

**Evaluation of the performance against the design parameters
of the unit processes of the Kondawaduwana water
treatment plant**

By

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Requirement for Master of Science degree in Environmental
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**Research work Supervised By
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Abstract

Eastern Coastal Towns of Ampara District (ECTAD) Water Supply Project has been planned to implement in two phases. The first phase of the project, having capacity of 17,500 m³/day was commissioned in June 2001. The second phase was commissioned in June 2007 and it has a capacity of 72,000m³/day. In phase I the treatment process in the plant consists of Coagulation and Flocculation, Dissolved Air Flotation (DAF), Rapid Sand Filtration, Post Chlorination, pH Correction and Sludge Treatment. The treatment process for the phase II is the same, except for pre-chlorination and addition of powdered activated carbon (PAC) at the flash mixer. The scheme serves the Ampara Township, too.

The first recorded water quality issue of coloured water, bad smell and taste were raised by consumers in the year 2004. From 2004, sporadic complaints from consumers were received and steps were taken to flush the pipelines periodically. The regular water quality tests had not revealed the cause for the problem and a series of studies have been carried out and various reports have been submitted. However, the water quality issues still persist.

Therefore, four numbers of trials were carried out for collecting the samples to identify the reason for the colour problem with following conditions at the various location of the treatment processes such as the rapid mixing, before DAF, after DAF (floated water), filtered and treated water.

- With pre chlorination and with PAC,
- With pre chlorination and without PAC,
- With out pre chlorinator and with PAC
- With out chlorinator without PAC

Water samples were collected at various location of the treatment processes like, rapid mixing, before DAF, after DAF (floated water), filtered and treated water. The water samples were tested at NWSDB Ampara, University of Moratuwa and NWSDB central laboratory for parameters such as total iron, dissolved iron, total manganese, dissolved manganese, total organic carbon and chemical oxygen demand.

Declaration

I certify that this dissertation does not incorporate without acknowledgement any material previously submitted for Degree or Diploma in any university and to the best of my knowledge and believe it does not contain any material previously published or written or orally communicated by another person except where due reference is made in the text.

.....

Signature of the candidate

The above particulars are correct to the best of my knowledge.

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Table of Contents

Acknowledgement	IV
Abstract	V
Table of contents	IX
List of Tables	X
List of Figures	XVI
Abbreviation	XVII

Chapter One: Introduction

1.1 Background	01
1.2 Problem statement	01
1.3 Objective of research	02

Chapter Two: Literature reviews

2.1 Appraisal of Previous Studies specially Kondawaduwana	03
2.2 Appraisal of Previous Studies	03
2.2.1 Pre chlorine	03
2.2.2 Coagulation	04
2.2.3 Powered activated carbon	04
2.2.4 Dissolved air flotation	05
2.2.5 Manganese in treated water	05
2.2.8 Problem associated with algae	06
2.2.9 Toxin producing cyanobacteria	06
2.2.10 Blue green algae	07
2.2.11 Cyanobacteria toxins	07

Chapter Three: Methodology	
3.1 Initiation of the case study	13
3.2 Filed work and laboratory analysis	13
3.3 Physico chemical parameters	14
3.4 Species composition and mass of phytoplankton	14
3.5 Detection of microcystins	
3.5.1 Requirement	15
3.5.2 Microcystin immuno strip	15
3.5.4 Sample preparation	16
3.5.5 Low approaching moderate risk	17
Chapter Four: Result and discussion	
4.1 Evaluation	
4.1.1 Coagulation process	18
4.1.2 Flocculation process	18
4.1.3 Rapid sand filter	18
4.2 The raw water quality deterioration	19
4.3 The efficiency of total iron removal	21
4.4 The efficiency of total manganese removal	22
4.5 Reduce the amount of algae enter for treatment	25
4.6 Effective use of PAC	
4.6.1 Calculation of cost saving	27
4.7 Optimization of PAC and PACL	
4.7.1 Procedure	30
4.7.2 The cost saving calculation	31
4.8 Analysis the removal of algae by DAF	32
Chapter Five: Conclusion	
4 Conclusions	33
Chapter Six: Recommendation	
6 Recommendations	35



Chapter Seven: Reference

7 Reference 37

Annexure;

