 4; i = 1, ..., 10)
$ROTAB_i$	Rotational constraint for alfalfa and barley crops in region i
$ROTBN_i$	Rotational constraint for barley and nurse crops in region i
$ROTAN_{ij}$	Rotational constraint for alfalfa and nurse crops for j^{th} class of land in region i
$ROTCS_i$	Rotational constraint for corn and sugar beets in region i
$ROTNAP_{ij}$	Rotational constraint for nurse apples and mature apples for j^{th} class of land in region i
$ROTNPE_{ij}$	Rotational constraint for nurse peaches and mature peaches for j^{th} class of land in region i
$ROTNST_{ij}$	Rotational constraint for nurse sweet cherries and mature sweet cherries for j^{th} class of land in region i
$ROTNSR_{ij}$	Rotational constraint for nurse sour cherries and mature sour cherries for j^{th} class of land in region i

ROWS

Code	Name
$NOTAB_i$ etc.	Are the same as defined above for $ROTAB_i$ etc. The only difference is that $ROTAB_i$ etc. are applied to presently irrigated land whereas $NOTAB_i$ etc. are applied to potentially irrigable land.
$AGWTREQ_i$	Agricultural water requirements in region i (i = 1, ..., 10)
$AGRF_iT_i$	Agricultural return flows of region i available to region i
$SWAVIL_i$	Local surface water availability in region i
$GWAVIL_i$	Groundwater availability in region i
$WETLREQ_i$	Wetland requirements in region i
INFTGSL	Inflow to Great Salt Lake
$FRUITAC_i$	Fruit acreage grown in region i
$EVLOSS_i$	Evaporation loss due to canals and channels in region i
$FLOWOL_i$	Flow of oil in region i
$CONERI_i$	Conversion of energy products to refinery in region i
$CAPOL_i$	Capacity of oil in region i
$CAPNG_i$	Capacity of natural gas in region i
$CAPRI_i$	Capacity of refinery in region i
$ENWREQ_i$	Energy water requirement in region i
$CONEEL_i$	Conversion to electricity in region i
$FLOWCL_i$	Flow of coal in region i
$FLOWTS_i$	Flow of tar sands in region i
$FLOWSH_i$	Flow of shale in region i
$FLOWLQ_i$	Flow of liquefacted coal in region i
$FLOWCG_i$	Flow of coal gas in region i
$CAPSH_i$	Capacity of oil shale in region i
$CAPTS_i$	Capacity of tar sands in region i
$CAPCG_i$	Capacity of coal gasification in region i
$CAPLQ_i$	Capacity of coal liquefaction in region i
$AUMWREQ_i$	Augmented municipal water requirements for energy in region i
$EQMWEN_i$	Equilibrium municipal water requirements for energy in region i
Columns	(This is a kind of transfer constraint.)
$ALFAF_{ji}$	Acres of alfalfa full grown in presently cultivated or irrigated j^{th} class of land in region i
$ALFAP_{ji}$	Acres of alfalfa partially grown in presently cultivated or irrigated j^{th} class of land in region i
$BARLY_{ji}$	Acres of barley grown in presently cultivated or irrigated j^{th} class of land in region i

ROWS

Code	Name
$NURSC_{ji}$	Acres of nurse crop grown in presently cultivated or irrigated j^{th} class of land in region i
$CORNG_{ji}$	Acres of corn grain grown in presently cultivated or irrigated j^{th} class of land in region i
$CORNS_{ji}$	Acres of corn silage grown in presently cultivated or irrigated j^{th} class of land in region i
$SBEET_{ji}$	Acres of sugar beets grown in presently cultivated or irrigated j^{th} class of land in region i
$DBEANS_{ji}$	Acres of dry beans grown in presently cultivated or irrigated j^{th} class of land in region i ($j = 4$)
$DWHEAT_{ji}$	Acres of dry wheat grown in presently cultivated or irrigated j^{th} class of land in region i ($j = 4$)
$NAPPL_{ji}$	Acres of nurse apples grown in presently cultivated or irrigated j^{th} class of land in region i ($j = 4$)
$NPEAC_{ji}$	Acres of nurse peaches grown in presently cultivated or irrigated j^{th} class of land in region i ($j = 4$)
$NSTCH_{ji}$	Acres of nurse sweet cherries grown in presently cultivated or irrigated j^{th} class of land in region i ($j = 4$)
$NSRCH_{ji}$	Acres of nurse sour cherries grown in presently cultivated or irrigated j^{th} class of land in region i ($j = 4$)
$MAPPL_{ji}$	Acres of mature apples grown in presently cultivated or irrigated j^{th} class of land in region i ($j = 4$)
$MPEAC_{ji}$	Acres of mature peaches grown in presently cultivated or irrigated j^{th} class of land in region i ($j = 4$)
$MSTCH_{ji}$	Acres of mature sweet cherries grown in presently cultivated or irrigated j^{th} class of land in region i ($j = 4$)
$MSRCH_{ji}$	Acres of mature sour cherries grown in presently cultivated or irrigated j^{th} class of land in region i ($j = 4$)
$NALFAF_{ji}$,	$NNURSC_{ji}$ etc. are same as defined above except they are grown in potentially cultivable or irrigable land
$WETLRES_i$	Wetland requirements met from surface water in region i
$WETLREG_i$	Wetland requirements met from groundwater in region i
$PSWAG_i$	Present local surface water available to agriculture in i^{th} region
$NSWAG_i$	New development local surface water to agriculture in i^{th} region
$PGWAG_i$	Present groundwater available to agriculture in i^{th} region
$NGWAG_i$	New development in groundwater available to agriculture in i^{th} region
$NIMAG_jT_i$	New import for agriculture from region j to i
$PIMAG_jT_i$	Present import for agriculture from region j to i

ROWS

Code	Name
$NIMAU_jT_i$	New import for agriculture from Ute in region j to i
$NIMAB_jT_i$	New import for agriculture from Bonneville in region j to i
$NIMAS_jT_i$	New import for agriculture from Sevier in region j to i
$AGWRF_i$	Agricultural water return flow from i^{th} region
$OUTFSW_{ij}$	Outflow of surface water from i^{th} region to j^{th} region
$OFSW_iGSL$	Outflow of surface water of i^{th} region to Great Salt Lake
$OFGW_iGSL$	Outflow of groundwater of i^{th} region to Great Salt Lake
$EVLFCAG_i$	Evaporation losses on canals from agriculture in i^{th} region
OIL_i	Oil in i^{th} region
TAR_i	Tar sands in i^{th} region
$SHAL_i$	Oil shale in i^{th} region
$NGAS_i$	Natural gas in i^{th} region
$CGAS_i$	Coal gas in i^{th} region
$LIQU_i$	Liquefaction in i^{th} region
$ROIL_i$	Refined oil in i^{th} region
$CLCG_{ij}$	Coal for coal gasification from i^{th} to j^{th} region
$CLLQ_{ij}$	Coal for coal liquefaction from i^{th} to j^{th} region
$CLEL_{ij}$	Coal for electricity from i^{th} to j^{th} region
$OLRI_{ij}$	Oil to refinery from i^{th} to j^{th} region
$TSRI_{ij}$	Tar sands to refinery from i^{th} to j^{th} region
$SHRI_{ij}$	Shale oil to refinery from i^{th} to j^{th} region
$LQRI_{ij}$	Liquefaction to refinery from i^{th} to j^{th} region
$TOTALCL_i$	Total coal in i^{th} region
$TOTALOL_i$	Total oil in i^{th} region
$TOTALTS_i$	Total tar sands in i^{th} region
$TOTALSH_i$	Total shale oil in i^{th} region
$TOTALLQ_i$	Total liquefaction in i^{th} region
$ELEC_i$	Electricity produced in i^{th} region
$PSWEN_i$	Present local surface water for energy in region i
$PGWEN_i$	Present groundwater for energy in region i
$NSWEN_i$	New local surface water for energy in region i
$NGWEN_i$	New groundwater for energy in region i
$PIMEN_{ij}$	Present import of water for energy from i^{th} to j^{th} region
$NIMEN_{ij}$	New development import of water for energy from i^{th} to j^{th} region
$AUMWEN_i$	Augmented municipal water requirements for energy in i^{th} region

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B6700/7700 TEMPO                                    ENBCDO
VERSION: 28.600.000

SETUP      TIME--PROCESSOR =     0.21    ELAPSED =     1.78

PROBLEM STATISTICS
              NUMBER        FREE      FIXED    BOUNDED     NORMAL
  ROWS    :    587           83        203         0        301
  COLUMNS:     897            0          2        33        862

MATRIX ON DISK : RECORD LENGTH =   2220 WORDS, NUMBER OF RECORDS =   5
INVERSE: MEMORY ALLOCATION =   4440 WORDS, RECORD LENGTH =   2220 WORDS.

LOAD       TIME--PROCESSOR =     0.24    ELAPSED =     1.92

 LOAD BASIS ENERGYO  SAVED ON 08/26/77 FOR ENBCDO

BCDOUT     TIME--PROCESSOR =     0.26    ELAPSED =     2.04

NAME          REVDATA
ROWS

N  PROFIT     N  TPEACH3    N  TCORNS7    L  ROTAN11    E  NOTNPE13   E  ROTNAP23   E  NOTNSR23   E  ROTNST33
N  TALFAF1    N  TSTCH3     N  TALFAF8    L  ROTAN12    E  NOTNST12   E  ROTNPE21   G  NOTMAPP2   E  ROTNSR31
N  TALFAP1    N  TSRCH3     N  TALFAP8    L  ROTAN13    E  NOTNST11   E  ROTNPE22   G  NOTMPEA2   E  ROTNSR32
N  TBARLY1    N  TALFAF4    N  TBARLY8    G  ROTCS1     E  NOTNST13   E  ROTNPE23   G  NOTMSTC2   E  ROTNSR33
N  TNURSC1    N  TALFAP4    N  TNURSC8    E  ROTNAP11   E  NOTNSR11   E  ROTNST21   G  NOTMSRC2   G  ROTMAPP3
N  TCORNG1    N  TBARLY4    N  TCORNG8    E  ROTNAP12   E  NOTNSR12   E  ROTNST22   E  AGWTREQ2   G  ROTMPEA3
N  TCORNS1    N  TNURSC4    N  TCORNS8    E  ROTNAP13   E  NOTNSR13   E  ROTNST23   E  AGRF2T2    G  ROTMSTC3
N  TSBEET1    N  TCORNG4    N  TALFAF9    E  ROTNPE11   G  NOTMAPP1   E  ROTNSR21   L  SWAVIL2    G  ROTMSRC3
N  TAPPLE1    N  TCORNS4    N  TALFAP9    E  ROTNPE12   G  NOTMPEA1   E  ROTNSR22   L  GWAVIL2    G  NOTAB3
N  TPEACH1    N  TSBEET4    N  TBARLY9    E  ROTNPE13   G  NOTMSTC1   E  ROTNSR23   L  PILND13    G  NOTBN3
N  TSTCH1     N  TAPPLE4    N  TNURSC9    E  ROTNST11   G  NOTMSRC1   G  ROTMAPP2   L  PILND23    L  NOTAN31
N  TSRCH1     N  TPEACH4    N  TCORNG9    E  ROTNST12   E  AGWTREQ1   G  ROTMPEA2   L  PILND33    L  NOTAN32
N  TALFAF2    N  TSTCH4     N  TCORNS9    E  ROTNST13   E  AGRF1T1    G  ROTMSTC2   L  PCLND43    L  NOTAN33
N  TALFAP2    N  TSRCH4     N  TALFAF0    E  ROTNSR11   L  SWAVIL1    G  ROTMSRC2   L  POILND13   G  NOTCS3
N  TBARLY2    N  TALFAF5    N  TALFAP0    E  ROTNSR12   L  GWAVIL1    G  NOTAB2     L  POILND23   E  NOTNAP31
N  TNURSC2    N  TALFAP5    N  TBARLY0    E  ROTNSR13   L  PILND12    G  NOTBN2     L  POILND33   E  NOTNAP32
N  TCORNG2    N  TBARLY5    N  TNURSC0    G  ROTMAPP1   L  PILND22    L  NOTAN21    L  POCLND43   E  NOTNAP33
N  TCORNS2    N  TNURSC5    N  TCORNG0    G  ROTMPEA1   L  PILND32    L  NOTAN22    G  ROTAB3     E  NOTNPE31
N  TSBEET2    N  TCORNG5    N  TCORNS0    G  ROTMSTC1   L  PCLND42    L  NOTAN23    G  ROTBN3     E  NOTNPE32
N  TAPPLE2    N  TCORNS5    N  TAPPLE0    G  ROTMSRC1   L  POILND12   G  NOTCS2     L  ROTAN31    E  NOTNPE33
N  TPEACH2    N  TALFAF6    N  TPEACH0    G  NOTAB1     L  POILND22   E  NOTNAP21   L  ROTAN32    E  NOTNST31
N  TSTCH2     N  TALFAP6    L  PILND11    G  NOTBN1     L  POILND32   E  NOTNAP22   L  ROTAN33    E  NOTNST32
N  TSRCH2     N  TBARLY6    L  PILND21    L  NOTAN11    L  POCLND42   E  NOTNAP23   G  ROTCS3     E  NOTNST33
N  TALFAF3    N  TNURSC6    L  PILND31    L  NOTAN12    G  ROTAB2     E  NOTNPE21   E  ROTNAP31   E  NOTNSR31
N  TALFAP3    N  TCORNG6    L  PCLND41    L  NOTAN13    G  ROTBN2     E  NOTNPE22   E  ROTNAP32   E  NOTNSR32
N  TBARLY3    N  TCORNS6    L  POILND11   G  NOTCS1     L  ROTAN21    E  NOTNPE23   E  ROTNAP33   E  NOTNSR33
N  TNURSC3    N  TALFAF7    L  POILND21   E  NOTNAP11   L  ROTAN22    E  NOTNST21   E  ROTNPE31   G  NOTMAPP3
N  TCORNG3    N  TALFAP7    L  POILND31   E  NOTNAP12   L  ROTAN23    E  NOTNST22   E  ROTNPE32   G  NOTMPEA3
N  TCORNS3    N  TBARLY7    L  POCLND41   E  NOTNAP13   G  ROTCS2     E  NOTNST23   E  ROTNPE33   G  NOTMSTC3
N  TSBEET3    N  TNURSC7    G  ROTAB1     E  NOTNPE11   E  ROTNAP21   E  NOTNSR21   E  ROTNST31   G  NOTMSRC3
N  TAPPLE3    N  TCORNG7    G  ROTBN1     E  NOTNPE12   E  ROTNAP22   E  NOTNSR22   E  ROTNST32   E  AGWTREQ3
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E AGRF3T3
L SWAVIL3
L GWAVIL3
L PILND14
L PILND24
L PILND34
L PCLND44
L POILND14
L POILND24
L POILND34
L POCLND44
G ROTAB4
G ROTBN4
L ROTAN41
L ROTAN42
L ROTAN43
G ROTCS4
E ROTNAP41
E ROTNAP42
E ROTNAP43
E ROTNPE41
E ROTNPE42
E ROTNPE43
E ROTNST41
E ROTNST42
E ROTNST43
E ROTNSR41
E ROTNSR42
E ROTNSR43
G ROTMAPP4
G ROTMPEA4
G ROTMSTC4
G ROTMSRC4
G NOTAB4
G NOTBN4
L NOTAN41
L NOTAN42
L NOTAN43
G NOTCS4
E NOTNAP41
E NOTNAP42
E NOTNAP43
E NOTNPE41
E NOTNPE42
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E NOTNST41
E NOTNST42
E NOTNST43
E NOTNSR41
E NOTNSR42
E NOTNSR43
G NOTMAPP4
G NOTMPEA4
G NOTMSTC4
G NOTMSRC4
E AGWTREQ4
E AGRF4T4
L SWAVIL4
L GWAVIL4
L PILND25
L PILND35
L PCLND45
L POILND25
L POILND35
L POCLND45
G ROTAB5
G ROTBN5
L ROTAN52
L ROTAN53
G ROTC5
G NOTAB5
G NOTBN5
L NOTAN52
L NOTAN53
G NOTC5
E AGWTREQ5
E AGRF5T5
L SWAVIL5
L GWAVIL5
L PILND16
L PILND26
L PILND36
L PCLND46
L POILND16
L POILND26
L POILND36
L POCLND46
G ROTAB6
G ROTBN6
L ROTAN61
L ROTAN62
L ROTAN63
G ROTC6
G NOTAB6
G NOTBN6
L NOTAN61
L NOTAN62
L NOTAN63
G NOTC6
E AGWTREQ6
E AGRF6T6
L SWAVIL6
L GWAVIL6
L PILND27
L PILND37
L PCLND47
L POILND27
L POILND37
L POCLND47
G ROTAB7
G ROTBN7
L ROTAN72
L ROTAN73
G ROTC7
G NOTAB7
G NOTBN7
L NOTAN72
L NOTAN73
G NOTC7
E AGWTREQ7
E AGRF7T7
E SWAVIL7
L GWAVIL7
L PILND18
L PILND28
L PILND38
L PCLND48
L POILND18
L POILND28
L POILND38
L POCLND48
G ROTAB8
G ROTBN8
L ROTAN81
L ROTAN82
L ROTAN83
G ROTC8
G NOTAB8
G NOTBN8
L NOTAN81
L NOTAN82
L NOTAN83
G NOTC8
E AGWTREQ8
E AGRF8T8
E SWAVIL8
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L PILND29
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L PCLND49
L POILND19
L POILND29
L POILND39
L POCLND49
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G ROTC9
G NOTAB9
G NOTBN9
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L NOTAN93
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E WETLREQ5
E WETLREQ6
E WETLREQ7
E WETLREQ8
E WETLREQ9
E WETLREQ0
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G FRUITAC1
G FRUITAC2
G FRUITAC3
G FRUITAC4
G FRUITAC0
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L PGWAE3
L NIM2T3
L NIMU7T3
L PSWAE4
L PGWAE4
L PIM1T4
L PIM3T4
L PIM7T4
L NIM3T4
L NIMS8T4
L PSWAE6
L PGWAE6
L PIMOT6
L NIM5T6
L NIMOT6
L PSWAE7
L PSWAE8
L PSWAE9
L PSWAE0
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L CAPRI4
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E EQMWEN3
E EQMWEN4
E EQMWEN6
E EQMWEN7
E EQMWEN8
E EQMWEN9
E EQMWEN0
L NDIUCW
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COLUMNS

ALFAF11	PROFIT	90.61000	PILND11	1.00000	NURSC11	PROFIT	57.87000	PILND11	1.00000
ALFAF11	ROTAB1	1.00000	ROTAN11	1.00000	NURSC11	ROTBN1	-1.00000	ROTAN11	-5.00000
ALFAF11	ROTCS1	1.00000	ROTMAPP1	1.00000	NURSC11	ROTCS1	1.00000	ROTMAPP1	1.00000
ALFAF11	ROTMPEA1	1.00000	ROTMSTC1	1.00000	NURSC11	ROTMPEA1	1.00000	ROTMSTC1	1.00000
ALFAF11	ROTMSRC1	1.00000	AGWTREQ1	2.00000	NURSC11	ROTMSRC1	1.00000	AGWTREQ1	1.60000
ALFAF11	PCLND41	1.00000	TALFAF1	1.00000	NURSC11	PCLND41	1.00000	TNURSC1	1.00000
ALFAF21	PROFIT	75.71000	PILND21	1.00000	NURSC21	PROFIT	40.14000	PILND21	1.00000
ALFAF21	ROTAB1	1.00000	ROTAN12	1.00000	NURSC21	ROTBN1	-1.00000	ROTAN12	-5.00000
ALFAF21	ROTCS1	1.00000	ROTMAPP1	1.00000	NURSC21	ROTCS1	1.00000	ROTMAPP1	1.00000
ALFAF21	ROTMPEA1	1.00000	ROTMSTC1	1.00000	NURSC21	ROTMPEA1	1.00000	ROTMSTC1	1.00000
ALFAF21	ROTMSRC1	1.00000	AGWTREQ1	2.00000	NURSC21	ROTMSRC1	1.00000	AGWTREQ1	1.60000
ALFAF21	PCLND41	1.00000	TALFAF1	1.00000	NURSC21	PCLND41	1.00000	TNURSC1	1.00000
ALFAF31	PROFIT	63.98000	PILND31	1.00000	NURSC31	PROFIT	31.21000	PILND31	1.00000
ALFAF31	ROTAB1	1.00000	ROTAN13	1.00000	NURSC31	ROTBN1	-1.00000	ROTAN13	-5.00000
ALFAF31	ROTCS1	1.00000	ROTMAPP1	1.00000	NURSC31	ROTCS1	1.00000	ROTMAPP1	1.00000
ALFAF31	ROTMPEA1	1.00000	ROTMSTC1	1.00000	NURSC31	ROTMPEA1	1.00000	ROTMSTC1	1.00000
ALFAF31	ROTMSRC1	1.00000	AGWTREQ1	2.00000	NURSC31	ROTMSRC1	1.00000	AGWTREQ1	1.60000
ALFAF31	PCLND41	1.00000	TALFAF1	1.00000	NURSC31	PCLND41	1.00000	TNURSC1	1.00000
ALFAP11	PROFIT	68.49000	PILND11	1.00000	CORNG11	PROFIT	161.72000	PILND11	1.00000
ALFAP11	ROTAB1	1.00000	ROTAN11	1.00000	CORNG11	ROTCS1	-9.00000	ROTMAPP1	1.00000
ALFAP11	ROTCS1	1.00000	ROTMAPP1	1.00000	CORNG11	ROTMPEA1	1.00000	ROTMSTC1	1.00000
ALFAP11	ROTMPEA1	1.00000	ROTMSTC1	1.00000	CORNG11	ROTMSRC1	1.00000	AGWTREQ1	1.40000
ALFAP11	ROTMSRC1	1.00000	AGWTREQ1	1.50000	CORNG11	PCLND41	1.00000	TCORNG1	1.00000
ALFAP11	PCLND41	1.00000	TALFAP1	1.00000	CORNG21	PROFIT	121.74000	PILND21	1.00000
ALFAP21	PROFIT	52.07000	PILND21	1.00000	CORNG21	ROTCS1	-9.00000	ROTMAPP1	1.00000
ALFAP21	ROTAB1	1.00000	ROTAN12	1.00000	CORNG21	ROTMPEA1	1.00000	ROTMSTC1	1.00000
ALFAP21	ROTCS1	1.00000	ROTMAPP1	1.00000	CORNG21	ROTMSRC1	1.00000	AGWTREQ1	1.40000
ALFAP21	ROTMPEA1	1.00000	ROTMSTC1	1.00000	CORNG21	PCLND41	1.00000	TCORNG1	1.00000
ALFAP21	ROTMSRC1	1.00000	AGWTREQ1	1.50000	CORNG31	PROFIT	79.92000	PILND31	1.00000
ALFAP21	PCLND41	1.00000	TALFAP1	1.00000	CORNG31	ROTCS1	-9.00000	ROTMAPP1	1.00000
ALFAP31	PROFIT	47.21000	PILND31	1.00000	CORNG31	ROTMPEA1	1.00000	ROTMSTC1	1.00000
ALFAP31	ROTAB1	1.00000	ROTAN13	1.00000	CORNG31	ROTMSRC1	1.00000	AGWTREQ1	1.40000
ALFAP31	ROTCS1	1.00000	ROTMAPP1	1.00000	CORNG31	PCLND41	1.00000	TCORNG1	1.00000
ALFAP31	ROTMPEA1	1.00000	ROTMSTC1	1.00000	CORNS11	PROFIT	202.34000	PILND11	1.00000
ALFAP31	ROTMSRC1	1.00000	AGWTREQ1	1.50000	CORNS11	ROTCS1	-9.00000	ROTMAPP1	1.00000
ALFAP31	PCLND41	1.00000	TALFAP1	1.00000	CORNS11	ROTMPEA1	1.00000	ROTMSTC1	1.00000
BARLY11	PROFIT	104.38000	PILND11	1.00000	CORNS11	ROTMSRC1	1.00000	AGWTREQ1	1.30000
BARLY11	ROTAB1	-1.00000	ROTBN1	1.00000	CORNS11	PCLND41	1.00000	TCORNS1	1.00000
BARLY11	ROTCS1	1.00000	ROTMAPP1	1.00000	CORNS21	PROFIT	187.45000	PILND21	1.00000
BARLY11	ROTMPEA1	1.00000	ROTMSTC1	1.00000	CORNS21	ROTCS1	-9.00000	ROTMAPP1	1.00000
BARLY11	ROTMSRC1	1.00000	AGWTREQ1	1.20000	CORNS21	ROTMPEA1	1.00000	ROTMSTC1	1.00000
BARLY11	PCLND41	1.00000	TBARLY1	1.00000	CORNS21	ROTMSRC1	1.00000	AGWTREQ1	1.30000
BARLY21	PROFIT	82.55000	PILND21	1.00000	CORNS21	PCLND41	1.00000	TCORNS1	1.00000
BARLY21	ROTAB1	-1.00000	ROTBN1	1.00000	CORNS31	PROFIT	155.00000	PILND31	1.00000
BARLY21	ROTCS1	1.00000	ROTMAPP1	1.00000	CORNS31	ROTCS1	-9.00000	ROTMAPP1	1.00000
BARLY21	ROTMPEA1	1.00000	ROTMSTC1	1.00000	CORNS31	ROTMPEA1	1.00000	ROTMSTC1	1.00000
BARLY21	ROTMSRC1	1.00000	AGWTREQ1	1.20000	CORNS31	ROTMSRC1	1.00000	AGWTREQ1	1.30000
BARLY21	PCLND41	1.00000	TBARLY1	1.00000	CORNS31	PCLND41	1.00000	TCORNS1	1.00000
BARLY31	PROFIT	69.32000	PILND31	1.00000	SBEET11	PROFIT	86.54000	PILND11	1.00000
BARLY31	ROTAB1	-1.00000	ROTBN1	1.00000	SBEET11	ROTCS1	-9.00000	ROTMAPP1	1.00000
BARLY31	ROTCS1	1.00000	ROTMAPP1	1.00000	SBEET11	ROTMPEA1	1.00000	ROTMSTC1	1.00000
BARLY31	ROTMPEA1	1.00000	ROTMSTC1	1.00000	SBEET11	ROTMSRC1	1.00000	AGWTREQ1	1.60000
BARLY31	ROTMSRC1	1.00000	AGWTREQ1	1.20000	SBEET11	PCLND41	1.00000	TSBEET1	1.00000
BARLY31	PCLND41	1.00000	TBARLY1	1.00000	SBEET21	PROFIT	68.07000	PILND21	1.00000

SBEET21	ROTCS1	-9.00000	ROTMAPP1	1.00000
SBEET21	ROTMPEA1	1.00000	ROTMSTC1	1.00000
SBEET21	ROTMSRC1	1.00000	AGWTREQ1	1.60000
SBEET21	PCLND41	1.00000	TSBEET1	1.00000
SBEET31	PROFIT	57.01000	PILND31	1.00000
SBEET31	ROTCS1	-9.00000	ROTMAPP1	1.00000
SBEET31	ROTMPEA1	1.00000	TSBEET1	1.00000
SBEET31	ROTMSTC1	1.00000	ROTMSRC1	1.00000
SBEET31	AGWTREQ1	1.60000	PCLND41	1.00000
DBEANS41	PROFIT	-35.20000	PCLND41	1.00000
DWHEAT41	PROFIT	18.86000	PCLND41	1.00000
NAPPL11	PROFIT	-118.55000	PILND11	1.00000
NAPPL11	ROTNAP11	-2.30000	AGWTREQ1	2.50000
NAPPL11	PCLND41	1.00000	TAPPLE1	1.00000
NAPPL11	FRUITAC1	1.00000		
NAPPL21	PROFIT	-146.29000	PILND21	1.00000
NAPPL21	ROTNAP12	-2.30000	AGWTREQ1	2.50000
NAPPL21	PCLND41	1.00000	TAPPLE1	1.00000
NAPPL21	FRUITAC1	1.00000		
NAPPL31	PROFIT	-194.01000	PILND31	1.00000
NAPPL31	ROTNAP13	-2.30000	AGWTREQ1	2.50000
NAPPL31	PCLND41	1.00000	TAPPLE1	1.00000
NAPPL31	FRUITAC1	1.00000		
NPEAC11	PROFIT	-91.08000	PILND11	1.00000
NPEAC11	ROTNPE11	-2.00000	AGWTREQ1	2.80000
NPEAC11	PCLND41	1.00000	TPEACH1	1.00000
NPEAC11	FRUITAC1	1.00000		
NPEAC21	PROFIT	-104.36000	PILND21	1.00000
NPEAC21	ROTNPE12	-2.00000	AGWTREQ1	2.80000
NPEAC21	PCLND41	1.00000	TPEACH1	1.00000
NPEAC21	FRUITAC1	1.00000		
NPEAC31	PROFIT	-110.96000	PILND31	1.00000
NPEAC31	ROTNPE13	-2.00000	AGWTREQ1	2.80000
NPEAC31	PCLND41	1.00000	TPEACH1	1.00000
NPEAC31	FRUITAC1	1.00000		
MAPPL11	PROFIT	197.30000	PILND11	1.00000
MAPPL11	ROTNAP11	1.00000	ROTMAPP1	-30.00000
MAPPL11	AGWTREQ1	3.60000	PCLND41	1.00000
MAPPL11	TAPPLE1	1.00000	FRUITAC1	1.00000
MAPPL21	PROFIT	105.84000	PILND21	1.00000
MAPPL21	ROTNAP12	1.00000	ROTMAPP1	-30.00000
MAPPL21	AGWTREQ1	3.60000	PCLND41	1.00000
MAPPL21	TAPPLE1	1.00000	FRUITAC1	1.00000
MAPPL31	PROFIT	35.52000	PILND31	1.00000
MAPPL31	ROTNAP13	1.00000	ROTMAPP1	-30.00000
MAPPL31	AGWTREQ1	3.60000	PCLND41	1.00000
MAPPL31	TAPPLE1	1.00000	FRUITAC1	1.00000
MPEAC11	PROFIT	174.90000	PILND11	1.00000
MPEAC11	ROTNPE11	1.00000	ROTMPEA1	-15.00000
MPEAC11	AGWTREQ1	3.90000	PCLND41	1.00000
MPEAC11	TPEACH1	1.00000	FRUITAC1	1.00000
MPEAC21	PROFIT	95.92000	PILND21	1.00000
MPEAC21	ROTNPE12	1.00000	ROTMPEA1	-15.00000
MPEAC21	AGWTREQ1	3.90000	PCLND41	1.00000
MPEAC21	TPEACH1	1.00000	FRUITAC1	1.00000
MPEAC31	PROFIT	50.06000	PILND31	1.00000
MPEAC31	ROTNPE13	1.00000	ROTMPEA1	-15.00000
MPEAC31	AGWTREQ1	3.90000	PCLND41	1.00000
MPEAC31	TPEACH1	1.00000	FRUITAC1	1.00000
NSTCH11	PROFIT	-129.36000	PILND11	1.00000
NSTCH11	ROTNST11	-2.00000	AGWTREQ1	2.70000
NSTCH11	PCLND41	1.00000	TSTCH1	1.00000
NSTCH11	FRUITAC1	1.00000		
NSTCH21	PROFIT	-129.53000	PILND21	1.00000
NSTCH21	ROTNST12	-2.00000	AGWTREQ1	2.70000
NSTCH21	PCLND41	1.00000	TSTCH1	1.00000
NSTCH21	FRUITAC1	1.00000		
NSTCH31	PROFIT	-157.46000	PILND31	1.00000
NSTCH31	ROTNST13	-2.00000	AGWTREQ1	2.70000
NSTCH31	PCLND41	1.00000	TSTCH1	1.00000
NSTCH31	FRUITAC1	1.00000		
NSRCH11	PROFIT	-100.59000	PILND11	1.00000
NSRCH11	ROTNSR11	-2.60000	AGWTREQ1	2.70000
NSRCH11	PCLND41	1.00000	TSRCH1	1.00000
NSRCH11	FRUITAC1	1.00000		
NSRCH21	PROFIT	-120.89000	PILND21	1.00000
NSRCH21	ROTNSR12	-2.60000	AGWTREQ1	2.70000
NSRCH21	PCLND41	1.00000	TSRCH1	1.00000
NSRCH21	FRUITAC1	1.00000		
NSRCH31	PROFIT	-141.87000	PILND31	1.00000
NSRCH31	ROTNSR13	-2.60000	AGWTREQ1	2.70000
NSRCH31	PCLND41	1.00000	TSRCH1	1.00000
NSRCH31	FRUITAC1	1.00000		
MSTCH11	PROFIT	148.58000	PILND11	1.00000
MSTCH11	ROTNST11	1.00000	ROTMSTC1	-27.00000
MSTCH11	AGWTREQ1	3.80000	PCLND41	1.00000
MSTCH11	TSTCH1	1.00000	FRUITAC1	1.00000
MSTCH21	PROFIT	89.02000	PILND21	1.00000
MSTCH21	ROTNST12	1.00000	ROTMSTC1	-27.00000
MSTCH21	AGWTREQ1	3.80000	PCLND41	1.00000
MSTCH21	TSTCH1	1.00000	FRUITAC1	1.00000
MSTCH31	PROFIT	7.99000	PILND31	1.00000
MSTCH31	ROTNST13	1.00000	ROTMSTC1	-27.00000
MSTCH31	AGWTREQ1	3.80000	PCLND41	1.00000
MSTCH31	TSTCH1	1.00000	FRUITAC1	1.00000
MSRCH11	PROFIT	149.64000	PILND11	1.00000
MSRCH11	ROTNSR11	1.00000	ROTMSRC1	-25.00000
MSRCH11	AGWTREQ1	3.80000	PCLND41	1.00000
MSRCH11	TSRCH1	1.00000	FRUITAC1	1.00000
MSRCH21	PROFIT	102.60000	PILND21	1.00000
MSRCH21	ROTNSR12	1.00000	ROTMSRC1	-25.00000
MSRCH21	AGWTREQ1	3.80000	PCLND41	1.00000
MSRCH21	TSRCH1	1.00000	FRUITAC1	1.00000
MSRCH31	PROFIT	41.97000	PILND31	1.00000
MSRCH31	ROTNSR13	1.00000	ROTMSRC1	-25.00000
MSRCH31	AGWTREQ1	3.80000	PCLND41	1.00000
MSRCH31	TSRCH1	1.00000	FRUITAC1	1.00000
NALFAF11	PROFIT	81.26000	POILND11	1.00000
NALFAF11	NOTAB1	1.00000	NOTAN11	1.00000
NALFAF11	NOTCS1	1.00000	NOTMAPP1	1.00000
NALFAF11	NOTMPEA1	1.00000	NOTMSTC1	1.00000
NALFAF11	NOTMSRC1	1.00000	AGWTREQ1	2.00000

