



LEGAL DEPARTMENT

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RECEIVED

AUG 20 2009

Department of Water Resources

August 7, 2009

Mr. Aaron Marshall
Sr. Water Resource Agent
Department of Water Resources
322 East Front Street
Boise ID 83720

Garden City received your response letter dated July 17, 2009; regarding our request for a license of water right permit no. 63-11487 (permit).

In the content of this letter, the Department of Water Resources requested Garden City provide:

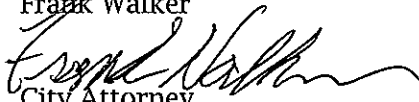
1. Evidence of the municipal water delivery system capacity and peak customer demand.
2. Information illustrating the interconnectivity of the water supply system and production wells.

Pursuant to the requested items, you will find the following enclosed:

- Appendix B - "Garden City 2005 Water Rights Investigation Report" (excerpt from Garden City Water Master Plan).- "Evidence of municipal water delivery system capacity..."
- Garden City Water Master Plan - pages 3, 18-27, 32 and 42. - "evidence of municipal water system... peak customer demand"
- Map of Garden City Water System - "illustrating the interconnectivity of the water supply system and production wells".

Please feel free to contact me if further information is necessary pursuant to our June 13, 2008 letter.

Frank Walker



City Attorney
Garden City

cc: Delhie Block, Interim Public Works Director
File



APPENDIX B

**GARDEN CITY 2005 WATER RIGHTS INVESTIGATION
REPORT**

Garden City Water Rights – A Preliminary Investigation

Purpose

The purpose of this report is to identify and list the known water rights, points of diversion, and the pumping capacities of wells used to supply the City of Garden City municipal water system. This report also seeks to suggest courses of action to protect existing water rights and to identify water right issues requiring further research, based upon information provided by Garden City and from records maintained by the Idaho Department of Water Resources (IDWR).

Introductory Information on Idaho Water Rights

All the waters in Idaho, when flowing in their natural channels, including the waters of all natural springs and lakes within the boundaries of the state, and ground waters of the state, are public waters by authority of the constitution and statutes of the State of Idaho.

The constitution of the State of Idaho along with state statutes guarantees individuals and lawful entities the right to appropriate the public waters of the State of Idaho. When a private right to the use of public waters is established by appropriation, a water right is established that is a real property right, much like property rights in land. The constitution and statutes of the state of Idaho protect private property rights, including water rights.

A water right is the right to divert the public waters of the state of Idaho and put them to a beneficial use, in accordance with one's priority date (IDWR, 2005).

Acquiring a water right in the State of Idaho consists of four consecutive components:

1. A Potential user must submit an application to the Department of Water Resources for specific water rights.
2. The Department of Water Resources grants a conditional permit for a specific development period.
3. The Potential user submits proof of beneficial use of the water.
4. The Department of Water Resources then performs a beneficial use exam and issues a water right license.

Priority Date

A priority date is the date the Department of Water Resources issues the conditional use permit. The priority date is used to determine who gets to use water when there is a shortage. If there is not enough water available to satisfy all of the water rights, then the individual or entity with the oldest (or senior) water rights get their water rights satisfied first and so on in order until there is no water left. It is the individual or entity with the new (or junior) water rights that do not get water when there is not enough to satisfy all

the water rights. This practice is often described by “first in time, first in line” under western water law (IDWR, 2005).

Beneficial Use

The state defines domestic use, irrigation, stock-watering, manufacturing, mining, hydropower, municipal use, aquaculture, recreation, and fish and wildlife as beneficial uses. The amount of the water right granted is the amount of water put to beneficial use. Due to the beneficial use requirement, a water right (or a portion of a water right) may be lost if it is not used for a continuous five-year period. (IDWR, 2005).

Diversion

A diversion is a structure used to divert the water from its natural source. Typical diversion structures include pumps, head gates, ditches, pipelines, and dams, or some combination thereof. A diversion is generally required to establish a water right. The Idaho Water Resource Board is authorized to acquire water rights without diversions. These water rights are called “instream flow” water rights, and are typically authorized for purposes of protecting some public interest in a natural stream or lake, such as recreation, wildlife, or natural beauty. A water right may also be acquired to water livestock directly from the stream, which is called an “instream livestock” water right.

Water law in Idaho is based on the appropriation doctrine, because water rights in Idaho are based upon diversion and beneficial use of water. The appropriation doctrine has also been called “first in time is first in right”, because the priority date determines who gets water when there is not enough to go around. The water right is said to have “appropriated” water. A water right under the law of the state of Idaho can be established only by appropriation (IDWR, 2005).

Surface Water

Prior to May 20, 1971, there were two ways in which a right to surface water could be established. The first way was to simply divert water and apply it to beneficial use. These water rights are called “beneficial use”, “historic use” or “constitutional” water rights. The priority date for a water right established by this method is the date water was first put to beneficial use.

