

**2001 ANNUAL REPORT
WATER QUALITY MANAGEMENT PROGRAM
OMAHA DISTRICT LAKES PROJECTS**

1.0 INTRODUCTION

a. Authorization

This report is prepared pursuant to the requirements of the U.S. Army Corps of Engineers (Corps) Engineer Regulation ER 1110-2-8154, "Water Quality and Environmental Management for Corps Civil Works Projects".

The purpose of the report is to summarize the implementation of the Omaha District's water quality management program for the past fiscal year and highlight specific project information and District activities. The report lists the general objectives of the District's water quality management program and the progress made towards their achievement. It discusses activities that are planned for out years, changes in technical capabilities within the District, relationships between water quality and water control management activities, pertinent water quality regulations, laboratory facilities, data management systems, training and research and development needs, special studies completed or required, water quality coordination with other agencies, scheduling for detailed project evaluations, and any problems encountered with contracted work. The report provides a project-by-project summary of water quality conditions, concerns, and any innovative techniques utilized to improve water quality.

b. Objectives

The Omaha District has adopted the following general water quality management objectives, identified in ER 1110-2-8154, to guide implementation of the District's water quality management program.

- (1) Ensure that water quality, as affected by District projects and their operation, is suitable for project purposes, existing water uses, and public health and safety. Water quality at District projects should be in compliance with applicable Federal, state, and local water quality standards.
- (2) Define baseline water quality conditions for each District project. A pre-project water quality evaluation, and/or a description of the post-construction water quality characteristics must be developed at the earliest time in which data collection and evaluation are practical.
- (3) Establish and maintain a water quality monitoring and data evaluation program that facilitates the implementation of the District's water quality management program and allows for evaluation of project performance and water quality trends.
- (4) Identify existing and potential water quality problems at Corps projects within the District, and develop and implement appropriate solutions. Identify opportunities for

water quality improvement to projects or receiving waters and initiate management actions that accomplish those improvements.

- (5) Integrate water quality considerations into District water control management decisions.
- (6) Maintain coordination and communication among Division and District elements involved in environmental and water quality matters.
- (7) Maintain close coordination and, where possible, collaboration with all interested governmental and non-governmental entities with regard to activities that may affect or be affected by the water quality or water control decisions associated with Corps projects within the District.
- (8) Use an interdisciplinary team approach to develop objectives, establish priorities, and execute the District's water quality management program.
- (9) Develop an understanding and continuing awareness of the water quality factors and processes in the project, in the watershed, and in the area influenced by project operation.
- (10) Where degraded conditions exist at Corps projects within the District, develop a plan for restoration that will restore the aquatic environment to a desirable, biologically diverse, productive, and robust condition. This plan should normally be coordinated with appropriate local, state, and other Federal agencies.
- (11) Ensure that the project and its operation offer the lowest stress possible to the aquatic environment.
- (12) Ensure that Corps projects within the District are managed to accentuate the projects' potential to play a positive role in the conservation and preservation of natural and cultural resources.
- (13) Document the water quality management activities of the District's water quality management program and individual projects within the District to record trends, identify problems and accomplishments, and provide guidance to program and project managers.
- (14) Recognize that some problems and opportunities are of short duration and demand rapid response. The District water managers should be empowered to react in a time frame commensurate with the event and with best available information and judgment. Long-term situations provide for more comprehensive study and refined response.
- (15) As appropriate, promote and develop cost-sharing partnerships in accordance with applicable authorities.

The Omaha District implemented activities that addressed, at least in part, all of the above general water quality management objectives. In an effort to position itself to

better implement activities to address these objectives, the District initiated an effort to “retool” its water quality management program. Activities that were initiated and are currently ongoing include: 1) development of a strategy for the District’s monitoring program that focuses on project-specific monitoring needs, 2) review and enhancement of the components of the District’s quality assurance and quality control program, and 3) increased efforts in coordinating and partnering water quality monitoring efforts with state and local governmental entities.

c. Summary of Significant Problems

Water quality problems identified in Omaha District projects during 2001 include pesticide and fertilizer contamination from agricultural practices, storm water run-off from urbanization especially during construction, sediment and nutrient inputs to the lakes, endangered species temperature study, contaminants in fish tissue and shoreline erosion. Details of these problems are discussed in section 4. a. Water Quality Issues and Problems in NWO. Following is a summary of significant problems identified in the Omaha District.

