6.0 RECOMMENDATIONS

This appraisal-level water needs assessment has provided information on the potential unmet water demands of several major cities in the Red River Valley along with potential limitations on the availability of additional ground water for municipalities and rural water systems. Actual water use or demand may fall somewhere between the Bureau of Reclamation's projections and participant projections. Using the shortages of the 1930s that provides a basis for the known "worse-case" situation. The 1930s drought cycle, together with the projected water needs at year 2050, provide an indication of the magnitude of future water shortages. The water supply shortages indicated by this analysis are large enough to suggest that some action should be taken to consider water supply alternatives. The next prudent step in water supply management or development would be to scope and assess a full spectrum of alternatives to provide solutions to the water needs mentioned above. This followup planning study would also be at an appraisal level of detail and would be considered the Phase II component of this comprehensive water needs assessment.

Concerns about the costs and the degree of difficulty for treatment of surface water and the occurrence of disinfection byproducts have been clearly stated by the municipal water treatment authorities and health department officials. This report therefore illustrates a need for action on issues which relate to both water quantity and water quality. Water supply alternatives that can stabilize and improve water quality will help contain water treatment costs and enhance the capabilities of the water suppliers to meet Safe Drinking Water Act requirements.

Municipal water supply needs that should be addressed in the follow-up studies are the quantity and quality of flows under drought and low flow conditions. Rural demands are included here primarily as a ground water demand for the rural water systems. Rural water demands have not been modeled; however, expected increasing demands for ground water will require continued restraint on ground water permitting, therefore, limiting the expansion capability of future rural and municipal well fields. Rural water systems that are currently using a high percentage of their appropriated amount may not be able to obtain additional ground water. Declining ground water trends expected during a prolonged drought may create restrictions on some ground water users. The next phase of planning could incorporate these rural water systems into a plan for addressing water needs for the entire study area. Alternatives could be developed that would address this demand in concert with other unmet water supply demands.

Industrial water demand has become an important growth and economic issue due to the amount of agricultural processing and related industrial development in the Red River Valley. Additional details concerning the existing and future industrial water uses and treatment methods are needed to establish firm quantity and quality requirements. Contributions to the surface water return flows need to be verified and assessed for their impact on water quality and subsequent treatment requirements by other downstream municipalities.

Other issues that should be addressed as part of followup studies include the technical and institutional concerns regarding fish and wildlife needs, drought response planning, Lake Ashtabula operation optimization, and agricultural water supply issues. Reclamation is preparing a separate document to evaluate and discuss minimum flows within the study area. This document should be prepared in a timely manner so that it can be used as guidance in planning for alternatives for the Red River Valley MR&I needs. To fully analyze the above issues, it is important that input be provided from all interested stakeholders.

The need for a minimum stream flow to accommodate M&I discharges and to maintain aquatic life and recreation has been raised as an issue. Given the legal and institutional setting, solutions to this issue could be very difficult to develop. The hydrologic and biologic setting will be described and analyzed in the Phase I, Part B study. It is recommended that Reclamation prepare a separate document to discuss and evaluate minimum instream flows within the study area. This document should be prepared in a timely manner so that it can be used as guidance in Phase II of the Red River Valley MR&I studies.

Alternatives to address identified water shortages should be considered. An assessment of various alternatives would provide useful information to the participants and decision makers. Such an assessment would be performed at an appraisal level and considered to be the Phase II component of this water needs analysis. This effort should include an evaluation of alternatives to manage projected water demands and supplies, including, but not be limited to, the following:

Demand Management

- Alternative city water management techniques including conservation programs for both the public and private sectors.

- Drought response planning to provide for the maximum benefit of water supplies that are available in times of prolonged dry periods.

Supply Management

- Optimization of Lake Ashtabula reservoir operations and a re-examination of coordination of operations, especially during drought periods. This could include development of a drought operations plan that uses some of the storage below elevation 1257 feet which is currently identified by the Corps of Engineers as a conservation pool for wildlife.

- Optimization of basin supply including transfer of available water between in-basin users when necessary.

- Consideration of additional storage facilities in the Red River Valley.

- Examination of water importation proposals.

- Advanced water treatment technologies.

- Water recycling.

- Conjunctive use of surface and ground water resources.

- Various combination of the above alternatives.

These items are complex and would require further input from interested stakeholders to ensure a more thorough analysis of basin water management concerns. Continued refinements and details of the river system and municipal demands should be included with the Phase II analysis as time and budget allow.