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DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WATER RIGHTS

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UTAH/GOSHEN VALLEY GROUND-WATER MANAGEMENT PLAN

I. PURPOSE

The purpose of this ground-water management plan is to set forth guidelines for the future administration and management of the ground-water resources in Utah and Goshen valleys.

For the purposes of this plan, Utah/Goshen Valley is defined as the valley fill in that part of Utah County which is tributary to Utah Lake and the Jordan River and bounded on the east by the Wasatch Range, on the south by Long Ridge and the Tintic Mountains, on the west by the Tintic Mountains and Lake Mountain, and on the north by the Traverse Range. The aquifers of this valley consist of unconsolidated and semi-consolidated formations, which together are referred to as the valley fill. Utah/Goshen Valley covers portions of the State Engineer's administrative areas 51, 53, 54 and 55.

II. BACKGROUND

Past studies have identified as many as four distinct aquifers in the valley fill. More recent studies by the United States Geological Survey (USGS) indicate that the valley fill is more accurately described as one aquifer comprised of many discontinuous layers and lenses of permeable and less permeable material, which gives the appearance of multiple aquifers. The permeable layers interact with each other and with surface water sources. Ground-water models have been developed for northern Utah Valley, and Southern Utah and Goshen valleys. These models are useful in assessing the effects of increased withdrawals on water levels and the relationship between surface and ground water.

According to recent estimates, recharge to the Utah/Goshen valley ground-water system totals about 342,000 acre-feet per year. Discharge is about 370,000 acre-feet per year with the major sources of discharge being wells and waterways and springs. The principal sources of recharge are seepage from streams and canals, and subsurface inflow from bedrock, primarily from the Wasatch Range. At the time the estimates were made, the discharge exceeded the recharge by 30,000 acre-feet per year. However, over the long term, recharge and discharge are roughly equal and no significant

mining of ground water[1] takes place. Long-term water levels show a decline of about 10 feet over much of the valley area east of Utah Lake.

Over the period, 1984 through 1993, well pumpage has averaged nearly 106,000 acre-feet per year, which breaks down as follows;

48,500 acre-feet per year for irrigation;
5,700 acre-feet per year for industry and other uses;
20,300 acre-feet per year for domestic use and stockwatering;
31,500 acre-feet per year for public supply.

During this period, pumpage has been increasing by an average of just over 2,700 acre-feet per year, with irrigation accounting for nearly 1,500 acre feet per year of this increase, and public supply and industry each about 600 acre-feet per year.

Because of the topography of Utah/Goshen valleys, there are opportunities to reuse water. Under normal flood irrigation practices, only about one-half of the water diverted from a source for irrigation purposes is consumed. The other half is return flow in the form of recharge to the ground-water system, inflow to Utah Lake, and/or discharge to drains or other water ways. Thus, the important point to consider in water management is that as you develop ground water which is tributary to Utah Lake, you must factor in the return flow aspect. This is particularly important for municipal water systems which have waste water treatment plants.

Based on current data and estimates, the consumptive use of well pumpage is estimated to be 35,670 acre-feet per year or about one-third of diversions. The water use figures cited above reflect the actual use under the ground-water rights in the valley. The State Engineer did a review of the existing perfected and approved water rights to determine the potential withdrawals that could occur if the water rights were exercised to their full extent.

Based on water rights on file in the Division of Water Rights, wells in the valley have the potential of withdrawing about 235,000 acre-feet per year, which breaks down by use as follows;

131,000 acre-feet per year for irrigation;
23,000 acre-feet per year for industry and other uses;
7,600 acre-feet per year for domestic use and stockwatering;
73,000 acre-feet per year for public supply.

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[1] Mining is defined as the removal of water from the aquifer system in such a manner that the total volume of water in the aquifer system is constantly diminishing.

Out of the-total potential withdrawal, perfected water rights account for 97% of the valid well water rights in the valley; approved water rights account for the remaining 3% of well rights. The potential diversion requirement from drains and springs is estimated to be about 77,000 acre-feet per year. As the valley continues to urbanize, there are more and more wells that are no longer used. There are presently about 7,000 wells in Utah/Goshen Valley. A significant portion of these wells are over 50 years old, and many are experiencing operational problems. When wells are not actively used and maintained they become more susceptible to contamination. As the density of wells increases in those areas using individual septic tanks, the potential of contamination increases. As this area experiences additional,growth, it appears that one of the best methods to protect the water quality in the aquifer is to encourage central water and sewage systems.

Some concern has been expressed about ground-water contamination near the mouth of Spanish Fork Canyon related to explosive manufacturing. To control the migration of the contaminants, it may be necessary to place restrictions on future ground-water withdrawals in and adjacent to this area.

Utah/Goshen Valley was open to appropriation of ground water until the early 1960s; at that time the valley was closed to all appropriations greater than 3 acre-feet per year. In 1967, the State Engineer instituted a moratorium on all ground-water appropriations in southern Utah Valley as a result of persistent water level declines in the early 1960s. That moratorium lasted until 1975 when water levels had recovered and the previous policy was reinstated.

The State Engineer's ground-water appropriation policy for the entire Utah/Goshen Valley limits the quantity of water granted for new wells. The limitations are a maximum of 3 acre-feet per year and the proposed well must be located in an area not served by a public water system and must not be located in a "subdivision".

