NEBRASKA

DEPT. OF ENVIRONMENT AND ENERGY

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Guidance for Writing Basin Management Plans

Nebraska Department of Environmental Quality (NDEE) receives funding for management of nonpoint source pollution from the Environmental Protection Agency (EPA) through Section 319 of the Clean Water Act. These funds are made available through NDEE's Nonpoint Source Management Program to, in part, implement approved nine-element watershed management plans. A basin management plan is intended to encompass several separate watershed management plans under an umbrella document that covers a common basin area generally aligning with the boundaries and jurisdiction of a natural resources district. This guidance provides the preferred format for an acceptable basin management plan.

Why develop a basin management plan?

Nebraska's unique system of managing resources through Natural Resources Districts (NRDs) provides the opportunity to address nonpoint source water pollution issues. The NRDs, delineated nominally by river basin boundaries, have the jurisdiction and capacity to manage water resources as a continuous system. Incorporating management plans for multiple watersheds into one document provides economy of scale in developing plans and focuses attention on priority water quality issues within each NRD. The basin plan should provide flexibility for NRDs to prioritize projects to resolve the most pressing impairments of water resources in the basin.

What is a nine-element watershed management plan?

A nine-element watershed management plan provides a systematic strategy to resolve nonpoint source water pollution in a defined drainage area of manageable size (HUC 8 watershed or smaller). The nine elements essential for an effective management plan are listed below.

1) **Identification of Pollutant Sources** – description of the pollutants of concern, their sources (crop production, livestock, street runoff) and where in the watershed they are generated (identify geographic source areas) such that practices can be targeted towards 20% or less of a watershed area.
2) **Estimation of Pollutant Loads** – quantification of pollutants per source.
3) **Identification of Management Practices** – description of practices planned to reduce loads of specific pollutants, placement of practices in targeted area(s), load reductions by management practice for targeted pollutants and justification for why these management practices were selected to address the pollutant (achieve the load reductions calculated in #2) and specific sources (described in #1).
4) **Communication and Outreach** – strategy to promote awareness of and participation in projects by targeting key audiences.
5) **Implementation Schedule** – timeline for completing planned actions to resolve water quality impairments.
6) **Milestones for Measuring Implementation Progress** – completion dates for major tasks and accomplishments.
7) **Evaluation Criteria** – benchmarks and methods for measuring the effectiveness of implemented practices.
8) **Monitoring** – process and methods for measuring water quality and other improvements.
9) **Technical and Financial Assistance** – listing of technical and financial resources expected to support projects.

How does a basin plan incorporate the nine elements?

The nine elements must be incorporated into management plans for each of the individual watersheds identified in the basin plan to be considered a fully developed watershed plan. It is not necessary for watershed plans to be fully developed (including the nine elements) for every watershed identified in the basin plan. ***However***, Section 319 funds may not be used to support projects in a watershed that does not fully incorporate the nine elements. While there are benefits to developing multiple watershed plans under one basin plan, NRDs must weigh the advantage of developing a basin plan rather than separate watershed management plans.

Chapter 1. Introduction and Background

This chapter should provide the necessary background information to understand the intent of the plan, the process for developing the plan and the authorities for implementing the plan. Be realistic and concise. Examples of information to provide are outlined below.

- **Purpose and function of the plan**.
  - Focus on prioritization of resources and coordination of partnerships.
  - Focus on resolving water quality impairments and (if applicable) on protecting high quality (unimpaired) water resources.
  - Include description of the nine elements of a watershed plan.
- **Brief discussion of the function and authorities of the NRD**.
- **Basin overview**.
  - Identify location and delineation of the basin and watersheds within the basin.
  - Discuss historical concerns and common pollutants (not detailed).
  - Summarize (briefly) previous plans, studies, and projects.
  - Summarize (briefly) the planning process including the process for public input. Details can be included in an attached report *if* it is desired to preserve that information with the plan.