The second way to establish a right to surface water was to comply with the statutory method in effect at the time the water right was established. The current statutory method is an application/permit/license procedure that is described further below. The priority date for a water right established by this method is the date of filing the application with IDWR, and this priority date is shown on the license that is issued when the process is completed. Prior to 1903, Idaho had a “posted notice” statute, which provided for posting of a notice at the point of diversion and recording the notice at the county recorder’s office, followed by actual diversion and beneficial use of water, among other things. If the statutory requirements were met then the priority date for a water right established under the posted notice statute was the date of posting the notice. Water rights established

under the old statutory method are called "Posted Notice" water rights, but are considered beneficial use rights because they are not confirmed by a license or decree.

As of May 20, 1971, there is only one way to establish a right to surface water, and that is by following the application/permit/license procedure that is described further below. The one exception to this rule is for water rights used solely for instream watering of livestock. (IDWR, 2004).

Ground Water

Prior to March 25, 1963, there were two ways to establish rights to ground water, which are the same methods described above under Surface Water. As of March 25, 1963, there is only one way to establish a right to ground water, and that is by following the application/permit/license procedure that is described further below. There is one exception to this rule. A "beneficial use" right to ground water may still be established for domestic purposes. "Domestic purposes" is defined by statute as "(a) the use of water for homes, organization camps, public campgrounds, livestock and for any other purpose in connection therewith, including irrigation of up to one-half (1/2) acre of land, if the total use is not in excess of thirteen thousand (13,000) gallons per day, or (b) any other uses, if the total use does not exceed a diversion rate of four one-hundredths (0.04) cubic feet per second and a diversion volume of twenty-five hundred (2,500) gallons per day." The exception for domestic purposes does not include "water for multiple ownership subdivisions, mobile home parks, commercial or business establishments" unless the use does not exceed a diversion rate of four one-hundredths (0.04) cubic feet per second and a diversion volume of twenty-five hundred (2,500) gallons per day. (IDWR, 2004).

Issues Involved in Increasing the Pumping Capacity of a Well (Point of Diversion)

The State of Idaho issues permits to develop a water right at a point of diversion through the application/permit/license process. For licensing, the State of Idaho requires the submittal of a "proof of beneficial use" which represents the results of a flow test for the well. The license for the water right assigns a maximum diversion rate based on the IDWR's examination of the proof of beneficial use. The maximum diversion rate cannot exceed the calculated or actual flow from the well.

If later modifications to the well (more efficient pump, more powerful motor, or re-installed screen) result in a flow capacity that exceeds the maximum diversion rate stated in the license, the State of Idaho requires the submittal of an application for additional water right, which if granted, is added to the existing water right (Phone Conversation with IDWR, 8/8/05).

Garden City Water Rights and Water System Data

Demographics and Water System Data

Garden City has an estimated population of 10,985 persons and has approximately 3,319 residential connections, and an estimated 4,590 total connections. A typical Idaho household in the Boise area consumes approximately 450 gallons of water per day according to numbers published by United Water (large purveyor of municipal water in the Boise area). Other studies suggest the per capita domestic water consumption in Ada and Canyon Counties at 194 gallons per day. Communities that use their domestic water system for outdoor irrigation experience consumption rates during the summer months that approach five times winter water consumption rates. In addition, peaking factors for daily fluctuations range are on the order of 2 times the average daily demand. Estimated system demands using 450 gpd for each connection are presented in Table I below:

Table I – Municipal Water System Demand

Water System Parameter	Gallons Per Day (Millions)	Gallons Per Minute
Average Daily Demand (winter)	2.1	1,458
Average Daily Demand (summer)	10.5	7,290
Peak Daily Demand (summer)	21.0	14,580

The values presented above are based on published information in the Boise area. More refined data can be developed using the actual water records maintained by the City.

Garden City Water Rights Descriptions

Water Rights

Based on our research, the City of Garden City obtained 10 separate water rights by license which correspond to City wells 1-10, and is also using water from Wells #11 and #12 whose water rights appear to be owned by other parties (see Table II and footnotes). It is unclear at this time whether or not Garden City owns the properties or the water rights to wells #11 and #12, indeed, per the IDWR, the water right for Well #11 is owned by Green Acre Properties and the water right for Well #12 is owned by United Water.

Points of Diversion

The municipal drinking water system is currently supplied by wells 3, 5, 6, 7, 8, 10, 11 and 12 (Garden City Water System Consumer Confidence Report-July 2005). Wells #1 and #2 were taken out of service several years ago, and Well #2 was plugged and abandoned in 1990. The corresponding water rights for Well #1 may have expired, although it remains listed on the IDWR database. The diversion point for the water right associated with Well #2 is located in the same quarter, quarter section as the diversion point for Well #4. Under current procedures in the State of Idaho used to transfer water rights to a new diversion point, an application is not required if the diversion point lies within the same quarter, quarter section. Therefore, it is probable that the water right for Well #2 remains active and can be withdrawn from the diversion point associated with

Well #4. However, Well #4 has been inactive for a period of time and the pumping equipment may need to be overhauled before it is placed in service. Well #9 is not currently functional pending repairs (per Garden City staff).