Shoreline erosion is prevalent at all Omaha District projects. The erosion destroys littoral zone habitat, decreases light penetration, and decreases lake depth all of which in turn impact the ecology, chemistry and recreational longevity of the lake.

Pesticides and mercury continue to be detected in Omaha District projects and both have been detected in fish tissue in the Zorinsky, Wehrspann, Garrison, Bowman-Haley, Pipestem, and Audubon Projects. Polychlorinated biphenyls (PCBs) and dieldrin have also been detected in tissue taken from fish collected in both the Salt Creek and Papillion Creek. Although these creeks are not Corps of Engineer (COE) managed, the contaminants in these streams may have passed through COE projects.

Extensive urbanization in the basins of tributary reservoirs has caused problems with excessive sediment, nutrients and other pollutant inputs. Cherry Creek, Chatfield, Bear Creek, Holmes, Zorinsky, Wehrspann, Glenn Cunningham and Standing Bear lakes are experiencing urbanization associated problems.

A special sampling in the reach of the Missouri River just downstream of Fort Peck dam was performed for the planning division. The endangered pallid sturgeon has not been reproducing in the downstream reaches, the sampling effort was to document temperature and turbidity of the release water. A spill of warm spring water via the spillway is scheduled for 2002 and will require additional sampling.

The Old Williston Landfill Area, located on the Garrison Project, has undergone extensive ground water and sediment monitoring for the past ten years. The City of Williston, North Dakota, conducted the monitoring and the Omaha District conducted water sampling in the Little Muddy River adjacent to the site. The City of Williston has hired a contractor to compile data collected as 2000 was the final year of the study. This report will be reviewed by the North Dakota Department of Health and other entities to determine if additional sampling is necessary. This determination is expected in 2002.

The EPA water quality data storage system, STORET, has undergone complete reorganization at the EPA level. Difficulties in entering and retrieving data from STORET forced the NWO to search other data entry programs. A COE owned Microsoft ACCESS based program called DASLER was chosen to store and manage data collected from 1998 through the present. Eventually, DASLER will act as a "front-end" program to submit data to the STORET system. Several Corps districts are now using DASLER as a water quality data storage program and with the Corps ownership of DASLER the program is now known as CE-DASLER.

2. ORGANIZATION AND COORDINATION

a. Organization and Assigned Responsibilities

The Omaha District is responsible for the implementation of the Water Quality Management Program at the Corps projects located within the district boundaries. The Northwestern Division, Omaha office provides policy guidance and monitors the overall Water Quality Management Program. The Environmental Research and Development Center, Environmental Chemistry Branch – Omaha (ERDC-ECB) performs water quality analyses for the NWO and is responsible for technical supervision of water analyses performed at district, project and commercial laboratories. The ERDC-ECB has established and maintains a laboratory quality control program. Engineering organizational elements in the district offices are responsible for the water quality program, although the activities are coordinated with Operations and Planning elements. A biologist coordinates the water quality sampling and data management programs in the Omaha District. An ecologist coordinates water quality problems, data analysis and non-routine monitoring. The following table provides further staffing information:

TITLE	GRADE	YEARS OF EXPERIENCE	AREAS OF EXPERTISE
Biologist Student Intern	7	2	General biological study
Biologist Student Intern	5	.5	General biological study, Data management, field work
Hydrologic Technician	9	6	Data entry
Biologist	11	17	Sample collection, Data management
Ecologist	12	20	Limnology, Chemistry, Aquatic Ecology, Ichthyology, Environmental Remediation, Wetlands

Additionally, approximately 30 area personnel are involved in sample collection and mainstem release water monitoring in the water quality monitoring program.

