

## CHAPTER VI

### PRELIMINARY DESIGN

#### Proposed Water Production Facilities

Based on the water supply plan, water production facilities, i.e., tubewell, transmission line, discharge tank, booster pump and distribution tank are designed according to the following design parameters.

#### 6.1 Tubewell

- a. Diameter of well :  $\phi$  300 mm  
Depth of well : 300 - 350m
- b. Type of pump : Submersible pump
- c. Diameter of riser :  $\phi$  150 mm  
pipe
- d. Production : 30 lit./sec (= 1.8 m<sup>3</sup>/min)
- e. Electric power : AC 460 V, 60 Hz
- f. Operation method : Remote control operation

#### (1) Design of tubewells

##### 1) Calculation of pump head loss

Pump head is calculated by the following formula,

$$h_a = f \times \frac{L}{D} \times \left(\frac{v^2}{2g}\right) \times 1.5$$

where,  $h_a$  : Head of friction loss (m)

$f$  : Friction loss coefficient  
(0.02 + 0.0005/D)

$L$  : Length of riser pipe (210 m)

V : Mean velocity in the riser pipe (1.70 m/sec)

g : Acceleration of gravity (9.8 m/s<sup>2</sup>)

$$h_1 = (0.02 + 0.0005/0.15) \times \frac{210}{0.15} \times \left(\frac{1.72}{2g}\right) \times 1.5$$
$$= 7.225$$

2) Diameter of feeder pipe : ( $\phi$  150 mm)

3) Friction loss of laying pipe ( $\phi$  150 mm, L = 1.0 m)

$$h_2 = (0.02 + 0.0005/0.15) \times \frac{1}{0.15} \times \left(\frac{1.7^2}{2g}\right) \times 1.5$$
$$= 0.034 \text{ (m)}$$

4) Friction loss in feeder pipe which is connected with the main transmission pipe line. ( $\phi$  150 mm, L = 30 m)

$$h_3 = (0.02 + 0.0005/0.15) \times \frac{30}{0.15} \times \left(\frac{1.7^2}{2g}\right) \times 1.5$$
$$= 1.032 \text{ (m)}$$

5) Loss in bent pipe and valves (approximately 10) (t = 1.0)

$$h_4 = 1.0 \times \left(\frac{1.7^2}{2g}\right) = 0.147 \text{ (m)}$$

6) Total head loss

$$H_f = h_1 + h_2 + h_3 + h_4$$
$$= 7.225 + 0.034 + 1.032 + 0.147$$
$$= 8.438 \text{ (m)}$$

7) Total pump head

$$H = 210 + 8.438 = 218.438 \text{ (m)}$$

(2) Power of submersible pump

The power of submersible pumps is calculated by the following formula,

$$P(\text{KW}) = \frac{0.163 \times Q \times H}{\text{pump efficiency}} \times (1 + \text{surplus ratio})$$

where, Q : 1.8 m<sup>3</sup>/min (= 30 lit./sec)

H : 218.44 (m)

Surplus ratio : 20%

Pump efficiency : 63%

$$\begin{aligned} P(\text{KW}) &= \frac{0.163 \times 1.8 \times 218.44}{0.63} \times 1.2 \\ &= 122.01 (\text{KW}) \end{aligned}$$

(3) As mentioned above, the specifications of the submersible pumps for tubewells are as follows;

Diameter of riser pipe : D =  $\phi$  150 mm

Production : 1.8 m<sup>3</sup>/min (= 30 lit./sec)

Pump head : 275 m

Power of submersible pump : 185 KW

## 6.2 Transmission Pipeline

- a. Ductile cast iron pipe
- b. Design velocity

| Diameter     | Design Velocity |
|--------------|-----------------|
| ø75 - 150 mm | 0.7 - 1.0 m/s   |
| 200 - 400    | 0.9 - 1.5       |
| 450 - 800    | 1.2 - 1.8       |

### (1) Head loss

The Hazen - Williams formula is used for the calculation as follows.

$$H_f = 10.666 \times C^{-1.85} \times D^{-4.87} \times Q^{1.85} \times L$$

where,  $H_f$  : Head loss (m)

$C$  : Coefficient of velocity ( $C = 130$ )

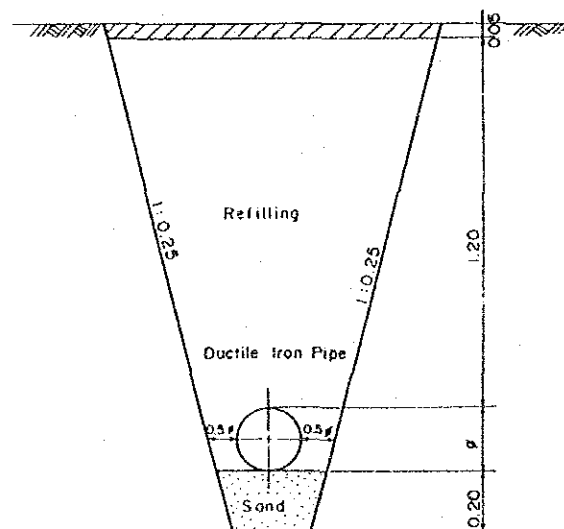
$D$  : Diameter (m)

$Q$  : Production water ( $m^3/sec$ )

$L$  : Pipe length (m)

### (2) Pipe installation

A typical cross section of pipe installation is shown in the following figure,



SECTION OF PIPE INSTALLATION

### 6.3 Discharge Tanks

a.  $V = 30 q$

V : Available storage capacity (m<sup>3</sup>)

q : Discharge (m<sup>3</sup>/min)

For the Project, the five discharge tanks are planned to include one at Campo de Canalitos, three at Campo de Norte and one at Campo de Lavarreda.

As shown in the following table,

| Name of Well Field | Name of Booster Pump Station | Available Storage Capacity |
|--------------------|------------------------------|----------------------------|
| Campo de Canalitos | B.P.6                        | 162 m <sup>3</sup>         |
| Campo de Norte     | B.P.2                        | 126                        |
| - do -             | B.P.5                        | 63                         |
| - do -             | B.P.6                        | 63                         |
| Campo de Lavarreda | B.P.1                        | 63                         |

### 6.4 Booster Pumps

The power of the booster pumps is calculated by the following design factor.

Design factor

- Design discharge: 60 lit./sec = 3.6m<sup>3</sup>/min  
(Canalitos BP-6)

- Head: H = 78m

(1) Power of Booster Pump

$$\begin{aligned} P(\text{KW}) &= \frac{0.163 \times Q \times H}{\text{pump efficiency}} \\ &= \frac{0.163 \times 3.6 \times 78}{0.63} \\ &= 72.77 \text{ (kW)} \doteq 75 \text{ (kW)} \end{aligned}$$

(2) Specification

The specifications of the multi-stage volute pump at B.P.1 are determined as follows.

Diameter of suction pipe :  $\phi$  200mm  
discharge :  $Q = 3.6 \text{ m}^3/\text{min}$   
pump head :  $H = 78.0\text{m}$   
Power of multi-stage volute pump : 75 KW

6.5 Distribution Tanks

In the project, five new distribution tanks shall be constructed in Campo de Canalitos, El Rodeo and Hermosa. Their dimensions are as shown in the following table.

| Name of Well Field | Name of Tank | Available Storage Capacity (V) | Dimensions    | Ground Elevation EL (m) |
|--------------------|--------------|--------------------------------|---------------|-------------------------|
| Compo de Canalitos | San Gaspar * | 2,240 $\text{m}^3$             | 20x20x5.6     | 1,610.00                |
| El Rodeo           | El Rodeo *   | 1,260                          | 15x15x5.6     |                         |
| -do-               | No.3 **      | 25.2                           | 4x4x1.6       | 1,270.00                |
| -do-               | Norte        | 360                            | 8x8x5.6       |                         |
| Hermosa            | Hermosa *    | 2,835                          | 22.5x22.5x5.6 |                         |

Note: \* (V) = Discharge ( $\text{m}^3/\text{hr}$ ) x 7(hr) x 1.25

\*\* Public standpipes

## CHAPTER VII

### ORGANIZATION AND MANAGEMENT

#### 7.1 Organization for Project Execution

The proposed project aims to solve the water service problems at present and for the following several years through groundwater development for 1 m<sup>3</sup>/s. The early implementation of the EMPAGUA plan is urgently required. The project implementation will be executed under the responsibility of EMPAGUA.

The main component of the project is groundwater development plan for 1 m<sup>3</sup>/s and the supply plan for the developed groundwater. Its main project facilities consist of the 38 wells, 34.2km of transmission pipe line, and the associated facilities.

EMPAGUA will be responsible for the execution of the entire project implementation including the following works:

- Detailed design of the project facilities
- Planning and supervision of the construction works
- Land acquisition and other required preliminary works
- Procurement and supply of the main material and equipment
- Procurement and furnishing of funds

For overall execution, EMPAGUA will appoint a Project Manager under the Engineering sub-manager for the implementation of design and construction works.

The appointed Project Manager will be directly responsible for the implementation of the Project and for coordinating the activities of all the relevant agencies within the given level of responsibility under the EMPAGUA's regulations.

The proposed organization chart for the construction stage is presented in FIGURE 7.1.

It is proposed that detailed design of facilities required for project, preliminary works and supervision of implementation to be carried out by the consultant engineering services.

## 7.2 Construction Works

The major construction works are as follows:

- Wells 38 (estimated pump-up volume 1.12 m<sup>3</sup>/s)
- Conveyance pipes 13 systems  
total length of 45,790m (of which 34,180m  
is to be newly laid)
- Tanks At 4 locations
- Booster pumps At 6 locations  
(including spare pumps)
- Electrical lines 22.8km
- O/M Roads 57.5km (of which 3.2km will be newly  
constructed, widening 1.5km)
- O/M Offices At 2 places (situated at existing facility)
- Main Station At 4 places (situated at existing facility)
- Sub-offices At 7 places (of which 3 is newly  
constructed)
- Pump stations 38
- Workshop 1

## 7.3 Implementation Schedule

The implementation period was determined on the basis of such factors as the scale, cost and number of proposed Project facilities, ability of contractors, procurement of materials and labor, and EMPAGUA's capability to finance construction, etc.

The preparatory works such as the preliminary design, the land acquisition and the construction of access roads will be completed within the first year to expedite the commencement and consequent completion of the construction works.

Although the funding capability of EMPAGUA, as well as financial cooperation from Japan, other countries and international financing agencies will be studied before final determination, a total



implementation period of 4 years is tentatively proposed including 1 year for preliminary works and 3 years for construction.

In consideration of Project objectives, facilities to be constructed in a certain year are scheduled to be completed within the same year, and implementation will be phased in order to obtain benefits upon the completion of each construction period.

Moreover, annual target works that must be completed, will be scheduled based on the annual water distribution program.

The time and work schedule will be proposed as shown below:

IMPLEMENTATION SCHEDULE

| Year           | 1987                                                                                 | 1988                                                                                                                         | 1989                                                                                                                        | 1990                                                                                                      |
|----------------|--------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
|                | Pre Project Works                                                                    |                                                                                                                              | Construction Works                                                                                                          |                                                                                                           |
| Work Schedule  | Detailed Design & Survey<br>Preliminary Works<br>Temporary Works<br>Land Acquisition | Well - 13<br>Booster Pump - 1<br>Pipe Line 9,420m<br>Distribution<br>Tank - 2<br>O/M Road<br>Sub Station<br>Land Acquisition | Well-13<br>Booster Pump - 3<br>Pipe Line 13,670m<br>Distribution<br>Tank - 1<br>O/M Road<br>Sub Station<br>Land Acquisition | Well - 12<br>Booster Pump - 2<br>Pipe Line 10,090m<br>Distribution<br>Tank - 2<br>O/M Road<br>Sub Station |
| Canalitos      |                                                                                      |                                                                                                                              |                                                                                                                             |                                                                                                           |
| J.A.           |                                                                                      | -                                                                                                                            | Well-7, B.Pump-1<br>P.Line 7,880m                                                                                           | -                                                                                                         |
| S.L.           |                                                                                      | Well-7<br>P.Line 7,060m                                                                                                      | -                                                                                                                           | -                                                                                                         |
| S.G.           |                                                                                      | -                                                                                                                            | -                                                                                                                           | Well-3, Tank-1<br>P.Line 1,950m                                                                           |
| Norte          |                                                                                      | -                                                                                                                            | Well-3, B.Pump-2<br>P.Line 1,850m                                                                                           | Well-5, B.Pump-2<br>P.Line 4,940m                                                                         |
| Lavarreda      |                                                                                      | Well-2, B.Pump-1<br>P.Line 1,400m                                                                                            | -                                                                                                                           | -                                                                                                         |
| EL Rodeo       |                                                                                      | Well-4, Tank-2<br>P.Line 960m                                                                                                | Well-3, Tank-1<br>P.Line 2,260m                                                                                             | -                                                                                                         |
| Hermosa        |                                                                                      | -                                                                                                                            | -                                                                                                                           | Well-4, Tank-1<br>P.Line 3,260m                                                                           |
| Rehabilitation | Well-22                                                                              |                                                                                                                              |                                                                                                                             |                                                                                                           |

#### 7.4 Material Procurement and Construction Work

The main materials and equipments for the project facilities will be directly procure of on the responsibility of the EMPAGUA and will be supplied to the contractors. The construction works will be executed by international or local contractors contracted through competitive tendering.

Land acquisition for the required facilities and arrangement of the power line will be executed under the responsibility of EMPAGUA.

#### 7.5 Organization for Management and Control

Water produced under the proposed Project will be conducted to the 5-distribution terminal facilities through a transmission system of 7-lines.

Basically, water production, water distribution maintenance of the facilities and equipment are performed under the responsibility of the O/M director of EMPAGUA on the basis of EMPAGUA regulations.

Daily operation and management for the water production, water distribution and maintenance of the facilities and equipments will be carried out the secondary operation office situated at the respective transmission system terminal sites and the 4-Main operation control office situated at the distribution terminal site. The 4-main control offices are under the Las Ilusiones or Santa Luisa Plant offices, depending on the command area for water service. Operation wells of EMPAGUA will be increased at 2-time of the present wells post the proposed Project implementation. Consequently, the staff for the O/M should be supplemented to the optimum and necessary number corresponding facilities.

In addition, to maintain effective operation and maintenance, a new workshop will be created near the newly developed wellfield and will be provided with the equipments. and machine as shown in TABLE 7.1. The proposed organization chart for the O/M of the post project is indicated in FIGURE 7.2.

FIG. 6-1 PROPOSED ORGANIZATION CHART FOR PROJECT EXECUTION

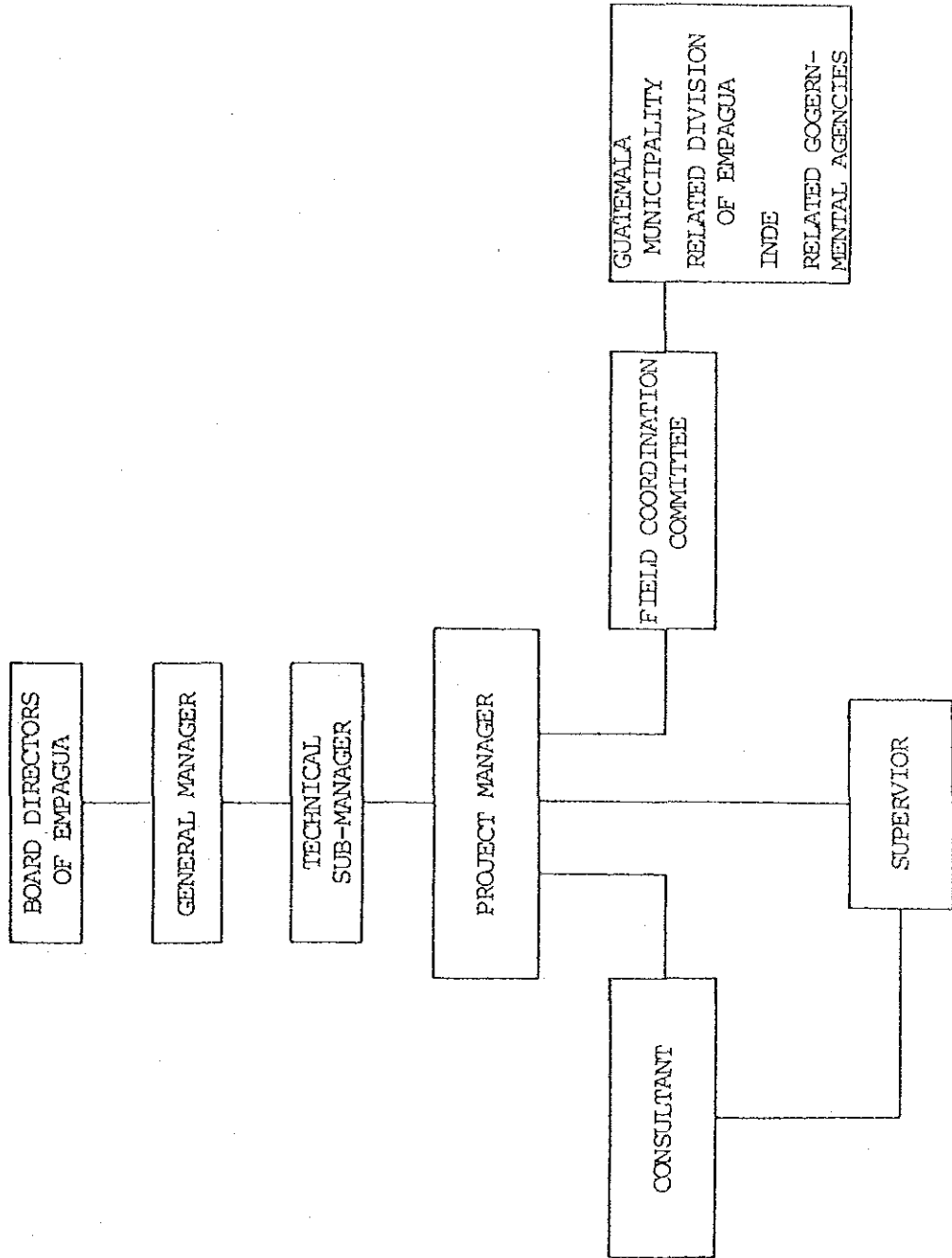
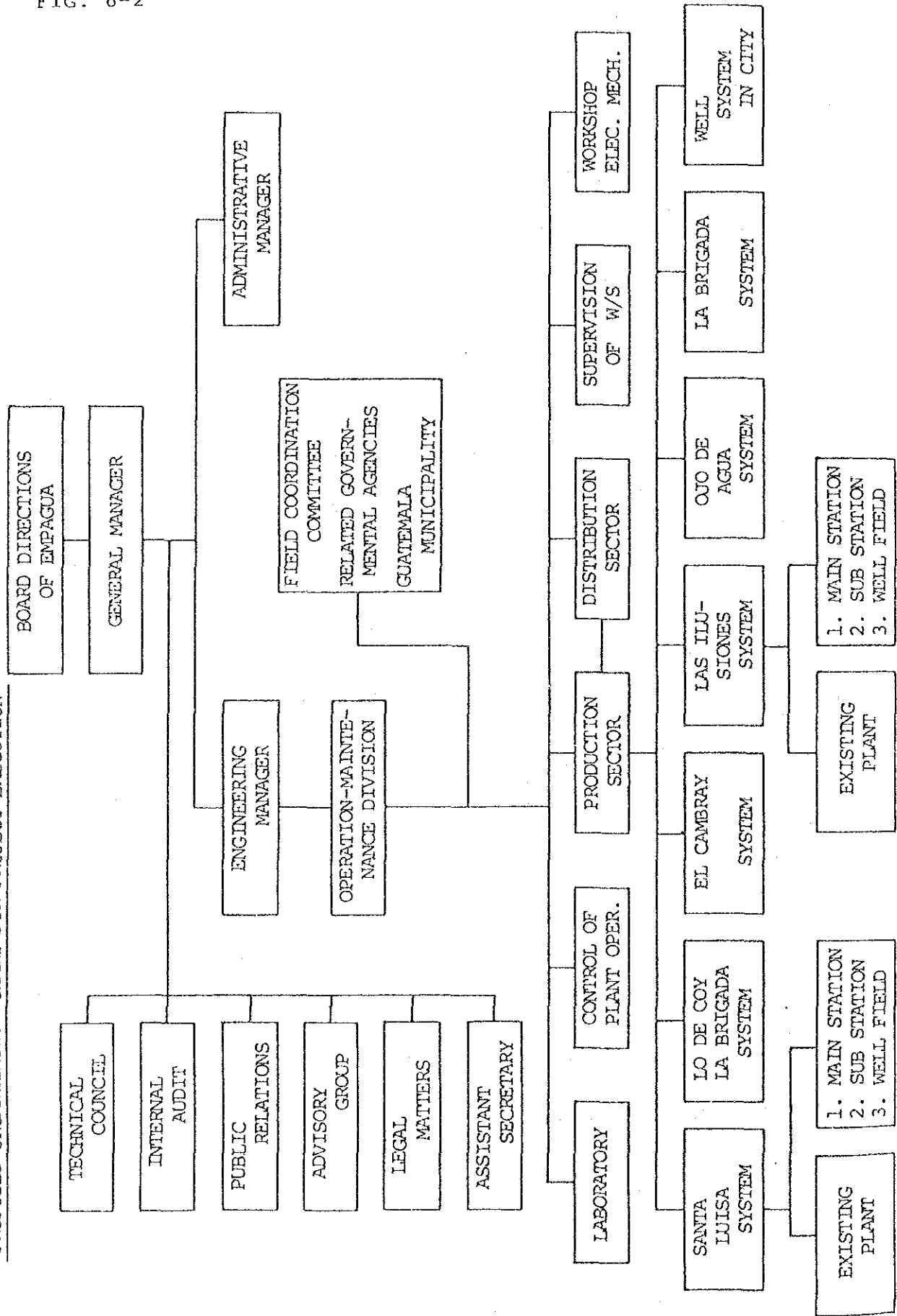


FIG. 6-2

PROPOSED ORGANIZATION CHART FOR PROJECT EXECUTION



## CHAPTER VIII

### COST ESTIMATION

#### 8.1 Outline

The expenses associated with the implementation of this project largely consist of the direct construction expenses, the management expenses, the land acquisition expenses, the technical management expenses and the contingencies with respect to the amount of work and price fluctuations. The financial cost estimation for the project implementation was therefore performed on the basis of the following conditions.

- (1) Prices for December, 1985 were used for the financial evaluation.
- (2) The following exchange rate was used.  
US\$1 = 1 Quetzal
- (3) The construction works are to be implemented on the basis of competitive bidding between international and domestic contractors.
- (4) The materials expenses associated with the construction work are to be directly purchased by EMPAGUA which is the implementing body, and the procured and supplied to the contractors.
- (5) The contingencies are regarded as 10% of the direct works expenses and the price contingencies are estimated as follows according to the LC and FC portions of the project for each year.

| Year | FC        | LC        |
|------|-----------|-----------|
| 1987 | 2,304,995 | 1,676,041 |
| 1988 | 6,802,767 | 3,287,291 |
| 1989 | 8,343,786 | 3,406,073 |
| 1990 | 7,199,934 | 2,688,319 |

## 8.2 Work Expenses

The expenses for the implementation of this project were calculated for December, 1985 prices as shown TABLE 8.1. The financial expenses were Q 35,709,206, and the breakdown of this gives Q 11,057,724 (31%) for the local currency portion and Q 24,651,482 (69%) for the external currency portion. The breakdown of the project expensed as shown in TABLE 8.2 - 8.8.

## 8.3 Land Acquisition Expenses

The purchase, acquisition and lease of the land necessary for the project is all number the charge of EMPAGUA. The financial expenses Total for the local currency portion were Q 1,022,525.

## 8.4 Maintenance and Management Expenses

The maintenance and management expenses are composed of the personnel expenses, the machine and equipment depreciation expenses, the vehicle and office running expenses, and the expenses for consumables, etc. The maintenance and management expenses were calculated on the basis of the works organization indicated in FIG. 8.1. The annual maintenance and management expenses amount to Q 6,359,119 and represent approximately 18% of the direct project expenses.

## 8.5 Existing Well Rehabilitation Expenses

The expenses for the replacement of lift pumps, cables, control panels and other equipment for the rehabilitation of the 57 existing wells, were incorporated into the calculations.

TABLE 8.1

Financial Cost

(Unit: Quetzal)

|                                         | Foreign    | Local      | Total      |
|-----------------------------------------|------------|------------|------------|
| 1. Production system                    | 9,241,725  | 1,415,441  | 10,657,166 |
| 2. Water Supply System                  | 4,083,072  | 1,695,223  | 5,778,295  |
| 3. O/M Facilities                       | 2,872,750  | 695,271    | 3,568,021  |
| 4. Rehabilitation                       | 1,191,100  | 159,190    | 1,350,290  |
| 5. Power Supply System                  | 2,490,201  | 396,433    | 2,886,634  |
| 6. Monitoring System                    | 275,240    | 40,300     | 315,540    |
| 7. Preparation                          | -          | 220,093    | 220,093    |
| Direct Construction Cost<br>(Sub Total) | 20,154,088 | 4,621,951  | 24,776,039 |
| 8. Administration &<br>Engineering      | 2,256,350  | 4,408,000  | 6,664,350  |
| 9. Land Acquisition                     | -          | 1,022,525  | 1,022,525  |
| Sub Total                               | 22,410,438 | 10,052,476 | 32,462,914 |
| 10. Physical Contingencies              | 2,241,044  | 1,005,248  | 3,246,292  |
| Total                                   | 24,651,482 | 11,057,724 | 35,709,206 |

TABLE 8.2

FINANCIAL CONSTRUCTION COST

(Unit: Quetzal)

| Item                                     | Foreign   | Local     | Total      |
|------------------------------------------|-----------|-----------|------------|
| <b>1. Water Production System</b>        |           |           |            |
| Drilling                                 | 5,104,812 | 990,390   | 6,095,202  |
| Test Pilot Dirll                         | 254,150   | 10,800    | 264,950    |
| Pump                                     | 3,674,800 | -         | 3,674,800  |
| Trasportation                            | 207,963   | 68,651    | 276,614    |
| Pump House                               | -         | 345,600   | 345,600    |
| Sub Total                                | 9,241,725 | 1,415,441 | 10,657,166 |
| <b>2. Water Supply System</b>            |           |           |            |
| Pipe Line                                | 2,739,138 | 797,467   | 3,536,605  |
| Discharge Tank                           | -         | 112,639   | 112,639    |
| Distribution Tank                        | 5,400     | 686,285   | 691,685    |
| Syphon Bridge                            | 18,534    | 81,950    | 100,484    |
| Booster Pump                             | 1,300,000 | 11,882    | 1,311,882  |
| Rehabilitation of Existing System Bridge | 20,000    | 5,000     | 25,000     |
| Sub Total                                | 4,083,071 | 1,695,223 | 5,778,295  |
| <b>3. O/M Facilities</b>                 |           |           |            |
| O/M Road                                 | -         | 225,343   | 225,343    |
| Communication Cable, etc.                | 334,230   | -         | 334,230    |
| Control Panel & Remote Control Panel     | 891,000   | -         | 891,000    |
| Transportation                           | 123,875   | 20,895    | 144,770    |
| Erection                                 | 568,265   | 202,073   | 770,338    |
| Sub-Station                              | 60,000    | 30,000    | 90,000     |
| Transceiver (FM)                         | 10,000    | -         | 10,000     |
| Maintenance Facilities/Equipments        | 885,380   | 29,460    | 914,840    |
| Work Shop                                | -         | 187,500   | 187,500    |
| Sub Total                                | 2,872,750 | 695,271   | 3,568,021  |
| <b>4. Rehabilitation</b>                 |           |           |            |
| Clearing Jet & Piston                    | -         | 79,200    | 79,200     |
| Casing Pipe Repair                       | -         | 13,200    | 13,200     |
| Submersible Pump/Operation Board         | 859,000   | -         | 859,000    |



Cont'd

(Unit: Quetzal)

| Item                                           | Foreign           | Local            | Total             |
|------------------------------------------------|-------------------|------------------|-------------------|
| Communication Cable and<br>Other Necessary     | 45,000            | -                | 45,000            |
| Control Panel and Remote<br>Control, Telephone | 171,000           | -                | 171,000           |
| Transportation                                 | 54,900            | 18,270           | 73,170            |
| Erection                                       | <u>61,200</u>     | <u>48,520</u>    | <u>109,720</u>    |
| Sub Total                                      | 1,191,100         | 159,190          | 1,350,290         |
| 5. Power Supply Facilities                     |                   |                  |                   |
| Pole                                           | 97,150            | -                | 97,150            |
| Cable                                          | 387,175           | -                | 387,175           |
| Cable Connection                               | -                 | 167,960          | 167,960           |
| Construction Cost                              | -                 | 11,395           | 11,395            |
| Access Road                                    | -                 | 157,380          | 157,380           |
| Electrical Leading Pole,<br>Transformer Bay    | 409,500           | -                | 409,500           |
| Cable Conduit & Erection Material              | 267,999           | -                | 267,999           |
| Receiving Parts                                | 483,600           | -                | 483,600           |
| Transformer                                    | 643,300           | -                | 643,300           |
| Transmission Cost                              | 186,277           | 48,298           | 234,575           |
| Erection                                       | <u>15,200</u>     | <u>11,400</u>    | <u>26,600</u>     |
| Sub Total                                      | 2,490,201         | 396,433          | 2,886,634         |
| 6. Monitoring System                           |                   |                  |                   |
| Monitoring Well                                | 190,240           | 21,100           | 211,340           |
| Observation House                              | -                 | 19,200           | 19,200            |
| Auto-water Gauge                               | 80,000            | -                | 80,000            |
| Handy-water Gauge                              | <u>5,000</u>      | <u>-</u>         | <u>5,000</u>      |
| Sub Total                                      | 275,240           | 40,300           | 315,540           |
| 7. Preparation                                 |                   |                  |                   |
| Preparation                                    | -                 | 220,093          | 220,093           |
|                                                | <u>20,154,088</u> | <u>4,621,951</u> | <u>24,776,039</u> |

TABLE 8-3

## BREAKDOWN OF DIRECTION COST

(Unit: Q)

|                            | Currency | Canalitos |           |           | Norte     | Lavarreda | El Rodeo  | Hermosa   | Total      |
|----------------------------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|
|                            |          | J.A-Line  | S.L-Line  | S.G-Line  |           |           |           |           |            |
| 1. Water Production System | Foreign  | 1,871,193 | 1,611,559 | 755,296   | 2,042,918 | 495,893   | 1,477,333 | 987,533   | 9,241,725  |
|                            | Local    | 272,010   | 236,501   | 121,420   | 309,390   | 77,130    | 245,430   | 153,560   | 1,415,441  |
|                            | Total    | 2,143,203 | 1,848,060 | 876,716   | 2,352,716 | 573,023   | 1,722,763 | 1,141,093 | 10,657,166 |
| 2. Water Supply System     | Foreign  | 1,312,984 | 689,014   | 118,315   | 1,401,411 | 232,100   | 142,790   | 186,458   | 4,083,072  |
|                            | Local    | 380,437   | 202,393   | 246,279   | 223,471   | 38,285    | 335,018   | 269,340   | 1,695,223  |
|                            | Total    | 1,693,421 | 891,407   | 364,594   | 1,624,882 | 270,385   | 477,808   | 455,798   | 5,778,295  |
| 3. O/M Facilities          | Foreign  | 430,047   | 352,239   | 111,427   | 526,848   | 83,717    | 296,704   | 176,388   | 1,977,370  |
|                            | Local    | 101,131   | 62,124    | 14,939    | 126,729   | 15,777    | 107,030   | 50,581    | 478,311    |
|                            | Total    | 531,178   | 414,363   | 125,366   | 653,577   | 99,494    | 403,734   | 226,969   | 2,455,681  |
| 4. Rehabilitation          | Foreign  |           |           |           |           |           |           |           | 1,112,340  |
|                            | Local    |           |           |           |           |           |           |           | 1,191,100  |
|                            | Total    |           |           |           |           |           |           |           | 159,190    |
| 5. Power Supply System     | Foreign  | 440,151   | 460,726   | 225,112   | 574,630   | 119,872   | 371,691   | 298,064   | 1,350,290  |
|                            | Local    | 43,041    | 202,046   | 20,228    | 55,073    | 12,073    | 41,421    | 22,551    | 2,490,201  |
|                            | Total    | 483,192   | 662,772   | 245,340   | 629,703   | 131,900   | 413,112   | 320,615   | 396,433    |
| 6. Monitoring System       | Foreign  |           |           |           |           |           |           |           | 2,886,634  |
|                            | Local    |           |           |           |           |           |           |           | 275,240    |
|                            | Total    |           |           |           |           |           |           |           | 40,300     |
| 7. Preparation Work        | Foreign  |           |           |           |           |           |           |           | 315,540    |
|                            | Local    | 39,831    | 35,153    | 20,143    | 35,733    | 7,163     | 36,445    | 24,802    | 199,270    |
|                            | Total    | 39,831    | 35,153    | 20,143    | 35,733    | 7,163     | 36,445    | 24,802    | 20,823     |
| 8. Direct Construction     | Foreign  | 4,054,375 | 3,113,538 | 1,210,150 | 4,545,807 | 931,537   | 2,288,518 | 1,648,443 | 199,270    |
|                            | Local    | 836,450   | 738,217   | 423,009   | 750,396   | 150,428   | 765,344   | 520,834   | 20,823     |
|                            | Total    | 4,890,825 | 3,851,755 | 1,633,159 | 5,296,203 | 1,081,965 | 3,053,862 | 2,169,277 | 199,270    |