Maximum Diversion Rates for Water Rights

The City of Garden City can divert up to 23.30 CFS (10,470 gpm) from the water rights associated with wells 3-10. Garden City has total maximum diversion rates 24.2 CFS (10,865 gpm) if water rights connected with wells #11 and #12 are included. Maximum diversion rates even without Well #11 or Well #12 exceed the average daily demand.

Pumping Capacities

Garden City currently has 6,300 gpm of pumping capacity from the wells that are now operational (see Table II). This total excludes estimated capacities of Wells #4 (800 gpm or more) and Well #9 (300 gpm).

Table II – Garden City Water Rights and Other Rights Associated with Wells 1-12

Water Right	Priority Date	Source/Original Point of Diversion	Type/Beneficial Use	Maximum Diversion Rate (CFS)	Maximum Diversion Rate (GPM)
63-2872*	1951-08-04	Groundwater/Well #1	License/Municipal	1.15	516
63-2895	1952-02-13	Groundwater/Well #2	License/Municipal	1.5	673
63-3124	1958-02-28	Groundwater/Well #3	License/Municipal	3.56	1,598
63-5330	1927-01-01	Groundwater (Well #5)	Statutory Claim/Municipal	1.95	875
63-7805	1973-06-01	Groundwater (Well #4)	License/Municipal and Irrigation of 978 acres	1.11	498
63-8005	1974-07-10	Groundwater (Well #9)	License/Municipal	4.80	2,154
63-9134	1978-06-27	Groundwater (Well #7)	License/Municipal	1.43	642
93-9136	1978-07-01	Groundwater (Well #6)	License/Municipal	1.38	619
63-10270	1984-10-18	Groundwater (Well #8)	License/Municipal	3.10	1,391
63-11487	1990-10-18	Groundwater (Well #10)	Permit	4.5	2,020
63-9144**	1978-04-25	Groundwater (Well #11)	License (Green Acre Properties)	1.2	539
63-8357**	1976-08-16	Groundwater (Well #12)	License (United Water)	1.18	530
Total Allowable Diversion Rate Wells 3-10 (Including right for #2)				23.3	10,470
Total Allowable Diversion Rate Wells 1-12				25.90	12,055

** These water rights have probably lapsed. ** These water rights do not appear to be owned by Garden City.*

An estimated pumping capacity of 14,600 gpm could be available if all wells were repaired and operated simultaneously, which would exceed the sum of maximum diversion rates from all water rights.

Footnotes on Points of Diversion Listed Above by Well Number:

Well #1, constructed in 1951, has had its equipment removed, and the property was sold to Western Building Maintenance. This was the sole point of diversion for the water right, and the well has not been used for well over five years. There is no record of a transfer of point of diversion, so this right may have lapsed.

Well #2, constructed in a city park in 1952, was abandoned in 1990 after Well #4 was constructed near the same location. It is assumed that the water right associated with Well #2 may be utilized through Well #4 although Well #4 was assigned its own water right as well.

Well #3 was constructed at East 43rd and Adams Streets in 1958 and is still in service.

Well #4, located at the city park, was drilled to replace well #2. Well #4 equipment is presently being overhauled, and is not currently in use. The maximum output for this well has been estimated to be at least 800 gpm and possibly significantly higher (B. Burger, correspondence, 8/2/05).

Well #5 was constructed by Garden City when water rights were transferred from Martin Zachreson. This is near the state fairgrounds, and is used for irrigation purposes.

Marigold Well #6; a rate of 3 CFM was requested but IDWR granted lower flow based on calculated pump yield.

Well #7, the water right was obtained by Gary Land Development Company in collaboration with Phillips Enterprises by the construction of the original well, located at Bunch Court/Gary Lane. A new well was constructed later in 1978, coincident to the transfer of the water right to the City of Garden City.

Well #8, is located on Garrett between Mtn. View and Chinden according to the driller's report.

Well #9, was constructed when Well #5 was being rehabilitated. Well #9 is not operating, pending repairs.

Well #10 (Joplin Well) Max output 1600 gpm.

Well #11 Shenandoah Mobile Home Park Hometown America. System is tied into Garden City at 3 points. Well #11 supplies supplemental water to Garden City water system. Any documentation within the IDWR files that ties Garden City to this well or water right has not been found.

Well #12 Millstream Subdivision Well. T4N R1E Sec 25 SW of NW. Well was apparently traded to Garden City by United Water at some time in the past. Details of the agreement are not well known, but a search of Garden City's files is recommended.