Those Operation Division elements assigned with this responsibility are as follows:

PROJECT OFFICE	STATE
Fort Peck	Montana
Garrison	North Dakota
Oahe	South Dakota
Big Bend	South Dakota
Fort Randall	South Dakota
Gavin's Point	South Dakota
Tri-Lakes	Colorado

b. Coordination with Others

Water quality activities conducted jointly or under contract with other groups or agencies are as follows:

AGENCY/ CONTRACTOR	PROJECT	TYPE OF INVESTIGATION	TYPE OF WORK
USGS	Fort Peck	Surveillance	Sample Collection
USGS	Garrison	Surveillance	Sample Collection
Three Affiliated Tribes	Garrison	Surveillance	Sample Collection
Wayne Kormaed, Contractor	Bowman-Haley	Surveillance	Sample Collection

Routine coordination of sample collection and analyses is conducted with other state organizations within the Omaha District to avoid duplication of sampling effort.

3. WATER QUALITY ACTIVITIES IN NWO

a. Investigations

Three types of investigations are performed on reservoir projects: pre-impoundment, surveillance and comprehensive investigations. A pre-impoundment investigation is made before completion of a project to establish base line conditions. A surveillance investigation is an annual post-project investigation consisting of fixed station sample collection and analysis of basic water quality parameters to establish water quality trends. A comprehensive investigation is an extensive investigation conducted at several locations in the lake to obtain a more thorough understanding of reservoir water quality. Additional water quality parameters are analyzed if a specific problem is being investigated and to obtain a comprehensive evaluation of the present project conditions.

Field investigations conducted during 2001 are as follows:

- (1) Pre-impoundment Investigations - none.
- (2) Surveillance Investigations

MAINSTEM PROJECTS	TRIBUTARY PROJECTS			
Fort Peck	Pipestem	Standing Bear	Branched Oak	
Garrison	Bowman-Haley	Zorinsky	Pawnee	
Oahe	Cherry Creek	Glenn Cunningham	Stagecoach	
Fort Randall	Bear Creek	Lake Audubon	Olive Creek	Cold
Gavin's Point	Brook	Lake Pocasset	Wagon Train Lake	
Big Bend	Yankton	East Twin	West Twin	
	Chatfield	Wehrspann	Yankee Hill	
	Conestoga	Bluestem	Holmes	

(3) Comprehensive Investigations

b. Special Studies

Western Pilot EMAP Study

In summer of 2000 the EPA began a long-term study on Lake Oahe. This study involves collecting water quality data to be used in a program called EMAP (Environmental Monitoring and Assessment Program). EMAP is a research program to develop the tools necessary to monitor and assess the status and trends of ecological systems. The purpose of using Lake Oahe as a study site is that the lake covers a large geographical area and the data contributes to general information about lake environments. Also of interest is the Missouri River watershed, which is being looked at in a water quality interest instead of just a water quantity view. Data from the Omaha District water quality program will be shared with the study coordinators and the water quality unit will review data collected on this study.

Missouri River – Gavins Point Dam to Ponca State Park, NE

The 59-mile unchannelized reach of the Missouri River from immediately below Gavins Point Dam to Ponca State Park in Nebraska has several issues ongoing that involve the Corps and water quality management. The reach was designated for protection as a recreational river under a 1978 amendment to the Wild and Scenic Rivers Act. It is included in an action area identified by the U.S. Fish and Wildlife Service (USFWS) under the Federal Endangered Species Act (ESA) for three species (pallid sturgeon, least tern, and piping plover) identified as being in jeopardy. The State of Nebraska has afforded the reach Tier 3 protection under the antidegradation provisions of the state's water quality standards and Federal Clean Water Act (CWA).