: Includes work shop

TABLE 8-4

Direct Construction Cost

(Unit = Q)

| Item                                          | Foreign Currency | Local Currency | Total      |
|-----------------------------------------------|------------------|----------------|------------|
| Production System                             |                  |                |            |
| Water Supply System                           |                  |                |            |
| Well 38 Nos.                                  | 9,241,725        | 1,415,441      | 10,657,166 |
| Transmission pipe line, Tank,<br>Booster pump | 4,083,072        | 1,695,223      | 5,778,295  |
| Well 22 Nos.                                  | 1,191,100        | 159,190        | 1,350,290  |
| O/M Road, work shop substation                | 2,872,750        | 695,271        | 3,568,021  |
| Power wiring, Transformer                     | 2,490,201        | 396,433        | 2,886,634  |
| Observation well 6 Nos.                       | 275,240          | 40,300         | 315,540    |
| Preperation Work-                             |                  | 220,093        | 220,093    |
| Total                                         | 20,154,088       | 4,621,951      | 24,776,039 |

TABLE 8-5

Water Production System

(Unit = Q)

| Item                 | Unit     | Foreign Currency |           | Local Currency |           | Total      |
|----------------------|----------|------------------|-----------|----------------|-----------|------------|
|                      |          | Unit Cost        | Quantity  | Unit Cost      | Quantity  |            |
| Canalitos (J.A-Line) | 7 Nos    |                  | 1,871,193 |                | 272,010   | 2,143,203  |
| Canalitos (S.L-Line) | 7 Nos    |                  | 1,611,559 |                | 236,501   | 1,848,060  |
| Canalitos (S.G-Line) | 3 Nos    |                  | 755,296   |                | 121,420   | 876,716    |
| Norte                | 8 Nos    |                  | 2,042,918 |                | 309,390   | 2,352,308  |
| Lavarreda            | 2 Nos    |                  | 495,893   |                | 77,130    | 573,023    |
| El Rodeo             | 7 Nos    |                  | 1,477,333 |                | 245,430   | 1,722,763  |
| Hermosa              | 4 Nos    |                  | 987,533   |                | 153,560   | 1,141,093  |
| TOTAL                | 38 Wells |                  | 9,241,725 |                | 1,415,441 | 10,657,166 |

TABLE 8-6

Water Supply System

(Unit = Q)

| Item                   | Foreign Currency |                         | Local Currency |                         | Total     |
|------------------------|------------------|-------------------------|----------------|-------------------------|-----------|
|                        | Unit<br>Cost     | Quan-<br>tity<br>Amount | Unit<br>Cost   | Quan-<br>tity<br>Amount |           |
| Canalitos I J.A-Line   |                  | 1,312,984               |                | 380,437                 | 1,693,421 |
| Canalitos II S.L-Line  |                  | 689,014                 |                | 202,393                 | 891,407   |
| Canalitos III S.G-Line |                  | 118,315                 |                | 246,279                 | 364,594   |
| Norte                  |                  | 1,401,411               |                | 223,471                 | 1,624,882 |
| Lavarreda              |                  | 232,100                 |                | 38,285                  | 270,385   |
| Rodleo                 |                  | 142,790                 |                | 335,018                 | 477,808   |
| Hermosa                |                  | 186,458                 |                | 269,340                 | 455,798   |
| Total                  |                  | 4,083,072               |                | 1,695,223               | 5,778,295 |

TABLE 8-7

O/M Facilities

(Unit = Q)

| Item                              | Foreign Currency |          | Local Currency |          | Total     |
|-----------------------------------|------------------|----------|----------------|----------|-----------|
|                                   | Unit Cost        | Quantity | Amount         | Quantity |           |
| Canalitos (J.A-Line)              |                  |          | 430,047        | 101,131  | 531,178   |
| Canalitos (S.L-Line)              |                  |          | 352,239        | 62,124   | 414,363   |
| Calanitos (S.G-Line)              |                  |          | 111,427        | 14,939   | 126,366   |
| Norte                             |                  |          | 526,848        | 126,729  | 653,577   |
| Lavarreda                         |                  |          | 83,717         | 15,777   | 99,494    |
| El Rodeo                          |                  |          | 296,704        | 107,030  | 403,734   |
| Hermosa                           |                  |          | 176,388        | 50,581   | 226,969   |
| Sub-total                         |                  |          | 1,977,370      | 478,311  | 2,455,681 |
| Transceiver (U.H.F)               |                  |          | 10,000         | -        | 10,000    |
| Maintenance Facilities/Equipments |                  |          | 885,380        | 29,460   | 914,840   |
| Work Shop                         |                  |          | -              | 187,500  | 187,500   |
| Sub-total                         |                  |          | 895,380        | 216,960  | 1,112,340 |
| Total                             |                  |          | 2,872,750      | 695,271  | 3,568,021 |

TABLE 8-8

Rehabilitation

(Unit = Q)

| Item                                       | Unit | Foreign Currency |           | Local Currency |          | Total     |
|--------------------------------------------|------|------------------|-----------|----------------|----------|-----------|
|                                            |      | Unit Cost        | Quantity  | Unit Cost      | Quantity |           |
| Clearing                                   | 22   |                  |           |                | 79,200   | 79,200    |
| Casing pipe repair                         | 4    |                  |           |                | 13,200   | 13,200    |
| Submersible pump/moter operation board     | 22   |                  | 859,000   |                |          | 859,000   |
| Transportation                             | 150  |                  | 23,550    |                | 12,000   | 35,550    |
| Erection                                   | 22   |                  |           |                | 22,000   | 22,000    |
| (Ojo de Agua)                              |      |                  |           |                |          |           |
| Communication cable and other necessary    |      |                  | 45,000    |                |          | 45,000    |
| Control panel and remote control telephone |      |                  | 171,000   |                |          | 171,000   |
| Transportation                             |      |                  | 31,350    |                | 6,270    | 37,620    |
| Election                                   |      |                  | 61,200    |                | 26,520   | 87,720    |
| Total                                      |      |                  | 1,191,100 |                | 159,190  | 1,350,290 |

TABLE 8-9

Power Supply Facilities

(Unit = Q)

| Item                 | Foreign Currency |               | Local Currency |               | Total     |
|----------------------|------------------|---------------|----------------|---------------|-----------|
|                      | Unit<br>Cost     | Quan-<br>tity | Unit<br>Cost   | Quan-<br>tity |           |
| Canalitos (J.A-Line) |                  | 440,151       |                | 43,041        | 483,192   |
| Canalitos (S.L-Line) |                  | 460,726       |                | 202,046       | 662,772   |
| Canalitos (S.G-Line) |                  | 225,112       |                | 20,228        | 245,340   |
| Norte                |                  | 574,630       |                | 55,073        | 629,703   |
| Lavarreda            |                  | 119,827       |                | 12,073        | 131,900   |
| El Rodeo             |                  | 371,691       |                | 41,421        | 413,112   |
| Hermosa              |                  | 298,064       |                | 22,551        | 320,615   |
| Total                |                  | 2,490,201     |                | 396,433       | 2,886,634 |



TABLE 8-10

Monitoring System

(Unit = Q)

| Item                        | Unit | Quan-<br>tity | Foreign Currency |         | Local Currency |        | Total        |         |
|-----------------------------|------|---------------|------------------|---------|----------------|--------|--------------|---------|
|                             |      |               | Unit<br>cost     | Amount  | Unit<br>Cost   | Amount | Unit<br>Cost | Amount  |
| Monitoring Well (1 = 300 m) | Nos. | 5             | 33,048           | 190,240 | 4,220          | 21,100 |              | 211,340 |
| Observation House           | Nos. | 8             |                  |         | 2,400          | 19,200 |              | 19,200  |
| Auto-water gage             | Nos. | 8             | 10,000           | 80,000  |                |        |              | 80,000  |
| Handy water gage            | Nos. | 1             | 5,000            | 5,000   |                |        |              | 5,000   |
| Total                       |      |               |                  | 275,240 |                | 40,300 |              | 315,540 |

TABLE 8-11

Land Acquisition Cost

(Unit = Q)

| Item                 | Foreign Currency |          | Local Currency |          | Total     |
|----------------------|------------------|----------|----------------|----------|-----------|
|                      | Unit Cost        | Quantity | Unit Cost      | Quantity |           |
| Canalitos (J.A-Line) |                  |          | 201,750        |          | 201,750   |
| Canalitos (S.L-Line) |                  |          | 67,375         |          | 67,375    |
| Canalitos (S.G-Line) |                  |          | 54,375         |          | 54,375    |
| Norte                |                  |          | 234,750        |          | 234,750   |
| Lavarreda            |                  |          | 24,950         |          | 24,950    |
| El Rodeo             |                  |          | 288,450        |          | 288,450   |
| Hermosa              |                  |          | 150,875        |          | 150,875   |
| Total                |                  |          | 1,022,525      |          | 1,022,525 |

TABLE 8-12

MATERIALS COST

(As of December 1985)

(Unit: Quetzal)

| Item                                               | Unit           | Unit Price |
|----------------------------------------------------|----------------|------------|
| <b>Ductile Iron Pipe</b>                           |                |            |
| ø200 mm (37 kg/m)                                  | m              | 44.8       |
| ø250 mm (48.5 kg/m)                                | m              | 58.7       |
| ø300 mm (61 kg/m)                                  | m              | 73.8       |
| ø350 mm (79.5 kg/m)                                | m              | 96.2       |
| ø400 mm (94.5 kg/m)                                | m              | 114.3      |
| ø450 mm (112 kg/m)                                 | m              | 135.5      |
| ø500 mm (129 kg/m)                                 | m              | 156.1      |
| ø600 mm (168 kg/m)                                 | m              | 203.3      |
| ø800 mm (267 kg/m)                                 | m              | 323.1      |
| ø900 mm (321 kg/m)                                 | m              | 388.4      |
| ø1,100 mm (442 kg/m)                               | m              | 534.8      |
| ø1,200 mm (510 kg/m)                               | m              | 617.1      |
| * Cost of Pipe: Q. 1.1/kg + 10% Accessory          |                |            |
| Portland Cement                                    | Bag (45 kg)    | 4.85       |
| Asbestos Cement                                    | m <sup>2</sup> | 15.63      |
| Concrete (include labor charge)                    | m <sup>3</sup> | 90.00      |
| <b>Aggregate</b>                                   |                |            |
| Sand                                               | m <sup>3</sup> | 10.00      |
| Gravel                                             | m <sup>3</sup> | 16.00      |
| Boulder                                            | m <sup>3</sup> | 17.00      |
| Wooden Form (triple use)                           | m <sup>2</sup> | 5.00       |
| Reinforcing Bar<br>(Incl. charge for placing work) | kg             | 1.32       |
| Timber                                             | m <sup>3</sup> | 45.83      |
| <b>Fuel</b>                                        |                |            |
| Gasoline                                           | Galon          | 2.90       |
| Diesel Oil                                         |                | 1.10       |

Cont'd

(Unit: Quetzal)

| Item                                       | Unit           | Unit Price |
|--------------------------------------------|----------------|------------|
| H-Type Steel Beam                          |                |            |
| H - 150 x 150 x 7 mm                       | kg             | 2.59       |
| H - 100 x 100 x 6                          | kg             | 2.48       |
| L-Type Steel Beam                          |                |            |
| L - 100 x 75 x 7 mm                        | kg             | 3.65       |
| L - 50 x 50 x 6 mm                         | kg             | 2.26       |
| [-Type Steel Beam                          |                |            |
| [ - 100 x 50 x 5 mm                        | kg             | 2.66       |
| Plain Steel                                | kg             | 1.18       |
| Protection net (metallic)<br>(0.7 x 2.0 m) | m <sup>2</sup> | 4.16       |
| Submersible Pump                           |                |            |
| 35 l/sec x 270 m x 185 kw                  | pc             | 4,700      |
| 35 x 242 x 185                             | pc             | 4,435      |
| 35 x 220 x 132                             | pc             | 3,320      |
| 20 x 220 x 75                              | pc             | 1,965      |
| Casing (STGP)                              |                |            |
| ø12"                                       | m              | 82         |
| ø4"                                        | m              | 25         |
| Multi-stage Volute Pump                    |                |            |
| Cap. 45 kw 35 l/sec                        | pc             | 7,300      |
| Cap. 75 kw 70 l/sec                        | pc             | 9,100      |
| Cap. 110 kw 90 l/sec                       | pc             | 12,800     |
| Electric Poles (wood)                      | pc             | 290        |
| Cable (3 fase/2)                           | m              | 17         |

Cont'd

(Unit: Quetzal)

| Item                         | Unit           | Unit Price |
|------------------------------|----------------|------------|
| Transceiver (UHF)            |                |            |
| Main Transceiver             | pc             | 1,000      |
| Handy Transceiver            | pc             | 500        |
| Battery Charger              | pc             | 250        |
| Land Acquisition             |                |            |
| Zona 6                       | m <sup>2</sup> | 18-50      |
| Zona 16                      | m <sup>2</sup> | 25-30      |
| Zona 18                      | m <sup>2</sup> | 13-18      |
| Excavation                   | m <sup>3</sup> | 3.0        |
| Refilling                    | m <sup>3</sup> | 2.0        |
| Hauling Excavation Materials | m <sup>3</sup> | 2.0        |
| Banking                      | m <sup>3</sup> | 2.0        |

TABLE 8-13

LABOR COST

(As of December 1985)

(Unit: Quetzal)

| Item                      | Unit      | Unit Price |
|---------------------------|-----------|------------|
| Operator                  | Man/Month | 500        |
| Driver (Light)            | "         | 350        |
| Driver (Heavy)            | "         | 500        |
| Mechanic (Light)          | "         | 300        |
| Mechanic (Heavy)          | "         | 300        |
| Head Driller              | "         | 300        |
| Assistant Driller         | "         | 200        |
| Welder                    | "         | 350        |
| Pipe Placer               | "         | 250        |
| Electrician (Hi-Tension)  | "         | 350        |
| Electrician (Low-Tension) | "         | 300        |
| Reinforcing Bar Placer    | "         | 200        |
| Concrete Worker           | "         | 200        |
| Carpenter                 | "         | 250        |
| Steelman                  | "         | 250        |
| Mason                     | "         | 250        |
| Plasterer                 | "         | 250        |
| Plumber                   | "         | 250        |
| Watchman                  | "         | 200        |

TABLE 8-14

ADMINISTRATION AND ENGINEERING COST

(Unit: Quetzal)

| Item                   | Foreign          | Local            | Total            |
|------------------------|------------------|------------------|------------------|
| 1. Detail Design Stage |                  |                  |                  |
| EMPAGUA Administration | 83,000           | 961,000          | 1,044,000        |
| Engineering Consultant | 782,000          | 186,000          | 968,000          |
| Training               | <u>39,350</u>    | <u>-</u>         | <u>39,350</u>    |
| Sub Total              | 904,350          | 1,147,000        | 2,051,350        |
| 2. Construction Stage  |                  |                  |                  |
| EMPAGUA Administration | 20,000           | 2,739,000        | 2,759,000        |
| Engineering Cost       | <u>1,332,000</u> | <u>522,000</u>   | <u>1,854,000</u> |
| Sub Total              | 1,352,000        | 3,261,000        | 4,613,000        |
|                        | <u>2,256,350</u> | <u>4,408,000</u> | <u>6,664,350</u> |

TABLE 8-15

Electric Cost

| Well field  | A (KW) | A x 24hr | Kwh (Month) | Electric Cost (Q) | System                      | Remarks                         |
|-------------|--------|----------|-------------|-------------------|-----------------------------|---------------------------------|
| Canalitos I | 1,242  | 29,808   | 894,240     | 88,768            | Juana de Arco               | (1)(2)(3)(7)(9)<br>(10)(11) 1BP |
| II          | 1,114  | 26,736   | 802,080     | 79,620            | Santa Luisa                 | (4)(5)(6)(12)<br>(13)(14)(8)    |
| III         | 449    | 10,776   | 323,280     | 32,091            | San Gasper                  | (15)(16)(17)                    |
| Sub Total   | 2,805  | 67,320   | 2,019,600   | 200,479           |                             | 17 Wells, 1BP                   |
| Norte       | 1,706  | 40,994   | 1,228,320   | 121,931           | Zona 6<br><br>Juana de Arco | 8 Wells, 5BP                    |
| Lavarreda   | 362    | 8,688    | 260,640     | 25,873            | Juana de Arco               | 2 Wells, 1BP                    |
| El Rodio    | 753    | 18,072   | 542,160     | 49,322            | Zona 17<br>" 18             | 7 Wells                         |
| Hermosa     | 634    | 15,216   | 456,480     | 45,313            |                             | 4 Wells                         |
| Total       | 6,260  | 138,120  | 4,143,600   | 442,919           |                             | 38 Wells                        |

Calculation method: Contract for all wells & plant system

$$A: \text{Basic cost} = \text{Consumption} \times 2.532982 \text{ Q}$$

$$a: (-100 \text{ KW}) = 100 \times \text{Consumption} \times 0.111188 \text{ Q}$$

$$b: (101 - 200 \text{ KW}) = 100 \times \text{Consumption} \times 0.105398 \text{ Q}$$

$$c: (201 - \text{KW}) = (\text{Consumption} \times 24\text{hr} \times 30) - (100 \times \text{Consumption} \times 2) \times 0.090924$$

$$\text{Electric cost} = A + a + b + c$$

$$\text{The average electric cost/KWh} = 0.099267 \text{ Q}$$



TABLE 8-16

Estimated Electric Cost in 1989 - 1991

| Well Group |      | 1989      |      | 1990      |      | 1991      |      | Total     |
|------------|------|-----------|------|-----------|------|-----------|------|-----------|
| Canalitos  | (7)  | 955,400   | (7)  | 1,065,216 | (3)  | 385,092   | (17) | 2,405,708 |
| Hermosa    |      | -         | (1)  | -         | (3)  | 543,756   | (4)  | 543,756   |
| Lavarreda  | (2)  | 310,476   |      | -         |      | -         | (2)  | 310,476   |
| El Rodio   | (5)  | 355,068   | (2)  | 236,796   |      | -         | (7)  | 591,864   |
| Norte      |      | -         | (3)  | 657,828   | (5)  | 805,344   | (8)  | 1,463,172 |
| Total      | (13) | 1,620,944 | (13) | 1,959,840 | (12) | 1,734,192 | (38) | 5,315,016 |

Note: ( ) is number of wells

TABLE 8-17

ANNUAL OPERATION AND MAINTENANCE COST

(Unit: Quetzal)

| Description                        | Foreign | Local     | Total     |
|------------------------------------|---------|-----------|-----------|
| 1. Salaries and Wages              |         |           |           |
| Staff Salaries                     | -       | 550,200   | 550,200   |
| Wages                              | -       | 20,995    | 20,995    |
| 2. Office Expenses                 | -       | 64,000    | 64,000    |
| 3. Power Rates                     | -       | 5,315,016 | 5,315,016 |
| 4. Fuel for Vehicles and Equipment | -       | 22,700    | 22,700    |
| 5. Chlorine Gas                    | 52,899  | -         | 52,899    |
| 6. Miscellaneous Expenses          | 107,196 | 211,000   | 318,196   |
| Total                              | 160,095 | 6,183,911 | 6,344,006 |

TABLE 8-18

## O/M STAFF LIST

| Item                              | Office Number | Occupation              | Labour Number |
|-----------------------------------|---------------|-------------------------|---------------|
| O/M Office                        | 2 Nos         | Engineer (A)            | 2             |
| (with the installed construction) |               | Asst. Engineer          | 4             |
| Main Station                      | 4 Nos         | Engineer (C)            | 4             |
| (with the installed construction) |               | Asst. Engineer          | 12            |
|                                   |               | Labour for Chlorination | 4             |
|                                   |               | Other                   | 12            |
| Sub Station                       | 7 Nos         | Asst. Engineer          | 21            |
| (newly station) (3 Nos)           |               | Electric Technician     | 6             |
| (installed station) (4 Nos)       |               | Operator (Light)        | 42            |
|                                   |               | Janitor                 | 12            |
| Work Shop                         | 1 Nos         | Engineer (B)            | 1             |
|                                   |               | Asst. Engineer          | 6             |
|                                   |               | Operator (Heavy)        | 2             |
|                                   |               | Clerk                   | 1             |
| Total                             |               |                         | 138           |

TABLE 8-19

REPLACEMENT COST AND USEFUL LIFE

(Unit: Quetzal)

| ITEM                                       | Useful Life<br>(year) | Cost      |
|--------------------------------------------|-----------------------|-----------|
| 1. Pump motor                              | 8                     | 835,800   |
| 2. Booster Pump, Submergible Pump          | 16                    | 2,152,598 |
| 3. Monitoring System<br>(water level gage) | 15                    | 85,000    |
| 4. Maintenance Service Car                 | 8                     | 35,000    |
| 5. Motor Bicycle                           | 5                     | 12,000    |
| 6. Pick-up                                 | 8                     | 60,000    |

TABLE 8-20

## BREAKDOWN OF O/M STAFF SALARIES

| Item                        | Monthly Salary (Q) | Staff (Nos) | Annual Salary (Q) | Total (Q)      |
|-----------------------------|--------------------|-------------|-------------------|----------------|
| <u>O/M Office (2 Nos)</u>   |                    |             |                   |                |
| Engineer (A)                | 900                | 2           | 10,800            | 21,600         |
| Asst. Engineer              | 350                | <u>4</u>    | 4,200             | <u>16,800</u>  |
| Sub-total                   |                    | 6           |                   | 38,400         |
| <u>Main Station (4 Nos)</u> |                    |             |                   |                |
| Engineer (C)                | 650                | 4           | 7,800             | 31,200         |
| Asst. Engineer              | 350                | 12          | 4,200             | 50,400         |
| Labour for Chlorination     | 350                | 4           | 4,200             | 16,800         |
| Other                       | 300                | <u>12</u>   | 3,600             | <u>43,200</u>  |
| Sub-total                   |                    | 32          |                   | 141,600        |
| <u>Sub Station (8 Nos)</u>  |                    |             |                   |                |
| Asst. Engineer              | 350                | 21          | 4,200             | 88,200         |
| Electric Technician         | 350                | 7           | 4,200             | 29,400         |
| Operation (Light)           | 350                | 42          | 4,200             | 176,400        |
| Janitor                     | 200                | <u>12</u>   | 2,400             | <u>28,800</u>  |
| Sub-total                   |                    | 82          |                   | 322,800        |
| <u>Workshop (1 Nos)</u>     |                    |             |                   |                |
| Engineer (B)                | 850                | 1           | 10,200            | 10,200         |
| Asst. Engineer              | 350                | 6           | 4,200             | 25,200         |
| Operator (Heavy)            | 350                | 2           | 4,200             | 8,400          |
| Clerk                       | 300                | <u>1</u>    | 3,600             | <u>3,600</u>   |
| Sub-total                   |                    | 10          |                   | <u>47,400</u>  |
| TOTAL                       |                    | <u>130</u>  |                   | <u>550,200</u> |

TABLE 8-21

## DISBURSEMENT SCHEDULE

|                               | (Unit: Q) |           |           |           |             |            |           |                        |            |           |                       |            |                          |                        |                          |
|-------------------------------|-----------|-----------|-----------|-----------|-------------|------------|-----------|------------------------|------------|-----------|-----------------------|------------|--------------------------|------------------------|--------------------------|
|                               | 1987      |           |           | 1988      |             |            | 1989      |                        |            | 1990      |                       |            | Total                    |                        |                          |
|                               | Foreign   | Local     | Total     | Foreign   | Local       | Total      | Foreign   | Local                  | Total      | Foreign   | Local                 | Total      | Foreign                  | Local                  | Total                    |
| 1. Production system          |           |           | -         | 2,997,283 | 460,631     | 3,457,914  | 3,296,089 | 486,529                | 3,782,618  | 2,948,353 | 468,281               | 3,416,634  | 9,241,725                | 1,415,441              | 10,657,166               |
| 2. Water Supply System        |           |           | -         | 962,994   | 394,432     | 1,357,426  | 2,178,655 | 721,248                | 2,899,903  | 941,423   | 579,543               | 1,520,966  | 4,083,072                | 1,695,223              | 5,778,295                |
| 3. O/M Facilities             |           |           | -         | 682,628   | 142,927     | 825,555    | 809,970   | 193,735                | 1,003,705  | 474,772   | 141,649               | 626,421    | 1,997,370<br>(2,872,750) | 488,311<br>(695,271)   | 2,485,681<br>(3,568,021) |
| 4. Power Supply System        |           |           | -         | 802,189   | 237,789     | 1,039,978  | 856,546   | 85,267                 | 941,813    | 831,466   | 73,377                | 904,843    | 2,490,201                | 396,433                | 2,886,634                |
| 5. Rehabilitation             | 1,191,100 | 159,190   | 1,350,290 |           |             | -          |           |                        | -          |           |                       | -          | 1,191,100                | 159,190                | 1,350,290                |
| 6. Monitoring System          |           |           | -         | 275,240   | 40,300      | 315,540    |           |                        | -          |           |                       | -          | 275,240                  | 40,300                 | 315,540                  |
| 7. Work Shop                  |           | (159,190) | -         |           | (1,276,079) | -          |           | 187,500<br>(1,674,279) | 187,500    | 895,380   | 29,460<br>(1,292,310) | 924,840    | 895,380                  | 216,960<br>(4,384,163) | 1,112,340                |
| 8. Preparation Work           |           | 7,959     | 7,959     |           | 63,804      | 63,804     |           | 83,714                 | 83,714     |           | 64,616                | 64,616     | -                        | 220,093                | 220,093                  |
| 9. Engineering/Administration | 904,350   | 1,147,000 | 2,051,350 | 464,000   | 1,087,000   | 1,551,000  | 444,000   | 1,087,000              | 1,531,000  | 444,000   | 1,087,000             | 1,531,000  | 2,256,350                | 4,408,000              | 6,664,350                |
| 10. Land Acquisition          |           | 209,525   | 209,525   |           | 561,563     | 561,563    |           | 251,437                | 251,437    |           |                       | -          | -                        | 1,022,525              | 1,022,525                |
| Sub Total                     | 2,095,450 | 1,523,674 | 3,619,124 | 6,184,334 | 2,988,446   | 9,172,780  | 7,585,260 | 3,096,430              | 10,681,690 | 6,545,394 | 2,443,926             | 8,989,320  | 22,410,438               | 10,052,476             | 32,462,914               |
| 11. Physical Contingencies    | 209,545   | 152,367   | 361,912   | 618,433   | 298,845     | 917,278    | 758,526   | 309,643                | 1,068,169  | 654,540   | 244,393               | 898,933    | 2,241,044                | 1,005,248              | 3,246,292                |
| Total                         | 2,304,995 | 1,676,041 | 3,981,036 | 6,802,767 | 3,287,291   | 10,090,058 | 8,343,786 | 3,406,073              | 11,749,859 | 7,199,934 | 2,688,319             | 9,888,253  | 24,651,482               | 11,057,724             | 35,709,206               |
| 12. Price Contingency Ratio   | 8%        | 20%       |           | 7%        | 15%         |            | 6%        | 10%                    |            | 5%        | 10%                   |            |                          |                        |                          |
| Ground Total                  | 2,489,395 | 2,011,249 | 4,500,644 | 7,278,961 | 3,780,385   | 11,059,346 | 8,844,413 | 3,746,680              | 12,591,093 | 7,559,931 | 2,957,151             | 10,517,082 | 26,172,700               | 12,495,465             | 38,668,165               |



**MEASURED AND ESTIMATED CONSUMPTION**  
for Guatemala City Postal Zone

Month: December  
Year: 1984

| Zone | m <sup>3</sup> /<br>month | Number of Service           |                     |      | Consumptions m <sup>3</sup> /month |                    |                    | Total<br>Estimated<br>Consump-<br>tion<br>m <sup>3</sup> /day |
|------|---------------------------|-----------------------------|---------------------|------|------------------------------------|--------------------|--------------------|---------------------------------------------------------------|
|      |                           | Total<br>Instal-<br>lations | With<br>Consumption |      | Measured                           |                    | Estimated<br>Total |                                                               |
|      |                           |                             | Total               | %    | Total                              | W/Con-<br>sumption |                    |                                                               |
| 1    | 30                        | 3,478                       | 1,883               | 54.1 | 64,484                             | 34.25              | 119,105            | 3,842                                                         |
|      | 30<br>120                 | 4,986                       | 2,271               | 45.5 | 133,933                            | 58.98              | 294,051            | 8,069                                                         |
|      | 120                       | 256                         | 114                 | 44.5 | 80,860                             | 709.30             | 181,580            | 5,857                                                         |
|      | Total                     | 8,720                       | 4,268               | 48.9 | 259,277                            | 68.20              | 594,736            | 17,768                                                        |
| 2    | 30                        | 1,696                       | 961                 | 56.7 | 28,083                             | 29.22              | 49,562             | 1,599                                                         |
|      | 30<br>120                 | 1,238                       | 580                 | 46.8 | 25,251                             | 43.54              | 53,898             | 1,739                                                         |
|      | 120                       | 19                          | 10                  | 52.6 | 1,908                              | 190.80             | 3,625              | 117                                                           |
|      | Total                     | 2,953                       | 1,551               | 52.5 | 55,242                             | 36.26              | 107,085            | 3,455                                                         |
| 3    | 30                        | 3,080                       | 2,040               | 66.2 | 56,526                             | 20.18              | 89,873             | 2,899                                                         |
|      | 30<br>120                 | 828                         | 474                 | 57.2 | 25,061                             | 52.87              | 43,777             | 1,412                                                         |
|      | 120                       | 22                          | 4                   | 18.2 | 1,540                              | 385.00             | 8,470              | 273                                                           |
|      | Total                     | 3,930                       | 2,518               | 64.1 | 86,127                             | 36.16              | 142,120            | 4,584                                                         |
| 4    | 30                        | 172                         | 106                 | 61.6 | 4,106                              | 38.74              | 6,663              | 215                                                           |
|      | 30<br>120                 | 319                         | 148                 | 46.4 | 8,650                              | 68.45              | 18,644             | 601                                                           |
|      | 120                       | 53                          | 23                  | 43.4 | 12,207                             | 530.74             | 28,129             | 907                                                           |
|      | Total                     | 544                         | 277                 | 50.9 | 24,963                             | 98.23              | 53,436             | 1,723                                                         |
| 5    | 30                        | 7,877                       | 4,857               | 61.7 | 148,019                            | 30.48              | 240,055            | 7,744                                                         |
|      | 30<br>120                 | 1,335                       | 668                 | 50.0 | 27,783                             | 41.59              | 55,524             | 1,791                                                         |
|      | 120                       | 21                          | 9                   | 42.9 | 1,031                              | 114.56             | 2,406              | 78                                                            |
|      | Total                     | 9,233                       | 5,534               | 59.9 | 176,833                            | 32.27              | 297,985            | 9,613                                                         |
| 6    | 30                        | 10,488                      | 6,783               | 64.7 | 181,795                            | 26.80              | 281,095            | 0,068                                                         |
|      | 30<br>120                 | 1,384                       | 556                 | 40.2 | 28,650                             | 51.53              | 71,316             | 2,301                                                         |
|      | 120                       | 23                          | 6                   | 26.1 | 2,061                              | 343.5              | 7,901              | 255                                                           |
|      | Total                     | 11,895                      | 7,345               | 61.7 | 212,506                            | 30.29              | 360,312            | 11,624                                                        |



**MEASURED AND ESTIMATED CONSUMPTION**

for Guatemala City Postal Zone

Month: December  
Year: 1984

| Zone | m <sup>3</sup> /<br>month | Number of Service           |                     |      | Consumptions m <sup>3</sup> /month |                    |                    | Total<br>Estimated<br>Consump-<br>tion<br>m <sup>3</sup> /day |
|------|---------------------------|-----------------------------|---------------------|------|------------------------------------|--------------------|--------------------|---------------------------------------------------------------|
|      |                           | Total<br>Instal-<br>lations | With<br>Consumption |      | Measured                           |                    | Estimated<br>Total |                                                               |
|      |                           |                             | Total               | %    | Total                              | W/Con-<br>sumption |                    |                                                               |
| 7    | 30                        | 15,824                      | 11,679              | 73.8 | 317,982                            | 27.23              | 430,837            | 13,898                                                        |
|      | 30<br>120                 | 1,930                       | 1,025               | 53.1 | 53,238                             | 51.94              | 100,243            | 3.234                                                         |
|      | 120                       | 44                          | 17                  | 38.6 | 3,242                              | 190.71             | 8,391              | 271                                                           |
|      | Total                     | 17,798                      | 12,721              | 71.5 | 374,462                            | 30.31              | 539,471            | 17,403                                                        |
| 8    | 30                        | 1,469                       | 797                 | 54.3 | 27,830                             | 34.92              | 51,295             | 1,655                                                         |
|      | 30<br>120                 | 784                         | 310                 | 39.5 | 19,617                             | 63.28              | 49,612             | 1,600                                                         |
|      | 120                       | 19                          | 5                   | 26.3 | 1,086                              | 217.2              | 4,127              | 133                                                           |
|      | Total                     | 2,272                       | 111,2               | 48.9 | 48,533                             | 46.23              | 105,034            | 3,388                                                         |
| 9    | 30                        | 328                         | 202                 | 61.6 | 13,654                             | 67.59              | 22,171             | 715                                                           |
|      | 30<br>120                 | 1,046                       | 644                 | 61.6 | 46,244                             | 71.81              | 75,111             | 2,423                                                         |
|      | 120                       | 72                          | 38                  | 52.8 | 11,690                             | 307.63             | 22,149             | 714                                                           |
|      | Total                     | 1,446                       | 884                 | 61.1 | 71,588                             | 82.59              | 119,431            | 3,852                                                         |
| 10   | 30                        | 1,100                       | 675                 | 61.4 | 23,567                             | 34.91              | 38,405             | 1,239                                                         |
|      | 30<br>120                 | 1,619                       | 895                 | 55.3 | 51,336                             | 57.36              | 92,864             | 2,996                                                         |
|      | 120                       | 99                          | 34                  | 34.2 | 9,927                              | 291.97             | 28,905             | 932                                                           |
|      | Total                     | 2,818                       | 1,605               | 56.9 | 84,830                             | 56.84              | 160,174            | 5,167                                                         |
| 11   | 30                        | 6,596                       | 4,578               | 69.4 | 166,294                            | 36.32              | 239,597            | 7,729                                                         |
|      | 30<br>120                 | 1,865                       | 1,133               | 60.6 | 64,144                             | 56.61              | 105,586            | 3,406                                                         |
|      | 120                       | 53                          | 24                  | 45.3 | 37,381                             | 886.83             | 47,002             | 1,516                                                         |
|      | Total                     | 8,514                       | 5,735               | 67.4 | 267,819                            | 46.06              | 392,185            | 12,651                                                        |
| 12   | 30                        | 10,676                      | 7,527               | 70.5 | 231,918                            | 30.81              | 328,943            | 10,611                                                        |
|      | 30<br>120                 | 2,190                       | 1,109               | 50.6 | 70,333                             | 63.42              | 138,890            | 4,480                                                         |
|      | 120                       | 76                          | 29                  | 38.2 | 10,933                             | 320.58             | 24,364             | 786                                                           |
|      | Total                     | 12,942                      | 8,665               | 67.0 | 313,184                            | 38.03              | 492,197            | 15,877                                                        |

