Madison Water Utility	PROJECT SCOPING DOCUMENT	Project Manager:	Dennis M. Cawley P.E.
		Project Information:	Pressure Zone 4 Water Supply Augmentation
		Draft:	
Department: Madison Water Utility	Section: Engineering	Revised:	
		Approved:	

Project Scoping Document

Pressure Zone 4 Water Supply Augmentation

Table Of Contents:

Madison Water Utility	PROJECT SCOPING DOCUMENT	Project Manager:	Dennis M. Cawley P.E.
		Project Information:	Pressure Zone 4 Water Supply Augmentation
		Draft:	
Department: Madison Water Utility	Section: Engineering	Revised:	
		Approved:	

Scoping Document – Pressure Zone 4 Water Supply Augmentation

1. Project Description

A description of the project, including a map showing existing facilities, approximate location of proposed facilities, documented contaminated sites, the extent of the Eau Claire shale (if applicable) and the location of floodplain areas.

The 2006 Water Utility Master Plan identified fire flow deficiencies throughout significant portions of Pressure Zone 4 (PZ4). PZ4 is supplied by a single source, which makes it vulnerable and the water supply less reliable. PZ4 is also expanding rapidly to the southeast making Unit Well 9 hydraulically remote from the far reaches of the zone and therefore difficult to move water efficiently and effectively to where it is needed.

The Madison Water Utility proposes to construct a new Unit Well in the southeast corner of the City in Pressure Zone 4. Maps showing existing facilities and the boundary of PZ4 are shown in Exhibit A.

A standard Madison unit well consists of a deep well capable of producing 3 MGD, an approximately 400,000 gallon reservoir, and a booster station. This booster station is expected to have multiple sets of booster pumps, as it will be designed to serve both pressure district 6(PZ6) and pressure district 4 (PZ4).

Depending on the final location of this well it is possible additional water main may need to be installed to serve PZ4, and it is likely additional water main will need to be installed to serve PZ6.

2. Purpose

The purpose and necessity of the project, with supporting data including recent and anticipated water consumption data and hydraulic model summarizations.

The two primary reasons for needing another unit well in this area are fire protection and supply redundancy.

During the preparation of the 2006 Water Master Plan, PZ4 was analyzed for fire flow capability and the fire flow analysis of our current system shows significant areas of deficiency in this zone. The criteria established to determine fire flow requirements and maps showing areas of fire flow deficiency are included in Exhibit B.

The system facilities map shows that PZ4 is presently served only by Unit Well 9. When Well 9 is out of service valves must be opened so that service can be maintained from PZ6. All points of connection between the pressure districts are at the northern end of PZ4. When Well 9 is down the system has difficulty maintaining adequate flow and pressure in the rapidly expanding southeast portion of this pressure zone.

Once constructed PZ4 will have excess supply capacity when both wells are in service. The proposed dual pump station and transmission main will allow water to be pumped from PZ4 to PZ6 to supplement supply in PZ6. This function will serve to delay future well projects within PZ6 and will improve supply reliability.

Madison Water Utility	PROJECT SCOPING DOCUMENT	Project Manager:	Dennis M. Cawley P.E.
		Project Information:	Pressure Zone 4 Water Supply Augmentation
		Draft:	
Department: Madison Water Utility	Section: Engineering	Revised:	
		Approved:	

Scoping Document – Pressure Zone 4 Water Supply Augmentation

3. Projected Effect

The projected affect of the project on quality and reliability of service, and hydrologic impacts.

This project will increase system reliability and improve fire protection to the customers in Pressure Zone 4.

4. Alternatives

A description of alternative projects or programs considered (This does not include specific site comparisons during early phases of the project).

1. Transfer water from Pressure Zone 6
   a. Description
      Instead of creating redundancy from a new well, one alternative would be to transfer water from other existing wells in other pressure districts.

   b. Discussion
      The only adjoining pressure district is PZ6. This is how the Water Utility currently provides water to PZ4 when Unit Well 9 is taken out of service.