NALFAF11	POCLND41	1.00000	TALFAF1	1.00000
NALFAF21	PROFIT	60.11000	POILND21	1.00000
NALFAF21	NOTAB1	1.00000	NOTAN12	1.00000
NALFAF21	NOTCS1	1.00000	NOTMAPP1	1.00000
NALFAF21	NOTMPEA1	1.00000	NOTMSTC1	1.00000
NALFAF21	NOTMSRC1	1.00000	AGWTREQ1	2.00000
NALFAF21	POCLND41	1.00000	TALFAF1	1.00000
NALFAF31	PROFIT	46.68000	POILND31	1.00000
NALFAF31	NOTAB1	1.00000	NOTAN13	1.00000
NALFAF31	NOTCS1	1.00000	NOTMAPP1	1.00000
NALFAF31	NOTMPEA1	1.00000	NOTMSTC1	1.00000
NALFAF31	NOTMSRC1	1.00000	AGWTREQ1	2.00000
NALFAF31	POCLND41	1.00000	TALFAF1	1.00000
NALFAP11	PROFIT	55.14000	POILND11	1.00000
NALFAP11	NOTAB1	1.00000	NOTAN11	1.00000
NALFAP11	NOTCS1	1.00000	NOTMAPP1	1.00000
NALFAP11	NOTMPEA1	1.00000	NOTMSTC1	1.00000
NALFAP11	NOTMSRC1	1.00000	AGWTREQ1	1.50000
NALFAP11	POCLND41	1.00000	TALFAP1	1.00000
NALFAP21	PROFIT	36.47000	POILND21	1.00000
NALFAP21	NOTAB1	1.00000	NOTAN12	1.00000
NALFAP21	NOTCS1	1.00000	NOTMAPP1	1.00000
NALFAP21	NOTMPEA1	1.00000	NOTMSTC1	1.00000
NALFAP21	NOTMSRC1	1.00000	AGWTREQ1	1.50000
NALFAP21	POCLND41	1.00000	TALFAP1	1.00000
NALFAP31	PROFIT	29.91000	POILND31	1.00000
NALFAP31	NOTAB1	1.00000	NOTAN13	1.00000
NALFAP31	NOTCS1	1.00000	NOTMAPP1	1.00000
NALFAP31	NOTMPEA1	1.00000	NOTMSTC1	1.00000
NALFAP31	NOTMSRC1	1.00000	AGWTREQ1	1.50000
NALFAP31	POCLND41	1.00000	TALFAP1	1.00000
NBARLY11	PROFIT	91.03000	POILND11	1.00000
NBARLY11	NOTAB1	-1.00000	NOTBN1	1.00000
NBARLY11	NOTCS1	1.00000	NOTMAPP1	1.00000
NBARLY11	NOTMPEA1	1.00000	NOTMSTC1	1.00000
NBARLY11	NOTMSRC1	1.00000	AGWTREQ1	1.20000
NBARLY11	POCLND41	1.00000	TBARLY1	1.00000
NBARLY21	PROFIT	66.95000	POILND21	1.00000
NBARLY21	NOTAB1	-1.00000	NOTBN1	1.00000
NBARLY21	NOTCS1	1.00000	NOTMAPP1	1.00000
NBARLY21	NOTMPEA1	1.00000	NOTMSTC1	1.00000
NBARLY21	NOTMSRC1	1.00000	AGWTREQ1	1.20000
NBARLY21	POCLND41	1.00000	TBARLY1	1.00000
NBARLY31	PROFIT	52.02000	POILND31	1.00000
NBARLY31	NOTAB1	-1.00000	NOTBN1	1.00000
NBARLY31	NOTCS1	1.00000	NOTMAPP1	1.00000
NBARLY31	NOTMPEA1	1.00000	NOTMSTC1	1.00000
NBARLY31	NOTMSRC1	1.00000	AGWTREQ1	1.20000
NBARLY31	POCLND41	1.00000	TBARLY1	1.00000
NNURSC11	PROFIT	44.52000	POILND11	1.00000
NNURSC11	NOTBN1	-1.00000	NOTAN11	-5.00000
NNURSC11	NOTCS1	1.00000	NOTMAPP1	1.00000
NNURSC11	NOTMPEA1	1.00000	NOTMSTC1	1.00000
NNURSC11	NOTMSRC1	1.00000	AGWTREQ1	1.60000
NNURSC11	POCLND41	1.00000	TNURSC1	1.00000
NNURSC21	PROFIT	24.54000	POILND21	1.00000

NNURSC21	NOTBN1	-1.00000	NOTAN12	-5.00000
NNURSC21	NOTCS1	1.00000	NOTMAPP1	1.00000
NNURSC21	NOTMPEA1	1.00000	NOTMSTC1	1.00000
NNURSC21	NOTMSRC1	1.00000	AGWTREQ1	1.60000
NNURSC21	POCLND41	1.00000	TNURSC1	1.00000
NNURSC31	PROFIT	13.91000	POILND31	1.00000
NNURSC31	NOTBN1	-1.00000	NOTAN13	-5.00000
NNURSC31	NOTCS1	1.00000	NOTMAPP1	1.00000
NNURSC31	NOTMPEA1	1.00000	NOTMSTC1	1.00000
NNURSC31	NOTMSRC1	1.00000	AGWTREQ1	1.60000
NNURSC31	POCLND41	1.00000	TNURSC1	1.00000
NCORNG11	PROFIT	148.37000	POILND11	1.00000
NCORNG11	NOTCS1	-9.00000	NOTMAPP1	1.00000
NCORNG11	NOTMPEA1	1.00000	NOTMSTC1	1.00000
NCORNG11	NOTMSRC1	1.00000	AGWTREQ1	1.40000
NCORNG11	POCLND41	1.00000	TCORNG1	1.00000
NCORNG21	PROFIT	106.14000	POILND21	1.00000
NCORNG21	NOTCS1	-9.00000	NOTMAPP1	1.00000
NCORNG21	NOTMPEA1	1.00000	NOTMSTC1	1.00000
NCORNG21	NOTMSRC1	1.00000	AGWTREQ1	1.40000
NCORNG21	POCLND41	1.00000	TCORNG1	1.00000
NCORNG31	PROFIT	62.62000	POILND31	1.00000
NCORNG31	NOTCS1	-9.00000	NOTMAPP1	1.00000
NCORNG31	NOTMPEA1	1.00000	NOTMSTC1	1.00000
NCORNG31	NOTMSRC1	1.00000	AGWTREQ1	1.40000
NCORNG31	POCLND41	1.00000	TCORNG1	1.00000
NCORNS11	PROFIT	188.99000	POILND11	1.00000
NCORNS11	NOTCS1	-9.00000	NOTMAPP1	1.00000
NCORNS11	NOTMPEA1	1.00000	NOTMSTC1	1.00000
NCORNS11	NOTMSRC1	1.00000	AGWTREQ1	1.30000
NCORNS11	POCLND41	1.00000	TCORNS1	1.00000
NCORNS21	PROFIT	171.85000	POILND21	1.00000
NCORNS21	NOTCS1	-9.00000	NOTMAPP1	1.00000
NCORNS21	NOTMPEA1	1.00000	NOTMSTC1	1.00000
NCORNS21	NOTMSRC1	1.00000	AGWTREQ1	1.30000
NCORNS21	POCLND41	1.00000	TCORNS1	1.00000
NCORNS31	PROFIT	137.70000	POILND31	1.00000
NCORNS31	NOTCS1	-9.00000	NOTMAPP1	1.00000
NCORNS31	NOTMPEA1	1.00000	NOTMSTC1	1.00000
NCORNS31	NOTMSRC1	1.00000	AGWTREQ1	1.30000
NCORNS31	POCLND41	1.00000		
NSBEET11	PROFIT	73.19000	POILND11	1.00000
NSBEET11	NOTCS1	-9.00000	NOTMAPP1	1.00000
NSBEET11	NOTMPEA1	1.00000	NOTMSTC1	1.00000
NSBEET11	NOTMSRC1	1.00000	AGWTREQ1	1.60000
NSBEET11	POCLND41	1.00000	TSBEET1	1.00000
NSBEET21	PROFIT	52.47000	POILND21	1.00000
NSBEET21	NOTCS1	-9.00000	NOTMAPP1	1.00000
NSBEET21	NOTMPEA1	1.00000	NOTMSTC1	1.00000
NSBEET21	NOTMSRC1	1.00000	AGWTREQ1	1.60000
NSBEET21	POCLND41	1.00000	TSBEET1	1.00000
NSBEET31	PROFIT	39.71000	POILND31	1.00000
NSBEET31	NOTCS1	-9.00000	NOTMAPP1	1.00000
NSBEET31	NOTMPEA1	1.00000	NOTMSTC1	1.00000
NSBEET31	NOTMSRC1	1.00000	AGWTREQ1	1.60000
NSBEET31	POCLND41	1.00000	TSBEET1	1.00000

NDBEAN41	PROFIT	-54.94000	POCLND41	1.00000
NDWHEA41	PROFIT	-0.88000	POCLND41	1.00000
NNAPPL11	PROFIT	-131.90000	POILND11	1.00000
NNAPPL11	NOTNAP11	-2.30000	AGWTREQ1	2.50000
NNAPPL11	POCLND41	1.00000	TAPPLE1	1.00000
NNAPPL21	PROFIT	-161.89000	POILND21	1.00000
NNAPPL21	NOTNAP12	-2.30000	AGWTREQ1	2.50000
NNAPPL21	POCLND41	1.00000	TAPPLE1	1.00000
NNAPPL31	PROFIT	-211.31000	POILND31	1.00000
NNAPPL31	NOTNAP13	-2.30000	AGWTREQ1	2.50000
NNAPPL31	POCLND41	1.00000	TAPPLE1	1.00000
NNPEAC11	PROFIT	-104.43000	POILND11	1.00000
NNPEAC11	NOTNPE11	-2.00000	AGWTREQ1	2.80000
NNPEAC11	POCLND41	1.00000	TPEACH1	1.00000
NNPEAC21	PROFIT	-119.96000	POILND21	1.00000
NNPEAC21	NOTNPE12	-2.00000	AGWTREQ1	2.80000
NNPEAC21	POCLND41	1.00000	TPEACH1	1.00000
NNPEAC31	PROFIT	-128.26000	POILND31	1.00000
NNPEAC31	NOTNPE13	-2.00000	AGWTREQ1	2.80000
NNPEAC31	POCLND41	1.00000	TPEACH1	1.00000
NMAPPL11	PROFIT	183.95000	POILND11	1.00000
NMAPPL11	NOTNAP11	1.00000	NOTMAPP1	-30.00000
NMAPPL11	AGWTREQ1	3.60000	POCLND41	1.00000
NMAPPL11	TAPPLE1	1.00000		
NMAPPL21	PROFIT	90.24000	POILND21	1.00000
NMAPPL21	NOTNAP12	1.00000	NOTMAPP1	-30.00000
NMAPPL21	AGWTREQ1	3.60000	POCLND41	1.00000
NMAPPL21	TAPPLE1	1.00000		
NMAPPL31	PROFIT	18.22000	POILND31	1.00000
NMAPPL31	NOTNAP13	1.00000	NOTMAPP1	-30.00000
NMAPPL31	AGWTREQ1	3.60000	POCLND41	1.00000
NMAPPL31	TAPPLE1	1.00000		
NMPEAC11	PROFIT	161.55000	POILND11	1.00000
NMPEAC11	NOTNPE11	1.00000	NOTMPEA1	-15.00000
NMPEAC11	AGWTREQ1	3.90000	POCLND41	1.00000
NMPEAC11	TPEACH1	1.00000		
NMPEAC21	PROFIT	80.32000	POILND21	1.00000
NMPEAC21	NOTNPE12	1.00000	NOTMPEA1	-15.00000
NMPEAC21	AGWTREQ1	3.90000	POCLND41	1.00000
NMPEAC21	TPEACH1	1.00000		
NMPEAC31	PROFIT	32.76000	POILND31	1.00000
NMPEAC31	NOTNPE13	1.00000	NOTMPEA1	-15.00000
NMPEAC31	AGWTREQ1	3.90000	POCLND41	1.00000
NMPEAC31	TPEACH1	1.00000		
NNSTCH11	PROFIT	-142.71000	POILND11	1.00000
NNSTCH11	NOTNST11	-2.00000	AGWTREQ1	2.70000
NNSTCH11	POCLND41	1.00000	TSTCH1	1.00000
NNSTCH21	PROFIT	-145.13000	POILND21	1.00000
NNSTCH21	NOTNST12	-2.00000	AGWTREQ1	2.70000
NNSTCH21	POCLND41	1.00000	TSTCH1	1.00000
NNSTCH31	PROFIT	-174.76000	POILND31	1.00000
NNSTCH31	NOTNST13	-2.00000	AGWTREQ1	2.70000
NNSTCH31	POCLND41	1.00000	TSTCH1	1.00000
NNSRCH11	PROFIT	-113.94000	POILND11	1.00000
NNSRCH11	NOTNSR11	-2.60000	AGWTREQ1	2.70000
NNSRCH11	POCLND41	1.00000	TSRCH1	1.00000

NNSRCH21	PROFIT	-136.49000	POILND21	1.00000
NNSRCH21	NOTNSR12	-2.60000	AGWTREQ1	2.70000
NNSRCH21	POCLND41	1.00000	TSRCH1	1.00000
NNSRCH31	PROFIT	-159.17000	POILND31	1.00000
NNSRCH31	NOTNSP13	-2.60000	AGWTREQ1	2.70000
NNSRCH31	POCLND41	1.00000	TSRCH1	1.00000
NMSTCH11	PROFIT	135.23000	POILND11	1.00000
NMSTCH11	NOTNST11	1.00000	NOTMSTC1	-27.00000
NMSTCH11	AGWTREQ1	3.80000	POCLND41	1.00000
NMSTCH11	TSTCH1	1.00000		
NMSTCH21	PROFIT	73.42000	POILND21	1.00000
NMSTCH21	NOTNST12	1.00000	NOTMSTC1	-27.00000
NMSTCH21	AGWTREQ1	3.80000	POCLND41	1.00000
NMSTCH21	TSTCH1	1.00000		
NMSTCH31	PROFIT	-9.31000	POILND31	1.00000
NMSTCH31	NOTNST13	1.00000	NOTMSTC1	-27.00000
NMSTCH31	AGWTREQ1	3.80000	POCLND41	1.00000
NMSTCH31	TSTCH1	1.00000		
NMSRCH11	PROFIT	136.29000	POILND11	1.00000
NMSRCH11	NOTNSR11	1.00000	NOTMSRC1	-25.00000
NMSRCH11	AGWTREQ1	3.80000	POCLND41	1.00000
NMSRCH11	TSRCH1	1.00000		
NMSRCH21	PROFIT	87.00000	POILND21	1.00000
NMSRCH21	NOTNSR12	1.00000	NOTMSRC1	-25.00000
NMSRCH21	AGWTREQ1	3.80000	POCLND41	1.00000
NMSRCH21	TSRCH1	1.00000		
NMSRCH31	PROFIT	24.67000	POILND31	1.00000
NMSRCH31	NOTNSR13	1.00000	NOTMSRC1	-25.00000
NMSRCH31	AGWTREQ1	3.80000	POCLND41	1.00000
NMSRCH31	TSRCH1	1.00000		
ALFAF12	PROFIT	107.32000	PILND12	1.00000
ALFAF12	ROTAB2	1.00000	ROTAN21	1.00000
ALFAF12	ROTCS2	1.00000	ROTMAPP2	1.00000
ALFAF12	ROTMPEA2	1.00000	ROTMSTC2	1.00000
ALFAF12	ROTMSRC2	1.00000	AGWTREQ2	1.60000
ALFAF12	PCLND42	1.00000	TALFAF2	1.00000
ALFAF22	PROFIT	86.83000	PILND22	1.00000
ALFAF22	ROTAB2	1.00000	ROTAN22	1.00000
ALFAF22	ROTCS2	1.00000	ROTMAPP2	1.00000
ALFAF22	ROTMPEA2	1.00000	ROTMSTC2	1.00000
ALFAF22	ROTMSRC2	1.00000	AGWTREQ2	1.60000
ALFAF22	PCLND42	1.00000	TALFAF2	1.00000
ALFAF32	PROFIT	67.81000	PILND32	1.00000
ALFAF32	ROTAB2	1.00000	ROTAN23	1.00000
ALFAF32	ROTCS2	1.00000	ROTMAPP2	1.00000
ALFAF32	ROTMPEA2	1.00000	ROTMSTC2	1.00000
ALFAF32	ROTMSRC2	1.00000	AGWTREQ2	1.60000
ALFAF32	PCLND42	1.00000	TALFAF2	1.00000
ALFAP12	PROFIT	82.28000	PILND12	1.00000
ALFAP12	ROTAB2	1.00000	ROTAN21	1.00000
ALFAP12	ROTCS2	1.00000	ROTMAPP2	1.00000
ALFAP12	ROTMPEA2	1.00000	ROTMSTC2	1.00000
ALFAP12	ROTMSRC2	1.00000	AGWTREQ2	1.00000
ALFAP12	PCLND42	1.00000	TALFAP2	1.00000
ALFAP22	PROFIT	68.16000	PILND22	1.00000
ALFAP22	ROTAB2	1.00000	ROTAN22	1.00000

ALFAP22	ROTCS2	1.00000	ROTMAPP2	1.00000
ALFAP22	ROTMPEA2	1.00000	ROTMSTC2	1.00000
ALFAP22	ROTMSRC2	1.00000	AGWTREQ2	1.00000
ALFAP22	PCLND42	1.00000	TALFAP2	1.00000
ALFAP32	PROFIT	62.25000	PILND32	1.00000
ALFAP32	ROTAB2	1.00000	ROTAN23	1.00000
ALFAP32	ROTCS2	1.00000	ROTMAPP2	1.00000
ALFAP32	ROTMPEA2	1.00000	ROTMSTC2	1.00000
ALFAP32	ROTMSRC2	1.00000	AGWTREQ2	1.00000
ALFAP32	PCLND42	1.00000	TALFAP2	1.00000
BARLY12	PROFIT	106.69000	PILND12	1.00000
BARLY12	ROTAB2	-1.00000	ROTBN2	1.00000
BARLY12	ROTCS2	1.00000	ROTMAPP2	1.00000
BARLY12	ROTMPEA2	1.00000	ROTMSTC2	1.00000
BARLY12	ROTMSRC2	1.00000	AGWTREQ2	0.70000
BARLY12	PCLND42	1.00000	TBARLY2	1.00000
BARLY22	PROFIT	89.75000	PILND22	1.00000
BARLY22	ROTAB2	-1.00000	ROTBN2	1.00000
BARLY22	ROTCS2	1.00000	ROTMAPP2	1.00000
BARLY22	ROTMPEA2	1.00000	ROTMSTC2	1.00000
BARLY22	ROTMSRC2	1.00000	AGWTREQ2	0.70000
BARLY22	PCLND42	1.00000	TBARLY2	1.00000
BARLY32	PROFIT	74.96000	PILND32	1.00000
BARLY32	ROTAB2	-1.00000	ROTBN2	1.00000
BARLY32	ROTCS2	1.00000	ROTMAPP2	1.00000
BARLY32	ROTMPEA2	1.00000	ROTMSTC2	1.00000
BARLY32	ROTMSRC2	1.00000	AGWTREQ2	0.70000
BARLY32	PCLND42	1.00000	TBARLY2	1.00000
NURSC12	PROFIT	64.22000	PILND12	1.00000
NURSC12	ROTBN2	-1.00000	ROTAN21	-5.00000
NURSC12	ROTCS2	1.00000	ROTMAPP2	1.00000
NURSC12	ROTMPEA2	1.00000	ROTMSTC2	1.00000
NURSC12	ROTMSRC2	1.00000	AGWTREQ2	1.20000
NURSC12	PCLND42	1.00000	TNURSC2	1.00000
NURSC22	PROFIT	50.98000	PILND22	1.00000
NURSC22	ROTBN2	-1.00000	ROTAN22	-5.00000
NURSC22	ROTCS2	1.00000	ROTMAPP2	1.00000
NURSC22	ROTMPEA2	1.00000	ROTMSTC2	1.00000
NURSC22	ROTMSRC2	1.00000	AGWTREQ2	1.20000
NURSC22	PCLND42	1.00000	TNURSC2	1.00000
NURSC32	PROFIT	39.98000	PILND32	1.00000
NURSC32	ROTBN2	-1.00000	ROTAN23	-5.00000
NURSC32	ROTCS2	1.00000	ROTMAPP2	1.00000
NURSC32	ROTMPEA2	1.00000	ROTMSTC2	1.00000
NURSC32	ROTMSRC2	1.00000	AGWTREQ2	1.20000
NURSC32	PCLND42	1.00000	TNURSC2	1.00000
CORNG12	PROFIT	156.63000	PILND12	1.00000
CORNG12	ROTCS2	-9.00000	ROTMAPP2	1.00000
CORNG12	ROTMPEA2	1.00000	ROTMSTC2	1.00000
CORNG12	ROTMSRC2	1.00000	AGWTREQ2	1.10000
CORNG12	PCLND42	1.00000	TCORNG2	1.00000
CORNG22	PROFIT	120.22000	PILND22	1.00000
CORNG22	ROTCS2	-9.00000	ROTMAPP2	1.00000
CORNG22	ROTMPEA2	1.00000	ROTMSTC2	1.00000
CORNG22	ROTMSRC2	1.00000	AGWTREQ2	1.10000
CORNG22	PCLND42	1.00000	TCORNG2	1.00000

CORNG32	PROFIT	77.32000	PILND32	1.00000
CORNG32	ROTCS2	-9.00000	ROTMAPP2	1.00000
CORNG32	ROTMPEA2	1.00000	ROTMSTC2	1.00000
CORNG32	ROTMSRC2	1.00000	AGWTREQ2	1.10000
CORNG32	PCLND42	1.00000	TCORNG2	1.00000
CORNS12	PROFIT	198.26000	PILND12	1.00000
CORNS12	ROTCS2	-9.00000	ROTMAPP2	1.00000
CORNS12	ROTMPEA2	1.00000	ROTMSTC2	1.00000
CORNS12	ROTMSRC2	1.00000	AGWTREQ2	1.00000
CORNS12	PCLND42	1.00000	TCORNS2	1.00000
CORNS22	PROFIT	187.49000	PILND22	1.00000
CORNS22	ROTCS2	-9.00000	ROTMAPP2	1.00000
CORNS22	ROTMPEA2	1.00000	ROTMSTC2	1.00000
CORNS22	ROTMSRC2	1.00000	AGWTREQ2	1.00000
CORNS22	PCLND42	1.00000	TCORNS2	1.00000
CORNS32	PROFIT	161.39000	PILND32	1.00000
CORNS32	ROTCS2	-9.00000	ROTMAPP2	1.00000
CORNS32	ROTMPEA2	1.00000	ROTMSTC2	1.00000
CORNS32	ROTMSRC2	1.00000	AGWTREQ2	1.00000
CORNS32	PCLND42	1.00000	TCORNS2	1.00000
SBEET12	PROFIT	72.42000	PILND12	1.00000
SBEET12	ROTCS2	-9.00000	ROTMAPP2	1.00000
SBEET12	ROTMPEA2	1.00000	ROTMSTC2	1.00000
SBEET12	ROTMSRC2	1.00000	AGWTREQ2	1.40000
SBEET12	PCLND42	1.00000	TSBEET2	1.00000
SBEET22	PROFIT	48.52000	PILND22	1.00000
SBEET22	ROTCS2	-9.00000	ROTMAPP2	1.00000
SBEET22	ROTMPEA2	1.00000	ROTMSTC2	1.00000
SBEET22	ROTMSRC2	1.00000	AGWTREQ2	1.40000
SBEET22	PCLND42	1.00000	TSBEET2	1.00000
SBEET32	PROFIT	43.80000	PILND32	1.00000
SBEET32	ROTCS2	-9.00000	ROTMAPP2	1.00000
SBEET32	ROTMPEA2	1.00000	ROTMSTC2	1.00000
SBEET32	ROTMSRC2	1.00000	AGWTREQ2	1.40000
SBEET32	PCLND42	1.00000	TSBEET2	1.00000
DWHEAT42	PROFIT	17.47000	PCLND42	1.00000
NAPPL12	PROFIT	-124.92000	PILND12	1.00000
NAPPL12	ROTNAP21	-2.30000	AGWTREQ2	2.40000
NAPPL12	PCLND42	1.00000	TAPPLE2	1.00000
NAPPL12	FRUITAC2	1.00000		
NAPPL22	PROFIT	-150.99000	PILND22	1.00000
NAPPL22	ROTNAP22	-2.30000	AGWTREQ2	2.40000
NAPPL22	PCLND42	1.00000	TAPPLE2	1.00000
NAPPL22	FRUITAC2	1.00000		
NAPPL32	PROFIT	-196.20000	PILND32	1.00000
NAPPL32	ROTNAP23	-2.30000	AGWTREQ2	2.40000
NAPPL32	PCLND42	1.00000	TAPPLE2	1.00000
NAPPL32	FRUITAC2	1.00000		
NPEAC12	PROFIT	-93.76000	PILND12	1.00000
NPEAC12	ROTNPE21	-2.00000	AGWTREQ2	2.70000
NPEAC12	PCLND42	1.00000	TPEACH2	1.00000
NPEAC12	FRUITAC2	1.00000		
NPEAC22	PROFIT	-105.51000	PILND22	1.00000
NPEAC22	ROTNPE22	-2.00000	AGWTREQ2	2.70000
NPEAC22	PCLND42	1.00000	TPEACH2	1.00000
NPEAC22	FRUITAC2	1.00000		

