APPENDIX 6 TO WATER MANAGEMENT CONTRACT [004]

**Appendix 6**

**Performance Standards Appendix**

**Performance Standards Appendix**

**Appendix #6 to the General Conditions**

**for a**

**Management Contract**

**for the Provision of**

Water and Wastewater Services

# GENERAL

## Documents Comprising the Performance Standards Appendix

#### The Performance Standards Appendix consists of,

##### the Performance Standards General Provisions; and

##### the Performance Standards Appendix Chart.

#### The Performance Standards Appendix Chart sets out the performance standards with reference to the Services Appendix Sections.

## Supplementing the General Conditions and Services Appendix

The Performance Standards Appendix supplements the General Conditions and the Services Appendix for the purpose of providing greater specificity of the performance standards which the Operator is required to meet.

# THE PERFORMANCE STANDARDS CHART

## Services Appendix Description

The descriptions contained in the column of the Performance Standards Appendix Chart entitled, “Description of Service” are for the convenience of the Operator and do not supersede the actual wording of the Services Appendix.

## Quality Operating Standards

#### Where the term “Quality Operating Standard” is used in the Performance Standards Chart it means a standard of performance which,

##### is competent, efficient, economical and in accordance with internationally accepted techniques used in the water and wastewater industry;

##### is in accordance with professional engineering, accounting and consulting standards, as applicable, recognized by international professional bodies;

##### is in accordance with sound management, commercial, technical and engineering practices;

##### employs appropriate technology and safe and effective equipment, machinery and methods;

##### protects the interests of the Authorities;

##### is in accordance with the Applicable Law;

##### is at least equal to the standard of performance in place in the Base Year; and

##### is in accordance with the technical specifications and design standards of the YWSC as provided to the Operator.

#### The Operator shall, at all times, carry out the Services in accordance with the Performance Standards as specified and, where a specific standard of quality of performance has not been specified, the Operator shall perform the Services to the standard of “Quality Operating Standards” set out in Section 2.2(1) of the Performance Standards Appendix.

#### Where the Operator’s performance is based on improvement from the Base Year data, the Base Year data must be certified by an independent inspection agency.

