Water Supply Authority

Tariff Determination Guidelines

2005 – 2007 Tariff Review

Edition 6

Nov 2004

Prepared by the Water Supply Authority with assistance from Interconsult International AS (Norway) financed by the Norwegian Agency for Development Co-operation (NORAD)

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Foreword

From the Minister of the Ministry of Communications Transport Posts and Construction.

The determination of tariffs is central to the long term sustainability of the NPSEs. Until now tariffs have been determined on the basis of short term considerations that fail to recognise the long term implications.

Simply increasing tariffs to cover previous years losses is not a sustainable policy nor is it fair to the customers. These guidelines establish a more rigorous approach to tariff determinations that not only ensures longer term cost recovery and short term cash flow obligations but also capture reasonable efficiency improvement expectations.

The Tariff Policy, now approved by government, sets out the framework for tariff determinations. These guidelines follow on from this Tariff Policy incorporating the information that WASA expects from the new regulatory accounting system and the regulatory planning and reporting processes.

Although, the actual determination process will be undertaken by WASA these guidelines are issued for the purposes of public accountability and for information to the managers of the NPSEs.

1 Introduction

1.1 Background

These Tariff Determination Guidelines, prepared by WASA with assistance from Interconsult International AS (Norway), financed by the Norwegian Agency for Development Co-operation (NORAD,follow on from the *Water Tariff Policy* of the Lao PDR approved by the Prime Minister under Decree No 57 dated 7 May 2004. ~~prepared by WASA with assistance from Interconsult International AS (Norway), financed by the Norwegian Agency for Development Co-operation (NORAD).~~

The first tariff determination shall take place during 2004 for the period 2005 to 2007 inclusive with subsequent tariff reviews taking place at periodic intervals ~~as determined by WASA~~, generally every three to five years. In exceptional circumstances that greatly affect the financial base of an individual NPSE ~~or group of NPSEs~~ intermediate tariff reviews may be undertaken.

1.2 Foundation

The foundation for the tariff determination process is the *Water Tariff Policy*. This policy sets out the basic principles including: consumer interest and affordability, *s*upplier costs of service provision, the environment and national economic policy.

The *Water Tariff Policy* states:

'The overall objective of this Tariff Policy is to provide the most appropriate balance that best protects the interests of the principal stakeholders in the water supply ~~and wastewater~~ sector, namely:

***'Customers**: to provide the best value level of service that can be afforded by promoting maximum efficiency*

***'Operators**: To ensure that the financial integrity of the operating utility is maintained*

***'The environment**: To ensure that water resources are exploited at sustainable levels by promoting efficiency in the use of water*

***'National and local treasuries**: To reduce or remove the economic and financial burden of subsidies*

***'Society**: To promote social fairness*

***'International development agencies**: To promote economic development and poverty alleviation in a sustainable and affordable manner.'*

This overall objective shall be the principal focus of the tariff determination process.

1.3 Concepts

The W*ater Tariff Policy* concepts are summarised in Table 1.1 below.

Table 1.1 – Tariff determination concepts

No	Policy statements	Description	Remarks
1	Section 1, Objectives	Tariffs set to best meet the needs of all the stakeholders	WASA to take a flexible approach to determine the best balance between stakeholder needs.
2	1 – 5, 7 - 10	Tariffs to provide for social fairness including cross-subsidies between customer groups and services	Notably the concepts of uniform tariffs throughout an NPSE and the tariffs for non-domestic connections.
3	6	Tariffs to be efficient	Examine the concept of phasing out rising block structures.
4	11 – 12	Tariffs not to be used as a mechanism to reduce consumption and leakage control to be based upon economic levels of leakage	Leakage reduction benefits measured as increased sales and/or reduced marginal costs of supply (energy and chemicals)
5	14	Tariffs shall adopt the Polluter Pays principle where applicable	Not very applicable in the water sector but will apply if extended to wastewater
6	15	Tariff determination shall be based upon a long-term analysis	Suggested 10 year analysis to be revisited every three years. For the 2005-7 tariff review a simple approach shall be adopted to reflect simplicity leading towards full cost recovery. Subsequent tariff reviews shall adopt a more long term approach.
7	16 – 17	Tariffs shall be based upon improved efficiency and comparative competition	WASA to review performance expectations as reported by the NPSEs and adjust to reflect the performance of the better NPSEs In the first instance comparative competition could be used to determine basic unit cost elements.
8	18 – 19	Longer-term investment plans to include capital maintenance	Capital maintenance based upon existing asset register and current useful lives of assets.
9	20	Tariffs to be based upon current cost depreciation	Automatically included in the discounted cash flow analysis for a long-run model. In the 2005-7 review current cost depreciation examined.
10	22	Tariffs shall be determined on the basis of local currency costs with foreign exchange risk borne by the government	Applicable to loans
11	23 25 – 27	All capital shall be expected to generate a return, including grant financed equity investment	WASA to determine the most appropriate return on capital. For the 2005-7 tariff review returns on capital should reflect cash flow demands from lending institutions.
12	24	Short term grant investment shall be converted to a longer-term tariff benefit	To be included in the long run discounted cash flow calculation. Not considered in detail for the 2005-7 tariff review.

