

FOOTNOTES



Sacramento County Water Agency

Final Report

Zone 40 Water Supply Master Plan Update

June 1995



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Appendix A - Zone 40 Water Supply Elements

| | |
|------------------------|--|
| ELEMENT: | G3. SPREADING BASINS USING INTERMITTENT FLOWS |
| ELEMENT SUMMARY | |
| Water Source: | Groundwater, Surface Water |
| Maximum Yield: | 50,000 AF/Yr |
| Reliability: | Low |
| Average Yield: | up to 37,500 AF/Yr |
| Raw Water Cost: | \$2.30 - \$15.50/AF |

ELEMENT DESCRIPTION

General Description

This water supply element involves groundwater recharge through the use of spreading basins with intermittent flows from either the Sacramento or American Rivers as the source of water. Spreading basins can be constructed by either excavation or by building dikes and berms. Water is spread over the ground surface to maximize the amount that can infiltrate into the ground and percolate to the groundwater. This water will be later recovered from the groundwater basin using wells situated near the recharge basins and conveyed to Zone 40's distribution system.

The soils within Zone 40 are classified in the Soil Hydrologic Groups C and D which are not conducive for percolation/recharge. The best location for groundwater spreading basins is adjacent to the Zone 40 study area in the Deer Creek and Cosumnes River floodplains where soil infiltration rates are fairly high.

Yield/Reliability

While intermittent flows are large in many years, the yield of this element is limited by the storage capacity of the groundwater basin in the recharge area. Groundwater modeling analyses indicates there is enough aquifer storage for about 50,000 AF/Yr in the vicinity of the Deer Creek and Cosumnes River floodplains. Spreading operations will have to be "put and take" operations. Intermittent flow will be stored during the winter and then recovered during the same year. Groundwater levels will have to be drawn down before the next winter in order to provide storage capacity for both stream recharge that naturally occurs in the floodplain and the intermittent flow recharge operations.

Intermittent flow is unreliable with respect to when it will be available and in what quantities. During an extreme drought extending over several years there will not be any intermittent flows available. Based on the work done by Water Resources Management, Inc., excess flows will be available from the Sacramento River about 75% of the time during the four months period of December through March providing an average yield of

Appendix A - Zone 40 Water Supply Elements

approximately 37,500 AF/Yr. In most years, intermittent flows will not be available during the late spring, summer and fall months.

Facilities

Facilities required for this element include a diversion structure on the Sacramento River, a pump station and pipeline to the recharge area, spreading basins, recovery wells, and conveyance facilities to deliver recovered water to the Zone 40 distribution system. An alternative route will involve taking intermittent flow off the American River, using the Folsom South Canal as conveyance, and constructing a pipeline from the Folsom South Canal to the recharge area.

Institutional/Environmental

This element will require obtaining permits from the State Water Resources Control Board and possibly the DWR and USBR to divert intermittent flows on a long term basis. In addition, CEQA and possibly NEPA environmental compliance will be required.

Environmental permitting must also be performed for the recharge and recovery operations. The Agency will also be required to obtain the appropriate land use permits develop and operate the recharge and recovery operations within the Cosumnes River floodplain. Potential impacts of the spreading and recovery operations on the existing groundwater users in the area would have to be addressed. These impacts may include additional pumping costs due to a lowered groundwater table during months when pumping operations are underway.

In addition, the location of the spreading basins (within the Cosumnes River and Deer Creek floodplain) may subject the recharge operations to periodic flooding events which may impede the recharge operations. Also, the spreading basins may adversely impact the severity of flooding within the existing floodplain and therefore may require additional land use permits and mitigation measures.

Time to Implement

Based on the required facilities and coordination between County agencies and regulatory agencies, it is anticipated that this water supply element will not be available for 5 - 10 years.

Cost of Raw Water

The cost of the raw water will need to be determined based on negotiations with the USBR. However, based on 1994 rates, the raw water costs will range from approximately \$2.30/AF (without Folsom South Canal conveyance) to \$15.50/AF (with Folsom South Canal conveyance). Because the intermittent "winter" water is not stored