      There are two problems with this current scenario. The first is that because PZ6 operates at a higher hydraulic gradient than PZ4 the 3 million gallon reservoir at Unit Well 9 is taken out of service and thus while the static pressures are actually raised the fire protection in this zone is reduced during these periods. To overcome this a series of pressure reducing stations along with larger transmission mains would have to be installed along the border between the two districts. The second problem is that this alternative puts more pressure on the wells in the eastern portion of PZ6. PZ6 east does not have excess supply capacity, especially with the use of Unit Well 29 at 1100 gpm, and the loss of Unit Well 3. Hydraulic analysis using the Water Utility's computer model shows that this option creates significant fire flow deficiencies in PZ 6, specifically in the Truax area and in the East Towne area. This lack of surplus makes routine transfer of water to PZ4 unfeasible.

2. Transfer water from adjacent municipalities
   a. Description
      Another alternative would be to purchase water from other municipalities.

   b. Discussion
      The only adjoining municipalities are the City of Monona and the Village of McFarland. Neither municipality however has enough excess capacity to meet our supply needs. A new well would have to be constructed in one of the adjoining municipalities.

3. Construct a reservoir only, without a deep well
   a. Description
      Instead of drilling a well we build a large reservoir only on the site.

Scoping Document – Pressure Zone 4 Water Supply Augmentation

b. Discussion
A large reservoir would provide needed supplemental supply for fire flow but it would not be a redundant water supply source. In order to solve the redundancy issue large volumes of water would still have to be transferred from PZ6 and the same fire flow deficiency issues discussed in Alternative 1. Since PZ4 has a domestic water demand of about 1 MGD even a 6 million gallon reservoir would have less than a weeks capacity and thus would not solve the redundant supply problem. This alternative does not meet all project objectives.

5. Photographic Examples

Photographic examples of similar facilities with discussion of possible variations.

The most recent similar projects are Unit Wells 28, 29, & 30. Photos of these wells are attached as Exhibit C for your viewing in order to give all parties an idea of the size and scope of the project, as well as seeing different architectural styles.

6. Cost Estimate

The cost of the project by major plant accounts.

The total budget for this project is $3,259,000. This breaks down to $601,000 for well construction, $269,000 for design, and $2,990,000 for construction. Previously the Water Utility spent $56,976.44 on a test well at this site. Also previously the Water Utility paid a $13,196 sewer assessment on this property. This creates the following estimate of final project cost by major plant account.

Land $13,196
Well $658,000
Reservoir $854,000
Pumphouse $1,297,000
Pumping Equipment $997,000
Chlorinating Equipment $23,000
Fluoridating Equipment $ 20,000
Telemetry Equipment $68,000

7. Financing

The proposed method of financing the project.

We propose to continue our practice of financing new construction through revenue bonds.

It is estimated that the addition of this project will cost the average ratepayer approximately $ 4.00 per year.

8. Operational Costs

The estimated annual operating costs of the project, by major expense accounts, to include possible fiscal effects of water treatment if anticipated.

Madison Water Utility	PROJECT SCOPING DOCUMENT	Project Manager:	Dennis M. Cawley P.E.
		Project Information:	Pressure Zone 4 Water Supply Augmentation
		Draft:	
Department: Madison Water Utility	Section: Engineering	Revised:	
		Approved:	

Scoping Document – Pressure Zone 4 Water Supply Augmentation

The following are average yearly operating costs for a typical well:

Power $ 80,000 to $ 110,000
Building and Pumping equipment maintenance $ 18,000
Chemicals $ 7500
Chemical equipment maintenance $5000
Sampling and testing $ 13,000

9. Replacement Costs	*A description of and the original cost of any property being replaced, by major plant accounts.*

No Utility property is being replaced with this project.