**MEASURED AND ESTIMATED CONSUMPTION**  
for Guatemala City Postal Zone

Month: December  
Year: 1984

| Zone | m <sup>3</sup> /<br>month | Number of Service           |                     |      | Consumptions m <sup>3</sup> /month |                    |                        | Total<br>Estimated<br>Consump-<br>tion<br>m <sup>3</sup> /day |
|------|---------------------------|-----------------------------|---------------------|------|------------------------------------|--------------------|------------------------|---------------------------------------------------------------|
|      |                           | Total<br>Instal-<br>lations | With<br>Consumption |      | Measured                           |                    | Estimated<br><br>Total |                                                               |
|      |                           |                             | Total               | %    | Total                              | W/Con-<br>sumption |                        |                                                               |
| 13   | 30                        | 2,159                       | 1,347               | 62.4 | 50,536                             | 37.52              | 81,000                 | 2,613                                                         |
|      | 30<br>120                 | 899                         | 507                 | 56.4 | 37,641                             | 74.24              | 67,744                 | 2,153                                                         |
|      | 120                       | 30                          | 8                   | 26.7 | 2,361                              | 295.13             | 8,854                  | 286                                                           |
|      | Total                     | 8,088                       | 1,862               | 60.3 | 90,538                             | 50.71              | 156,598                | 5,052                                                         |
| 14   | 30                        | 826                         | 484                 | 58.6 | 24,114                             | 49.82              | 41,153                 | 1,328                                                         |
|      | 30<br>120                 | 1,118                       | 679                 | 60.7 | 51,483                             | 75.82              | 84,769                 | 2,734                                                         |
|      | 120                       | 47                          | 29                  | 61.7 | 6,915                              | 238.45             | 11,207                 | 362                                                           |
|      | Total                     | 1,911                       | 1,192               | 59.9 | 82,512                             | 68.87              | 137,129                | 4,424                                                         |
| 15   | 30                        | 1,074                       | 719                 | 66.9 | 28,629                             | 39.82              | 42,764                 | 1,380                                                         |
|      | 30<br>120                 | 1,531                       | 888                 | 58.0 | 58,767                             | 66.18              | 101,320                | 3,268                                                         |
|      | 120                       | 35                          | 20                  | 67.1 | 4,955                              | 247.75             | 8,671                  | 280                                                           |
|      | Total                     | 2,640                       | 1,627               | 61.6 | 92,351                             | 57.86              | 152,755                | 4,928                                                         |
| 16   | 30                        | 260                         | 170                 | 65.4 | 4,736                              | 27.96              | 7,243                  | 234                                                           |
|      | 30<br>120                 | 42                          | 20                  | 47.6 | 1,382                              | 69.10              | 2,902                  | 94                                                            |
|      | 120                       | 20                          | 9                   | 45.0 | 3,1643                             | 351.56             | 7,031                  | 227                                                           |
|      | Total                     | 322                         | 199                 | 61.8 | 9,282                              | 53.34              | 17,176                 | 555                                                           |
| 17   | 30                        | 2,076                       | 1,370               | 66.0 | 40,679                             | 29.69              | 61,642                 | 1,988                                                         |
|      | 30<br>120                 | 115                         | 45                  | 39.1 | 1,926                              | 42.80              | 4,922                  | 159                                                           |
|      | 120                       | 9                           | 1                   | 11.1 | 10,738                             | 1,379.56           | 12,416                 | 401                                                           |
|      | Total                     | 2,200                       | 1,416               | 64.4 | 53,343                             | 35.90              | 78,980                 | 2,548                                                         |
| 18   | 30                        | 13,895                      | 9,764               | 70.4 | 212,460                            | 21.76              | 302,349                | 9,753                                                         |
|      | 30<br>120                 | 352                         | 142                 | 40.3 | 7,262                              | 51.14              | 18,002                 | 581                                                           |
|      | 120                       | 54                          | 19                  | 35.2 | 2,635                              | 228.71             | 12,350                 | 398                                                           |
|      | Total                     | 14,301                      | 9,925               | 69.4 | 222,357                            | 23.26              | 332,701                | 10,732                                                        |

MEASURED AND ESTIMATED CONSUMPTION

for Guatemala City Postal Zone

Month: December  
Year: 1984

| Zone  | m <sup>3</sup> /<br>month | Number of Service           |                     |      | Consumptions m <sup>3</sup> /month |                    |           | Total<br>Estimated<br>Consump-<br>tion<br>m <sup>3</sup> /day |
|-------|---------------------------|-----------------------------|---------------------|------|------------------------------------|--------------------|-----------|---------------------------------------------------------------|
|       |                           | Total<br>Instal-<br>lations | With<br>Consumption |      | Measured                           |                    | Estimated |                                                               |
|       |                           |                             | Total               | %    | Total                              | W/Con-<br>sumption | Total     |                                                               |
|       | 30                        | 2,593                       | 1,221               | 47.1 | 39,230                             | 32.13              | 83,312    | 2,687                                                         |
| 19    | 30                        | 348                         | 79                  | 22.7 | 5,806                              | 73.49              | 25,576    | 825                                                           |
|       | 120                       | 1                           | 1                   | 100  | 200                                | 2.00               | 200       | 6                                                             |
|       | Total                     | 2,942                       | 1,301               | 44.2 | 45,236                             | 37.08              | 109,088   | 3,514                                                         |
|       | 30                        |                             |                     |      |                                    |                    |           |                                                               |
|       | 30                        |                             |                     |      |                                    |                    |           |                                                               |
|       | 120                       |                             |                     |      |                                    |                    |           |                                                               |
|       | 120                       |                             |                     |      |                                    |                    |           |                                                               |
|       | Total                     | 266                         | 132                 | 49.6 | 870,683                            | 611.23             | 162,589   | 5,245                                                         |
|       | 30                        |                             |                     |      |                                    |                    |           |                                                               |
|       | 30                        |                             |                     |      |                                    |                    |           |                                                               |
| Total | 120                       |                             |                     |      |                                    |                    |           |                                                               |
|       | 120                       |                             |                     |      |                                    |                    |           |                                                               |
|       | Total                     | 110,015                     | 69,872              | 63.1 | 2,651,740                          | 40.31              | 4,467,272 | 144,106                                                       |

**MEASURED AND ESTIMATED CONSUMPTION**  
for Guatemala City Postal Zone

Month: January  
Year: 1985

| Zone | m <sup>3</sup> /<br>month | Number of Service           |                     |      | Consumptions m <sup>3</sup> /month |                    |                        | Total<br>Estimated<br>Consump-<br>tion<br>m <sup>3</sup> /day |
|------|---------------------------|-----------------------------|---------------------|------|------------------------------------|--------------------|------------------------|---------------------------------------------------------------|
|      |                           | Total<br>Instal-<br>lations | With<br>Consumption |      | Measured                           |                    | Estimated<br><br>Total |                                                               |
|      |                           |                             | Total               | %    | Total                              | W/Con-<br>sumption |                        |                                                               |
| 1    | 30                        | 3,444                       | 1,803               | 52.4 | 54,189                             | 30.05              | 103,509                | 3,339                                                         |
|      | 30<br>120                 | 4,984                       | 2,182               | 43.8 | 115,968                            | 53.15              | 264,887                | 8,545                                                         |
|      | 120                       | 296                         | 140                 | 47.3 | 36,350                             | 259.65             | 76,856                 | 2,497                                                         |
|      | Total                     | 8,724                       | 4,125               | 47.3 | 206,508                            | 51.04              | 445,252                | 14,363                                                        |
| 2    | 30                        | 1,691                       | 911                 | 53.9 | 28,617                             | 31.41              | 53,119                 | 1,714                                                         |
|      | 30<br>120                 | 1,235                       | 550                 | 44.5 | 29,946                             | 54.45              | 67,242                 | 2,169                                                         |
|      | 120                       | 26                          | 15                  | 57.7 | 4,894                              | 323.27             | 8,405                  | 271                                                           |
|      | Total                     | 2,952                       | 1,4376              | 50.0 | 63,412                             | 43.62              | 128,766                | 4,154                                                         |
| 3    | 30                        | 3,023                       | 1,971               | 65.2 | 47,645                             | 25.19              | 76,142                 | 2,456                                                         |
|      | 30<br>120                 | 831                         | 454                 | 54.6 | 19,217                             | 42.33              | 35,175                 | 1,135                                                         |
|      | 120                       | 88                          | 18                  | 20.5 | 5,764                              | 320.22             | 28,180                 | 909                                                           |
|      | Total                     | 3,942                       | 2,443               | 62.0 | 74,626                             | 35.39              | 139,487                | 4,500                                                         |
| 4    | 30                        | 172                         | 99                  | 57.6 | 3,618                              | 36.55              | 6,286                  | 203                                                           |
|      | 30<br>120                 | 353                         | 139                 | 39.4 | 8,378                              | 60.27              | 21,277                 | 686                                                           |
|      | 120                       | 53                          | 20                  | 37.7 | 17,428                             | 395.08             | 26,239                 | 846                                                           |
|      | Total                     | 578                         | 258                 | 44.6 | 29,424                             | 93.08              | 53,802                 | 1,735                                                         |
| 5    | 30                        | 7,845                       | 4,685               | 59.7 | 137,502                            | 29.35              | 230,246                | 7,427                                                         |
|      | 30<br>120                 | 1,349                       | 659                 | 48.9 | 36,493                             | 55.38              | 74,703                 | 2,410                                                         |
|      | 120                       | 62                          | 26                  | 41.9 | 8,510                              | 327.30             | 20,293                 | 655                                                           |
|      | Total                     | 9,256                       | 5,370               | 58.0 | 182,505                            | 35.14              | 325,242                | 10,492                                                        |
| 6    | 30                        | 10,474                      | 6,483               | 61.9 | 183,575                            | 28.32              | 296,618                | 9,568                                                         |
|      | 30<br>120                 | 1,377                       | 544                 | 39.5 | 29,075                             | 53.45              | 73,596                 | 2,374                                                         |
|      | 120                       | 66                          | 18                  | 27.3 | 4,534                              | 251.80             | 16,625                 | 536                                                           |
|      | Total                     | 11,917                      | 7,045               | 59.1 | 217,204                            | 32.46              | 386,837                | 12,478                                                        |

**MEASURED AND ESTIMATED CONSUMPTION**  
for Guatemala City Postal Zone

Month: January  
Year: 1985

| Zone | m <sup>3</sup> /<br>month | Number of Service           |                     |      | Consumptions m <sup>3</sup> /month |                    |                    | Total<br>Estimated<br>Consump-<br>tion<br>m <sup>3</sup> /day |
|------|---------------------------|-----------------------------|---------------------|------|------------------------------------|--------------------|--------------------|---------------------------------------------------------------|
|      |                           | Total<br>Instal-<br>lations | With<br>Consumption |      | Measured                           |                    | Estimated<br>Total |                                                               |
|      |                           |                             | Total               | %    | Total                              | W/Con-<br>sumption |                    |                                                               |
| 7    | 30                        | 15,836                      | 11,258              | 71.1 | 293,983                            | 26.11              | 413,529            | 13,340                                                        |
|      | 30<br>120                 | 1,937                       | 1,014               | 52.3 | 51,371                             | 50.66              | 98,1323            | 3,166                                                         |
|      | 120                       | 52                          | 20                  | 38.5 | 26,733                             | 696.79             | 36,233             | 1,169                                                         |
|      | Total                     | 17,825                      | 12,282              | 69.0 | 372,087                            | 30.74              | 547,894            | 17,675                                                        |
| 8    | 30                        | 1,473                       | 779                 | 52.9 | 27,328                             | 35.08              | 51,674             | 1,667                                                         |
|      | 30<br>120                 | 784                         | 306                 | 39.0 | 18,102                             | 59.16              | 46,379             | 1,496                                                         |
|      | 120                       | 19                          | 6                   | 31.9 | 960                                | 160.00             | 3,040              | 98                                                            |
|      | Total                     | 2,276                       | 1,091               | 47.9 | 46,390                             | 44.42              | 101,093            | 3,261                                                         |
| 9    | 30                        | 328                         | 195                 | 59.5 | 9,519                              | 48.82              | 16,011             | 516                                                           |
|      | 30<br>120                 | 1,045                       | 631                 | 29.7 | 49,968                             | 79.19              | 82,752             | 2,669                                                         |
|      | 120                       | 72                          | 37                  | 51.4 | 44,274                             | 983.00             | 70,776             | 2,283                                                         |
|      | Total                     | 1,445                       | 863                 | 59.7 | 103,761                            | 117.32             | 169,539            | 5,468                                                         |
| 10   | 30                        | 1,110                       | 653                 | 58.8 | 21,002                             | 32.16              | 35,700             | 1,152                                                         |
|      | 30<br>120                 | 1,665                       | 876                 | 52.6 | 49,130                             | 56.08              | 93,373             | 3,012                                                         |
|      | 120                       | 90                          | 31                  | 34.4 | 8,165                              | 242.64             | 21,837             | 704                                                           |
|      | Total                     | 2,865                       | 1,560               | 54.5 | 78,297                             | 52.67              | 150,910            | 4,868                                                         |
| 11   | 30                        | 6,601                       | 4,489               | 68.0 | 121,964                            | 27.17              | 179,346            | 5,785                                                         |
|      | 30<br>120                 | 1,869                       | 1,121               | 60.0 | 49,056                             | 43.76              | 81,789             | 2,638                                                         |
|      | 120                       | 58                          | 35                  | 60.3 | 28,091                             | 537.62             | 33,270             | 1,073                                                         |
|      | Total                     | 8,528                       | 5,645               | 66.2 | 199,111                            | 34.52              | 294,405            | 9,496                                                         |
| 12   | 30                        | 10,700                      | 7,356               | 60.7 | 171,888                            | 23.37              | 250,027            | 8,065                                                         |
|      | 30<br>120                 | 2,196                       | 1,124               | 51.2 | 54,926                             | 48.87              | 107,311            | 3,462                                                         |
|      | 120                       | 91                          | 32                  | 35.2 | 11,441                             | 357.53             | 32,535             | 1,050                                                         |
|      | Total                     | 12,987                      | 8,512               | 65.5 | 238,255                            | 30.02              | 387,873            | 12,577                                                        |

MEASURED AND ESTIMATED CONSUMPTION

for Guatemala City Postal Zone

Month: January  
Year: 1985

| Zone | m <sup>3</sup> /<br>month | Number of Service           |                     |        | Consumptions m <sup>3</sup> /month |                    |                    | Total<br>Estimated<br>Consump-<br>tion<br>m <sup>3</sup> /day |
|------|---------------------------|-----------------------------|---------------------|--------|------------------------------------|--------------------|--------------------|---------------------------------------------------------------|
|      |                           | Total<br>Instal-<br>lations | With<br>Consumption |        | Measured                           |                    | Estimated<br>Total |                                                               |
|      |                           |                             | Total               | %      | Total                              | W/Con-<br>sumption |                    |                                                               |
| 30   | 2,164                     | 1,399                       | 61.8                | 33,759 |                                    | 25.21              | 54,584             | 1,761                                                         |
| 13   | 30                        | 901                         | 511                 | 56.7   | 26,705                             | 52.26              | 47,087             | 1,519                                                         |
|      | 120                       | 30                          | 12                  | 40.0   | 2,681                              | 223.42             | 6,703              | 216                                                           |
|      | Total                     | 3,096                       | 1,862               | 60.1   | 63,145                             | 35.00              | 108,374            | 3,496                                                         |
| 14   | 30                        | 823                         | 484                 | 58.6   | 13,472                             | 27.95              | 23,003             | 742                                                           |
|      | 30                        | 1,121                       | 670                 | 59.8   | 32,666                             | 48.76              | 54,655             | 1,763                                                         |
|      | 120                       | 51                          | 28                  | 54.9   | 5,366                              | 172.55             | 8,800              | 284                                                           |
|      | Total                     | 1,995                       | 1,180               | 59.2   | 51,504                             | 43.34              | 86,458             | 2,789                                                         |
| 15   | 30                        | 1,074                       | 705                 | 65.6   | 24,025                             | 37.08              | 36,600             | 1,181                                                         |
|      | 30                        | 1,533                       | 862                 | 56.2   | 49,158                             | 57.03              | 87,424             | 2,820                                                         |
|      | 120                       | 35                          | 18                  | 51.4   | 4,015                              | 223.06             | 7,807              | 252                                                           |
|      | Total                     | 2,642                       | 1,585               | 60.0   | 77,198                             | 49.90              | 131,831            | 4,253                                                         |
| 16   | 30                        | 264                         | 163                 | 61.7   | 4,213                              | 25.85              | 6,824              | 220                                                           |
|      | 30                        | 42                          | 19                  | 45.2   | 1,169                              | 61.53              | 2,584              | 83                                                            |
|      | 120                       | 20                          | 7                   | 35.0   | 5,724                              | 365.83             | 7,317              | 236                                                           |
|      | Total                     | 326                         | 189                 | 58.0   | 11,106                             | 51.30              | 16,725             | 539                                                           |
| 17   | 30                        | 2,081                       | 1,349               | 64.8   | 41,521                             | 30.78              | 64,051             | 2,066                                                         |
|      | 30                        | 115                         | 49                  | 42.6   | 2,353                              | 48.02              | 5,522              | 178                                                           |
|      | 120                       | 9                           | 1                   | 11.1   | 56,908                             | 88.89              | 8,000              | 255                                                           |
|      | Total                     | 2,205                       | 1,399               | 63.5   | 100,782                            | 35.18              | 77,573             | 2,499                                                         |
| 18   | 30                        | 13,907                      | 9,478               | 68.2   | 217,267                            | 22.92              | 318,794            | 10,284                                                        |
|      | 30                        | 412                         | 147                 | 35.7   | 7,691                              | 52.32              | 21,556             | 695                                                           |
|      | 120                       | 56                          | 30                  | 53.6   | 4,778                              | 159.27             | 8,919              | 288                                                           |
|      | Total                     | 14,375                      | 9,655               | 67.2   | 229,736                            | 24.30              | 349,269            | 11,267                                                        |

**MEASURED AND ESTIMATED CONSUMPTION**  
for Guatemala City Postal Zone

Month: January  
Year: 1985

| Zone  | m <sup>3</sup> /<br>month | Number of Service           |                     |      | Consumptions m <sup>3</sup> /month |                    |           | Total<br>Estimated<br>Consump-<br>tion<br>m <sup>3</sup> /day |
|-------|---------------------------|-----------------------------|---------------------|------|------------------------------------|--------------------|-----------|---------------------------------------------------------------|
|       |                           | Total<br>Instal-<br>lations | With<br>Consumption |      | Measured                           |                    | Estimated |                                                               |
|       |                           |                             | Total               | %    | Total                              | W/Con-<br>sumption | Total     |                                                               |
|       | 30                        | 2,583                       | 1,179               | 45.6 | 36,861                             | 31.26              | 80,757    | 2,605                                                         |
| 19    | 30                        | 348                         | 78                  | 22.4 | 4,866                              | 62.38              | 21,710    | 700                                                           |
|       | 120                       |                             |                     |      |                                    |                    |           |                                                               |
|       | 120                       |                             |                     |      |                                    |                    |           |                                                               |
|       | Total                     | 2,948                       | 1,261               | 42.8 | 42,472                             | 35.81              | 105,556   | 3,405                                                         |
|       | 30                        |                             |                     |      |                                    |                    |           |                                                               |
|       | 30                        |                             |                     |      |                                    |                    |           |                                                               |
|       | 120                       |                             |                     |      |                                    |                    |           |                                                               |
|       | 120                       |                             |                     |      |                                    |                    |           |                                                               |
|       | Total                     | 266                         | 129                 | 51.5 | 62,522                             | 484.67             | 128,922   | 4,159                                                         |
| Total | 30                        |                             |                     |      |                                    |                    |           |                                                               |
|       | 30                        |                             |                     |      |                                    |                    |           |                                                               |
|       | 120                       |                             |                     |      |                                    |                    |           |                                                               |
|       | 120                       |                             |                     |      |                                    |                    |           |                                                               |
|       | Total                     | 110,650                     | 67,943              | 61.4 | 2,400,208                          | 37.40              | 4,137,820 | 133,478                                                       |

**MEASURED AND ESTIMATED CONSUMPTION**  
for Guatemala City Postal Zone

Month: July  
Year: 1985

| Zone | m <sup>3</sup> /<br>month | Number of Service           |                     |      | Consumptions m <sup>3</sup> /month |                    |                    | Total<br>Estimated<br>Consump-<br>tion<br>m <sup>3</sup> /day |
|------|---------------------------|-----------------------------|---------------------|------|------------------------------------|--------------------|--------------------|---------------------------------------------------------------|
|      |                           | Total<br>Instal-<br>lations | With<br>Consumption |      | Measured                           |                    | Estimated<br>Total |                                                               |
|      |                           |                             | Total               | %    | Total                              | W/Con-<br>sumption |                    |                                                               |
| 1    | 30                        | 3,524                       | 1,991               | 56.5 | 73,717                             | 37.03              | 130,477            | 4,209                                                         |
|      | 30<br>120                 | 5,309                       | 2,339               | 44.1 | 142,541                            | 60.94              | 323,536            | 10,437                                                        |
|      | 120                       | 259                         | 124                 | 47.9 | 36,450                             | 293.95             | 76,133             | 2,456                                                         |
|      | Total                     | 9,092                       | 4,454               | 49.0 | 252,708                            | 58.31              | 530,146            | 17,102                                                        |
| 2    | 30                        | 1,721                       | 970                 | 56.4 | 34,506                             | 35.57              | 61,221             | 1,975                                                         |
|      | 30<br>120                 | 1,198                       | 581                 | 48.5 | 29,780                             | 51.26              | 61,405             | 1,981                                                         |
|      | 120                       | 19                          | 9                   | 47.4 | 1,633                              | 181.44             | 3,447              | 111                                                           |
|      | Total                     | 2,938                       | 1,560               | 53.1 | 65,919                             | 42.91              | 126,073            | 4,067                                                         |
| 3    | 30                        | 3,168                       | 2,138               | 67.5 | 60,762                             | 28.42              | 90,046             | 2,904                                                         |
|      | 30<br>120                 | 922                         | 506                 | 54.9 | 27,607                             | 54.56              | 50,304             | 1,623                                                         |
|      | 120                       | 21                          | 6                   | 28.6 | 1,334                              | 222.33             | 4,559              | 151                                                           |
|      | Total                     | 4,111                       | 2,650               | 64.5 | 89,703                             | 35.27              | 145,008            | 4,678                                                         |
| 4    | 30                        | 194                         | 110                 | 56.7 | 9,419                              | 85.63              | 16,612             | 536                                                           |
|      | 30<br>120                 | 357                         | 160                 | 44.8 | 10,534                             | 65.84              | 23,504             | 758                                                           |
|      | 120                       | 39                          | 20                  | 51.3 | 7,365                              | 368.35             | 14,366             | 463                                                           |
|      | Total                     | 590                         | 290                 | 49.2 | 27,320                             | 92.34              | 54,482             | 1,757                                                         |
| 5    | 30                        | 7,948                       | 4,962               | 62.4 | 149,957                            | 30.22              | 240,197            | 7,748                                                         |
|      | 30<br>120                 | 1,302                       | 698                 | 53.6 | 40,764                             | 58.40              | 76,038             | 2,453                                                         |
|      | 120                       | 21                          | 10                  | 47.6 | 2,334                              | 233.4              | 4,901              | 158                                                           |
|      | Total                     | 9,271                       | 5,670               | 61.2 | 193,055                            | 34.64              | 321,136            | 10,359                                                        |
| 6    | 30                        | 10,675                      | 7,245               | 67.9 | 205,427                            | 28.35              | 302,682            | 9,764                                                         |
|      | 30<br>120                 | 1,319                       | 564                 | 42.7 | 219,095                            | 51.59              | 68,043             | 2,195                                                         |
|      | 120                       | 23                          | 9                   | 39.1 | 3,354                              | 372.67             | 8,571              | 277                                                           |
|      | Total                     | 12,017                      | 7,818               | 65.1 | 237,876                            | 31.56              | 279,296            | 12,236                                                        |



**MEASURED AND ESTIMATED CONSUMPTION**  
for Guatemala City Postal Zone

Month: July  
Year: 1985

| Zone | m <sup>3</sup> /<br>month | Number of Service           |                     |      | Consumptions m <sup>3</sup> /month |                    |                    | Total<br>Estimated<br>Consump-<br>tion<br>m <sup>3</sup> /day |
|------|---------------------------|-----------------------------|---------------------|------|------------------------------------|--------------------|--------------------|---------------------------------------------------------------|
|      |                           | Total<br>Instal-<br>lations | With<br>Consumption |      | Measured                           |                    | Estimated<br>Total |                                                               |
|      |                           |                             | Total               | %    | Total                              | W/Con-<br>sumption |                    |                                                               |
| 7    | 30                        | 16,208                      | 12,023              | 74.2 | 453,420                            | 37.71              | 611,248            | 19,718                                                        |
|      | 30<br>120                 | 1,831                       | 1,086               | 59.3 | 67,204                             | 61.88              | 113,306            | 3,655                                                         |
|      | 120                       | 44                          | 22                  | 50.2 | 7,235                              | 253.66             | 11,161             | 360                                                           |
|      | Total                     | 18,083                      | 13,131              | 72.6 | 527,8509                           | 40.69              | 735,715            | 23,733                                                        |
| 8    | 30                        | 1,492                       | 913                 | 61.2 | 34,694                             | 38.00              | 56,696             | 1,829                                                         |
|      | 30<br>120                 | 758                         | 368                 | 48.5 | 27,772                             | 75.47              | 57,204             | 1,845                                                         |
|      | 120                       | 18                          | 7                   | 38.9 | 810                                | 115.71             | 2,083              | 67                                                            |
|      | Total                     | 2,268                       | 1,288               | 56.8 | 63,276                             | 51.14              | 115,983            | 3,741                                                         |
| 9    | 30                        | 329                         | 202                 | 81.4 | 11,999                             | 59.40              | 19,543             | 630                                                           |
|      | 30<br>120                 | 1,051                       | 595                 | 56.6 | 48,862                             | 82.12              | 86,309             | 2,784                                                         |
|      | 120                       | 72                          | 42                  | 58.3 | 32,454                             | 562.15             | 40,475             | 1,306                                                         |
|      | Total                     | 1,452                       | 839                 | 57.8 | 93,315                             | 100.78             | 146,327            | 4,720                                                         |
| 10   | 30                        | 1,121                       | 661                 | 59.0 | 24,701                             | 37.347             | 41,890             | 1,351                                                         |
|      | 30<br>120                 | 1,699                       | 880                 | 51.8 | 52,349                             | 59.49              | 101,069            | 3,260                                                         |
|      | 120                       | 89                          | 34                  | 38.2 | 15,744                             | 442.91             | 34,419             | 1,272                                                         |
|      | Total                     | 2,909                       | 1,575               | 54.1 | 92,794                             | 62.69              | 182,378            | 5,883                                                         |
| 11   | 30                        | 6,721                       | 4,770               | 71.0 | 184,293                            | 38.85              | 261,081            | 8,422                                                         |
|      | 30<br>120                 | 1,854                       | 1,154               | 62.2 | 62,423                             | 54.09              | 100,288            | 3,235                                                         |
|      | 120                       | 53                          | 30                  | 56.6 | 50,882                             | 1,126.47           | 59,703             | 1,926                                                         |
|      | Total                     | 8,628                       | 5,954               | 69.0 | 298,598                            | 48.80              | 421,072            | 13,583                                                        |
| 12   | 30                        | 10,968                      | 8,031               | 73.2 | 246,305                            | 30.67              | 336,381            | 10,851                                                        |
|      | 30<br>120                 | 2,130                       | 1,203               | 56.5 | 86,303                             | 71.74              | 152,806            | 4,929                                                         |
|      | 120                       | 75                          | 31                  | 41.3 | 15,024                             | 484.65             | 36,348             | 1,173                                                         |
|      | Total                     | 13,173                      | 9,265               | 70.3 | 347,632                            | 39.89              | 525,535            | 16,953                                                        |

**MEASURED AND ESTIMATED CONSUMPTION**  
for Guatemala City Postal Zone

Month: July  
Year: 1985

| Zone | m <sup>3</sup> /<br>month | Number of Service           |                     |        | Consumptions m <sup>3</sup> /month |                    |                    | Total<br>Estimated<br>Consump-<br>tion<br>m <sup>3</sup> /day |
|------|---------------------------|-----------------------------|---------------------|--------|------------------------------------|--------------------|--------------------|---------------------------------------------------------------|
|      |                           | Total<br>Instal-<br>lations | With<br>Consumption |        | Measured                           |                    | Estimated<br>Total |                                                               |
|      |                           |                             | Total               | %      | Total                              | W/Con-<br>sumption |                    |                                                               |
| 13   | 30                        | 2,209                       | 1,424               | 64.5   | 45,551                             | 31.99              | 70,662             | 2,279                                                         |
|      | 30<br>120                 | 981                         | 507                 | 51.7   | 34,764                             | 68.57              | 67,265             | 2,170                                                         |
|      | 120                       | 30                          | 2                   | 40.0   | 3,139                              | 261.58             | 7,848              | 253                                                           |
|      | Total                     | 3,230                       | 1,943               | 60.3   | 83,454                             | 45.27              | 145,775            | 4,702                                                         |
| 14   | 30                        | 855                         | 522                 | 61.1   | 32,788                             | 62.81              | 53,704             | 1,732                                                         |
|      | 30<br>120                 | 1,175                       | 680                 | 57.9   | 41,860                             | 61.56              | 72,332             | 2,333                                                         |
|      | 120                       | 47                          | 33                  | 70.2   | 6,981                              | 211.55             | 9,943              | 321                                                           |
|      | Total                     | 2,077                       | 1,235               | 59.5   | 81,629                             | 65.47              | 135,979            | 4,386                                                         |
| 15   | 30                        | 1,096                       | 919                 | 65.6   | 25,920                             | 36.05              | 39,511             | 1,275                                                         |
|      | 30<br>120                 | 1,586                       | 924                 | 70.170 |                                    | 75.94              | 120,443            | 3,885                                                         |
|      | 120                       | 36                          | 19                  | 52.8   | 4,230                              | 222.63             | 8,015              | 259                                                           |
|      | Total                     | 2,718                       | 1,662               | 61.1   | 100,320                            | 61.80              | 167,969            | 5,419                                                         |
| 16   | 30                        | 286                         | 193                 | 67.5   | 6,629                              | 34.35              | 9,823              | 317                                                           |
|      | 30<br>120                 | 50                          | 21                  | 42.0   | 1,182                              | 56.29              | 2,814              | 91                                                            |
|      | 120                       | 7                           | 2                   | 28.6   | 88                                 | 44.00              | 308                | 10                                                            |
|      | Total                     | 343                         | 215                 | 63.0   | 7,899                              | 37.74              | 12,945             | 418                                                           |
| 17   | 30                        | 2,145                       | 1,396               | 65.1   | 44,2865                            | 31.72              | 68,047             | 2,195                                                         |
|      | 30<br>120                 | 181                         | 52                  | 28.7   | 2,861                              | 55.02              | 9,958              | 321                                                           |
|      | 120                       | 9                           | 2                   | 2.2    | 13,255                             | 1,592.78           | 14,353             | 462                                                           |
|      | Total                     | 2,335                       | 1,450               | 62.1   | 60,402                             | 39.55              | 92,340             | 2,978                                                         |
| 18   | 30                        | 14,697                      | 10,640              | 72.4   | 233,920                            | 21.98              | 323,113            | 10,423                                                        |
|      | 30<br>120                 | 502                         | 185                 | 36.9   | 10,425                             | 56.35              | 28,288             | 913                                                           |
|      | 120                       | 7                           | 2                   | 28.6   | 1,055                              | 527.50             | 3,693              | 119                                                           |
|      | Total                     | 15,206                      | 10,827              | 71.2   | 245,400                            | 23.55              | 355,094            | 11,455                                                        |