Water quality data as needed by the Corps in the MNRR reach to facilitate current and future efforts regarding the management of the reach as a recreational river and enhancing the riverine habitat for the endangered pallid sturgeon. There is also a need to establish existing water quality conditions to enable the Corps to interact with the State of Nebraska regarding application of the antidegradation provisions of the state's water

quality standards and the CWA. Water quality conditions are intrinsic to the values for which the reach was designated a recreational river under the Wild and Scenic Rivers Act. Knowing baseline water quality conditions and how water quality may be changing due to anthropogenic influences is crucial to managing the water resource aspects of the recreational river. Water temperature and turbidity have been identified as factors contributing to the jeopardization of the pallid sturgeon in the Missouri River. Documenting existing conditions of these parameters for comparison is of paramount importance in evaluating any implemented actions to enhance the pallid sturgeon population. Gaining insights into whether pollutants are impacting the pallid sturgeon population in this reach of the Missouri River is also important. Knowing existing water quality conditions for pertinent parameters is also needed to facilitate addressing the antidegradation provisions of the CWA.

A preliminary review of water quality monitoring activities along the MNRR reach found limited historic and ongoing water quality sampling. The Corps is collecting water quality data at the Gavins Point Dam discharge. Although this sampling has occurred over a fairly lengthy time, the water quality parameters monitored are limited to water temperature, dissolved oxygen, pH, and conductivity. The Nebraska Department of Environmental Quality has sampled the Missouri River at Ponca on a periodic basis (i.e., every 5 years) as part of its rotating river basin monitoring network. The City of Yankton utilizes the Missouri River as a drinking water source, and regularly monitors the “raw” river water for numerous water quality parameters. Water quality data to define water quality conditions throughout the MNRR reach are generally lacking.

In an initial effort to begin addressing the lack of water quality data for the MNRR reach, the Corps conducted a scoping study of water quality conditions within the MNRR reach. The monitoring objectives established for the scoping study were:

- (1) Define “baseline” water quality conditions for the period of the study.
- (2) Assess longitudinal variation in selected parameters from the upstream to downstream boundaries of the MNRR reach.
- (3) Assess “horizontal” (i.e. thalweg versus backwater) and “vertical” (i.e., near-surface versus near-bottom) variation of selected parameters.
- (4) Assess the impact, if any, that the inflows of the James and Vermillion Rivers have on turbidity levels in the Missouri River. Estimate the suspended solids load being delivered by these tributary rivers to associate with measured turbidity levels in the Missouri River above and below the tributary inflows.

Monitoring occurred over a 6-week period from late August through September 2001, and included the collection of water quality samples at 8 sites.

Missouri River – Fort Peck Dam to Lake Sakakawea

The USFWS issued a Biological Opinion (BiOp) to the Corps on compliance with the Federal Endangered Species Act regarding the operation of the Missouri River mainstem reservoir system. In particular, the BiOp stated that the current operation of the Corps’ Fort Peck project has adversely impacted the endangered pallid sturgeon. The USFWS believes that regulated flows from the Fort Peck Dam coupled with a suppressed water temperature regime and reduced turbidity during the spring and early summer spawning period have failed to provide adequate spawning cues for pallid sturgeon. In addition, the

clear cold-water releases from Fort Peck Dam are believed to have limited the amount of riverine habitat suitable for pallid sturgeon spawning. The Corps has proposed to modify operations of the Fort Peck Dam following specifications outlined in the BiOp. Modified dam operations are proposed to increase discharge and increase water temperatures and turbidity during late May and June to provide spawning cues and enhance environmental conditions for pallid sturgeon and other native fish species. In contrast to “normal” cold-water releases through the dam, it is proposed to release warmer surface water from Fort Peck Reservoir down the spillway to increase water temperatures in the Missouri River below the dam.

As a precursor to a full implementation of the proposed discharge modification to the operation of the Fort Peck project, the Corps plans to implement a “mini-test” in the spring of 2002 to evaluate the proposed modified operation of the project. The mini-test proposes to release up to 11,000 cfs down the spillway for up to four weeks during the month of June, and is contingent upon there being sufficient water available in Fort Peck Lake. At least 4,000 cfs would be simultaneously released from the powerhouse, with a total discharge not to exceed 15,000 cfs. The primary benefits of the mini-test will be: 1) the collection of data about the spillway integrity at various spillway discharges, 2) the collection of temperature information at various combinations of spillway/powerhouse discharges for use in future water temperature modeling, 3) the temporary increase in Missouri River water temperatures within a limited area to enhance pallid sturgeon habitat, and 4) the testing and standardization of methodologies to be used for monitoring conditions during full implementation.