Chapter 2. Goals and Objectives

This chapter should present the goals and objectives that will drive watershed projects implemented under the basin plan. Goals one and two (see below) should align with the two goals of the State NPS Management Plan. Additional goals and objectives specific to the basin or elements of the plan may be added. Goals and objectives should be presented as a statement of a condition to be achieved rather than actions to be taken. Tasks should be presented as actions in the separate watershed chapters and referenced to relevant goals and objectives of the plan.

GOAL 1. Implementation of the LOCAL BASIN water quality management plan will result in attainment of water quality standards through comprehensive and collaborative actions that efficiently and effectively restore and protect water resources from degradation and impairment by nonpoint source pollution.

Objective 1. Actions for management of nonpoint source pollution will be based on sound data and effective directing of resources.

Objective 2. Strong working partnerships and collaboration among appropriate local, state and federal agencies and non-governmental organizations will be established and maintained regarding management of nonpoint source pollution.

Objective 3. Comprehensive and systematic strategies will be employed to restore and protect water resources from nonpoint source pollution and to communicate nonpoint source information.

Objective 4. The status, effectiveness and accomplishments of projects and activities directed toward management of water resources will be continually assessed and periodically reported to appropriate audiences.

GOAL 2. Resource managers, public officials, community leaders and private citizens will understand the effects of human activities on water quality and support actions to restore and protect water resources from impairment by nonpoint source pollution.

Objective 1. Deficiencies in knowledge needed to improve decision making regarding management of nonpoint source pollution will be identified and investigated.

Objective 2. Tools to effectively transfer knowledge and facilitate actions regarding management of natural resources will be developed, improved and maintained.

GOAL 3. The water, land, and biological resources in the BASIN or LOCAL CREEK watershed will be healthy, productive and sustainable.

Objective 1. Water resources will meet or exceed levels of quality and quantity necessary to serve the needs of the citizens in the LOCAL CREEK watershed.

Objective 2. The land and stream resources in the LOCAL CREEK watershed will be stable and productive.

Objective 3. The LOCAL CREEK corridor will support a natural community of flora and fauna that is healthy and productive.

Chapter 3. Basin Characteristics

This chapter should broadly summarize the condition of land, water, and natural resources in the basin to provide a broad overview of basin conditions. It should include information (with appropriate tables, figures, and maps) that generally applies across the basin, influencing conditions and potential activities in individual watersheds. Detailed information should be presented in specific watershed chapters. Examples of information to provide in this chapter are outlined below.

- **Climatic conditions of the basin**. This could be covered at the basin scale and would not need to be discussed in individual watershed chapters unless local conditions vary significantly.
- **Topography of the basin**. This could be covered at the basin scale and would not need to be discussed in individual watershed chapters unless local conditions vary significantly.
- **Soils and soil conditions in the basin**. This could be covered at the basin scale, however, depending on how much soils vary across the basin, greater detail may be appropriate in specific watershed chapters.
- **Stream conditions in the basin**. This should be a general summary and map at the basin scale. Conditions should be characterized by primary disturbances, characterization of stream stability, condition of riparian zones and similar attributes. More detailed information about stream conditions should be covered in the watershed chapters including the number and miles of impaired and unimpaired streams segments (referencing the most current Integrated Report) and maps.

- **Lake and reservoir conditions in the basin**. This should be a general summary and map at the basin scale, characterizing primary disturbances and similar attributes. More detailed information about lake and reservoir conditions should be covered in the watershed chapters, including a table and map of impaired and unimpaired lakes and reservoirs with details about any impairments.
- **Wetland conditions in the basin**. This should include a description of major wetland complexes, including the location, characterization of primary disturbances and similar attributes. More detailed information may be included in watershed chapters as needed.
- **Groundwater conditions in the basin**. This should include a description of major aquifer complexes and a general summary of groundwater conditions in the basin. Watershed chapters should include more detailed information, including identification of wellhead protection areas and groundwater management areas, identification and characterization of water quality in groundwater resources, characterization of primary disturbances, description of any controls currently in place (e.g., Groundwater Management Areas) and similar attributes.
- **Type and condition of biological communities in the basin**. This may include identification and description of plant, animal and other species dependent on water quality; threatened and endangered species; habitat conditions; characterization of primary disturbances; and similar attributes. More detailed information may also be included in watershed chapters as needed.