Well Pumping Rates --Limitations

The maximum diversion rate stated in each water right license governs the legal quantity of water a license holder for water right may use. Table III below summarizes the

amount of water that the City of Garden City can legally pump from the wells at any given time along with the reported pump capacities at each well. The last column in the table considers the limiting factor for each well, the physical means of extraction or the licensed diversion rate, to arrive at an available water flow.

Table III – Summary Legal and Practical Well Production Capacity

Water Right	Source/Original Point of Diversion	Well Physical Output (GPM)	Licensed Diversion Rate (GPM)	Maximum Available Diversion (Legal or Physical) (GPM)
63-2872	Groundwater/Well #1	0	Presumed Lapsed	0
63-2895	Groundwater/Well #2	Not in service	673	Transferred to Well #4
63-3124	Groundwater/Well #3	900	1,598	900
63-5330	Groundwater (Well #5)	1,400	875	875
63-7805	Groundwater (Well #4)	800*	498 + 673	498 + 302**
63-8005	Groundwater (Well #9)	300	2,154	300
63-9134	Groundwater (Well #7)	400	642	400
93-9136	Groundwater (Well #6)	400	619	400
63-10270	Groundwater (Well #8)	800	1391	800
63-11487	Groundwater (Well #10)	1,600	2,020	1,600
63-9144	Groundwater (Well #11)	400	539	400
63-8357	Groundwater (Well #12)	400	530	400
Totals		7,400	11,539	6,875

*Well #4 may have pumping capacity as high as 2600 GPM, but the more conservative number was used for this table. Well #2 was abandoned, therefore, assume the water right can be pumped from well #4 since the diversion points are in the same ¼, ¼ section. The maximum available diversion rate is equal to Well #4 total capacity plus the capacity from the licensed diversion rate for Well #2 that can be pumped using the physical equipment installed for Well #4.

**Includes 498 gpm licensed for water right 63-7805 + 302 gpm utilized from water right 62-2895

The data indicates the licensed diversion rate exceeds the ability of the pumping equipment to provide the prescribed quantity of water to the delivery system. However, there are a couple of anomalies in the data worthy of mention. The well equipment for Well #5 exceeds the licensed diversion rate.

The estimated average daily demand during the summer of 7,290 gpm is well below the allowed diversion rate of 11,539 gpm although the ownership of the water right for Well #11 and Well #12 has some uncertainty. The licensed diversion rate without including the water from these two wells still exceeds the average daily demand. However, the current maximum available diversion rate is insufficient to meet the average daily demand during the summer months and is well short of the peak daily summer demand

Well Equipment and Pumping Capacities

Beyond the right to extract water from the ground water resources of the State, an analysis of water supply should include the physical ability to provide water to the point of use through diversion apparatus, which in the case of this analysis for Garden City means pumping systems installed on groundwater wells. The total pumping capacity of the operating wells is shown in Table IV below. Wells #4 and #9 were not included in the total, because they are currently not in operation. Based on discussions with City staff, a minimum capacity of 800 gpm can be assumed for well #4 and a capacity of 300 gpm can be assumed for well #9 when they are returned to operation.

Table IV – Well Pump Production Capacity

Well Number	Pump Type	Motor MFG	HP	Reported Max GPM	Available Capacity GPM	Owned Available Capacity GPM
3	Vertical Turbine	G.E.	130	900	900	900
4	Vertical Turbine?	Unknown	Unknown	* 800+		
5	Vertical Turbine	US Motors	125	1,400	1,400	1,400
6	Submersible	No Record	Unknown	400	400	400
7	Submersible	No Record	Unknown	400	400	400
8	Vertical Turbine	G.E.	150	800	800	800
9	Submersible	No Record	Unknown	*300		
10	Vertical Turbine	G.E. Tricad	250	1,600	1,600	1,600
11	Submersible	No Record	Unknown	400	400	
12	Submersible	No Record	Unknown	400	400	
Total				7,400**	6,300	5,500

* Not operational; undergoing repairs. Capacity value is an estimate

**Sum of Capacity from operational wells (on the date of this report).

The data in Table IV suggest the total capacity of the existing pumps is roughly equivalent to the estimated demand for water. However, the currently available capacity is insufficient because of current maintenance and repair work on Well #4 and Well #9. The situation is further exacerbated if ownership or use agreements are not in place for Well #11 and Well #12.

SUMMARY OF FINDINGS

In summary, the current water rights analysis results in several conclusion concerning the water rights associated with the City of Garden City and introduces several more items that require additional information or should receive further attention to satisfactorily resolve before conclusions can be drawn. The conclusions drawn include:

- The water rights for the City of Garden City are not complete based on readily available data.