NPEAC32	PROFIT	-115.65000	PILND32	1.00000
NPEAC32	ROTNPE23	-2.00000	AGWTREQ2	2.70000
NPEAC32	PCLND42	1.00000	TPEACH2	1.00000
NPEAC32	FRUITAC2	1.00000		
MAPPL12	PROFIT	191.83000	PILND12	1.00000
MAPPL12	ROTNAP21	1.00000	ROTMAPP2	-30.00000
MAPPL12	AGWTREQ2	3.50000	PCLND42	1.00000
MAPPL12	TAPPLE2	1.00000	FRUITAC2	1.00000
MAPPL22	PROFIT	101.25000	PILND22	1.00000
MAPPL22	ROTNAP22	1.00000	ROTMAPP2	-30.00000
MAPPL22	AGWTREQ2	3.50000	PCLND42	1.00000
MAPPL22	TAPPLE2	1.00000	FRUITAC2	1.00000
MAPPL32	PROFIT	30.74000	PILND32	1.00000
MAPPL32	ROTNAP23	1.00000	ROTMAPP2	-30.00000
MAPPL32	AGWTREQ2	3.50000	PCLND42	1.00000
MAPPL32	TAPPLE2	1.00000	FRUITAC2	1.00000
MPEAC12	PROFIT	167.26000	PILND12	1.00000
MPEAC12	ROTNPE21	1.00000	ROTMPEA2	-15.00000
MPEAC12	AGWTREQ2	3.80000	PCLND42	1.00000
MPEAC12	TPEACH2	1.00000	FRUITAC2	1.00000
MPEAC22	PROFIT	92.48000	PILND22	1.00000
MPEAC22	ROTNPE22	1.00000	ROTMPEA2	-15.00000
MPEAC22	AGWTREQ2	3.80000	PCLND42	1.00000
MPEAC22	TPEACH2	1.00000	FRUITAC2	1.00000
MPEAC32	PROFIT	47.19000	PILND32	1.00000
MPEAC32	ROTNPE23	1.00000	ROTMPEA2	-15.00000
MPEAC32	AGWTREQ2	3.80000	PCLND42	1.00000
MPEAC32	TPEACH2	1.00000	FRUITAC2	1.00000
NSTCH12	PROFIT	-133.18000	PILND12	1.00000
NSTCH12	ROTNST21	-2.00000	AGWTREQ2	2.60000
NSTCH12	PCLND42	1.00000	TSTCH2	1.00000
NSTCH12	FRUITAC2	1.00000		
NSTCH22	PROFIT	-133.29000	PILND22	1.00000
NSTCH22	ROTNST22	-2.00000	AGWTREQ2	2.60000
NSTCH22	PCLND42	1.00000	TSTCH2	1.00000
NSTCH22	FRUITAC2	1.00000		
NSTCH32	PROFIT	-159.37000	PILND32	1.00000
NSTCH32	ROTNST23	-2.00000	AGWTREQ2	2.60000
NSTCH32	PCLND42	1.00000	TSTCH2	1.00000
NSTCH32	FRUITAC2	1.00000		
NSRCH12	PROFIT	-106.42000	PILND12	1.00000
NSRCH12	ROTNSR21	-2.60000	AGWTREQ2	2.60000
NSRCH12	PCLND42	1.00000	TSRCH2	1.00000
NSRCH12	FRUITAC2	1.00000		
NSRCH22	PROFIT	-121.61000	PILND22	1.00000
NSRCH22	ROTNSR22	-2.60000	AGWTREQ2	2.60000
NSRCH22	PCLND42	1.00000	TSRCH2	1.00000
NSRCH22	FRUITAC2	1.00000		
NSRCH32	PROFIT	-144.05000	PILND32	1.00000
NSRCH32	ROTNSR23	-2.60000	AGWTREQ2	2.60000
NSRCH32	PCLND42	1.00000	TSRCH2	1.00000
NSRCH32	FRUITAC2	1.00000		
MSTCH12	PROFIT	138.74000	PILND12	1.00000
MSTCH12	ROTNST21	1.00000	ROTMSTC2	-27.00000
MSTCH12	AGWTREQ2	3.70000	PCLND42	1.00000
MSTCH12	TSTCH2	1.00000	FRUITAC2	1.00000
MSTCH22	PROFIT	84.71000	PILND22	1.00000
MSTCH22	ROTNST22	1.00000	ROTMSTC2	-27.00000
MSTCH22	AGWTREQ2	3.70000	PCLND42	1.00000
MSTCH22	TSTCH2	1.00000	FRUITAC2	1.00000
MSTCH32	PROFIT	3.79000	PILND32	1.00000
MSTCH32	ROTNST23	1.00000	ROTMSTC2	-27.00000
MSTCH32	AGWTREQ2	3.70000	PCLND42	1.00000
MSTCH32	TSTCH2	1.00000	FRUITAC2	1.00000
MSRCH12	PROFIT	145.56000	PILND12	1.00000
MSRCH12	ROTNSR21	1.00000	ROTMSRC2	-25.00000
MSRCH12	AGWTREQ2	3.70000	PCLND42	1.00000
MSRCH12	TSRCH2	1.00000	FRUITAC2	1.00000
MSRCH22	PROFIT	100.10000	PILND22	1.00000
MSRCH22	ROTNSR22	1.00000	ROTMSRC2	-25.00000
MSRCH22	AGWTREQ2	3.70000	PCLND42	1.00000
MSRCH22	TSRCH2	1.00000	FRUITAC2	1.00000
MSRCH32	PROFIT	37.18000	PILND32	1.00000
MSRCH32	ROTNSR23	1.00000	ROTMSRC2	-25.00000
MSRCH32	AGWTREQ2	3.70000	PCLND42	1.00000
MSRCH32	TSRCH2	1.00000	FRUITAC2	1.00000
NALFAF12	PROFIT	92.09000	POILND12	1.00000
NALFAF12	NOTAB2	1.00000	NOTAN21	1.00000
NALFAF12	NOTCS2	1.00000	NOTMAPP2	1.00000
NALFAF12	NOTMPEA2	1.00000	NOTMSTC2	1.00000
NALFAF12	NOTMSRC2	1.00000	AGWTREQ2	1.60000
NALFAF12	POCLND42	1.00000	TALFAF2	1.00000
NALFAF22	PROFIT	69.35000	POILND22	1.00000
NALFAF22	NOTAB2	1.00000	NOTAN22	1.00000
NALFAF22	NOTCS2	1.00000	NOTMAPP2	1.00000
NALFAF22	NOTMPEA2	1.00000	NOTMSTC2	1.00000
NALFAF22	NOTMSRC2	1.00000	AGWTREQ2	1.60000
NALFAF22	POCLND42	1.00000	TALFAF2	1.00000
NALFAF32	PROFIT	48.63000	POILND32	1.00000
NALFAF32	NOTAB2	1.00000	NOTAN23	1.00000
NALFAF32	NOTCS2	1.00000	NOTMAPP2	1.00000
NALFAF32	NOTMPEA2	1.00000	NOTMSTC2	1.00000
NALFAF32	NOTMSRC2	1.00000	AGWTREQ2	1.60000
NALFAF32	POCLND42	1.00000	TALFAF2	1.00000
NALFAP12	PROFIT	67.05000	POILND12	1.00000
NALFAP12	NOTAB2	1.00000	NOTAN21	1.00000
NALFAP12	NOTCS2	1.00000	NOTMAPP2	1.00000
NALFAP12	NOTMPEA2	1.00000	NOTMSTC2	1.00000
NALFAP12	NOTMSRC2	1.00000	AGWTREQ2	1.00000
NALFAP12	POCLND42	1.00000	TALFAP2	1.00000
NALFAP22	PROFIT	50.68000	POILND22	1.00000
NALFAP22	NOTAB2	1.00000	NOTAN22	1.00000
NALFAP22	NOTCS2	1.00000	NOTMAPP2	1.00000
NALFAP22	NOTMPEA2	1.00000	NOTMSTC2	1.00000
NALFAP22	NOTMSRC2	1.00000	AGWTREQ2	1.00000
NALFAP22	POCLND42	1.00000	TALFAP2	1.00000
NALFAP32	PROFIT	43.07000	POILND32	1.00000
NALFAP32	NOTAB2	1.00000	NOTAN23	1.00000
NALFAP32	NOTCS2	1.00000	NOTMAPP2	1.00000
NALFAP32	NOTMPEA2	1.00000	NOTMSTC2	1.00000
NALFAP32	NOTMSRC2	1.00000	AGWTREQ2	1.00000
NALFAP32	POCLND42	1.00000	TALFAP2	1.00000

NBARLY12	PROFIT	91.46000	POILND12	1.00000
NBARLY12	NOTAB2	-1.00000	NOTBN2	1.00000
NBARLY12	NOTCS2	1.00000	NOTMAPP2	1.00000
NBARLY12	NOTMPEA2	1.00000	NOTMSTC2	1.00000
NBARLY12	NOTMSRC2	1.00000	AGWTREQ2	0.70000
NBARLY12	POCLND42	1.00000	TBARLY2	1.00000
NBARLY22	PROFIT	72.27000	POILND22	1.00000
NBARLY22	NOTAB2	-1.00000	NOTBN2	1.00000
NBARLY22	NOTCS2	1.00000	NOTMAPP2	1.00000
NBARLY22	NOTMPEA2	1.00000	NOTMSTC2	1.00000
NBARLY22	NOTMSRC2	1.00000	AGWTREQ2	0.70000
NBARLY22	POCLND42	1.00000	TBARLY2	1.00000
NBARLY32	PROFIT	55.78000	POILND32	1.00000
NBARLY32	NOTAB2	-1.00000	NOTBN2	1.00000
NBARLY32	NOTCS2	1.00000	NOTMAPP2	1.00000
NBARLY32	NOTMPEA2	1.00000	NOTMSTC2	1.00000
NBARLY32	NOTMSRC2	1.00000	AGWTREQ2	0.70000
NBARLY32	POCLND42	1.00000	TBARLY2	1.00000
NNURSC12	PROFIT	48.99000	POILND12	1.00000
NNURSC12	NOTBN2	-1.00000	NOTAN21	-5.00000
NNURSC12	NOTCS2	1.00000	NOTMAPP2	1.00000
NNURSC12	NOTMPEA2	1.00000	NOTMSTC2	1.00000
NNURSC12	NOTMSRC2	1.00000	AGWTREQ2	1.20000
NNURSC12	POCLND42	1.00000	TNURSC2	1.00000
NNURSC22	PROFIT	33.50000	POILND22	1.00000
NNURSC22	NOTBN2	-1.00000	NOTAN22	-5.00000
NNURSC22	NOTCS2	1.00000	NOTMAPP2	1.00000
NNURSC22	NOTMPEA2	1.00000	NOTMSTC2	1.00000
NNURSC22	NOTMSRC2	1.00000	AGWTREQ2	1.20000
NNURSC22	POCLND42	1.00000	TNURSC2	1.00000
NNURSC32	PROFIT	20.80000	POILND32	1.00000
NNURSC32	NOTBN2	-1.00000	NOTAN23	-5.00000
NNURSC32	NOTCS2	1.00000	NOTMAPP2	1.00000
NNURSC32	NOTMPEA2	1.00000	NOTMSTC2	1.00000
NNURSC32	NOTMSRC2	1.00000	AGWTREQ2	1.20000
NNURSC32	POCLND42	1.00000	TNURSC2	1.00000
NCORNG12	PROFIT	141.40000	POILND12	1.00000
NCORNG12	NOTCS2	-9.00000	NOTMAPP2	1.00000
NCORNG12	NOTMPEA2	1.00000	NOTMSTC2	1.00000
NCORNG12	NOTMSRC2	1.00000	AGWTREQ2	1.10000
NCORNG12	POCLND42	1.00000	TCORNG2	1.00000
NCORNG22	PROFIT	102.74000	POILND22	1.00000
NCORNG22	NOTCS2	-9.00000	NOTMAPP2	1.00000
NCORNG22	NOTMPEA2	1.00000	NOTMSTC2	1.00000
NCORNG22	NOTMSRC2	1.00000	AGWTREQ2	1.10000
NCORNG22	POCLND42	1.00000	TCORNG2	1.00000
NCORNG32	PROFIT	58.14000	POILND32	1.00000
NCORNG32	NOTCS2	-9.00000	NOTMAPP2	1.00000
NCORNG32	NOTMPEA2	1.00000	NOTMSTC2	1.00000
NCORNG32	NOTMSRC2	1.00000	AGWTREQ2	1.10000
NCORNG32	POCLND42	1.00000	TCORNG2	1.00000
NCORNS12	PROFIT	183.03000	POILND12	1.00000
NCORNS12	NOTCS2	-9.00000	NOTMAPP2	1.00000
NCORNS12	NOTMPEA2	1.00000	NOTMSTC2	1.00000
NCORNS12	NOTMSRC2	1.00000	AGWTREQ2	1.00000
NCORNS12	POCLND42	1.00000	TCORNS2	1.00000
NCORNS22	PROFIT	170.01000	POILND22	1.00000
NCORNS22	NOTCS2	-9.00000	NOTMAPP2	1.00000
NCORNS22	NOTMPEA2	1.00000	NOTMSTC2	1.00000
NCORNS22	NOTMSRC2	1.00000	AGWTREQ2	1.00000
NCORNS22	POCLND42	1.00000	TCORNS2	1.00000
NCORNS32	PROFIT	142.21000	POILND32	1.00000
NCORNS32	NOTCS2	-9.00000	NOTMAPP2	1.00000
NCORNS32	NOTMPEA2	1.00000	NOTMSTC2	1.00000
NCORNS32	NOTMSRC2	1.00000	AGWTREQ2	1.00000
NCORNS32	POCLND42	1.00000	TCORNS2	1.00000
NSBEET12	PROFIT	57.19000	POILND12	1.00000
NSBEET12	NOTCS2	-9.00000	NOTMAPP2	1.00000
NSBEET12	NOTMPEA2	1.00000	NOTMSTC2	1.00000
NSBEET12	NOTMSRC2	1.00000	AGWTREQ2	1.40000
NSBEET12	POCLND42	1.00000	TSBEET2	1.00000
NSBEET22	PROFIT	31.04000	POILND22	1.00000
NSBEET22	NOTCS2	-9.00000	NOTMAPP2	1.00000
NSBEET22	NOTMPEA2	1.00000	NOTMSTC2	1.00000
NSBEET22	NOTMSRC2	1.00000	AGWTREQ2	1.40000
NSBEET22	POCLND42	1.00000	TSBEET2	1.00000
NSBEET32	PROFIT	24.62000	POILND32	1.00000
NSBEET32	NOTCS2	-9.00000	NOTMAPP2	1.00000
NSBEET32	NOTMPEA2	1.00000	NOTMSTC2	1.00000
NSBEET32	NOTMSRC2	1.00000	AGWTREQ2	1.40000
NSBEET32	POCLND42	1.00000	TSBEET2	1.00000
NDWHEA42	PROFIT	-4.15000	POCLND42	1.00000
NNAPPL12	PROFIT	-140.15000	POILND12	1.00000
NNAPPL12	NOTNAP21	-2.30000	AGWTREQ2	2.40000
NNAPPL12	POCLND42	1.00000	TAPPLE2	1.00000
NNAPPL22	PROFIT	-168.47000	POILND22	1.00000
NNAPPL22	NOTNAP22	-2.30000	AGWTREQ2	2.40000
NNAPPL22	POCLND42	1.00000	TAPPLE2	1.00000
NNAPPL32	PROFIT	-215.38000	POILND32	1.00000
NNAPPL32	NOTNAP23	-2.30000	AGWTREQ2	2.40000
NNAPPL32	POCLND42	1.00000	TAPPLE2	1.00000
NNPEAC12	PROFIT	-108.99000	POILND12	1.00000
NNPEAC12	NOTNPE21	-2.00000	AGWTREQ2	2.70000
NNPEAC12	POCLND42	1.00000	TPEACH2	1.00000
NNPEAC22	PROFIT	-122.99000	POILND22	1.00000
NNPEAC22	NOTNPE22	-2.00000	AGWTREQ2	2.70000
NNPEAC22	POCLND42	1.00000	TPEACH2	1.00000
NNPEAC32	PROFIT	-134.83000	POILND32	1.00000
NNPEAC32	NOTNPE23	-2.00000	AGWTREQ2	2.70000
NNPEAC32	POCLND42	1.00000	TPEACH2	1.00000
NMAPPL12	PROFIT	176.60000	POILND12	1.00000
NMAPPL12	NOTNAP21	1.00000	NOTMAPP2	-30.00000
NMAPPL12	AGWTREQ2	3.50000	POCLND42	1.00000
NMAPPL12	TAPPLE2	1.00000		
NMAPPL22	PROFIT	83.77000	POILND22	1.00000
NMAPPL22	NOTNAP22	1.00000	NOTMAPP2	-30.00000
NMAPPL22	AGWTREQ2	3.50000	POCLND42	1.00000
NMAPPL22	TAPPLE2	1.00000		
NMAPPL32	PROFIT	11.56000	POILND32	1.00000
NMAPPL32	NOTNAP23	1.00000	NOTMAPP2	-30.00000
NMAPPL32	AGWTREQ2	3.50000	POCLND42	1.00000
NMAPPL32	TAPPLE2	1.00000		

NMPEAC12	PROFIT	152.03000	POILND12	1.00000
NMPEAC12	NOTNPE21	1.00000	NOTMPEA2	-15.00000
NMPEAC12	AGWTREQ2	3.80000	POCLND42	1.00000
NMPEAC12	TPEACH2	1.00000		
NMPEAC22	PROFIT	75.00000	POILND22	1.00000
NMPEAC22	NOTNPE22	1.00000	NOTMPEA2	-15.00000
NMPEAC22	AGWTREQ2	3.80000	POCLND42	1.00000
NMPEAC22	TPEACH2	1.00000		
NMPEAC32	PROFIT	28.01000	POILND32	1.00000
NMPEAC32	NOTNPE23	1.00000	NOTMPEA2	-15.00000
NMPEAC32	AGWTREQ2	3.80000	POCLND42	1.00000
NMPEAC32	TPEACH2	1.00000		
NNSTCH12	PROFIT	-148.41000	POILND12	1.00000
NNSTCH12	NOTNST21	-2.00000	AGWTREQ2	2.60000
NNSTCH12	POCLND42	1.00000	TSTCH2	1.00000
NNSTCH22	PROFIT	-150.77000	POILND22	1.00000
NNSTCH22	NOTNST22	-2.00000	AGWTREQ2	2.60000
NNSTCH22	POCLND42	1.00000	TSTCH2	1.00000
NNSTCH32	PROFIT	-178.55000	POILND32	1.00000
NNSTCH32	NOTNST23	-2.00000	AGWTREQ2	2.60000
NNSTCH32	POCLND42	1.00000	TSTCH2	1.00000
NNSRCH12	PROFIT	-121.65000	POILND12	1.00000
NNSRCH12	NOTNSR21	-2.60000	AGWTREQ2	2.60000
NNSRCH12	POCLND42	1.00000	TSRCH2	1.00000
NNSRCH22	PROFIT	-139.09000	POILND22	1.00000
NNSRCH22	NOTNSR22	-2.60000	AGWTREQ2	2.60000
NNSRCH22	POCLND42	1.00000	TSRCH2	1.00000
NNSRCH32	PROFIT	-163.23000	POILND32	1.00000
NNSRCH32	NOTNSR23	-2.60000	AGWTREQ2	2.60000
NNSRCH32	POCLND42	1.00000	TSRCH2	1.00000
NMSTCH12	PROFIT	123.51000	POILND12	1.00000
NMSTCH12	NOTNST21	1.00000	NOTMSTC2	-27.00000
NMSTCH12	AGWTREQ2	3.70000	POCLND42	1.00000
NMSTCH12	TSTCH2	1.00000		
NMSTCH22	PROFIT	67.23000	POILND22	1.00000
NMSTCH22	NOTNST22	1.00000	NOTMSTC2	-27.00000
NMSTCH22	AGWTREQ2	3.70000	POCLND42	1.00000
NMSTCH22	TSTCH2	1.00000		
NMSTCH32	PROFIT	-15.39000	POILND32	1.00000
NMSTCH32	NOTNST23	1.00000	NOTMSTC2	-27.00000
NMSTCH32	AGWTREQ2	3.70000	POCLND42	1.00000
NMSTCH32	TSTCH2	1.00000		
NMSRCH12	PROFIT	130.33000	POILND12	1.00000
NMSRCH12	NOTNSR21	1.00000	NOTMSRC2	-25.00000
NMSRCH12	AGWTREQ2	3.70000	POCLND42	1.00000
NMSRCH12	TSRCH2	1.00000		
NMSRCH22	PROFIT	82.62000	POILND22	1.00000
NMSRCH22	NOTNSR22	1.00000	NOTMSRC2	-25.00000
NMSRCH22	AGWTREQ2	3.70000	POCLND42	1.00000
NMSRCH22	TSRCH2	1.00000		
NMSRCH32	PROFIT	18.00000	POILND32	1.00000
NMSRCH32	NOTNSR23	1.00000	NOTMSRC2	-25.00000
NMSRCH32	AGWTREQ2	3.70000	POCLND42	1.00000
NMSRCH32	TSRCH2	1.00000		
ALFAF13	PROFIT	112.31000	PILND13	1.00000
ALFAF13	ROTAB3	1.00000	ROTAN31	1.00000

ALFAF13	ROTCS3	1.00000	ROTMAPP3	1.00000
ALFAF13	ROTMPEA3	1.00000	ROTMSTC3	1.00000
ALFAF13	ROTMSRC3	1.00000	AGWTREQ3	1.60000
ALFAF13	PCLND43	1.00000	TALFAF3	1.00000
ALFAF23	PROFIT	99.71000	PILND23	1.00000
ALFAF23	ROTAB3	1.00000	ROTAN32	1.00000
ALFAF23	ROTCS3	1.00000	ROTMAPP3	1.00000
ALFAF23	ROTMPEA3	1.00000	ROTMSTC3	1.00000
ALFAF23	ROTMSRC3	1.00000	AGWTREQ3	1.60000
ALFAF23	PCLND43	1.00000	TALFAF3	1.00000
ALFAF33	PROFIT	77.97000	PILND33	1.00000
ALFAF33	ROTAB3	1.00000	ROTAN33	1.00000
ALFAF33	ROTCS3	1.00000	ROTMAPP3	1.00000
ALFAF33	ROTMPEA3	1.00000	ROTMSTC3	1.00000
ALFAF33	ROTMSRC3	1.00000	AGWTREQ3	1.60000
ALFAF33	PCLND43	1.00000	TALFAF3	1.00000
ALFAP13	PROFIT	86.95000	PILND13	1.00000
ALFAP13	ROTAB3	1.00000	ROTAN31	1.00000
ALFAP13	ROTCS3	1.00000	ROTMAPP3	1.00000
ALFAP13	ROTMPEA3	1.00000	ROTMSTC3	1.00000
ALFAP13	ROTMSRC3	1.00000	AGWTREQ3	1.00000
ALFAP13	PCLND43	1.00000	TALFAP3	1.00000
ALFAP23	PROFIT	75.51000	PILND23	1.00000
ALFAP23	ROTAB3	1.00000	ROTAN32	1.00000
ALFAP23	ROTCS3	1.00000	ROTMAPP3	1.00000
ALFAP23	ROTMPEA3	1.00000	ROTMSTC3	1.00000
ALFAP23	ROTMSRC3	1.00000	AGWTREQ3	1.00000
ALFAP23	PCLND43	1.00000	TALFAP3	1.00000
ALFAP33	PROFIT	70.29000	PILND33	1.00000
ALFAP33	ROTAB3	1.00000	ROTAN33	1.00000
ALFAP33	ROTCS3	1.00000	ROTMAPP3	1.00000
ALFAP33	ROTMPEA3	1.00000	ROTMSTC3	1.00000
ALFAP33	ROTMSRC3	1.00000	AGWTREQ3	1.00000
ALFAP33	PCLND43	1.00000	TALFAP3	1.00000
BARLY13	PROFIT	107.59000	PILND13	1.00000
BARLY13	ROTAB3	-1.00000	ROTBN3	1.00000
BARLY13	ROTCS3	1.00000	ROTMAPP3	1.00000
BARLY13	ROTMPEA3	1.00000	ROTMSTC3	1.00000
BARLY13	ROTMSRC3	1.00000	AGWTREQ3	0.70000
BARLY13	PCLND43	1.00000	TBARLY3	1.00000
BARLY23	PROFIT	97.52000	PILND23	1.00000
BARLY23	ROTAB3	-1.00000	ROTBN3	1.00000
BARLY23	ROTCS3	1.00000	ROTMAPP3	1.00000
BARLY23	ROTMPEA3	1.00000	ROTMSTC3	1.00000
BARLY23	ROTMSRC3	1.00000	AGWTREQ3	0.70000
BARLY23	PCLND43	1.00000	TBARLY3	1.00000
BARLY33	PROFIT	76.69000	PILND33	1.00000
BARLY33	ROTAB3	-1.00000	ROTBN3	1.00000
BARLY33	ROTCS3	1.00000	ROTMAPP3	1.00000
BARLY33	ROTMPEA3	1.00000	ROTMSTC3	1.00000
BARLY33	ROTMSRC3	1.00000	AGWTREQ3	0.70000
BARLY33	PCLND43	1.00000	TBARLY3	1.00000
NURSC13	PROFIT	65.12000	PILND13	1.00000
NURSC13	ROTBN3	-1.00000	ROTAN31	-5.00000
NURSC13	ROTCS3	1.00000	ROTMAPP3	1.00000
NURSC13	ROTMPEA3	1.00000	ROTMSTC3	1.00000

NURSC13	TNURSC3	1.00000	ROTMSRC3	1.00000
NURSC13	AGWTREQ3	1.10000	PCLND43	1.00000
NURSC23	PROFIT	58.76000	PILND23	1.00000
NURSC23	ROTBN3	-1.00000	ROTAN32	-5.00000
NURSC23	ROTCS3	1.00000	ROTMAPP3	1.00000
NURSC23	ROTMPEA3	1.00000	ROTMSTC3	1.00000
NURSC23	ROTMSRC3	1.00000	AGWTREQ3	1.10000
NURSC23	PCLND43	1.00000	TNURSC3	1.00000
NURSC33	PROFIT	42.45000	PILND33	1.00000
NURSC33	ROTBN3	-1.00000	ROTAN33	-5.00000
NURSC33	ROTCS3	1.00000	ROTMAPP3	1.00000
NURSC33	ROTMPEA3	1.00000	ROTMSTC3	1.00000
NURSC33	ROTMSRC3	1.00000	AGWTREQ3	1.10000
NURSC33	PCLND43	1.00000	TNURSC3	1.00000
CORNG13	PROFIT	156.63000	PILND13	1.00000
CORNG13	ROTCS3	-9.00000	ROTMAPP3	1.00000
CORNG13	ROTMPEA3	1.00000	ROTMSTC3	1.00000
CORNG13	ROTMSRC3	1.00000	AGWTREQ3	1.20000
CORNG13	PCLND43	1.00000	TCORNG3	1.00000
CORNG23	PROFIT	120.22000	PILND23	1.00000
CORNG23	ROTCS3	-9.00000	ROTMAPP3	1.00000
CORNG23	ROTMPEA3	1.00000	ROTMSTC3	1.00000
CORNG23	ROTMSRC3	1.00000	AGWTREQ3	1.20000
CORNG23	PCLND43	1.00000	TCORNG3	1.00000
CORNG33	PROFIT	77.32000	PILND33	1.00000
CORNG33	ROTCS3	-9.00000	ROTMAPP3	1.00000
CORNG33	ROTMPEA3	1.00000	ROTMSTC3	1.00000
CORNG33	ROTMSRC3	1.00000	AGWTREQ3	1.20000
CORNG33	PCLND43	1.00000	TCORNG3	1.00000
CORNS13	PROFIT	199.37000	PILND13	1.00000
CORNS13	ROTCS3	-9.00000	ROTMAPP3	1.00000
CORNS13	ROTMPEA3	1.00000	ROTMSTC3	1.00000
CORNS13	ROTMSRC3	1.00000	AGWTREQ3	1.10000
CORNS13	PCLND43	1.00000	TCORNS3	1.00000
CORNS23	PROFIT	193.27000	PILND23	1.00000
CORNS23	ROTCS3	-9.00000	ROTMAPP3	1.00000
CORNS23	ROTMPEA3	1.00000	ROTMSTC3	1.00000
CORNS23	ROTMSRC3	1.00000	AGWTREQ3	1.10000
CORNS23	PCLND43	1.00000	TCORNS3	1.00000
CORNS33	PROFIT	172.76000	PILND33	1.00000
CORNS33	ROTCS3	-9.00000	ROTMAPP3	1.00000
CORNS33	ROTMPEA3	1.00000	ROTMSTC3	1.00000
CORNS33	ROTMSRC3	1.00000	AGWTREQ3	1.10000
CORNS33	PCLND43	1.00000	TCORNS3	1.00000
SBEET13	PROFIT	101.48000	PILND13	1.00000
SBEET13	ROTCS3	-9.00000	ROTMAPP3	1.00000
SBEET13	ROTMPEA3	1.00000	ROTMSTC3	1.00000
SBEET13	ROTMSRC3	1.00000	AGWTREQ3	1.60000
SBEET13	PCLND43	1.00000	TSBEET3	1.00000
SBEET23	PROFIT	82.52000	PILND23	1.00000
SBEET23	ROTCS3	-9.00000	ROTMAPP3	1.00000
SBEET23	ROTMPEA3	1.00000	ROTMSTC3	1.00000
SBEET23	ROTMSRC3	1.00000	AGWTREQ3	1.60000
SBEET23	PCLND43	1.00000	TSBEET3	1.00000
SBEET33	PROFIT	60.71000	PILND33	1.00000
SBEET33	ROTCS3	-9.00000	ROTMAPP3	1.00000
SBEET33	ROTMPEA3	1.00000	ROTMSTC3	1.00000
SBEET33	ROTMSRC3	1.00000	AGWTREQ3	1.60000
SBEET33	PCLND43	1.00000	TSBEET3	1.00000
DBEANS43	PROFIT	-34.58000	PCLND43	1.00000
DWHEAT43	PROFIT	20.82000	PCLND43	1.00000
NAPPL13	PROFIT	-124.92000	PILND13	1.00000
NAPPL13	ROTNAP31	-2.30000	AGWTREQ3	2.40000
NAPPL13	PCLND43	1.00000	TAPPLE3	1.00000
NAPPL13	FRUITAC3	1.00000		
NAPPL23	PROFIT	-150.99000	PILND23	1.00000
NAPPL23	ROTNAP32	-2.30000	AGWTREQ3	2.40000
NAPPL23	PCLND43	1.00000	TAPPLE3	1.00000
NAPPL23	FRUITAC3	1.00000		
NAPPL33	PROFIT	-196.20000	PILND33	1.00000
NAPPL33	ROTNAP33	-2.30000	AGWTREQ3	2.40000
NAPPL33	PCLND43	1.00000	TAPPLE3	1.00000
NAPPL33	FRUITAC3	1.00000		
NPEAC13	PROFIT	-93.76000	PILND13	1.00000
NPEAC13	ROTNPE31	-2.00000	AGWTREQ3	2.70000
NPEAC13	PCLND43	1.00000	TPEACH3	1.00000
NPEAC13	FRUITAC3	1.00000		
NPEAC23	PROFIT	-105.51000	PILND23	1.00000
NPEAC23	ROTNPE32	-2.00000	AGWTREQ3	2.70000
NPEAC23	PCLND43	1.00000	TPEACH3	1.00000
NPEAC23	FRUITAC3	1.00000		
NPEAC33	PROFIT	-115.65000	PILND33	1.00000
NPEAC33	ROTNPE33	-2.00000	AGWTREQ3	2.70000
NPEAC33	PCLND43	1.00000	TPEACH3	1.00000
NPEAC33	FRUITAC3	1.00000		
MAPPL13	PROFIT	191.83000	PILND13	1.00000
MAPPL13	ROTNAP31	1.00000	ROTMAPP3	-30.00000
MAPPL13	AGWTREQ3	3.50000	PCLND43	1.00000
MAPPL13	TAPPLE3	1.00000	FRUITAC3	1.00000
MAPPL23	PROFIT	101.25000	PILND23	1.00000
MAPPL23	ROTNAP32	1.00000	ROTMAPP3	-30.00000
MAPPL23	AGWTREQ3	3.50000	PCLND43	1.00000
MAPPL23	TAPPLE3	1.00000	FRUITAC3	1.00000
MAPPL33	PROFIT	30.74000	PILND33	1.00000
MAPPL33	ROTNAP33	1.00000	ROTMAPP3	-30.00000
MAPPL33	AGWTREQ3	3.50000	PCLND43	1.00000
MAPPL33	TAPPLE3	1.00000	FRUITAC3	1.00000
MPEAC13	PROFIT	167.26000	PILND13	1.00000
MPEAC13	ROTNPE31	1.00000	ROTMPEA3	-15.00000
MPEAC13	AGWTREQ3	3.80000	PCLND43	1.00000
MPEAC13	TPEACH3	1.00000	FRUITAC3	1.00000
MPEAC23	PROFIT	92.48000	PILND23	1.00000
MPEAC23	ROTNPE32	1.00000	ROTMPEA3	-15.00000
MPEAC23	AGWTREQ3	3.80000	PCLND43	1.00000
MPEAC23	TPEACH3	1.00000	FRUITAC3	1.00000
MPEAC33	PROFIT	47.19000	PILND33	1.00000
MPEAC33	ROTNPE33	1.00000	ROTMPEA3	-15.00000
MPEAC33	AGWTREQ3	3.80000	PCLND43	1.00000
MPEAC33	TPEACH3	1.00000	FRUITAC3	1.00000
NSTCH13	PROFIT	-133.15000	PILND13	1.00000
NSTCH13	ROTNST31	-2.00000	AGWTREQ3	2.60000
NSTCH13	PCLND43	1.00000	TSTCH3	1.00000