No	Policy statements	Description	Remarks
13	29	Tariffs shall not result in household expenditure on water to exceed 3-5% of total household income.	Shall not exceed 3% on average and not more than 5% for the poorest 10%. Limited data not available for the 2005-7 tariff review.
14	32	Tariffs shall not be set to cover an unreasonable level of non-payment by some customers	Accounts receivable expected to be reduced through improved revenue collection performance and writing off of bad and doubtful debts.
15	33	Tariffs shall be set to ensure positive cash flow	Examined within tariff analysis

2 Unit cost approach

2.1 General

For the 2005 – 2007 tariff review there is insufficient data for WASA to undertake a detailed tariff analysis based upon long term discounted cash flow analysis. The data required includes sales projections, capital and recurrent cost profiles, etc. Such data is being collected as part of the regulatory reporting process but totality, reliability and accuracy are likely to be questionable.

An alternative approach based upon unit cost analysis is therefore proposed. Essentially, this approach negates the need for detailed sales and costs profiles but rather analyses the actual costs per unit of water sold. In determining future unit costs assumptions are made concerning expected efficiency improvement expectations based upon comparative analysis and professional judgement.

It is recognised that this approach is not accurate but it is the opinion of WASA that detailed accuracy is not an issue whilst the NPSEs are operating at less than full cost recovery (especially with respect to depreciation). Any inaccuracies will result in variability in the gap between existing tariffs and the required full cost recovery tariff. Accuracy only becomes a major concern once full cost recovery is achieved and WASA's role is to then protect the customer against excessive profiteering.

The unit cost approach has other advantages, the most notable of which are that it lends itself to comparative competition and it is easily monitored.

2.2 Unit costs

The unit costs of water supply can be broken down into three elements:

- Basic operating costs (excluding depreciation and return on capital)
- Depreciation
- Return on capital (profit and interest)

The basic operating costs can be subdivided into energy and non-energy costs recognising that unit energy cost is unique to each NPSE and cannot be compared on a like for like basis.

The 2003 Annual Water Sector Performance Report analysed these costs and compared them. The tariff determination process shall take this examination further to estimate realistic unit cost allowances for each NPSE recognising the potential for efficiency improvements, depreciation and capital maintenance demands, and the individual characteristics of each NPSE.

The actual unit costs shall be monitored and compared with the allowances determined in the tariff review. In subsequent reviews the unit costs shall be recalculated based upon actual costs in the preceding review period.

2.3 Demand and sales

Although a more rigorous tariff analysis would analyse, in detail, projected demands and sales it is felt that a less rigorous approach is justified in this instance because:

- It is expected that sales will increase over time allowing for several unit costs to fall, e.g. non-energy costs. However, until such time that full cost recovery is reached (for most NPSEs this in not expected in the 2005 -2007 review period) the gains realised from this shall serve to promote the move towards full cost recovery.
- The increase in sales of the review period is not expected to be so large as to warrant a detailed demand analysis. However, a small reduction in the unit costs on non-energy costs could be provided for.

If, however, in the opinion of WASA the increase in sales will be sufficiently large as to warrant special consideration WASA shall examine the implications in more detail.

2.4 Operating costs

2.4.1 Energy and chemicals

The unit cost of energy and chemicals (relative to water production) shall be considered to be static in real terms unless there is evidence to suggest otherwise. It is assumed that these costs are directly proportional to water production.

However, expectations of improved leakage control (reducing production but not sales) will reduce the unit costs (relative to sales). WASA shall undertake a simple assessment of leakage reduction expectations for incorporation in the unit cost analysis

2.4.2 Non-energy costs

Other costs, e.g. labour etc. are expected fall over time for two principal reasons:

- Improved efficiency, and
- Increased sales over which these costs are spread.

WASA shall take a view as to the potential for these costs to be reduced employing comparisons with the more efficient NPSEs.

2.5 Capital costs

Unit capital costs are reflected in the tariff as depreciation. The regulatory accounting guidelines have established a methodology for the determination of depreciation on a current cost basis. Although technically incorrect, it is assumed for the tariff determination process that the unit depreciation charge is constant over the review period (in reality it is expected to fall as sales increase and greater use of the asset is made).