- The licensed diversion rate is sufficient for the water demand for an average day during the summer months but may fall short of the peak day demand during the summer months. This study did not address water storage capabilities, which may be a more cost effective way to meet the demand imposed by the customers on a peak summer day.
- The diversion equipment, if completely operational, appears to have nominal capacity to provide sufficient water to the distribution system for the demand of an average summer day. However, because of water right limitations, Well #5 is underutilized and the average daily summer demand cannot be met. In addition, the system has neither redundancy nor extra capacity to accommodate future growth.
- Due to maintenance and repair issues, the current capacity of the diversion equipment appears to be insufficient to provide adequate water to the delivery system for the demand associated with an average summer day. Storage facilities likely mitigate the full impact of this deficiency.
- Without the benefit of water associated with rights for Well #1 and Well #2 along with the questioned ownership of Well #11 and Well #12, the ability to physically provide adequate water to the distribution system appears to be impaired.

It is our suggestion that the following issues merit further examination. Some items may require a detailed search of Garden City records or other sources, others may require action on the part of Garden City to safeguard existing water rights, such as submittal of water right applications to IDWR for transfer of existing rights.

1. Additional research into water rights associated with Wells #1 and #2 to verify activity and ownership (IDWR records on-line do not indicate inactivity or transfer).
2. Protect the water right associated with Well #4 by the repair of the well, other construction of a new well (along with a Transfer of Water Right Application).
3. Verify ownership of water rights associated with Well #11 and Well #12 by a detailed examination of agreements between United Water and the City of Garden City and the agreement between Garden City and Shenandoah Mobile Home Court.
4. If the investigation identified in item #3 reveals Well #11 and/or Well #12 is leased, purchase the well property and water rights associated with the diversion points.
5. Submit a Transfer of Water Right application to IDWR to combine all water rights, listing all points of diversion (wells) to reflect the way in which water is distributed from wells to areas of use within the city limits.
6. Upgrade wells that produce significantly less flow than the maximum allowable diversion rate and if this allows the owner to retain the maximum diversion rate.

7. Apply for additional water right at Well #5 to bring the maximum allowable diversion rates up to match the well capacity.
8. Conduct a study to compare the expenses of acquiring additional water rights versus the construction of more storage facilities.



The main goals of the study are:

- ❖ Develop a planning basis to systematically improve the utilities through replacement, rehabilitation, and new construction;
- ❖ formulating an implementation plan example that includes realistic means of financing the scheduled improvement;
- ❖ develop computerized models of the water system with reliable mapping of the existing and future elements;
- ❖ suggested capital improvement examples for the water system based on current conditions;
- ❖ outline a financial plan presenting the scenario of funding both the operation and maintenance and the suggested capital improvement examples.

2. Planning Area

The planning area consists of the incorporated limits of Garden City as depicted in Figure I-1. A vicinity map is provided in Figure I-2. The planning area includes the following "Special opportunity areas" as described in the *Garden City Comprehensive Plan*: (1) the Expo Idaho; (2) the area around 37th and Adams Street; (3) the ITD property at Chinden Boulevard and Coffey Street; (4) the area west of the city limits and north of Chinden Boulevard; (5) the east gateway at Chinden Boulevard; and (6) the area between the river and Riverside Drive west of Glenwood Street.

