

Chapter 1. INTRODUCTION

TABLE OF CONTENTS

	Page
1.1 <u>General Document Format</u>	4
1.2 <u>General Area Description</u>	4

CHAPTER 1. INTRODUCTION

Beginning in 1975 with the passage of the Ground Water Management Act and furthered by the passage in 1984 of the Ground Water Management and Protection Act (GWMPA), the state legislatively recognized ground water as one of its most valuable natural resources requiring sound management practices to insure future sustainability. Initially, ground water legislation provided for examination of ground water quantity problems and established a pattern of local control through delegated authority to the Natural Resource Districts (NRDs). In 1984, the state passed LB 1106 which required the NRDs to prepare ground water management plans specific to their area and submit these plans to the Nebraska Department of Water Resources (DWR). In the past few years, a policy evolved with the emphasis including water quantity and water quality. In 1991, LB 51 was enacted, requiring NRDs to expand their management plans to include ground water quality protection and submit revisions for approval to the DWR.

The basic purpose of these Ground Water Management Plans is to identify the ground water supplies, identify changes of the ground water levels, and identify the sources and levels of ground water contamination within an NRD boundary, to establish ground water quantity and quality goals, as well as a goal for the life of the ground water reservoir, and to develop long-term solutions necessary for the prevention and/or reduction of ground water declines or of high levels of ground water contaminants posing environmental and health hazards. The plans further include recommendations of suitable practices and programs to stabilize, reduce, and prevent the occurrence, increase, or spread of ground water declines or contamination.

The Twin Platte Natural Resources District (TPNRD) has prepared this Ground Water Management Plan to comply with the provisions of the GWMPA (LB 1106) and LB 51. Since the management of both quantity and quality for ground and surface waters has always been a priority of the District, this requirement complements long-standing District policy. This Ground Water Management Plan will be maintained as a growing and dynamic document consistent with the evolving understanding of the ground water resource limitations within the District. It is intended to provide a basis for decisions concerning the need for, and usefulness of, alternative corrective and preventive actions to be implemented within the District.

When evaluating the preparation process and content of these plans, one disadvantage must be recognized. In certain areas there is a lack of good scientific knowledge about ground water systems. The subsurface environment of ground water involves a complex interplay of physical, geochemical and biological forces which vary from place to place dependent on climatic, demographic and hydrogeologic factors. When analyzing quality of these systems, spatial and temporal trends are often further complicated by the effect of both natural phenomena and anthropogenic activities. Research projects and investigations on these systems have recently been increasing with objectives ranging from technological improvements for the assessment of the subsurface and chemical behavior in geologic materials to state-of-the-art remedial techniques.

As such, this Plan should also be viewed as a resource document presenting available technical and research information in a convenient form for utilization by relevant decision makers and other interested persons or organizations. The continual incorporation of new data will ensure that uncertainties do not undermine predictions and actions formulated by the District.

The framework for nonpoint source ground water quality include: 1) evaluate existing and potential sources of ground water contamination's; 2) prepare comprehensive description of the quality and vulnerability of the ground water; 3) develop the programs and identify practices that would be most effective in handling areas of existing and potential ground water contamination; and 4) evaluate the ground water monitoring program to determine the most efficient use of resources which will, in turn, enable the TPNRD to more effectively understand and react to existing or potential ground water contamination.

1.1 General Document Format

The Plan is divided into the following sections: Hydrogeologic Characterization; Land Use and Contamination Source Inventory; Water Usage and Demand; Data Collection; Ground Water Goals and Objectives; Endangered and Threatened Species; Ground Water Quantity; Ground Water Quality; and Plan for Action. Appendices include all pertinent supplemental materials.

Technical information on ground water resources is readily available for a statewide region, but detailed information specific to this District is limited at this time. As such, the technical sections of this Plan will provide general information for the entire District and specific information for limited areas. Where technical data is currently undeveloped, it will be so stated.

1.2 General Area Description

The TPNRD encompasses approximately 4,157 square miles within four counties: Arthur, and Keith in their entirety, the northern approximately three-fourths of Lincoln and the western two-thirds of McPhersen. The delineation of the TPNRD is shown in Figure 1.

Portions of three major river basins are contained within the TPNRD: the North Platte, the South Platte and the Platte.

Population totals for the 1990 census for the District is 40,816. Approximately 68 % of the District's 1990 census population reside in the cities of North Platte and Ogallala.

Topographically, the District consists of the Nebraska Sandhills, the Central Nebraska Loess Hills, the Rolling Plains and Breaks and the Central High Tableland as defined by the United States Department of Agriculture Natural Resources Conservation Service Major Land Resource Areas in Nebraska. The Major Land Resource Areas are shown in

Figure 8.

The soils vary in types, textures and relief. The soils in the District are shown in Figure 9.

The majority of the valley lands are devoted to pasture and row crops with the uplands consisting primarily of pasture with scattered row crops.

Ground Water or Surface Water for irrigation is required for agriculture production, as there is not sufficient moisture in the form of snow and rainfall to effectively produce crops. The mean annual precipitation is shown in Figure 7.

A complete description of the water supply sources available in the District is necessary so that ground water management decisions can be systematically and logically made. This Plan is based upon available data.

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