NSTCH13	FRUITAC3	1.00000		
NSTCH23	PROFIT	-133.29000	PILND23	1.00000
NSTCH23	ROTNST32	-2.00000	AGWTREQ3	2.60000
NSTCH23	PCLND43	1.00000	TSTCH3	1.00000
NSTCH23	FRUITAC3	1.00000		
NSTCH33	PROFIT	-159.37000	PILND33	1.00000
NSTCH33	ROTNST33	-2.00000	AGWTREQ3	2.60000
NSTCH33	PCLND43	1.00000	TSTCH3	1.00000
NSTCH33	FRUITAC3	1.00000		
NSRCH13	PROFIT	-106.42000	PILND13	1.00000
NSRCH13	ROTNSR31	-2.60000	AGWTREQ3	2.60000
NSRCH13	PCLND43	1.00000	TSRCH3	1.00000
NSRCH13	FRUITAC3	1.00000		
NSRCH23	PROFIT	-121.61000	PILND23	1.00000
NSRCH23	ROTNSR32	-2.60000	AGWTREQ3	2.60000
NSRCH23	PCLND43	1.00000	TSRCH3	1.00000
NSRCH23	FRUITAC3	1.00000		
NSRCH33	PROFIT	-144.05000	PILND33	1.00000
NSRCH33	ROTNSR33	-2.60000	AGWTREQ3	2.60000
NSRCH33	PCLND43	1.00000	TSRCH3	1.00000
NSRCH33	FRUITAC3	1.00000		
MSTCH13	PROFIT	138.74000	PILND13	1.00000
MSTCH13	ROTNST31	1.00000	ROTMSTC3	-27.00000
MSTCH13	AGWTREQ3	3.70000	PCLND43	1.00000
MSTCH13	TSTCH3	1.00000	FRUITAC3	1.00000
MSTCH23	PROFIT	84.71000	PILND23	1.00000
MSTCH23	ROTNST32	1.00000	ROTMSTC3	-27.00000
MSTCH23	AGWTREQ3	3.70000	PCLND43	1.00000
MSTCH23	TSTCH3	1.00000	FRUITAC3	1.00000
MSTCH33	PROFIT	3.79000	PILND33	1.00000
MSTCH33	ROTNST33	1.00000	ROTMSTC3	-27.00000
MSTCH33	AGWTREQ3	3.70000	PCLND43	1.00000
MSTCH33	TSTCH3	1.00000	FRUITAC3	1.00000
MSRCH13	PROFIT	145.56000	PILND13	1.00000
MSRCH13	ROTNSR31	1.00000	ROTMSRC3	-25.00000
MSRCH13	AGWTREQ3	3.70000	PCLND43	1.00000
MSRCH13	TSRCH3	1.00000	FRUITAC3	1.00000
MSRCH23	PROFIT	100.10000	PILND23	1.00000
MSRCH23	ROTNSR32	1.00000	ROTMSRC3	-25.00000
MSRCH23	AGWTREQ3	3.70000	PCLND43	1.00000
MSRCH23	TSRCH3	1.00000	FRUITAC3	1.00000
MSRCH33	PROFIT	37.18000	PILND33	1.00000
MSRCH33	ROTNSR33	1.00000	ROTMSRC3	-25.00000
MSRCH33	AGWTREQ3	3.70000	PCLND43	1.00000
MSRCH33	TSRCH3	1.00000	FRUITAC3	1.00000
NALFAF13	PROFIT	95.20000	POILND13	1.00000
NALFAF13	NOTAB3	1.00000	NOTAN31	1.00000
NALFAF13	NOTCS3	1.00000	NOTMAPP3	1.00000
NALFAF13	NOTMPEA3	1.00000	NOTMSTC3	1.00000
NALFAF13	NOTMSRC3	1.00000	AGWTREQ3	1.60000
NALFAF13	POCLND43	1.00000	TALFAF3	1.00000
NALFAF23	PROFIT	80.35000	POILND23	1.00000
NALFAF23	NOTAB3	1.00000	NOTAN32	1.00000
NALFAF23	NOTCS3	1.00000	NOTMAPP3	1.00000
NALFAF23	NOTMPEA3	1.00000	NOTMSTC3	1.00000
NALFAF23	NOTMSRC3	1.00000	AGWTREQ3	1.60000
NALFAF23	POCLND43	1.00000	TALFAF3	1.00000
NALFAF33	PROFIT	56.91000	POILND33	1.00000
NALFAF33	NOTAB3	1.00000	NOTAN33	1.00000
NALFAF33	NOTCS3	1.00000	NOTMAPP3	1.00000
NALFAF33	NOTMPEA3	1.00000	NOTMSTC3	1.00000
NALFAF33	NOTMSRC3	1.00000	AGWTREQ3	1.60000
NALFAF33	POCLND43	1.00000	TALFAF3	1.00000
NALFAP13	PROFIT	69.84000	POILND13	1.00000
NALFAP13	NOTAB3	1.00000	NOTAN31	1.00000
NALFAP13	NOTCS3	1.00000	NOTMAPP3	1.00000
NALFAP13	NOTMPEA3	1.00000	NOTMSTC3	1.00000
NALFAP13	NOTMSRC3	1.00000	AGWTREQ3	1.00000
NALFAP13	POCLND43	1.00000	TALFAP3	1.00000
NALFAP23	PROFIT	56.15000	POILND23	1.00000
NALFAP23	NOTAB3	1.00000	NOTAN32	1.00000
NALFAP23	NOTCS3	1.00000	NOTMAPP3	1.00000
NALFAP23	NOTMPEA3	1.00000	NOTMSTC3	1.00000
NALFAP23	NOTMSRC3	1.00000	AGWTREQ3	1.00000
NALFAP23	POCLND43	1.00000	TALFAP3	1.00000
NALFAP33	PROFIT	49.23000	POILND33	1.00000
NALFAP33	NOTAB3	1.00000	NOTAN33	1.00000
NALFAP33	NOTCS3	1.00000	NOTMAPP3	1.00000
NALFAP33	NOTMPEA3	1.00000	NOTMSTC3	1.00000
NALFAP33	NOTMSRC3	1.00000	AGWTREQ3	1.00000
NALFAP33	POCLND43	1.00000	TALFAP3	1.00000
NBARLY13	PROFIT	90.48000	POILND13	1.00000
NBARLY13	NOTAB3	-1.00000	NOTBN3	1.00000
NBARLY13	NOTCS3	1.00000	NOTMAPP3	1.00000
NBARLY13	NOTMPEA3	1.00000	NOTMSTC3	1.00000
NBARLY13	NOTMSRC3	1.00000	AGWTREQ3	0.70000
NBARLY13	POCLND43	1.00000	TBARLY3	1.00000
NBARLY23	PROFIT	78.16000	POILND23	1.00000
NBARLY23	NOTAB3	-1.00000	NOTBN3	1.00000
NBARLY23	NOTCS3	1.00000	NOTMAPP3	1.00000
NBARLY23	NOTMPEA3	1.00000	NOTMSTC3	1.00000
NBARLY23	NOTMSRC3	1.00000	AGWTREQ3	0.70000
NBARLY23	POCLND43	1.00000	TBARLY3	1.00000
NBARLY33	PROFIT	55.63000	POILND33	1.00000
NBARLY33	NOTAB3	-1.00000	NOTBN3	1.00000
NBARLY33	NOTCS3	1.00000	NOTMAPP3	1.00000
NBARLY33	NOTMPEA3	1.00000	NOTMSTC3	1.00000
NBARLY33	NOTMSRC3	1.00000	AGWTREQ3	0.70000
NBARLY33	POCLND43	1.00000	TBARLY3	1.00000
NNURSC13	PROFIT	48.01000	POILND13	1.00000
NNURSC13	NOTBN3	-1.00000	NOTAN31	-5.00000
NNURSC13	NOTCS3	1.00000	NOTMAPP3	1.00000
NNURSC13	NOTMPEA3	1.00000	NOTMSTC3	1.00000
NNURSC13	NOTMSRC3	1.00000	AGWTREQ3	1.10000
NNURSC13	POCLND43	1.00000	TNURSC3	1.00000
NNURSC23	PROFIT	39.40000	POILND23	1.00000
NNURSC23	NOTBN3	-1.00000	NOTAN32	-5.00000
NNURSC23	NOTCS3	1.00000	NOTMAPP3	1.00000
NNURSC23	NOTMPEA3	1.00000	NOTMSTC3	1.00000
NNURSC23	NOTMSRC3	1.00000	AGWTREQ3	1.10000
NNURSC23	POCLND43	1.00000	TNURSC3	1.00000
NNURSC33	PROFIT	21.39000	POILND33	1.00000

NNURSC33	NOTBN3	-1.00000	NOTAN33	-5.00000
NNURSC33	NOTCS3	1.00000	NOTMAPP3	1.00000
NNURSC33	NOTMPEA3	1.00000	NOTMSTC3	1.00000
NNURSC33	NOTMSRC3	1.00000	AGWTREQ3	1.10000
NNURSC33	POCLND43	1.00000	TNURSC3	1.00000
NCORNG13	PROFIT	139.52000	POILND13	1.00000
NCORNG13	NOTCS3	-9.00000	NOTMAPP3	1.00000
NCORNG13	NOTMPEA3	1.00000	NOTMSTC3	1.00000
NCORNG13	NOTMSRC3	1.00000	AGWTREQ3	1.20000
NCORNG13	POCLND43	1.00000	TCORNG3	1.00000
NCORNG23	PROFIT	100.86000	POILND23	1.00000
NCORNG23	NOTCS3	-9.00000	NOTMAPP3	1.00000
NCORNG23	NOTMPEA3	1.00000	NOTMSTC3	1.00000
NCORNG23	NOTMSRC3	1.00000	AGWTREQ3	1.20000
NCORNG23	POCLND43	1.00000	TCORNG3	1.00000
NCORNG33	PROFIT	56.26000	POILND33	1.00000
NCORNG33	NOTCS3	-9.00000	NOTMAPP3	1.00000
NCORNG33	NOTMPEA3	1.00000	NOTMSTC3	1.00000
NCORNG33	NOTMSRC3	1.00000	AGWTREQ3	1.20000
NCORNG33	POCLND43	1.00000	TCORNG3	1.00000
NCORNS13	PROFIT	182.26000	POILND13	1.00000
NCORNS13	NOTCS3	-9.00000	NOTMAPP3	1.00000
NCORNS13	NOTMPEA3	1.00000	NOTMSTC3	1.00000
NCORNS13	NOTMSRC3	1.00000	AGWTREQ3	1.10000
NCORNS13	POCLND43	1.00000	TCORNS3	1.00000
NCORNS23	PROFIT	173.91000	POILND23	1.00000
NCORNS23	NOTCS3	-9.00000	NOTMAPP3	1.00000
NCORNS23	NOTMPEA3	1.00000	NOTMSTC3	1.00000
NCORNS23	NOTMSRC3	1.00000	AGWTREQ3	1.10000
NCORNS23	POCLND43	1.00000	TCORNS3	1.00000
NCORNS33	PROFIT	151.70000	POILND33	1.00000
NCORNS33	NOTCS3	-9.00000	NOTMAPP3	1.00000
NCORNS33	NOTMPEA3	1.00000	NOTMSTC3	1.00000
NCORNS33	NOTMSRC3	1.00000	AGWTREQ3	1.10000
NCORNS33	POCLND43	1.00000	TCORNS3	1.00000
NSBEET13	PROFIT	84.37000	POILND13	1.00000
NSBEET13	NOTCS3	-9.00000	NOTMAPP3	1.00000
NSBEET13	NOTMPEA3	1.00000	NOTMSTC3	1.00000
NSBEET13	NOTMSRC3	1.00000	AGWTREQ3	1.60000
NSBEET13	POCLND43	1.00000	TSBEET3	1.00000
NSBEET23	PROFIT	63.16000	POILND23	1.00000
NSBEET23	NOTCS3	-9.00000	NOTMAPP3	1.00000
NSBEET23	NOTMPEA3	1.00000	NOTMSTC3	1.00000
NSBEET23	NOTMSRC3	1.00000	AGWTREQ3	1.60000
NSBEET23	POCLND43	1.00000	TSBEET3	1.00000
NSBEET33	PROFIT	39.73000	POILND33	1.00000
NSBEET33	NOTCS3	-9.00000	NOTMAPP3	1.00000
NSBEET33	NOTMPEA3	1.00000	NOTMSTC3	1.00000
NSBEET33	NOTMSRC3	1.00000	AGWTREQ3	1.60000
NSBEET33	POCLND43	1.00000	TSBEET3	1.00000
NDBEAN43	PROFIT	-58.08000	POCLND43	1.00000
NDWHEA43	PROFIT	-2.68000	POCLND43	1.00000
NNAPPL13	PROFIT	-142.03000	POILND13	1.00000
NNAPPL13	NOTNAP31	-2.30000	AGWTREQ3	2.40000
NNAPPL13	POCLND43	1.00000	TAPPLE3	1.00000
NNAPPL23	PROFIT	-170.35000	POILND23	1.00000
NNAPPL23	NOTNAP32	-2.30000	AGWTREQ3	2.40000
NNAPPL23	POCLND43	1.00000	TAPPLE3	1.00000
NNAPPL33	PROFIT	-217.26000	POILND33	1.00000
NNAPPL33	NOTNAP33	-2.30000	AGWTREQ3	2.40000
NNAPPL33	POCLND43	1.00000	TAPPLE3	1.00000
NNPEAC13	PROFIT	-110.87000	POILND13	1.00000
NNPEAC13	NOTNPE31	-2.00000	AGWTREQ3	2.70000
NNPEAC13	POCLND43	1.00000	TPEACH3	1.00000
NNPEAC23	PROFIT	-124.87000	POILND23	1.00000
NNPEAC23	NOTNPE32	-2.00000	AGWTREQ3	2.70000
NNPEAC23	POCLND43	1.00000	TPEACH3	1.00000
NNPEAC33	PROFIT	-136.71000	POILND33	1.00000
NNPEAC33	NOTNPE33	-2.00000	AGWTREQ3	2.70000
NNPEAC33	POCLND43	1.00000	TPEACH3	1.00000
NMAPPL13	PROFIT	174.72000	POILND13	1.00000
NMAPPL13	NOTNAP31	1.00000	NOTMAPP3	-30.00000
NMAPPL13	AGWTREQ3	3.50000	POCLND43	1.00000
NMAPPL13	TAPPLE3	1.00000		
NMAPPL23	PROFIT	81.89000	POILND23	1.00000
NMAPPL23	NOTNAP32	1.00000	NOTMAPP3	-30.00000
NMAPPL23	AGWTREQ3	3.50000	POCLND43	1.00000
NMAPPL23	TAPPLE3	1.00000		
NMAPPL33	PROFIT	9.68000	POILND33	1.00000
NMAPPL33	NOTNAP33	1.00000	NOTMAPP3	-30.00000
NMAPPL33	AGWTREQ3	3.50000	POCLND43	1.00000
NMAPPL33	TAPPLE3	1.00000		
NMPEAC13	PROFIT	150.15000	POILND13	1.00000
NMPEAC13	NOTNPE31	1.00000	NOTMPEA3	-15.00000
NMPEAC13	AGWTREQ3	3.80000	POCLND43	1.00000
NMPEAC13	TPEACH3	1.00000		
NMPEAC23	PROFIT	73.12000	POILND23	1.00000
NMPEAC23	NOTNPE32	1.00000	NOTMPEA3	-15.00000
NMPEAC23	AGWTREQ3	3.80000	POCLND43	1.00000
NMPEAC23	TPEACH3	1.00000		
NMPEAC33	PROFIT	26.13000	POILND33	1.00000
NMPEAC33	NOTNPE33	1.00000	NOTMPEA3	-15.00000
NMPEAC33	AGWTREQ3	3.80000	POCLND43	1.00000
NMPEAC33	TPEACH3	1.00000		
NNSTCH13	PROFIT	-150.29000	POILND13	1.00000
NNSTCH13	NOTNST31	-2.00000	AGWTREQ3	2.60000
NNSTCH13	POCLND43	1.00000	TSTCH3	1.00000
NNSTCH23	PROFIT	-152.65000	POILND23	1.00000
NNSTCH23	NOTNST32	-2.00000	AGWTREQ3	2.60000
NNSTCH23	POCLND43	1.00000	TSTCH3	1.00000
NNSTCH33	PROFIT	-180.43000	POILND33	1.00000
NNSTCH33	NOTNST33	-2.00000	AGWTREQ3	2.60000
NNSTCH33	POCLND43	1.00000	TSTCH3	1.00000
NNSRCH13	PROFIT	-123.53000	POILND13	1.00000
NNSRCH13	NOTNSR31	-2.60000	AGWTREQ3	2.60000
NNSRCH13	POCLND43	1.00000	TSRCH3	1.00000
NNSRCH23	PROFIT	-140.97000	POILND23	1.00000
NNSRCH23	NOTNSR32	-2.60000	AGWTREQ3	2.60000
NNSRCH23	POCLND43	1.00000	TSRCH3	1.00000
NNSRCH33	PROFIT	-165.11000	POILND33	1.00000
NNSRCH33	NOTNSR33	-2.60000	AGWTREQ3	2.60000
NNSRCH33	POCLND43	1.00000	TSRCH3	1.00000

NMSTCH13	PROFIT	121.63000	POILND13	1.00000
NMSTCH13	NOTNST31	1.00000	NOTMSTC3	-27.00000
NMSTCH13	AGWTREQ3	3.70000	POCLND43	1.00000
NMSTCH13	TSTCH3	1.00000		
NMSTCH23	PROFIT	65.35000	POILND23	1.00000
NMSTCH23	NOTNST32	1.00000	NOTMSTC3	-27.00000
NMSTCH23	AGWTREQ3	3.70000	POCLND43	1.00000
NMSTCH23	TSTCH3	1.00000		
NMSTCH33	PROFIT	-17.27000	POILND33	1.00000
NMSTCH33	NOTNST33	1.00000	NOTMSTC3	-27.00000
NMSTCH33	AGWTREQ3	3.70000	POCLND43	1.00000
NMSTCH33	TSTCH3	1.00000		
NMSRCH13	PROFIT	128.45000	POILND13	1.00000
NMSRCH13	NOTNSR31	1.00000	NOTMSRC3	-25.00000
NMSRCH13	AGWTREQ3	3.70000	POCLND43	1.00000
NMSRCH13	TSRCH3	1.00000		
NMSRCH23	PROFIT	80.74000	POILND23	1.00000
NMSRCH23	NOTNSR32	1.00000	NOTMSRC3	-25.00000
NMSRCH23	AGWTREQ3	3.70000	POCLND43	1.00000
NMSRCH23	TSRCH3	1.00000		
NMSRCH33	PROFIT	16.12000	POILND33	1.00000
NMSRCH33	NOTNSR33	1.00000	NOTMSRC3	-25.00000
NMSRCH33	AGWTREQ3	3.70000	POCLND43	1.00000
NMSRCH33	TSRCH3	1.00000		
ALFAF14	PROFIT	114.04000	PILND14	1.00000
ALFAF14	ROTAB4	1.00000	ROTAN41	1.00000
ALFAF14	ROTCS4	1.00000	ROTMAPP4	1.00000
ALFAF14	ROTMPEA4	1.00000	ROTMSTC4	1.00000
ALFAF14	ROTMSRC4	1.00000	AGWTREQ4	2.00000
ALFAF14	PCLND44	1.00000	TALFAF4	1.00000
ALFAF24	PROFIT	96.87000	PILND24	1.00000
ALFAF24	ROTAB4	1.00000	ROTAN42	1.00000
ALFAF24	ROTCS4	1.00000	ROTMAPP4	1.00000
ALFAF24	ROTMPEA4	1.00000	ROTMSTC4	1.00000
ALFAF24	ROTMSRC4	1.00000	AGWTREQ4	2.00000
ALFAF24	PCLND44	1.00000	TALFAF4	1.00000
ALFAF34	PROFIT	77.81000	PILND34	1.00000
ALFAF34	ROTAB4	1.00000	ROTAN43	1.00000
ALFAF34	ROTCS4	1.00000	ROTMAPP4	1.00000
ALFAF34	ROTMPEA4	1.00000	ROTMSTC4	1.00000
ALFAF34	ROTMSRC4	1.00000	AGWTREQ4	2.00000
ALFAF34	PCLND44	1.00000	TALFAF4	1.00000
ALFAP14	PROFIT	88.67000	PILND14	1.00000
ALFAP14	ROTAB4	1.00000	ROTAN41	1.00000
ALFAP14	ROTCS4	1.00000	ROTMAPP4	1.00000
ALFAP14	ROTMPEA4	1.00000	ROTMSTC4	1.00000
ALFAP14	ROTMSRC4	1.00000	AGWTREQ4	1.30000
ALFAP14	PCLND44	1.00000	TALFAP4	1.00000
ALFAP24	PROFIT	74.93000	PILND24	1.00000
ALFAP24	ROTAB4	1.00000	ROTAN42	1.00000
ALFAP24	ROTCS4	1.00000	ROTMAPP4	1.00000
ALFAP24	ROTMPEA4	1.00000	ROTMSTC4	1.00000
ALFAP24	ROTMSRC4	1.00000	AGWTREQ4	1.30000
ALFAP24	PCLND44	1.00000	TALFAP4	1.00000
ALFAP34	PROFIT	60.32000	PILND34	1.00000
ALFAP34	ROTAB4	1.00000	ROTAN43	1.00000

ALFAP34	ROTCS4	1.00000	ROTMAPP4	1.00000
ALFAP34	ROTMPEA4	1.00000	ROTMSTC4	1.00000
ALFAP34	ROTMSRC4	1.00000	AGWTREQ4	1.30000
ALFAP34	PCLND44	1.00000	TALFAP4	1.00000
BARLY14	PROFIT	107.59000	PILND14	1.00000
BARLY14	ROTAB4	-1.00000	ROTBN4	1.00000
BARLY14	ROTCS4	1.00000	ROTMAPP4	1.00000
BARLY14	ROTMPEA4	1.00000	ROTMSTC4	1.00000
BARLY14	ROTMSRC4	1.00000	AGWTREQ4	0.90000
BARLY14	PCLND44	1.00000	TBARLY4	1.00000
BARLY24	PROFIT	95.67000	PILND24	1.00000
BARLY24	ROTAB4	-1.00000	ROTBN4	1.00000
BARLY24	ROTCS4	1.00000	ROTMAPP4	1.00000
BARLY24	ROTMPEA4	1.00000	ROTMSTC4	1.00000
BARLY24	ROTMSRC4	1.00000	AGWTREQ4	0.90000
BARLY24	PCLND44	1.00000	TBARLY4	1.00000
BARLY34	PROFIT	78.08000	PILND34	1.00000
BARLY34	ROTAB4	-1.00000	ROTBN4	1.00000
BARLY34	ROTCS4	1.00000	ROTMAPP4	1.00000
BARLY34	ROTMPEA4	1.00000	ROTMSTC4	1.00000
BARLY34	ROTMSRC4	1.00000	AGWTREQ4	0.90000
BARLY34	PCLND44	1.00000	TBARLY4	1.00000
NURSC14	PROFIT	65.12000	PILND14	1.00000
NURSC14	ROTBN4	-1.00000	ROTAN41	-5.00000
NURSC14	ROTCS4	1.00000	ROTMAPP4	1.00000
NURSC14	ROTMPEA4	1.00000	ROTMSTC4	1.00000
NURSC14	ROTMSRC4	1.00000	AGWTREQ4	1.50000
NURSC14	PCLND44	1.00000	TNURSC4	1.00000
NURSC24	PROFIT	56.54000	PILND24	1.00000
NURSC24	ROTBN4	-1.00000	ROTAN42	-5.00000
NURSC24	ROTCS4	1.00000	ROTMAPP4	1.00000
NURSC24	ROTMPEA4	1.00000	ROTMSTC4	1.00000
NURSC24	ROTMSRC4	1.00000	AGWTREQ4	1.50000
NURSC24	PCLND44	1.00000	TNURSC4	1.00000
NURSC34	PROFIT	43.06000	PILND34	1.00000
NURSC34	ROTBN4	-1.00000	ROTAN43	-5.00000
NURSC34	ROTCS4	1.00000	ROTMAPP4	1.00000
NURSC34	ROTMPEA4	1.00000	ROTMSTC4	1.00000
NURSC34	ROTMSRC4	1.00000	AGWTREQ4	1.50000
NURSC34	PCLND44	1.00000	TNURSC4	1.00000
CORNG14	PROFIT	175.28000	PILND14	1.00000
CORNG14	ROTCS4	-9.00000	ROTMAPP4	1.00000
CORNG14	ROTMPEA4	1.00000	ROTMSTC4	1.00000
CORNG14	ROTMSRC4	1.00000	AGWTREQ4	1.50000
CORNG14	PCLND44	1.00000	TCORNG4	1.00000
CORNG24	PROFIT	117.12000	PILND24	1.00000
CORNG24	ROTCS4	-9.00000	ROTMAPP4	1.00000
CORNG24	ROTMPEA4	1.00000	ROTMSTC4	1.00000
CORNG24	ROTMSRC4	1.00000	AGWTREQ4	1.50000
CORNG24	PCLND44	1.00000	TCORNG4	1.00000
CORNG34	PROFIT	85.75000	PILND34	1.00000
CORNG34	ROTCS4	-9.00000	ROTMAPP4	1.00000
CORNG34	ROTMPEA4	1.00000	ROTMSTC4	1.00000
CORNG34	ROTMSRC4	1.00000	AGWTREQ4	1.50000
CORNG34	PCLND44	1.00000	TCORNG4	1.00000
CORNS14	PROFIT	199.37000	PILND14	1.00000

CORNS14	ROTCS4	-9.00000	ROTMAPP4	1.00000
CORNS14	ROTMPEA4	1.00000	ROTMSTC4	1.00000
CORNS14	ROTMSRC4	1.00000	AGWTREQ4	1.40000
CORNS14	PCLND44	1.00000	TCORNS4	1.00000
CORNS24	PROFIT	191.97000	PILND24	1.00000
CORNS24	ROTCS4	-9.00000	ROTMAPP4	1.00000
CORNS24	ROTMPEA4	1.00000	ROTMSTC4	1.00000
CORNS24	ROTMSRC4	1.00000	AGWTREQ4	1.40000
CORNS24	PCLND44	1.00000	TCORNS4	1.00000
CORNS34	PROFIT	163.11000	PILND34	1.00000
CORNS34	ROTCS4	-9.00000	ROTMAPP4	1.00000
CORNS34	ROTMPEA4	1.00000	ROTMSTC4	1.00000
CORNS34	ROTMSRC4	1.00000	AGWTREQ4	1.40000
CORNS34	PCLND44	1.00000	TCORNS4	1.00000
SBEET14	PROFIT	85.67000	PILND14	1.00000
SBEET14	ROTCS4	-9.00000	ROTMAPP4	1.00000
SBEET14	ROTMPEA4	1.00000	ROTMSTC4	1.00000
SBEET14	ROTMSRC4	1.00000	AGWTREQ4	1.80000
SBEET14	PCLND44	1.00000	TSBEET4	1.00000
SBEET24	PROFIT	63.56000	PILND24	1.00000
SBEET24	ROTCS4	-9.00000	ROTMAPP4	1.00000
SBEET24	ROTMPEA4	1.00000	ROTMSTC4	1.00000
SBEET24	ROTMSRC4	1.00000	AGWTREQ4	1.80000
SBEET24	PCLND44	1.00000	TSBEET4	1.00000
SBEET34	PROFIT	54.13000	PILND34	1.00000
SBEET34	ROTCS4	-9.00000	ROTMAPP4	1.00000
SBEET34	ROTMPEA4	1.00000	ROTMSTC4	1.00000
SBEET34	ROTMSRC4	1.00000	AGWTREQ4	1.80000
SBEET34	PCLND44	1.00000	TSBEET4	1.00000
DBEANS44	PROFIT	-30.42000	PCLND44	1.00000
DWHEAT44	PROFIT	15.41000	PCLND44	1.00000
NAPPL14	PROFIT	-124.92000	PILND14	1.00000
NAPPL14	ROTNAP41	-2.30000	AGWTREQ4	2.70000
NAPPL14	PCLND44	1.00000	TAPPLE4	1.00000
NAPPL14	FRUITAC4	1.00000		
NAPPL24	PROFIT	-150.99000	PILND24	1.00000
NAPPL24	ROTNAP42	-2.30000	AGWTREQ4	2.70000
NAPPL24	PCLND44	1.00000	TAPPLE4	1.00000
NAPPL24	FRUITAC4	1.00000		
NAPPL34	PROFIT	-196.20000	PILND34	1.00000
NAPPL34	ROTNAP43	-2.30000	AGWTREQ4	2.70000
NAPPL34	PCLND44	1.00000	TAPPLE4	1.00000
NAPPL34	FRUITAC4	1.00000		
NPEAC14	PROFIT	-93.76000	PILND14	1.00000
NPEAC14	ROTNPE41	-2.00000	AGWTREQ4	3.00000
NPEAC14	PCLND44	1.00000	TPEACH4	1.00000
NPEAC14	FRUITAC4	1.00000		
NPEAC24	PROFIT	-105.51000	PILND24	1.00000
NPEAC24	ROTNPE42	-2.00000	AGWTREQ4	3.00000
NPEAC24	PCLND44	1.00000	TPEACH4	1.00000
NPEAC24	FRUITAC4	1.00000		
NPEAC34	PROFIT	-115.65000	PILND34	1.00000
NPEAC34	ROTNPE43	-2.00000	AGWTREQ4	3.00000
NPEAC34	PCLND44	1.00000	TPEACH4	1.00000
NPEAC34	FRUITAC4	1.00000		
MAPPL14	PROFIT	191.83000	PILND14	1.00000

MAPPL14	ROTNAP41	1.00000	ROTMAPP4	-30.00000
MAPPL14	AGWTREQ4	3.80000	PCLND44	1.00000
MAPPL14	TAPPLE4	1.00000	FRUITAC4	1.00000
MAPPL24	PROFIT	101.25000	PILND24	1.00000
MAPPL24	ROTNAP42	1.00000	ROTMAPP4	-30.00000
MAPPL24	AGWTREQ4	3.80000	PCLND44	1.00000
MAPPL24	TAPPLE4	1.00000	FRUITAC4	1.00000
MAPPL34	PROFIT	30.74000	PILND34	1.00000
MAPPL34	ROTNAP43	1.00000	ROTMAPP4	-30.00000
MAPPL34	AGWTREQ4	3.80000	PCLND44	1.00000
MAPPL34	TAPPLE4	1.00000	FRUITAC4	1.00000
MPEAC14	PROFIT	167.26000	PILND14	1.00000
MPEAC14	ROTNPE41	1.00000	ROTMPEA4	-15.00000
MPEAC14	AGWTREQ4	4.20000	PCLND44	1.00000
MPEAC14	TPEACH4	1.00000	FRUITAC4	1.00000
MPEAC24	PROFIT	92.48000	PILND24	1.00000
MPEAC24	ROTNPE42	1.00000	ROTMPEA4	-15.00000
MPEAC24	AGWTREQ4	4.20000	PCLND44	1.00000
MPEAC24	TPEACH4	1.00000	FRUITAC4	1.00000
MPEAC34	PROFIT	47.19000	PILND34	1.00000
MPEAC34	ROTNPE43	1.00000	ROTMPEA4	-15.00000
MPEAC34	AGWTREQ4	4.20000	PCLND44	1.00000
MPEAC34	TPEACH4	1.00000	FRUITAC4	1.00000
NSTCH14	PROFIT	-133.18000	PILND14	1.00000
NSTCH14	ROTNST41	-2.00000	AGWTREQ4	2.90000
NSTCH14	PCLND44	1.00000	TSTCH4	1.00000
NSTCH14	FRUITAC4	1.00000		
NSTCH24	PROFIT	-133.29000	PILND24	1.00000
NSTCH24	ROTNST42	-2.00000	AGWTREQ4	2.90000
NSTCH24	PCLND44	1.00000	TSTCH4	1.00000
NSTCH24	FRUITAC4	1.00000		
NSTCH34	PROFIT	-159.37000	PILND34	1.00000
NSTCH34	ROTNST43	-2.00000	AGWTREQ4	2.90000
NSTCH34	PCLND44	1.00000	TSTCH4	1.00000
NSTCH34	FRUITAC4	1.00000		
NSRCH14	PROFIT	-106.42000	PILND14	1.00000
NSRCH14	ROTNSR41	-2.60000	AGWTREQ4	2.90000
NSRCH14	PCLND44	1.00000	TSRCH4	1.00000
NSRCH14	FRUITAC4	1.00000		
NSRCH24	PROFIT	-121.61000	PILND24	1.00000
NSRCH24	ROTNSR42	-2.60000	AGWTREQ4	2.90000
NSRCH24	PCLND44	1.00000	TSRCH4	1.00000
NSRCH24	FRUITAC4	1.00000		
NSRCH34	PROFIT	-144.05000	PILND34	1.00000
NSRCH34	ROTNSR43	-2.60000	AGWTREQ4	2.90000
NSRCH34	PCLND44	1.00000	TSRCH4	1.00000
NSRCH34	FRUITAC4	1.00000		
MSTCH14	PROFIT	138.74000	PILND14	1.00000
MSTCH14	ROTNST41	1.00000	ROTMSTC4	-27.00000
MSTCH14	AGWTREQ4	4.10000	PCLND44	1.00000
MSTCH14	TSTCH4	1.00000	FRUITAC4	1.00000
MSTCH24	PROFIT	84.71000	PILND24	1.00000
MSTCH24	ROTNST42	1.00000	ROTMSTC4	-27.00000
MSTCH24	AGWTREQ4	4.10000	PCLND44	1.00000
MSTCH24	TSTCH4	1.00000	FRUITAC4	1.00000
MSTCH34	PROFIT	3.79000	PILND34	1.00000