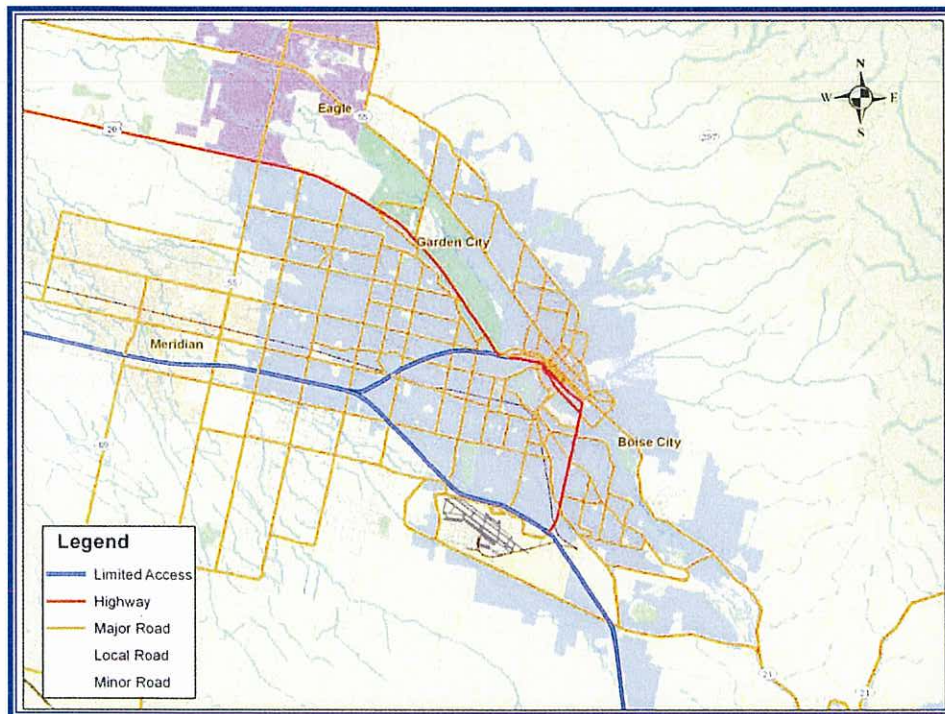


Figure I-2 Vicinity Map for Garden City



III. EXISTING SOURCE, DISTRIBUTION, AND TREATMENT FACILITIES:

A. Current Population, Connections and Water Demand

1. Current Population

The population of Garden City was reported at 10,624 residents in the 2000 census. The estimated 2006 population of the city is 12,074 residents (Source: Garden City Comprehensive Plan, 2006). This suggests a 2000-2006 average annual growth rate (AAGR) of approximately 2%. This growth rate would imply a 2007 population for Garden City at 12,315 residents. This population estimate is comparable to the Ada County Comprehensive Plan that was published in September, 2007. However, the U.S. Census population estimate for 2006 suggests a smaller population of around 11,353 residents. According to the U.S. Census, this approximation is calculated using the base population from the 2000 census and calculating the estimate based on data for births, deaths, and migration. This projection results in an AAGR that is approximately one-half of that suggested for Garden City in both the 2006 Comprehensive Plan and the 2007 Ada County Comprehensive Plan. Since the AAGR for Ada County for the past five to ten years has been above 2%, and Garden City along with the cities of Meridian, Eagle, Kuna, and Star were responsible for nearly half of the county's population growth over that time period, a 2% AAGR used to estimate the 2007 populace for Garden City of 12,315 is being used for this plan. It is important to note that this is an estimation based on current data used in recent planning documents, population growth rates may change in the future as more data becomes available. (Source: Garden City Comprehensive Plan 2006; Ada County Comprehensive Plan 2007; U.S. Census Bureau, 2006 Population Estimates, Census 2000; COMPASS 2006 Population Estimates).

2. Water System Connections

Although the City has a few customers that are connected to the sewer system that do not use water provided through the municipally owned water system, the City of Garden City invoices most of their customers for sewer use based on the flow of water through each metered connection to the water system. Therefore, a reasonable estimate of the number of units connected to the water and sewer system is the number of units represented in the billed accounts for the water system.

Based on billing records, the city invoices approximately 4,420 accounts, 650 of which are commercial. The accounts are comprised of an estimated 5,340 residential units (3,400 single family, 60 duplexes, 1,100 mobile homes, and 780 apartments) and 650 commercial units. The average daily demand including consumptive and non-consumptive uses of 1,700,000 gallons per day for the residential connections calculates as nearly 320 gallons per day per connection (gpdc), while that of the commercial units calculates as approximately 1,400 gpdc with a combined average of 437 gpdc as shown in Table III-1.

3. Water System Demand

Garden City utilizes water meters to measure water usage for both residential and commercial connections. Besides water meters, the City also tracks system water production with flowmeters at each well. Meter readings from 2005 through September 2007 have been used to establish the consumer water demand. Well production data for 2006 and 2007 indicate that more water is reported to have been produced at the wells than delivered to customers. Table III-2 summarizes this discrepancy, which indicates that meter readings were 24% and 29% lower than well production for 2006 and 2007, respectively. Possible causes that result in "non-revenue water" being produced, but not metered, are listed below:

- ❖ Leaking from aging water lines; this can usually account for 10-15% of the well production.
- ❖ Illegal and unaccounted for hookups to the system.
- ❖ Old meters and/or flow meters

Garden City
Utility Master Plan Water System



Month	Residential ADD (gallons)	Commercial ADD (gallons)	System Total ADD (gallons)	Residential ADD per Connection (gallons)	Commercial ADD per Connection (gallons)	System Total ADD per Connection (gallons)
January	682,000	381,000	1,063,000	128	586	178
February	842,000	416,000	1,258,000	158	641	210
March	840,000	487,000	1,328,000	158	750	222
April	1,715,000	1,144,000	2,859,000	322	1,761	478
May	2,313,000	1,146,000	3,459,000	434	1,764	578
June	3,420,000	1,696,000	5,117,000	641	2,610	855
July	3,802,000	1,831,000	5,634,000	713	2,818	941
August	2,690,000	1,444,000	4,133,000	504	2,222	691
September	1,743,000	1,081,000	2,825,000	327	1,664	472
October	1,027,000	666,000	1,693,000	193	1,025	283
November	591,000	362,000	953,000	111	558	160
December	673,000	384,000	1,056,000	126	591	177
Ave*	1,700,000	922,000	2,622,000	318	1,415	437

*Calculations based on 5,340 residential unit connections and 650 commercial unit connections.

