

A CONTINUOUS WATERSHED MODEL FOR EVALUATION AND
DESIGN OF FEEDLOT RUNOFF CONTROL SYSTEMS

by

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TABLE OF CONTENTS

175

	Page
INTRODUCTION.	1
THE MODEL	3
POTENTIAL EVAPOTRANSPIRATION.	4
WATER MOVEMENT WITHIN THE DISPOSAL AREA	9
Soil Evaporation	10
Evapotranspiration	11
Surface Runoff	13
Interception	17
Infiltration and Redistribution.	18
Snow on the Disposal Area.	19
Criteria for Disposal on the Area.	21
FEEDLOT RUNOFF.	21
THE STORAGE FACILITY.	24
Pond Volume Accounting Hierarchy	25
DISCUSSION AND RESULTS OF PRELIMINARY TESTING	26
SUMMARY	27
APPENDIX I - References	29
APPENDIX II - Notation.	32
APPENDIX III - Computer Printouts	34

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INTRODUCTION

For the past two decades concern has grown in the U.S. over pollution of this nation's waters. Through the mid-sixties, the federal government formulated various general guidelines and provided financial assistance for antipollution programs, but encouraged the states to act on their own specific problems. As pollution levels increased through the late sixties, the federal government deemed it necessary to reorganize taking a firmer stance on the issue. Because of increased concern and the lack of pollution regulatory programs in some states, the U.S. Congress enacted the Federal Water Pollution Control Act Amendments of 1972 (Public Law 92-500) in October of 1972. The Act (FWPCA) required the establishment of effluent guidelines for various categories of polluters; one of which was the feedlot industry.

The national water discharge permit program was initiated on December 22, 1972 when regulations were promulgated and published in the Federal Register (24) establishing a new "Part 124 National Pollutant Discharge Elimination System (NPDES)" and "State Elements Necessary for Participation." On May 22, 1973, regulations establishing policies and procedures for issuance of NPDES permits were published (25) as Part 125. Subsequently, the Environmental Protection Agency (EPA) published an amendment (26) to this Part on July 5, 1973. The amendment provided for an expansion of exclusions which eliminated categories of small concentrated animal feeding operations and certain agricultural and silvicultural activities from the permit program. In promulgating the amendment, the EPA contended that while some point sources within the excluded categories should be regulated to be consistent with the purpose of the FWPCA, it would be difficult administratively if not impossible to issue individual

permits to all point sources. The Natural Resources Defense Council (NRDC) raised objection to this exercise of the EPA's discretion and challenged it in the Federal District Court of the District of Columbia in the case of "NRDC vs. Train." As a result of the court's ruling on June 10, 1975 to extend the NPDES permit program to include all point sources, the EPA proposed regulations (28) for applying the NPDES permit program to concentrated animal feeding operations on November 20, 1975.

Under the FWPCA, the EPA was charged to define and require the application of best practicable control technology currently available (BPT) to all existing facilities by July 1, 1977. Further, application of best available technology economically achievable (BAT) was required for all new and existing facilities by July, 1983. The effluent guidelines (27) published on February 14, 1974, in essence state "no discharge" except in the case of an extreme rainfall event. For the application of BPT, this event is the 10 year, 24 hour storm, while for application of BAT it is the 25 year, 24 hour storm.

As stated in the regulations of March 18, 1976 (29), feedlots are subject to case-by-case designation for evaluation under the NPDES permit program. This places a heavy burden on regulators who have to evaluate these facilities. A simple continuous watershed model originally developed by Koelliker (9) for evaluation of long term performance of runoff control facilities in Kansas and later used in other states has demonstrated usefulness as a design evaluation tool on the state level. Continuous watershed modeling involves the use of meteorological data as input to a computer program which simulates actual conditions occurring over a period of several years. Accordingly, a more complex computerized model which can appraise various management schemes of land disposal and