The data collected during the trails 41

Algae count data 56

Analysis based on the data collected 61

Past data collected 78

Hydraulics design of the treatment plant

 Coagulator 70

 Flocculator 72

 Dissolved air flocculation 74

 Rapid sand filter 76

 Summary 89

Hydraulic profile changes-Sketch-1 93

ECTAD phase-11 water supply area-Sketch-11 94

Plan view of treatment plant 95



List of Tables

Table -1.1;	Common genera of cyanobacteria and toxins produced by them	06
Table 1.2	Recommended levels of Mn in the drinking water particularly to avoid aesthetic problems	24

Data collected

Table 2.1	Trial -I, without pre chlorination, without PAC-Morning	41
Table 2.2	Trial -I, without pre chlorination, without PAC - Evening	41
Table 2.3	Trial-1, without pre chlorination with PAC - Morning	42
Table 2.4	Trial-1, without pre chlorination with PAC -Evening	42
Table 2.5	Trial-1, with pre chlorination, with PAC - Morning	42
Table 2.6	Trial-1, with pre chlorination, with PAC -Evening	43
Table 2.7	Trial-1, with pre chlorination with out PAC - Morning	43
Table 2.8	Trial-1, total iron test result, University of Moratuwa	44
Table 2.9	Trial-1, dissolved iron test result, University of Moratuwa	44
Table 2.10	Trial-1, total manganese test result, University of Moratuwa	44
Table 2.11	Trial-1, dissolved manganese test result, University of Moratuwa	44
Table 2.12	Trial-1, dissolved TOC, NWSDB, central lab	44
Table 3.1	Trial-11, with pre chlorine and with PAC – Morning	45
Table 3.2	Trial-11, with pre chlorine and with PAC –Evening	45
Table 3.3	Trial-11, with pre chlorine and with out PAC - Morning	46
Table 3.4	Trial-11, with pre chlorine and with out PAC –Evening	46
Table 3.5	Trial-11, without pre chlorine and without PAC - Morning	47
Table 3.6	Trial-11, without pre chlorine and without PAC- Evening	47
Table 3.7	Trial-11, without pre chlorine and with PAC – Morning	48
Table 3.8	Trial-11, without pre chlorine and with PAC -Evening	48
Table 3.9	Trial-11, total iron test result, University of Moratuwa	49
Table 3.10	Trial-11, dissolved iron test result, University of Moratuwa	49
Table 3.11	Trial-11, total manganese test result, University of Moratuwa	49
Table 3.12	Trial-11, dissolved manganese test result, University of Moratuwa	49

Table 3.13	Trial-11, dissolved TOC, NWSDB, central lab	49
Table 4.1	Trial-111, without Pre chlorine & with PAC-Morning	50
Table 4.2	Trial-111, vertical profile variation details-Morning	50
Table 4.3	Trial-111, without Pre chlorine & with PAC -Evening	50
Table 4.4	Trial-111, vertical profile variation details-Evening	50
Table 4.5	Trial-111, with pre chlorination with out PAC – Morning	51
Table 4.6	Trial-111, vertical profile variation details-Morning	51
Table 4.7	Trial-111, with pre chlorination with out PAC - Evening	51
Table 4.8	Trial-111, vertical profile variation details-Evening	51
Table 4.9	Trial-111, with pre chlorination and with PAC - Morning	52
Table 4.10	Trial-111, with pre chlorination and with PAC -Evening	52
Table 4.11	Trial-111, without pre chlorination and with out PAC-Morning	52
Table 4.12	Trial-111, total iron test result, University of Moratuwa	53
Table 4.13	Trial-111, total manganese test result, University of Moratuwa	53
Table 4.14	Trial-111, dissolved manganese test result, University of Moratuwa	53
Table 4.15	Trial-111, dissolved iron test result, University of Moratuwa	53
Table 4.16	Trial-111, COD result	53
Table 5.1	Trial-iv, without Pre Chlorination and without PAC – Morning	54
Table 5.2	Trial-iv, without Pre Chlorination and without PAC -Evening	54
Table 5.3	Trial-iv, with Pre Chlorination and with PAC – Morning	55
Table 5.4	Trial-iv, with Pre Chlorination and with PAC -Evening	55
Table 6.1	Trial-11, algae Counted, with pre chlorination and without PAC – Morning	56
Table 6.2	Trial-11, algae Counted, with pre chlorination and without PAC -Evening	56
Table 6.3	Trial-11, algae Counted, without pre Cl and without PAC - Morning	56
Table 6.4	Trial-11, algae Counted, without Cl and without PAC -Evening	56
Table 6.5	Trial-11, algae Counted Without pre chlorination and with PAC – Morning	57