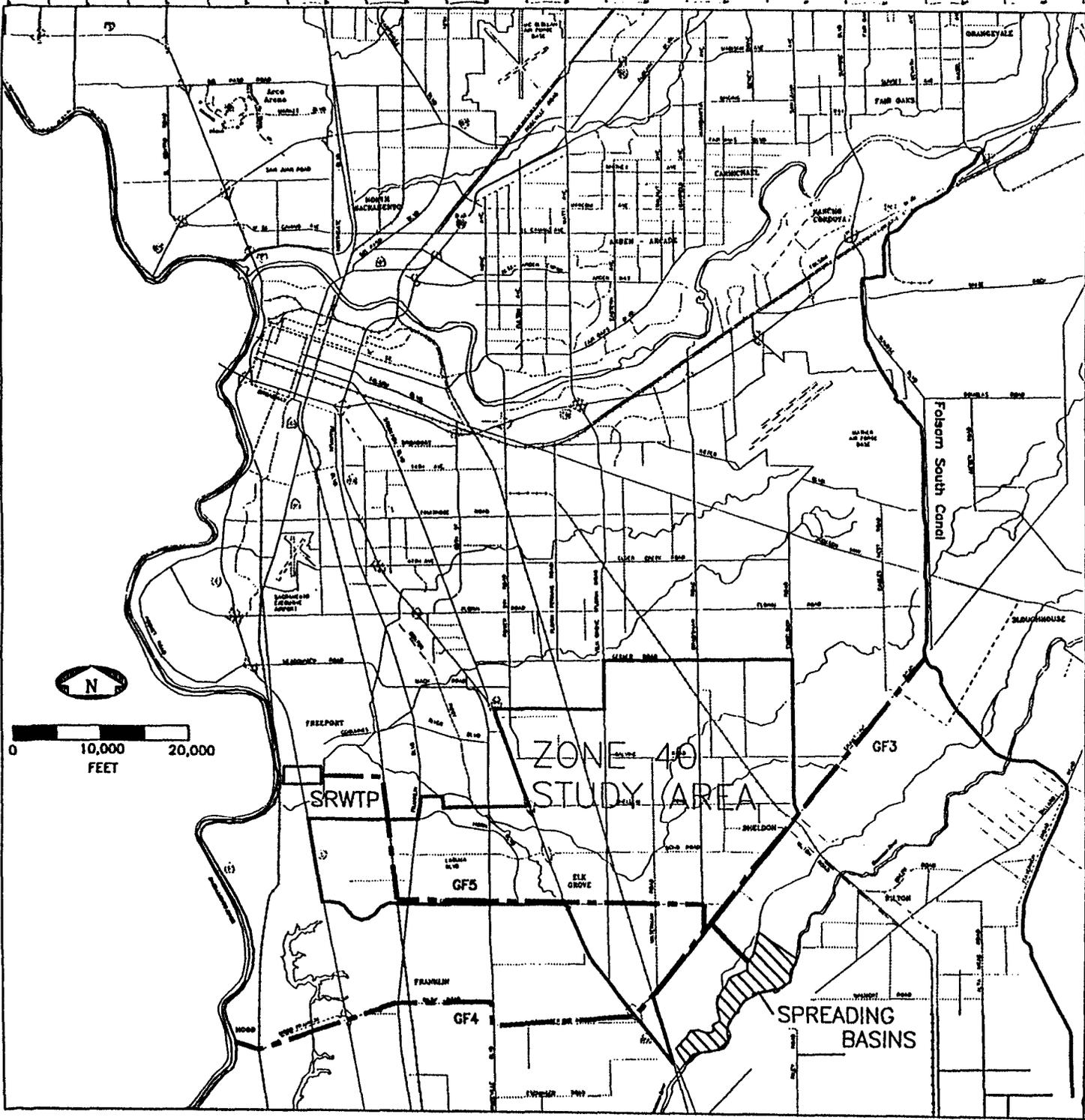
Appendix A - Zone 40 Water Supply Elements

in the USBR CVP storage system, the above costs do not include a CVP storage fee for obtaining the water. However, the costs do include the CVP O&M marketing fee (\$1.31/AF) and deferred interest (approximately \$1.00/AF). The raw water costs are higher if Folsom South Canal conveyance is used due to a conveyance capital charge (\$5.50/AF) and conveyance O&M charge (\$7.70/AF).

TABLE 10

ZONE 40 WATER SUPPLY MASTER PLAN UPDATE
Summary of Groundwater Facility Elements

| Facility Element | Required Facilities | Capital Costs (in Millions of Dollars) | Appendix B Reference Page No. |
|--|--|---|-------------------------------------|
| GF1. Additional Groundwater Capacity | <ul style="list-style-type: none"> • Wells • Satellite Treatment • Conveyance | 10 mgd: w/ iron, manganese: and arsenic: \$14.7 w/ radon: \$21.7 | B-2 |
| GF2. Local Infiltration Basins | <ul style="list-style-type: none"> • Infiltration Basin w/ stream diversion | 10 acre basin: \$0.8 | B-4 |
| GF3. Spreading Basin using Surface Water from Folsom South Canal | <ul style="list-style-type: none"> • Pump Station • Conveyance to Basins • Recharge Basins • Wells • Wellfield Pipeline • Conveyance to Zone 40 | 10,000 AF/Yr: \$34.7 20,000 AF/Yr: \$56.4 | B-6 |
| GF4 Spreading Basin using Surface Water from the Sacramento River | <ul style="list-style-type: none"> • Intake Structure • Pump Station • Conveyance to Basins • Recharge Basins • Wells • Wellfield Pipeline • Conveyance to Zone 40 | 10,000 AF/Yr: \$43.3 20,000 AF/Yr: \$68.6 | B-9 |
| GF5. Spreading Basin using Reclamation | <ul style="list-style-type: none"> • Tertiary WW Treatment • Pump Station • Conveyance to Basins • Recharge Basins • Wells • Wellfield Pipeline • Conveyance to Zone 40 | 10,000 AF/Yr: \$70.1 20,000 AF/Yr: \$122.2 | B-12 |
| GF6. Zone 40 Injection Wells using Treated Surface Water | <ul style="list-style-type: none"> • Injection Wells | \$0.07/well (retrofit existing well) \$0.39/well (new injection/ extraction well) | B-15 |
| GF7. Northgate Groundwater Transfer | <ul style="list-style-type: none"> • Connection to City distribution system at Northgate | \$0.3 | B-17 |
| GF8. Direct Groundwater Transfer from POU, South of American River | <ul style="list-style-type: none"> • Conveyance to Zone 40 | 10 mgd: \$4.7 20 mgd: \$7.4 | B-19 |



Legend

- GF3 SPREADING BASIN USING SURFACE WATER FROM FOLSOM SOUTH CANNAL
- GF4 SPREADING BASIN USING SURFACE WATER FROM SACRAMENTO RIVER
- GF5 SPREADING BASIN USING RECLAMATION

--- CONVEYANCE PIPELINE

FIGURE 1
SPREADING BASIN
CONVEYANCE:
ALTERNATIVE ELEMENTS

