

MINISTRY OF LOCAL GOVERNMENT, EASTERN PROVINCE

Japan International Cooperation Agency (JICA)

Water supply sub-projects in the Eastern province

INVITATION FOR EXPRESSION OF INTEREST (EOI) FOR ELECTRIC RESISTIVITY SURVEY AND AQUIFER PUMPING TEST ALONG WITH THE PROPOSALS

The water supply sub projects programme funded by Japan International Co-operation Agency will be initiated & implemented within short period in Ampara, Batticaloa and Trincomalee. For this purpose vertical electric resistibility survey and Aquifer Pumping Test in the existing dug well(s) shall be carried out to assess the hydro geological condition of those aquifers as most of sub-project area may be contaminated by saline water intrusion while pumping out non-saline water in the end of dry season when non-saline water table goes in deep.

SPECIFICATION FOR ELECTRIC RESISTIBILITY SURVEY AND AQUIFER PUMPING TEST

1) Eastern Provincial Council is planning to implement rural water supply sub-projects in the areas as shown below and it is concerned that Whereas Vertical Electric Resistibility survey (hereafter called VES) and aquifer pumping test (hereafter called APT) in the existing dug well(s) shall be carried out to assess the hydro geological condition of those aquifers .

- 2) Batticaloa - 10 sub projects, if necessities arise it will be increased up to 15 for experiment to find out the exact 10 sub projects
- Ampara - 10 sub projects, if necessities arise it will be increased up to 15 for experiment to find out the exact 10 sub projects
- Trincomalee- 11 sub projects, if necessities arise it will be increased up to 15 for experiment to find out the exact 11 sub projects

- a) Job experience: Must have more than 5 year experience of similar type of work. Past experiences with particular field shall be attached.
- b) Qualified engineer: should have a hydro geologist/geologist and mechanical/civil Engineers. Certificate of qualification shall be attached.
- c) Equipment: Should be electric resistibility sounding machine, aquifer pumping equipment.
- d) Conductivity meter and Ph meter to carry out works specified in the attached technical specification.
- e) Financial capacity: Should submit auditor's report to proof sound financial capacity.

The project expects to conduct a short term evaluation studies on the activities implemented under the above components. Accordingly the Commissioner of Local government invites EOI from the individual consultants.

Those interested and have proven track records in specialized areas should send the above mentioned documents and description of similar assignments experience in similar conditions indicating the name of client, nature of the assignment, date and contract value.

The interested persons are requested to submit their contract value of each project district wise along with the detailed proposals in accordance with the EOI.

The panel of the selection reserves the right to accept or reject or postpone the EOI. No claim will be entertained in any occasion in this regard.

EOI must be sent to the address given below to reach on or before 23.07.2010 indicating“ Expression of Interest for consultancy” on the top left corner of the envelope.

Commissioner of Local Government.
Eastern Province,
St.Anthony’s Road,
Trincomalee

Late receipts of the EOI will be rejected without any intimation.

For more clarification if any, please contact phone number - 026 2220075 – Commissioner of Local Government, Eastern Province

V.P.Balasingham,
Chief Secretary,
Eastern Provincial Council.

Tender specification for electric resistivity survey and aquifer pumping test

EPC is planning to implement rural water supply in 31 sub-project areas listed in the table attached. It is concerned that most of sub-project area may be contaminated by saline water intrusion while pumping out non-saline water in the end of dry season when non-saline water table goes in deep.

Whereas vertical electric resistivity survey (hereafter called VES) and aquifer pumping test (hereafter called APT) in the existing dug well(s) shall be carried out to assess the hydro geological condition of those aquifers .

1) VES

Exploration method : Schulumberger or Wenner array .

Schulumberger array : $AB/2=2,4,6,8,10,15,20,25,30,40,50$ and $60m$, $MN/2$ shall be selected in accordance with $AB/2$.