| SERVICES APPENDIX SECTION # | DESCRIPTION OF SERVICE | PERFORMANCE STANDARD | DELIVERABLE | YEARLY TARGET | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| FOUR YEAR TARGET | YEAR 1 | | YEAR 2 | | YEAR 3 | YEAR 4 | |
| SA 2.2 | Base Year Data Report | | | | | | | | | | |
| SA 2.2 | • develop Base Year Data Report | • no later than 60 days after the Starting Date | Report | 100% | 100% | |  | |  |  | |
| SA 2.3 | Water and Wastewater Operations and Maintenance Procurement | | | | | | | | | | |
| SA 2.3(2) | • develop Procurement Guidelines | • no later than 30 days after Starting Date | Guidelines | 100% | 100% | |  | |  |  | |
| SA 2.3(4) | • implement Procurement Guidelines | • Approved Guidelines | Procurement | Ongoing | Ongoing | | Ongoing | | Ongoing | Ongoing | |
| SA 3.1.1 | Water Quality Sampling and Testing | | | | | | | | | | |
| SA 3.1.1(1) | • prepare and submit the Water Quality Monitoring Program to the YWSC | • no later than 30 days after Starting Date | Draft Program | 100% | 100% | |  | |  |  |
| SA 3.1.1(3) | • implement Water Quality Monitoring Program | • no later than 30 days after program is approved | Program | Ongoing | Ongoing | | Ongoing | | Ongoing | Ongoing |
| SA 3.1.2 | Safety Conditions of the Facilities | | | | | | | | | | |
| SA 3.1.2(1) | • conduct physical inspection of the Facilities | • no later than 60 days after Starting Date | Physical Inspection Report | 100% | 100% | |  | |  |  | |
| SA 3.1.2(2) | • prepare Safety Deficiencies Correction Plan | • no later than 90 days after the Starting Date | Safety Deficiencies Correction Plan | 100% | 100% | |  | |  |  | |
| SA 3.1.2(3) | • implement Safety Deficiencies Correction Plan | • immediately on completion of the plan | Implementation of Plan | 100% | 40% | | 75% cumulative | | 100% cumulative |  | |
| SA 3.1.3 | Occupational Health and Safety | | | | | | | | | | |
| SA 3.1.3(1) | • develop Safety Program | • no later than 60 days after the Starting Date | Safety Program | 100% | 100% | |  | |  |  | |
| SA 3.1.3(2) | • occupational health and safety training | • ongoing | Training | 100% | 25% | | 50% cumulative | | 75% cumulative | 100% cumulative | |
| SA 3.1.4 | Inventory Management | | | | | | | | | | |
| SA 3.1.4(1) and (3) | • develop Inventory Management Program | • no later than 6 months after the Starting Date | Inventory Management Program |  |  | |  | |  |  | |
| SA 3.1.4(2) | • implement Inventory Management Program | • Approved Program | Implementation | 100% | 25% | | 60% | | 100% |  | |
| SA 3.1.5 | Emergency Response Plans | | | | | | | | | | |
| SA 3.1.5 | • familiarize with existing Emergency Response Plans | • ongoing  • Quality Operating Standard | N/A | Ongoing | Ongoing | | Ongoing | | Ongoing | Ongoing | |
| SA 3.1.6 | Standard Operating Procedures | | | | | | | | | | |
| SA 3.1.6(1) | • prepare and submit for approval Standard Operating Procedures | • no later than 1 year after Starting Date  • Quality Operating Standard | Standard Operating Procedures | 100% | 100% | |  | |  |  | |
| SA 3.1.6(2) | • provide training on the Standard Operating Procedures and implement | • Quality Operating Standard | Training Program | 100% | 100% | |  | |  |  | |
| SA 3.1.6(3) | • update Standard Operating Procedures | • Annually  • Quality Operating Standards | Annual Updated Standard Operating Procedures | Ongoing | Ongoing | | Ongoing | | Ongoing | Oongoing | |
| SA 3.1.7 | Operations and Maintenance Manuals | | | | | | | | | | |
| SA 3.1.7(1) | • prepare and submit for approval Operations and Maintenance Manuals | • no later than 1 year after Starting Date  • Quality Operating Standards | Operations and Maintenance Manuals | 100% | | 100% |  |  | |  | |
| SA 3.1.7(3) | • provide training on the Operations and Maintenance Manuals | • Quality Operating Standard | Training Program | 100% of Operations Staff/ Management Staff | |  | 100% of Operations Staff/ Management Staff | All new Operations Staff/ Management Staff | | All new Operations Staff/ Management Staff | |
| SA 3.1.7(4) | • update Operations and Maintenance Manuals | • Annually  • Quality Operating Standards | Updated Operations and Maintenance Manuals | Ongoing | | Ongoing | Ongoing | Ongoing | | Ongoing | |
| SA 3.1.8 | Energy Management Plan | | | | | | | | | | |