10. Designation of Affected Parties, Notification List	*The designation of public utilities, alders, and other persons materially affected by the project and a list of those, which have been notified.*

Since no site has been selected for a well the current list of stakeholders is considered to be all residents of PZ4. There are currently 3 active neighborhood associations in PZ4.
The Eastmorland Community Association
The Lake Edge Neighborhood Association
The Glendale Neighborhood Association

The alders for this area are Alder Larry Palm representing the northwest corner of PZ4 and Alder Judy Compton representing the balance of PZ4.

11. RFP for Property Valuation Analysis	*A draft request for proposals (RFP) for the acquisition of services to determine the impact on values of adjoining properties.*

It is anticipated that this project will have no negative impact on the real estate values of the surrounding area. If requested the Madison Water Utility will prepare an RFP for the acquisition of services to determine the impact on values of adjoining properties.

12. Site Selection Criteria	*A description of the draft site selection criteria to be used in locating, evaluating, and ranking potential sites for the proposed facility. Site selection criteria categories will include regulatory requirements, groundwater quality and quantity, aesthetic impact, compatibility with existing neighborhood context, historic land use, existence of natural buffers, and environmental equity/justice considerations.*

When determining the permanent location for this well the following criteria will be considered: Quantity and quality of available water, land availability and cost, proximity to sources of contamination, proximity to large transmission mains, and neighborhood impact. Other criteria may be added by the Citizens Advisory Panel.

Madison Water Utility	PROJECT SCOPING DOCUMENT	Project Manager:	Dennis M. Cawley P.E.
		Project Information:	Pressure Zone 4 Water Supply Augmentation
		Draft:	
Department: Madison Water Utility	Section: Engineering	Revised:	
		Approved:	

Scoping Document – Pressure Zone 4 Water Supply Augmentation

At this time the only identified potential location for the well is 5802 Femrite Drive.

This site was dedicated to the Water Utility at no cost as part of the creation of the Second Addition to World Dairy Center Plat in 1996. This site was selected due to its availability, its proximity to a natural drainage way, and its proximity to existing distribution mains. Due to the presence of groundwater contamination however other sites will be explored.

In 2001 the Water Utility did consider an alternative site in the Madison Commerce Park Plat on Marsh Road approximately 1000 ft. south of Voges Road. However due to the presence of a quarry just east of this site the Wisconsin Department of Natural Resources indicated that they would not approve this site for a municipal well.

When siting wells in this pressure zone it is important to note that due to the existence of certain geological conditions, mainly a fault line that does not allow the lateral movement of water, there are lands in this pressure zone where adequate capacity does not exist for a municipal well. A municipal well, originally drilled by the Town of Blooming Grove on Savannah Road, and Parks Department irrigation wells at Yahara Hills all have specific capacities ten to twenty times less than our standard City of Madison wells.

13. Project Timeline	*The estimated project timeline, with identifies major project phases and decision points requiring an approved resolution from the Water Utility Board. Project phases requiring a resolution shall, at a minimum, include the establishment of the proposed project, the facility site selection, and the site plan selection.*

The key dates in the project approval process are as follows:

On March 24, 2009 the Water Utility Board held a public hearing and voted to establish a project.

On December 15, 2009 the Water Utility Board will hold a public hearing and be asked to accept staff recommendation to select drilling a new well as the preferred alternative for solving the problems identified at the beginning of this document. If the Board votes to accept this recommendation then the process will begin to select a site for a new well.

Madison Water Utility	PROJECT SCOPING DOCUMENT	Project Manager:	Dennis M. Cawley P.E.
		Project Information:	Pressure Zone 4 Water Supply Augmentation
		Draft:	
Department: Madison Water Utility	Section: Engineering	Revised:	
		Approved:	

Scoping Document – Pressure Zone 4 Water Supply Augmentation

14. Exhibits

Documents referenced in the Scoping Document.

List of Exhibits

Location Map and Existing Facilities Map	Exhibit A
Black & Veatch Fire Flow Analysis	Exhibit B
Photos of Similar Projects	Exhibit C