MSTCH34	ROTNST43	1.00000	ROTMSTC4	-27.00000
MSTCH34	AGWTREQ4	4.10000	PCLND44	1.00000
MSTCH34	TSTCH4	1.00000	FRUITAC4	1.00000
MSRCH14	PROFIT	145.56000	PILND14	1.00000
MSRCH14	ROTNSR41	1.00000	ROTMSRC4	-25.00000
MSRCH14	AGWTREQ4	4.10000	PCLND44	1.00000
MSRCH14	TSRCH4	1.00000	FRUITAC4	1.00000
MSRCH24	PROFIT	100.10000	PILND24	1.00000
MSRCH24	ROTNSR42	1.00000	ROTMSRC4	-25.00000
MSRCH24	AGWTREQ4	4.10000	PCLND44	1.00000
MSRCH24	TSRCH4	1.00000	FRUITAC4	1.00000
MSRCH34	PROFIT	37.18000	PILND34	1.00000
MSRCH34	ROTNSR43	1.00000	ROTMSRC4	-25.00000
MSRCH34	AGWTREQ4	4.10000	PCLND44	1.00000
MSRCH34	TSRCH4	1.00000	FRUITAC4	1.00000
NALFAF14	PROFIT	95.05000	POILND14	1.00000
NALFAF14	NOTAB4	1.00000	NOTAN41	1.00000
NALFAF14	NOTCS4	1.00000	NOTMAPP4	1.00000
NALFAF14	NOTMPEA4	1.00000	NOTMSTC4	1.00000
NALFAF14	NOTMSRC4	1.00000	AGWTREQ4	2.00000
NALFAF14	POCLND44	1.00000	TALFAF4	1.00000
NALFAF24	PROFIT	75.63000	POILND24	1.00000
NALFAF24	NOTAB4	1.00000	NOTAN42	1.00000
NALFAF24	NOTCS4	1.00000	NOTMAPP4	1.00000
NALFAF24	NOTMPEA4	1.00000	NOTMSTC4	1.00000
NALFAF24	NOTMSRC4	1.00000	AGWTREQ4	2.00000
NALFAF24	POCLND44	1.00000	TALFAF4	1.00000
NALFAF34	PROFIT	54.87000	POILND34	1.00000
NALFAF34	NOTAB4	1.00000	NOTAN43	1.00000
NALFAF34	NOTCS4	1.00000	NOTMAPP4	1.00000
NALFAF34	NOTMPEA4	1.00000	NOTMSTC4	1.00000
NALFAF34	NOTMSRC4	1.00000	AGWTREQ4	2.00000
NALFAF34	POCLND44	1.00000	TALFAF4	1.00000
NALFAP14	PROFIT	69.68000	POILND14	1.00000
NALFAP14	NOTAB4	1.00000	NOTAN41	1.00000
NALFAP14	NOTCS4	1.00000	NOTMAPP4	1.00000
NALFAP14	NOTMPEA4	1.00000	NOTMSTC4	1.00000
NALFAP14	NOTMSRC4	1.00000	AGWTREQ4	1.30000
NALFAP14	POCLND44	1.00000	TALFAP4	1.00000
NALFAP24	PROFIT	53.69000	POILND24	1.00000
NALFAP24	NOTAB4	1.00000	NOTAN42	1.00000
NALFAP24	NOTCS4	1.00000	NOTMAPP4	1.00000
NALFAP24	NOTMPEA4	1.00000	NOTMSTC4	1.00000
NALFAP24	NOTMSRC4	1.00000	AGWTREQ4	1.30000
NALFAP24	POCLND44	1.00000	TALFAP4	1.00000
NALFAP34	PROFIT	37.38000	POILND34	1.00000
NALFAP34	NOTAB4	1.00000	NOTAN43	1.00000
NALFAP34	NOTCS4	1.00000	NOTMAPP4	1.00000
NALFAP34	NOTMPEA4	1.00000	NOTMSTC4	1.00000
NALFAP34	NOTMSRC4	1.00000	AGWTREQ4	1.30000
NALFAP34	POCLND44	1.00000	TALFAP4	1.00000
NBARLY14	PROFIT	88.60000	POILND14	1.00000
NBARLY14	NOTAB4	-1.00000	NOTBN4	1.00000
NBARLY14	NOTCS4	1.00000	NOTMAPP4	1.00000
NBARLY14	NOTMPEA4	1.00000	NOTMSTC4	1.00000
NBARLY14	NOTMSRC4	1.00000	AGWTREQ4	0.90000
NBARLY14	POCLND44	1.00000	TBARLY4	1.00000
NBARLY24	PROFIT	74.40000	POILND24	1.00000
NBARLY24	NOTAB4	-1.00000	NOTBN4	1.00000
NBARLY24	NOTCS4	1.00000	NOTMAPP4	1.00000
NBARLY24	NOTMPEA4	1.00000	NOTMSTC4	1.00000
NBARLY24	NOTMSRC4	1.00000	AGWTREQ4	0.90000
NBARLY24	POCLND44	1.00000	TBARLY4	1.00000
NBARLY34	PROFIT	55.14000	POILND34	1.00000
NBARLY34	NOTAB4	-1.00000	NOTBN4	1.00000
NBARLY34	NOTCS4	1.00000	NOTMAPP4	1.00000
NBARLY34	NOTMPEA4	1.00000	NOTMSTC4	1.00000
NBARLY34	NOTMSRC4	1.00000	AGWTREQ4	0.90000
NBARLY34	POCLND44	1.00000	TBARLY4	1.00000
NNURSC14	PROFIT	46.13000	POILND14	1.00000
NNURSC14	NOTBN4	-1.00000	NOTAN41	-5.00000
NNURSC14	NOTCS4	1.00000	NOTMAPP4	1.00000
NNURSC14	NOTMPEA4	1.00000	NOTMSTC4	1.00000
NNURSC14	NOTMSRC4	1.00000	AGWTREQ4	1.50000
NNURSC14	POCLND44	1.00000	TNURSC4	1.00000
NNURSC24	PROFIT	35.30000	POILND24	1.00000
NNURSC24	NOTBN4	-1.00000	NOTAN42	-5.00000
NNURSC24	NOTCS4	1.00000	NOTMAPP4	1.00000
NNURSC24	NOTMPEA4	1.00000	NOTMSTC4	1.00000
NNURSC24	NOTMSRC4	1.00000	AGWTREQ4	1.50000
NNURSC24	POCLND44	1.00000	TNURSC4	1.00000
NNURSC34	PROFIT	20.12000	POILND34	1.00000
NNURSC34	NOTBN4	-1.00000	NOTAN43	-5.00000
NNURSC34	NOTCS4	1.00000	NOTMAPP4	1.00000
NNURSC34	NOTMSRC4	1.00000	AGWTREQ4	1.50000
NNURSC34	NOTMPEA4	1.00000	NOTMSTC4	1.00000
NNURSC34	POCLND44	1.00000	TNURSC4	1.00000
NCORNG14	PROFIT	156.29000	POILND14	1.00000
NCORNG14	NOTCS4	-9.00000	NOTMAPP4	1.00000
NCORNG14	NOTMPEA4	1.00000	NOTMSTC4	1.00000
NCORNG14	NOTMSRC4	1.00000	AGWTREQ4	1.50000
NCORNG14	POCLND44	1.00000	TCORNG4	1.00000
NCORNG24	PROFIT	95.88000	POILND24	1.00000
NCORNG24	NOTCS4	-9.00000	NOTMAPP4	1.00000
NCORNG24	NOTMPEA4	1.00000	NOTMSTC4	1.00000
NCORNG24	NOTMSRC4	1.00000	AGWTREQ4	1.50000
NCORNG24	POCLND44	1.00000	TCORNG4	1.00000
NCORNG34	PROFIT	62.81000	POILND34	1.00000
NCORNG34	NOTCS4	-9.00000	NOTMAPP4	1.00000
NCORNG34	NOTMPEA4	1.00000	NOTMSTC4	1.00000
NCORNG34	NOTMSRC4	1.00000	AGWTREQ4	1.50000
NCORNG34	POCLND44	1.00000	TCORNG4	1.00000
NCORNS14	PROFIT	180.38000	POILND14	1.00000
NCORNS14	NOTCS4	-9.00000	NOTMAPP4	1.00000
NCORNS14	NOTMPEA4	1.00000	NOTMSTC4	1.00000
NCORNS14	NOTMSRC4	1.00000	AGWTREQ4	1.40000
NCORNS14	POCLND44	1.00000	TCORNS4	1.00000
NCORNS24	PROFIT	170.73000	POILND24	1.00000
NCORNS24	NOTCS4	-9.00000	NOTMAPP4	1.00000
NCORNS24	NOTMPEA4	1.00000	NOTMSTC4	1.00000
NCORNS24	NOTMSRC4	1.00000	AGWTREQ4	1.40000
NCORNS24	POCLND44	1.00000	TCORNS4	1.00000

NCORNS34	PROFIT	140.17000	POILND34	1.00000
NCORNS34	NOTCS4	-9.00000	NOTMAPP4	1.00000
NCORNS34	NOTMPEA4	1.00000	NOTMSTC4	1.00000
NCORNS34	NOTMSRC4	1.00000	AGWTREQ4	1.40000
NCORNS34	POCLND44	1.00000	TCORNS4	1.00000
NSBEET14	PROFIT	66.68000	POILND14	1.00000
NSBEET14	NOTCS4	-9.00000	NOTMAPP4	1.00000
NSBEET14	NOTMPEA4	1.00000	NOTMSTC4	1.00000
NSBEET14	NOTMSRC4	1.00000	AGWTREQ4	1.80000
NSBEET14	POCLND44	1.00000	TSBEET4	1.00000
NSBEET24	PROFIT	42.32000	POILND24	1.00000
NSBEET24	NOTCS4	-9.00000	NOTMAPP4	1.00000
NSBEET24	NOTMPEA4	1.00000	NOTMSTC4	1.00000
NSBEET24	NOTMSRC4	1.00000	AGWTREQ4	1.80000
NSBEET24	POCLND44	1.00000	TSBEET4	1.00000
NSBEET34	PROFIT	31.19000	POILND34	1.00000
NSBEET34	NOTCS4	-9.00000	NOTMAPP4	1.00000
NSBEET34	NOTMPEA4	1.00000	NOTMSTC4	1.00000
NSBEET34	NOTMSRC4	1.00000	AGWTREQ4	1.80000
NSBEET34	POCLND44	1.00000	TSBEET4	1.00000
NDBEAN44	PROFIT	-55.80000	POCLND44	1.00000
NDWHEA44	PROFIT	-9.97000	POCLND44	1.00000
NNAPPL14	PROFIT	-143.91000	POILND14	1.00000
NNAPPL14	NOTNAP41	-2.30000	AGWTREQ4	2.70000
NNAPPL14	POCLND44	1.00000	TAPPLE4	1.00000
NNAPPL24	PROFIT	-172.23000	POILND24	1.00000
NNAPPL24	NOTNAP42	-2.30000	AGWTREQ4	2.70000
NNAPPL24	POCLND44	1.00000	TAPPLE4	1.00000
NNAPPL34	PROFIT	-219.14000	POILND34	1.00000
NNAPPL34	NOTNAP43	-2.30000	AGWTREQ4	2.70000
NNAPPL34	POCLND44	1.00000	TAPPLE4	1.00000
NNPEAC14	PROFIT	-112.75000	POILND14	1.00000
NNPEAC14	NOTNPE41	-2.00000	AGWTREQ4	3.00000
NNPEAC14	POCLND44	1.00000	TPEACH4	1.00000
NNPEAC24	PROFIT	-126.75000	POILND24	1.00000
NNPEAC24	NOTNPE42	-2.00000	AGWTREQ4	3.00000
NNPEAC24	POCLND44	1.00000	TPEACH4	1.00000
NNPEAC34	PROFIT	-138.59000	POILND34	1.00000
NNPEAC34	NOTNPE43	-2.00000	AGWTREQ4	3.00000
NNPEAC34	POCLND44	1.00000	TPEACH4	1.00000
NMAPPL14	PROFIT	172.84000	POILND14	1.00000
NMAPPL14	NOTNAP41	1.00000	NOTMAPP4	-30.00000
NMAPPL14	AGWTREQ4	3.80000	POCLND44	1.00000
NMAPPL14	TAPPLE4	1.00000		
NMAPPL24	PROFIT	80.01000	POILND24	1.00000
NMAPPL24	NOTNAP42	1.00000	NOTMAPP4	-30.00000
NMAPPL24	AGWTREQ4	3.80000	POCLND44	1.00000
NMAPPL24	TAPPLE4	1.00000		
NMAPPL34	PROFIT	7.80000	POILND34	1.00000
NMAPPL34	NOTNAP43	1.00000	NOTMAPP4	-30.00000
NMAPPL34	AGWTREQ4	3.80000	POCLND44	1.00000
NMAPPL34	TAPPLE4	1.00000		
NMPEAC14	PROFIT	148.27000	POILND14	1.00000
NMPEAC14	NOTNPE41	1.00000	NOTMPEA4	-15.00000
NMPEAC14	AGWTREQ4	4.20000	POCLND44	1.00000
NMPEAC14	TPEACH4	1.00000		
NMPEAC24	PROFIT	71.24000	POILND24	1.00000
NMPEAC24	NOTNPE42	1.00000	NOTMPEA4	-15.00000
NMPEAC24	AGWTREQ4	4.20000	POCLND44	1.00000
NMPEAC24	TPEACH4	1.00000		
NMPEAC34	PROFIT	24.25000	POILND34	1.00000
NMPEAC34	NOTNPE43	1.00000	NOTMPEA4	-15.00000
NMPEAC34	AGWTREQ4	4.20000	POCLND44	1.00000
NMPEAC34	TPEACH4	1.00000		
NNSTCH14	PROFIT	-152.17000	POILND14	1.00000
NNSTCH14	NOTNST41	-2.00000	AGWTREQ4	2.90000
NNSTCH14	POCLND44	1.00000	TSTCH4	1.00000
NNSTCH24	PROFIT	-154.53000	POILND24	1.00000
NNSTCH24	NOTNST42	-2.00000	AGWTREQ4	2.90000
NNSTCH24	POCLND44	1.00000	TSTCH4	1.00000
NNSTCH34	PROFIT	-182.31000	POILND34	1.00000
NNSTCH34	NOTNST43	-2.00000	AGWTREQ4	2.90000
NNSTCH34	POCLND44	1.00000	TSTCH4	1.00000
NNSRCH14	PROFIT	-125.41000	POILND14	1.00000
NNSRCH14	NOTNSR41	-2.60000	AGWTREQ4	2.90000
NNSRCH14	POCLND44	1.00000	TSRCH4	1.00000
NNSRCH24	PROFIT	-142.85000	POILND24	1.00000
NNSRCH24	NOTNSR42	-2.60000	AGWTREQ4	2.90000
NNSRCH24	POCLND44	1.00000	TSRCH4	1.00000
NNSRCH34	PROFIT	-166.99000	POILND34	1.00000
NNSRCH34	NOTNSR43	-2.60000	AGWTREQ4	2.90000
NNSRCH34	POCLND44	1.00000	TSRCH4	1.00000
NMSTCH14	PROFIT	119.75000	POILND14	1.00000
NMSTCH14	NOTNST41	1.00000	NOTMSTC4	-27.00000
NMSTCH14	AGWTREQ4	4.10000	POCLND44	1.00000
NMSTCH14	TSTCH4	1.00000		
NMSTCH24	PROFIT	63.47000	POILND24	1.00000
NMSTCH24	NOTNST42	1.00000	NOTMSTC4	-27.00000
NMSTCH24	AGWTREQ4	4.10000	POCLND44	1.00000
NMSTCH24	TSTCH4	1.00000		
NMSTCH34	PROFIT	-19.15000	POILND34	1.00000
NMSTCH34	NOTNST43	1.00000	NOTMSTC4	-27.00000
NMSTCH34	AGWTREQ4	4.10000	POCLND44	1.00000
NMSTCH34	TSTCH4	1.00000		
NMSRCH14	PROFIT	126.57000	POILND14	1.00000
NMSRCH14	NOTNSR41	1.00000	NOTMSRC4	-25.00000
NMSRCH14	AGWTREQ4	4.10000	POCLND44	1.00000
NMSRCH14	TSRCH4	1.00000		
NMSRCH24	PROFIT	78.86000	POILND24	1.00000
NMSRCH24	NOTNSR42	1.00000	NOTMSRC4	-25.00000
NMSRCH24	AGWTREQ4	4.10000	POCLND44	1.00000
NMSRCH24	TSRCH4	1.00000		
NMSRCH34	PROFIT	14.24000	POILND34	1.00000
NMSRCH34	NOTNSR43	1.00000	NOTMSRC4	-25.00000
NMSRCH34	AGWTREQ4	4.10000	POCLND44	1.00000
NMSRCH34	TSRCH4	1.00000		
ALFAF25	PROFIT	85.20000	PILND25	1.00000
ALFAF25	ROTABS	1.00000	ROTAN52	1.00000
ALFAF25	ROTCS	1.00000	AGWTREQ5	2.20000
ALFAF25	PCLND45	1.00000	TALFAF5	1.00000
ALFAF35	PROFIT	71.18000	PILND35	1.00000
ALFAF35	ROTABS	1.00000	ROTAN53	1.00000

ALFAF35	ROTC5	1.00000	AGWTREQ5	2.20000
ALFAF35	PCLND45	1.00000	TALFAF5	1.00000
ALFAP25	PROFIT	60.58000	PILND25	1.00000
ALFAP25	ROTAB5	1.00000	ROTAN52	1.00000
ALFAP25	ROTC5	1.00000	AGWTREQ5	1.10000
ALFAP25	PCLND45	1.00000	TALFAP5	1.00000
ALFAP35	PROFIT	50.17000	PILND35	1.00000
ALFAP35	ROTAB5	1.00000	ROTAN53	1.00000
ALFAP35	ROTC5	1.00000	AGWTREQ5	1.10000
ALFAP35	PCLND45	1.00000	TALFAP5	1.00000
BARLY25	PROFIT	81.49000	PILND25	1.00000
BARLY25	ROTAB5	-1.00000	ROTBN5	1.00000
BARLY25	ROTC5	1.00000	AGWTREQ5	1.20000
BARLY25	PCLND45	1.00000	TBARLY5	1.00000
BARLY35	PROFIT	65.75000	PILND35	1.00000
BARLY35	ROTAB5	-1.00000	ROTBN5	1.00000
BARLY35	ROTC5	1.00000	AGWTREQ5	1.20000
BARLY35	PCLND45	1.00000	TBARLY5	1.00000
NURSC25	PROFIT	39.33000	PILND25	1.00000
NURSC25	ROTBN5	-1.00000	ROTAN52	-5.00000
NURSC25	ROTC5	1.00000	AGWTREQ5	1.60000
NURSC25	PCLND45	1.00000	TNURSC5	1.00000
NURSC35	PROFIT	27.05000	PILND35	1.00000
NURSC35	ROTBN5	-1.00000	ROTAN53	-5.00000
NURSC35	ROTC5	1.00000	AGWTREQ5	1.60000
NURSC35	PCLND45	1.00000	TNURSC5	1.00000
CORNG25	PROFIT	114.05000	PILND25	1.00000
CORNG25	ROTC5	-7.00000	AGWTREQ5	1.50000
CORNG25	PCLND45	1.00000	TCORNG5	1.00000
CORNG35	PROFIT	71.74000	PILND35	1.00000
CORNG35	ROTC5	-7.00000	AGWTREQ5	1.50000
CORNG35	PCLND45	1.00000	TCORNG5	1.00000
CORNS25	PROFIT	194.85000	PILND25	1.00000
CORNS25	ROTC5	-7.00000	AGWTREQ5	1.40000
CORNS25	PCLND45	1.00000	TCORNS5	1.00000
CORNS35	PROFIT	168.02000	PILND35	1.00000
CORNS35	ROTC5	-7.00000	AGWTREQ5	1.40000
CORNS35	PCLND45	1.00000	TCORNS5	1.00000
DBEANS45	PROFIT	-34.71000	PCLND45	1.00000
DWHEAT45	PROFIT	15.42000	PCLND45	1.00000
NALFAF25	PROFIT	67.72000	POILND25	1.00000
NALFAF25	NOTAB5	1.00000	NOTAN52	1.00000
NALFAF25	NOTC5	1.00000	AGWTREQ5	2.20000
NALFAF25	POCLND45	1.00000	TALFAF5	1.00000
NALFAF35	PROFIT	52.00000	POILND35	1.00000
NALFAF35	NOTAB5	1.00000	NOTAN53	1.00000
NALFAF35	NOTC5	1.00000	AGWTREQ5	2.20000
NALFAF35	POCLND45	1.00000	TALFAF5	1.00000
NALFAP25	PROFIT	43.10000	POILND25	1.00000
NALFAP25	NOTAB5	1.00000	NOTAN52	1.00000
NALFAP25	NOTC5	1.00000	AGWTREQ5	1.10000
NALFAP25	POCLND45	1.00000	TALFAP5	1.00000
NALFAP35	PROFIT	30.99000	POILND35	1.00000
NALFAP35	NOTAB5	1.00000	NOTAN53	1.00000
NALFAP35	NOTC5	1.00000	AGWTREQ5	1.10000
NALFAP35	POCLND45	1.00000	TALFAP5	1.00000
NBARLY25	PROFIT	64.01000	POILND25	1.00000
NBARLY25	NOTAB5	-1.00000	NOTBN5	1.00000
NBARLY25	NOTC5	1.00000	AGWTREQ5	1.20000
NBARLY25	POCLND45	1.00000	TBARLY5	1.00000
NBARLY35	PROFIT	46.56000	PILND35	1.00000
NBARLY35	NOTAB5	-1.00000	NOTBN5	1.00000
NBARLY35	NOTC5	1.00000	AGWTREQ5	1.20000
NBARLY35	POCLND45	1.00000	TBARLY5	1.00000
NNURSC25	PROFIT	21.85000	POILND25	1.00000
NNURSC25	NOTBN5	-1.00000	NOTAN52	-5.00000
NNURSC25	NOTC5	1.00000	AGWTREQ5	1.60000
NNURSC25	POCLND45	1.00000	TNURSC5	1.00000
NNURSC35	PROFIT	7.87000	POILND35	1.00000
NNURSC35	NOTBN5	-1.00000	NOTAN53	-5.00000
NNURSC35	NOTC5	1.00000	AGWTREQ5	1.60000
NNURSC35	POCLND45	1.00000	TNURSC5	1.00000
NCORNG25	PROFIT	96.57000	POILND25	1.00000
NCORNG25	NOTC5	-7.00000	AGWTREQ5	1.50000
NCORNG25	POCLND45	1.00000	TCORNG5	1.00000
NCORNG35	PROFIT	52.56000	POILND35	1.00000
NCORNG35	NOTC5	-7.00000	AGWTREQ5	1.50000
NCORNG35	POCLND45	1.00000	TCORNG5	1.00000
NCORNS25	PROFIT	177.37000	POILND25	1.00000
NCORNS25	NOTC5	-7.00000	AGWTREQ5	1.40000
NCORNS25	POCLND45	1.00000	TCORNS5	1.00000
NCORNS35	PROFIT	148.64000	POILND35	1.00000
NCORNS35	NOTC5	-7.00000	AGWTREQ5	1.40000
NCORNS35	POCLND45	1.00000	TCORNS5	1.00000
NDBEAN45	PROFIT	-56.33000	POCLND45	1.00000
NDWHEA45	PROFIT	-6.20000	POCLND45	1.00000
ALFAF16	PROFIT	101.82000	PILND16	1.00000
ALFAF16	ROTAB6	1.00000	ROTAN61	1.00000
ALFAF16	ROTC6	1.00000	AGWTREQ6	2.10000
ALFAF16	PCLND46	1.00000	TALFAF6	1.00000
ALFAF26	PROFIT	88.39000	PILND26	1.00000
ALFAF26	ROTAB6	1.00000	ROTAN62	1.00000
ALFAF26	ROTC6	1.00000	AGWTREQ6	2.10000
ALFAF26	PCLND46	1.00000	TALFAF6	1.00000
ALFAF36	PROFIT	76.76000	PILND36	1.00000
ALFAF36	ROTAB6	1.00000	ROTAN63	1.00000
ALFAF36	ROTC6	1.00000	AGWTREQ6	2.10000
ALFAF36	PCLND46	1.00000	TALFAF6	1.00000
ALFAP16	PROFIT	75.03000	PILND16	1.00000
ALFAP16	ROTAB6	1.00000	ROTAN61	1.00000
ALFAP16	ROTC6	1.00000	AGWTREQ6	1.50000
ALFAP16	PCLND46	1.00000	TALFAP6	1.00000
ALFAP26	PROFIT	69.27000	PILND26	1.00000
ALFAP26	ROTAB6	1.00000	ROTAN62	1.00000
ALFAP26	ROTC6	1.00000	AGWTREQ6	1.50000
ALFAP26	PCLND46	1.00000	TALFAP6	1.00000
ALFAP36	PROFIT	64.52000	PILND36	1.00000
ALFAP36	ROTAB6	1.00000	ROTAN63	1.00000
ALFAP36	ROTC6	1.00000	AGWTREQ6	1.50000
ALFAP36	PCLND46	1.00000	TALFAP6	1.00000
BARLY16	PROFIT	97.66000	PILND16	1.00000
BARLY16	ROTAB6	-1.00000	ROTBN6	1.00000

BARLY16	ROTC6	1.00000	AGWTREQ6	1.00000
BARLY16	PCLND46	1.00000	TBARLY6	1.00000
BARLY26	PROFIT	82.18000	PILND26	1.00000
BARLY26	ROTAB6	-1.00000	ROTBN6	1.00000
BARLY26	ROTC6	1.00000	AGWTREQ6	1.00000
BARLY26	PCLND46	1.00000	TBARLY6	1.00000
BARLY36	PROFIT	67.59000	PILND36	1.00000
BARLY36	ROTAB6	-1.00000	ROTBN6	1.00000
BARLY36	ROTC6	1.00000	AGWTREQ6	1.00000
BARLY36	PCLND46	1.00000	TBARLY6	1.00000
NURSC16	PROFIT	51.82000	PILND16	1.00000
NURSC16	ROTBN6	-1.00000	ROTAN61	-5.00000
NURSC16	ROTC6	1.00000	AGWTREQ6	1.60000
NURSC16	PCLND46	1.00000	TNURSC6	1.00000
NURSC26	PROFIT	40.04000	PILND26	1.00000
NURSC26	ROTBN6	-1.00000	ROTAN62	-5.00000
NURSC26	ROTC6	1.00000	AGWTREQ6	1.60000
NURSC26	PCLND46	1.00000	TNURSC6	1.00000
NURSC36	PROFIT	29.15000	PILND36	1.00000
NURSC36	ROTBN6	-1.00000	ROTAN63	-5.00000
NURSC36	ROTC6	1.00000	AGWTREQ6	1.60000
NURSC36	PCLND46	1.00000	TNURSC6	1.00000
CORNG16	PROFIT	162.07000	PILND16	1.00000
CORNG16	ROTC6	-7.00000	AGWTREQ6	1.50000
CORNG16	PCLND46	1.00000	TCORNG6	1.00000
CORNG26	PROFIT	110.17000	PILND26	1.00000
CORNG26	ROTC6	-7.00000	AGWTREQ6	1.50000
CORNG26	PCLND46	1.00000	TCORNG6	1.00000
CORNG36	PROFIT	66.39000	PILND36	1.00000
CORNG36	ROTC6	-7.00000	AGWTREQ6	1.50000
CORNG36	PCLND46	1.00000	TCORNG6	1.00000
CORNS16	PROFIT	217.71000	PILND16	1.00000
CORNS16	ROTC6	-7.00000	AGWTREQ6	1.40000
CORNS16	PCLND46	1.00000	TCORNS6	1.00000
CORNS26	PROFIT	194.75000	PILND26	1.00000
CORNS26	ROTC6	-7.00000	AGWTREQ6	1.40000
CORNS26	PCLND46	1.00000	TCORNS6	1.00000
CORNS36	PROFIT	177.17000	PILND36	1.00000
CORNS36	ROTC6	-7.00000	AGWTREQ6	1.40000
CORNS36	PCLND46	1.00000	TCORNS6	1.00000
DBEANS46	PROFIT	-35.90000	PCLND46	1.00000
DWHEAT46	PROFIT	15.85000	PCLND46	1.00000
NALFAF16	PROFIT	84.71000	POILND16	1.00000
NALFAF16	NOTAB6	1.00000	NOTAN61	1.00000
NALFAF16	NOTC6	1.00000	AGWTREQ6	2.10000
NALFAF16	POCLND46	1.00000	TALFAF6	1.00000
NALFAF26	PROFIT	69.03000	POILND26	1.00000
NALFAF26	NOTAB6	1.00000	NOTAN62	1.00000
NALFAF26	NOTC6	1.00000	AGWTREQ6	2.10000
NALFAF26	POCLND46	1.00000	TALFAF6	1.00000
NALFAF36	PROFIT	55.70000	POILND36	1.00000
NALFAF36	NOTAB6	1.00000	NOTAN63	1.00000
NALFAF36	NOTC6	1.00000	AGWTREQ6	2.10000
NALFAF36	POCLND46	1.00000	TALFAF6	1.00000
NALFAP16	PROFIT	57.92000	POILND16	1.00000
NALFAP16	NOTAB6	1.00000	NOTAN61	1.00000
NALFAP16	NOTC6	1.00000	AGWTREQ6	1.50000
NALFAP16	POCLND46	1.00000	TALFAP6	1.00000
NALFAP26	PROFIT	49.91000	POILND26	1.00000
NALFAP26	NOTAB6	1.00000	NOTAN62	1.00000
NALFAP26	NOTC6	1.00000	AGWTREQ6	1.50000
NALFAP26	POCLND46	1.00000	TALFAP6	1.00000
NALFAP36	PROFIT	43.46000	POILND36	1.00000
NALFAP36	NOTAB6	1.00000	NOTAN63	1.00000
NALFAP36	NOTC6	1.00000	AGWTREQ6	1.50000
NALFAP36	POCLND46	1.00000	TALFAP6	1.00000
NBARLY16	PROFIT	80.55000	POILND16	1.00000
NBARLY16	NOTAB6	-1.00000	NOTBN6	1.00000
NBARLY16	NOTC6	1.00000	AGWTREQ6	1.00000
NBARLY16	POCLND46	1.00000	TBARLY6	1.00000
NBARLY26	PROFIT	62.82000	POILND26	1.00000
NBARLY26	NOTAB6	-1.00000	NOTBN6	1.00000
NBARLY26	NOTC6	1.00000	AGWTREQ6	1.00000
NBARLY26	POCLND46	1.00000	TBARLY6	1.00000
NBARLY36	PROFIT	46.53000	POILND36	1.00000
NBARLY36	NOTAB6	-1.00000	NOTBN6	1.00000
NBARLY36	NOTC6	1.00000	AGWTREQ6	1.00000
NBARLY36	POCLND46	1.00000	TBARLY6	1.00000
NNURSC16	PROFIT	34.71000	POILND16	1.00000
NNURSC16	NOTBN6	-1.00000	NOTAN61	-5.00000
NNURSC16	NOTC6	1.00000	AGWTREQ6	1.60000
NNURSC16	POCLND46	1.00000	TNURSC6	1.00000
NNURSC26	PROFIT	20.68000	POILND26	1.00000
NNURSC26	NOTBN6	-1.00000	NOTAN62	-5.00000
NNURSC26	NOTC6	1.00000	AGWTREQ6	1.60000
NNURSC26	POCLND46	1.00000	TNURSC6	1.00000
NNURSC36	PROFIT	8.09000	POILND36	1.00000
NNURSC36	NOTBN6	-1.00000	NOTAN63	-5.00000
NNURSC36	NOTC6	1.00000	AGWTREQ6	1.60000
NNURSC36	POCLND46	1.00000	TNURSC6	1.00000
NCORNG16	PROFIT	144.96000	POILND16	1.00000
NCORNG16	NOTC6	-7.00000	AGWTREQ6	1.50000
NCORNG16	POCLND46	1.00000	TCORNG6	1.00000
NCORNG26	PROFIT	90.81000	POILND26	1.00000
NCORNG26	NOTC6	-7.00000	AGWTREQ6	1.50000
NCORNG26	POCLND46	1.00000	TCORNG6	1.00000
NCORNG36	PROFIT	45.33000	POILND36	1.00000
NCORNG36	NOTC6	-7.00000	AGWTREQ6	1.50000
NCORNG36	POCLND46	1.00000	TCORNG6	1.00000
NCORNS16	PROFIT	200.60000	POILND16	1.00000
NCORNS16	NOTC6	-7.00000	AGWTREQ6	1.40000
NCORNS16	POCLND46	1.00000	TCORNS6	1.00000
NCORNS26	PROFIT	175.39000	POILND26	1.00000
NCORNS26	NOTC6	-7.00000	AGWTREQ6	1.40000
NCORNS26	POCLND46	1.00000	TCORNS6	1.00000
NCORNS36	PROFIT	156.11000	POILND36	1.00000
NCORNS36	NOTC6	-7.00000	AGWTREQ6	1.40000
NCORNS36	POCLND46	1.00000	TCORNS6	1.00000
NDBEAN46	PROFIT	-59.40000	POCLND46	1.00000
NDWHEA46	PROFIT	-7.65000	POCLND46	1.00000
ALFAF27	PROFIT	78.93000	PILND27	1.00000
ALFAF27	ROTAB7	1.00000	ROTAN72	1.00000