| SA 3.1.8(1) | • develop and implement an Energy Management Plan | • no later than 150 days after Starting Date | Energy Management Plan | 25% reduction in kilowatt hours per million cubic meters from baseline | 5% reduction from baseline | | 15% reduction from baseline | | 20% reduction from baseline | 25% reduction from baseline | |
| SA 3.1.9 | Illegal Connections | | | | | | | | | | |
| SA 3.1.9(1) | • develop and submit Illegal Connections Program | • no later than 90 days after Starting Date | Illegal Connections Program | 100% | 100% | |  | |  |  | |
| SA 3.1.9(2) | • implement program to convert Illegal Connections to legal connections | • Approved Program | Implementation | 100% of illegal connections corrected | 50% | | 100% cumulative | |  |  | |
| SA 3.1.10 | Staff Training and Development | | | | | | | | | | |
| SA 3.1.10(1) | • prepare and submit Training and Development Program | • no later than 6 months after Starting Date | Training and Development Program | 100% | 100% | |  | |  |  | |
| SA 3.1.10(2) | • implement Training and Development Program | • Approved Program | Training | 100% | 15% | | 35% | | 35% | 15% | |
| SA 3.1.11 | Vehicles and Equipment | | | | | | | | | | |
| SA 3.1.11(1) | • repair and maintain all vehicles and equipment | • ongoing  • in accordance with the Preventive Maintenance Program | Implementation | Ongoing | Ongoing | | Ongoing | | Ongoing | Ongoing | |
| 3.1.12 | System Mapping | | | | | | | | | | |
| SA 3.1.12(1) | • system mapping | • Percent of water and wastewater transmission and water distribution storage mapped | • Computerized map of water transmission, water distribution storage and wastewater | 100% | 100% | |  | |  |  | |
| SA 3.1.12(2) | • plan for mapping water distribution and wastewater collection | • Prior to the expiration of the first Contract Year | • Plan |  |  | |  | |  |  | |
| SA 3.2.1 | Management of Water Sources Facilities | | | | | | | | | | |
| SA 3.2.1(1) | • operate and maintain water sources Facilities | • Quality Operating Standards  • YWSC Annual Instruction  • Approved Standard Operating Procedures and Operations and Maintenance Manuals | Operation and Maintenance | Ongoing | Ongoing | | Ongoing | | Ongoing | Ongoing | |
| SA 3.2.1(2) | • manage the extraction of water from water sources | • Quality Operating Standards  • YWSC Annual Instructions  • Approved Standard Operating Procedures and Operations and Maintenance Manuals | Operation | Ongoing | Ongoing | | Ongoing | | Ongoing | Ongoing | |
| SA 3.2.1(3)(a) | • carry out inspection of water sources Facilities | • no later than 90 days after Starting Date | Inspection | 100% | 100% | |  | |  |  | |
| SA 3.2.1(3)(b) | • submit Water Sources Facilities Inspection Report | • no later than 30 days after Inspection | Water Source Facilities Inspection Report | 100% | 100% | |  | |  |  | |
| SA 3.2.1(3)(c) | • correct deficiencies identified in Water Sources Facilities Inspection Report | • Approved Water Source Facilities Inspection Report | Implementation | 100% | 20% | | 20% | | 60% |  | |
| SA 3.2.1(3)(d) | • establish and implement water sources protection and monitoring | • To the satisfaction of the YWSC | Implementation | 100% | Ongoing | | Ongoing | | Ongoing | Ongoing | |
| SA 3.2.2 | Pumping of Raw Water and Supply and Distribution to Customers | | | | | | | | | | |
| SA 3.2.2(1)(a) to (u) | • various water operations responsibilities | • Quality Operating Standard  • Armenian Standards for Drinking Water Quality  • Approved Standard Operating Procedures and Operations and Maintenance Manuals | Operation | Ongoing | Ongoing | | Ongoing | | Ongoing | Ongoing | |
| SA 3.3.1 | Collection, Treatment and Disposal of Wastewater | | | | | | | | | | |
| SA 3.3.1(1)(a) | • install new service connections | • YWSC Policy  • Standard Operating Procedures (Approved)  • Quality Operating Standards | Implementation | Ongoing | Ongoing | | Ongoing | | Ongoing | Ongoing | |
| SA 3.3.1(1)(c) | • regularly inspect surcharged sewers | • Standard Operating Procedures (Approved)  • Quality Operating Standards | Operations | Ongoing | Ongoing | | Ongoing | | Ongoing | Ongoing | |
| SA 3.3.1(1)(d) | • monitor flow blockages | • Approved Standard Operating Procedures  • Quality Operating Standards | Operations | Ongoing | Ongoing | | Ongoing | | Ongoing | Ongoing | |
