Water Management and Conservation Plan

Emigration Improvement District - November 14, 2002

A. Background Information:

The Emigration Improvement District "EID" was established by vote of the Salt Lake County Commission in the fall of 1968 for the purpose of providing water and sewer services to Emigration Canyon residents. In June 1998, EID contracted with the Boyer Company and Freeze Creek Water Company "Boyer" to take over the water system they had built to provide water for Emigration Oaks Subdivision - Phase 1 - 6A "Oaks". This system has been run by EID since June 1998 and currently serves approximately 113 homes. As part of the agreement with Boyer, Boyer agreed to hold the number of lots to be developed in the future to a finite number and EID agreed to provide water services for Oaks. Build out of Oaks currently stands at 223 connections, or approximately 110 more than are currently served.

The engineers for EID determined that the Oaks system was insufficient in capacity both as to source and as to storage to provide service for the entire 223 connections. At about the same time, residents from two areas of the Canyon - Young Oaks/Little Oaks/Quads at mid canyon and Lower Burr Fork/Killyons Canyon in the upper canyon petitioned EID to expand the existing system to include their neighborhoods.

B. Existing Resources:

1. Water Rights - EID owns water rights 57-7796 (a17521, t26672) and 57- 8865 (a12710b), which combined, as modified by their respective change applications, provide for the annual diversion of approximately 740 acre-feet and allow for diversion from the three existing wells in the Oaks system. EID leases portions of its water rights to approximately 35 homeowners for use at their residences. There has been a moratorium on new water right appropriations in the canyon for approximately forty years. With the exception of the Oaks and Emigration Place, most of the existing homes in the canyon have individual water rights. Most individual water rights have been developed and are associated with existing homes with few unperfected rights remaining in the Canyon. In evaluating future impacts to the Canyon's water resources, EID considers all existing water rights whether held by the District or by individual Canyon residents.

2. Wells - Two wells are currently used to provide for the Oaks water system. Freeze Creek Well #1 (FCW#1) is 500 feet deep and is located in the Freeze Creek drainage. It is capable of providing about 60 - 70 gallons per minute continuously for several days to a week at a time. After sustained use, the level in the well drops and production rates are very limited. This well is used to supplement the production of Freeze Creek Well #2 (FCW#2). FCW#2 is approximately 800 feet deep with the pump placed at approximately 650 feet. It will normally pump approximately 200 gallons per minute for more sustained lengths of time. It will reach as high as 300 gallons per minute when the water level is high and has dropped to as low as 100 gallons per

minute when the water levels get very low. This well when assisted from time to time by FCW#1 has sufficient water to provide for the existing 114 homes in Oaks, plus a few more. However, it will not be able to provide for the entire Oaks build out of 224 homes.

A new well (BFW) has been drilled in the Brigham Fork drainage to a depth of 1,200 feet and was drilled on a 30 degree angle off vertical, to maximize the number of beds of aquifer material that it penetrates so as to maximize production and increase the aquifer storage potential. Initial pump tests indicate that EID has been successful in these goals. However, as with any bedrock well, only time will tell its true long-term pumping capacity. EID intends to equip BFW with a pump which can produce up to approximately 300 gpm, but, in order to protect water quality and insure against ground-water mining, EID intends to pump at an average rate of approximately 200 gpm. It is believed that placing BFW into production in combination with FCW#1 and FCW#2 will be sufficient to meet the needs of Oaks as well as the expansion areas.

Several years ago EID commissioned a hydrogeologic study of upper Emigration Canyon. That study catalogued surface and ground-water sources and identified potential source aquifers. The study identified that the canyon's aquifers are part of an integrated hydrologic system upon which present and future uses are dependant. All present and future water diversions impact the canyon's water resources, though the degree of direct impact to stream flows may differ depending on the source developed.

3. Storage - EID currently owns a 300,000 gallon underground concrete reservoir located within Oaks. An additional one million gallon concrete underground reservoir is anticipated as a part of the expansion project and will accommodate the two new areas and the Oaks shortfall in required facilities.

4. Distribution System - Oaks has water lines, fire hydrants, meter boxes, pressure reducing valves where appropriate and various and sundry connections and fixtures in place and is a viable operating system.. The main pipeline is 8 inches in diameter. The system provides a minimum 1,000 gallon per minute flow with the exception of one spur known as Old Oak Road which has up to five homes on it that may not receive a full 1,000 gallon per minute flow. An eight inch line with 5 fire hydrants was installed in an Easterly direction from Brigham Fork Circle (the furthest East road in Oaks) by Steve Creamer in 2000 as a condition of a contract to provide water services to Creamer by EID. That pipe will become part of the distribution system and will connect the existing system to the new reservoir site and beyond to the Lower Burr Fork/Killyon homes.

5. Telemetry System - A new telemetry system was installed by EID in 2000 for the Oaks water system. This system communicates via radio transmission and measures and records well depths, reservoir levels, pumping volumes, rates of pumping and electrical use. The pumps are selectively prompted to turn on automatically when the reservoir level gets below a prescribed level and turn off automatically when the level gets up to a prescribed level. All of these levels, volumes etc are available for observation and print-out on-line through PC Anywhere. The

levels are as set by an operator on a computer in Well house #2 or on-line. Permanent hard copy tables and graphs are created and kept in EID files in addition to the electronic files created by the computer programs in use. EID's manager and Aqua Environmental Services personnel monitor the system from their homes or offices thru the computer on a daily basis to assure the system continues to operate properly. The system includes a dial up system to warn the operator in case of unusual use, break in service etc.