**MEASURED AND ESTIMATED CONSUMPTION**  
for Guatemala City Postal Zone

Month: July  
Year: 1985

| Zone | m <sup>3</sup> /<br>month | Number of Service           |                     |      | Consumptions m <sup>3</sup> /month |                    |           | Total<br>Estimated<br>Consump-<br>tion<br>m <sup>3</sup> /day |
|------|---------------------------|-----------------------------|---------------------|------|------------------------------------|--------------------|-----------|---------------------------------------------------------------|
|      |                           | Total<br>Instal-<br>lations | With<br>Consumption |      | Measured                           |                    | Estimated |                                                               |
|      |                           |                             | Total               | %    | Total                              | W/Con-<br>sumption | Total     |                                                               |
|      | 30                        | 2,632                       | 1,286               | 48.9 | 42,021                             | 32.68              | 86,003    | 2,774                                                         |
| 19   | 30                        | 278                         | 86                  | 30.9 | 5,258                              | 61.14              | 16,997    | 548                                                           |
|      | 120                       |                             |                     |      |                                    |                    |           |                                                               |
|      | 120                       | 1                           | 1                   | 10.0 | 144                                | 144                | 144       | 5                                                             |
|      | Total                     | 2,912                       | 1,373               | 47.1 | 47,423                             | 35.42              | 103,144   | 3,327                                                         |
|      | 30                        |                             |                     |      |                                    |                    |           |                                                               |
|      | 30                        |                             |                     |      |                                    |                    |           |                                                               |
|      | 120                       |                             |                     |      |                                    |                    |           |                                                               |
|      | 120                       |                             |                     |      |                                    |                    |           |                                                               |
|      | Total                     | 267                         | 138                 | 51.7 | 88,816                             | 643.59             | 171,840   | 5,543                                                         |
|      | 30                        |                             |                     |      |                                    |                    |           |                                                               |
|      | 30                        |                             |                     |      |                                    |                    |           |                                                               |
|      | 120                       |                             |                     |      |                                    |                    |           |                                                               |
|      | 120                       |                             |                     |      |                                    |                    |           |                                                               |
|      | Total                     | 113,614                     | 73,341              | 64.6 | 3,005,395                          | 42.85              | 4,868,237 | 157,040                                                       |

**MEASURED AND ESTIMATED CONSUMPTION**

for Guatemala City Postal Zone

Month: August  
Year: 1985

| Zone | m <sup>3</sup> /<br>month | Number of Service           |                     |      | Consumptions m <sup>3</sup> /month |                    |                    | Total<br>Estimated<br>Consump-<br>tion<br>m <sup>3</sup> /day |
|------|---------------------------|-----------------------------|---------------------|------|------------------------------------|--------------------|--------------------|---------------------------------------------------------------|
|      |                           | Total<br>Instal-<br>lations | With<br>Consumption |      | Measured                           |                    | Estimated<br>Total |                                                               |
|      |                           |                             | Total               | %    | Total                              | W/Con-<br>sumption |                    |                                                               |
| 1    | 30                        | 3,533                       | 1,983               | 56.1 | 65,142                             | 32.85              | 116,060            | 3,744                                                         |
|      | 30<br>120                 | 5,281                       | 2,336               | 44.2 | 130,087                            | 55.69              | 294,088            | 2,361                                                         |
|      | 120                       | 254                         | 122                 | 48.0 | 35,158                             | 288.18             | 73,198             | 2,361                                                         |
|      | Total                     | 9,068                       | 4,441               | 49.0 | 230,387                            | 53.30              | 483,346            | 15,592                                                        |
| 2    | 30                        | 1,720                       | 1,023               | 59.5 | 23,695                             | 23.16              | 39,839             | 1,285                                                         |
|      | 30<br>120                 | 1,196                       | 633                 | 52.9 | 32,575                             | 51.46              | 61,548             | 1,985                                                         |
|      | 120                       | 26                          | 15                  | 75.7 | 4,275                              | 285.00             | 7,410              | 239                                                           |
|      | Total                     | 2,942                       | 1,671               | 56.8 | 60,544                             | 36.98              | 108,789            | 3,509                                                         |
| 3    | 30                        | 3,109                       | 2,170               | 59.8 | 71,242                             | 32.83              | 102,070            | 3,293                                                         |
|      | 30<br>120                 | 920                         | 509                 | 55.3 | 30,903                             | 60.71              | 55,856             | 1,802                                                         |
|      | 120                       | 87                          | 25                  | 28.7 | 12,372                             | 494.88             | 43,055             | 1,389                                                         |
|      | Total                     | 4,116                       | 2,704               | 65.7 | 114,517                            | 48.83              | 200,981            | 6,484                                                         |
| 4    | 30                        | 181                         | 108                 | 59.7 | 4,215                              | 39.02              | 7,064              | 228                                                           |
|      | 30<br>120                 | 355                         | 160                 | 45.1 | 11,967                             | 74.79              | 26,552             | 857                                                           |
|      | 120                       | 53                          | 26                  | 49.1 | 13,800                             | 208.99             | 11,076             | 357                                                           |
|      | Total                     | 589                         | 294                 | 49.2 | 29,982                             | 75.88              | 44,692             | 1,442                                                         |
| 5    | 30                        | 7,913                       | 4,944               | 62.5 | 155,757                            | 31.50              | 249,293            | 8,042                                                         |
|      | 30<br>120                 | 1,299                       | 683                 | 52.6 | 38,035                             | 55.69              | 72,339             | 2,334                                                         |
|      | 120                       | 62                          | 39                  | 62.9 | 10,920                             | 280.00             | 17,360             | 560                                                           |
|      | Total                     | 9,274                       | 5,666               | 61.1 | 204,712                            | 36.55              | 338,992            | 10,932                                                        |
| 7    | 30                        | 10,641                      | 7,279               | 68.4 | 199,328                            | 27.38              | 291,383            | 9,400                                                         |
|      | 30<br>120                 | 1,316                       | 555                 | 42.2 | 30,126                             | 54.28              | 71,434             | 2,304                                                         |
|      | 120                       | 66                          | 30                  | 45.5 | 3,287                              | 109.57             | 7,231              | 233                                                           |
|      | Total                     | 12,023                      | 7,864               | 65.4 | 226,167                            | 30.78              | 370,058            | 11,937                                                        |

**MEASURED AND ESTIMATED CONSUMPTION**

for Guatemala City Postal Zone

Month: August  
Year: 1985

| Zone | m <sup>3</sup> /<br>month | Number of Service           |                     |      | Consumptions m <sup>3</sup> /month |                    |                    | Total<br>Estimated<br>Consump-<br>tion<br>m <sup>3</sup> /day |
|------|---------------------------|-----------------------------|---------------------|------|------------------------------------|--------------------|--------------------|---------------------------------------------------------------|
|      |                           | Total<br>Instal-<br>lations | With<br>Consumption |      | Measured                           |                    | Estimated<br>Total |                                                               |
|      |                           |                             | Total               | %    | Total                              | W/Con-<br>sumption |                    |                                                               |
| 7    | 30                        | 16,234                      | 12,138              | 74.8 | 348,673                            | 28.73              | 466,334            | 15,043                                                        |
|      | 30<br>120                 | 1,832                       | 1,097               | 59.9 | 52,855                             | 48.18              | 88,268             | 2,847                                                         |
|      | 120                       | 52                          | 24                  | 48.1 | 17,682                             | 647.58             | 33,674             | 1,086                                                         |
|      | Total                     | 18,118                      | 13,2650             | 73.2 | 419,210                            | 32.47              | 588,276            | 18,976                                                        |
| 8    | 30                        | 1,505                       | 911                 | 60.5 | 42,239                             | 38.68              | 58,216             | 1,878                                                         |
|      | 30<br>120                 | 752                         | 366                 | 48.7 | 28,135                             | 76.87              | 57,807             | 1,865                                                         |
|      | 120                       | 18                          | 7                   | 38.9 | 1,371                              | 195.86             | 3,525              | 114                                                           |
|      | Total                     | 2,275                       | 1,284               | 56.4 | 64,745                             | 52.55              | 119,548            | 3,857                                                         |
| 9    | 30                        | 311                         | 197                 | 63.3 | 9,046                              | 45.92              | 14,281             | 461                                                           |
|      | 30<br>120                 | 1,050                       | 592                 | 56.4 | 44,072                             | 74.45              | 78,168             | 2,522                                                         |
|      | 120                       | 90                          | 55                  | 61.1 | 3,056                              | 474.63             | 42,717             | 1,378                                                         |
|      | Total                     | 1,451                       | 844                 | 58.2 | 86,174                             | 93.15              | 135,166            | 4,361                                                         |
| 10   | 30                        | 1,125                       | 656                 | 58.3 | 24,348                             | 37.12              | 41,755             | 1,347                                                         |
|      | 30<br>120                 | 1,699                       | 888                 | 52.3 | 43,475                             | 48.98              | 83,218             | 2,684                                                         |
|      | 120                       | 90                          | 40                  | 44.4 | 15,672                             | 377.90             | 34,011             | 1,097                                                         |
|      | Total                     | 2,914                       | 1,584               | 54.4 | 83,515                             | 54.56              | 158,984            | 5,128                                                         |
| 11   | 30                        | 6,725                       | 4,816               | 71.6 | 157,315                            | 32.67              | 219,673            | 7,086                                                         |
|      | 30<br>120                 | 1,861                       | 1,179               | 63.4 | 58,216                             | 49.38              | 91,891             | 2,964                                                         |
|      | 120                       | 59                          | 35                  | 59.3 | 28,923                             | 990.46             | 58,437             | 1,885                                                         |
|      | Total                     | 8,645                       | 6,030               | 69.8 | 264,454                            | 42.80              | 370,001            | 11,935                                                        |
| 12   | 30                        | 10,994                      | 8,042               | 73.1 | 240,017                            | 29.85              | 328,221            | 10,585                                                        |
|      | 30<br>120                 | 2,133                       | 1,220               | 57.2 | 84,322                             | 69.12              | 147,425            | 4,756                                                         |
|      | 120                       | 86                          | 36                  | 41.9 | 19,180                             | 532.78             | 45,819             | 1,478                                                         |
|      | Total                     | 13,213                      | 9,298               | 70.4 | 343,519                            | 39.47              | 521,465            | 16,819                                                        |

**MEASURED AND ESTIMATED CONSUMPTION**  
for Guatemala City Postal Zone

Month: August  
Year: 1985

| Zone | m <sup>3</sup> /<br>month | Number of Service           |                     |        | Consumptions m <sup>3</sup> /month |                    |                        | Total<br>Estimated<br>Consump-<br>tion<br>m <sup>3</sup> /day |
|------|---------------------------|-----------------------------|---------------------|--------|------------------------------------|--------------------|------------------------|---------------------------------------------------------------|
|      |                           | Total<br>Instal-<br>lations | With<br>Consumption |        | Measured                           |                    | Estimated<br><br>Total |                                                               |
|      |                           |                             | Total               | %      | Total                              | W/Con-<br>sumption |                        |                                                               |
| 13   | 30                        | 2,212                       | 1,461               | 66.0   | 45,348                             | 31.04              | 68,568                 | 2,215                                                         |
|      | 30<br>120                 | 981                         | 554                 | 56.5   | 236,078                            | 65.12              | 63,885                 | 2,061                                                         |
|      | 120                       | 30                          | 11                  | 36.7   | 4,384                              | 398.55             | 11,956                 | 385                                                           |
|      | Total                     | 3,223                       | 2,026               | 62.9   | 85,810                             | 44.83              | 144,499                | 4,661                                                         |
| 14   | 30                        | 856                         | 523                 | 61.1   | 20,158                             | 38.54              | 32,993                 | 1,064                                                         |
|      | 30<br>120                 | 1,170                       | 702                 | 60.0   | 39,430                             | 56.21              | 65,767                 | 2,122                                                         |
|      | 120                       | 51                          | 33                  | 64.7   | 7,881                              | 238.82             | 12,180                 | 393                                                           |
|      | Total                     | 2,077                       | 1,258               | 60.2   | 67,469                             | 53.41              | 110,940                | 3,579                                                         |
| 15   | 30                        | 1,097                       | 720                 | 65.6   | 26,010                             | 23.71              | 26,010                 | 839                                                           |
|      | 30<br>120                 | 1,581                       | 930                 | 58.8   | 54,919                             | 59.05              | 93,362                 | 3,012                                                         |
|      | 120                       | 36                          | 16                  | 44.4   | 13,849                             | 845.77             | 30,448                 | 982                                                           |
|      | Total                     | 2,714                       | 1,666               | 61.4   | 94,778                             | 55.20              | 149,820                | 4,833                                                         |
| 16   | 30                        | 276                         | 184                 | 66.7   | 4,125                              | 27.85              | 7,686                  | 248                                                           |
|      | 30<br>120                 | 49                          | 22                  | 44.9   | 1,391                              | 62.23              | 3,098                  | 100                                                           |
|      | 20                        | 14                          | 70.0                | 7,349  | 7,349                              | 524.93             | 10,496                 | 339                                                           |
|      | 345                       | 220                         | 63.8                | 13,865 |                                    | 61.68              | 21,281                 | 687                                                           |
| 17   | 30                        | 2,156                       | 1,439               | 66.7   | 43,842                             | 30.47              | 65,687                 | 2,112                                                         |
|      | 30<br>120                 | 180                         | 52                  | 28.9   | 2,703                              | 51.98              | 9,357                  | 302                                                           |
|      | 120                       | 9                           | 2                   | 22.2   | 4,402                              | 2,201.00           | 19,809                 | 639                                                           |
|      | Total                     | 2,345                       | 1,493               | 63.7   | 50,947                             | 40.45              | 94,853                 | 3,060                                                         |
| 18   | 30                        | 14,664                      | 10,716              | 73.1   | 254,624                            | 23.76              | 348,433                | 11,240                                                        |
|      | 30<br>120                 | 495                         | 188                 | 38.0   | 9,233                              | 49.11              | 24,310                 | 784                                                           |
|      | 120                       | 53                          | 29                  | 54.7   | 3,252                              | 112.14             | 5,943                  | 192                                                           |
|      | Total                     | 15,212                      | 10,933              | 71.9   | 267,109                            | 24.89              | 378,666                | 12,216                                                        |

MEASURED AND ESTIMATED CONSUMPTION

for Guatemala City Postal Zone

Month: August  
Year: 1985

| Zone  | m <sup>3</sup> /<br>month | Number of Service           |                     |      | Consumptions m <sup>3</sup> /month |                    |           | Total<br>Estimated<br>Consump-<br>tion<br>m <sup>3</sup> /day |
|-------|---------------------------|-----------------------------|---------------------|------|------------------------------------|--------------------|-----------|---------------------------------------------------------------|
|       |                           | Total<br>Instal-<br>lations | With<br>Consumption |      | Measured                           |                    | Estimated |                                                               |
|       |                           |                             | Total               | %    | Total                              | W/Con-<br>sumption | Total     |                                                               |
|       | 30                        | 2,616                       | 1,320               | 50.5 | 42,045                             | 31.85              | 83,326    | 2,688                                                         |
| 19    | 30                        | 275                         | 82                  | 29.8 | 4,969                              | 60.60              | 16,664    | 538                                                           |
|       | 120                       |                             |                     |      |                                    |                    |           |                                                               |
|       | 120                       |                             |                     |      |                                    |                    |           |                                                               |
|       | Total                     | 2,913                       | 1,408               | 48.3 | 48,199                             | 35.81              | 104,335   | 3,366                                                         |
|       | 30                        |                             |                     |      |                                    |                    |           |                                                               |
|       | 30                        |                             |                     |      |                                    |                    |           |                                                               |
|       | 120                       |                             |                     |      |                                    |                    |           |                                                               |
|       | 120                       |                             |                     |      |                                    |                    |           |                                                               |
|       | Total                     | 267                         | 144                 | 63.9 | 77,762                             | 540.01             | 144,181   | 4,651                                                         |
| Total | 30                        |                             |                     |      |                                    |                    |           |                                                               |
|       | 30                        |                             |                     |      |                                    |                    |           |                                                               |
|       | 120                       |                             |                     |      |                                    |                    |           |                                                               |
|       | 120                       |                             |                     |      |                                    |                    |           |                                                               |
|       | Total                     | 113,729                     | 74,087              | 65.2 | 2,833,866                          | 40.35              | 4,588,905 | 148,029                                                       |

NUMBER OF SERVICE AND MEASURED,  
UNIT & ESTIMATED CONSUMPTION  
for Guatemala City Postal Zone

January, 1985

| Zone         | Number of Service  |                  | Average Consumption |                          |                     | Total Consumption             |                       |                     |
|--------------|--------------------|------------------|---------------------|--------------------------|---------------------|-------------------------------|-----------------------|---------------------|
|              | Total Installation | With Consumption |                     | Service with Consumption |                     | Mean<br>m <sup>3</sup> /month | Estimated             |                     |
|              |                    | Total            | %                   | m <sup>3</sup> /month    | m <sup>3</sup> /day |                               | m <sup>3</sup> /month | m <sup>3</sup> /day |
| 1            | 8,225              | 4,128            | 50.2                | 50.07                    | 1.62                | 206,671                       | 411,850               | 13,284              |
| 2            | 2,952              | 1,476            | 50.0                | 42.06                    | 1.39                | 63,412                        | 126,824               | 4,091               |
| 3            | 3,942              | 2,443            | 62.0                | 30.55                    | 0.99                | 74,626                        | 120,415               | 3,884               |
| 4            | 578                | 258              | 44.6                | 114.05                   | 3.68                | 29,424                        | 65,919                | 2,126               |
| 5            | 9,256              | 5,370            | 58.0                | 33.99                    | 1.10                | 182,505                       | 314,575               | 10,148              |
| 6            | 11,917             | 7,045            | 59.1                | 30.83                    | 1.00                | 217,204                       | 367,412               | 11,852              |
| 7            | 17,825             | 12,292           | 69.0                | 30.27                    | 0.98                | 372,087                       | 539,574               | 17,406              |
| 8            | 2,276              | 1,091            | 47.9                | 42.52                    | 1.37                | 46,390                        | 96,777                | 3,122               |
| 9            | 1,445              | 863              | 59.7                | 96.79                    | 3.12                | 103,761                       | 173,737               | 5,604               |
| 10           | 2,865              | 1,560            | 54.5                | 50.19                    | 1.62                | 78,297                        | 143,795               | 4,639               |
| 11           | 8,528              | 5,645            | 66.2                | 35.27                    | 1.14                | 199,111                       | 300,800               | 9,703               |
| 12           | 12,988             | 8,512            | 65.5                | 27.99                    | 0.90                | 238,255                       | 363,540               | 11,727              |
| 13           | 3,096              | 1,862            | 60.1                | 33.91                    | 1.09                | 63,145                        | 104,993               | 3,387               |
| 14           | 1,995              | 1,180            | 59.2                | 43.065                   | 1.41                | 51,504                        | 87,077                | 2,809               |
| 15           | 2,642              | 1,585            | 60.0                | 48.71                    | 1.57                | 77,198                        | 128,679               | 4,151               |
| 16           | 326                | 189              | 58.0                | 58.76                    | 1.90                | 11,106                        | 19,156                | 618                 |
| 17           | 2,205              | 1,399            | 63.5                | 32.30                    | 1.04                | 50,782                        | 80,039                | 2,582               |
| 18           | 14,375             | 9,655            | 67.2                | 23.79                    | 0.77                | 229,746                       | 342,046               | 11,033              |
| 19           | 2,948              | 1,261            | 42.8                | 33.68                    | 1.09                | 42,472                        | 99,292                | 3,203               |
| G            | 266                | 129              | 51.5                | 484.67                   | 15.63               | 62,522                        | 128,922               | 4,159               |
| <b>Total</b> | <b>110,650</b>     | <b>67,943</b>    | <b>61.4</b>         | <b>35.33</b>             | <b>1.14</b>         | <b>2,400,208</b>              | <b>3,908,999</b>      | <b>126,097</b>      |



NUMBER OF SERVICE AND MEASURED,  
UNIT & ESTIMATED CONSUMPTION

for Guatemala City Postal Zone

February, 1985

| Zone  | Number of Service  |                  |      | Average Consumption      |                     | Total Consumption             |                       |                     |
|-------|--------------------|------------------|------|--------------------------|---------------------|-------------------------------|-----------------------|---------------------|
|       | Total Installation | With Consumption |      | Service with Consumption |                     | Mean<br>m <sup>3</sup> /month | Estimated             |                     |
|       |                    | Total            | %    | m <sup>3</sup> /month    | m <sup>3</sup> /day |                               | m <sup>3</sup> /month | m <sup>3</sup> /day |
| 1     | 8,794              | 4,058            | 46.0 | 46.71                    | 1.51                | 189,566                       | 410,804               | 14,672              |
| 2     | 2,941              | 1,442            | 49.0 | 32.81                    | 1.17                | 47,318                        | 96,506                | 3,447               |
| 3     | 3,950              | 2,383            | 60.3 | 30.27                    | 1.08                | 72,127                        | 119,556               | 4,269               |
| 4     | 580                | 259              | 44.7 | 66.75                    | 2.38                | 17,289                        | 38,717                | 1,383               |
| 5     | 9,264              | 5,298            | 57.2 | 26.73                    | 0.95                | 141,604                       | 247,606               | 8,843               |
| 6     | 11,925             | 7,104            | 59.6 | 23.82                    | 0.85                | 169,187                       | 284,002               | 10,143              |
| 7     | 17,836             | 12,025           | 67.4 | 23.88                    | 0.85                | 287,147                       | 425,090               | 15,211              |
| 8     | 2,278              | 1,069            | 46.9 | 35.81                    | 1.28                | 38,278                        | 81,596                | 2,913               |
| 9     | 1,442              | 847              | 58.7 | 176.40                   | 6.30                | 149,413                       | 254,372               | 9,084               |
| 10    | 2,866              | 1,538            | 53.7 | 45.10                    | 1.61                | 69,371                        | 129,270               | 4,617               |
| 11    | 8,551              | 5,592            | 65.4 | 42.04                    | 1.50                | 235,097                       | 359,498               | 12,839              |
| 12    | 13,006             | 8,355            | 64.2 | 30.45                    | 1.09                | 254,442                       | 396,083               | 14,146              |
| 13    | 3,185              | 1,801            | 56.5 | 36.10                    | 1.29                | 65,025                        | 114,994               | 4,107               |
| 14    | 2,001              | 1,176            | 58.8 | 54.89                    | 1.96                | 64,550                        | 109,834               | 3,923               |
| 15    | 2,682              | 1,547            | 57.7 | 41.86                    | 1.50                | 64,757                        | 112,268               | 4,009               |
| 16    | 333                | 195              | 58.6 | 52.65                    | 1.88                | 10,266                        | 17,531                | 626                 |
| 17    | 2,206              | 1,387            | 62.9 | 25.38                    | 0.91                | 35,202                        | 55,988                | 1,999               |
| 18    | 15,022             | 9,585            | 63.8 | 18.65                    | 0.67                | 178,791                       | 280,208               | 10,007              |
| 19    | 2,952              | 1,233            | 41.8 | 26.58                    | 0.95                | 32,774                        | 78,466                | 2,802               |
| G     | 266                | 125              | 47.0 | 540.66                   | 19.31               | 67,583                        | 14,817                | 5,136               |
| Total | 112,080            | 67,019           | 59.8 | 32.67                    | 1.17                | 2,189,787                     | 3,662,326             | 130,727             |

NUMBER OF SERVICE AND MEASURED,  
UNIT & ESTIMATED CONSUMPTION  
for Guatemala City Postal Zone

April 1985

| Zone         | Number of Service  |                  | Average Consumption |                          | Total Consumption   |                       |                       |                     |
|--------------|--------------------|------------------|---------------------|--------------------------|---------------------|-----------------------|-----------------------|---------------------|
|              | Total Installation | With Consumption |                     | Service with Consumption |                     | Mean                  | Estimated             |                     |
|              |                    | Total            | %                   | m <sup>3</sup> /month    | m <sup>3</sup> /day | m <sup>3</sup> /month | m <sup>3</sup> /month | m <sup>3</sup> /day |
| 1            | 9,108              | 3,884            | 42.7                | 51.89                    | 1.73                | 201,557               | 472,652               | 15,755              |
| 2            | 2,931              | 1,384            | 47.2                | 46.05                    | 1.54                | 63,739                | 134,985               | 4,499               |
| 3            | 4,073              | 2,331            | 57.2                | 32.80                    | 1.09                | 76,449                | 133,581               | 4,453               |
| 4            | 585                | 241              | 41.2                | 85.00                    | 2.83                | 20,484                | 497,123               | 1,657               |
| 5            | 9,258              | 5,104            | 56.00               | 36.10                    | 1.20                | 187,139               | 339,446               | 11,315              |
| 6            | 11,946             | 6,910            | 57.8                | 36.10                    | 1.20                | 249,425               | 431,206               | 14,374              |
| 7            | 18,050             | 11,711           | 64.9                | 35.30                    | 1.18                | 413,448               | 637,241               | 21,241              |
| 8            | 2,270              | 1,081            | 47.6                | 50.41                    | 1.68                | 54,489                | 114,422               | 3,814               |
| 9            | 1,454              | 816              | 56.1                | 92.77                    | 3.09                | 75,702                | 134,891               | 4,498               |
| 10           | 2,908              | 1,458            | 50.1                | 56.61                    | 1.89                | 82,541                | 164,629               | 5,488               |
| 11           | 8,572              | 5,471            | 63.8                | 45.48                    | 1.52                | 248,810               | 389,837               | 12,995              |
| 12           | 13,122             | 8,181            | 62.4                | 34.65                    | 1.16                | 283,444               | 454,633               | 15,154              |
| 13           | 3,202              | 1,679            | 52.4                | 34.91                    | 1.16                | 58,622                | 216,542               | 7,218               |
| 14           | 2,067              | 1,105            | 53.5                | 55.04                    | 1.83                | 60,523                | 113,214               | 3,774               |
| 15           | 2,707              | 1,462            | 54.0                | 57.60                    | 1.92                | 84,200                | 155,902               | 5,197               |
| 16           | 337                | 197              | 58.5                | 73.58                    | 2.55                | 14,495                | 24,796                | 827                 |
| 17           | 2,290              | 1,370            | 59.8                | 47.60                    | 1.59                | 65,205                | 108,992               | 3,633               |
| 18           | 15,084             | 9,816            | 65.1                | 27.07                    | 0.90                | 274,525               | 421,856               | 14,062              |
| 19           | 2,917              | 1,190            | 40.8                | 36.55                    | 1.22                | 43,489                | 106,603               | 3,553               |
| G            | 266                | 121              | 45.5                | 588.55                   | 19.62               | 71,215                | 156,556               | 5,219               |
| <b>Total</b> | <b>113,147</b>     | <b>65,512</b>    | <b>57.9</b>         | <b>50.14</b>             | <b>1.34</b>         | <b>2,629,501</b>      | <b>4,541,721</b>      | <b>151,391</b>      |

NUMBER OF SERVICE AND MEASURED,  
UNIT & ESTIMATED CONSUMPTION  
for Guatemala City Postal Zone

May 1985

| Zone  | Number of Service  |                  | Average Consumption |                          |                     | Total Consumption             |                       |                     |
|-------|--------------------|------------------|---------------------|--------------------------|---------------------|-------------------------------|-----------------------|---------------------|
|       | Total Installation | With Consumption |                     | Service with Consumption |                     | Mean<br>m <sup>3</sup> /month | Estimated             |                     |
|       |                    | Total            | %                   | m <sup>3</sup> /month    | m <sup>3</sup> /day |                               | m <sup>3</sup> /month | m <sup>3</sup> /day |
| 1     | 9,115              | 4,483            | 49.2                | 42.48                    | 1.37                | 190,459                       | 287,248               | 12,492              |
| 2     | 2,940              | 1,554            | 52.9                | 42.52                    | 1.37                | 66,078                        | 125,012               | 4,033               |
| 3     | 4,093              | 2,324            | 56.8                | 37.68                    | 1.22                | 87,560                        | 154,210               | 4,975               |
| 4     | 586                | 293              | 50.9                | 77.55                    | 2.50                | 22,721                        | 45,442                | 1,466               |
| 5     | 9,263              | 5,571            | 60.1                | 32.50                    | 1.05                | 181,042                       | 300,697               | 9,700               |
| 6     | 11,968             | 7,924            | 66.2                | 16.59                    | 0.54                | 131,469                       | 198,564               | 6,504               |
| 7     | 18,050             | 11,497           | 63.7                | 30.29                    | 0.98                | 348,296                       | 546,816               | 17,639              |
| 8     | 2,268              | 1,076            | 47.4                | 40.57                    | 1.31                | 43,642                        | 92,010                | 2,968               |
| 9     | 1,455              | 901              | 61.9                | 74.31                    | 2.40                | 66,951                        | 108,117               | 3,488               |
| 10    | 2,912              | 1,554            | 53.4                | 49.49                    | 1.60                | 76,892                        | 144,086               | 4,648               |
| 11    | 8,599              | 6,063            | 70.5                | 31.86                    | 1.03                | 193,166                       | 273,962               | 8,837               |
| 12    | 13,138             | 9,237            | 70.3                | 37.37                    | 1.21                | 345,173                       | 490,948               | 15,837              |
| 13    | 3,218              | 1,941            | 60.3                | 41.76                    | 1.35                | 81,063                        | 134,395               | 4,335               |
| 14    | 2,071              | 1,221            | 59.0                | 55.10                    | 1.78                | 67,273                        | 114,105               | 3,681               |
| 15    | 2,707              | 1,645            | 60.8                | 51.22                    | 1.65                | 84,252                        | 138,644               | 4,472               |
| 16    | 340                | 215              | 63.2                | 140.47                   | 4.53                | 30,202                        | 47,761                | 1,541               |
| 17    | 2,295              | 1,157            | 66.1                | 48.66                    | 1.57                | 73,822                        | 1,079,118             | 34,810              |
| 18    | 15,096             | 10,642           | 70.8                | 22.83                    | 0.74                | 242,909                       | 344,574               | 11,115              |
| 19    | 2,090              | 1,126            | 36.7                | 27.21                    | 0.88                | 30,541                        | 78,902                | 2,545               |
| G     | 267                | 120              | 45.0                | 603.58                   | 19.47               | 72,430                        | 161,157               | 5,199               |
| Total | 113,290            | 70,904           | 62.6                | 34.36                    | 1.11                | 2,435,951                     | 3,802,386             | 125,559             |

NUMBER OF SERVICE AND MEASURED,  
UNIT & ESTIMATED CONSUMPTION

for Guatemala City Postal Zone

June 1985

| Zone  | Number of Service  |                  | Average Consumption |                          | Total Consumption   |                       |                       |                     |
|-------|--------------------|------------------|---------------------|--------------------------|---------------------|-----------------------|-----------------------|---------------------|
|       | Total Installation | With Consumption |                     | Service with Consumption |                     | Mean                  | Estimated             |                     |
|       |                    | Total            | %                   | m <sup>3</sup> /month    | m <sup>3</sup> /day | m <sup>3</sup> /month | m <sup>3</sup> /month | m <sup>3</sup> /day |
| 1     | 9,136              | 4,549            | 49.8                | 56.57                    | 1.86                | 257,348               | 516,860               | 17,229              |
| 2     | 3,087              | 1,609            | 52.1                | 40.68                    | 1.36                | 65,449                | 125,569               | 4,186               |
| 3     | 4,116              | 2,689            | 65.3                | 37.65                    | 1.21                | 101,245               | 154,973               | 5,166               |
| 4     | 590                | 296              | 50.2                | 86.36                    | 2.88                | 25,563                | 50,953                | 1,698               |
| 5     | 9,269              | 5,759            | 62.1                | 35.3                     | 1.18                | 203,317               | 327,235               | 10,908              |
| 6     | 11,986             | 7,887            | 65.8                | 28.98                    | 0.97                | 228,587               | 347,387               | 11,579              |
| 7     | 18,079             | 13,154           | 72.8                | 31.12                    | 1.04                | 409,329               | 562,586               | 18,753              |
| 8     | 2,271              | 1,286            | 56.6                | 44.09                    | 1.47                | 56,694                | 100,118               | 3,337               |
| 9     | 1,455              | 884              | 60.7                | 121.59                   | 4.05                | 107,484               | 176,911               | 5,897               |
| 10    | 2,916              | 1,598            | 54.8                | 58.23                    | 1.94                | 93,056                | 169,807               | 5,660               |
| 11    | 8,621              | 6,065            | 70.4                | 52.49                    | 1.75                | 318,334               | 452,491               | 15,083              |
| 12    | 13,168             | 9,393            | 71.3                | 36.21                    | 1.21                | 340,087               | 476,766               | 15,892              |
| 13    | 3,225              | 1,981            | 61.4                | 41.50                    | 1.38                | 82,205                | 133,827               | 4,461               |
| 14    | 2,084              | 1,276            | 62.2                | 53.84                    | 1.74                | 68,694                | 112,193               | 3,739               |
| 15    | 2,715              | 1,665            | 61.3                | 50.27                    | 1.68                | 83,695                | 136,476               | 4,549               |
| 16    | 341                | 215              | 63.1                | 42.55                    | 1.42                | 9,149                 | 14,511                | 484                 |
| 17    | 2,326              | 1,507            | 64.8                | 40.59                    | 1.35                | 61,174                | 94,420                | 3,147               |
| 18    | 15,184             | 10,777           | 71.0                | 19.87                    | 0.66                | 214,136               | 301,702               | 10,057              |
| 19    | 2,911              | 1,336            | 45.9                | 32.41                    | 1.08                | 43,295                | 94,335                | 3,145               |
| G     | 267                | 129              | 48.3                | 638.10                   | 21.27               | 82,315                | 170,374               | 5,679               |
| Total | 113,747            | 74,055           | 65.1                | 38.50                    | 1.28                | 2,851,156             | 4,379,487             | 145,983             |

NUMBER OF SERVICE AND MEASURED,  
UNIT & ESTIMATED CONSUMPTION  
for Guatemala City Postal Zone