| SA 3.3.1(1)(e) | • monitor industrial discharges | • Approved Standard Operating Procedures  • YWSC Policy  • Armenian Standards for Effluent | Operations | Ongoing | Ongoing | | Ongoing | | Ongoing | Ongoing | |
| SA 3.3.1(1)(b) and (f) (g) (h) | • various wastewater operations | • Quality Operating Standard  • Approved Standard Operating Procedures  • Armenian Standards for Effluent | Operations | Ongoing | Ongoing | | Ongoing | | Ongoing | Ongoing | |
| SA 4.1 | Corrective Maintenance | | | | | | | | | | |
| SA 4.1(1) | • carry out Corrective Maintenance | • YWSC Base Year level in accordance with Budget | Operations | Ongoing | Ongoing | | Ongoing | | Ongoing | Ongoing | |
| SA 4.2 | Preventive Maintenance | | | | | | | | | | |
| SA 4.2(1)(a) | • develop Preventive Maintenance Program | • no later than 6 months after Starting Date | Preventive Maintenance Program | 100% | 100% | |  | |  |  | |
| SA 4.2(1)(b) | • implement Preventive Maintenance Program | • Approved Preventive Maintenance Program | Implementation | 100% | 25% | | 100% cumulative | |  |  | |
| SA 5.1 | Repairs, Rehabilitation and Improvements and the Operating Investment Fund | | | | | | | | | | |
| SA 5.1(1) | • carry out repairs, rehabilitation and improvements | • in accordance with Operating Investment Fund  • Quality Operating Standards | Implementation | 100% | Ongoing | | Ongoing | | Ongoing | Ongoing | |
| SA 5.2 | Inventory/Condition of the Facilities | | | | | | | | | | |
| SA 5.2.1(1)(a) | • complete physical inspection of the Facilities | • no later than 60 days after Starting Date | N/A | 100% | 100% | |  | |  |  | |
| SA 5.2(1)(b) | • prepare Facilities Data Base | • no later than 2 years after Starting Date | Facilities | 100% | 50% | | 100% cumulative | |  |  | |
| SA 5.2.1(1)(c) | • prepare Initial Condition Survey | • no later than 90 days after Starting Date | Initial Condition Survey | 100% | 100% | |  | |  |  | |
| SA 5.2.1(2) | • develop and implement program to correct deficiencies | • Initial Condition Survey  • Operating Investment Fund | Implementation | 100% | Ongoing | | Ongoing | | Ongoing | Ongoing | |
| SA 5.2.1(3) | • update Facilities Data Base | • Annually  • Quality Operating Standards | Updated Facilities Data Base |  |  | | Ongoing | | Ongoing | Ongoing | |
| SA 5.2.2 | • prepare Final Condition Survey | • no later than 90 before the End Date | Final Condition Survey | 100% |  | |  | |  | 100% | |
| SA 5.3 | Repairs, Rehabilitation and Improvement of the Facilities Under the Annual Operating Investment Fund Plan | | | | | | | | | | |
| SA 5.3(1)(a) | • correct deficiencies identified in Initial Condition Survey | • Initial Condition Survey  • Quality Operating Standards | Implementation | 100% | Ongoing | | Ongoing | | Ongoing | Ongoing | |
| SA 5.3.1(b) | • develop program to improve measurements of water production/ identify baseline | • no later than 6 months after Starting Date | Program | 100% | 100% | |  | |  |  | |
| SA 5.3(1)(c) | • identify Base Year Accounted for Water | • Baseline Identification no later than 60 days after the Starting Date | Base Year Measurement | 100% | 100% | |  | |  |  | |
| • increase Accounted for Water | • Percentage Points from Baseline | Implementation | 25 percentage points from baseline | 5 percentage points from baseline | | 15 percentage points from baseline | | 20 percentage points from baseline | 25 percentage points from baseline | |
| SA 5.3(1)(d) | • improve Constancy of Supply | • % of total hours per months that all consumers can draw water from system in accordance with calculation for Constancy of Supply 1 | • Improved constancy of water | 75% | 20% | | 40% cumulative | | 60% cumulative | 75% cumulative | |
| SA 5.3(1)(e) | • install, repair and replace water meters | • Quality Operating Standards  • Operating Investment Fund Annual Plan | • 100% Production Metering | 100% | 100% | |  | |  |  | |
| • Retail metering implementation | 20,000 | 5,000 | | 7,500 | | 7,500 |  | |
| SA 5.3(1)(f) | • continue and enhance leak detection and repair | • Quality Operating Standards | • Program | 1500km | 500km | | 500km | | 250km | 250km | |
| SA 5.3(1)(g) | • identify/reduce frequency of breakdown repairs (water) | • Baseline identification no later than 60 days after the Starting Date | •Baseline Identification | 100% | 100% | |  | |  |  | |