III. RELATIONSHIP BETWEEN SURFACE AND GROUND WATER

All surface waters in the Utah Lake/Jordan River system are considered to be fully appropriated. From the recent studies and computer ground-water models that have been developed, the data suggests a strong relationship between ground water and surface water sources, particularly Utah Lake. The movement of ground water in the valley is generally from the mountains towards Utah Lake. A relatively small quantity of water is directly discharged to the lake, but large quantities of ground-water are discharged adjacent to the lake which then flows via drains and waterways to Utah Lake to make up a significant quantity of the water supply. The total annual inflow to Utah Lake is about 725,000 acre-feet.

Of this amount, about half is from ground-water sources.

Utah Lake is the ultimate destination of all unconsumed water in Utah/Goshen Valley. This water then flows north into Salt Lake Valley to satisfy water rights which divert from the Jordan River. These water rights are governed by the 1901 Morse Decree which provides irrigation water to some 51,000 acres. These are some of the most senior water rights on the Utah Lake/Jordan River system. Another 11,900 acres are supplied by certificated water rights.

The USGS has constructed two ground-water models; one for Northern Utah Valley and the other for Southern Utah and Goshen Valleys. The Division of Water Rights has used these two models and other data to investigate the relationship between surface and ground-water sources. These investigations support the conclusion that every acre-foot of well water consumed in Utah/Goshen Valley causes the loss of an acre-foot of water discharging to Utah Lake. Thus, the development of ground water in the basin will affect the quantity of water available to surface water rights, particularly during drought periods.

Because of the rapid urbanization of both Salt Lake and Utah/Goshen Valleys, much of the land that was previously irrigated has been converted over to residential and commercial uses. In many cases, the underlying water right has gone unused and is available for conversion to other uses. It appears there is adequate water supplies in Utah/Goshen valleys to meet most of the future needs, if existing water rights are changed over to these new uses. The State Engineer wants to encourage the transfer of irrigation water to municipal purposes as farm land converts to subdivisions. To accomplish this will require that change applications be filed to transfer surface water rights to ground-water sources.

IV. ELEMENTS OF THE PLAN

The objectives of this plan are to promote the efficient use of the waters of the Utah/Goshen Valley ground-water system within the safe yield[2] of that system and to jointly manage the surface and ground water. To achieve that objective, the State Engineer wants to develop a plan which is flexible to provide for changing future conditions, and at the same time protect prior water rights. The plan needs to allow for conjunctive use of surface and ground-water supplies, promote conservation, and allow changes in water use. Due to urbanization in the area, there are significant changes in water use practices. As water use practices change, the

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[2] Safe yield is defined as the volume of ground water that can be extracted annually from a ground-water basin without causing any adverse effects to water quantity or quality.

determination of safe yield may need to be modified accordingly. To be effective, the plan needs to encourage the efficient transfer of water, especially from irrigation to municipal and domestic uses, while protecting prior water rights.

1. New Appropriations

   The Utah/Goshen Valley is closed to new appropriations of ground water.

2. Withdrawal Limits

   Assuming that the effect on surface water rights can be mitigated, the allowable ground-water withdrawals for the different areas of the valley are as follows:

   a. Northern Utah Valley - Annual withdrawals from wells are limited to an average of 160,000 acre-feet per year, using a 5-year moving average. Maximum withdrawals in any one year shall not exceed 200,000 acre-feet.

   b. Southern Utah Valley - Annual withdrawals from wells are limited to an average of 100,000 acre-feet per year, using a 5-year moving average. Maximum withdrawals in any one year shall not exceed 120,000 acre-feet.

   c. Goshen Valley - Annual withdrawals from wells are limited to an average of 18,000 acre-feet per year, using a 5-year moving average. Maximum withdrawals in any one year shall not exceed 20,000 acre-feet.

3. Change Applications

   All new withdrawals of ground water will be based on the acquisition and transfer of existing surface or ground-water rights, and the filing of a change application. These applications will be considered on their own merits. In order to better protect prior water rights and public health and safety, consideration will be given as to whether the application proposes delivery through a central water system and the discharge of effluent through a sanitary sewer system. All such applications will be required to indicate, in acre-feet per year, the proposed annual withdrawal.

4. Proof-of Appropriation/Change

   All proofs of appropriation or change will be required to state the water right's annual withdrawal in acre-feet per year in addition to the maximum allowable flow rate. All maps submitted with proofs of change which involve the transfer of

irrigation water rights will be required to show the lands being taken out of irrigation as well as the new uses covered under change.

5. A contaminated site has been identified near the mouth of Spanish Fork Canyon with high levels of nitrate and explosive compounds. For the purposes of this management plan, this area is referred to as a restricted area. To protect public health and reduce the migration of these contaminants, no new change applications which propose to transfer water into this restricted area will be granted. The restricted area is:

Township 8 South, Range 3 East, Salt Lake Base & Meridian
All Section 14
NE¼NE¼, SE¼NE¼, SE¼ Section 15
E½ Section 22
NE¼, NW¼, SW¼ Section 23
NW¼, NW¼SW¼ Section 26
NE¼, N½SE¼ Section 27

6. Reporting Provisions

To effectively monitor ground-water withdrawals, all wells which have the potential to divert 100 acre-feet per year or more of water shall be equipped with meters and shall report their diversions to the State Engineer on a calendar year basis.

The State Engineer will monitor data on well withdrawals, ground-water levels and water quality data. If in the opinion of the State Engineer the data suggests additional management guidelines are needed in order to protect the resources, action will be taken to present this to the water users and the general public. This plan may be updated as new data and information becomes available. All modifications to the plan will be done through a public review process.