July 1985

| Zone  | Number of Service  |                  | Average Consumption |                          | Total Consumption   |                               |                       |                     |
|-------|--------------------|------------------|---------------------|--------------------------|---------------------|-------------------------------|-----------------------|---------------------|
|       | Total Installation | With Consumption |                     | Service with Consumption |                     | Mean<br>m <sup>3</sup> /month | Estimated             |                     |
|       |                    | Total            | %                   | m <sup>3</sup> /month    | m <sup>3</sup> /day |                               | m <sup>3</sup> /month | m <sup>3</sup> /day |
| 1     | 9,906              | 4,457            | 49.0                | 56.70                    | 11.83               | 252,705                       | 515,734               | 16,637              |
| 2     | 2,938              | 1,560            | 53.1                | 42.26                    | 1.36                | 65,919                        | 124,147               | 4,005               |
| 3     | 4,111              | 2,650            | 64.5                | 33.72                    | 1.09                | 89,703                        | 139,158               | 4,489               |
| 4     | 590                | 290              | 49.2                | 94.21                    | 3.04                | 27,320                        | 55,582                | 1,793               |
| 5     | 9,271              | 5,670            | 61.2                | 34.05                    | 1.10                | 193,055                       | 315,663               | 10,183              |
| 6     | 12,017             | 7,818            | 65.1                | 40.43                    | 1.10                | 237,876                       | 365,638               | 11,795              |
| 7     | 18,083             | 13,131           | 72.6                | 40.20                    | 1.30                | 527,859                       | 726,927               | 23,449              |
| 8     | 2,268              | 1,288            | 56.8                | 49.13                    | 1.58                | 63,276                        | 111,420               | 3,594               |
| 9     | 1,452              | 839              | 57.8                | 111.22                   | 3.59                | 93,315                        | 161,494               | 5,209               |
| 10    | 2,909              | 1,575            | 54.1                | 58.92                    | 1.90                | 92,794                        | 171,389               | 5,529               |
| 11    | 8,628              | 5,954            | 69.0                | 50.15                    | 1.30                | 298,598                       | 432,701               | 13,958              |
| 12    | 13,173             | 9,265            | 70.3                | 36.03                    | 1.16                | 347,632                       | 494,264               | 15,944              |
| 13    | 3,220              | 1,943            | 60.3                | 42.95                    | 1.39                | 83,454                        | 138,303               | 4,461               |
| 14    | 2,077              | 1,235            | 59.5                | 66.10                    | 2.13                | 81,629                        | 137,282               | 4,428               |
| 15    | 2,718              | 1,662            | 61.1                | 60.36                    | 1.95                | 100,320                       | 164,061               | 5,292               |
| 16    | 343                | 216              | 63.0                | 36.57                    | 1.18                | 7,899                         | 12,543                | 405                 |
| 17    | 2,335              | 1,450            | 62.1                | 41.66                    | 1.34                | 60,402                        | 97,268                | 3,318               |
| 18    | 15,206             | 10,827           | 71.2                | 22.67                    | 0.73                | 245,400                       | 344,652               | 11,118              |
| 19    | 2,912              | 1,373            | 47.1                | 34.54                    | 1.11                | 47,423                        | 100,579               | 3,245               |
| G     | 267                | 138              | 51.7                | 643.59                   | 20.76               | 88,816                        | 171,840               | 5,543               |
| Total | 113,614            | 73,341           | 64.6                | 40.98                    | 1.32                | 3,005,395                     | 4,655,777             | 150,186             |

NUMBER OF SERVICE AND MEASURED,  
UNIT & ESTIMATED CONSUMPTION  
for Guatemala City Postal Zone

August 1985

| Zone  | Number of Service  |                  | Average Consumption |                          | Total Consumption   |                               |                       |                     |
|-------|--------------------|------------------|---------------------|--------------------------|---------------------|-------------------------------|-----------------------|---------------------|
|       | Total Installation | With Consumption |                     | Service with Consumption |                     | Mean<br>m <sup>3</sup> /month | Estimated             |                     |
|       |                    | Total            | %                   | m <sup>3</sup> /month    | m <sup>3</sup> /day |                               | m <sup>3</sup> /month | m <sup>3</sup> /day |
| 1     | 9,073              | 4,444            | 49.0                | 52.29                    | 1.69                | 232,361                       | 474,406               | 15,303              |
| 2     | 2,942              | 1,671            | 56.8                | 36.23                    | 1.17                | 60,545                        | 106,597               | 3,439               |
| 3     | 4,116              | 2,704            | 65.7                | 42.35                    | 1.37                | 114,517                       | 174,317               | 5,623               |
| 4     | 589                | 294              | 49.9                | 101.98                   | 3.29                | 29,982                        | 60,066                | 1,938               |
| 5     | 9,274              | 5,666            | 61.1                | 36.13                    | 1.17                | 204,712                       | 335,069               | 10,809              |
| 6     | 12,023             | 7,864            | 65.4                | 28.76                    | 0.93                | 226,167                       | 345,779               | 11,154              |
| 7     | 18,118             | 13,260           | 73.2                | 31.61                    | 1.02                | 419,210                       | 572,794               | 18,477              |
| 8     | 2,275              | 1,284            | 56.4                | 50.42                    | 1.63                | 64,745                        | 114,716               | 3,701               |
| 9     | 1,451              | 844              | 58.2                | 102.10                   | 3.29                | 86,174                        | 148,150               | 4,779               |
| 10    | 2,914              | 1,585            | 54.4                | 103.16                   | 3.33                | 163,515                       | 300,620               | 9,697               |
| 11    | 8,645              | 6,030            | 69.8                | 32.61                    | 1.05                | 294,454                       | 422,148               | 13,618              |
| 12    | 13,213             | 9,298            | 70.4                | 36.95                    | 1.19                | 344,519                       | 488,161               | 15,747              |
| 13    | 3,223              | 2,026            | 62.9                | 42.35                    | 1.37                | 85,810                        | 136,508               | 4,403               |
| 14    | 2,077              | 1,258            | 60.6                | 53.63                    | 1.73                | 67,469                        | 111,393               | 3,593               |
| 15    | 2,714              | 1,667            | 61.4                | 110.84                   | 3.58                | 184,778                       | 300,832               | 9,704               |
| 16    | 345                | 214              | 62.0                | 64.79                    | 2.09                | 13,865                        | 22,352                | 721                 |
| 17    | 2,345              | 1,493            | 63.7                | 43.72                    | 1.41                | 65,274                        | 102,523               | 3,307               |
| 18    | 15,212             | 10,933           | 71.9                | 24.43                    | 0.79                | 267,109                       | 371,651               | 11,988              |
| 19    | 2,913              | 1,408            | 48.3                | 34.23                    | 1.10                | 48,199                        | 99,719                | 3,216               |
| G     | 267                | 144              | 53.9                | 540.01                   | 17.42               | 77,762                        | 144,185               | 4,651               |
| Total | 113,729            | 74,087           | 65.2                | 41.17                    | 1.33                | 3,050,167                     | 4,682,348             | 151,043             |

NUMBER OF SERVICE AND MEASURED,  
UNIT & ESTIMATED CONSUMPTION

for Guatemala City Postal Zone

September 1985

| Zone  | Number of Service  |                  | Average Consumption |                          | Total Consumption   |                       |                       |                     |
|-------|--------------------|------------------|---------------------|--------------------------|---------------------|-----------------------|-----------------------|---------------------|
|       | Total Installation | With Consumption |                     | Service with Consumption |                     | Mean                  | Estimated             |                     |
|       |                    | Total            | %                   | m <sup>3</sup> /month    | m <sup>3</sup> /day | m <sup>3</sup> /month | m <sup>3</sup> /month | m <sup>3</sup> /day |
| 1     | 9,091              | 4,513            | 49.7                | 45.79                    | 1.53                | 206,649               | 416,295               | 13,877              |
| 2     | 2,946              | 1,915            | 65.0                | 33.84                    | 1.13                | 64,813                | 99,707                | 3,324               |
| 3     | 4,138              | 2,679            | 64.7                | 38.14                    | 1.27                | 102,169               | 157,810               | 5,260               |
| 4     | 597                | 301              | 50.4                | 83.00                    | 2.77                | 24,984                | 49,553                | 1,652               |
| 5     | 9,291              | 5,719            | 61.6                | 33.43                    | 1.11                | 191,179               | 310,586               | 10,353              |
| 6     | 12,044             | 7,898            | 65.6                | 36.23                    | 1.21                | 286,170               | 436,402               | 14,547              |
| 7     | 18,138             | 13,169           | 72.6                | 30.95                    | 1.03                | 407,558               | 561,340               | 18,711              |
| 8     | 2,273              | 1,228            | 54.0                | 47.90                    | 1.59                | 58,816                | 108,867               | 3,629               |
| 9     | 1,450              | 985              | 67.9                | 186.65                   | 6.22                | 183,849               | 270,641               | 9,021               |
| 10    | 2,914              | 1,665            | 57.1                | 57.43                    | 1.91                | 95,618                | 167,346               | 5,578               |
| 11    | 8,654              | 6,051            | 69.0                | 37.19                    | 1.24                | 225,044               | 321,853               | 10,728              |
| 12    | 13,243             | 9,342            | 70.5                | 40.76                    | 1.36                | 380,741               | 539,730               | 17,991              |
| 13    | 3,253              | 1,968            | 60.5                | 59.15                    | 2.31                | 136,095               | 224,958               | 7,499               |
| 14    | 2,081              | 1,265            | 60.8                | 50.78                    | 2.69                | 64,235                | 105,670               | 3,522               |
| 15    | 2,716              | 1,660            | 61.1                | 47.97                    | 1.60                | 97,633                | 130,291               | 4,343               |
| 16    | 347                | 219              | 63.1                | 48.24                    | 1.61                | 10,565                | 16,740                | 558                 |
| 17    | 2,353              | 1,493            | 63.5                | 37.44                    | 1.25                | 55,895                | 88,092                | 2,936               |
| 18    | 15,334             | 11,012           | 71.8                | 19.34                    | 0.64                | 212,965               | 296,575               | 9,886               |
| 19    | 2,913              | 1,375            | 47.2                | 32.24                    | 1.07                | 44,329                | 93,913                | 3,130               |
| G     | 267                | 186              | 69.7                | 477.83                   | 15.93               | 88,876                | 127,580               | 4,253               |
| Total | 114,043            | 73,633           | 65.5                | 39.13                    | 1.30                | 2,920,183             | 4,462,389             | 148,746             |

NUMBER OF SERVICE AND MEASURED,  
UNIT & ESTIMATED CONSUMPTION  
for Guatemala City Postal Zone

October 1985

| Zone  | Number of Service  |                  |      | Average Consumption      |                     | Total Consumption     |                       |                     |
|-------|--------------------|------------------|------|--------------------------|---------------------|-----------------------|-----------------------|---------------------|
|       | Total Installation | With Consumption |      | Service with Consumption |                     | Mean                  | Estimated             |                     |
|       |                    | Total            | %    | m <sup>3</sup> /month    | m <sup>3</sup> /day | m <sup>3</sup> /month | m <sup>3</sup> /month | m <sup>3</sup> /day |
| 1     | 9,090              | 4,278            | 47.1 | 48.33                    | 1.56                | 206,737               | 425,112               | 14,170              |
| 2     | 2,948              | 1,899            | 64.4 | 33.44                    | 1.08                | 63,503                | 98,582                | 3,180               |
| 3     | 4,155              | 2,695            | 64.9 | 34.46                    | 1.11                | 92,862                | 143,170               | 4,618               |
| 4     | 598                | 277              | 46.3 | 72.50                    | 2.34                | 20,083                | 34,357                | 1,399               |
| 5     | 9,304              | 5,330            | 59.4 | 27.52                    | 0.89                | 152,189               | 256,052               | 8,260               |
| 6     | 12,074             | 7,370            | 61.0 | 29.31                    | 0.95                | 216,030               | 353,914               | 11,417              |
| 7     | 18,178             | 13,423           | 73.8 | 28.33                    | 0.91                | 380,323               | 515,055               | 16,615              |
| 8     | 2,277              | 1,262            | 55.4 | 41.03                    | 1.32                | 51,775                | 93,417                | 3,013               |
| 9     | 1,448              | 922              | 63.7 | 112.96                   | 3.64                | 104,146               | 163,561               | 5,276               |
| 10    | 2,916              | 1,609            | 55.2 | 44.84                    | 1.45                | 72,145                | 130,749               | 4,218               |
| 11    | 8,664              | 5,708            | 65.9 | 43.17                    | 1.39                | 246,420               | 374,033               | 12,066              |
| 12    | 13,255             | 8,853            | 66.8 | 30.07                    | 0.97                | 266,250               | 398,660               | 12,860              |
| 13    | 3,256              | 1,890            | 58.1 | 42.37                    | 1.37                | 80,086                | 137,968               | 4,451               |
| 14    | 2,087              | 1,310            | 62.8 | 49.55                    | 1.60                | 64,917                | 103,421               | 3,336               |
| 15    | 2,716              | 1,619            | 59.6 | 42.21                    | 1.36                | 68,340                | 114,646               | 3,698               |
| 16    | 348                | 202              | 58.1 | 56.90                    | 1.84                | 11,493                | 19,645                | 634                 |
| 17    | 2,353              | 397              | 16.9 | 50.59                    | 1.63                | 20,086                | 153,949               | 4,966               |
| 18    | 15,338             | 932              | 6.1  | 26.34                    | 0.85                | 24,545                | 403,939               | 13,030              |
| 19    | 2,917              | 1,404            | 48.1 | 28.32                    | 0.91                | 39,768                | 82,623                | 2,665               |
| G     | 268                | 213              | 79.5 | 572.55                   | 18.47               | 121,954               | 153,445               | 4,949               |
| Total | 114,190            | 61,613           | 54.0 | 37.39                    | 1.21                | 2,303,652             | 4,269,462             | 137,725             |



NUMBER OF SERVICE AND MEASURED,  
UNIT & ESTIMATED CONSUMPTION

for Guatemala City Postal Zone

November 1985

| Zone  | Number of Service  |                  |      | Average Consumption      |                     | Total Consumption |                       |                     |
|-------|--------------------|------------------|------|--------------------------|---------------------|-------------------|-----------------------|---------------------|
|       | Total Installation | With Consumption |      | Service with Consumption |                     | Mean              | Estimated             |                     |
|       |                    | Total            | %    | m <sup>3</sup> /month    | m <sup>3</sup> /day |                   | m <sup>3</sup> /month | m <sup>3</sup> /day |
| 1     | 9,140              | 4,277            | 47.0 | 59.44                    | 1.98                | 254,244           | 541,187               | 18,040              |
| 2     | 2,954              | 1,891            | 64.0 | 44.46                    | 1.48                | 84,081            | 131,353               | 4,378               |
| 3     | 4,154              | 2,637            | 63.4 | 29.92                    | 1.00                | 78,887            | 122,421               | 4,147               |
| 4     | 598                | 271              | 45.3 | 55.51                    | 1.85                | 15,052            | 33,192                | 1,106               |
| 5     | 9,320              | 6,325            | 67.9 | 38.25                    | 1.27                | 241,904           | 356,462               | 11,882              |
| 6     | 12,099             | 7,491            | 61.9 | 29.35                    | 0.98                | 219,876           | 355,166               | 11,839              |
| 7     | 18,192             | 12,718           | 69.9 | 25.70                    | 0.86                | 326,894           | 467,607               | 15,587              |
| 8     | 2,274              | 1,592            | 70.0 | 44.69                    | 1.49                | 71,152            | 101,634               | 3,388               |
| 9     | 1,446              | 940              | 64.9 | 119.17                   | 3.97                | 112,018           | 172,318               | 5,744               |
| 10    | 2,924              | 1,687            | 57.7 | 62.50                    | 2.08                | 105,439           | 182,756               | 6,092               |
| 11    | 9,682              | 5,764            | 66.4 | 47.03                    | 1.57                | 271,069           | 408,297               | 13,610              |
| 12    | 13,273             | 8,844            | 66.6 | 26.03                    | 0.87                | 230,201           | 345,509               | 11,517              |
| 13    | 3,263              | 1,918            | 58.8 | 46.09                    | 1.54                | 88,410            | 150,408               | 5,014               |
| 14    | 2,092              | 1,317            | 63.0 | 63.46                    | 2.12                | 83,579            | 132,763               | 4,425               |
| 15    | 2,276              | 1,745            | 64.0 | 50.69                    | 1.69                | 88,459            | 138,192               | 4,606               |
| 16    | 351                | 201              | 57.3 | 59.30                    | 1.98                | 11,919            | 20,815                | 694                 |
| 17    | 2,354              | 402              | 17.1 | 52.24                    | 1.74                | 21,000            | 122,971               | 4,099               |
| 18    | 15,357             | 977              | 6.4  | 30.84                    | 1.03                | 30,135            | 473,702               | 15,790              |
| 19    | 2,920              | 1,282            | 43.9 | 30.37                    | 1.01                | 38,933            | 88,677                | 2,956               |
| G     | 269                | 171              | 63.6 | 439.98                   | 14.67               | 85,480            | 118,453               | 3,945               |
| Total | 114,356            | 62,450           | 54.6 | 40.97                    | 1.37                | 2,258,722         | 4,685,622             | 156,187             |

NUMBER OF SERVICE AND MEASURED,  
UNIT & ESTIMATED CONSUMPTION

for Guatemala City Postal Zone

October 1984

| Zone  | Number of Service  |                  |       | Average Consumption      |                     | Total Consumption             |                       |                     |
|-------|--------------------|------------------|-------|--------------------------|---------------------|-------------------------------|-----------------------|---------------------|
|       | Total Installation | With Consumption |       | Service with Consumption |                     | Mean<br>m <sup>3</sup> /month | Estimated             |                     |
|       |                    | Total            | %     | m <sup>3</sup> /month    | m <sup>3</sup> /day |                               | m <sup>3</sup> /month | m <sup>3</sup> /day |
| 1     | 9,655              | 4,292            | 49.6  | 74.15                    | 2.39                | 318,267                       | 641,799               | 20,703              |
| 2     | 2,937              | 1                |       |                          |                     | 515                           | 1,512,555             | 48,792              |
| 3     | 3,847              | 2,495            | 64.9  | 30.19                    | 0.97                | 75,323                        | 116,139               | 3,746               |
| 4     | 530                | 269              | 50.8  | 84.48                    | 2.73                | 22,724                        | 44,772                | 1,444               |
| 5     | 9,045              | 2,104            | 23.3  | 37.00                    | 1.19                | 77,855                        | 334,695               | 10,797              |
| 6     | 11,436             | 7,007            | 61.3  | 29.02                    | 0.94                | 203,346                       | 331,877               | 10,706              |
| 7     | 17,533             | 12,141           | 69.3  | 27.62                    | 0.89                | 336,363                       | 485,747               | 15,669              |
| 8     | 2,244              | 1,923            | 45.6  | 39.27                    | 1.27                | 40,174                        | 46,880                | 1,512               |
| 9     | 1,426              | 941              | 66.00 | 73.93                    | 2.38                | 69,568                        | 105,424               | 3,400               |
| 10    | 2,806              | 10               | 0.4   | 433.76                   |                     | 4,337                         | 1,216,962             | 39,257              |
| 11    | 8,341              | 6,099            | 73.1  | 39.09                    | 1.26                | 238,262                       | 325,847               | 10,511              |
| 12    | 12,772             | 9,053            | 70.9  | 36.91                    | 1.19                | 334,161                       | 471,435               | 15,208              |
| 13    | 3,062              | 1,986            | 64.9  | 51.72                    | 1.67                | 102,710                       | 158,358               | 5,108               |
| 14    | 1,948              | 1,248            | 63.7  | 63.34                    | 2.04                | 78,537                        | 122,588               | 3,954               |
| 15    | 2,629              | 1,651            | 62.8  | 53.51                    | 1.73                | 88,337                        | 140,665               | 4,537               |
| 16    | 304                | 173              | 56.9  | 33.38                    | 1.08                | 5,775                         | 10,148                | 327                 |
| 17    | 2,143              | 1,391            | 64.9  | 27.78                    | 0.90                | 38,647                        | 59,540                | 1,920               |
| 18    | 14,036             | 3,892            | 27.7  | 34.47                    | 0.76                | 91,325                        | 329,351               | 10,624              |
| 19    | 2,742              | 1,244            | 45.4  | 26.11                    | 0.84                | 34,963                        | 77,065                | 2,486               |
| G     | 251                | 122              | 48.6  | 368.4                    | 11.88               | 44,945                        | 92,469                | 2,983               |
| Total | 108,687            | 58,042           | 53.4  | 38.01                    | 1.23                | 2,206,134                     | 4,131,432             | 133,272             |

NUMBER OF SERVICE AND MEASURED,  
UNIT & ESTIMATED CONSUMPTION  
for Guatemala City Postal Zone

November 1984

| Zone  | Number of Service  |                  |      | Average Consumption      |                     | Total Consumption |                       |                       |
|-------|--------------------|------------------|------|--------------------------|---------------------|-------------------|-----------------------|-----------------------|
|       | Total Installation | With Consumption |      | Service with Consumption |                     | Mean              | Estimated             |                       |
|       |                    | Total            | %    | m <sup>3</sup> /month    | m <sup>3</sup> /day |                   | m <sup>3</sup> /month | m <sup>3</sup> /month |
| 1     | 8,701              | 4,415            | 50.8 | 59.48                    | 1.98                | 262,618           | 517,563               | 17,252                |
| 2     | 2,947              | 1,597            | 54.2 | 40.43                    | 1.35                | 64,564            | 119,142               | 3,971                 |
| 3     | 3,926              | 2,587            | 65.6 | 42.72                    | 1.42                | 110,526           | 167,733               | 5,591                 |
| 4     | 544                | 267              | 52.8 | 92.07                    | 3.07                | 26,425            | 53,840                | 1,795                 |
| 5     | 9,154              | 5,601            | 61.2 | 43.94                    | 1.46                | 246,135           | 402,271               | 13,409                |
| 6     | 11,642             | 7,408            | 63.6 | 35.24                    | 1.17                | 261,048           | 410,248               | 13,675                |
| 7     | 17,733             | 12,847           | 72.5 | 35.96                    | 1.20                | 462,021           | 637,738               | 21,258                |
| 8     | 2,267              | 1,156            | 51.0 | 54.40                    | 1.81                | 62,886            | 123,324               | 4,111                 |
| 9     | 1,439              | 910              | 63.2 | 118.20                   | 3.94                | 107,562           | 170,090               | 5,670                 |
| 10    | 2,818              | 1,649            | 56.5 | 52.86                    | 1.76                | 87,172            | 148,969               | 4,966                 |
| 11    | 8,405              | 5,862            | 69.7 | 64.60                    | 2.15                | 377,517           | 541,288               | 18,043                |
| 12    | 12,914             | 8,881            | 68.8 | 38.65                    | 1.29                | 383,220           | 499,082               | 16,636                |
| 13    | 3,087              | 1,931            | 62.6 | 44.81                    | 1.49                | 86,523            | 138,320               | 4,611                 |
| 14    | 1,959              | 1,243            | 63.5 | 54.77                    | 1.83                | 68,084            | 107,302               | 3,577                 |
| 15    | 2,635              | 1,649            | 62.6 | 53.93                    | 1.80                | 88,929            | 143,103               | 4,737                 |
| 16    | 320                | 201              | 62.8 | 41.08                    | 1.37                | 8,258             | 13,147                | 438                   |
| 17    | 2,188              | 1,405            | 64.2 | 36.63                    | 1.22                | 51,459            | 80,137                | 2,671                 |
| 18    | 14,190             | 10,007           | 70.5 | 26.74                    | 0.89                | 267,557           | 379,398               | 12,646                |
| 19    | 2,932              | 1,312            | 44.8 | 38.27                    | 1.28                | 50,210            | 112,207               | 3,740                 |
| G     | 251                | 135              | 53.8 | 325.18                   | 10.84               | 43,899            | 81,62                 | 2,721                 |
| Total | 110,052            | 71,067           | 64.6 | 42.68                    | 1.42                | 3,032,714         | 4,701,067             | 156,702               |

NUMBER OF SERVICE AND MEASURED,  
UNIT & ESTIMATED CONSUMPTION  
for Guatemala City Postal Zone

December 1984

| Zone         | Number of Service  |                  | Average Consumption |                          | Total Consumption   |                       |                       |                     |
|--------------|--------------------|------------------|---------------------|--------------------------|---------------------|-----------------------|-----------------------|---------------------|
|              | Total Installation | With Consumption |                     | Service with Consumption |                     | Mean                  | Estimated             |                     |
|              |                    | Total            | %                   | m <sup>3</sup> /month    | m <sup>3</sup> /day | m <sup>3</sup> /month | m <sup>3</sup> /month | m <sup>3</sup> /day |
| 1            | 8,724              | 4,270            | 49.0                | 60.74                    | 1.96                | 259,351               | 529,881               | 17,093              |
| 2            | 2,953              | 1,551            | 52.5                | 35.62                    | 1.15                | 55,242                | 105,177               | 3,392               |
| 3            | 3,930              | 2,518            | 64.1                | 34.20                    | 1.10                | 86,127                | 134,424               | 4,336               |
| 4            | 544                | 277              | 50.9                | 90.12                    | 2.91                | 24,963                | 49,025                | 1,581               |
| 5            | 9,233              | 5,534            | 59.9                | 31.95                    | 1.03                | 176,833               | 295,030               | 9,517               |
| 6            | 11,895             | 7,345            | 61.7                | 28.93                    | 0.91                | 212,506               | 344,146               | 11,106              |
| 7            | 17,798             | 12,721           | 71.5                | 29.44                    | 0.95                | 374,462               | 523,911               | 16,900              |
| 8            | 2,272              | 1,112            | 48.9                | 43.64                    | 1.41                | 48,533                | 99,161                | 3,199               |
| 9            | 1,446              | 884              | 61.1                | 80.98                    | 2.61                | 71,588                | 117,099               | 3,777               |
| 10           | 2,818              | 1,604            | 56.9                | 52.89                    | 1.71                | 84,830                | 149,034               | 4,808               |
| 11           | 8,514              | 5,735            | 67.4                | 46.70                    | 1.51                | 267,819               | 397,596               | 12,826              |
| 12           | 12,943             | 8,665            | 67.0                | 36.14                    | 1.17                | 313,184               | 467,878               | 15,093              |
| 13           | 3,088              | 1,862            | 60.3                | 48.62                    | 1.57                | 90,538                | 150,151               | 4,844               |
| 14           | 1,991              | 1,192            | 59.9                | 69.22                    | 2.23                | 82,512                | 137,820               | 4,446               |
| 15           | 2,640              | 1,627            | 61.6                | 56.76                    | 1.83                | 92,351                | 149,850               | 4,834               |
| 16           | 322                | 199              | 61.8                | 46.64                    | 1.50                | 9,282                 | 15,019                | 484                 |
| 17           | 2,200              | 1,416            | 64.6                | 37.67                    | 1.22                | 53,343                | 82,878                | 2,673               |
| 18           | 14,301             | 9,925            | 69.4                | 22.40                    | 0.72                | 222,357               | 320,396               | 10,335              |
| 19           | 2,942              | 1,301            | 44.2                | 34.77                    | 1.12                | 45,236                | 102,294               | 3,300               |
| G            | 266                | 132              | 49.6                | 611.23                   | 19.72               | 80,683                | 162,589               | 5,245               |
| <b>Total</b> | <b>102,820</b>     | <b>69,872</b>    | <b>63.1</b>         | <b>37.95</b>             | <b>1.22</b>         | <b>2,651,740</b>      | <b>4,205,985</b>      | <b>135,677</b>      |



## POWER DEMAND OF PUMPS

( Submerged pump and Booster pump )

| Well Block<br>Name | Total of<br>Pump Number | Items of Pumps |       |       |      |      | Power<br>Demand |
|--------------------|-------------------------|----------------|-------|-------|------|------|-----------------|
|                    |                         | 185KW          | 132KW | 110KW | 75KW | 45KW |                 |
| Canalitos          | 18                      | 10             | 5     | 2     | 1    | -    | 2,805 KW        |
| Norte              | 12                      | 5              | 3     | 1     | 1    | 2    | 1,596 KW        |
| Lavarreda          | 3                       | 1              | 1     | -     | -    | 1    | 362 KW          |
| El Rodeo           | 7                       | -              | 4     | -     | 3    | -    | 753 KW          |
| Hermosa            | 4                       | 2              | 2     | -     | -    | -    | 634 KW          |
| Total              | 44                      | 18             | 15    | 3     | 5    | 3    | 6,150 KW        |

## PUMP LIST

### HERMOSA

| Pump Station | Pump Diameter | Stage | Number | Production | Pump Head | Power  |
|--------------|---------------|-------|--------|------------|-----------|--------|
| 1            | Ø 125         | 10    | 1      | 35 (1/s)   | 220 m     | 132 KW |
| 2            | Ø 150         | 10    | 1      | 35 (1/s)   | 220 m     | 185 KW |
| 3            | Ø 150         | 10    | 1      | 35 (1/s)   | 220 m     | 185 KW |
| 4            | Ø 125         | 6     | 1      | 35 (1/s)   | 250 m     | 132 KW |

PUMP LIST

EL. RODEO

| Pump Station | Pump Diameter | Stage | Number | Production | Pump Head | Power  |
|--------------|---------------|-------|--------|------------|-----------|--------|
| 1            | Ø 125         | 10    | 1      | 20 (l/s)   | 268 m     | 132 KW |
| 2            | Ø 125         | 10    | 1      | 20 (l/s)   | 272 m     | 132 KW |
| 3            | Ø 125         | 8     | 1      | 20 (l/s)   | 220 m     | 75 KW  |
| 4            | Ø 125         | 8     | 1      | 20 (l/s)   | 220 m     | 75 KW  |
| 5            | Ø 125         | 10    | 1      | 20 (l/s)   | 270 m     | 132 KW |
| 6            | Ø 125         | 8     | 1      | 20 (l/s)   | 220 m     | 75 KW  |
| 7            | Ø 125         | 10    | 1      | 20 (l/s)   | 270 m     | 132 KW |



## PUMP LIST

### LAVARREDA

| Pump Station | Pump Diameter | Stage | Number | Production | Pump Head | Power  |
|--------------|---------------|-------|--------|------------|-----------|--------|
| 1            | Ø 125         | 10    | 1      | 35 (1/s)   | 220 m     | 132 KW |
| 2            | Ø 150         | 7     | 1      | 35 (1/s)   | 274 m     | 185 KW |
| B.P. 1       | Ø 125         | -     | 1*     | 35 (1/s)   | 82 m      | 45 KW  |

\* Boosterpump with one stand-by pump

## PUMP LIST

### CANALITOS

| Pump Station | Pump diameter | Stage | Number | Production | Pump Head | Power  |
|--------------|---------------|-------|--------|------------|-----------|--------|
| 1            | Ø 125         | 10    | 1      | 30 (1/s)   | 235 m     | 132 KW |
| 2            | Ø 150         | 10    | 1      | 30 (1/s)   | 240 m     | 185 KW |
| 3            | Ø 150         | 6     | 1      | 30 (1/s)   | 270 m     | 185 KW |
| 4            | Ø 125         | 9     | 1      | 30 (1/s)   | 210 m     | 110 KW |
| 5            | Ø 125         | 10    | 1      | 30 (1/s)   | 230 m     | 132 KW |
| 6            | Ø 150         | 6     | 1      | 30 (1/s)   | 250 m     | 185 KW |
| 7            | Ø 150         | 6     | 1      | 30 (1/s)   | 260 m     | 185 KW |
| 8            | Ø 150         | 6     | 1      | 30 (1/s)   | 250 m     | 185 KW |
| 9            | Ø 150         | 6     | 1      | 30 (1/s)   | 275 m     | 185 KW |
| 10           | Ø 125         | 6     | 1      | 30 (1/s)   | 250 m     | 110 KW |
| 11           | Ø 150         | 10    | 1      | 30 (1/s)   | 225 m     | 185 KW |
| 12           | Ø 150         | 7     | 1      | 30 (1/s)   | 280 m     | 185 KW |
| 13           | Ø 125         | 10    | 1      | 30 (1/s)   | 245 m     | 132 KW |
| 14           | Ø 150         | 6     | 1      | 30 (1/s)   | 255 m     | 185 KW |
| 15           | Ø 150         | 6     | 1      | 30 (1/s)   | 260 m     | 185 KW |
| 16           | Ø 125         | 10    | 1      | 30 (1/s)   | 220 m     | 132 KW |
| 17           | Ø 125         | 9     | 1      | 30 (1/s)   | 210 m     | 132 KW |
| B.P. b       | Ø 200         | -     | 1*     | 60 (1/s)   | 70 m      | 75 KW  |

\* Boosterpump with one stand-by pump

## PUMP LIST

### NORTE

| Pump Station | Pump Diameter | Stage | Number | Production | Pump Head | Power  |
|--------------|---------------|-------|--------|------------|-----------|--------|
| 1            | Ø 150         | 6     | 1      | 35 (1/s)   | 242 m     | 185 KW |
| 2            | Ø 125         | 10    | 1      | 35 (1/s)   | 220 m     | 132 KW |
| 3            | Ø 150         | 6     | 1      | 35 (1/s)   | 250 m     | 185 KW |
| 4            | Ø 150         | 7     | 1      | 35 (1/s)   | 270 m     | 185 KW |
| 5            | Ø 125         | 6     | 1      | 35 (1/s)   | 264 m     | 132 KW |
| 6            | Ø 125         | 6     | 1      | 35 (1/s)   | 264 m     | 132 KW |
| 7            | Ø 150         | 6     | 1      | 35 (1/s)   | 264 m     | 185 KW |
| 8            | Ø 150         | 7     | 1      | 35 (1/s)   | 272 m     | 185 KW |
| B.P. 2       | Ø 200         | -     | 1*     | 70 (1/s)   | 72 m      | 75 KW  |
| B.P. 5       | Ø 125         | -     | 1*     | 35 (1/s)   | 80 m      | 45 KW  |
| B.P. 6       | Ø 150         | -     | 1*     | 35 (1/s)   | 74 m      | 45 KW  |
| B.P. T       | Ø 200         | -     | 1**    | 87.5 (1/s) | 70 m      | 110 KW |