ALFAF27	ROTC7	1.00000	AGWTREQ7	2.10000
ALFAF27	PCLND47	1.00000	TALFAF7	1.00000
ALFAF37	PROFIT	70.39000	PILND37	1.00000
ALFAF37	ROTAB7	1.00000	ROTAN73	1.00000
ALFAF37	ROTC7	1.00000	AGWTREQ7	2.10000
ALFAF37	PCLND47	1.00000	TALFAF7	1.00000
ALFAP27	PROFIT	64.20000	PILND27	1.00000
ALFAP27	ROTAB7	1.00000	ROTAN72	1.00000
ALFAP27	ROTC7	1.00000	AGWTREQ7	1.10000
ALFAP27	PCLND47	1.00000	TALFAP7	1.00000
ALFAP37	PROFIT	43.99000	PILND37	1.00000
ALFAP37	ROTAB7	1.00000	ROTAN73	1.00000
ALFAP37	ROTC7	1.00000	AGWTREQ7	1.10000
ALFAP37	PCLND47	1.00000	TALFAP7	1.00000
BARLY27	PROFIT	82.65000	PILND27	1.00000
BARLY27	ROTAB7	-1.00000	ROTBN7	1.00000
BARLY27	ROTC7	1.00000	AGWTREQ7	1.30000
BARLY27	PCLND47	1.00000	TBARLY7	1.00000
BARLY37	PROFIT	75.86000	PILND37	1.00000
BARLY37	ROTAB7	-1.00000	ROTBN7	1.00000
BARLY37	ROTC7	1.00000	AGWTREQ7	1.30000
BARLY37	PCLND47	1.00000	TBARLY7	1.00000
NURSC27	PROFIT	38.45000	PILND27	1.00000
NURSC27	ROTBN7	-1.00000	ROTAN72	-5.00000
NURSC27	ROTC7	1.00000	AGWTREQ7	1.60000
NURSC27	PCLND47	1.00000	TNURSC7	1.00000
NURSC37	PROFIT	25.85000	PILND37	1.00000
NURSC37	ROTBN7	-1.00000	ROTAN73	-5.00000
NURSC37	ROTC7	1.00000	AGWTREQ7	1.60000
NURSC37	PCLND47	1.00000	TNURSC7	1.00000
CORNG27	PROFIT	117.34000	PILND27	1.00000
CORNG27	ROTC7	-7.00000	AGWTREQ7	1.60000
CORNG27	PCLND47	1.00000	TCORNG7	1.00000
CORNG37	PROFIT	65.59000	PILND37	1.00000
CORNG37	ROTC7	-7.00000	AGWTREQ7	1.60000
CORNG37	PCLND47	1.00000	TCORNG7	1.00000
CORNS27	PROFIT	191.01000	PILND27	1.00000
CORNS27	ROTC7	-7.00000	AGWTREQ7	1.50000
CORNS27	PCLND47	1.00000	TCORNS7	1.00000
CORNS37	PROFIT	160.80000	PILND37	1.00000
CORNS37	ROTC7	-7.00000	AGWTREQ7	1.50000
CORNS37	PCLND47	1.00000	TCORNS7	1.00000
DWHEAT47	PROFIT	14.65000	PCLND47	1.00000
NALFAF27	PROFIT	63.33000	POILND27	1.00000
NALFAF27	NOTAB7	1.00000	NOTAN72	1.00000
NALFAF27	NOTC7	1.00000	AGWTREQ7	2.10000
NALFAF27	POCLND47	1.00000	TALFAF7	1.00000
NALFAF37	PROFIT	53.09000	POILND37	1.00000
NALFAF37	NOTAB7	1.00000	NOTAN73	1.00000
NALFAF37	NOTC7	1.00000	AGWTREQ7	2.10000
NALFAF37	POCLND47	1.00000	TALFAF7	1.00000
NALFAP27	PROFIT	48.60000	POILND27	1.00000
NALFAP27	NOTAB7	1.00000	NOTAN72	1.00000
NALFAP27	NOTC7	1.00000	AGWTREQ7	1.10000
NALFAP27	POCLND47	1.00000	TALFAP7	1.00000
NALFAP37	PROFIT	26.69000	POILND37	1.00000

NALFAP37	NOTAB7	1.00000	NOTAN73	1.00000
NALFAP37	NOTC7	1.00000	AGWTREQ7	1.10000
NALFAP37	POCLND47	1.00000	TALFAP7	1.00000
NBARLY27	PROFIT	67.05000	POILND27	1.00000
NBARLY27	NOTAB7	-1.00000	NOTBN7	1.00000
NBARLY27	NOTC7	1.00000	AGWTREQ7	1.30000
NBARLY27	POCLND47	1.00000	TBARLY7	1.00000
NBARLY37	PROFIT	58.56000	POILND37	1.00000
NBARLY37	NOTAB7	-1.00000	NOTBN7	1.00000
NBARLY37	NOTC7	1.00000	AGWTREQ7	1.30000
NBARLY37	POCLND47	1.00000	TBARLY7	1.00000
NNURSC27	PROFIT	22.85000	POILND27	1.00000
NNURSC27	NOTBN7	-1.00000	NOTAN72	-5.00000
NNURSC27	NOTC7	1.00000	AGWTREQ7	1.60000
NNURSC27	POCLND47	1.00000	TNURSC7	1.00000
NNURSC37	PROFIT	8.55000	POILND37	1.00000
NNURSC37	NOTBN7	-1.00000	NOTAN73	-5.00000
NNURSC37	NOTC7	1.00000	AGWTREQ7	1.60000
NNURSC37	POCLND47	1.00000	TNURSC7	1.00000
NCORNG27	PROFIT	101.74000	POILND27	1.00000
NCORNG27	NOTC7	-7.00000	AGWTREQ7	1.60000
NCORNG27	POCLND47	1.00000	TCORNG7	1.00000
NCORNG37	PROFIT	48.29000	POILND37	1.00000
NCORNG37	NOTC7	-7.00000	AGWTREQ7	1.60000
NCORNG37	POCLND47	1.00000	TCORNG7	1.00000
NCORNS27	PROFIT	175.41000	POILND27	1.00000
NCORNS27	NOTC7	-7.00000	AGWTREQ7	1.50000
NCORNS27	POCLND47	1.00000	TCORNS7	1.00000
NCORNS37	PROFIT	143.50000	POILND37	1.00000
NCORNS37	NOTC7	-7.00000	AGWTREQ7	1.50000
NCORNS37	POCLND47	1.00000	TCORNS7	1.00000
NDWHEA47	PROFIT	-5.09000	POCLND47	1.00000
ALFAF18	PROFIT	104.42000	PILND18	1.00000
ALFAF18	ROTAB8	1.00000	ROTAN81	1.00000
ALFAF18	ROTC8	1.00000	AGWTREQ8	2.00000
ALFAF18	PCLND48	1.00000	TALFAF8	1.00000
ALFAF28	PROFIT	93.80000	PILND28	1.00000
ALFAF28	ROTAB8	1.00000	ROTAN82	1.00000
ALFAF28	ROTC8	1.00000	AGWTREQ8	2.00000
ALFAF28	PCLND48	1.00000	TALFAF8	1.00000
ALFAF38	PROFIT	82.55000	PILND38	1.00000
ALFAF38	ROTAB8	1.00000	ROTAN83	1.00000
ALFAF38	ROTC8	1.00000	AGWTREQ8	2.00000
ALFAF38	PCLND48	1.00000	TALFAF8	1.00000
ALFAP18	PROFIT	79.23000	PILND18	1.00000
ALFAP18	ROTAB8	1.00000	ROTAN81	1.00000
ALFAP18	ROTC8	1.00000	AGWTREQ8	1.10000
ALFAP18	PCLND48	1.00000	TALFAP8	1.00000
ALFAP28	PROFIT	74.22000	PILND28	1.00000
ALFAP28	ROTAB8	1.00000	ROTAN82	1.00000
ALFAP28	ROTC8	1.00000	AGWTREQ8	1.10000
ALFAP28	PCLND48	1.00000	TALFAP8	1.00000
ALFAP38	PROFIT	70.14000	PILND38	1.00000
ALFAP38	ROTAB8	1.00000	ROTAN83	1.00000
ALFAP38	ROTC8	1.00000	AGWTREQ8	1.10000
ALFAP38	PCLND48	1.00000	TALFAP8	1.00000

BARLY18	PROFIT	99.89000	PILND18	1.00000
BARLY18	ROTAB8	-1.00000	ROTBN8	1.00000
BARLY18	ROTC8	1.00000	AGWTREQ8	1.20000
BARLY18	PCLND48	1.00000	TBARLY8	1.00000
BARLY28	PROFIT	88.52000	PILND28	1.00000
BARLY28	ROTAB8	-1.00000	ROTBN8	1.00000
BARLY28	ROTC8	1.00000	AGWTREQ8	1.20000
BARLY28	PCLND48	1.00000	TBARLY8	1.00000
BARLY38	PROFIT	73.47000	PILND38	1.00000
BARLY38	ROTAB8	-1.00000	ROTBN8	1.00000
BARLY38	ROTC8	1.00000	AGWTREQ8	1.20000
BARLY38	PCLND48	1.00000	TBARLY8	1.00000
NURSC18	PROFIT	52.00000	PILND18	1.00000
NURSC18	ROTBN8	-1.00000	ROTAN81	-5.00000
NURSC18	ROTC8	1.00000	AGWTREQ8	1.60000
NURSC18	PCLND48	1.00000	TNURSC8	1.00000
NURSC28	PROFIT	44.32000	PILND28	1.00000
NURSC28	ROTBN8	-1.00000	ROTAN82	-5.00000
NURSC28	ROTC8	1.00000	AGWTREQ8	1.60000
NURSC28	PCLND48	1.00000	TNURSC8	1.00000
NURSC38	PROFIT	32.98000	PILND38	1.00000
NURSC38	ROTBN8	-1.00000	ROTAN83	-5.00000
NURSC38	ROTC8	1.00000	AGWTREQ8	1.60000
NURSC38	PCLND48	1.00000	TNURSC8	1.00000
CORNG18	PROFIT	143.71000	PILND18	1.00000
CORNG18	ROTC8	-7.00000	AGWTREQ8	1.50000
CORNG18	PCLND48	1.00000	TCORNG8	1.00000
CORNG28	PROFIT	103.54000	PILND28	1.00000
CORNG28	ROTC8	-7.00000	AGWTREQ8	1.50000
CORNG28	PCLND48	1.00000	TCORNG8	1.00000
CORNG38	PROFIT	71.23000	PILND38	1.00000
CORNG38	ROTC8	-7.00000	AGWTREQ8	1.50000
CORNG38	PCLND48	1.00000	TCORNG8	1.00000
CORNS18	PROFIT	199.36000	PILND18	1.00000
CORNS18	ROTC8	-7.00000	AGWTREQ8	1.40000
CORNS18	PCLND48	1.00000	TCORNS8	1.00000
CORNS28	PROFIT	190.03000	PILND28	1.00000
CORNS28	ROTC8	-7.00000	AGWTREQ8	1.40000
CORNS28	PCLND48	1.00000	TCORNS8	1.00000
CORNS38	PROFIT	165.48000	PILND38	1.00000
CORNS38	ROTC8	-7.00000	AGWTREQ8	1.40000
CORNS38	PCLND48	1.00000	TCORNS8	1.00000
DWHEAT48	PROFIT	14.73000	PCLND48	1.00000
NALFAF18	PROFIT	91.07000	POILND18	1.00000
NALFAF18	NOTAB8	1.00000	NOTAN81	1.00000
NALFAF18	NOTC8	1.00000	AGWTREQ8	2.00000
NALFAF18	POCLND48	1.00000	TALFAF8	1.00000
NALFAF28	PROFIT	78.20000	POILND28	1.00000
NALFAF28	NOTAB8	1.00000	NOTAN82	1.00000
NALFAF28	NOTC8	1.00000	AGWTREQ8	2.00000
NALFAF28	POCLND48	1.00000	TALFAF8	1.00000
NALFAF38	PROFIT	65.25000	POILND38	1.00000
NALFAF38	NOTAB8	1.00000	NOTAN83	1.00000
NALFAF38	NOTC8	1.00000	AGWTREQ8	2.00000
NALFAF38	POCLND48	1.00000	TALFAF8	1.00000
NALFAP18	PROFIT	65.88000	POILND18	1.00000
NALFAP18	NOTAB8	1.00000	NOTAN81	1.00000
NALFAP18	NOTC8	1.00000	AGWTREQ8	1.10000
NALFAP18	POCLND48	1.00000	TALFAP8	1.00000
NALFAP28	PROFIT	58.62000	POILND28	1.00000
NALFAP28	NOTAB8	1.00000	NOTAN82	1.00000
NALFAP28	NOTC8	1.00000	AGWTREQ8	1.10000
NALFAP28	POCLND48	1.00000	TALFAP8	1.00000
NALFAP38	PROFIT	52.84000	POILND38	1.00000
NALFAP38	NOTAB8	1.00000	NOTAN83	1.00000
NALFAP38	ROTC8	1.00000	AGWTREQ8	1.10000
NALFAP38	POCLND48	1.00000	TALFAP8	1.00000
NBARLY18	PROFIT	86.54000	POILND18	1.00000
NBARLY18	NOTAB8	-1.00000	NOTBN8	1.00000
NBARLY18	POCLND48	1.00000	TBARLY8	1.00000
NBARLY18	NOTC8	1.00000	AGWTREQ8	1.20000
NBARLY28	PROFIT	72.92000	POILND28	1.00000
NBARLY28	POCLND48	1.00000	TBARLY8	1.00000
NBARLY28	NOTC8	1.00000	AGWTREQ8	1.20000
NBARLY28	NOTAB8	-1.00000	NOTBN8	1.00000
NBARLY38	PROFIT	56.17000	POILND38	1.00000
NBARLY38	NOTAB8	-1.00000	NOTBN8	1.00000
NBARLY38	NOTC8	1.00000	AGWTREQ8	1.20000
NBARLY38	POCLND48	1.00000	TBARLY8	1.00000
NNURSC18	PROFIT	38.65000	POILND18	1.00000
NNURSC18	ROTBN8	-1.00000	NOTAN81	5.00000
NNURSC18	NOTC8	1.00000	AGWTREQ8	1.60000
NNURSC18	POCLND48	1.00000	TNURSC8	1.00000
NNURSC28	PROFIT	28.72000	POILND28	1.00000
NNURSC28	NOTBN8	-1.00000	NOTAN82	-5.00000
NNURSC28	NOTC8	1.00000	AGWTREQ8	1.60000
NNURSC28	POCLND48	1.00000	TNURSC8	1.00000
NNURSC38	PROFIT	15.68000	POILND38	1.00000
NNURSC38	NOTBN8	-1.00000	NOTAN83	-5.00000
NNURSC38	NOTC8	1.00000	AGWTREQ8	1.60000
NNURSC38	POCLND48	1.00000	TNURSC8	1.00000
NCORNG18	PROFIT	130.36000	POILND18	1.00000
NCORNG18	NOTC8	-7.00000	AGWTREQ8	1.50000
NCORNG18	POCLND48	1.00000	TCORNG8	1.00000
NCORNG28	PROFIT	87.94000	POILND28	1.00000
NCORNG28	NOTC8	-7.00000	AGWTREQ8	1.50000
NCORNG28	POCLND48	1.00000	TCORNG8	1.00000
NCORNG38	PROFIT	53.93000	POILND38	1.00000
NCORNG38	NOTC8	-7.00000	AGWTREQ8	1.50000
NCORNG38	POCLND48	1.00000	TCORNG8	1.00000
NCORNS18	PROFIT	186.01000	POILND18	1.00000
NCORNS18	NOTC8	-7.00000	AGWTREQ8	1.40000
NCORNS18	POCLND48	1.00000	TCORNS8	1.00000
NCORNS28	PROFIT	174.43000	POILND28	1.00000
NCORNS28	NOTC8	-7.00000	AGWTREQ8	1.40000
NCORNS28	POCLND48	1.00000	TCORNS8	1.00000
NCORNS38	PROFIT	148.18000	POILND38	1.00000
NCORNS38	NOTC8	-7.00000	AGWTREQ8	1.40000
NCORNS38	POCLND48	1.00000	TCORNS8	1.00000
NDWHEA48	PROFIT	-5.01000	POCLND48	1.00000
ALFAF19	PROFIT	116.47000	PILND19	1.00000
ALFAF19	ROTA89	1.00000	ROTAN91	1.00000

ALFAF19	ROTC9	1.00000	AGWTREQ9	2.30000	CORNS19	ROTC9	-7.00000	AGWTREQ9	1.90000
ALFAF19	PCLND49	1.00000	TALFAF8	1.00000	CORNS19	PCLND49	1.00000	TCORNS9	1.00000
ALFAF29	PROFIT	92.32000	PILND29	1.00000	CORNS29	PROFIT	194.33000	PILND29	1.00000
ALFAF29	ROTAB9	1.00000	ROTAN92	1.00000	CORNS29	ROTC9	-7.00000	AGWTREQ9	1.90000
ALFAF29	ROTC9	1.00000	AGWTREQ9	2.30000	CORNS29	PCLND49	1.00000	TCORNS9	1.00000
ALFAF29	PCLND49	1.00000	TALFAF9	1.00000	CORNS39	PROFIT	166.68000	PILND39	1.00000
ALFAF39	PROFIT	78.12000	PILND39	1.00000	CORNS39	ROTC9	-7.00000	AGWTREQ9	1.90000
ALFAF39	ROTAB9	1.00000	ROTAN93	1.00000	CORNS39	PCLND49	1.00000	TCORNS9	1.00000
ALFAF39	ROTC9	1.00000	AGWTREQ9	2.30000	DBEANS49	PROFIT	-29.50000	PCLND49	1.00000
ALFAF39	PCLND49	1.00000	TALFAF9	1.00000	DWHEAT49	PROFIT	12.42000	PCLND49	1.00000
ALFAP19	PROFIT	89.68000	PILND19	1.00000	NALFAF19	PROFIT	103.12000	POILND19	1.00000
ALFAP19	ROTAB9	1.00000	ROTAN91	1.00000	NALFAF19	NOTAB9	1.00000	NOTAN91	1.00000
ALFAP19	ROTC9	1.00000	AGWTREQ9	1.30000	NALFAF19	NOTC9	1.00000	AGWTREQ9	2.30000
ALFAP19	PCLND49	1.00000	TALFAP9	1.00000	NALFAF19	POCLND49	1.00000	TALFAF9	1.00000
ALFAP29	PROFIT	60.37000	PILND29	1.00000	NALFAF29	PROFIT	76.72000	POILND29	1.00000
ALFAP29	ROTAB9	1.00000	ROTAN92	1.00000	NALFAF29	NOTAB9	1.00000	NOTAN92	1.00000
ALFAP29	ROTC9	1.00000	AGWTREQ9	1.30000	NALFAF29	NOTC9	1.00000	AGWTREQ9	2.30000
ALFAP29	PCLND49	1.00000	TALFAP9	1.00000	NALFAF29	POCLND49	1.00000	TALFAF9	1.00000
ALFAP39	PROFIT	43.26000	PILND39	1.00000	NALFAF39	PROFIT	60.82000	POILND39	1.00000
ALFAP39	ROTAB9	1.00000	ROTAN93	1.00000	NALFAF39	NOTAB9	1.00000	NOTAN93	1.00000
ALFAP39	ROTC9	1.00000	AGWTREQ9	1.30000	NALFAF39	NOTC9	1.00000	AGWTREQ9	2.30000
ALFAP39	PCLND49	1.00000	TALFAP9	1.00000	NALFAF39	POCLND49	1.00000	TALFAF9	1.00000
BARLY19	PROFIT	108.03000	PILND19	1.00000	NALFAP19	PROFIT	76.33000	POILND19	1.00000
BARLY19	ROTAB9	-1.00000	ROTBN9	1.00000	NALFAP19	NOTAB9	1.00000	NOTAN91	1.00000
BARLY19	ROTC9	1.00000	AGWTREQ9	1.40000	NALFAP19	NOTC9	1.00000	AGWTREQ9	1.30000
BARLY19	PCLND49	1.00000	TBARLY9	1.00000	NALFAP19	POCLND49	1.00000	TALFAP9	1.00000
BARLY29	PROFIT	83.85000	PILND29	1.00000	NALFAP29	PROFIT	44.77000	POILND29	1.00000
BARLY29	ROTAB9	-1.00000	ROTBN9	1.00000	NALFAP29	NOTAB9	1.00000	NOTAN92	1.00000
BARLY29	ROTC9	1.00000	AGWTREQ9	1.40000	NALFAP29	NOTC9	1.00000	AGWTREQ9	1.30000
BARLY29	PCLND49	1.00000	TBARLY9	1.00000	NALFAP29	POCLND49	1.00000	TALFAP9	1.00000
BARLY39	PROFIT	66.37000	PILND39	1.00000	NALFAP39	PROFIT	25.96000	POILND39	1.00000
BARLY39	ROTAB9	-1.00000	ROTBN9	1.00000	NALFAP39	NOTAB9	1.00000	NOTAN93	1.00000
BARLY39	ROTC9	1.00000	AGWTREQ9	1.40000	NALFAP39	NOTC9	1.00000	AGWTREQ9	1.30000
BARLY39	PCLND49	1.00000	TBARLY9	1.00000	NALFAP39	POCLND49	1.00000	TALFAP9	1.00000
NURSC19	PROFIT	60.14000	PILND19	1.00000	NBARLY19	PROFIT	94.68000	POILND19	1.00000
NURSC19	ROTBN9	-1.00000	ROTAN91	-5.00000	NBARLY19	NOTAB9	-1.00000	NOTBN9	1.00000
NURSC19	ROTC9	1.00000	AGWTREQ9	1.80000	NBARLY19	NOTC9	1.00000	AGWTREQ9	1.40000
NURSC19	PCLND49	1.00000	TNURSC9	1.00000	NBARLY19	POCLND49	1.00000	TBARLY9	1.00000
NURSC29	PROFIT	39.66000	PILND29	1.00000	NBARLY29	PROFIT	68.25000	POILND29	1.00000
NURSC29	ROTBN9	-1.00000	ROTAN92	-5.00000	NBARLY29	NOTAB9	-1.00000	NOTBN9	1.00000
NURSC29	ROTC9	1.00000	AGWTREQ9	1.80000	NBARLY29	NOTC9	1.00000	AGWTREQ9	1.40000
NURSC29	PCLND49	1.00000	TNURSC9	1.00000	NBARLY29	POCLND49	1.00000	TBARLY9	1.00000
NURSC39	PROFIT	25.88000	PILND39	1.00000	NBARLY39	PROFIT	49.07000	POILND39	1.00000
NURSC39	ROTBN9	-1.00000	ROTAN93	-5.00000	NBARLY39	NOTAB9	-1.00000	NOTBN9	1.00000
NURSC39	ROTC9	1.00000	AGWTREQ9	1.80000	NBARLY39	NOTC9	1.00000	AGWTREQ9	1.40000
NURSC39	PCLND49	1.00000	TNURSC9	1.00000	NBARLY39	POCLND49	1.00000	TBARLY9	1.00000
CORNG19	PROFIT	121.12000	PILND19	1.00000	NNURSC19	PROFIT	46.79000	POILND19	1.00000
CORNG19	ROTC9	-7.00000	AGWTREQ9	2.00000	NNURSC19	NOTBN9	-1.00000	NOTAN91	-5.00000
CORNG19	PCLND49	1.00000	TCORNG9	1.00000	NNURSC19	NOTC9	1.00000	AGWTREQ9	1.80000
CORNG29	PROFIT	92.24000	PILND29	1.00000	NNURSC19	POCLND49	1.00000	TNURSC9	1.00000
CORNG29	ROTC9	-7.00000	AGWTREQ9	2.00000	NNURSC29	PROFIT	24.06000	POILND29	1.00000
CORNG29	PCLND49	1.00000	TCORNG9	1.00000	NNURSC29	NOTBN9	-1.00000	NOTAN92	-5.00000
CORNG39	PROFIT	65.59000	PILND39	1.00000	NNURSC29	NOTC9	1.00000	AGWTREQ9	1.80000
CORNG39	ROTC9	-7.00000	AGWTREQ9	2.00000	NNURSC29	POCLND49	1.00000	TNURSC9	1.00000
CORNG39	PCLND49	1.00000	TCORNG9	1.00000	NNURSC39	PROFIT	8.58000	POILND39	1.00000
CORNS19	PROFIT	197.30000	PILND19	1.00000	NNURSC39	NOTBN9	-1.00000	NOTAN93	-5.00000

NNURSC39	NOTC9	1.00000	AGWTREQ9	1.80000
NNURSC39	POCLND49	1.00000	TNURSC9	1.00000
NCORNG19	PROFIT	107.77000	POILND19	1.00000
NCORNG19	NOTC9	-7.00000	AGWTREQ9	2.00000
NCORNG19	POCLND49	1.00000	TCORNG9	1.00000
NCORNG29	PROFIT	76.64000	POILND29	1.00000
NCORNG29	NOTC9	-7.00000	AGWTREQ9	2.00000
NCORNG29	POCLND49	1.00000	TCORNG9	1.00000
NCORNG39	PROFIT	48.29000	POILND39	1.00000
NCORNG39	NOTC9	-7.00000	AGWTREQ9	2.00000
NCORNG39	POCLND49	1.00000	TCORNG9	1.00000
NCORNS19	PROFIT	183.95000	POILND19	1.00000
NCORNS19	NOTC9	-7.00000	AGWTREQ9	1.90000
NCORNS19	POCLND49	1.00000	TCORNS9	1.00000
NCORNS29	PROFIT	178.73000	POILND29	1.00000
NCORNS29	NOTC9	-7.00000	AGWTREQ9	1.90000
NCORNS29	POCLND49	1.00000	TCORNS9	1.00000
NCORNS39	PROFIT	149.38000	POILND39	1.00000
NCORNS39	NOTC9	-7.00000	AGWTREQ9	1.90000
NCORNS39	POCLND49	1.00000	TCORNS9	1.00000
NDBEAN49	PROFIT	-49.24000	POCLND49	1.00000
NDWHEA49	PROFIT	-7.32000	POCLND49	1.00000
ALFAF10	PROFIT	155.59000	PILND10	1.00000
ALFAF10	ROTAB0	1.00000	ROTAN01	1.00000
ALFAF10	ROTC0	1.00000	ROTMAPP0	1.00000
ALFAF10	ROTMPEA0	1.00000	AGWTREQ0	3.70000
ALFAF10	PCLND40	1.00000	TALFAF0	1.00000
ALFAF20	PROFIT	115.10000	PILND20	1.00000
ALFAF20	ROTAB0	1.00000	ROTAN02	1.00000
ALFAF20	ROTC0	1.00000	ROTMAPP0	1.00000
ALFAF20	ROTMPEA0	1.00000	AGWTREQ0	3.70000
ALFAF20	PCLND40	1.00000	TALFAF0	1.00000
ALFAF30	PROFIT	81.25000	PILND30	1.00000
ALFAF30	ROTAB0	1.00000	ROTAN03	1.00000
ALFAF30	ROTC0	1.00000	ROTMAPP0	1.00000
ALFAF30	ROTMPEA0	1.00000	AGWTREQ0	3.70000
ALFAF30	PCLND40	1.00000	TALFAF0	1.00000
ALFAP10	PROFIT	82.00000	PILND10	1.00000
ALFAP10	ROTAB0	1.00000	ROTAN01	1.00000
ALFAP10	ROTC0	1.00000	ROTMAPP0	1.00000
ALFAP10	ROTMPEA0	1.00000	AGWTREQ0	3.00000
ALFAP10	PCLND40	1.00000	TALFAP0	1.00000
ALFAP20	PROFIT	59.49000	PILND20	1.00000
ALFAP20	ROTAB0	1.00000	ROTAN02	1.00000
ALFAP20	ROTC0	1.00000	ROTMAPP0	1.00000
ALFAP20	ROTMPEA0	1.00000	AGWTREQ0	3.00000
ALFAP20	PCLND40	1.00000	TALFAP0	1.00000
ALFAP30	PROFIT	40.96000	PILND30	1.00000
ALFAP30	ROTAB0	1.00000	ROTAN03	1.00000
ALFAP30	ROTC0	1.00000	ROTMAPP0	1.00000
ALFAP30	ROTMPEA0	1.00000	AGWTREQ0	3.00000
ALFAP30	PCLND40	1.00000	TALFAP0	1.00000
BARLY10	PROFIT	95.28000	PILND10	1.00000
BARLY10	ROTAB0	-1.00000	ROTBN0	1.00000
BARLY10	ROTC0	1.00000	ROTMAPP0	1.00000
BARLY10	ROTMPEA0	1.00000	AGWTREQ0	1.50000
BARLY10	PCLND40	1.00000	TBARLY0	1.00000
BARLY20	PROFIT	81.28000	PILND20	1.00000
BARLY20	ROTAB0	-1.00000	ROTBN0	1.00000
BARLY20	ROTC0	1.00000	ROTMAPP0	1.00000
BARLY20	ROTMPEA0	1.00000	AGWTREQ0	1.50000
BARLY20	PCLND40	1.00000	TBARLY0	1.00000
BARLY30	PROFIT	64.74000	PILND30	1.00000
BARLY30	ROTAB0	-1.00000	ROTBN0	1.00000
BARLY30	ROTC0	1.00000	ROTMAPP0	1.00000
BARLY30	ROTMPEA0	1.00000	AGWTREQ0	1.50000
BARLY30	PCLND40	1.00000	TBARLY0	1.00000
NURSC10	PROFIT	46.04000	PILND10	1.00000
NURSC10	ROTBN0	-1.00000	ROTAN01	-5.00000
NURSC10	ROTC0	1.00000	ROTMAPP0	1.00000
NURSC10	ROTMPEA0	1.00000	AGWTREQ0	2.00000
NURSC10	PCLND40	1.00000	TNURSC0	1.00000
NURSC20	PROFIT	35.86000	PILND20	1.00000
NURSC20	ROTBN0	-1.00000	ROTAN02	-5.00000
NURSC20	ROTC0	1.00000	ROTMAPP0	1.00000
NURSC20	ROTMPEA0	1.00000	AGWTREQ0	2.00000
NURSC20	PCLND40	1.00000	TNURSC0	1.00000
NURSC30	PROFIT	23.13000	PILND30	1.00000
NURSC30	ROTBN0	-1.00000	ROTAN03	-5.00000
NURSC30	ROTC0	1.00000	ROTMAPP0	1.00000
NURSC30	ROTMPEA0	1.00000	AGWTREQ0	2.00000
NURSC30	PCLND40	1.00000	TNURSC0	1.00000
CORNG10	PROFIT	196.42000	PILND10	1.00000
CORNG10	ROTC0	-7.00000	ROTMAPP0	1.00000
CORNG10	ROTMPEA0	1.00000	AGWTREQ0	2.40000
CORNG10	PCLND40	1.00000	TCORNG0	1.00000
CORNG20	PROFIT	142.44000	PILND20	1.00000
CORNG20	ROTC0	-7.00000	ROTMAPP0	1.00000
CORNG20	ROTMPEA0	1.00000	AGWTREQ0	2.40000
CORNG20	PCLND40	1.00000	TCORNG0	1.00000
CORNG30	PROFIT	103.24000	PILND30	1.00000
CORNG30	ROTC0	-7.00000	ROTMAPP0	1.00000
CORNG30	ROTMPEA0	1.00000	AGWTREQ0	2.40000
CORNG30	PCLND40	1.00000	TCORNG0	1.00000
CORNS10	PROFIT	258.96000	PILND10	1.00000
CORNS10	ROTC0	-7.00000	ROTMAPP0	1.00000
CORNS10	ROTMPEA0	1.00000	AGWTREQ0	2.30000
CORNS10	PCLND40	1.00000	TCORNS0	1.00000
CORNS20	PROFIT	255.73000	PILND20	1.00000
CORNS20	ROTC0	-7.00000	ROTMAPP0	1.00000
CORNS20	ROTMPEA0	1.00000	AGWTREQ0	2.30000
CORNS20	PCLND40	1.00000	TCORNS0	1.00000
CORNS30	PROFIT	204.68000	PILND30	1.00000
CORNS30	ROTC0	-7.00000	ROTMAPP0	1.00000
CORNS30	ROTMPEA0	1.00000	AGWTREQ0	2.30000
CORNS30	PCLND40	1.00000	TCORNS0	1.00000
DWHEAT40	PROFIT	17.14000	PCLND40	1.00000
NAPPL10	PROFIT	-165.43000	PILND10	1.00000
NAPPL10	ROTNAP01	-2.30000	AGWTREQ0	3.00000
NAPPL10	PCLND40	1.00000	TAPPLE0	1.00000
NAPPL10	FRUITAC0	1.00000		
NAPPL20	PROFIT	-184.38000	PILND20	1.00000