Full cost recovery of this item is not necessarily expected in the review period. Depreciation is, in effect the cost element that is expected to rise over time to attain full cost recovery.

2.6 Capital structure and the cost of capital

In accordance with conventional economic theory capital structure should have no bearing on the performance of a business. This only applies when full cost recovery is attainable. Without full cost recovery including depreciation the minimum requirements for return on capital should equate to debt service; return on debt (interest) and return on equity (repayment of principal). For simplicity, the unit cost of return on capital shall be the total requirements divided by sales at the start of the review period.

2.7 Taxation

Turnover tax (5%) is to be added to the determined tariffs. This tax is only to be considered when determining affordability constraints.

Taxation on profits is to be estimated by WASA and added as a cost to the unit costs. In most cases the NPSEs are unlikely to generate taxable profits and tax is therefore not considered to be a major issue.

2.8 Inflation expectations

The basic tariff determination calculation shall be ‘real’, i.e. ignoring inflation on the assumption that costs and tariffs shall rise with inflation.

2.9 Revenue collection efficiency

The tariffs shall not be determined on the basis of poor revenue collection. It is expected that the NPSEs shall undertake significant improvements in their revenue collection performance although a small allowance for an acceptable level of non-payment shall be provided for in the analysis. The analysis shall not consider non-payment by government agencies as acceptable and will therefore not be considered in the determination process.

2.10 Household income and affordability constraints

There is limited data available on household income but where data exists the following tariff ceilings shall apply:

- Tariffs shall not result in average household water bills exceeding 3% of the average total household income
- Tariffs shall not result in household water bills for the poorest 10% of the population exceeding 5% of the total household income for the poorest 10%.

It is assumed that household income will grow relative to real GDP growth.

Where no reasonable data exists affordability constraints shall be estimated by using data of comparable provinces.

2.11 Customer categories

For the 2005 – 2007 tariff review WASA shall employ the customer categorisation currently in use by each of the provinces although adjustments shall be made in accordance with the approach set out in the Tariff Policy.

WASA shall assume the current ratios of tariffs between customer categories as being maintained in the tariff analysis unless the NPSEs request otherwise.

Where appropriate, WASA shall suggest alternative ratios and their effects on tariffs.

3 Determination method

3.1 Connection charges

In accordance with the Tariff Policy it is the intention to cross subsidise the connection charges by increasing the unit volumetric tariff. The amount of cross subsidy shall be determined on a case by case basis. The connection charge shall be the total average cost of a connection less the amount of cross subsidy per connection. The amount of cross subsidy per connection shall be multiplied by the estimated number of new connections (from the reporting requirements demand profile) and added to the overall cost profile for the determination of volumetric tariffs. Where data related to new connections is not available WASA shall estimate the number of new connections that can be reasonably expected from the NPSE.

3.2 Determination of long-run average tariff

The determination of the long-run average tariff cannot be determined for the 2005 – 2007 tariff review. However, a first estimate can be determined by employing a simple total unit cost analysis including full current cost depreciation and a modest return on capital (refer the analyses undertaken in the 2003 Annual Water Sector Performance Report).

Where tariffs exceed the long-run average tariff they shall be reduced not just to the cost recovery tariff but to a level that also reflects the potential for efficiency gains.

3.3 Determination of annual tariffs

The annual tariffs shall be determined on the basis of the cost profiles described in Section 2. As a minimum the unit cost tariff shall cover operating cash flow requirements including debt service.

If full cost recovery is not attained the tariff profiles shall reflect a movement towards full cost recovery by a gradual increase in the real depreciation provisions necessary.

3.4 Determination of customer group tariff

The calculation process for the determination of the different tariffs for each customer group is to derive the tariffs for different customer groups resulting in a weighted average tariff to that determined in by the unit cost analysis (refer Example 3.1).

Example 3.1 – Factoring of sales to suit different consumer groups

In year n sales comprise 100 000 m^3 of which 80 000 m^3 are domestic, 15 000 m^3 are commercial and 5 000 m^3 are institutional and the ratios of commercial and institutional tariffs to the domestic tariff are 3.0 and 2.0. If the average tariff is 1 500 kip/m^3 the tariffs for domestic (T_d), commercial (T_c) and institutional (T_i) are determined by first determining the domestic tariff.

80 000 T_d + 15 000 T_d x 3 + 5 000 T_d x 2 = 100 000 x 1 500

135 000 T_d = 150 000 000

T_d = 1111 kip / m^3

Therefore: **T_c = 3333 kip / m^3**, and **T_i = 2222 kip / m^3**

If it is required to adjust factors over time, e.g. to phase out differences in tariff rates, the model shall allow for different ratios for different years to be applied.