| • Percentage reduction from baseline level | • Improvements/ Implementation | 80% reduction from baseline | 20% reduction from baseline | | 40% reduction from baseline | | 60% reduction from baseline | 80% reduction from baseline | |
| • identify/reduce frequency of breakdown repairs (wastewater) | • Baseline Identification no later than 60 days after the Starting Date  • Percentage reduction from baseline level | • Improvements/ Implementation | 50% reduction for baseline | 12% reduction from baseline | | 25% reduction from baseline | | 37 % reduction from baseline | 50% reduction from baseline | |
| SA 5.3(1)(h) | • identify/reduce response time for repairs | • Baseline identification no later than 60 days after the Starting Date | • Baseline Identification |  |  | |  | |  |  | |
| • Percentage reduction from baseline level  • Quality Operating Standards | • Improvements Implementation | 80% reduction from baseline | 20% reduction from baseline | | 40% reduction from baseline | | 60% reduction from baseline | 80% reduction from baseline | |
| SA 6.1 | Operator Not Responsible But Shall Cooperate (Capital Investment Program) | | | | | | | | | | |
| SA 6.1(2) and (3) | • cooperate with Capital Investment Program | • Quality Operating Standards | • Cooperation/ recommendations as appropriate | Ongoing | Ongoing | | Ongoing | | Ongoing | Ongoing | |
| SA 6.1(4) | • nominate liaison person | • no later than 30 days after Starting Date | Nomination | 100% | 100% | |  | |  |  | |
| SA 7.1 | Information System - Billing, Collection and Customer Service | | | | | | | | | | |
| SA 7.1(1)(a) | • review existing computerized data base of Customers and advise | • no later than 90 days after Starting Date | Recommendations | 100% | 100% | |  | |  |  | |
| SA 7.1(1)(b) | • implement recommendations re: the computerized data base of Customers | • Approved recommendations | Implementation | 100% | 40% | | 100% cumulative | |  |  | |
| SA 7.1(2)(a) | • develop/ review computerized system for billing | • no later than 90 days after Starting Date | Recommendations/Implementation | 100% |  | | 100% | |  |  | |
| SA 7.1(2)(b) | • develop/ review computerized system to track collection/ receivables | • no later than 90 days after Starting Date | Recommendations/Implementation | 100% |  | | 100% | |  |  | |
| SA 7.1(2)(c) | • develop/ review computerized system for tracking Customer service | • no later than 90 days after Starting Date | Recommendations/Implementation | 100% |  | | 100% | |  |  | |
| SA 7.1(4) | • develop computerized accounting system | • no later than 1 year after Starting Date | Computerized Accounting System | 100% | 100% | |  | |  |  | |
| SA 7.2 | Billing | | | | | | | | | | |
| SA 7.2(1)(a) | • read Customer meters | • Quality Operating Standards | Meter Read Register | 100% read per year | 100% read per year | | 100% read per year | | 100% read per year | 100% read per year | |
| SA 7.2(1)(b) | • register meter readings | • no later than 1 year after Starting Date | Meter Register | 100% | 100% | |  | |  |  | |
| SA 7.2(1)(c) | • monitor meter accuracy | • Quality Operating Standards | • Annual Report  • Monitoring Program | Ongoing | Ongoing | | Ongoing | | Ongoing | Ongoing | |
| SA 7.2(1)(d) | • develop/ implement monitoring plan for meters | • no later than 90 days after Starting Date  • Quality Operating Standards | Monitoring Plan | 100% | 100% | |  | |  |  | |
| SA 7.2(1)(e) | • develop and implement plan to estimate consumption | • no later than 6 months after Starting Date | Program | 100% | 100% | |  | |  |  | |
| SA 7.2(1)(f) | • provide meter reading advice re: Accounted for Water | • no later than 6 months after Starting Date | Recommendations | 100% | 100% | |  | |  |  | |
| SA 7.2(1)(g) | • convert meter reading to billing | • Quality Operating Standards | Billing Registers | Ongoing | Ongoing | | Ongoing | | Ongoing | Ongoing | |
| SA 7.2(1)(h) | • identify consumption anomalies | • Quality Operating Standards | Exception Reports | Ongoing | Ongoing | | Ongoing | | Ongoing | Ongoing | |
| SA 7.2(1)(i) | • identify meters not read | • Quality Operating Standards | Exception Report | Ongoing | Ongoing | | Ongoing | | Ongoing | Ongoing | |
| SA 7.2(1)(j) | • review existing system for payment of bills by Customers provide recommendations | • no later than 6 months after Starting Date | • Report of Recommendations | 100% | 100% | |  | |  |  | |