NAPPL20	ROTNAP02	-2.30000	AGWTREQ0	3.00000
NAPPL20	PCLND40	1.00000	TAPPLE0	1.00000
NAPPL20	FRUITAC0	1.00000		
NAPPL30	PROFIT	-221.83000	PILND30	1.00000
NAPPL30	ROTNAP03	-2.30000	AGWTREQ0	3.00000
NAPPL30	PCLND40	1.00000	TAPPLE0	1.00000
NAPPL30	FRUITAC0	1.00000		
NPEAC10	PROFIT	-122.21000	PILND10	1.00000
NPEAC10	ROTNPE01	-2.00000	AGWTREQ0	3.40000
NPEAC10	PCLND40	1.00000	TPEACH0	1.00000
NPEAC10	FRUITAC0	1.00000		
NPEAC20	PROFIT	-128.96000	PILND20	1.00000
NPEAC20	ROTNPE02	-2.00000	AGWTREQ0	3.40000
NPEAC20	PCLND40	1.00000	TPEACH0	1.00000
NPEAC20	FRUITAC0	1.00000		
NPEAC30	PROFIT	-133.64000	PILND30	1.00000
NPEAC30	ROTNPE03	-2.00000	AGWTREQ0	3.40000
NPEAC30	PCLND40	1.00000	TPEACH0	1.00000
NPEAC30	FRUITAC0	1.00000		
MAPPL10	PROFIT	159.28000	PILND10	1.00000
MAPPL10	ROTNAP01	1.00000	ROTMAPP0	-30.00000
MAPPL10	AGWTREQ0	4.00000	PCLND40	1.00000
MAPPL10	TAPPLE0	1.00000	FRUITAC0	1.00000
MAPPL20	PROFIT	35.60000	PILND20	1.00000
MAPPL20	ROTNAP02	1.00000	ROTMAPP0	-30.00000
MAPPL20	AGWTREQ0	4.00000	PCLND40	1.00000
MAPPL20	TAPPLE0	1.00000	FRUITAC0	1.00000
MAPPL30	PROFIT	-19.66000	PILND30	1.00000
MAPPL30	ROTNAP03	1.00000	ROTMAPP0	-30.00000
MAPPL30	AGWTREQ0	4.00000	PCLND40	1.00000
MAPPL30	TAPPLE0	1.00000	FRUITAC0	1.00000
MPEAC10	PROFIT	117.54000	PILND10	1.00000
MPEAC10	ROTNPE01	1.00000	ROTMPEA0	-15.00000
MPEAC10	AGWTREQ0	4.40000	PCLND40	1.00000
MPEAC10	TPEACH0	1.00000	FRUITAC0	1.00000
MPEAC20	PROFIT	51.50000	PILND20	1.00000
MPEAC20	ROTNPE02	1.00000	ROTMPEA0	-15.00000
MPEAC20	AGWTREQ0	4.40000	PCLND40	1.00000
MPEAC20	TPEACH0	1.00000	FRUITAC0	1.00000
MPEAC30	PROFIT	15.74000	PILND30	1.00000
MPEAC30	ROTNPE03	1.00000	ROTMPEA0	-15.00000
MPEAC30	AGWTREQ0	4.40000	PCLND40	1.00000
MPEAC30	TPEACH0	1.00000	FRUITAC0	1.00000
NALFAF10	PROFIT	142.24000	POILND10	1.00000
NALFAF10	NOTAB0	1.00000	NOTAN01	1.00000
NALFAF10	NOTC0	1.00000	NOTMAPP0	1.00000
NALFAF10	NOTMPEA0	1.00000	AGWTREQ0	3.70000
NALFAF10	POCLND40	1.00000	TALFAF0	1.00000
NALFAF20	PROFIT	99.50000	POILND20	1.00000
NALFAF20	NOTAB0	1.00000	NOTAN02	1.00000
NALFAF20	NOTC0	1.00000	NOTMAPP0	1.00000
NALFAF20	NOTMPEA0	1.00000	AGWTREQ0	3.70000
NALFAF20	POCLND40	1.00000	TALFAF0	1.00000
NALFAF30	PROFIT	63.95000	POILND30	1.00000
NALFAF30	NOTAB0	1.00000	NOTAN03	1.00000
NALFAF30	NOTC0	1.00000	NOTMAPP0	1.00000
NALFAF30	NOTMPEA0	1.00000	AGWTREQ0	3.70000
NALFAF30	POCLND40	1.00000	TALFAF0	1.00000
NALFAP10	PROFIT	68.65000	POILND10	1.00000
NALFAP10	NOTAB0	1.00000	NOTAN01	1.00000
NALFAP10	NOTC0	1.00000	NOTMAPP0	1.00000
NALFAP10	NOTMPEA0	1.00000	AGWTREQ0	3.00000
NALFAP10	POCLND40	1.00000	TALFAP0	1.00000
NALFAP20	PROFIT	43.89000	POILND20	1.00000
NALFAP20	NOTAB0	1.00000	NOTAN02	1.00000
NALFAP20	NOTC0	1.00000	NOTMAPP0	1.00000
NALFAP20	NOTMPEA0	1.00000	AGWTREQ0	3.00000
NALFAP20	POCLND40	1.00000	TALFAP0	1.00000
NALFAP30	PROFIT	23.66000	POILND30	1.00000
NALFAP30	NOTAB0	1.00000	NOTAN03	1.00000
NALFAP30	NOTC0	1.00000	NOTMAPP0	1.00000
NALFAP30	NOTMPEA0	1.00000	AGWTREQ0	3.00000
NALFAP30	POCLND40	1.00000	TALFAP0	1.00000
NBARLY10	PROFIT	81.93000	POILND10	1.00000
NBARLY10	NOTAB0	-1.00000	NOTBN0	1.00000
NBARLY10	NOTC0	1.00000	NOTMAPP0	1.00000
NBARLY10	NOTMPEA0	1.00000	AGWTREQ0	1.50000
NBARLY10	POCLND40	1.00000	TBARLY0	1.00000
NBARLY20	PROFIT	65.68000	POILND20	1.00000
NBARLY20	NOTAB0	-1.00000	NOTBN0	1.00000
NBARLY20	NOTC0	1.00000	NOTMAPP0	1.00000
NBARLY20	NOTMPEA0	1.00000	AGWTREQ0	1.50000
NBARLY20	POCLND40	1.00000	TBARLY0	1.00000
NBARLY30	PROFIT	47.44000	POILND30	1.00000
NBARLY30	NOTAB0	-1.00000	NOTBN0	1.00000
NBARLY30	NOTC0	1.00000	NOTMAPP0	1.00000
NBARLY30	NOTMPEA0	1.00000	AGWTREQ0	1.50000
NBARLY30	POCLND40	1.00000	TBARLY0	1.00000
NNURSC10	PROFIT	32.69000	POILND10	1.00000
NNURSC10	NOTBN0	-1.00000	NOTAN01	-5.00000
NNURSC10	NOTC0	1.00000	NOTMAPP0	1.00000
NNURSC10	NOTMPEA0	1.00000	AGWTREQ0	2.00000
NNURSC10	POCLND40	1.00000	TNURSC0	1.00000
NNURSC20	PROFIT	20.26000	POILND20	1.00000
NNURSC20	NOTBN0	-1.00000	NOTAN02	-5.00000
NNURSC20	NOTC0	1.00000	NOTMAPP0	1.00000
NNURSC20	NOTMPEA0	1.00000	AGWTREQ0	2.00000
NNURSC20	POCLND40	1.00000	TNURSC0	1.00000
NNURSC30	PROFIT	5.83000	POILND30	1.00000
NNURSC30	NOTBN0	-1.00000	NOTAN03	5.00000
NNURSC30	NOTC0	1.00000	NOTMAPP0	1.00000
NNURSC30	NOTMPEA0	1.00000	AGWTREQ0	2.00000
NNURSC30	POCLND40	1.00000	TNURSC0	1.00000
NCORNG10	PROFIT	183.07000	POILND10	1.00000
NCORNG10	NOTC0	-7.00000	NOTMAPP0	1.00000
NCORNG10	NOTMPEA0	1.00000	AGWTREQ0	2.40000
NCORNG10	POCLND40	1.00000	TCORNG0	1.00000
NCORNG20	PROFIT	126.84000	POILND20	1.00000
NCORNG20	NOTC0	-7.00000	NOTMAPP0	1.00000
NCORNG20	NOTMPEA0	1.00000	AGWTREQ0	2.40000
NCORNG20	POCLND40	1.00000	TCORNG0	1.00000
NCORNG30	PROFIT	85.94000	POILND30	1.00000

NCORNG30	NOTCO	-7.00000	NOTMAPPO	1.00000
NCORNG30	NOTMPEA0	1.00000	AGWTREQ0	2.40000
NCORNG30	POCLND40	1.00000	TCORNGO	1.00000
NCORNS10	PROFIT	245.61000	POILND10	1.00000
NCORNS10	NOTCO	-7.00000	NOTMAPPO	1.00000
NCORNS10	NOTMPEA0	1.00000	AGWTREQ0	2.30000
NCORNS10	POCLND40	1.00000	TCORNSO	1.00000
NCORNS20	PROFIT	240.13000	POILND20	1.00000
NCORNS20	NOTCO	-7.00000	NOTMAPPO	1.00000
NCORNS20	NOTMPEA0	1.00000	AGWTREQ0	2.30000
NCORNS20	POCLND40	1.00000	TCORNSO	1.00000
NCORNS30	PROFIT	187.38000	POILND30	1.00000
NCORNS30	NOTCO	-7.00000	NOTMAPPO	1.00000
NCORNS30	NOTMPEA0	1.00000	AGWTREQ0	2.30000
NCORNS30	POCLND40	1.00000	TCORNSO	1.00000
NDWHEA40	PROFIT	-2.60000	POCLND40	1.00000
NNAPPL10	PROFIT	-178.78000	POILND10	1.00000
NNAPPL10	NOTNAP01	-2.30000	AGWTREQ0	3.00000
NNAPPL10	POCLND40	1.00000	TAPPLEO	1.00000
NNAPPL20	PROFIT	-199.98000	POILND20	1.00000
NNAPPL20	NOTNAP02	-2.30000	AGWTREQ0	3.00000
NNAPPL20	POCLND40	1.00000	TAPPLEO	1.00000
NNAPPL30	PROFIT	-239.13000	POILND30	1.00000
NNAPPL30	NOTNAP03	-2.30000	AGWTREQ0	3.00000
NNAPPL30	POCLND40	1.00000	TAPPLEO	1.00000
NNPEAC10	PROFIT	-135.56000	POILND10	1.00000
NNPEAC10	NOTNPE01	-2.00000	AGWTREQ0	3.40000
NNPEAC10	POCLND40	1.00000	TPEACHO	1.00000
NNPEAC20	PROFIT	-144.56000	POILND20	1.00000
NNPEAC20	NOTNPE02	-2.00000	AGWTREQ0	3.40000
NNPEAC20	POCLND40	1.00000	TPEACHO	1.00000
NNPEAC30	PROFIT	-150.94000	POILND30	1.00000
NNPEAC30	NOTNPE03	-2.00000	AGWTREQ0	3.40000
NNPEAC30	POCLND40	1.00000	TPEACHO	1.00000
NMAPPL10	PROFIT	145.93000	POILND10	1.00000
NMAPPL10	NOTNAP01	1.00000	NOTMAPPO	-30.00000
NMAPPL10	AGWTREQ0	4.00000	POCLND40	1.00000
NMAPPL10	TAPPLEO	1.00000		
NMAPPL20	PROFIT	20.00000	POILND20	1.00000
NMAPPL20	NOTNAP02	1.00000	NOTMAPPO	-30.00000
NMAPPL20	AGWTREQ0	4.00000	POCLND40	1.00000
NMAPPL20	TAPPLEO	1.00000		
NMAPPL30	PROFIT	-36.96000	POILND30	1.00000
NMAPPL30	NOTNAP03	1.00000	NOTMAPPO	-30.00000
NMAPPL30	AGWTREQ0	4.00000	POCLND40	1.00000
NMAPPL30	TAPPLEO	1.00000		
NMPEAC10	PROFIT	104.19000	POILND10	1.00000
NMPEAC10	NOTNPE01	1.00000	NOTMPEA0	-15.00000
NMPEAC10	AGWTREQ0	4.40000	POCLND40	1.00000
NMPEAC10	TPEACHO	1.00000		
NMPEAC20	PROFIT	35.90000	POILND20	1.00000
NMPEAC20	NOTNPE02	1.00000	NOTMPEA0	-15.00000
NMPEAC20	AGWTREQ0	4.40000	POCLND40	1.00000
NMPEAC20	TPEACHO	1.00000		
NMPEAC30	PROFIT	-1.56000	POILND30	1.00000
NMPEAC30	NOTNPE03	1.00000	NOTMPEA0	-15.00000

NMPEAC30	AGWTREQ0	4.40000	POCLND40	1.00000
NMPEAC30	TPEACHO	1.00000		
WETLRES1	SWAVIL1	1.00000	WETLREQ1	1.00000
WETLREG1	GWAVIL1	1.00000	WETLREQ1	1.00000
PSWAG1	PROFIT	-1.55000	AGWTREQ1	-0.47580
PSWAG1	AGRF1T1	0.52420	SWAVIL1	1.10000
PSWAG1	EVLOSS1	0.10000		
NSWAG1	PROFIT	-10.75000	AGWTREQ1	-0.47580
NSWAG1	AGRF1T1	0.52420	SWAVIL1	1.10000
NSWAG1	EVLOSS1	0.10000		
PGWAG1	PROFIT	-2.55000	AGWTREQ1	-0.47580
PGWAG1	AGRF1T1	0.52420	GWAVIL1	1.00000
NGWAG1	PROFIT	-3.10000	AGWTREQ1	-0.47580
NGWAG1	AGRF1T1	0.52420	GWAVIL1	1.00000
NIMAG2T1	PROFIT	-41.49000	AGWTREQ1	-0.47580
NIMAG2T1	AGRF1T1	0.52420	SWAVIL2	1.10000
NIMAG2T1	EVLOSS1	0.10000		
AGWRF1	AGRF1T1	-1.00000	SWAVIL1	-0.95000
AGWRF1	GWAVIL1	-0.05000		
WETLRES2	SWAVIL2	1.00000	WETLREQ2	1.00000
WETLREG2	GWAVIL2	1.00000	WETLREQ2	1.00000
PSWAG2	PROFIT	-1.55000	AGWTREQ2	-0.34230
PSWAG2	AGRF2T2	0.65770	SWAVIL2	1.10000
PSWAG2	EVLOSS2	0.10000		
NSWAG2	PROFIT	-9.75000	AGWTREQ2	-0.34230
NSWAG2	AGRF2T2	0.65770	SWAVIL2	1.10000
NSWAG2	EVLOSS2	0.10000		
PGWAG2	PROFIT	-3.60000	AGWTREQ2	-0.34230
PGWAG2	AGRF2T2	0.65770	GWAVIL2	1.00000
NGWAG2	PROFIT	-4.10000	AGWTREQ2	-0.34230
NGWAG2	AGRF2T2	0.65770	GWAVIL2	1.00000
PIMAG3T2	PROFIT	-3.80000	AGWTREQ2	-0.34230
PIMAG3T2	AGRF2T2	0.65770	SWAVIL3	1.10000
PIMAG3T2	EVLOSS2	0.10000		
AGWRF2	AGRF2T2	-1.00000	SWAVIL2	-0.95000
AGWRF2	GWAVIL2	-0.05000		
WETLRES3	SWAVIL3	1.00000	WETLREQ3	1.00000
WETLREG3	GWAVIL3	1.00000	WETLREQ3	1.00000
PSWAG3	PROFIT	-1.55000	AGWTREQ3	-0.36670
PSWAG3	AGRF3T3	0.63330	SWAVIL3	1.10000
PSWAG3	PSWAE3	1.00000	EVLOSS3	0.10000
NSWAG3	PROFIT	-11.25000	AGWTREQ3	-0.36670
NSWAG3	AGRF3T3	0.63330	SWAVIL3	1.10000
NSWAG3	EVLOSS3	0.10000		
PGWAG3	PROFIT	-4.10000	AGWTREQ3	-0.36670
PGWAG3	AGRF3T3	0.63330	GWAVIL3	1.00000
PGWAG3	PGWAE3	1.00000		
NGWAG3	PROFIT	-4.60000	AGWTREQ3	-0.36670
NGWAG3	AGRF3T3	0.63330	GWAVIL3	1.00000
NIMAU7T3	PROFIT	-65.16000	AGWTREQ3	-0.36670
NIMAU7T3	AGRF3T3	0.63330	SWAVIL7	1.10000
NIMAU7T3	NIMU7T3	1.00000	EVLOSS3	0.10000
NIMAG2T3	PROFIT	-52.86000	AGWTREQ3	-0.36670
NIMAG2T3	AGRF3T3	0.63330	SWAVIL2	1.10000
NIMAG2T3	NIM2T3	1.00000	EVLOSS3	0.10000
AGWRF3	AGRF3T3	-1.00000	SWAVIL3	-0.95000

AGWRF3	GWAVIL3	-0.05000		
WETLRES4	SWAVIL4	1.00000	WETLREQ4	1.00000
WETLREG4	GWAVIL4	1.00000	WETLREQ4	1.00000
PSWAG4	PROFIT	-1.55000	AGWTREQ4	-0.38910
PSWAG4	AGRF4T4	0.61090	SWAVIL4	1.10000
PSWAG4	PSWAE4	1.00000	EVLOSS4	0.10000
NSWAG4	PROFIT	-10.75000	AGWTREQ4	-0.38910
NSWAG4	AGRF4T4	0.61090	SWAVIL4	1.10000
NSWAG4	EVLOSS4	0.10000		
PGWAG4	PROFIT	-5.60000	AGWTREQ4	-0.38910
PGWAG4	AGRF4T4	0.61090	GWAVIL4	1.00000
PGWAG4	PGWAE4	1.00000		
NGWAG4	PROFIT	-6.15000	AGWTREQ4	-0.38910
NGWAG4	AGRF4T4	0.61090	GWAVIL4	1.00000
PIMAG1T4	PROFIT	-3.80000	AGWTREQ4	-0.38910
PIMAG1T4	AGRF4T4	0.61090	SWAVIL1	1.10000
PIMAG1T4	PIM1T4	1.00000	EVLOSS4	0.10000
PIMAG3T4	PROFIT	-2.56000	AGWTREQ4	-0.38910
PIMAG3T4	AGRF4T4	0.61090	SWAVIL3	1.10000
PIMAG3T4	PIM3T4	1.00000	EVLOSS4	0.10000
PIMAG7T4	PROFIT	-2.56000	AGWTREQ4	-0.38910
PIMAG7T4	AGRF4T4	0.61090	SWAVIL7	1.10000
PIMAG7T4	PIM7T4	1.00000	EVLOSS4	0.10000
PIMAG7T4	NDIUCW	1.00000		
NIMAG3T4	PROFIT	-45.60000	AGWTREQ4	-0.38910
NIMAG3T4	AGRF4T4	0.61090	SWAVIL3	1.10000
NIMAG3T4	NIM3T4	1.00000	EVLOSS4	0.10000
NIMAB7T4	PROFIT	-51.74000	AGWTREQ4	-0.38910
NIMAB7T4	AGRF4T4	0.61090	SWAVIL7	1.10000
NIMAB7T4	EVLOSS4	0.10000	NDIUCW	1.00000
NIMAU7T4	PROFIT	-57.88000	AGWTREQ4	-0.38910
NIMAU7T4	AGRF4T4	0.61090	SWAVIL7	1.10000
NIMAU7T4	EVLOSS4	0.10000	NDIUCW	1.00000
NIMAS8T4	PROFIT	-53.79000	AGWTREQ4	-0.38910
NIMAS8T4	AGRF4T4	0.61090	SWAVIL8	1.10000
NIMAS8T4	NIMS8T4	1.00000	EVLOSS4	0.10000
NIMAS8T4	NDIUCW	1.00000		
AGWRF4	AGRF4T4	-1.00000	SWAVIL4	-0.95000
AGWRF4	GWAVIL4	-0.05000		
WETLRES5	SWAVIL5	1.00000	WETLREQ5	1.00000
WETLREG5	GWAVIL5	1.00000	WETLREQ5	1.00000
PSWAG5	PROFIT	-1.55000	AGWTREQ5	-0.32500
PSWAG5	AGRF5T5	0.67500	SWAVIL5	1.10000
PSWAG5	EVLOSS5	0.10000		
NSWAG5	PROFIT	-9.75000	AGWTREQ5	-0.32500
NSWAG5	AGRF5T5	0.67500	SWAVIL5	1.10000
NSWAG5	EVLOSS5	0.10000		
PGWAG5	PROFIT	-3.60000	AGWTREQ5	-0.32500
PGWAG5	AGRF5T5	0.67500	GWAVIL5	1.00000
NGWAG5	PROFIT	-4.10000	AGWTREQ5	-0.32500
NGWAG5	AGRF5T5	0.67500	GWAVIL5	1.00000
PIMAG8T5	PROFIT	-3.80000	AGWTREQ5	-0.32500
PIMAG8T5	AGRF5T5	0.67500	SWAVIL8	1.10000
PIMAG8T5	EVLOSS5	0.10000	NDIUCW	1.00000
NIMAG4T5	PROFIT	-37.60000	AGWTREQ5	-0.32500
NIMAG4T5	AGRF5T5	0.67500	SWAVIL4	1.10000

NIMAG4T5	EVLOSS5	0.10000		
NIMAB7T5	PROFIT	-47.84000	AGWTREQ5	-0.32500
NIMAB7T5	AGRF5T5	0.67500	SWAVIL7	1.10000
NIMAB7T5	EVLOSS5	0.10000	NDIUCW	1.00000
NIMAU7T5	PROFIT	-53.99000	AGWTREQ5	-0.32500
NIMAU7T5	AGRF5T5	0.67500	SWAVIL7	1.10000
NIMAU7T5	EVLOSS5	0.10000	NDIUCW	1.00000
NIMAS8T5	PROFIT	-35.55000	AGWTREQ5	-0.32500
NIMAS8T5	AGRF5T5	0.67500	SWAVIL8	1.10000
NIMAS8T5	EVLOSS5	0.10000	NDIUCW	1.00000
AGWRF5	AGRF5T5	-1.00000	SWAVIL5	-0.95000
AGWRF5	GWAVIL5	-0.05000		
WETLRES6	SWAVIL6	1.00000	WETLREQ6	1.00000
WETLREG6	GWAVIL6	1.00000	WETLREQ6	1.00000
PSWAG6	PROFIT	-1.55000	AGWTREQ6	-0.45530
PSWAG6	AGRF6T6	0.54470	SWAVIL6	1.10000
PSWAG6	PSWAE6	1.00000	EVLOSS6	0.10000
NSWAG6	PROFIT	-9.25000	AGWTREQ6	-0.45530
NSWAG6	AGRF6T6	0.54470	SWAVIL6	1.10000
NSWAG6	EVLOSS6	0.10000		
PGWAG6	PROFIT	-4.60000	AGWTREQ6	-0.45530
PGWAG6	AGRF6T6	0.54470	GWAVIL6	1.00000
PGWAG6	PGWAE6	1.00000		
NGWAG6	PROFIT	-5.10000	AGWTREQ6	-0.45530
NGWAG6	AGRF6T6	0.54470	GWAVIL6	1.00000
PIMAG0T6	PROFIT	-2.56000	AGWTREQ6	-0.45530
PIMAG0T6	AGRF6T6	0.54470	SWAVIL0	1.10000
PIMAG0T6	PIM0T6	1.00000	EVLOSS6	0.10000
NIMAG5T6	PROFIT	-46.10000	AGWTREQ6	-0.45530
NIMAG5T6	AGRF6T6	0.54470	SWAVIL5	1.10000
NIMAG5T6	NIM5T6	1.00000	EVLOSS6	0.10000
NIMAG0T6	PROFIT	-46.10000	AGWTREQ6	-0.45530
NIMAG0T6	AGRF6T6	0.54470	SWAVIL0	1.10000
NIMAG0T6	NIM0T6	1.00000	EVLOSS6	0.10000
AGWRF6	AGRF6T6	-1.00000	SWAVIL6	-0.95000
AGWRF6	GWAVIL6	-0.05000		
WETLRES7	SWAVIL7	1.00000	WETLREQ7	1.00000
WETLRES7	NDIUCW	1.00000		
WETLREG7	GWAVIL7	1.00000	WETLREQ7	1.00000
PSWAG7	PROFIT	-1.55000	AGWTREQ7	-0.37120
PSWAG7	AGRF7T7	0.62880	SWAVIL7	1.10000
PSWAG7	PSWAE7	1.00000	EVLOSS7	0.10000
PSWAG7	NDIUCW	1.00000		
NSWAG7	PROFIT	-10.75000	AGWTREQ7	-0.37120
NSWAG7	AGRF7T7	0.62880	SWAVIL7	1.10000
NSWAG7	EVLOSS7	0.10000	NDIUCW	1.00000
PGWAG7	PROFIT	-2.10000	AGWTREQ7	-0.37120
PGWAG7	AGRF7T7	0.62880	GWAVIL7	1.00000
NGWAG7	PROFIT	-2.55000	AGWTREQ7	-0.37120
NGWAG7	GWAVIL7	1.00000	AGRF7T7	0.62880
AGWRF7	AGRF7T7	-1.00000	SWAVIL7	-1.00000
AGWRF7	NDIUCW	-1.00000		
OUTFSW78	SWAVIL7	1.00000	SWAVIL8	-1.00000
WETLRES8	SWAVIL8	1.00000	WETLREQ8	1.00000
WETLRES8	NDIUCW	1.00000		
PSWAG8	PROFIT	-1.55000	AGWTREQ8	-0.37500

PSWAG8	AGRF8T8	0.62500	SWAVIL8	1.10000
PSWAG8	PSWAE8	1.00000	EVLOSS8	0.10000
PSWAG8	NDIUCW	1.00000		
NSWAG8	PROFIT	-10.75000	AGWTREQ8	-0.37500
NSWAG8	AGRF8T8	0.62500	SWAVIL8	1.10000
NSWAG8	EVLOSS8	0.10000	NDIUCW	1.00000
AGWRF8	AGRF8T8	-1.00000	SWAVIL8	-1.00000
AGWRF8	NDIUCW	-1.00000		
OUTFSW89	SWAVIL8	1.00000	SWAVIL9	-1.00000
WETLRES9	SWAVIL9	1.00000	WETLREQ9	1.00000
WETLRES9	NDIUCW	1.00000		
PSWAG9	PROFIT	-1.55000	AGWTREQ9	-0.20000
PSWAG9	AGRF9T9	0.80000	SWAVIL9	1.10000
PSWAG9	PSWAE9	1.00000	EVLOSS9	0.10000
PSWAG9	NDIUCW	1.00000		
NSWAG9	PROFIT	-10.75000	AGWTREQ9	-0.20000
NSWAG9	AGRF9T9	0.80000	SWAVIL9	1.10000
NSWAG9	EVLOSS9	0.10000	NDIUCW	1.00000
PIMAG5T9	PROFIT	-3.80000	AGWTREQ9	-0.20000
PIMAG5T9	AGRF9T9	0.80000	SWAVIL5	1.10000
PIMAG5T9	EVLOSS9	0.10000		
AGWRF9	AGRF9T9	-1.00000	SWAVIL9	-1.00000
AGWRF9	NDIUCW	-1.00000		
OUTFSW9L	SWAVIL9	1.00000		
WETLRES0	SWAVIL0	1.00000	WETLREQ0	1.00000
WETLREG0	GWAVIL0	1.00000	WETLREQ0	1.00000
PSWAG0	PROFIT	-1.55000	AGWTREQ0	-0.50000
PSWAG0	AGRF0T0	0.50000	SWAVIL0	1.10000
PSWAG0	PSWAE0	1.00000	EVLOSS0	0.10000
NSWAG0	PROFIT	-10.75000	AGWTREQ0	-0.50000
NSWAG0	AGRF0T0	0.50000	SWAVIL0	1.10000
NSWAG0	EVLOSS0	0.10000		
PGWAG0	PROFIT	-2.10000	AGWTREQ0	-0.50000
PGWAG0	GWAVIL0	1.00000	AGRF0T0	0.50000
NGWAG0	PROFIT	-2.55000	AGWTREQ0	-0.50000
NGWAG0	GWAVIL0	1.00000	AGRF0T0	0.50000
AGWRF0	AGRF0T0	-1.00000	SWAVIL0	-1.00000
OFSW1GSL	INFTGSL	1.00000	SWAVIL1	1.00000
OFGW1GSL	INFTGSL	1.00000	GWAVIL1	1.00000
OFSW2GSL	INFTGSL	1.00000	SWAVIL2	1.00000
OFGW2GSL	INFTGSL	1.00000	GWAVIL2	1.00000
OFSW3GSL	INFTGSL	1.00000	SWAVIL3	1.00000
OFGW3GSL	INFTGSL	1.00000	GWAVIL3	1.00000
OFSW4GSL	INFTGSL	1.00000	SWAVIL4	1.00000
OFGW4GSL	INFTGSL	1.00000	GWAVIL4	1.00000
EVLFCAG1	EVLOSS1	-1.00000		
EVLFCAG2	EVLOSS2	-1.00000		
EVLFCAG3	EVLOSS3	-1.00000		
EVLFCAG4	EVLOSS4	-1.00000		
EVLFCAG5	EVLOSS5	-1.00000		
EVLFCAG6	EVLOSS6	-1.00000		
EVLFCAG7	EVLOSS7	-1.00000		
EVLFCAG8	EVLOSS8	-1.00000		
EVLFCAG9	EVLOSS9	-1.00000		
EVLFCAG0	EVLOSS0	-1.00000		
OIL3	PROFIT	2.47000	FLOWOL3	1.00000