Chapter 4. Monitoring

This chapter should summarize the past and planned monitoring efforts in the basin. Descriptions should include the purpose and use of the data for each monitoring effort or program and very briefly describe how monitoring is conducted. The level of detail should be limited to the minimum necessary to explain how the monitoring effort has or will contribute to planning and evaluating projects. Examples of information to provide are outlined below.

- **Prior and ongoing monitoring programs and monitoring networks**. This may include monitoring of surface water, ground water, vadose zone and other relevant resources.
- **General support for monitoring activities**.
    - Discuss what existing efforts will be maintained.
    - Discuss new, targeted or specialized monitoring efforts that will be implemented.
- **Project monitoring approach**. This may be broadly defined and discussed at the basin level and/or more specific descriptions may be presented in individual watershed chapters.
    - Discuss monitoring efforts that may be conducted to refine or evaluate project implementation in specific watersheds.
        - Discuss the purpose and use of the data collected.
        - Discuss methods for quality assurance, data management, data analysis, and data assessment. These may be generally described in this plan. A detailed Quality Assurance Project Plan (QAPP) most likely will be required prior to conducting monitoring. NDEE will help to determine if a QAPP is required.
        - Discuss the process for reporting and distributing monitoring results.

Chapter 5. Water Quality Assessment

This chapter should characterize the water resources and discuss general water quality issues in the basin watersheds. Specific details should be presented in the individual watershed chapters. Examples of information to provide are outlined below.

- Water resources and beneficial uses

- Applicable water quality standards
- Water quality concerns and conditions (general discussion in this chapter, with more detailed maps and discussion in the individual watershed chapters)
- Impaired and high quality (unimpaired) waterbodies
- Common causes (e.g. crop production, livestock, street runoff, hydromodification) and general sources of pollution (e.g. *E. coli*, nutrients, sediment, Atrazine). Specific details should be provided in the individual watershed chapters.
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Chapter 6. Communication and Outreach

This chapter should discuss the NRD's capacity and general approach to supporting watershed projects and activities through outreach and education. This chapter should be developed after identifying the goals, objectives, and tasks as well as major milestones. The communication and outreach identified in this chapter should directly support the goals and objectives of the plan. Examples of information to provide are outlined below.

- **Identification of outreach delivery systems in the basin**.
    - Local radio, television, and print media
    - Social media outlets
    - Organization outlets (newsletters, web pages, meetings, events, etc.)
    - Personal contact advisors (consultants, agencies, etc.)
- **Assessment of demographic information in the basin**.
    - Age, income, education, gender distribution of the population
    - Distribution of the population between rural and urban areas
    - Distribution of land management authority between land owners and tenant operators
    - Prevalence of absentee landowners
- **Identification of target audiences**. Target audiences should be specific to priority areas and projects outlined in the milestones and schedule. *Identifying all people living in the basin does not equate to a target audience.*
- **Assessment of educational needs relative to target audiences and planned projects and activities**. Identify the following for each target audience or group of target audiences.
    - awareness gaps
    - knowledge gaps
    - desired behavior changes in each target audience
    - messages and themes to support positive changes in awareness, knowledge, and behavior change as identified above
    - products and activities to support positive changes in awareness, knowledge, and behavior change as identified above
    - delivery systems to support positive changes in awareness, knowledge, and behavior change as identified above
- **Identify public involvement opportunities**.
- **Outline the general education and outreach strategy to promote projects, recruit participation in project activities and adoption of BMPs**. More specific strategies for specific projects will be outlined in watershed plan chapters (Chapters 9 +) for those projects planned in the first five years of implementation.
- **Identify methods to quantify and evaluate the effectiveness of outreach activities**.
- **Identify staffing needs and responsibilities in general for the basin plan.** More specific needs and responsibilities for specific projects will be outlined in watershed plan chapters (Chapters 9 +) for those projects planned in the first five years of implementation.