Table III-1 Average Daily Demand, ERU, and Unit Use

Table III-2 Well Production versus Meter Consumption Summary

Month	Well Production 2006 (MG)	Meter Consumption 2006 (MG)	Production versus Consumption Difference 2006 (%)	Well Production 2007 (MG)	Meter Consumption 2007 (MG)	Production versus Consumption Difference 2007 (%)
January	35.92	33.16	7.69	59.39	28.54	51.95
February	42.77	32.58	23.82	61.33	26.59	56.65
March	49.42	30.91	37.45	64.40	46.41	27.93
April	52.80	82.37	-56.01	92.12	95.98	-4.19
May	159.26	109.37	31.33	148.63	113.57	23.59
June	146.61	140.91	3.89	174.47	169.35	2.94
July	207.57	177.69	14.39	243.67	162.84	33.17
August	185.65	129.58	30.20	198.73	100.36	49.50
September	141.09	83.37	40.91	147.17	ND**	—
October	92.28	46.94	49.13	84.22	ND	—
November	55.74	25.79	53.73	63.07	ND	—
December	53.43	31.68	40.70	57.41	ND	—
Total	1222.54	924.37	24.39	1042.75*	743.63*	28.69*

*Total is for 2007 data through August only.
** ND = No data available at time of determination.



- ❖ Water users hooking up to fire services
- ❖ Water loss from water main breaks; water loss through line flushing
- ❖ Water used by the City or other public services that may be unaccounted for

Water use based on residential and commercial meters is being used to calculate current and future demands for this report since this data more accurately reflects the amount of water being consumed and ultimately charged for. As the City works to upgrade and improve the utility; tracking differences between well production and consumer usage should be evaluated on a continuous basis to determine if a water conservation program to calibrate or replace meters is necessary.

The water meter data was evaluated and Figure III-1 depicts the average daily demands by month for residential connections. This figure illustrates that the minimum average daily water demand of 591,000 gallons per day (gpd) occurs in the month of November, while the maximum average daily water demand of 3.8 million gallons per day (MGD) occurs in the month of July. Figure III-2 portrays the average daily demands by month for commercial connections. This figure also illustrates the minimum average daily water demand of 362,000 gpd occurs in the month of November, while the maximum average daily water demand of 1.8 MGD occurs in the month of July.

a. Average Daily Demand

The sum of the residential and commercial average demands is used to determine the total Average Daily Demand (ADD) for individual months, as well as, the overall ADD. The number of residential and commercial connections (5,340 residential and 650 commercial) were then used to calculate the number of gallons that make up an ERU. These values are shown in Table III-1 and the ADD is illustrated in Figure III-3. The total ADD for the system is 2.62 MGD with a residential ERU of approximately 320 (gpd) per residential connection based on water meter data. The number of persons in each Garden City household is estimated to be 2.43, resulting in water consumption of 132 gallons per capita per day (gpcd).

b. Domestic Versus Irrigation Water Use

Average domestic water is defined as that water used for indoor household use and was determined by evaluating the water production in months of low water consumption. During winter months it is assumed irrigation and outdoor water use is limited due to dormant vegetative growth inherent to a northern latitude. Based on this assumption, water use for the months of November, December, January, February, and March were selected to represent average domestic use for both residential and commercial connections. This value is based on meter data and is calculated as nearly 34.1 million gallons per month. This value is compared with seasonal water use in Figure III-4. The domestic use calculation equates to 1,132,000 gpd (726,000 gpd – residential and 406,000 gpd – commercial), 190 gallons per connection per day for the entire system (140 gpd per residential connection and 630 gpd per commercial connection), and 80 gpcd.

c. Maximum Day Demand

The Maximum Day Demand (MDD) was determined based on the demand during the highest peak month reported in water use data. The peak month was July 2005 when the estimated population of Garden City was around 11,820 persons. The total water usage during this month averaged 5.92 MGD, which equates to 500 gpcd when based on population. Water meter records also show that 4.09 MGD of this use was recorded on residential meters and 1.83 MGD of this use was recorded on commercial meters. The total system MDD based on residential and commercial use is 1,550 gallons per connection per day or 3.5 times the total system ADD (see Table III-3). Applying the peak month demand to the current populace results in a current MDD of 6.2 MGD (500 gpcd x 12,315 residents).