\* Boosterpump with one stand-by pump

\*\* B.P. T consists of two boosterpumps  
and one stand-by pump

## WATER SUPPLY PLAN

| <u>Well Field Name</u> | <u>Production</u>      | 1990             |                     | 1995             |                  | 2000             |                 |
|------------------------|------------------------|------------------|---------------------|------------------|------------------|------------------|-----------------|
|                        |                        | <u>Canalitos</u> | <u>474 l/s</u>      | <u>Canalitos</u> | <u>474 l/s</u>   | <u>Canalitos</u> | <u>474 l/s</u>  |
| I. Canalitos           | 474 l/s (No. 2 54 l/s) |                  |                     |                  |                  |                  |                 |
| Norte                  | 350 l/s                |                  |                     |                  |                  |                  |                 |
| Can Rafael La Laguna   | 80 l/s                 |                  |                     |                  |                  |                  |                 |
| Los Ocotes             | 140 l/s                |                  |                     |                  |                  |                  |                 |
|                        |                        |                  |                     |                  |                  |                  | Total 1,044 l/s |
| I. CASE A              |                        |                  |                     |                  |                  |                  |                 |
| <u>Canalitos</u>       |                        | <u>474 l/s</u>   | <u>Canalitos</u>    | <u>474 l/s</u>   | <u>Canalitos</u> | <u>474 l/s</u>   |                 |
| To Centro              | 348 l/s                |                  | To Centro           | 348 l/s          | To Centro        | 189 l/s          |                 |
| To Noreste             | 126 l/s                |                  | To Noreste          | 126 l/s          | To Noreste       | 285 l/s          |                 |
| Norte                  | 280 l/s                |                  | Norte               | 350 l/s          | Norte            | 350 l/s          |                 |
| To Centro via C.C.     | 210 l/s                |                  | To Norte            | 40 l/s           | To Norte         | 80 l/s           |                 |
| To Noreste via J.A.    | 70 l/s                 |                  | To Centro           | 240 l/s          | To Noreste       | 270 l/s          |                 |
| Centro Surplus Water   |                        |                  | To Noreste via J.A. | 70 l/s           |                  |                  |                 |
| To Noreste             |                        |                  |                     |                  |                  |                  |                 |
|                        |                        |                  | Los Ocotes          | 140 l/s          | Los Ocotes       | 140 l/s          |                 |
|                        |                        |                  | To Noreste          |                  | To Noreste       |                  |                 |
|                        |                        |                  | Noreste             | 80 l/s           | Noreste          | 80 l/s           |                 |

I. CASE B

|            | 1990    | 1995       | 2000       |
|------------|---------|------------|------------|
| Canalitos  | 420 l/s | 420 l/s    | 420 l/s    |
| To Centro  | 290 l/s | To Centro  | To Centro  |
| To Noreste | 130 l/s | To Noreste | To Noreste |
|            |         | 325 l/s    | 180 l/s    |
|            |         | 95 l/s     | 240 l/s    |
| Norte      | 320 l/s | Norte      | Norte      |
| To Centro  | 250 l/s | To Norte   | To Norte   |
| To Noreste | 70 l/s  | To Centro  | To Noreste |
|            |         | To Noreste | To Noreste |
|            |         | 40 l/s     | 80 l/s     |
|            |         | 215 l/s    | 270 l/s    |
|            |         | 70 l/s     |            |
|            |         | 325 l/s    | 350 l/s    |
|            |         | 175 l/s    | 175 l/s    |
|            |         | Los Ocotes | Los Ocotes |
|            |         | To Noreste | To Noreste |
|            |         | 80 l/s     | 80 l/s     |
|            |         | Noreste    | Noreste    |

I. CASE C

|                  | 1990           | 1995              | 2000              |
|------------------|----------------|-------------------|-------------------|
| <u>Canalitos</u> | <u>340 l/s</u> | <u>395 l/s</u>    | <u>420 l/s</u>    |
| To Centro        | 220 l/s        | To Centro         | To Centro         |
| To Noreste       | 120 l/s        | To Noreste        | To Noreste        |
|                  |                |                   | 180 l/s           |
|                  |                |                   | 240 l/s           |
| <u>Norte</u>     | <u>280 l/s</u> | <u>350 l/s</u>    | <u>350 l/s</u>    |
|                  |                |                   |                   |
| To Centro        |                | To Norte          | To Norte          |
|                  |                | To Centro         | To Noreste        |
|                  |                | To Noreste        |                   |
|                  |                |                   | 80 l/s            |
|                  |                |                   | 270 l/s           |
|                  |                |                   |                   |
|                  |                | <u>Los Ocotes</u> | <u>Los Ocotes</u> |
|                  |                |                   |                   |
|                  |                | To Noreste        | To Noreste        |
|                  |                |                   |                   |
|                  |                | <u>Noreste</u>    | <u>Noreste</u>    |
|                  |                |                   |                   |
|                  |                | 80 l/s            | 80 l/s            |

WATER SUPPLY PLAN

| <u>Well Field Name</u>  | <u>Production</u> |
|-------------------------|-------------------|
| II. (1) Los Octes       | 300 l/s           |
| (2) Canalitos           | 400 l/s           |
| (3) Norte               | 300 l/s           |
| (4) S. Rafael La Laguna | 40.1 l/s          |
| (5) Lavarreda           | 40 l/s            |

Total 1,080 l/s

II. CASE A

|                                           | 1990                                      | 1995                                      | 2000                                      |
|-------------------------------------------|-------------------------------------------|-------------------------------------------|-------------------------------------------|
| (1)                                       | 200 l/s                                   | 300 l/s                                   | 300 l/s                                   |
| To (4)                                    | To (4)                                    | To (4)                                    | To (4)                                    |
| (2)                                       | 300 l/s                                   | 400 l/s                                   | 400 l/s                                   |
| To Centro via<br>Tank Acatan<br>Tank J.A. | To Centro via<br>Tank Acatan<br>Tank J.A. | To Centro via<br>Tank Acatan<br>Tank J.A. | To centro via<br>Tank Acatan<br>Tank J.A. |
|                                           | To (4)                                    | To (4)                                    | To (4)                                    |
|                                           |                                           | 120 l/s                                   | 220 l/s                                   |
|                                           |                                           | 320 l/s                                   | 180 l/s                                   |

|                    | 1990       | 1995       | 2000               |
|--------------------|------------|------------|--------------------|
|                    | <u>(3)</u> | <u>(3)</u> | <u>(3)</u>         |
| To Centro via C.C. | 220 1/s    | 260 1/s    | 200 1/s            |
|                    | To (3)     | 40 1/s     | To (3)             |
|                    | To Centro  | 220 1/s    | To (4) via C.C;    |
|                    |            |            | Xayá, Pixcayá Line |
|                    |            |            | <u>(4)</u>         |
|                    |            |            | 40 1/s             |
|                    | <u>(5)</u> | <u>(5)</u> | <u>(5)</u>         |
|                    |            | 40 1/s     | 40 1/s             |
|                    | To (4)     |            | To (4)             |



II. CASE B

|                                           | 1990    | 1995                                 | 2000                    |
|-------------------------------------------|---------|--------------------------------------|-------------------------|
| (1)                                       | 100 l/s | (1) 300 l/s                          | 91) 300 l/s             |
| To (4)                                    |         | To (4)                               | To (1)                  |
| (2)                                       | 350 l/s | (2) 300 l/s                          | (2) 400 l/s             |
| To Centro via<br>Tank Acatan<br>Tank J.A. | 250 l/s | To Centro via<br>Tank A<br>Tank J.A. | To Centro via<br>Tank A |
| To (4)                                    | 100 l/s | To (4)                               | To (4) via<br>Tank J.A. |
| (3)                                       | 250 l/s | (3) 300 l/s                          | (3) 300 l/s             |
| To centro via C.C.                        |         | To Norte<br>To Centro via C.C.       | To Norte<br>To (4)      |
|                                           |         | 40 l/s<br>220 l/s                    | 80 l/s<br>220 l/s       |
|                                           |         | (4)                                  | (4) 40 l/s              |
|                                           |         | (5)                                  | (5) 40 l/s              |

II. CASE C

|                                 | 1990    | 1995                                 | 2000                            |
|---------------------------------|---------|--------------------------------------|---------------------------------|
| (1)                             | 200 l/s | (1) 300 l/s                          | (1) 300 l/s                     |
| To (4)                          |         | To (4)                               |                                 |
| (2)                             | 350 l/s | (2) 400 l/s                          | (2) 400 l/s                     |
| To Centro via Tank A, Tank J.A. | 350 l/s | To Centro via Tank A, Tank J.A.      | To Centro via Tank A 180 l/s    |
| (3)                             | 150 l/s | (3) 300 l/s                          | (3) 300 l/s                     |
| To Centro via C.C.              |         | To Norte 40 l/s<br>To Centro 220 l/s | To (3) 80 l/s<br>To (4) 220 l/s |
|                                 |         | (5) 40 l/s                           | (4) 40 l/s                      |
|                                 |         | To (4)                               |                                 |
|                                 |         |                                      | (5) 40 l/s                      |
|                                 |         |                                      | To (4)                          |

II. CASE D

|                    | 1990           | 1995                            | 2000                 |
|--------------------|----------------|---------------------------------|----------------------|
| (1)                | <u>100 l/s</u> | (1) <u>300 l/s</u>              | (1) <u>300 l/s</u>   |
| To (4)             |                | To (4)                          | To (4)               |
| (2)                | <u>350 l/s</u> | (2) <u>400 l/s</u>              | (2) <u>400 l/s</u>   |
| To Centro          | 250 l/s        | To Centro via Tank A, Tank J.A. | To Centro via Tank A |
| To (4)             | 100 l/s        | To (4)                          | To (4)               |
| (3)                | <u>250 l/s</u> | (3) <u>300 l/s</u>              | (3) <u>300 l/s</u>   |
| To Centro via C.C. |                | To (3)                          | To (3)               |
|                    |                | To Centro via C.C.              | To (4)               |
|                    |                | To (4)                          |                      |
|                    |                | 40 l/s                          | 80 l/s               |
|                    |                | 220 l/s                         | 220 l/s              |
|                    |                | 40 l/s                          |                      |
|                    |                | (4) <u>40 l/s</u>               | (4) <u>40 l/s</u>    |
|                    |                | (5) <u>40 l/s</u>               | (5) <u>40 l/s</u>    |
|                    |                | To (4)                          | To (4)               |
|                    |                |                                 | 40 l/s               |

**WATER SUPPLY PLAN**

| <u>Well Field Name</u> | <u>Production</u> |
|------------------------|-------------------|
| Canalitos              | 600 l/s           |
| Norte                  | 385 l/s           |
| Lavarreda              | 70 l/s            |
| S. Rafael La Laguna    | 90 l/s            |
| Total 1,145 l/s        |                   |

**III. CASE A**

|                               | 1990           | 1995             | 2000             |
|-------------------------------|----------------|------------------|------------------|
| <u>Canalitos</u>              | <u>330 l/s</u> | <u>510 l/s</u>   | <u>600 l/s</u>   |
| To Centro Tank A              | 150 l/s        | 150 l/s          | 150 l/s          |
| To Centro via Tank San Gaspar | 90 l/s         | 90 l/s           | 90 l/s           |
| To Noreste via Tank J.A       | 90 l/s         | 270 l/s          | 360 l/s          |
| <u>Norte</u>                  | <u>280 l/s</u> | <u>385 l/s</u>   | <u>385 l/s</u>   |
| To Centro via C.C             | 280 l/s        | 40 l/s           | 80 l/s           |
|                               |                | 345 l/s          | 305 l/s          |
|                               |                | <u>Lavarreda</u> | <u>Lavarreda</u> |
|                               |                | 70 l/s           | 70 l/s           |
|                               |                | To Noreste       | To Noreste       |
|                               |                | <u>Noreste</u>   | <u>Noreste</u>   |
|                               |                | 90 l/s           | 90 l/s           |

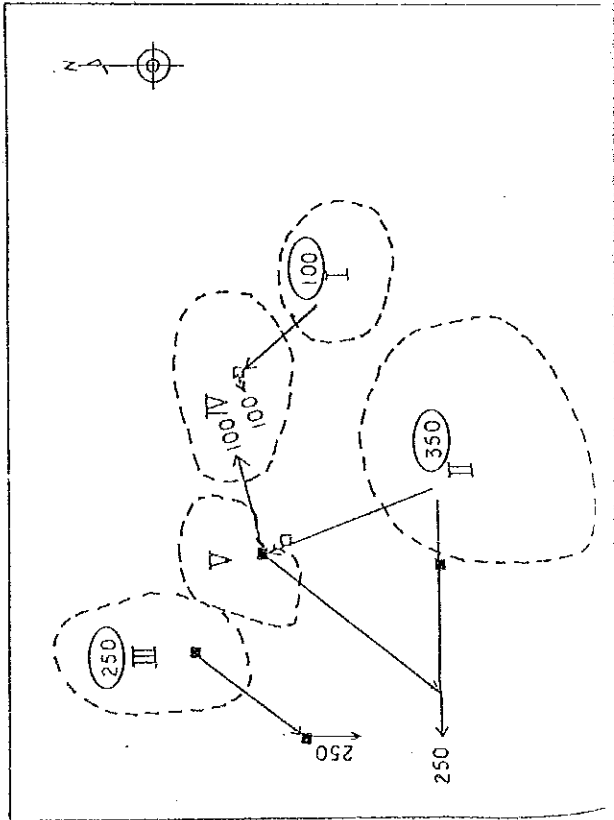
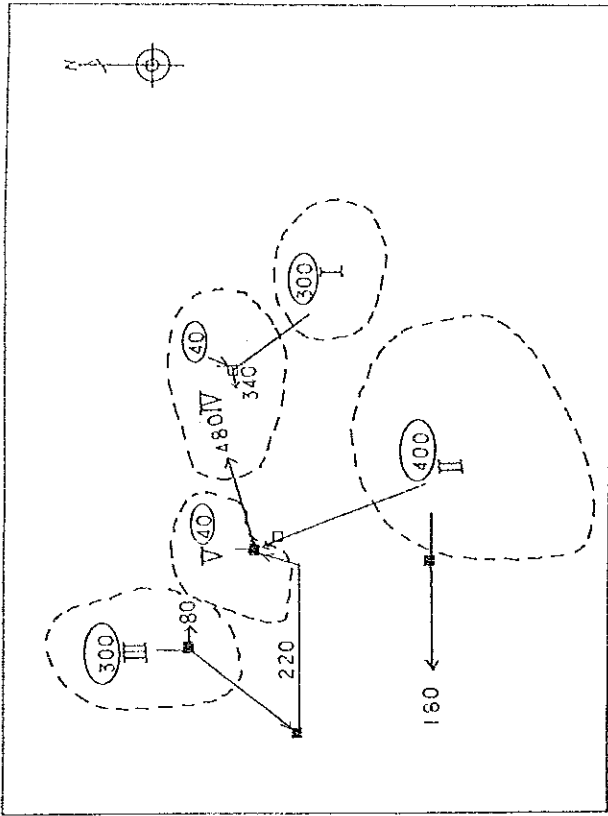




(CASE - B)

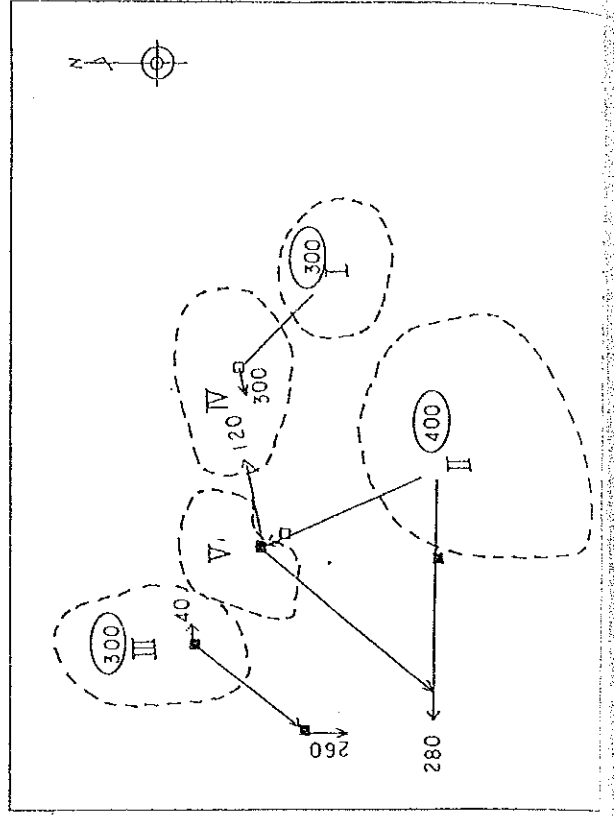


2000

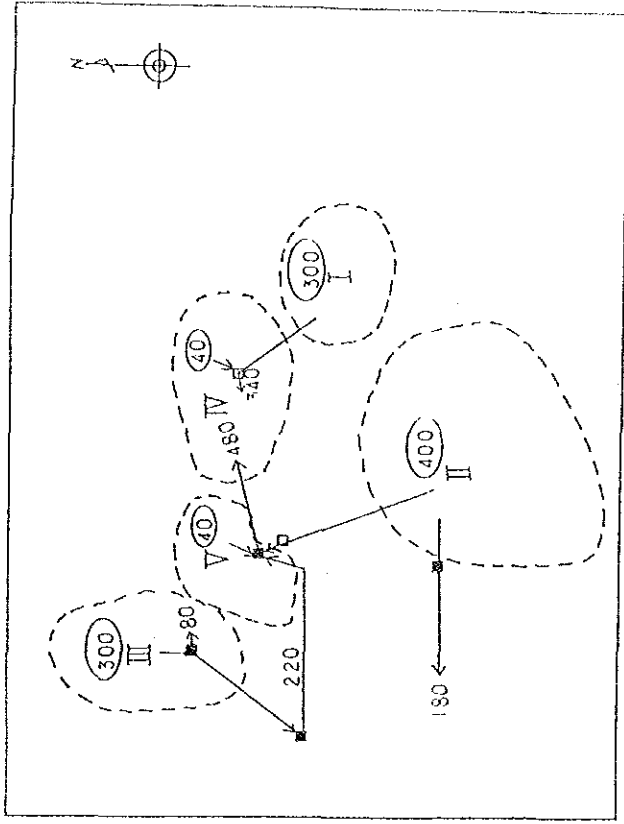
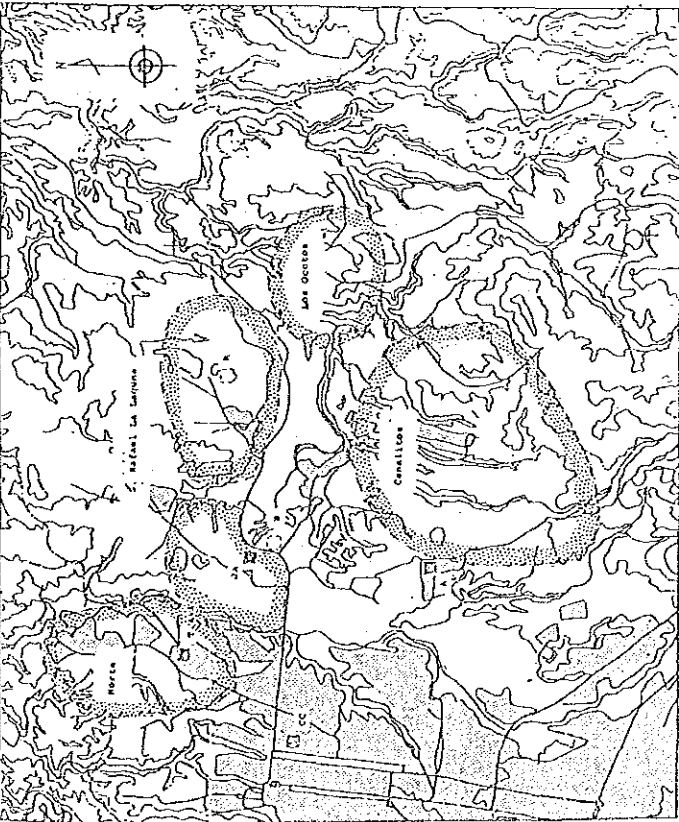


1990

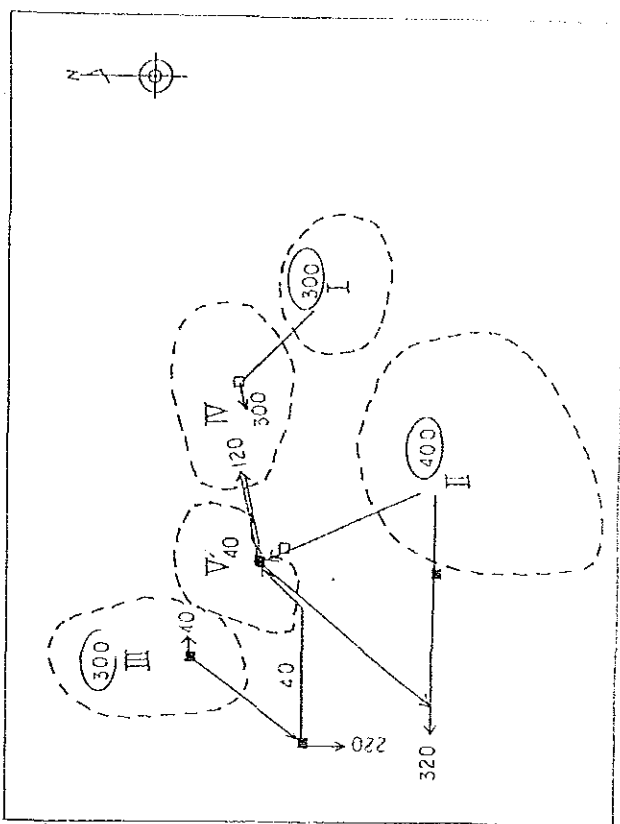
1995



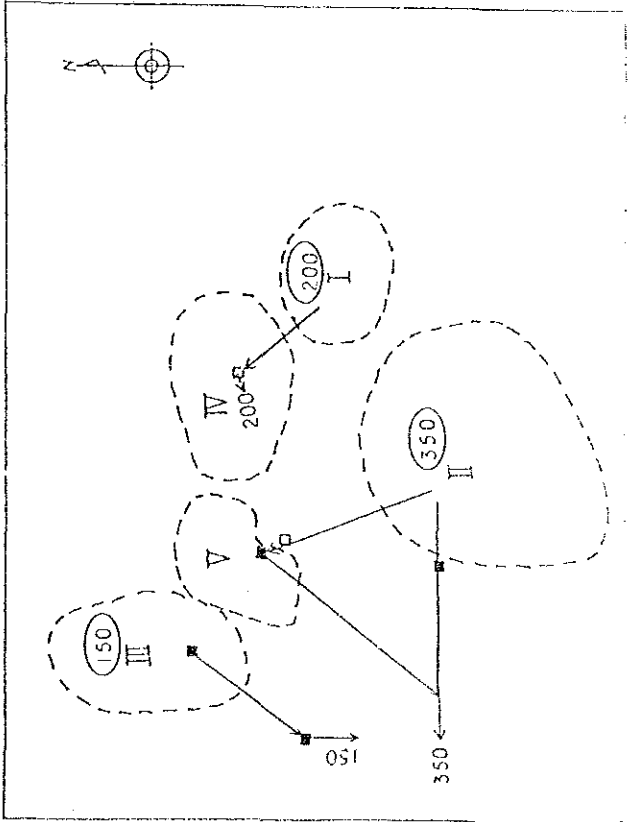
(CASE - C)



2000



1995



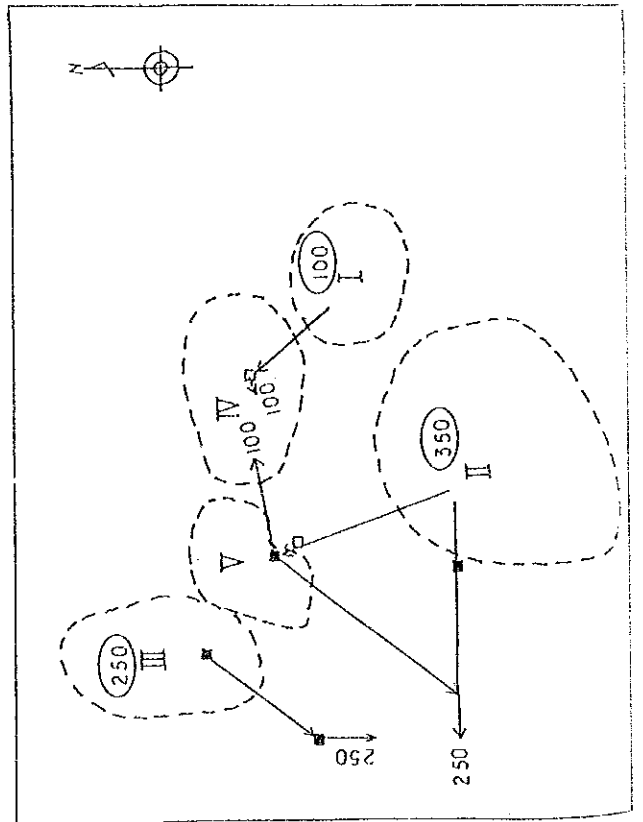
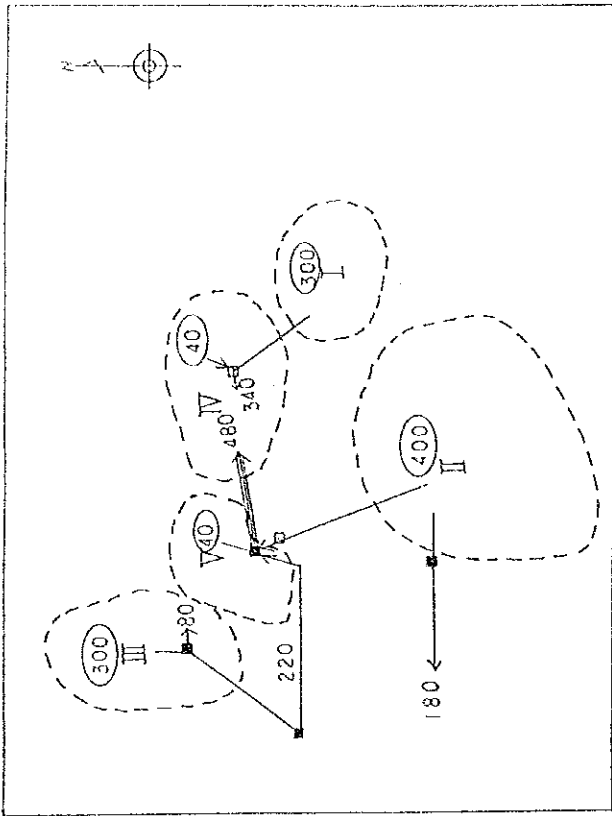
1990



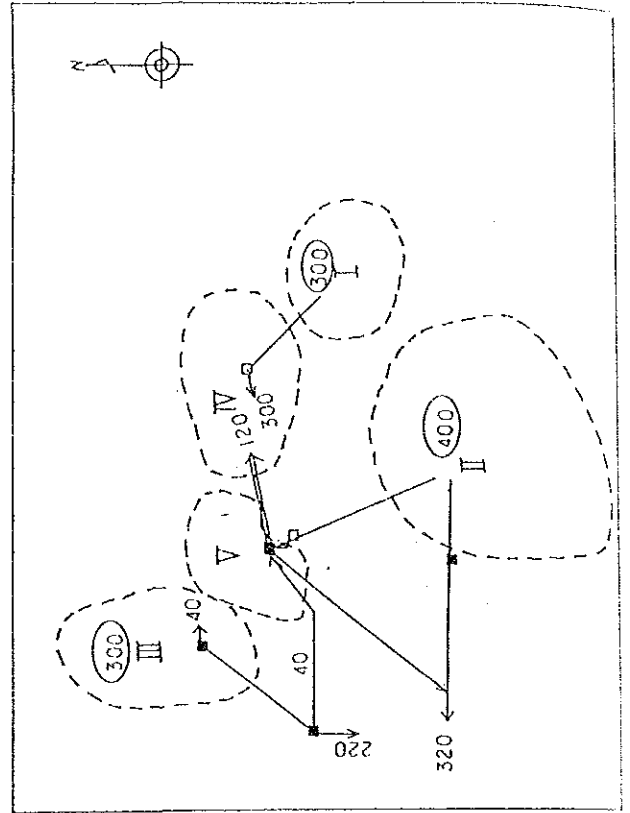


(CASE - D)

2000



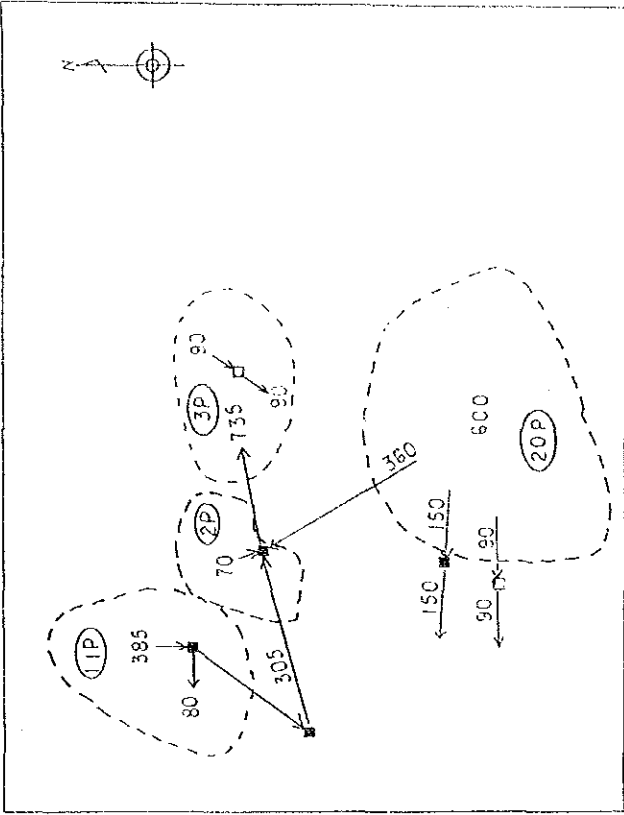
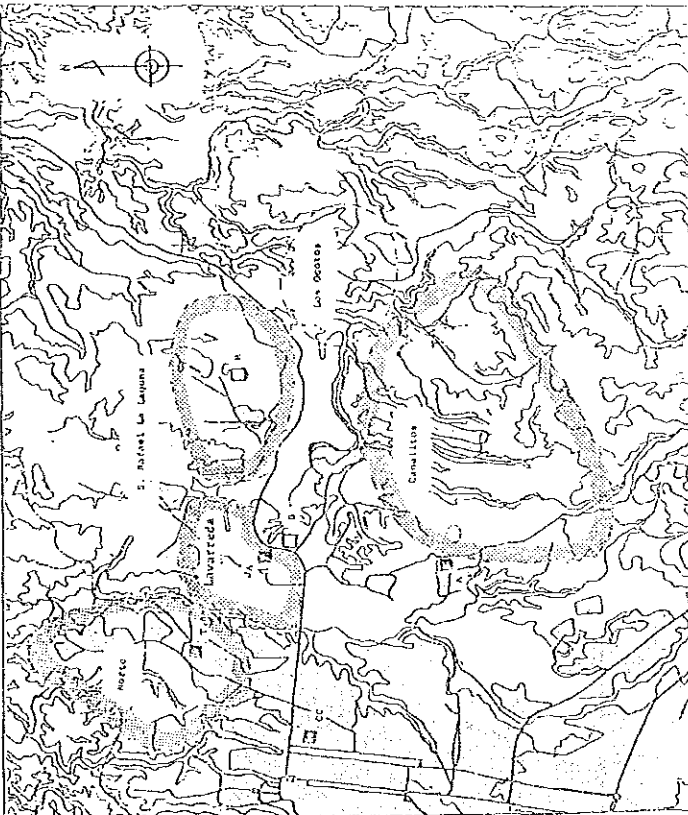
1990



1995

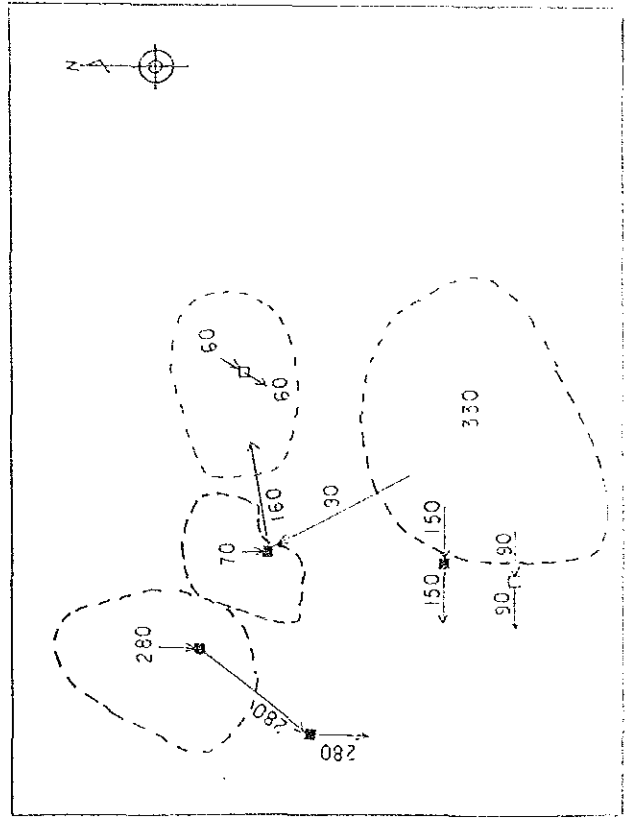


(CASE - A)