Chapter 7. Best Management Practices

This chapter should identify and discuss the common practices likely to be acceptable and appropriate to manage each targeted pollutant in the basin watersheds. The State NPS Management Plan, available on the NDEE website, provides a cross-referenced table of practices commonly implemented in Nebraska to manage NPS pollutants. Practices selected from the State NPS Management Plan should be prioritized for treatment of specific targeted pollutants in the individual watershed chapters. An estimate of effectiveness, citing literature, must be provided along with the assumptions about that practice that will be used to model each targeted pollutant's reductions in the individual watershed chapters. The outline below is recommended for categorizing and organizing management practices.

- Upland Structural Practices
- Upland Non-Structural Practices
- Urban Conservation Practices
- In-Stream Practices
    - Grade Control
    - Streambank Stabilization
    - Riparian Zone Practices
- In-Lake Practices
    - Sediment Management
    - Shoreline Stabilization
    - In-Flow and Discharge Control
- Groundwater Quality Management Practices
- Habitat Improvement Practices

Chapter 8. Technical and Financial Resources

This chapter should identify and discuss partnerships and cooperative efforts that will contribute technical and financial resources to implement of projects in the basin. The State NPS Management Plan provides a cross-referenced table of organizations and programs that provide support to NPS projects. Additional local resources should be identified and described where applicable. It is generally understood that this is an educated estimate and does not constitute a firm financial commitment by any partner.

Chapter 9. (*Name of Watershed #1*) Watershed Plan

Each individual (HUC8 or smaller) watershed identified in the basin plan must have a separate chapter to address the 9 elements. Prior chapters have laid out the general basin information and plan strategies. The watershed chapters should lay out the plan for reaching water quality standards in impaired waterbodies and/or maintain water quality in unimpaired waters. The general idea is to characterize each watershed, identify impaired waters, identify pollutant sources and loads, identify practices (select BMPs, how many and where in the watershed) that would address pollutants and plan an information and education campaign to get the BMPs on the ground. Other essential components include monitoring and evaluation of progress, setting measureable milestones and a schedule for plan implementation. Watershed chapter components are described below.

1. **Watershed Inventory.** Include land use, existing land treatment, irrigation in the watershed, permitted facilities (e.g. Animal Feeding Operations) and other watershed information pertinent to water quality.
2. **Water Resources and Current Condition.** Summarize water resources by streams, lakes, wetlands and groundwater and describe their current condition. For streams and lakes, list the impaired waterbodies

in the watershed, referencing the most current Integrated Report and indicating the waterbody ID and impairment. Include available water quality information for groundwater resources such as nitrate levels in Wellhead Protection Areas.