NGAS3	PROFIT	0.00018	CAPNG3	1.00000
NGAS3	ENWREQ3	5.00000E-13	AUMWREQ3	1.74700E-10
ROIL3	PROFIT	14.91900	CONERI3	-1.00000
ROIL3	CAPRI3	1.00000	ENWREQ3	0.00013
ROIL3	AUMWREQ3	4.36600E-10		
OLRI33	PROFIT	-2.60000	FLOWOL3	1.00000
OLRI33	CONERI3	0.50060		
OLRI34	PROFIT	-3.44000	FLOWOL3	1.00000
OLRI34	CONERI4	0.50060		
OLRI37	PROFIT	-4.09000	FLOWOL3	1.00000
OLRI37	CONERI7	0.50060		
OLRI38	PROFIT	-5.31000	FLOWOL3	1.00000
OLRI38	CONERI8	0.50060		
TOTALOL3	FLOWOL3	-1.00000	CAPOL3	1.00000
TOTALOL3	ENWREQ3	0.00005	AUMWREQ3	2.61900E-10
ELEC4	PROFIT	5.34000	CONEEL4	-1.00000
ELEC4	CAPEL4	1.00000	ENWREQ4	0.00126
ELEC4	AUMWREQ4	9.43600E-08		
ROIL4	PROFIT	14.91900	CONERI4	-1.00000
ROIL4	CAPRI4	1.00000	ENWREQ4	0.00013
ROIL4	AUMWREQ4	4.36600E-10		
ELEC6	PROFIT	8.57900	CONEEL6	-1.00000
ELEC6	CAPEL6	1.00000	ENWREQ6	0.00126
ELEC6	AUMWREQ6	9.43600E-08		
COAL7	PROFIT	4.02000	FLOWCL7	1.00000
OIL7	PROFIT	5.36000	FLOWOL7	1.00000
TAR7	PROFIT	2.14000	FLOWT87	1.00000
SHAL7	PROFIT	1.45000	FLOWSH7	1.00000
NGAS7	PROFIT	0.00020	CAPNG7	1.00000
NGAS7	ENWREQ7	5.00000E-13	AUMWREQ7	1.74700E-10
CGAS7	PROFIT	0.00014	CONECG7	-1.00000
CGAS7	CAPCG7	1.00000	ENWREQ7	4.80000E-10
CGAS7	AUMWREQ7	7.58600E-10		
LIQU7	PROFIT	1.21400	FLOWLQ7	1.00000
ROIL7	PROFIT	14.91900	CONERI7	-1.00000
ROIL7	CAPRI7	1.00000	ENWREQ7	0.00013
ROIL7	AUMWREQ7	4.36600E-10		
CLCG77	FLOWCL7	1.00000	CONECG7	15247.83000
CLCG78	PROFIT	-4.95000	FLOWCL7	1.00000
CLCG78	CONECG8	15247.83000		
CLLQ77	FLOWCL7	1.00000	CONELQ7	2.50120
CLLQ78	PROFIT	-7.63000	FLOWCL7	1.00000
CLLQ78	CONELQ8	2.50120		
CLEL74	PROFIT	-5.21500	FLOWCL7	1.00000
CLEL74	CONEEL4	2.93610		
CLEL76	PROFIT	-9.73000	FLOWCL7	1.00000
CLEL76	CONEEL6	2.93610		
CLEL78	PROFIT	-3.62000	FLOWCL7	1.00000
CLEL78	CONEEL8	2.93610		
OLRI73	PROFIT	-3.54000	FLOWOL7	1.00000
OLRI73	CONERI3	0.50060		
OLRI74	PROFIT	-3.54000	FLOWOL7	1.00000
OLRI74	CONERI4	0.50060		
OLRI77	PROFIT	-2.60000	FLOWOL7	1.00000
OLRI77	CONERI7	0.50060		
OLRI78	PROFIT	-4.59000	FLOWOL7	1.00000

OLRI78	CONERI8	0.50060		
TSRI73	PROFIT	-7.99000	FLOWTS7	1.00000
TSRI73	CONERI3	0.50060		
TSRI74	PROFIT	-7.99000	FLOWTS7	1.00000
TSRI74	CONERI4	0.50060		
TSRI77	FLOWTS7	1.00000	CONERI7	0.50060
TSRI78	PROFIT	-9.04000	FLOWTS7	1.00000
TSRI78	CONERI8	0.50060		
SHRI73	PROFIT	-5.37000	FLOWSH7	1.00000
SHRI73	CONERI3	0.50060		
SHRI74	PROFIT	-5.37000	FLOWSH7	1.00000
SHRI74	CONERI4	0.50060		
SHRI77	PROFIT	-4.25000	FLOWSH7	1.00000
SHRI77	CONERI7	0.50060		
SHRI78	PROFIT	-6.72000	FLOWSH7	1.00000
SHRI78	CONERI8	0.50060		
LQRI73	PROFIT	-6.89900	FLOWLQ7	1.00000
LQRI73	CONERI3	0.50060		
LQRI74	PROFIT	-6.89900	FLOWLQ7	1.00000
LQRI74	CONERI4	0.50060		
LQRI77	PROFIT	-4.25000	FLOWLQ7	1.00000
LQRI77	CONERI7	0.50060		
LQRI78	PROFIT	-6.72000	FLOWLQ7	1.00000
LQRI78	CONERI8	0.50060		
TOTALCL7	FLOWCL7	-1.00000	CAPCL7	1.00000
TOTALCL7	ENWREQ7	0.00005	AUMWREQ7	7.75600E-09
TOTALOL7	FLOWOL7	-1.00000	CAPOL7	1.00000
TOTALOL7	ENWREQ7	0.00005	AUMWREQ7	2.61900E-10
TOTALTS7	FLOWTS7	-1.00000	CAPTS7	1.00000
TOTALTS7	ENWREQ7	0.00006	AUMWREQ7	1.12390E-09
TOTALSH7	FLOWSH7	-1.00000	CAPSH7	1.00000
TOTALSH7	ENWREQ7	0.00046	AUMWREQ7	1.70300E-08
TOTALLQ7	FLOWLQ7	-1.00000	CONELQ7	-1.00000
TOTALLQ7	CAPLQ7	1.00000	ENWREQ7	0.00054
TOTALLQ7	AUMWREQ7	2.43300E-08		
COAL8	PROFIT	4.94000	FLOWCL8	1.00000
OIL8	PROFIT	5.55000	FLOWOL8	1.00000
TAR8	PROFIT	2.14000	FLOWTS8	1.00000
NGAS8	PROFIT	-0.00001	CAPNG8	1.00000
NGAS8	ENWREQ8	5.00000E-13	AUMWREQ8	1.74700E-10
CGAS8	PROFIT	0.00014	CONECG8	-1.00000
CGAS8	CAPCG8	1.00000	ENWREQ8	4.80000E-10
CGAS8	AUMWREQ8	7.58600E-10		
LIQU8	PROFIT	1.21400	FLOWLQ8	1.00000
ELEC8	PROFIT	10.82000	CONEEL8	-1.00000
ELEC8	CAPEL8	1.00000	ENWREQ8	0.00126
ELEC8	AUMWREQ8	9.43600E-09		
ROIL8	PROFIT	14.91900	CONERI8	-1.00000
ROIL8	ENWREQ8	0.00013	AUMWREQ8	6.43800E-09
CLCG87	PROFIT	-6.54000	FLOWCL8	1.00000
CLCG87	CONECG7	15247.82500		
CLCG88	FLOWCL8	1.00000	CONECG8	15247.82500
CLCG89	PROFIT	-7.56000	FLOWCL8	1.00000
CLCG89	CONECG9	15247.82500		
CLLQ87	PROFIT	-6.54000	FLOWCL8	1.00000
CLLQ87	CONELQ7	2.50120		

CLLQ88	FLOWCL8	1.00000	CONELQ8	2.50120
CLLQ89	PROFIT	-7.56000	FLOWCL8	1.00000
CLLQ89	CONELQ9	2.50120		
CLEL84	PROFIT	-4.15000	FLOWCL8	1.00000
CLEL84	CONEEL4	2.93610		
CLEL86	PROFIT	-9.04000	FLOWCL8	1.00000
CLEL86	CONEEL6	2.93610		
CLEL88	FLOWCL8	1.00000	CONEEL8	2.93610
CLEL89	PROFIT	-7.56000	FLOWCL8	1.00000
CLEL89	CONEEL9	2.93610		
OLRI83	PROFIT	-3.97000	FLOWOL8	1.00000
OLRI83	CONERI3	0.50060		
OLRI84	PROFIT	-3.97000	FLOWOL8	1.00000
OLRI84	CONERI4	0.50060		
OLRI87	PROFIT	-4.03000	FLOWOL8	1.00000
OLRI87	CONERI7	0.50060		
OLRI88	PROFIT	-2.60000	FLOWOL8	1.00000
OLRI88	CONERI8	0.50060		
TSRI83	PROFIT	-8.85000	FLOWTS8	1.00000
TSRI83	CONERI3	0.50060		
TSRI84	PROFIT	-8.85000	FLOWTS8	1.00000
TSRI84	CONERI4	0.50060		
TSRI87	PROFIT	-8.87000	FLOWTS8	1.00000
TSRI87	CONERI7	0.50060		
TSRI88	PROFIT	-7.05000	FLOWTS8	1.00000
TSRI88	CONERI8	0.50060		
LQRI83	PROFIT	-8.50900	FLOWLQ8	1.00000
LQRI83	CONERI3	0.50060		
LQRI84	PROFIT	-8.50900	FLOWLQ8	1.00000
LQRI84	CONERI4	0.50060		
LQRI87	PROFIT	-8.35900	FLOWLQ8	1.00000
LQRI87	CONERI7	0.50060		
LQRI88	PROFIT	-6.06900	FLOWLQ8	1.00000
LQRI88	CONERI8	0.50060		
TOTALCL8	FLOWCL8	-1.00000	CAPCL8	1.00000
TOTALCL8	ENWREQ8	0.00005	AUMWREQ8	7.75600E-09
TOTALOL8	FLOWOL8	-1.00000	CAPOL8	1.00000
TOTALOL8	ENWREQ8	0.00005	AUMWREQ8	2.61900E-10
TOTALTS8	FLOWTS8	-1.00000	CAPTS8	1.00000
TOTALTS8	ENWREQ8	0.00006	AUMWREQ8	1.12390E-09
TOTALLQ8	FLOWLQ8	-1.00000	CONELQ8	-1.00000
TOTALLQ8	CAPLQ8	1.00000	ENWREQ8	0.00054
TOTALLQ8	AUMWREQ8	2.43300E-08		
COAL9	PROFIT	4.81000	FLOWCL9	1.00000
OIL9	PROFIT	5.57200	FLOWOL9	1.00000
TAR9	PROFIT	2.14000	FLOWTS9	1.00000
NGAS9	PROFIT	0.00021	CAPNG9	1.00000
NGAS9	ENWREQ9	5.00000E-13	AUMWREQ9	1.74700E-10
CGAS9	PROFIT	0.00014	CONECG9	-1.00000
CGAS9	CAPCG9	1.00000	ENWREQ9	4.80000E-10
CGAS9	AUMWREQ9	7.58600E-10		
LIQU9	PROFIT	1.21400	FLOWLQ9	1.00000
ELEC9	PROFIT	11.91000	CONEEL9	-1.00000
ELEC9	CAPEL9	1.00000	ENWREQ9	0.00126
ELEC9	AUMWREQ9	9.43600E-09		
CLCG97	PROFIT	-12.11000	FLOWCL9	1.00000

CLCG97	CONECG7	15247.82500		
CLCG98	PROFIT	-4.16000	FLOWCL9	1.00000
CLCG98	CONECG8	15247.82500		
CLCG99	FLOWCL9	1.00000	CONECG9	15247.82500
CLLQ97	PROFIT	-12.11000	FLOWCL9	1.00000
CLLQ97	CONELQ7	2.50120		
CLLQ98	PROFIT	-4.16000	FLOWCL9	1.00000
CLLQ98	CONELQ8	2.50120		
CLLQ99	FLOWCL9	1.00000	CONELQ9	2.50120
CLEL94	PROFIT	-9.63000	FLOWCL9	1.00000
CLEL94	CONEEL4	2.93610		
CLEL96	PROFIT	-4.90000	FLOWCL9	1.00000
CLEL96	CONEEL6	2.93610		
CLEL98	PROFIT	-1.93000	FLOWCL9	1.00000
CLEL98	CONEEL8	2.93610		
CLEL99	FLOWCL9	1.00000	CONEEL9	2.93610
CLEL90	PROFIT	-6.44000	FLOWCL9	1.00000
CLEL90	CONEEL0	2.93610		
OLRI93	PROFIT	-6.35000	FLOWOL9	1.00000
OLRI93	CONERI3	0.50060		
OLRI94	PROFIT	-6.35000	FLOWOL9	1.00000
OLRI94	CONERI4	0.50060		
OLRI97	PROFIT	-5.97000	FLOWOL9	1.00000
OLRI97	CONERI7	0.50060		
OLRI98	PROFIT	-4.95000	FLOWOL9	1.00000
OLRI98	CONERI8	0.50060		
TSRI93	PROFIT	-9.63000	FLOWTS9	1.00000
TSRI93	CONERI3	0.50060		
TSRI94	PROFIT	-9.63000	FLOWTS9	1.00000
TSRI94	CONERI4	0.50060		
TSRI97	PROFIT	-9.31000	FLOWTS9	1.00000
TSRI97	CONERI7	0.50060		
TSRI98	PROFIT	-8.29000	FLOWTS9	1.00000
TSRI98	CONERI8	0.50060		
LQRI93	PROFIT	-8.90900	FLOWLQ9	1.00000
LQRI93	CONERI3	0.50060		
LQRI94	PROFIT	-8.92900	FLOWLQ9	1.00000
LQRI94	CONERI4	0.50060		
LQRI97	PROFIT	-9.36900	FLOWLQ9	1.00000
LQRI97	CONERI7	0.50060		
LQRI98	PROFIT	-7.76900	FLOWLQ9	1.00000
LQRI98	CONERI8	0.50060		
TOTALCL9	FLOWCL9	-1.00000	CAPCL9	1.00000
TOTALCL9	ENWREQ9	0.00005	AUMWREQ9	7.75600E-09
TOTALOL9	FLOWOL9	-1.00000	CAPOL9	1.00000
TOTALOL9	ENWREQ9	0.00005	AUMWREQ9	2.61900E-10
TOTALTS9	FLOWTS9	-1.00000	CAPTS9	1.00000
TOTALTS9	ENWREQ9	0.00006	AUMWREQ9	1.12390E-09
TOTALLQ9	FLOWLQ9	-1.00000	CONELQ9	-1.00000
TOTALLQ9	CAPLQ9	1.00000	ENWREQ9	0.00054
TOTALLQ9	AUMWREQ9	2.43300E-08		
COAL0	PROFIT	5.23000	FLOWCL0	1.00000
SLUR0	PROFIT	5.38000	CONESL0	-1.00000
SLUR0	CAPSL0	1.00000	ENWREQ0	0.00080
SLUR0	AUMWREQ0	2.43750E-10		
ELEC0	PROFIT	11.91000	CONEEL0	-1.00000

ELEC0	CAPEL0	1.00000	ENWREQ0	0.00126
ELEC0	AUMWREQ0	9.43600E-09		
CLCG08	PROFIT	-6.65000	FLOWCL0	1.00000
CLCG08	CONECG8	15247.82500		
CLCG09	PROFIT	-3.88000	FLOWCL0	1.00000
CLCG09	CONECG9	15247.82500		
CLLQ08	CONELQ8	15247.82500	PROFIT	-6.65000
CLLQ08	FLOWCL0	1.00000		
CLLQ09	PROFIT	-3.38000	FLOWCL0	1.00000
CLLQ09	CONELQ9	15247.82500		
CLEL04	PROFIT	-8.71000	FLOWCL0	1.00000
CLEL04	CONEEL4	2.93610		
CLEL06	PROFIT	-1.79000	FLOWCL0	1.00000
CLEL06	CONEEL6	2.93610		
CLEL08	PROFIT	-2.35000	FLOWCL0	1.00000
CLEL08	CONEEL8	2.93610		
CLEL09	PROFIT	-3.54000	FLOWCL0	1.00000
CLEL09	CONEEL9	2.93610		
CLEL00	FLOWCL0	1.00000	CONEEL0	2.93610
CLSL00	FLOWCL0	1.00000	CONESL0	0.63460
TOTALCL0	FLOWCL0	-1.00000	CAPCL0	1.00000
TOTALCL0	ENWREQ0	0.00005	AUMWREQ0	7.75600E-09
PSWEN3	PROFIT	-40.97000	ENWREQ3	-1.00000
PSWEN3	SWAVIL3	1.00000	PSWAE3	1.00000
NSWEN3	PROFIT	-120.87000	ENWREQ3	-1.00000
NSWEN3	SWAVIL3	1.00000		
PGWEN3	PROFIT	-61.46000	ENWREQ3	-1.00000
PGWEN3	GWAVIL3	1.00000	PGWAE3	1.00000
NGWEN3	PROFIT	-101.71000	ENWREQ3	-1.00000
NGWEN3	GWAVIL3	1.00000		
NIMEN23	PROFIT	-138.69600	ENWREQ3	-1.00000
NIMEN23	SWAVIL2	1.00000	NIM2T3	1.00000
NIMENUI3	PROFIT	-174.75600	ENWREQ3	-1.00000
NIMENUI3	SWAVIL7	1.00000	NIMU7T3	1.00000
NIMENUI3	NDIUCW	1.00000		
PSWEN4	PROFIT	-40.97200	ENWREQ4	-1.00000
PSWEN4	SWAVIL4	1.00000	PSWAE4	1.00000
NSWEN4	PROFIT	-120.86600	ENWREQ4	-1.00000
NSWEN4	SWAVIL4	1.00000		
PGWEN4	PROFIT	-61.45700	ENWREQ4	-1.00000
PGWEN4	GWAVIL4	1.00000	PGWAE4	1.00000
NGWEN4	PROFIT	-101.71200	ENWREQ4	-1.00000
NGWEN4	GWAVIL4	1.00000		
PIMEN14	PROFIT	-43.22700	ENWREQ4	-1.00000
PIMEN14	SWAVIL1	1.00000	PIM1T4	1.00000
PIMEN34	PROFIT	-41.99200	ENWREQ4	-1.00000
PIMEN34	SWAVIL3	1.00000	NIM3T4	1.00000
PIMEN74	PROFIT	-41.99200	ENWREQ4	-1.00000
PIMEN74	SWAVIL7	1.00000	PIM7T4	1.00000
PIMEN74	NDIUCW	1.00000		
NIMEN34	PROFIT	-162.46600	ENWREQ4	-1.00000
NIMEN34	SWAVIL3	1.00000	PIM3T4	1.00000
NIMENBU4	PROFIT	-161.84600	ENWREQ4	-1.00000
NIMENBU4	SWAVIL7	1.00000	NDIUCW	1.00000
NIMENUI4	PROFIT	-167.99600	ENWREQ4	-1.00000
NIMENUI4	SWAVIL7	1.00000	NDIUCW	1.00000

NIMENSA4	PROFIT	-163.89600	ENWREQ4	-1.00000	SWMEN6	EQMWEN6	1.00000	SWAVIL6	1.00000
NIMENSA4	SWAVIL8	1.00000	NIMS8T4	1.00000	SWMEN7	EQMWEN7	1.00000	SWAVIL7	1.00000
NIMENSA4	NDIUCW	1.00000			SWMEN8	EQMWEN8	1.00000	SWAVIL8	1.00000
PSWEN6	PROFIT	-36.87400	ENWREQ6	-1.00000	SWMEN9	EQMWEN9	1.00000	SWAVIL9	1.00000
PSWEN6	SWAVIL6	1.00000	PSWAE6	1.00000	SWMEN0	EQMWEN0	1.00000	SWAVIL0	1.00000
NSWEN6	PROFIT	-106.52600	ENWREQ6	-1.00000	GWMEN3	EQMWEN3	1.00000	GWAVIL3	1.00000
NSWEN6	SWAVIL6	1.00000			GWMEN4	EQMWEN4	1.00000	GWAVIL4	1.00000
PGWEN6	PROFIT	-49.16600	ENWREQ6	-1.00000	GWMEN6	EQMWEN6	1.00000	GWAVIL6	1.00000
PGWEN6	GWAVIL6	1.00000	PGWAE6	1.00000	GWMEN7	EQMWEN7	1.00000	GWAVIL7	1.00000
NGWEN6	PROFIT	-86.55300	ENWREQ6	-1.00000	GWMEN0	EQMWEN0	1.00000	GWAVIL0	1.00000
NGWEN6	GWAVIL6	1.00000			RHS				
PIMEN06	PROFIT	-37.89400	ENWREQ6	-1.00000	RHS1	PILND11	3100.00000	PILND21	15300.00000
PIMEN06	SWAVIL0	1.00000	PIMOT6	1.00000	RHS1	PILND31	21600.00000	PCLND41	47600.00000
NIMEN56	PROFIT	-132.34600	ENWREQ6	-1.00000	RHS1	POILND11	98900.00000	POILND21	4.87300E 05
NIMEN56	SWAVIL5	1.00000	NIM5T6	1.00000	RHS1	POILND31	6.11000E 05	POCLND41	1.67640E 06
NIMEN06	PROFIT	-144.02600	ENWREQ6	-1.00000	RHS1	PILND12	13600.00000	PILND22	75000.00000
NIMEN06	SWAVIL0	1.00000	NIMOT6	1.00000	RHS1	PILND32	78400.00000	PCLND42	2.46000E 05
PSWEN7	PROFIT	-36.87400	ENWREQ7	-1.00000	RHS1	POILND12	14900.00000	POILND22	78000.00000
PSWEN7	SWAVIL7	1.00000	PSWAE7	1.00000	RHS1	POILND32	68400.00000	POCLND42	2.89000E 05
PSWEN7	NDIUCW	1.00000			RHS1	PILND13	29400.00000	PILND23	51900.00000
NSWEN7	PROFIT	-106.52600	ENWREQ7	-1.00000	RHS1	PILND33	56200.00000	PCLND43	1.69700E 05
NSWEN7	SWAVIL7	1.00000	NDIUCW	1.00000	RHS1	POILND13	700.00000	POILND23	8000.00000
PGWEN7	PROFIT	-49.16600	ENWREQ7	-1.00000	RHS1	POILND33	21800.00000	POCLND43	56700.00000
PGWEN7	GWAVIL7	1.00000			RHS1	PILND14	17500.00000	PILND24	58900.00000
NGWEN7	PROFIT	-86.55300	ENWREQ7	-1.00000	RHS1	PILND34	88400.00000	PCLND44	2.24600E 05
NGWEN7	GWAVIL7	1.00000			RHS1	POILND14	24500.00000	POILND24	92400.00000
PSWEN8	PROFIT	-45.06900	ENWREQ8	-1.00000	RHS1	POILND34	1.00600E 05	POCLND44	2.96700E 05
PSWEN8	SWAVIL8	1.00000	PSWAE8	1.00000	RHS1	PILND25	1.86300E 05	PILND35	85900.00000
PSWEN8	NDIUCW	1.00000			RHS1	PCLND45	2.98000E 05	POILND25	2.21900E 05
NSWEN8	PROFIT	-137.25500	ENWREQ8	-1.00000	RHS1	POILND35	3.08100E 05	POCLND45	9.76000E 05
NSWEN8	SWAVIL8	1.00000	NDIUCW	1.00000	RHS1	PILND16	300.00000	PILND26	49300.00000
PSWEN9	PROFIT	-40.97200	ENWREQ9	-1.00000	RHS1	PILND36	21900.00000	PCLND46	80000.00000
PSWEN9	SWAVIL9	1.00000	PSWAE9	1.00000	RHS1	POILND16	200.00000	POILND26	2.33500E 05
PSWEN9	NDIUCW	1.00000			RHS1	POILND36	2.74100E 05	POCLND46	8.52500E 05
NSWEN9	PROFIT	-120.86600	ENWREQ9	-1.00000	RHS1	PILND27	56100.00000	PILND37	83000.00000
NSWEN9	SWAVIL9	1.00000	NDIUCW	1.00000	RHS1	PCLND47	2.17800E 05	POILND27	99300.00000
PSWEN0	PROFIT	-40.97200	ENWREQ0	-1.00000	RHS1	POILND37	1.33400E 05	POCLND47	3.20200E 05
PSWEN0	SWAVIL0	1.00000	PSWAE0	1.00000	RHS1	PILND18	1000.00000	PILND28	28700.00000
NSWEN0	PROFIT	-120.86600	ENWREQ0	-1.00000	RHS1	PILND38	42100.00000	PCLND48	94900.00000
NSWEN0	SWAVIL0	1.00000			RHS1	POILND18	2500.00000	POILND28	1.12800E 05
PGWEN0	PROFIT	-49.16600	ENWREQ0	-1.00000	RHS1	POILND38	1.18800E 05	POCLND48	2.99900E 05
PGWEN0	GWAVIL0	1.00000			RHS1	PILND19	1000.00000	PILND29	2100.00000
NGWEN0	PROFIT	-86.55300	ENWREQ0	-1.00000	RHS1	PILND39	12700.00000	PCLND49	19000.00000
NGWEN0	GWAVIL0	1.00000			RHS1	POILND19	5400.00000	POILND29	1.32000E 05
AUMWEN3	AUMWREQ3	-1.00000	EQMWEN3	-1.00000	RHS1	POILND39	2.90000E 05	POCLND49	5.33400E 05
AUMWEN4	AUMWREQ4	-1.00000	EQMWEN4	-1.00000	RHS1	PILND10	3200.00000	PILND20	11900.00000
AUMWEN6	AUMWREQ6	-1.00000	EQMWEN6	-1.00000	RHS1	PILND30	5200.00000	PCLND40	21000.00000
AUMWEN7	AUMWREQ7	-1.00000	EQMWEN7	-1.00000	RHS1	POILND10	7800.00000	POILND20	37600.00000
AUMWEN7	NDIUCW	1.00000			RHS1	POILND30	1.03400E 05	POCLND40	2.44100E 05
AUMWEN8	AUMWREQ8	-1.00000	EQMWEN8	-1.00000	RHS1	SWAVIL1	6.13000E 05	GWAVIL1	1.84000E 05
AUMWEN8	NDIUCW	1.00000			RHS1	SWAVIL2	9.33000E 05	GWAVIL2	94000.00000
AUMWEN9	AUMWREQ9	-1.00000	EQMWEN9	-1.00000	RHS1	SWAVIL3	7.68000E 05	GWAVIL3	62000.00000
AUMWEN9	NDIUCW	1.00000			RHS1	SWAVIL4	5.39000E 05	GWAVIL4	1.27000E 05
AUMWEN0	AUMWREQ0	-1.00000	EQMWEN0	-1.00000	RHS1	SWAVIL5	4.10000E 05	GWAVIL5	3.35000E 05
SWMEN3	EQMWEN3	1.00000	SWAVIL3	1.00000	RHS1	SWAVIL6	79000.00000	GWAVIL6	1.27000E 05
SWMEN4	EQMWEN4	1.00000	SWAVIL4	1.00000	RHS1	SWAVIL7	5.16200E 06	GWAVIL7	40000.00000

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RHS1        SWAVIL8       5.70240E 06     SWAVIL9       2.38000E 06
RHS1        SWAVIL0       2.49000E 05     GWAVIL0       10000.00000
RHS1        WETLREQ1      7.15000E 05     WETLREQ2      2.40000E 05
RHS1        WETLREQ3      1.43000E 05     WETLREQ4      2.76000E 05
RHS1        WETLREQ5      3.33000E 05     WETLREQ6      1.30000E 05
RHS1        WETLREQ7      3.15000E 05     WETLREQ8      36000.00000
RHS1        WETLREQ9       8000.00000     WETLREQ0      19000.00000
RHS1        INFTGSL       1.08600E 06     FRUITAC1        630.00000
RHS1        FRUITAC2       1633.00000     FRUITAC3       1422.00000
RHS1        FRUITAC4       8021.00000     FRUITAC0        383.00000
RHS1        PSWAE3        6.10500E 05     PGWAE3        32900.00000
RHS1        NIM2T3        1.30000E 05     NIMU7T3       20000.00000
RHS1        PSWAE4        7.13500E 05     PGWAE4        83200.00000
RHS1        PIM1T4        10000.00000     PIM3T4        71000.00000
RHS1        PIM7T4        1.01300E 05     NIM3T4        1.46000E 05
RHS1        NIMS8T4       15000.00000     PSWAE6        1.36100E 05
RHS1        PGWAE6        1.63900E 05     PIM0T6         3000.00000
RHS1        NIM5T6        60000.00000     NIM0T6        47000.00000
RHS1        PSWAE7        7.89100E 05     PSWAE8        3.03000E 05
RHS1        PSWAE9        1.46400E 05     PSWAE0        68000.00000
RHS1        CAPOL3        7.36419E 05     CAPNG3        3.29020E 09
RHS1        CAPRI3        1.66070E 07     CAPEL4        2.04900E 06
RHS1        CAPRI4        3.94200E 07     CAPEL6        65700.00000
RHS1        CAPCL7        3.42520E 07     CAPOL7        1.37480E 07
RHS1        CAPNG7        3.83102E 10     CAPCG7        9.12500E 10
RHS1        CAPRI7        2.73750E 06     CAPCL8        2.35917E 08
RHS1        CAPOL8        1.69950E 06     CAPNG8        4.11700E 08
RHS1        CAPCG8        9.12500E 10     CAPEL8        6.39567E 07
RHS1        CAPCL9        4.12177E 07     CAPOL9        2.86400E 06
RHS1        CAPNG9        3.59926E 10     CAPCG9        9.12500E 10
RHS1        CAPEL9        2.62800E 07     CAPCL0        3.77350E 07
RHS1        CAPSL0        1.00000E 07     CAPEL0        4.38000E 06
RHS1        NDIUCW        1.53200E 06     CAPTS7        3.90695E 08
RHS1        CAPSH7        6.00000E 09     CAPLQ7        3.65000E 07
RHS1        CAPTS8        3.84422E 08     CAPLQ8        3.65000E 07
RHS1        CAPTS9        9.25200E 07     CAPLQ9        3.65000E 07
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BOUNDS
 LO BONDX     WETLREG1     1.62200E 05
 UP BONDX     PSWAG1       1.04900E 05
 UP BONDX     PGWAG1       19100.00000
 UP BONDX     NIMAG2T1     90000.00000
 LO BONDX     WETLREG2     95850.00000
 UP BONDX     PSWAG2       9.96000E 05
 UP BONDX     PGWAG2       19000.00000
 UP BONDX     PIMAG3T2     19000.00000
 LO BONDX     WETLREG3     19535.00000
 UP BONDX     PSWAG3       6.10500E 05
 UP BONDX     PGWAG3       32900.00000
 UP BONDX     NIMAU7T3     20000.00000
 UP BONDX     NIMAG2T3     1.30000E 05
 LO BONDX     WETLREG4     56065.00000
 UP BONDX     PSWAG4       7.13500E 05
 UP BONDX     PGWAG4       83200.00000
 UP BONDX     PIMAG1T4     10000.00000
 UP BONDX     PIMAG3T4     71000.00000
 UP BONDX     PIMAG7T4     1.01300E 05
 UP BONDX     NIMAG3T4     1.46000E 05
 UP BONDX     NIMAS8T4     15000.00000
 LO BONDX     WETLREG5     1.58009E 05
 UP BONDX     PSWAG5       8.79300E 05
 UP BONDX     PGWAG5       1.27600E 05
 UP BONDX     PIMAG8T5     11000.00000
 UP BONDX     NIMAG4T5     69000.00000
 UP BONDX     NIMA87T5     29000.00000
 UP BONDX     NIMAU7T5     57000.00000
 LO BONDX     WETLREG6     27320.00000
 UP BONDX     PSWAG6       1.36100E 05
 UP BONDX     PGWAG6       1.63900E 05
 UP BONDX     PIMAG0T6      3000.00000
 UP BONDX     NIMAG5T6     60000.00000
 UP BONDX     NIMAG0T6     47000.00000
 LO BONDX     WETLREG7          .
 UP BONDX     PSWAG7       7.89100E 05
 FX BONDX     PGWAG7            .
 LO BONDX     OUTFSW78     1.00000E 05
 UP BONDX     PSWAG8       3.03000E 05
 LO BONDX     OUTFSW89     1.00000E 05
 UP BONDX     PSWAG9       1.46400E 05
 UP BONDX     PIMAG5T9      3600.00000
 LO BONDX     OUTFSW9L     7.55000E 06
 LO BONDX     WETLREG0     10000.00000
 UP BONDX     PSWAG0       68000.00000
 FX BONDX     PGWAG0            .
 LO BONDX     OFSW1GSL      7000.00000
 LO BONDX     OFGW1GSL      6000.00000
 LO BONDX     OFSW2GSL     50000.00000
 LO BONDX     OFGW2GSL      5000.00000
 LO BONDX     OFSW3GSL     50000.00000
 LO BONDX     OFGW3GSL     25000.00000
 LO BONDX     OFSW4GSL     50000.00000
 LO BONDX     OFGW4GSL      8000.00000
ENDATA
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