| • implement recommendations | • Approved Recommendations | • Implementation of Approved Recommendations | Ongoing | Ongoing | | Ongoing | | Ongoing | Ongoing | |
| SA 7.2(2)(a) | • respond to meter malfunctions | • no later than 5 days after complaint | Incident report and recommendations | Ongoing | Ongoing | | Ongoing | | Ongoing | Ongoing | |
| SA 7.2(2)(b) | • resolve Customer complaints | • no later than 30 days after complaint | Resolution report | Ongoing | Ongoing | | Ongoing | | Ongoing | Ongoing | |
| SA 7.3 | Collections | | | | | | | | | | |
| SA 7.3(1)(a) | • collect all amounts due from Customers | • Quality Operating Standards | Collections Report | Ongoing | Ongoing | | Ongoing | | Ongoing | Ongoing | |
| SA 7.3(1)(b) | • record/ identify all outstanding accounts | • no later than 45 days after each billing | Outstanding Accounts Report | Ongoing | Ongoing | | Ongoing | | Ongoing | Ongoing | |
| SA 7.3(1)(c) | • submit list of unpaid accounts | • monthly | Unpaid Account List | Ongoing | Ongoing | | Ongoing | | Ongoing | Ongoing | |
| SA 7.3(1)(d) | • develop collection procedures | • in accordance with SA 7.2(1)(j) | Collection Procedures Report | 100% | 100% | |  | |  |  | |
| SA 7.3.1(e) | • manage new and existing subscription contracts with Customers | • YWSC Procedures  • Quality Operating Standards | Operations | Ongoing | Ongoing | | Ongoing | | Ongoing | Ongoing | |
| SA 7.3(2)(a) | • improve collection of revenues from new sales | • % collected of new sales | Current Collections Report | 95% collected of new sales | 75% collected of new sales | | 85% collected of new sales | | 90% collected of new sales | 95% collected of new sales | |
| SA 7.3(2)(b) | • improve collection rate for Accounts Receivable | • Quality Operating Standards | Accounts Receivable Report | Ongoing | Ongoing | | Ongoing | | Ongoing | Ongoing | |
| SA 7.4 | Customer Service | | | | | | | | | | |
| SA 7.4(1)(a) | • carry out all Customer service related to new connections | • Quality Operating Standards  • YWSC Procedures | Operations | Ongoing | Ongoing | | Ongoing | | Ongoing | Ongoing | |
| SA 7.4(1)(b) and (c) | • receive and handle Customer complaints and requests | • Quality Operating Standards  • Approved Procedures | Operations | Ongoing | Ongoing | | Ongoing | | Ongoing | Ongoing | |
| SA 7.4(1)(d) | • analysis of advantages/ disadvantages of disconnection program | • no later than 6 months after Starting Date | Report of Recommendations | 100% | 100% | |  | |  |  | |
| SA 7.4(1)(e) | • manage Customer service offices | • Quality Operating Standards  • Approved Procedures | Operations | Ongoing | Ongoing | | Ongoing | | Ongoing | Ongoing | |
| SA 7.4(2)(a) | • develop Customer services training program | • no later than 180 days after Starting Date | Program | 100% | 100% | |  | |  |  | |
| • implement program | • Approved Program | Implementation | 100% | 100% | |  | |  |  | |
| SA 7.4(2)(b)(c) | • develop/ submit water and wastewater public information programs | • no later than 90 days after Starting Date | Program Report | 100% | 100% | |  | |  |  | |
| SA 8.1 | Bi-monthly Reports | | | | | | | | | | |
| SA 8.1(1) | • submit bi-monthly reports | • no later than 15 days after each bi-monthly period | Report | Ongoing | Ongoing | | Ongoing | | Ongoing | Ongoing | |
| SA 8.2 | Annual Report | | | | | | | | | | |
| SA 8.2 | • submit annual report | • no later than 30 days after the end of each Contract Year | Report | Ongoing | Ongoing | | Ongoing | | Ongoing | Ongoing | |

Endnotes to the Performance Standards Appendix

METHODS OF CALCULATION

1. Constancy of Supply

The Constancy of Supply will be measured as an average percentage of the time in which 100% of the customers have piped water supply available during the peak season (April through September). The Operator will install sufficient recording devices (flow and or pressure measuring devices) financed from the Operating Investment Fund and installed in locations identified by the YWSC, to record the measurement of flow in the pipeline.

Number of recorded hours of flow for April through September

Average % of continuous flow = ---------------------------------------------------------------------------- x 100

6 months x 720 hours/month