3. **Pollutant Sources.** Characterize sources of pollution in the watershed, focusing on pollutants for which waterbodies are impaired.
4. **Pollutant Loads.** Pollutants associated with waterbody impairments are modeled to characterize how much of each pollutant is expected to move from landscape to waterbodies. Models should indicate which catchments of the watershed are contributing more than others. This information is used to target BMPs on the landscape.
5. **Pollutant Load Reductions.** How much do pollutant loads need to be reduced in order to meet water quality standards in the impaired waterbody? If a TMDL or TMDL-like analysis such as a 5-alt has been developed for the waterbody, it must be utilized in pollutant modeling and development of the plan. Consult with NDEE regarding these analyses prior to initiating the plan development. Given the information about pollutant sources and pollutant loads, which BMPs would best address the problem and where would BMPs best be targeted on the landscape to reduce pollutant loads? Targeted areas are expected to cover 20% of the watershed area or less. Given the information gathered about financial and technical resources, estimate how long it would take to reach water quality standards.
6. **Communication and Outreach.** Expand on the general information given in Chapter 6 to be specific for projects in this particular watershed. Identify target audiences and means of communication that would help to make that specific project successful.
7. **Implementation Schedule.** Include any specific projects planned for implementation. Schedules are developed for each watershed and summarized in the Master Schedule in the Basin Summary chapter.
8. **Milestones for Measuring Implementation Progress.** List or chart completion dates for major tasks and accomplishments for this particular watershed.
9. **Evaluation Criteria**. Provide the benchmarks and methods that will be used for measuring the effectiveness of implemented practices for this particular watershed.
10. **Monitoring.** Expand on the general information given in Chapter 4 to be specific for projects in this particular watershed. Consider monitoring needs for both pre- and post-project timeframes.
11. **Watershed Budget.** Budgets are developed for each watershed and summarized in the Master Budget in the Basin Summary chapter.

Chapter X (*depending on number of Watershed Plan chapters*). Basin Summary

This chapter should provide a summary of activities and accomplishment expected to be achieved across the basin through separate watershed implementation projects. How activities and projects in multiple projects will be coordinated and managed should be discussed. Examples of information to provide are outlined below.

- Master Schedule. This should present a compilation of the major events and activities planned in individual watershed plans. Major events and activities in each watershed plan should be based on management actions which are associated with priority areas and targeted pollutant control.
- Master Milestones. This should present a compilation of completion dates for the major events and activities planned in individual watershed plans.
- Master Budget. This should present a compilation of the major cost categories from the individual watershed plan budgets.
- Load Reduction Summary. This should summarize the beginning load, projected load reduction and final load for each pollutant for the individual watersheds.

References

This section should document references cited in the text. The format is not prescribed, but should conform to the style of a representative technical publication.

Appendix

This section should include additional or supplemental information that directly supports material presented in the body of the document. For example, an appendix might be added to provide a more expansive description of material summarized in the document for readers less familiar with the concept.

Attachments

This section should include reports, articles and other publications that are independent of the document, but might provide supplemental information useful to some readers. Attachments might include a stream assessment report from which information was summarized in the document. A separate report on the planning process (summarized in the document) might be attached to preserve that history with the management plan.

Basin Plan Outline

The following outline shows how the plan should be organized and where the 9 Elements are covered.

Chapter	Description	9 Elements
1	**Introduction and Background**	
2	**Goals and Objectives**	
3	**Basin Characteristics**	
3.1	General Description of Basin (location, land use, etc)	
3.2	Climate	
3.3	Topography	
3.4	Soils and Soil Conditions	
3.5	Streams and Stream Conditions	
3.6	Lake and Reservoir Conditions	
3.7	Wetland Conditions	
3.8	Groundwater Conditions	
3.9	Biological Communities	
4	**Monitoring**	8
4.1	Prior and Ongoing Monitoring Programs and Networks	
4.2	General Support for Monitoring Activities	
4.3	Project Monitoring Approach	
5	**Water Quality Assessment**	1
5.1	Water Resoures and Beneficial Uses	
5.2	Applicable Water Quality Standards	
5.3	Water Quality Concerns and Conditions	
5.4	Impaired and Unimpaired Waterbodies	
5.5	Common Causes of Pollutants	
6	**Communication and Outreach**	4
6.1	Basinwide Outreach Delivery Systems	
6.2	Assessment of Basin Demographic Information	
6.4	Identification of Target Audiences	
6.5	Assessment of Educational Needs	
6.6	Public Involvement Opportunities	
6.7	General Education and Outreach Strategy	
6.8	Evaluation of Effectivness	
6.9	Staffing Needs and Responsibilities	