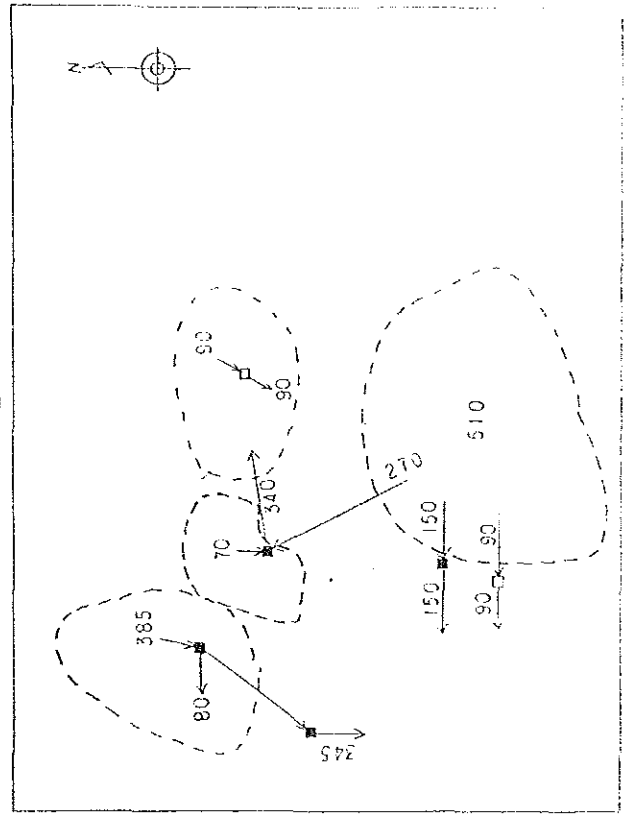
2000

Centro 0.18 m<sup>3</sup>/s  
 Noreste 0.74  
 Norte 0.08

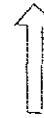


1990

Centro 0.50 m<sup>3</sup>/s  
 Noreste 0.20  
 Norte 0.00



1995



Centro 0.54 m<sup>3</sup>/s  
 Noreste 0.42  
 Norte 0.04



## Water Production System

(Unit: Quetzal)

| Item                         | Unit | Quantity | Foreign Currency |         | Local Currency |         | Total     |           | Remarks             |
|------------------------------|------|----------|------------------|---------|----------------|---------|-----------|-----------|---------------------|
|                              |      |          | Unit Cost        | Amount  | Unit Cost      | Amount  | Unit Cost | Amount    |                     |
| Canalitos-Juana de Arco Line |      |          |                  |         |                |         |           |           |                     |
| 1. Drilling ø12" 300-30m     | Nos  | 5        | 136,934          | 684,670 | 26,840         | 134,200 | 163,774   | 81,870    | Well No. 1,2,3,7,11 |
| Drilling ø12" 300-40m        | Nos  | 2        | 148,684          | 297,368 | 26,780         | 53,560  | 175,464   | 350,928   | No. 9, 10           |
| 2. Test Pilot Drilling       | Nos  | 7        | 6,900            | 48,300  | 300            | 2,100   | 7,200     | 50,400    | ø4"                 |
| 3. Pump Dia.125, 132kw       | Nos  | 1        | 83,500           | 167,000 | -              | -       | 83,500    | 167,000   | No. 1               |
| -do- Dia.125, 110kw          | Nos  | 1        | 75,900           | 75,900  | -              | -       | 75,900    | 75,900    | No. 10              |
| -do- Dia.150, 185kw          | Nos  | 5        | 110,550          | 552,750 | -              | -       | 110,550   | 552,750   | No. 2,3,7,9,11      |
| 4. Transportation            | lot  | 1        |                  | 45,205  |                | 14,950  |           | 60,155    | 149.5m <sup>3</sup> |
| 5. Pump House                | Nos  | 7        |                  | -       | 9,600          | 67,200  | 9,600     | 67,200    |                     |
| Sub Total                    |      |          | 1,871,193        |         |                | 272,010 |           | 2,143,203 |                     |
| Canalitos-Santa Luisa Line   |      |          |                  |         |                |         |           |           |                     |
| 1. Drilling ø12" 300-30m     | Nos  | 5        | 136,934          | 684,670 | 26,840         | 134,200 | 163,774   | 818,870   |                     |
| -do- ø12" (300-30m)          | "    | (1)      | 12,104           | 12,104  | 2,160          | 2,160   | 14,264    | 14,264    | 1985 Test well      |
| -do- ø12" 350-30m            | "    | 1        | 150,934          | 150,934 | 29,790         | 29,790  | 180,724   | 180,724   |                     |
| 2. Test Pilot Drilling 300m  | "    | 5        | 6,900            | 34,500  | 300            | 1,500   | 7200      | 36,00     | ø4"                 |
| -do- 350m                    | "    | 1        | 8,050            | 8,050   | 300            | 300     | 8,350     | 8,350     | ø4"                 |
| 3. Pump Dia.125, 110kw       | Nos  | 1        | 75,900           | 75,900  | -              | -       | -         | 75,900    | No. 4               |
| -do- Dia.125, 132kw          | "    | 2        | 83,500           | 167,000 | -              | -       | -         | 167,000   | No. 5,13            |
| -do- Dia.150, 185kw          | "    | 1        | 113,700          | 113,700 | -              | -       | 113,700   | 113,700   | No. 12              |
| -do- Dia.150, 185kw          | "    | 3        | 110,550          | 331,650 | -              | -       | 110,550   | 331,650   | N. 6,8,14           |
| 4. Transportation            | lot  | 1        |                  | 33,051  |                | 10,951  |           | 44,002    | 109.5m <sup>3</sup> |
| 5. Pump House                | Nos  | 6        |                  | -       | 9,600          | 57,600  | 9,600     | 57,600    |                     |
| Sub Total                    |      |          | 1,611,559        |         |                | 236,501 |           | 1,848,060 |                     |

Water Production System

(Unit: Quetzal)

| Item                             | Unit | Quantity | Foreign Currency |           | Local Currency |         | Total     |           | Remarks             |
|----------------------------------|------|----------|------------------|-----------|----------------|---------|-----------|-----------|---------------------|
|                                  |      |          | Unit Cost        | Amount    | Unit Cost      | Amount  | Unit Cost | Amount    |                     |
| <b>Canalitos-San Gaspar Line</b> |      |          |                  |           |                |         |           |           |                     |
| 1. Drilling ø12" 300-30m         | Nos  | 1        | 136,934          | 136,934   | 26,840         | 26,840  | 163,774   | 163,774   |                     |
| -do- ø12 350-30m                 | "    | 2        | 150,934          | 301,868   | 29,790         | 59,580  | 180,724   | 361,448   |                     |
| 2. Test Pilot Drill ø4" 300m     | "    | 1        | 6,900            | 6,900     | 300            | 300     | 7,200     | 7,200     |                     |
| -do- ø4" 350m                    | "    | 2        | 8,050            | 16,100    | 300            | 600     | 8,350     | 16,700    |                     |
| 3. Pump Dia.150. 185kw           | "    | 1        | 110,550          | 110,550   | -              | -       | 110,550   | 110,550   |                     |
| -do- Dia.125, 132kw              | "    | 2        | 83,500           | 167,000   | -              | -       | 83,500    | 167,000   |                     |
| 4. Transportation                | lot  |          | 15,944           | 15,944    |                | 5,300   |           | 21,244    |                     |
| 5. Pump House                    | Nos  | 3        | -                | -         | 9,600          | 28,800  | 9,600     | 28,800    |                     |
| Sub Total                        |      |          | 755,296          | 755,296   | 121,420        | 121,420 |           | 876,716   |                     |
| <b>Norte</b>                     |      |          |                  |           |                |         |           |           |                     |
| 1. Drilling ø12" 300-40m         | Nos  | 3        | 148,684          | 446,052   | 26,780         | 80,340  | 175,464   | 526,392   |                     |
| -do- ø12" 300-30m                | "    | 5        | 136,934          | 684,670   | 26,840         | 134,200 | 163,774   | 818,870   |                     |
| 2. Test Pilot Drilling           | "    | 8        | 6,900            | 55,200    | 300            | 2,400   | 7,200     | 57,600    | ø4"                 |
| 3. Pump Dia.150, 185kw           | "    | 2        | 113,700          | 227,400   | -              | -       | 113,700   | 227,400   |                     |
| -do- Dia.150, 185kw              | "    | 3        | 110,550          | 331,650   | -              | -       | 110,550   | 331,650   |                     |
| -do- Dia.125, 132kw              | "    | 3        | 83,500           | 250,500   | -              | -       | 83,500    | 250,500   |                     |
| 4. Transportation                | lot  |          | 47,446           | 47,446    |                | 15,650  |           | 63,096    | 156.5m <sup>3</sup> |
| 5. Pump House                    | Nos  | 8        | -                | -         | 9,600          | 76,800  | 9,600     | 76,800    |                     |
| Sub Total                        |      |          | 2,042,918        | 2,042,918 | 309,390        | 309,390 |           | 2,352,308 |                     |

Water Production System

(Unit: Quetzal)

| Item                         | Unit | Quantity | Foreign Currency |           | Local Currency |         | Total     |           | Remarks            |
|------------------------------|------|----------|------------------|-----------|----------------|---------|-----------|-----------|--------------------|
|                              |      |          | Unit Cost        | Amount    | Unit Cost      | Amount  | Unit Cost | Amount    |                    |
| <b>Lavarreda</b>             |      |          |                  |           |                |         |           |           |                    |
| 1. Drilling ø12" 300-30m     | Nos  | 2        | 136,934          | 273,868   | 26,840         | 53,680  | 163,774   | 327,548   |                    |
| 2. Test Pilot Drill ø4"      | "    | 2        | 6,900            | 13,800    | 300            | 600     | 7,200     | 14,400    |                    |
| 3. Pump Dia. 125, 132kw      | "    | 1        | 83,500           | 83,500    | -              | -       | 83,500    | 83,500    |                    |
| -do- Dia. 150, 185kw         | "    | 1        | 113,700          | 113,700   | -              | -       | 113,700   | 113,700   |                    |
| 4. Transportation            | lot  |          |                  | 11,025    |                | 3,650   |           | 14,675    | 36.5m <sup>3</sup> |
| 5. Pump House                | Nos  | 2        |                  | -         | 9,600          | 19,200  | 9,600     | 19,200    |                    |
| Sub Total                    |      |          |                  | 495,893   |                | 77,130  |           | 573,023   |                    |
| <b>El Rodeo</b>              |      |          |                  |           |                |         |           |           |                    |
| 1. Drilling ø12" 350-30m     | Nos  | 2        | 150,934          | 301,868   | 29,790         | 59,580  | 180,724   | 361,448   |                    |
| -do ø12" 300-30m             | "    | 4        | 136,934          | 547,736   | 26,840         | 107,360 | 163,774   | 555,096   |                    |
| -do- ø8" 50-30m              | "    | 1        | 34,334           | 34,334    | 7,540          | 7,540   | 41,874    | 41,874    |                    |
| 2. Test Pilot Drill ø4" 350m | "    | 2        | 8,050            | 16,100    | 30             | 600     | 8,350     | 16,700    |                    |
| -do- ø4" 300m                | "    | 4        | 6,900            | 27,600    | 300            | 1,200   | 7,200     | 28,800    |                    |
| 3. Pump Dia. 125, 132kw      | Nos  | 4        | 83,500           | 334,000   | -              | -       | 83,500    | 334,000   |                    |
| -do- Dia. 125, 75kw          | "    | 3        | 60,450           | 181,350   | -              | -       | 60,450    | 181,350   |                    |
| 4. Transportation            | lot  |          |                  | 34,345    |                | 11,550  |           | 45,895    | 115.5,3            |
| 5. Pump House                | Nos  | 6        |                  | -         | 9,600          | 57,600  | 9,600     | 57,600    | 1985 Test well 1   |
| Sub Total                    |      |          |                  | 1,477,333 |                | 245,430 |           | 1,722,763 |                    |

Water Production System

(Unit: Quetzal)

| Item                        | Unit | Quantity | Foreign Currency |           | Local Currency |           | Total     |            | Remarks |
|-----------------------------|------|----------|------------------|-----------|----------------|-----------|-----------|------------|---------|
|                             |      |          | Unit Cost        | Amount    | Unit Cost      | Amount    | Unit Cost | Amount     |         |
| Hermosa                     |      |          |                  |           |                |           |           |            |         |
| 1. Drilling 300-30m         | Nos  | 4        | 136,934          | 547,736   | 26,840         | 107,360   | 163,774   | 655,096    |         |
| 2. Test Pilot Drill 4" 300m | "    | 4        | 6,900            | 27,600    | 300            | 1,200     | 7,200     | 28,800     |         |
| 3. Pump Dia. 125, 132kw     | Nos  | 2        | 83,500           | 167,000   | -              | -         | 83,500    | 167,000    |         |
| -do- Dia. 150, 185kw        | "    | 1        | 113,700          | 113,700   | -              | -         | 113,700   | 113,700    |         |
| -do- Dia. 150, 185kw        | "    | 1        | 110,550          | 110,550   | -              | -         | 110,550   | 110,550    |         |
| 4. Transportation           | lot  |          |                  | 20,974    |                | 6,600     |           | 27,574     |         |
| 5. Pump House               | Nos  | 4        |                  | -         | 9,600          | 38,400    | 9,600     | 38,400     |         |
| Sub Total                   |      |          |                  | 987,533   |                | 153,560   |           | 1,141,093  |         |
| Total                       |      |          |                  | 9,241,725 |                | 1,415,441 |           | 10,657,166 |         |

Water Supply System

(Unit: Quetzal)

| Item                                        | Unit           | Quantity | Foreign Currency |           | Local Currency |         | Total     | Remarks |
|---------------------------------------------|----------------|----------|------------------|-----------|----------------|---------|-----------|---------|
|                                             |                |          | Unit Cost        | Amount    | Unit Cost      | Amount  |           |         |
| <b>Hermosa</b>                              |                |          |                  |           |                |         |           |         |
| <b>1. Canalitos-Juana de Arco Line</b>      |                |          |                  |           |                |         |           |         |
| <b>1) Pipe Line</b>                         |                |          |                  |           |                |         |           |         |
| ø200mm                                      | m              | 1,770    | 51.5             | 91,155    | 15.95          | 28,232  | 119,387   |         |
| ø250mm                                      | m              | 2,360    | 67.5             | 159,300   | 20.02          | 47,247  | 206,547   |         |
| ø300mm                                      | m              | 1,450    | 84.9             | 123,105   | 24.53          | 35,569  | 158,674   |         |
| ø350mm                                      | m              | 1,080    | 110.6            | 119,448   | 30.36          | 32,789  | 152,237   |         |
| ø450mm                                      | m              | 3,900    | 155.8            | 607,620   | 41.25          | 160,875 | 768,495   |         |
| Sub Total                                   |                |          |                  | 1,110,628 |                | 304,712 | 1,405,340 |         |
| <b>2) Discharge Tank (108m<sup>3</sup>)</b> |                |          |                  |           |                |         |           |         |
| Earth work                                  | m <sup>3</sup> | 370      | -                | -         | 5.47           | 2,024   | 2,024     |         |
| Concrete Work                               | m <sup>3</sup> | 60       | -                | -         | 105.07         | 6,304   | 6,304     |         |
| Reinforcement                               | kg             | 6,620    | -                | -         | 1.45           | 9,599   | 9,599     |         |
| Other                                       |                |          |                  |           |                | 1,240   | 1,240     |         |
| Sub total                                   |                |          |                  |           |                | 19,167  | 19,167    |         |
| <b>3) Syphon Bridge (20x2m)</b>             |                |          |                  |           |                |         |           |         |
| Earth Work                                  | m <sup>3</sup> | 184      |                  |           | 5.47           | 1,006   | 1,006     |         |
| Concrete Work                               | m <sup>3</sup> | 172      |                  |           | 105.07         | 18,072  | 18,072    |         |
| Reinforcement                               | kg             | 21,870   |                  |           | 1.45           | 31,712  | 31,712    |         |
| Steel                                       | kg             |          |                  | 11,570    |                | 580     | 12,150    |         |
| Other                                       |                |          |                  | 786       |                | 3,360   | 4,146     |         |
| Sub Total                                   |                |          |                  | 12,356    |                | 54,730  | 67,086    |         |
| <b>4) Booter Pump</b>                       |                |          |                  |           |                |         |           |         |
| BP pump<br>(75kw x 60 l/s)                  | No             | 2        | 100,000          | 200,000   |                |         | 200,000   |         |
| Installation                                |                |          |                  |           | 914            | 1,828   | 1,828     |         |
| Sub Total                                   |                |          |                  | 200,000   |                | 1,828   | 201,828   |         |
| Total                                       |                |          |                  | 1,312,984 |                | 380,437 | 1,693,421 |         |



Water Supply System

(Unit: Quetzal)

| Item                                         | Unit           | Quantity | Foreign Currency |         | Local Currency |         | Total     |         | Remarks |
|----------------------------------------------|----------------|----------|------------------|---------|----------------|---------|-----------|---------|---------|
|                                              |                |          | Unit Cost        | Amount  | Unit Cost      | Amount  | Unit Cost | Amount  |         |
| 2. Canalitos-Santa Luisa Line                |                |          |                  |         |                |         |           |         |         |
| 1) Pipe line                                 |                |          |                  |         |                |         |           |         |         |
| ø200mm                                       | m              | 3,450    | 51.5             | 177,675 | 15.95          | 55,027  |           | 232,702 |         |
| ø250mm                                       | m              | 250      | 67.6             | 16,875  | 20.02          | 5,005   |           | 21,880  |         |
| ø300mm                                       | m              | 1,360    | 84.9             | 115,464 | 24.53          | 33,361  |           | 148,825 |         |
| ø500mm                                       | m              | 2,000    | 179.5            | 359,000 | 52             | 104,000 |           | 463,000 |         |
| Sub Total                                    |                |          |                  | 669,014 |                | 197,393 |           | 866,407 |         |
| 2) Rehabilitation of existing syphone bridge |                |          |                  |         |                |         |           |         |         |
| Total                                        |                |          |                  | 20,000  |                | 5,000   |           | 25,000  |         |
|                                              |                |          |                  | 689,014 |                | 202,393 |           | 891,407 |         |
| 3. Canalitos-Sabta Luisa line                |                |          |                  |         |                |         |           |         |         |
| 1) Pipe Line                                 |                |          |                  |         |                |         |           |         |         |
| ø200mm                                       | m              | 950      | 51.5             | 48,925  | 15.95          | 15,153  |           | 64,078  |         |
| ø250mm                                       | m              | 1,000    | 67.5             | 67,500  | 20.02          | 20,020  |           | 87,520  |         |
| Sub Total                                    |                |          |                  | 116,425 |                | 35,173  |           | 151,598 |         |
| 2) Tank (2,835m <sup>3</sup> )               |                |          |                  |         |                |         |           |         |         |
| Earth Works                                  | m <sup>3</sup> | 3,577    |                  |         | 5.47           | 19,566  |           | 19,566  |         |
| Concrete Works                               | m <sup>3</sup> | 618      |                  |         | 105.07         | 64,933  |           | 64,933  |         |
| Reinforcement                                | kg             | 76,292   |                  |         | 1.45           | 110,623 |           | 110,623 |         |
| Other                                        |                |          |                  | 1,890   |                | 15,984  |           | 17,874  |         |
| Sub Total                                    |                |          |                  | 1,890   |                | 211,106 |           | 212,996 |         |
| Total                                        |                |          |                  | 118,315 |                | 246,279 |           | 364,594 |         |

Water Supply System

(Unit: Quetzal)

| Item                           | Unit           | Quantity | Foreign Currency |         | Local Currency |         | Total     |              | Remarks |
|--------------------------------|----------------|----------|------------------|---------|----------------|---------|-----------|--------------|---------|
|                                |                |          | Unit Cost        | Amount  | Unit Cost      | Amount  | Unit Cost | Amount       |         |
| 4. Norte                       |                |          |                  |         |                |         |           |              |         |
| 1) Pipe Line                   |                |          |                  |         |                |         |           |              |         |
| ø200mm                         | m              | 4,650    | 51.5             | 239,475 | 15.95          | 74,168  | 313,643   | (1850-6,7,8) |         |
| ø250mm                         | m              | 780      | 67.5             | 52,650  | 20.02          | 15,616  | 68,266    |              |         |
| ø300mm                         | m              | 200      | 84.9             | 16,980  | 24.53          | 4,906   | 21,886    |              |         |
| ø350mm                         | m              | 360      | 110.6            | 39,816  | 30.36          | 10,930  | 50,746    |              |         |
| ø400mm                         | m              | 500      | 131.5            | 65,750  | 35.81          | 17,905  | 83,655    |              |         |
| ø450mm                         | m              | 300      | 155.8            | 46,740  | 41.25          | 12,375  | 59,115    |              |         |
| Sub Total                      |                |          |                  | 461,411 |                | 135,900 | 597,311   |              |         |
| 2) Tank (126m <sup>3</sup> )   |                |          |                  |         |                |         |           |              |         |
| Earth Work                     | m <sup>3</sup> | 456      |                  |         | 5.47           | 2,494   | 2,494     |              | 2       |
| Concrete Works                 | m <sup>3</sup> | 73       |                  |         | 105.07         | 7,670   | 7,670     |              |         |
| Reinforcement                  | kg             | 8,111    |                  |         | 1.45           | 11,761  | 11,761    |              |         |
| Other                          |                |          |                  |         |                | 1,496   | 1,496     |              |         |
| Sub Total                      |                |          |                  |         |                | 23,421  | 23,421    |              |         |
| 3) Tank (63m <sup>2</sup> x 2) |                |          |                  |         |                |         |           |              |         |
| Earth Work                     | m <sup>3</sup> | 581      |                  |         | 5.47           | 3,178   | 3,178     |              |         |
| Concrete Works                 | m <sup>3</sup> | 87       |                  |         | 105.07         | 9,141   | 9,141     |              |         |
| Reinforcement                  | kg             | 9,733    |                  |         | 1.45           | 14,113  | 14,113    |              |         |
| Other                          |                |          |                  |         |                | 1,797   | 1,797     |              |         |
| Sub Total                      |                |          |                  |         |                | 28,229  | 28,229    |              |         |

Water Supply System

(Unit: Quetzal)

| Item                                   | Unit           | Quantity | Foreign Currency |         | Local Currency |        | Total     |        | Remarks |
|----------------------------------------|----------------|----------|------------------|---------|----------------|--------|-----------|--------|---------|
|                                        |                |          | Unit Cost        | Amount  | Unit Cost      | Amount | Unit Cost | Amount |         |
| 4) Booster Pump                        |                |          |                  |         |                |        |           |        |         |
| BP2 Pump<br>(75kw x 70 l/s)            | set            | 2        | 100,000          | 200,000 | 914            | 1,828  | 201,828   | 2      |         |
| BP5 Pump<br>(45kw x 35 l/s)            | "              | 2        | 80,000           | 160,000 | 914            | 1,828  | 161,828   | 5      |         |
| BP6 Pump<br>(45kw x 35 l/s)            | "              | 2        | 80,000           | 160,000 | 914            | 1,828  | 161,828   | 6      |         |
| BPT Pump<br>(110kw x 87.5 l/s)         | "              | 3        | 140,000          | 420,000 | 914            | 2,742  | 422,742   | T4-4   |         |
| Sub Total                              |                |          | 940,000          | 940,000 |                | 8,226  | 948,226   |        |         |
| 5) Discharge Tank (158m <sup>3</sup> ) |                |          |                  |         |                |        |           |        |         |
| Earth Work                             | m <sup>3</sup> | 543      |                  |         | 5.47           | 2,976  | 2,976     |        |         |
| Concrete Works                         | m <sup>3</sup> | 86       |                  |         | 105.07         | 9,036  | 9,036     |        |         |
| Reinforcement                          | kg             | 9,646    |                  |         | 1.45           | 13,987 | 13,987    |        |         |
| Other                                  |                |          |                  |         |                | 1,702  | 1,702     |        |         |
| Sub Total                              |                |          |                  |         |                | 27,695 | 27,695    |        |         |
| Total                                  |                |          | 1,401,411        | 223,471 |                |        | 1,624,882 |        |         |

Water Supply System

(Unit: Quetzal)

| Item                           | Unit           | Quantity | Foreign Currency |         | Local Currency |         | Total     |         | Remarks |
|--------------------------------|----------------|----------|------------------|---------|----------------|---------|-----------|---------|---------|
|                                |                |          | Unit Cost        | Amount  | Unit Cost      | Amount  | Unit Cost | Amount  |         |
| 5. Latorrda                    |                |          |                  |         |                |         |           |         |         |
| 1) Pipe Line                   |                |          |                  |         |                |         |           |         |         |
| ø200mm                         | m              | 1,400    | 51.5             | 72,100  | 15.95          | 22,330  |           | 94,430  |         |
| 2) Tank (63m <sup>3</sup> )    |                |          |                  |         |                |         |           |         |         |
| Earth Works                    | m <sup>3</sup> | 290      |                  |         | 5.47           | 1,586   |           | 1,586   |         |
| Concrete Works                 | m <sup>3</sup> | 43.5     |                  |         | 105.07         | 4,571   |           | 4,571   |         |
| Reinforcement                  | kg             | 4,866    |                  |         | 1.45           | 7,056   |           | 7,056   |         |
| Other                          |                |          |                  |         |                | 914     |           | 914     |         |
| Sub Total                      |                |          |                  |         |                | 14,127  |           | 14,127  |         |
| 3) Booster Pump                |                |          |                  |         |                |         |           |         |         |
| BP1 Pump<br>(45kw x 35 l/s)    | set            | 2        | 80,000           | 160,000 | 914            | 1,828   |           | 161,828 |         |
| Total                          |                |          |                  | 232,100 |                | 38,285  |           | 270,385 |         |
| 6. El Rodeo (I)                |                |          |                  |         |                |         |           |         |         |
| 1) Pipe Line                   |                |          |                  |         |                |         |           |         |         |
| ø150mm                         | m              | 1,770    | 42.5             | 75,225  | 14.50          | 25,665  |           | 100,890 | 1       |
| ø200mm                         | m              | 390      | 51.5             | 20,085  | 15.95          | 6,221   |           | 26,306  | 3       |
| Sub Total                      |                |          |                  | 95,310  |                | 31,886  |           | 127,196 | 1,2     |
| 2) Tank (1,260m <sup>3</sup> ) |                |          |                  |         |                |         |           |         |         |
| Earth Works                    | m <sup>3</sup> | 2,289    |                  |         | 5.47           | 12,521  |           | 12,521  |         |
| Concrete Works                 | m <sup>3</sup> | 409      |                  |         | 105.07         | 42,974  |           | 42,974  |         |
| Reinforcement                  | kg             | 50,494   |                  |         | 1.45           | 73,216  |           | 73,216  |         |
| Other                          |                |          |                  | 1,080   |                | 11,123  |           | 12,203  |         |
| Sub Total                      |                |          |                  | 1,080   |                | 139,834 |           | 140,914 |         |

Water Supply System

(Unit: Quetzal)

| Item                           | Unit           | Quantity | Foreign Currency |         | Local Currency |         | Total     |         | Remarks |
|--------------------------------|----------------|----------|------------------|---------|----------------|---------|-----------|---------|---------|
|                                |                |          | Unit Cost        | Amount  | Unit Cost      | Amount  | Unit Cost | Amount  |         |
| 7. El Rodeo (II)               |                |          |                  |         |                |         |           |         |         |
| 1) Pipe Line                   |                |          |                  |         |                |         |           |         |         |
| ∅150mm                         | m              | 100      | 42.5             | 4,250   | 14.50          | 1,450   | 5,700     | 3       |         |
| Sub Total                      |                |          |                  | 4,250   |                | 1,450   | 5,700     |         |         |
| 2) Tank (25.2m <sup>3</sup> )  |                |          |                  |         |                |         |           |         |         |
| Earth works                    | m <sup>3</sup> | 15       |                  |         | 5.47           | 82      |           | 82      |         |
| Concrete Works                 | m <sup>3</sup> | 26       |                  |         | 105.07         | 2,732   |           | 2,732   |         |
| Reinforcement                  | kg             | 3,304    |                  |         | 1.45           | 4,791   |           | 4,791   |         |
| Other                          |                |          |                  | 270     |                | 489     |           | 749     |         |
| Sub Total                      |                |          |                  | 270     |                | 8,094   |           | 8,364   |         |
| 8. El Rodeo (III)              |                |          |                  |         |                |         |           |         |         |
| 1) Pipe Line                   |                |          |                  |         |                |         |           |         |         |
| ∅150mm                         | m              | 960      | 42.5             | 40,800  | 14.50          | 13,920  | 54,720    | 4,5     |         |
| Sub Total                      |                |          |                  | 40,800  |                | 13,920  | 54,720    |         |         |
| 2) Tank (1,260m <sup>3</sup> ) |                |          |                  |         |                |         |           |         |         |
| Earth Works                    | m <sup>3</sup> | 2,289    |                  |         | 5.47           | 12,521  |           | 12,521  |         |
| Concrete Works                 | m <sup>3</sup> | 409      |                  |         | 105.07         | 42,974  |           | 42,974  |         |
| Reinforcement                  | kg             | 50,494   |                  |         | 1.45           | 73,216  |           | 73,216  |         |
| Other                          |                |          |                  | 1,080   |                | 11,123  |           | 12,203  |         |
| Sub Total                      |                |          |                  | 1,080   |                | 139,834 |           | 140,914 |         |
| Total                          |                |          |                  | 142,790 |                | 335,018 |           | 477,808 |         |

Water Supply System

(Unit: Quetzal)

| Item                           | Unit           | Quantity | Foreign Currency |         | Local Currency |         | Total     |         | Remarks |
|--------------------------------|----------------|----------|------------------|---------|----------------|---------|-----------|---------|---------|
|                                |                |          | Unit Cost        | Amount  | Unit Cost      | Amount  | Unit Cost | Amount  |         |
| 9. Hermosa                     |                |          |                  |         |                |         |           |         |         |
| 1) Pipe Line                   |                |          |                  |         |                |         |           |         |         |
| ø200mm                         | m              | 2,300    | 51.5             | 118,450 | 15.95          | 36,685  |           | 155,135 |         |
| ø250mm                         | m              | 900      | 67.5             | 60,750  | 20.02          | 18,018  |           | 78,768  |         |
| Sub Total                      |                |          |                  | 179,200 |                | 54,703  |           | 233,903 |         |
| 2) Tank (1,980m <sup>3</sup> ) |                |          |                  |         |                |         |           |         |         |
| Earth Works                    | m <sup>3</sup> | 3,066    |                  |         | 5.47           | 16,771  |           | 16,771  |         |
| Concrete                       | m <sup>3</sup> | 553      |                  |         | 105.07         | 58,104  |           | 58,104  |         |
| Reinforcement                  | kg             | 68,268   |                  |         | 1.45           | 98,989  |           | 98,989  |         |
| Other                          |                |          |                  | 1,080   |                | 13,553  |           | 14,633  |         |
| Sub Total                      |                |          |                  | 1,080   |                | 187,417 |           | 188,497 |         |
| 3) Syphon Bridge               |                |          |                  |         |                |         |           |         |         |
| Earth Works                    | m <sup>3</sup> | 92       |                  |         | 5.47           | 503     |           | 503     |         |
| Concrete Works                 | m <sup>3</sup> | 86       |                  |         | 105.07         | 9,036   |           | 9,036   |         |
| Reinforcement                  | kg             | 10,935   |                  |         | 1.45           | 15,856  |           | 15,856  |         |
| Steel                          | kg             |          |                  | 5,785   |                | 145     |           | 5,930   |         |
| other                          |                |          |                  | 393     |                | 1,680   |           | 2,073   |         |
| Sub Total                      |                |          |                  | 6,178   |                | 27,220  |           | 33,398  |         |
| Total                          |                |          |                  | 186,458 |                | 269,340 |           | 455,798 |         |

O/H Facilities

(Unit: Quetzal)

| Item                                        | Unit | Quantity | Foreign Currency |         | Local Currency |         | Total     |         | Remarks |
|---------------------------------------------|------|----------|------------------|---------|----------------|---------|-----------|---------|---------|
|                                             |      |          | Unit Cost        | Amount  | Unit Cost      | Amount  | Unit Cost | Amount  |         |
| Canalitos-Juana de Arco Line                |      |          |                  |         |                |         |           |         |         |
| O/M Road Widening                           | m    | 550      |                  |         | 28.853         | 15,869  |           | 15,869  |         |
| O/M Road Widening                           | m    | 900      |                  |         | 28.853         | 25,968  |           | 25,968  |         |
| Communication Cable and Other Necessary     |      |          |                  | 73,920  |                |         |           | 73,920  |         |
| Control Panel and Remote Control, Telephone |      |          |                  | 182,000 |                |         |           | 182,000 |         |
| Transportation                              |      |          |                  | 35,430  |                | 7,086   |           | 42,516  |         |
| Erection                                    |      |          |                  | 118,697 |                | 42,208  |           | 160,905 |         |
| Sub-Station                                 |      |          |                  | 20,000  |                | 10,000  |           | 30,000  |         |
| Sub Total                                   |      |          |                  | 430,047 |                | 101,131 |           | 531,178 |         |
| Canalitos-Santa Luisa Line                  |      |          |                  |         |                |         |           |         |         |
| O/M road Construction                       | m    | 250      |                  |         | 57.706         | 14,427  |           | 14,427  |         |
| Sub-Station                                 |      |          |                  | 20,000  |                | 10,000  |           | 30,000  |         |
| Communication Cable and Other Necessary     |      |          |                  | 44,520  |                |         |           | 44,520  |         |
| Control Panel and Remote Control, Telephone |      |          |                  | 171,000 |                |         |           | 171,000 |         |
| Transportation                              |      |          |                  | 16,760  |                | 2,152   |           | 18,912  |         |
| Erection                                    |      |          |                  | 99,959  |                | 35,545  |           | 135,504 |         |
| Sub Total                                   |      |          |                  | 352,239 |                | 62,124  |           | 414,363 |         |