If there is insufficient data to determine the appropriate ratio WASA shall estimate realistic ratios based upon the number of connections for each group.

3.5 Fixed and minimum charges

The Tariff policy does not support the policy of charging a fixed amount per month irrespective of the volume of consumption. In many cased this applies to a set charge for the first 5 or 10 m^3 of consumption whether or not is has been used.

For the 2005 – 2007 tariff review we believe that the tariff determinations should be sufficiently robust for this practice to be abolished by the end of 2005, at least for the domestic customers.

3.6 Rising block structures

The tariff policy does not support the rising block tariff structures. However, it is accepted that such structures are widely employed in the Lao PDR. Where the differences between the blocks are small it is considered appropriate for them to be abolished. Where the differences are large, they will be reduced with a view to abolishing their use in the medium to longer term.

3.7 Outputs

The principal outputs from the tariff model (before adjustments) are:

1. Full cost recovery tariff for each PNP
2. Annual full cost recovery tariffs
3. Adjusted tariffs allowing for progress towards full cost recovery

4. Average tariffs and tariffs for each customer group for the years 2005 to 2007 in real terms based upon 2004 prices

These outputs shall be analysed for cash flow, price shocks, and affordability. Where appropriate adjustments shall be made to the outputs to alleviate any problems identified.

4 Analysis of results and adjustments

4.1 Cash flow

It is unlikely that the NPSEs will have access to borrowing to offset any short term cash flow deficits. Consequently, it is essential that the NPSEs shall operate with positive accumulated cash flows. If the model suggests that the future accumulated cash flow is negative at any time then tariff adjustments may be necessary. However, tariff adjustments to accommodate poor revenue collection performance are not supported.

In order to analyse the cash flow it is necessary to convert the model from ‘real’ to ‘nominal’ with reasonable assessments of inflation expectations built into the calculation.

It is not necessary to analyse cash flow beyond the tariff review period, i.e. three years, although should the results indicate serious problems that may extend beyond this period then a more detailed and longer-term analysis may be required.

4.2 Price shocks

It is apparent that in many cases the current tariffs are below full cost recovery levels. The methodology set out in these guidelines will still return tariffs lower than full cost recovery but may differ considerably from current tariff levels, either much higher or much lower. It is desirable that significant increases in tariffs are to be avoided and, where appropriate, adjustments may be required, e.g. to lower the starting tariff but to accelerate the increases thereafter.

Conversely, the model may return a tariff that is much lower than the existing tariff. If, however, subsequent increases quickly raise the tariff beyond the existing level then it may be more appropriate to start at the existing level and reduce the annual increases.

WASA shall apply regulatory judgement and discretion in applying any adjustments necessary to alleviate price shocks.

4.3 Affordability

Section 2.10 states the tariff ceilings based upon affordability. If the calculated tariffs exceed these affordability constraints adjustments may be necessary. It is anticipated that real household income growth shall overtake any affordability constraints and therefore any downwards adjustments of tariffs will most likely be temporary.

4.4 Tariff smoothing

The tariff methodology presented in these guidelines may return tariffs that fluctuate greatly over time. It is preferable that fluctuations be smoothed to produce a uniformly rising (or falling) tariff from year to year.

5 Tariff recommendations

5.1 Process

The WASA tariff determination process shall be as follows:

Activity	Date	Responsible
Preparation of paper for NPSEs explaining basis on which tariffs have been set	12 Novr 2004	WASA
Meeting with Directors of NPSEs to explain paper and to give them draft determinations	17 Nov 2004	WASA
NPSEs to consider tariff proposals and to submit comments to WASA	26 Nov 2004	NPSEs
Consideration by WASA of NPSEs representations on proposed tariffs	3 Dec 2004	WASA
Issuing of final draft determinations to NPSEs	13 Dec 2004	WASA
Provincial Governors consult on draft determinations	Dec 2004 and Jan 2005	Governors
Approval of tariffs by approval authorities (Provincial Governors)	1 Feb 2005	Governors
Adoption of new tariffs	1 Mar 2005	NPSEs

5.2 Interim adjustments

The tariffs shall be subject to annual adjustments for inflation for the three year review period. However, there may be a material change in circumstances either for a particular NPSE, or for all of them, that was not anticipated in the original determinations. In such cases WASA may be required to initiate an interim tariff review, the details and process to be decided if and when such a situation arises.

5.3 Review periods

Save for any interim adjustments as described above tariff reviews shall be conducted every three years.