The Omaha District is cooperating with the Montana Department of Fish, Wildlife, and Parks (MTFWP) to collect water temperature and turbidity data at several locations in the Missouri River below Fort Peck Dam. This information will be used to establish baseline water quality conditions and evaluate the effects of discharging water down the spillway at Fort Peck Dam.

4. WATER QUALITY ISSUES AND PROBLEMS IN NWO

a. Issues and Problems of 2001

(1) Pesticides and Heavy Metal Contamination. Pesticide application throughout the Missouri River basin has affected most Omaha District projects. Pesticides detected in the past five years include cyanazine, atrazine, alachlor, diazinon, dachthal, metolachlor, dieldrin, simazine, metribuzin, propachlor, dicamba and trifluralin. Not all the listed pesticides are covered by Federal criteria or state water quality standards.

Due to the widespread occurrence of pesticides, bioaccumulation of some pesticides in tissue of aquatic organisms is a potential threat to all consumers of these organisms. A 1986 fish tissue analyses program evaluated the extent of bioaccumulation of pesticides and metals in fish of the Salt Creek and Papillion Creeks Lake projects. Results of those tests show that chlordane, dieldrin, DDT and several metals were detectable, but below the level set by the Food and Drug Administration (FDA) to limit or restrict human consumption. Similar studies have not been undertaken to update this information.

Fish tissue collected from Zorinsky and Wehrspann Lakes by the Nebraska Department of Environmental Quality (NDEQ) past four years has exceeded FDA recommended human consumption limits based on mercury levels in the tissue. The Nebraska Health and Human Services (NHHSS) have issued an advisory against consumption of fish caught in these impoundments. The advisory at these impoundments is only directed at pregnant women, nursing women or infants; there is no cancer risk level involved.

Although not a COE project, the NHHSS has issued advisories on eating fish caught in the Salt Creek from Lincoln to the Platte River.

Tissue collected in the Salt Creek has contained both poly-chlorinated biphenyls (PCB) and dieldrin. The levels of these toxins were high enough to issue a consumption advisory.

The following sites, tested by the NDEQ, have shown no fish contamination that would warrant a consumption advisory under Nebraska protocol: Branched Oak, Bluestem, Conestoga, Holmes, Olive Creek, Pawnee, Wagon Train, Yankee Hill, Glen Cunningham, and Lewis and Clark Lake.

The USFWS has also conducted studies concerning fish collected in irrigation return water. The studies measured heavy metals and organochlorine pesticides in the fish tissue. Data were collected in 1996 in Lake Pocasse and in 1997 in the Cheyenne arm of Lake Oahe. Results of the 1996 testing are being combined with similar studies conducted in Colorado, Utah, Montana, North and South Dakota, Kansas and Nebraska. A report of the findings was to be published in 2001 but is now expected in 2002.

The Cheyenne River Sioux Tribe and the South Dakota Game, Fish and Parks collected fish tissue in the Cheyenne River, Moreau River, Grand River and these arms of Lake Oahe in 2000 and 2001. The tissue contained sufficient mercury to warrant a consumption advisory on fish caught in waters adjacent to tribal lands.

As a result of this study the South Dakota Game, Fish and Parks Department is going to extend the area of study in other portions of Lake Oahe in 2001 and 2002. To determine background levels of mercury, they are also going to study fish in land locked stock ponds. The source of the mercury may be mining concerns upstream from the reservoir.