Report of analysis : Apparent resistivity VS electrode distance ($AB/2$)

Field obtained results

Induced one dimensional analyzed results in terms of Ohm-meter and Dept .

2) APT

APT shall be carried out in 3 (three) method, that is Preliminary pumping, Step draw down pumping, Continuous pumping and Recovery test.

2-1) Preliminary pumping test : It shall be carried out to know approximate maximum yield volume of water from well and to decide each volume of step drawdown test .

This test may takes for 4-6 hours depending on yield volume of well .

Report : Time elapse VS drawdown curves .

2-2) Step draw down test : By dividing max. volume of water into 5 nearly equal rate and each rate of pumping shall be conducted for 2 hours . This pumping shall be started from the smallest volume to biggest volume in order . Ph and conductivity shall be measured and recorded at end of each steps .

Report : Time elapse VS drawdown curves for each step in one continuous sheet .

5 steps of each volume VS Drawdown at particular volume and Ph and Conductivity .

To decide max. yield volume of the well .

2-3) Continuous pumping test : To keep pumping for 72 hours continuously in the rate of 65% of max. yield volume of the well . To record drawdown at 1,2,3,4,5,10,20,30,40, 50,100,150,200, 400,600,800,1000 4300 minutes elapsed .

Report : Accumulated time elapse VS Drawdown curve

Ph and conductivity results at each recording of drawdown .

2-4) Recovery test : To monitor water recovery for 24 hours or until to recover to the static water table , whichever reach to early .

Report : Time elapse VS water recovery curve .

3) Water quality test

Water quality test shall be conducted for every sample taken at the end of the continuous pumping test (at the time of test being elapsed for 72 hours after started) in accordance with Standard of Sri Lanka for potable water quality test . Sampling method ,test procedures and test laboratory(s) shall be subject to the approval of client .

4) Nos. of VES ,APT and water quality test required .

Trincomalee : VES , APT and water quality test at each sub-project (Total 11 sub-projects)

Batticaloa : As above (Total 10 sub-projects)

Ampara : As above (Total10 sub-projects)

TOTAL 31 sub-projects

Prepared by JICA SAPI team on 16, June,2010 .

Qualification for Tender to Carry out Electric Resistivity Sounding, Aquifer Pumping Test and Water Quality Test at Eastern Province.

- 1) Job Experience : Tenderer must have more than 5 years experiences of similar type of work. Past experiences with particular field shall be attached.
- 2) Qualified Engineer : Tenderer shall have a hydrogeologist/geologist and mechanical/civil Engineers. Certificate of qualification shall be attached.
- 3) Equipment : Tenderer shall have a electric resistivity sounding machine , aquifer pumping equipment , conductivity meter and Ph meter to carry out works specified in the attached technical specification.
- 4) Financial capacity : Tenderer shall submit auditor's report to proof sound financial Capacity.

test to know the approx. maximum volume of water to yield from well for the following step drawdown test . Secondly , 5 steps of drawdown test shall be conducted to detect the max. volume of the well . Thirdly , **continuous** pumping test at the rate of optimum volume which is 65% of max. volume of yield obtained by step drawn down test shall be conducted for 72 hours . The volume of water , water table in the dug well , Ph and conductivity of water and water table in the observation well(s) if any available near the pump test well shall be monitored while test . Water sample shall be taken at the end of test to conduct water quality test . It is very important to conduct this test at the end of dry season . The test conducted in rainy season does not provide the proper results to evaluate the designing figures of aquifer .

The aquifer evaluation composed of electric resistivity sounding and pumping test may take a week time at one sub-project . If all of sub-projects need to conduct the test , it 'll need for 31 weeks for site work and 2 (two) weeks to appraise the results .

According to the site visit at Ralkuli and Muthur West in Muthur (P.S) and Pulmodai 1,2,3 &4 in **Kuchichaveli** , all of them (3 sites) need the aquifer appraisal for future water supply design .