Table 6.6	Trial-11, algae Counted Without pre chlorination and with PAC -Evening	57
Table 6.7	Trial-11, vertical Algae counted - Morning	57
Table 6.8	Trial-11, vertical Algae counted -After noon	57
Table 6.9	Trial-11, vertical Algae counted –Evening	57
Table 6.10	Trial-11, vertical Algae counted –Night	58
Table 6.11	Trial-111, vertical Algae counted - Morning	58
Table 6.12	Trial-111, vertical Algae counted -After noon	58
Table 6.13	Trial-111, vertical Algae counted –Evening	58
Table 6.14	Algae Count ,Oct- 2009,NWSD,Ampara,Lab	58
Table 6.15	Algae Count, Sep- 2009,NWSD,Ampara,Lab	59
Table 6.16	Algae Count ,Aug- 2009,NWSD,Ampara,Lab	59
Table 6.17	Algae Count ,Jul- 2009,NWSD,Ampara,Lab	59
Table 6.18	Algae Count ,Jun- 2009,NWSD,Ampara,Lab	59
Table 6.19	Algae Count ,May- 2009,NWSD,Ampara,Lab	59
Table 6.20	Algae Count ,Apr- 2009,NWSD,Ampara,Lab	59
Table 6.21	Algae Count ,Mar- 2009,NWSD,Ampara,Lab	60
Table 6.22	Algae Count, Feb- 2009,NWSD,Ampara,Lab	60
Table 6.23	Algae Count , Jan- 2009,NWSD,Ampara,Lab	60
Table 6.24	The total algae collected during the year of 2008 and 2009	60

Analysis of data

Table 7.1	Average total iron changes without pre chlorine	61
Table 7.2	Average total iron changes with pre chlorine	61
Table 7.3	Total iron changes along the total distribution system during the year of 2009	62
Table 7.4	Average manganese changes without pre chlorination	62
Table 7.5	Average manganese changes with pre chlorination	63
Table 7.6	Analysis of total and dissolved manganese changes	64

Table 7.7	Total manganese changes along the distribution year of 2009	65
Table 7.8	Vertical Algae Migration Analysis-march-2009	65
Table 7.9	Vertical Algae Migration Analysis-Sep-2009	65
Table 7.10	The Percentage of Algae removed by DAF during Year-2009	65
Table 7.11	The result of cyano toxin -with powered activated carbon/MCRL ($\mu\text{g l}^{-1}$)	66
Table 7.12	The result of cyano toxin -PAC/MCRL ($\mu\text{g l}^{-1}$)-Feb, Sep-2009	66
Table 7.13	The result of cyano toxin -with out powered activated carbon/MCRL ($\mu\text{g l}^{-1}$)-Dec-2009	66
Table 7.14	Retention time taken for unit process	67

Past data record

Table 8.1	Average monthly water quality data during Jan 2003- may 2006	68
Table 8.2	Analysis of past pH values changes in the raw water	69

Hydraulics design of the treatment plant

Table 9.1-	Retention time taken for unit process	93
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List of Figures

- Figure.1. Structure of microcystin-LR in which X and Z are variable of L amino acids.
- Figure.2. Cytotoxin and neurotoxins produced by cyanobacteria
- Figure.3. Sampling Point Locations
- Figure.4. Result of the immunostrip assay
- Figure.5. Turbidity variation year 2009
- Figure.6. Raw water pH variation during the year Of 1997 to 2009
- Figure.7. The phosphate and nitrate changes during the year of 2006 to 2009
- Figure.8. The treated water total iron change with and with out pre chlorination
- Figure.9. Treated water total iron changes with and with out pre chlorine condition
- Figure.10. Total manganese removed by total treatment
- Figure.11. Total manganese removed by DAF
- Figure.12. Total manganese changes along the coastal distribution system
- Figure.13. Total and dissolved manganese changes
- Figure.14. Vertical migration of algae 1.0 m interval (March-2009)
- Figure.15. Vertical migration of algae 1.0 m interval (March-2009)
- Figure.16. Total algae count at plant raw water during years of 2008 & 2009
- Figure.17. Percentage of algae removed by DAF

Abbreviations

° C	- Degree Celsius
Cl	- Chlorine
COD	- Chemical oxygen demand
DAF	- Dissolved Air Flotation
DPD	- Method for testing chlorine residual
NWSDB	- National Water Supply & Drainage Board
PAC	- Powered Activated Carbon
PACL	- Poly aluminium chloride
RPM	- Revolutions per minute
TOC	- Total organic carbon
TDS	- Total dissolved solids
UOM	- University of Moratuwa
WHO	- World Health Organization



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