The North Dakota Department of Health and Consolidated Laboratories (NDDHCL) in Bismarck, North Dakota, has issued an advisory on consumption of fish caught in some streams and lakes in North Dakota. Analysis of fish tissue was not undertaken in 2001 and the advisory has been applied state-wide with no specific lakes listed. The advisory is a chart and is species specific. Collection and analysis of fish may begin in 2002.

The Montana Department of Public Health and Human Services has published a "Meal Advisory" for consuming certain species and size of fish caught in Fort Peck Lake. The advisory is based on mercury in tissues of Walleye, northern pike, Lake Trout and Chinook salmon. The source of the mercury is considered to be mostly from natural sources, however, some may be from industrial or mining in the watershed.

(2) Urbanization. Urbanization is on-going around many Omaha District reservoirs. Reservoirs with urbanizing watersheds include Cherry Creek, Chatfield, Bear Creek, Holmes, Zorinsky, Glen Cunningham, Standing Bear, and Wehrspann Lakes. Urbanization to a lesser degree is occurring at additional projects.

Construction methods disturb the land and allow sediment laden run-off to impact nearby streams and lakes. Best Management Practices (BMP) to minimize construction associated sedimentation damages are rarely used effectively. Methods of minimizing construction impact include; temporary sediment retention basins, phased “grading”, runoff control (e.g. hay bales, silt curtains, etc). Efforts should be made to prevent off-project construction sedimentation from causing on-project impacts. This could be accomplished by working with developers and appropriate state, city, or county agencies.

Post construction problems are commonly associated with storm drainage and urban pollution. The conversion of grasslands or forests to roads, rooftops, sidewalks, and other water impervious surfaces make stream flows more variable and increases the frequency of high flow events. In addition, pollutants associated with urban drainage can cause severe impacts to downstream water bodies. Storm sewer exits can be allowed on project lands provided detention in the form of ponds, swales, or wetlands exist on private property. A developer may be asked to construct a series of wetlands to slow downhill flows and provide time for bacterial die-off, chemical degradation, reduced flow rates, and sediment fall out.

(3) Sedimentation Sedimentation is a process which reduces the usefulness of reservoirs. In the design and construction of reservoirs, the COE will commonly allow for additional volume to accommodate sedimentation. The inflowing sediment can seriously affect the reservoir ecology, fisheries and benthos. The reservoir can suffer ecological damage before a volume function such as flood control is impacted. The influx of sediment eliminates fish habitat, adds nutrients, destroys aesthetics, and decreases biodiversity. Working closely with the project sponsors in an effort to manage sediment input would ultimately prolong reservoir life. Wetlands or sediment traps could be constructed at the upper end of a reservoir either upstream of the reservoir, or by taking a portion of the reservoir’s upper end, making a wetland.

In an effort to slow the sediment load emptying into Wehrspann Lake a sediment impoundment structure was built upstream of the reservoir in 1999.

(4) Shoreline Erosion. Shoreline erosion is a major problem occurring on nearly all reservoirs located in areas of erodible soils such as the Midwest. The Omaha District alone has over 6000 miles of reservoir shoreline of which between 70 and 90 percent is eroding. Some facilities have been protected, such as recreational and archaeological sites, but most of the shoreline continues to erode. Continued loss of the shoreline habitat (littoral zone) results in the loss of fishery habitat as well as loss of habitat for other biota such as aquatic vegetation and benthos. Past shoreline erosion efforts should be evaluated for effectiveness so that successes can be repeated.

b. Water Quality Classification

The water quality conditions in each project have been classified in accordance with the following criteria:

CLASS	CRITERIA
I	High Water Quality No Known Problems
II	Generally Good Water Quality: Minor or Suspected Problems
III	Continuing Water Quality Concerns Requires Close Monitoring of Trends and Careful Examination of Water Quality Concerns

The following is a list of projects evaluated according to the above classifications. This classification was conducted in 1989.

