

TO: James L. App, City Manager
FROM: Joseph M. Deakin, Public Works Director
SUBJECT: Southwest Reservoir Design Revision
DATE: September 17, 2002

NEEDS: For the City Council to review and endorse a revised design of the Southwest Reservoir Project.

- FACTS:**
1. In 1995, the City Council reviewed and approved the most recent amendment to the City Water Master Plan. The Water Master Plan describes adding reservoir (0.7 million gallons), the Southwest Reservoir, to serve the water pressure needs to 'Area F'.
 2. Area 'F', the southwest corner of the City, is generally bounded by First Street (extended west) to the north, Vine Street/Theatre Drive to the east, and to the west and south by the City sphere-of-influence boundary.
 3. The City Council engaged Boyle Engineering in 2001 to site the Southwest Reservoir. In July 2001, Boyle Engineering presented several options for reservoir site location. The City Council directed staff to proceed with a design for the reservoir west of Highway 101 and north of Highway 46 West.
 4. In October 2001, the City Council engaged Boyle Engineering to design the Southwest Reservoir at the selected site.

**ANALYSIS
AND**

CONCLUSION: The 1995 City Water Master Plan identified the need for a Southwest Reservoir at an elevation of 1,060 feet above mean sea level (amsl) to supply a demand planned at 80 million-gallons per year. The 1,060 feet amsl elevation specified in the Master Plan would provide gravity flow service to the ultimate build-out elevations in Area 'F', including residential areas in the sphere-of-influence and to the west (Almira Heights).

Area 'F' also includes service to the commercial zone located on Theatre Drive within the City. The Master Plan initiated the concept to use the Southwest Reservoir to yield necessary fire-flows during emergencies to these commercial developments. Because Theatre Drive is much lower in elevation than the planned Southwest Reservoir, a pressure-reducing-valve (PRV) would be needed. The PRV insures that the pressure from the reservoir (at 1,060 feet amsl) can be adequately reduced, so service delivered to lower elevations is provided at a safe, manageable pressure. It is important to note that, while PRVs are necessary and valuable components of a typical municipal water distribution network, they are energy dissipaters, i.e. they purposely cause energy to be lost.

In the late 1990's, commercial development along Theatre Drive accelerated the priorities planned in the Master Plan. Currently, the City's priority in Area 'F' is to provide storage, flow and residual pressure to supplement and improve fire-flow to Theatre Drive. Residential development in the hillsides to the north and west of Area 'F' (not currently within City limits) are not as pressing as the Theatre Drive development, but still need to be evaluated in the Southwest Reservoir design. The difference in need and time are important considerations in developing a reservoir, and revisiting assumptions made in 1995 versus actual current circumstances.

The planned and actual developments in Area 'F' served by the proposed Southwest Reservoir demand water quantity and pressure specific to a need. The needs are interdependent, but also specific to the development's location, size, elevation and category. Staff reviewed the complex demands for the reservoir service, and developed 3 primary reservoir design/siting inquiries:

1. Is it better to build to the ultimate planning elevation (1,060 feet amsl)?;
or
2. Is it better to locate the tank at a lower elevation (requiring less energy cost to fill it) and plan to build a secondary delivery component to the higher elevations if/when the demand develops?;
or
3. Are there other options that provide effective energy use and needed service?

Boyle Engineering studied site options to analyze the cost/benefits of alternate site locations. Boyle's analysis evaluated three (3) options:

1. Construct a reservoir at 1,060 feet amsl
2. Construct a reservoir at a lower elevation to primarily address fireflow requirements on Theatre Drive
3. Upsize 20,400 linear feet of existing pipes to 24-inch diameter throughout downtown and areas west of Spring Street.

The analysis indicates that option (2), adding a 700,000-gallon reservoir within the southern West Main Zone at a revised elevation of 870 feet amsl would best meet the City's needs. This lower elevation:

- provides the needed additional fire flow to the currently developing commercial areas on Ramada Drive;
- is within property already under consideration and discussion;
- minimizes investment in piping; and
- is energy efficient, while still increasing water pressure in the Zone.

The drawback to the lower reservoir elevation is it will require a secondary pressure system (e.g. a booster pump house) for any future residential developments on properties currently outside City limits at the higher elevations, if they occur. Because the residential developments at those higher elevations are on properties currently outside City limits they are not likely to occur in the near future, and because a secondary booster is a common element in water distribution networks, staff provides this as an option for consideration.

POLICY

REFERENCE: 1995 El Paso de Robles Water Master Plan Update

FISCAL

IMPACT: The project as originally designed (elevation 1,060) is estimated probably at \$2.2 million dollars. Energy costs to pump the water to this elevation is up to an additional \$65,000 annually depending on demand flow. The estimated construction cost for the revised design (elevation 870) is \$1.3 million dollars. Neither amount includes the cost to acquire property, landscaping, or special construction to reduce the impact of the tank to the surrounding view shed. The project budget of \$3 million dollars remains adequate to fund the design, property acquisition and construction for the 0.7 million-gallon reservoir and distribution piping at elevation 870 feet amsl.

OPTIONS:

- a. Direct staff to continue to design the Southwest Reservoir, revising the design reservoir design elevation to 870 feet above mean sea level, and to begin negotiations to acquire property needed to construct the reservoir, distribution piping, and associated facilities.
- b. Direct staff to continue designing the Southwest Reservoir at the original elevation of 1,060 feet, and begin negotiations to acquire property needed to construct the reservoir, distribution piping, and associated facilities.
- c. Amend, modify or reject the above options.

Attachments (1)

- 1) Boyle Engineering's Report dated September 2002