C. Current Water Use and Determination of Future Requirements - Water Management Issues and Goals:

1. Use and Delivery - Both Oaks and Emigration Place Subdivisions have community water delivery systems. The Oaks and Emigration Place systems have water meters, while any other meters are voluntary and are read and monitored only by the owners. EID does have a program wherein they lease water rights to approximately 35 residences in the canyon. EID leases .75 acre feet per household, .45 acre feet for indoor use and .30 acre feet for outdoor use. Such leases and amounts apply to residents both within and outside of the water system.

2. System Additions - Since the existing source and storage are inadequate to meet the build-out of 300 in the expanded water service area, plans are being implemented to add storage and source to the system.

3. Meter Use - Meters are required by EID for all connections served by EID.

4. Limited Resource - For a number of years EID has been concerned about protecting the Canyon's limited water resources. More than ten years ago EID drilled 5 monitor wells in the Canyon and regularly measures water levels in these wells to determine whether there are changes in the aquifers upon which Canyon residents are dependant for their culinary water supply. Further, a continuing EID goal is to manage existing water resources in the canyon in such a way as to keep water flow in the creek the large majority of the time. While it is understood that in some drought years the stream may go dry, as it has historically, in most years it should be possible to maintain a flow. Many residents currently have wells (some quite shallow) along the stream that depend on the stream for recharging of the aquifer from which they derive their domestic and irrigation water. If the stream is allowed to dry up, then these wells along the creek suffer and many also dry up leaving the residents without a water supply. Recognizing that existing and future water depletions will impact the flows of Emigration Creek, EID adopted a creek protection policy to maintain our stream flow in all but the worst drought years. After substantial investigation, it was determined that the Canyon hydrology could not support more than approximately 700 homes without meaningful impacts to the flows in Emigration Creek. Since there are already roughly 450 homes in the canyon and 100 more lots approved for which water has been provided for, there remain about 150 future water services

EID will continue to promote water conservation throughout the Canyon. Not only must attempts be made to manage the number of homes in the canyon, the canyon must also promote

conservation by all homes. As an educational guide aimed at reducing water usage, EID hired Gayle Weyher Landscape Design to do a study and published a pamphlet entitled "A Guide to Landscaping with Available Water in Emigration Canyon". This booklet identifies low water use plants and gives ideas on how to landscape so that minimal water is used. This pamphlet has been distributed to all canyon residents.

5. **Conservation Campaign** - During the late summer and early fall of 2000, an intensive campaign to reduce water use in the Oaks was undertaken by EID, because of declining water levels in its wells. The campaign was successful in reducing water use to about 2/3 of its prior use. The conservation awareness level of the residents is good and lower consumption levels have been maintained.

6. **Rate Structure** - A "progressive" water rate structure was adopted in late 1999 for the Oaks water system that is owned by EID. The rate for the first 1,000 gallons is $ 2.15. The second 1,000 gallons in at a rate of $ 2.20 per thousand. The rates continue to increase by $ .05 per 1,000 gallons for each 1,000 gallons used. If water is used conservatively, then the use fee is very moderate, however, the more water that is used, the higher the use fee becomes per gallon. Excessive use can result in very high cost to the user thus penalizing excessive use. EID intended to continue with this rate structure as the new expansion is completed, but may adjust and fine tune it in the future.

D. Identification of Alternatives to Meet Future Water Needs:

EID does not have plans to expand beyond the current expansion project described herein. Any water system improvement in the Canyon should be built in such a way that they do not have to be redone if additional expansion is undertaken.

E. Evaluation and Selection of Alternatives:

Future demands for source, storage or distribution lines for areas served in the expanded water system should be minimal or non-existent. However, if additional source or storage is required it may dictate additional pipe lines to hook-up with the existing system. Research would be done to determine various alternatives that might be used to meet the need. Public hearings and careful assessment would be conducted by EID if such an expansion is required. Trustees are sympathetic to the Canyon environment and would strive to have as little impact as possible on animals, flora, fauna and visual appearance of our canyon.

F. Periodic Evaluation:

EID will review this Water Management and Conservation Plan periodically to determine if updating is appropriate. Trustees are on alert for new ideas, trends and policy that would help us better manage our precious resource - water. This is a major duty of the Trustees. EID will continue to monitor both the monitor wells owned by EID, stream flows, and use by customers to determine if there is deterioration in our conservation program.

G. Associated Plans - Emergency Response Plan:

Each year EID adopts an "Emergency Response Plan" as a part of its application for a [illegible] waste permit. This Plan of the EID Board of Trustees is attached and hereby made a part of the Water Management and Conservation Plan.

H. List of Utility Administrators and Officers:

Board of Trustees:

Michael Hughes, Chairman
Lynn B. Hales, Clerk
William Bowen

Manager:

Fred A. Smolka, Treasurer

I. Certification of Adoption:

We, Trustees and officers of the Emigration Improvement District, hereby certify that the attached Water Management and Conservation Plan has been established and adopted by the Board on November 14, 2002.

Michael Hughes, Chairman — Date: 11-14-02

Attest:

Lynn B. Hales, Clerk — Date: 11-14-02