(1) Class I: None

(2) Class II

Fort Peck	Chatfield	Garrison	Oahe
Big Bend	Fort Randall	Gavins Point	Audubon
Pipestem	Lake Pocasse	Lake Yankton	Cold Brook
Cottonwood Springs			

(3) Class III

Zorinsky	Standing Bear	Pawnee	Wehrspann
Yankee Hill	Glenn Cunningham	Stagecoach	Conestoga
Cherry Creek	Bowman-Haley	Holmes	Bluestem
Bear Creek	Branched Oak	East Twin	West Twin
Olive Creek	Wagon Train	Missouri River	

5. TECHNICAL ASSISTANCE TO OTHERS

a. Technical Assistance – Engineering Division

- Participated in revising the Hydrological Engineering Branch’s Quality Management Plan.
- Reviewed proposed Sand Creek project regarding water quality issues.
- Reviewed Section 1135 projects.

- Presented a paper on the Omaha Districts use of CE-Dasler water quality data management system

b. Technical Assistance – Planning Division

- Reviewed proposed Ft. Peck “mini-test” regarding water quality issues and application of state and tribal water quality standards. Provided information to assist in the development of the Environmental Assessment of the proposed action.
- Developed and conducted a water quality scoping study of the Missouri National Recreational Reach below Gavins Point Dam. A study report is in preparation.
- Collected elutriate samples from two locations, Tieville Bend and Ponca State Park

c. Technical Assistance – Northwest Division

- Participated on the Division’s “Water Quality Team”

d. Technical Assistance – Outside Agencies.

- Participated with other Federal, state, and local agencies on a monitoring “workgroup” regarding water quality issues in the Missouri River below Ft. Peck Dam.
- Provided water quality information to the State of Nebraska regarding Corps reservoirs.

f. Water Quality Sample Collection Training. The Omaha District Water Quality Unit utilizes approximately 30 area personnel for water quality sample collection and support of the continuous recording water quality monitors. Periodic training of new personnel and refresher training is necessary to maintain the present quality of field sampling. The following Projects were provided with training:

1. Fort Randall
2. Big Bend
3. Gavins Point

6. GOALS AND RECOMMENDATIONS

The following actions are recommended to maintain the overall water quality program.

- a. Maintain a balanced Water Quality Management Program that is responsive to project and agency needs.
- b. Assist Operations elements with the development of action plans for dealing with emergency situations such as fish kills or algal problems and assist Real Estate with easement problems pertinent to water quality applications.

- c. Expand on the use and training of project personnel to collect water quality data.
- d. Maintain a viable Water Quality Data Collection Program to determine if project waters are in compliance with applicable State water quality standards.
- e. Cooperate with state and Federal agencies in evaluation of stream flow needs and resolving problems beyond Corps management boundaries to insure beneficial usage of impounded waters.
- f. Assist other district elements in the assessment of potential or actual water quality issues.
- g. Identify and resolve point source pollution problems such as inadequate sewage treatment.
- h. Maintain a viable monitoring program at all the projects in accordance with ranked priorities, concentrating more effort on Class III projects, as identified in 4.b.
- i. Facilitate coordination with state agencies in regard to implementing watershed pollution control by providing an understanding of project conditions.

The following actions are recommended to improve the Omaha District's water quality management program.

- (1) Maintain a water quality data collection program that addresses project-specific information needs, is response to emerging water quality issues, ensures validity of collected data, and maximizes partnering of monitoring efforts with other entities.
- (2) Develop a monitoring strategy to direct and refocus District water quality monitoring activities.
- (3) Revise and Update the Quality Assurance Quality Control (QA/QC) Program for water quality monitoring and assessment.
 - (a) Development and revise Standards Operating Procedures (SOPs) as appropriate.
 - (b) Institute a "formal" data quality review process.
 - (c) Institute a systematic planning process for establishing data quality objectives for all water quality monitoring activities.
 - (d) Require development of Sampling and Analysis Plans (SAPs) for all water quality monitoring activities.
- (4) Upgrade the Water Quality Unit's ability to assess and evaluate water quality information by providing the appropriate statistical and GIS software and staff training.
- (5) Institute a process to conduct detailed project-specific water quality evaluations and update project water quality management plans on a regular basis.