

Water Quality Through Market Efficiency:  
An Examination of Design Alternatives for an Effluent Fee Program in  
Rhode Island

by

Maria C. Rea

Thesis

Submitted in partial fulfillment of the requirements for the  
Degree of Bachelor of Arts  
in the Center for Environmental Studies at Brown University

December 1983

## CONTENTS

<b>ACKNOWLEDGEMENTS</b>		<b>ii</b>
<b>PREFACE</b>		<b>iii</b>
<i>Chapter</i>		<i>page</i>
<b>I.</b>	<b>INTRODUCTION</b>	<b>1</b>
<b>II.</b>	<b>DESCRIPTION OF DISCHARGE PROBLEM IN RHODE ISLAND</b>	<b>5</b>
	Industrial Discharges	5
	Municipal Discharges	6
	Industrial Discharges into Municipal Sewers	8
	Conclusions	9
<b>III.</b>	<b>CURRENT REGULATIONS GOVERNING DISCHARGES</b>	<b>10</b>
	Water Quality Standards	10
	National Pollutant Discharge Elimination System	12
	Pretreatment Standards	14
	Rhode Island's Monitoring Program	15
	Conclusions	16
<b>IV.</b>	<b>EFFLUENT FEE THEORY</b>	<b>17</b>
<b>V.</b>	<b>EFFLUENT FEE PROGRAM DESIGN: GENERAL</b>	<b>20</b>
	Who will be Charged?	21
	How Will the Total Amount of the Fee be Determined?	24
	Revenue Use Considerations	25
	Reduction Incentive Considerations	27
	Conclusions	39
	How Will the Individual Fees be Structured?	40
	Fee Structure Conclusions	50
	Effluent Fee Program Design: Conclusions	50
<b>VI.</b>	<b>EFFLUENT FEE PROGRAMS IN OTHER STATES AND COUNTRIES</b>	<b>52</b>
	European Countries	52
	Germany's Ruhr Valley	52
	West Germany	54
	France	55
	Conclusions	56
	United States	58

	Wisconsin	58
	New Jersey	59
	Vermont	61
	Conclusions	62
<b>VII.</b>	<b>EFFLUENT FEE PROGRAM DESIGN: RHODE ISLAND</b>	<b>65</b>
	Goal Definition	65
	Legislative History	66
	Who will be Charged?	67
	How will the Total Amount of the Fee be Determined?	68
	How will the Individual Fees be Structured?	73
	Conclusions	76
<b>VIII.</b>	<b>EVALUATION OF RHODE ISLAND'S EFFLUENT FEE PROGRAM</b>	<b>78</b>
	Program Strengths	78
	Program Weaknesses and Limitations	80
	Fee Program Interaction with Related Regulatory Programs	81
	Recommendations for Future Actions	84
<b>IX.</b>	<b>CONCLUSIONS</b>	<b>87</b>
	<b>BIBLIOGRAPHY</b>	<b>90</b>
	<i>Appendix</i>	<i>page</i>
<b>A.</b>	<b>PRIORITY POLLUTANT SCAN RESULTS</b>	<b>93</b>
<b>B.</b>	<b>NPDES LIMITS FOR CONVENTIONAL POLLUTANTS</b>	<b>104</b>
<b>C.</b>	<b>MEMOS PRESENTED TO THE EFFLUENT FEE COMMITTEE</b>	<b>107</b>
<b>D.</b>	<b>DRAFT SCORING MECHANISM FOR RHODE ISLAND</b>	<b>124</b>
<b>E.</b>	<b>ENVIRONMENTAL HARM SCORES FOR PRIORITY POLLUTANTS</b>	<b>130</b>