O/M Facilities

(Unit: Quetzal)

| Item                                        | Unit | Quantity | Foreign Currency |        | Local Currency |         | Total     |           | Remarks |
|---------------------------------------------|------|----------|------------------|--------|----------------|---------|-----------|-----------|---------|
|                                             |      |          | Unit Cost        | Amount | Unit Cost      | Amount  | Unit Cost | Amount    |         |
| <b>Canalitos-San Gaspar line</b>            |      |          |                  |        |                |         |           |           |         |
| O/M Road Construction                       | m    | 50       |                  |        | 57,706         | 2,885   |           | 2,885     |         |
| Communication Cable and Other Necessary     |      |          | 13,650           |        |                |         |           | 13,650    |         |
| Control Panel and Remote Control, Telephone |      |          | 57,000           |        |                |         |           | 57,000    |         |
| Transportation                              |      |          | 8,010            |        |                | 402     |           | 8,412     |         |
| Erection                                    |      |          | 32,767           |        |                | 11,652  |           | 44,419    |         |
| Sub Total                                   |      |          | 111,427          |        |                | 14,939  |           | 126,366   |         |
| Total                                       |      |          | 893,713          |        |                | 178,194 |           | 1,071,907 |         |
| <b>Norte</b>                                |      |          |                  |        |                |         |           |           |         |
| O/M Road Construction                       | m    | 1,120    |                  |        | 57,706         | 64,631  |           | 64,631    |         |
| Communication Cable and Other Necessary     |      |          | 142,500          |        |                |         |           | 142,500   |         |
| Control Panel and Remote Control, Telephone |      |          | 196,000          |        |                |         |           | 196,000   |         |
| Transportation                              |      |          | 31,350           |        |                | 6,270   |           | 37,620    |         |
| Erection                                    |      |          | 156,998          |        |                | 55,828  |           | 212,826   |         |
| Sub Total                                   |      |          | 526,848          |        |                | 126,729 |           | 653,577   |         |



O/M Facilities

(Unit: Quetzal)

| Item                                        | Unit | Quantity | Foreign Currency |        | Local Currency |         | Total     |         | Remarks |
|---------------------------------------------|------|----------|------------------|--------|----------------|---------|-----------|---------|---------|
|                                             |      |          | Unit Cost        | Amount | Unit Cost      | Amount  | Unit Cost | Amount  |         |
| Lavarreda                                   |      |          |                  |        |                |         |           |         |         |
| O/M Road Construction                       | m    | 100      |                  |        | 57.706         | 5,771   |           | 5,771   |         |
| Communication Calbe and Other Necessary     |      |          | 14,700           |        |                |         |           | 14,700  |         |
| Control Panel and Remote Control, Telephone |      |          | 38,000           |        |                |         |           | 38,000  |         |
| Transportation                              |      |          | 6,575            |        |                | 1,315   |           | 7,890   |         |
| Erection                                    |      |          | 24,442           |        |                | 8,691   |           | 33,133  |         |
| Sub Total                                   |      |          | 83,717           |        |                | 15,777  |           | 99,494  |         |
| EL Rodeo                                    |      |          |                  |        |                |         |           |         |         |
| O/M Road Construction                       | m    | 1,260    |                  |        | 57.706         | 72,710  |           | 72,710  |         |
| Communication Cable and Other Necessary     |      |          | 22,540           |        |                |         |           | 22,540  |         |
| Control Panel and Remote Control, Telephone |      |          | 171,000          |        |                |         |           | 171,000 |         |
| Transportation                              |      |          | 13,400           |        |                | 2,400   |           | 15,800  |         |
| Erection                                    |      |          | 89,764           |        |                | 31,920  |           | 121,684 |         |
| Sub Total                                   |      |          | 296,704          |        |                | 107,030 |           | 403,734 |         |

O/M Facilities

(Unit: Quetzal)

| Item                                        | Unit | Quantity | Foreign Currency |        | Local Currency |        | Total     |         | Remarks |
|---------------------------------------------|------|----------|------------------|--------|----------------|--------|-----------|---------|---------|
|                                             |      |          | Unit Cost        | Amount | Unit Cost      | Amount | Unit Cost | Amount  |         |
| Hermosa                                     |      |          |                  |        |                |        |           |         |         |
| O/M Road Construction                       | m    | 400      |                  |        | 57,706         | 23,082 |           | 23,082  |         |
| Sub Station                                 |      |          | 20,000           |        |                | 10,000 |           | 30,000  |         |
| Communication Calbe and Other Necessary     |      |          | 22,400           |        |                |        |           | 22,400  |         |
| Control Panel and Remote Control, Telephone |      |          | 76,000           |        |                |        |           | 76,000  |         |
| Transportation                              |      |          | 12,350           |        |                | 1,270  |           | 13,620  |         |
| Erection                                    |      |          | 45,638           |        |                | 16,229 |           | 61,867  |         |
| Sub Total                                   |      |          | 176,388          |        |                | 50,581 |           | 226,969 |         |

Rehabilitation

(Unit: Quetzal)

| Item                                        | Unit | Quantity | Foreign Currency |           | Local Currency |         | Total     |         | Remarks   |
|---------------------------------------------|------|----------|------------------|-----------|----------------|---------|-----------|---------|-----------|
|                                             |      |          | Unit Cost        | Amount    | Unit Cost      | Amount  | Unit Cost | Amount  |           |
| Clearing Jet and Piston                     |      | 22       |                  |           | 3,600          | 79,200  |           | 79,200  |           |
| Casing Pipe Repair                          |      | 4        |                  |           | 3,300          | 13,200  |           | 13,200  |           |
| Submargible Pump, Motor, Operation Board    |      | 22       | 39,045.5         | 859,000   |                |         |           | 859,000 |           |
| Transportation                              |      | 150      |                  | 23,550    |                | 12,000  |           | 35,550  |           |
| Erectio                                     |      |          |                  |           |                | 22,000  |           | 22,000  |           |
| Ojo de Auga                                 |      |          |                  |           |                |         |           |         |           |
| Communication Calbe and Other Necessary     |      |          |                  | 45,000    |                |         |           |         | 45,000    |
| Control Panel and Remote Control, Telephone |      |          |                  | 171,000   |                |         |           |         | 171,000   |
| Transportation                              |      |          |                  | 31,350    |                | 6,270   |           |         | 37,620    |
| Erection                                    |      |          |                  | 61,200    |                | 26,520  |           |         | 87,720    |
| Total                                       |      |          |                  | 1,191,100 |                | 159,190 |           |         | 1,350,290 |

Power Supply System

(Unit: Quetzal)

| Item                                    | Unit | Quantity | Foreign Currency |           | Local Currency |         | Total     |        | Remarks |
|-----------------------------------------|------|----------|------------------|-----------|----------------|---------|-----------|--------|---------|
|                                         |      |          | Unit Cost        | Amount    | Unit Cost      | Amount  | Unit Cost | Amount |         |
| Pole                                    | Nos  | 335      | 290              | 97,150    |                |         | 97,150    |        |         |
| Cable                                   | m    | 22,775   | 17               | 387,175   |                |         | 387,175   |        |         |
| Cable Connection                        | Nos  | 38       |                  |           | 4,420          | 167,960 | 167,960   |        |         |
| Construction cost                       |      |          |                  |           |                | 11,395  | 11,395    |        |         |
| Electrical Leading Pole Transformer Bay | set  | 39       | 10,500           | 409,500   |                |         | 409,500   |        |         |
| Cable Conduit and Erection Material     |      |          |                  | 267,999   |                |         | 267,999   |        |         |
| Receiving Part                          | set  |          | 12,400           | 483,600   |                |         | 483,600   |        |         |
| Transformer                             |      |          |                  | 643,300   |                |         | 643,300   |        |         |
| Transportation                          |      |          |                  | 186,277   |                | 48,298  | 234,575   |        |         |
| Erection                                |      |          |                  | 15,200    |                | 11,400  | 26,600    |        |         |
| Access road                             | km   | 3        |                  |           | 52,460         | 157,380 | 157,380   |        |         |
| Total                                   |      |          |                  | 2,490,201 |                | 396,433 | 2,886,634 |        |         |

Power Supply System

(Unit: Quetzal)

| Item                                     | Unit | Quantity | Foreign Currency |         | Local Currency |        | Total     |        | Remarks                          |
|------------------------------------------|------|----------|------------------|---------|----------------|--------|-----------|--------|----------------------------------|
|                                          |      |          | Unit Cost        | Amount  | Unit Cost      | Amount | Unit Cost | Amount |                                  |
| Canalitos-Juana de Arco Line<br>(2,900m) |      |          |                  |         |                |        |           |        |                                  |
| Pole                                     | Nos  | 43       | 290              | 12,470  |                |        | 12,470    |        |                                  |
| Cable                                    | m    | 2,900    | 17               | 49,300  |                |        | 49,300    |        |                                  |
| Cable Connection                         | Nos  | 7        |                  |         | 4,420          | 30,940 | 30,940    |        |                                  |
| Construction Cost                        |      |          |                  |         |                | 1,450  | 1,450     |        |                                  |
| Electrical Leading Pole Transformer Bay  | set  | 7        | 10,500           | 73,500  |                |        | 73,500    |        |                                  |
| Cable Conduit and Erection Material      |      |          |                  | 62,000  |                |        | 62,000    |        |                                  |
| Receiving Part                           | set  | 7        | 12,400           | 86,800  |                |        | 86,800    |        |                                  |
| Transformer                              |      |          |                  | 120,300 |                |        | 120,300   |        |                                  |
| Transportation                           |      |          |                  | 32,981  |                | 8,551  | 41,532    |        |                                  |
| Erection                                 |      |          |                  | 2,800   |                | 2,100  | 4,900     |        |                                  |
| Total                                    |      |          |                  | 440,151 |                | 43,041 | 483,192   |        |                                  |
|                                          |      |          |                  |         |                |        |           |        | 200KVA x 1 = 11,800              |
|                                          |      |          |                  |         |                |        |           |        | 300KVA x 1 = 14,200              |
|                                          |      |          |                  |         |                |        |           |        | 400KVA x 4 = 68,000 (17,000 x 4) |
|                                          |      |          |                  |         |                |        |           |        | 700KVA x 1 = 26,300              |
|                                          |      |          |                  |         |                |        |           |        | *transformer                     |

Power Supply System

(Unit: Quetzal)

| Item                                    | Unit | Quantity | Foreign Currency |         | Local Currency |         | Total     |         | Remarks                           |
|-----------------------------------------|------|----------|------------------|---------|----------------|---------|-----------|---------|-----------------------------------|
|                                         |      |          | Unit Cost        | Amount  | Unit Cost      | Amount  | Unit Cost | Amount  |                                   |
| Canalitos-Santa Luisa Line<br>(5,350m)  |      |          |                  |         |                |         |           |         |                                   |
| Pole                                    | Nos  | 78       | 290              | 22,620  |                |         |           | 22,620  |                                   |
| Cable                                   | m    | 5,350    | 17               | 90,950  |                |         |           | 90,950  |                                   |
| Cable Connection                        | set  | 7        |                  |         | 4,420          | 30,940  |           | 30,940  |                                   |
| Construction Cost                       |      | 1        |                  |         |                | 2,675   |           | 2,675   |                                   |
| Electrical Leading Pole Transformer Bay | set  | 7        | 10,500           | 73,500  |                |         |           | 73,500  |                                   |
| Cable Conduit and Erection Material     |      | 1        |                  | 41,333  |                |         |           | 41,333  |                                   |
| Receiving Part                          | set  | 7        | 12,400           | 86,800  |                |         |           | 86,800  |                                   |
| Transformer                             |      |          |                  | 108,200 |                |         |           | 108,200 |                                   |
| Transportation                          |      |          |                  | 34,523  |                | 8,951   |           | 43,474  |                                   |
| Erection                                |      |          |                  | 2,800   |                | 2,100   |           | 4,900   |                                   |
| Access Road                             | km   | 3        |                  |         | 52,460         | 157,380 |           | 157,380 |                                   |
| Total                                   |      |          |                  | 460,726 |                | 202,046 |           | 662,772 |                                   |
|                                         |      |          |                  |         |                |         |           |         | 200KVA x 1 = 11,800               |
|                                         |      |          |                  |         |                |         |           |         | 300KVA x 2 = 28,400 (=14,200 x 2) |
|                                         |      |          |                  |         |                |         |           |         | 400KVA x 4 = 68,000 (=17,000 x 4) |

Power Supply System

(Unit: Quetzal)

| Item                                    | Unit | Quantity | Foreign Currency |         | Local Currency |              | Total                                                    |        | Remarks |
|-----------------------------------------|------|----------|------------------|---------|----------------|--------------|----------------------------------------------------------|--------|---------|
|                                         |      |          | Unit Cost        | Amount  | Unit Cost      | Amount       | Unit Cost                                                | Amount |         |
| Canalitos-San Gaspar Line<br>(3,400m)   |      |          |                  |         |                |              |                                                          |        |         |
| Pole                                    | Nos  | 50       | 290              | 14,500  |                |              | 14,500                                                   |        |         |
| Cable                                   | m    | 3,400    | 17               | 57,800  |                |              | 57,800                                                   |        |         |
| Cable Connection                        | Nos  | 3        |                  |         | 4,420          | 13,260       | 13,260                                                   |        |         |
| Construction Cost                       |      |          |                  |         |                | 1,700        | 1,700                                                    |        |         |
| Electrical Leading Pole Transformer Bay | set  | 3        | 10,500           | 31,500  |                |              | 31,500                                                   |        |         |
| Cable Conduit and Erection Material     |      |          |                  | 20,666  |                |              | 20,666                                                   |        |         |
| Receiving Part                          | set  | 3        | 12,400           | 37,200  |                |              | 37,200                                                   |        |         |
| Transformer                             |      |          |                  | 45,400  |                |              | 45,400                                                   |        |         |
| Transportation                          |      |          |                  | 16,846  |                | 4,368        | 21,214                                                   |        |         |
| Erection                                |      |          |                  | 1,200   |                | 900          | 2,100                                                    |        |         |
| Total                                   |      |          |                  | 225,112 |                | 20,228       | 245,340                                                  |        |         |
|                                         |      |          |                  |         |                | *Transformer | 400KVA x 1 = 17,000<br>300KVA x 2 = 28,400 (=14,200 x 2) |        |         |

Power Supply System

(Unit: Quetzal)

| Item                                    | Unit | Quantity | Foreign Currency |         | Local Currency |        | Total     |         | Remarks                                                                                                                            |
|-----------------------------------------|------|----------|------------------|---------|----------------|--------|-----------|---------|------------------------------------------------------------------------------------------------------------------------------------|
|                                         |      |          | Unit Cost        | Amount  | Unit Cost      | Amount | Unit Cost | Amount  |                                                                                                                                    |
| Norte (3,005m)                          |      |          |                  |         |                |        |           |         |                                                                                                                                    |
| Pole                                    | Nos  | 44       | 290              | 12,760  |                |        |           | 12,760  |                                                                                                                                    |
| Cable                                   | m    | 3,006    | 17               | 51,085  |                |        |           | 51,085  |                                                                                                                                    |
| Cable Connection                        | Nos  | 9        |                  |         | 4,420          | 39,780 |           | 39,780  |                                                                                                                                    |
| Construction Cost                       |      |          |                  |         |                | 1,500  |           | 1,500   |                                                                                                                                    |
| Electrical Leading Pole Transformer Bay | set  | 9        | 10,500           | 94,500  |                |        |           | 94,500  |                                                                                                                                    |
| Cable Conduit and Erection Material     |      |          |                  | 80,000  |                |        |           | 80,000  |                                                                                                                                    |
| Receiving Part                          | set  | 9        | 12,400           | 111,600 |                |        |           | 111,600 |                                                                                                                                    |
| Transformer                             |      |          |                  | 178,300 |                |        |           | 178,300 |                                                                                                                                    |
| Transportation                          |      |          |                  | 42,785  |                | 11,093 |           | 53,878  |                                                                                                                                    |
| Erection                                |      |          |                  | 3,600   |                | 2,700  |           | 6,300   |                                                                                                                                    |
| Total                                   |      |          |                  | 574,630 |                | 55,073 |           | 629,703 |                                                                                                                                    |
|                                         |      |          |                  |         |                |        |           |         | 400KVA x 4 = 68,000 (=17,000 x 4)<br>500KVA x 2 = 39,000 (=19,500 x 2)<br>600KVA x 2 = 45,000 (=22,500 x 2)<br>700KVA x 1 = 26,300 |

\*transformer



Power Supply System

(Unit: Quetzal)

| Item                                    | Unit | Quantity | Foreign Currency |         | Local Currency |              | Total     |                     | Remarks |
|-----------------------------------------|------|----------|------------------|---------|----------------|--------------|-----------|---------------------|---------|
|                                         |      |          | Unit Cost        | Amount  | Unit Cost      | Amount       | Unit Cost | Amount              |         |
| Lavarreda (610m)                        |      |          |                  |         |                |              |           |                     |         |
| Pole                                    | Nos  | 10       | 290              | 2,900   |                |              |           | 2,900               |         |
| Cable                                   | m    | 610      | 17               | 10,370  |                |              |           | 10,370              |         |
| Cable Connection                        | Nos  | 2        |                  |         | 4,420          | 8,840        |           | 8,840               |         |
| Construction Cost                       |      |          |                  |         |                | 310          |           | 310                 |         |
| Electrical Leading Pole Transformer Bay | set  | 2        | 10,500           | 21,000  |                |              |           | 21,000              |         |
| Cable Conduit and Erection Material     |      |          |                  | 14,500  |                |              |           | 14,500              |         |
| Receiving Part                          | set  | 2        | 12,400           | 24,800  |                |              |           | 24,800              |         |
| Transportation                          |      |          |                  | 8,957   |                | 2,323        |           | 11,280              |         |
| Erection                                |      |          |                  | 800     |                | 600          |           | 1,400               |         |
| Transformer                             |      |          |                  | 36,500  |                |              |           | 36,500              |         |
| Total                                   |      |          |                  | 119,827 |                | 12,073       |           | 131,900             |         |
|                                         |      |          |                  |         |                | *transformer |           | 400KVA x 1 = 17,000 |         |
|                                         |      |          |                  |         |                |              |           | 500KVA x 1 = 19,500 |         |

Power Supply System

(Unit: Quetzal)

| Item                                    | Unit | Quantity | Foreign Currency |         | Local Currency |        | Total     |         | Remarks                                                                |
|-----------------------------------------|------|----------|------------------|---------|----------------|--------|-----------|---------|------------------------------------------------------------------------|
|                                         |      |          | Unit Cost        | Amount  | Unit Cost      | Amount | Unit Cost | Amount  |                                                                        |
| El Rodeo (2,910m)                       |      |          |                  |         |                |        |           |         |                                                                        |
| Pole                                    | Nos  | 43       | 290              | 12,470  |                |        |           | 12,470  |                                                                        |
| Cable                                   | m    | 2,910    | 17               | 49,470  |                |        |           | 49,470  |                                                                        |
| Cable Connection                        | Nos  | 7        |                  |         | 4,420          | 30,940 |           | 30,940  |                                                                        |
| Construction Cost                       |      |          |                  |         |                | 1,460  |           | 1,460   |                                                                        |
| Electrical Leading Pole Transformer Bay | set  | 7        | 10,500           | 73,500  |                |        |           | 73,500  |                                                                        |
| Cable Conduit and Erection Material     |      |          |                  | 27,000  |                |        |           | 27,000  |                                                                        |
| Receiving Part                          | set  | 7        |                  | 86,800  |                |        |           | 86,800  |                                                                        |
| Transportation                          |      |          |                  | 27,851  |                |        | 7,221     | 35,072  |                                                                        |
| Erection                                |      |          |                  | 2,400   |                |        | 1,800     | 4,200   |                                                                        |
| Transformer                             |      |          |                  | 92,200  |                |        |           | 92,200  |                                                                        |
| Total                                   |      |          |                  | 371,691 |                |        | 41,421    | 413,112 |                                                                        |
|                                         |      |          |                  |         |                |        |           |         | 200KVA x 3 = 35,400 (=11,800 x 3)<br>300KVA x 4 = 56,800 (=14,200 x 4) |

\*transformer

Power Supply System

(Unit: Quetzal)

| Item                                    | Unit | Quantity | Foreign Currency |         | Local Currency |              | Total     |                                   | Remarks |
|-----------------------------------------|------|----------|------------------|---------|----------------|--------------|-----------|-----------------------------------|---------|
|                                         |      |          | Unit Cost        | Amount  | Unit Cost      | Amount       | Unit Cost | Amount                            |         |
| Hermasa (4,600m)                        |      |          |                  |         |                |              |           |                                   |         |
| Pole                                    | Nos  | 67       | 290              | 19,430  |                |              |           | 19,430                            |         |
| Cable                                   | m    | 4,600    | 17               | 78,200  |                |              |           | 78,200                            |         |
| Cable Connection                        | Nos  | 3        |                  |         | 4,420          | 13,260       |           | 13,260                            |         |
| Construction Cost                       |      |          |                  |         |                | 2,300        |           | 2,300                             |         |
| Electrical Leading Pole Transformer Bay | set  | 4        | 10,500           | 42,000  |                |              |           | 42,000                            |         |
| Cable Conduit and Erection Material     |      |          |                  | 22,500  |                |              |           | 22,500                            |         |
| Receiving Part Transformer              | set  | 4        | 12,400           | 49,600  |                |              |           | 49,600                            |         |
| Transportation Erection                 |      |          |                  | 22,334  |                | 5,791        |           | 28,125                            |         |
|                                         |      |          |                  | 1,600   |                | 1,200        |           | 2,800                             |         |
| Total                                   |      |          |                  | 298,064 |                | 22,551       |           | 320,615                           |         |
|                                         |      |          |                  |         |                | *transformer |           | 300KVA x 2 = 28,400 (=14,200 x 2) |         |
|                                         |      |          |                  |         |                |              |           | 400KVA x 2 = 34,000 (=17,000 x 2) |         |

Land Acquisition

(Unit: Quetzal)

| Item                                     | Unit           | Quantity | Foreign Currency |        | Local Currency |         | Total     |         | Remarks |
|------------------------------------------|----------------|----------|------------------|--------|----------------|---------|-----------|---------|---------|
|                                          |                |          | Unit Cost        | Amount | Unit Cost      | Amount  | Unit Cost | Amount  |         |
| Canalitos - (J.A-Line)                   |                |          |                  |        |                |         |           |         |         |
| O/M Road (Widening)                      | m <sup>2</sup> | 7,250    | -                | -      | 25             | 181,250 | -         | 181,250 |         |
| Well (7 Nos)                             | m <sup>2</sup> | 700      | -                | -      | 25             | 17,500  | -         | 17,500  |         |
| Discharge Tank (108m <sup>3</sup> )      | m <sup>2</sup> | 120      | -                | -      | 25             | 3,000   | -         | 3,000   |         |
| Canalitos - (S.L-Line)                   |                |          |                  |        |                |         |           |         |         |
| O/M Road                                 | m <sup>2</sup> | 1,875    | -                | -      | 25             | 46,875  | -         | 46,875  |         |
| Well (7 Nos)                             | m <sup>2</sup> | 700      | -                | -      | 25             | 17,500  | -         | 17,500  |         |
| Sub Station                              | m <sup>2</sup> | 120      | -                | -      | 25             | 3,000   | -         | 3,000   |         |
| Canalitos - (S.G-Line)                   |                |          |                  |        |                |         |           |         |         |
| O/M Road                                 | m <sup>2</sup> | 375      | -                | -      | 25             | 9,375   | -         | 9,375   |         |
| Well (3 Nos)                             | m <sup>2</sup> | 300      | -                | -      | 25             | 7,500   | -         | 7,500   |         |
| Distribution Tank (2,835m <sup>3</sup> ) | m <sup>2</sup> | 1,500    | -                | -      | 25             | 37,500  | -         | 37,500  |         |
| Norte                                    |                |          |                  |        |                |         |           |         |         |
| O/M road                                 | m <sup>2</sup> | 8,400    | -                | -      | 25             | 210,000 | -         | 210,000 |         |
| Well (8 Nos)                             | m <sup>2</sup> | 800      | -                | -      | 25             | 20,000  | -         | 20,000  |         |
| Discharge Tank (2x63m <sup>3</sup> )     | m <sup>2</sup> | 95       | -                | -      | 25             | 2,375   | -         | 2,375   |         |
| Discharge Tank (126m <sup>3</sup> )      | m <sup>2</sup> | 95       | -                | -      | 25             | 2,375   | -         | 2,375   |         |
| Sub Total                                |                |          | -                | -      |                | 558,250 | -         | 558,250 |         |

Land Acquisition

(Unit: Quetzal)

| Item                                          | Unit           | Quantity | Foreign Currency |        | Local Currency |           | Total     |           | Remarks |
|-----------------------------------------------|----------------|----------|------------------|--------|----------------|-----------|-----------|-----------|---------|
|                                               |                |          | Unit Cost        | Amount | Unit Cost      | Amount    | Unit Cost | Amount    |         |
| <b>Lavarréda</b>                              |                |          |                  |        |                |           |           |           |         |
| O/M Road                                      | m <sup>2</sup> | 750      |                  |        | 25             | 18,750    |           | 18,750    |         |
| Well (2 Nos)                                  | m <sup>2</sup> | 200      |                  |        | 25             | 5,000     |           | 5,000     |         |
| Discharge Tank (63m <sup>3</sup> )            | m <sup>2</sup> | 48       |                  |        | 25             | 1,200     |           | 1,200     |         |
| <b>El Rodeo</b>                               |                |          |                  |        |                |           |           |           |         |
| O/M Road                                      | m <sup>2</sup> | 9,450    |                  |        | 25             | 236,250   |           | 236,250   |         |
| Well (7 Nos)                                  | m <sup>2</sup> | 700      |                  |        | 25             | 17,500    |           | 17,500    |         |
| Distribution Tank<br>(1,260m <sup>3</sup> x2) | m <sup>2</sup> | 1,350    |                  |        | 25             | 33,750    |           | 33,750    |         |
| Distribution Tank<br>(25.2m <sup>3</sup> )    | m <sup>2</sup> | 38       |                  |        | 25             | 950       |           | 950       |         |
| <b>Hermosa</b>                                |                |          |                  |        |                |           |           |           |         |
| O/M road                                      | m <sup>2</sup> | 4,500    |                  |        | 25             | 112,500   |           | 112,500   |         |
| Well (4 Nos)                                  | m <sup>2</sup> | 400      |                  |        | 25             | 10,000    |           | 10,000    |         |
| Distribution Tank (1,890m <sup>3</sup> )      | m <sup>2</sup> | 1,015    |                  |        | 25             | 25,375    |           | 25,375    |         |
| Sub Station                                   | m <sup>2</sup> | 120      |                  |        |                | 3,000     |           | 3,000     |         |
| Sub Total                                     |                |          |                  |        |                | 464,275   |           | 464,275   |         |
| Total                                         |                |          |                  |        |                | 1,022,525 |           | 1,022,525 |         |

## O/M Cost

(Unit: Quetzal)

| Item                               | Unit | Quantity | Foreign Currency |        | Local Currency |           | Total     | Remarks |
|------------------------------------|------|----------|------------------|--------|----------------|-----------|-----------|---------|
|                                    |      |          | Unit Cost        | Amount | Unit Cost      | Amount    |           |         |
| 1. Salaries & Wages                |      |          |                  |        |                |           |           |         |
| Staff Salaries                     |      |          | -                |        |                | 550,200   | 550,200   |         |
| Wages                              |      |          | -                |        |                | 20,995    | 20,995    |         |
| 2. Office Expenses                 |      |          | -                |        |                | 64,000    | 64,000    |         |
| 3. Power Rates                     |      |          | -                |        |                | 5,315,016 | 5,315,016 |         |
| 4. Fuel for Vehicles and Equipment |      |          | -                |        |                | 22,700    | 22,700    |         |
| 5. Chlorine Gas                    |      |          | 52,899           |        |                | -         | 52,899    |         |
| 6. Miscellaneous Expenses          |      |          | 107,196          |        |                | 211,000   | 318,196   |         |
| Sub Total                          |      |          | 160,095          |        |                | 6,183,911 | 6,344,006 |         |
| 7. Rehabilitation-Electric         |      |          | -                |        |                | 513,168   | 513,168   |         |
| Total                              |      |          | 160,095          |        |                | 6,697,079 | 6,857,174 |         |

Breakdown O/M Cost

(Unit: Quetzal)

| Item                    | Unit | Quantity | Foreign Currency |        | Local Currency |        | Total     |        | Remarks |
|-------------------------|------|----------|------------------|--------|----------------|--------|-----------|--------|---------|
|                         |      |          | Unit Cost        | Amount | Unit Cost      | Amount | Unit Cost | Amount |         |
| 2. Office Expenses      |      |          |                  |        |                |        |           |        |         |
| Articles of Consumption | Lot  | 1        |                  | 27,927 |                | 27,927 |           | 27,927 |         |
| Furnitures              | "    | 1        |                  | 20,000 |                | 20,000 |           | 20,000 |         |
| Building & Repairs      | "    | 1        |                  | 13,250 |                | 13,250 |           | 13,250 |         |
| Others                  | "    | 1        |                  | 2,823  |                | 2,823  |           | 2,823  |         |
| Total                   |      |          |                  | 64,000 |                | 64,000 |           | 64,000 |         |

Breakdown O/M Cost

(Unit: Quetzal)

| Item                     | Unit | Quantity | Foreign Currency |        | Local Currency |           | Total     |         | Remarks |
|--------------------------|------|----------|------------------|--------|----------------|-----------|-----------|---------|---------|
|                          |      |          | Unit Cost        | Amount | Unit Cost      | Amount    | Unit Cost | Amount  |         |
| 3. Power Rates           |      |          |                  |        |                |           |           |         |         |
| 1) Canalitos-1 (JA-Line) | M    | 12       | -                | -      | 88,768         | 1,065,216 | 1,065,216 | 1,242kW |         |
| Canalitos-2 (SL-Line)    | "    | 12       | -                | -      | 79,620         | 955,440   | 955,440   | 1,114kW |         |
| Canalitos-3 (San Casper) | "    | 12       | -                | -      | 32,091         | 385,092   | 385,092   | 449kW   |         |
| 2) Norte                 | "    | 12       | -                | -      | 121,931        | 1,463,172 | 1,463,172 | 1,706kW |         |
| 3) Lavarreda             | "    | 12       | -                | -      | 25,873         | 310,476   | 310,476   | 362kW   |         |
| 4) El Rodeo              | "    | 12       | -                | -      | 49,322         | 591,864   | 591,864   | 753kW   |         |
| 5) Hermosa               | "    | 12       | -                | -      | 45,313         | 543,756   | 543,756   | 634kW   |         |
| Total                    |      |          |                  |        | 442,918        | 5,315,016 | 5,315,016 | 6,260kW |         |



Breakdown O/M Cost

(Unit: Quetzal)

| Item                               | Unit | Quantity | Foreign Currency |        | Local Currency |        | Total     |        | Remarks |
|------------------------------------|------|----------|------------------|--------|----------------|--------|-----------|--------|---------|
|                                    |      |          | Unit Cost        | Amount | Unit Cost      | Amount | Unit Cost | Amount |         |
| 4. Fuel for Vehicles and Equipment |      |          |                  |        |                |        |           |        |         |
| Gasoline, Oil, etc.                | Lot  | 1        |                  | 22,700 |                |        | 22,700    |        |         |

Breakdown O/M Cost

(Unit: Quetzal)

| Item                     | Unit | Quantity | Foreign Currency |          | Local Currency |        | Total     |          | Remarks |
|--------------------------|------|----------|------------------|----------|----------------|--------|-----------|----------|---------|
|                          |      |          | Unit Cost        | Amount   | Unit Cost      | Amount | Unit Cost | Amount   |         |
| 5. Chlorine Gas          |      |          |                  |          |                |        |           |          |         |
| 1) Canalitos-1 (JA-Line) | Day  | 365      | 33.38            | 12,183.7 |                |        |           | 12,183.7 |         |
| Canalitos-2 (SL-Line)    | "    | "        | 22.62            | 8,256.3  |                |        |           | 8,256.3  |         |
| Canalitos-3 (San Gasper) | "    | "        | 11.63            | 4,245.0  |                |        |           | 4,245.0  |         |
| 2) Norte                 | "    | "        | 35.48            | 12,950.2 |                |        |           | 12,950.2 |         |
| 3) Lavarreda             | "    | "        | 8.87             | 3,237.6  |                |        |           | 3,237.6  |         |
| 4) El Rodeo              | "    | "        | 17.74            | 6,475.1  |                |        |           | 6,475.1  |         |
| 5) Hermosa               | "    | "        | 15.21            | 5,551.7  |                |        |           | 5,551.7  |         |
| Total                    |      |          | 144.93           | 52,899   |                |        |           | 52,899   |         |

Breakdown O/M Cost

(Unit: Quetzal)

| Item                       | Unit | Quantity | Foreign Currency |         | Local Currency |         | Total   | Remarks |
|----------------------------|------|----------|------------------|---------|----------------|---------|---------|---------|
|                            |      |          | Unit Cost        | Amount  | Unit Cost      | Amount  |         |         |
| 6. Miscellaneous Expenses  |      |          |                  |         |                |         |         |         |
| 1) Maintenance Service Car | Nos  | 2        | 17,500           | 35,000  |                |         | 35,000  |         |
| 2) Pick Up                 | "    | 2        | 30,000           | 60,000  |                |         | 60,000  |         |
| 3) Vehicles                | "    | 12       | 1,000            | 12,000  |                |         | 12,000  |         |
| 4) Others                  |      |          | 196              |         |                | 45,250  | 45,446  |         |
| 5) Sararies                | Lot  |          |                  |         |                | 62,500  | 62,500  |         |
| 6) Communication           | "    |          |                  |         |                | 12,000  | 12,000  |         |
| 7) Hire, Repairs           | "    |          |                  |         |                | 30,000  | 30,000  |         |
| 8) Wages                   | "    |          |                  |         |                | 61,250  | 61,250  |         |
| Total                      |      |          |                  | 107,196 |                | 211,000 | 318,196 |         |

Breakdown O/M Cost

(Unit: Quetzal)

| Item              | Unit | Quantity | Foreign Currency |        | Local Currency |         | Total     |        | Remarks                                  |
|-------------------|------|----------|------------------|--------|----------------|---------|-----------|--------|------------------------------------------|
|                   |      |          | Unit Cost        | Amount | Unit Cost      | Amount  | Unit Cost | Amount |                                          |
| 7. Rehabilitation |      |          |                  |        |                |         |           |        |                                          |
| Electric          | M    | 12       |                  |        | 42,764         | 513,168 | 513,168   |        | 22 Wells 1795kW(M)<br>128,292Q 3=42,764Q |





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