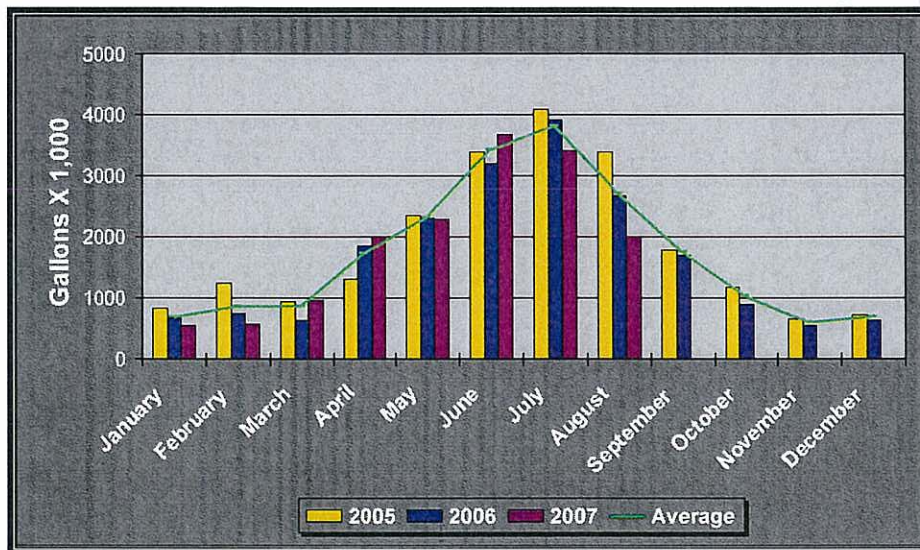


Figure III-1 Garden City Average Daily Residential Water Demand

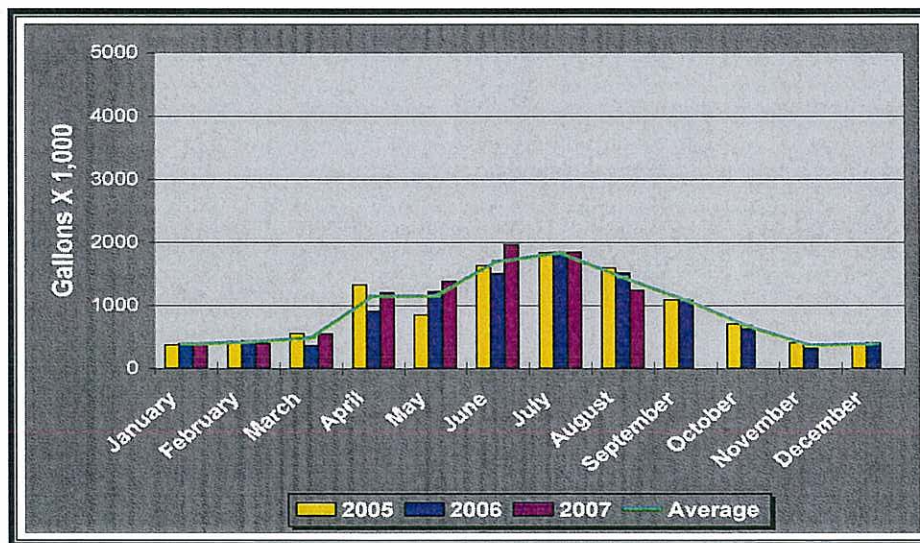


Figure III-2 Garden City Average Daily Commercial Water Demand

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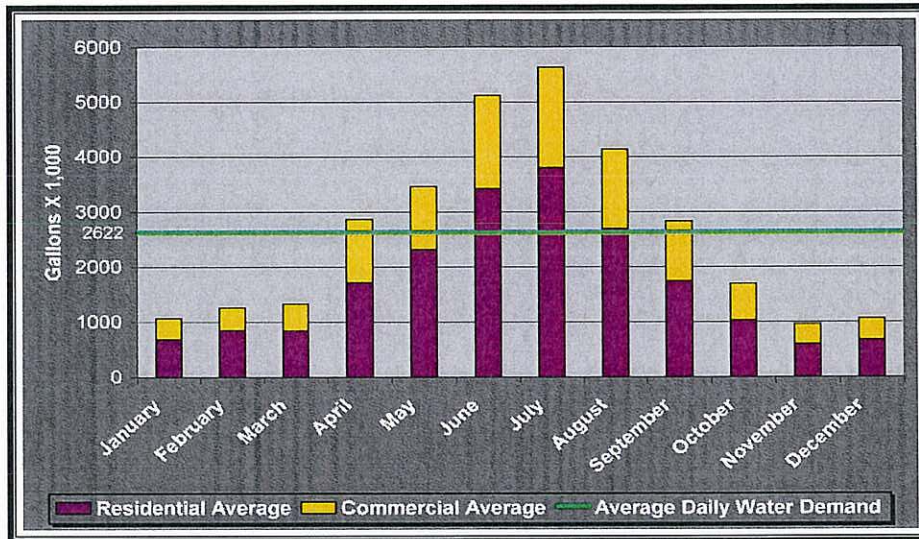


Figure III-3 Garden City Total Daily Water Demand by Month

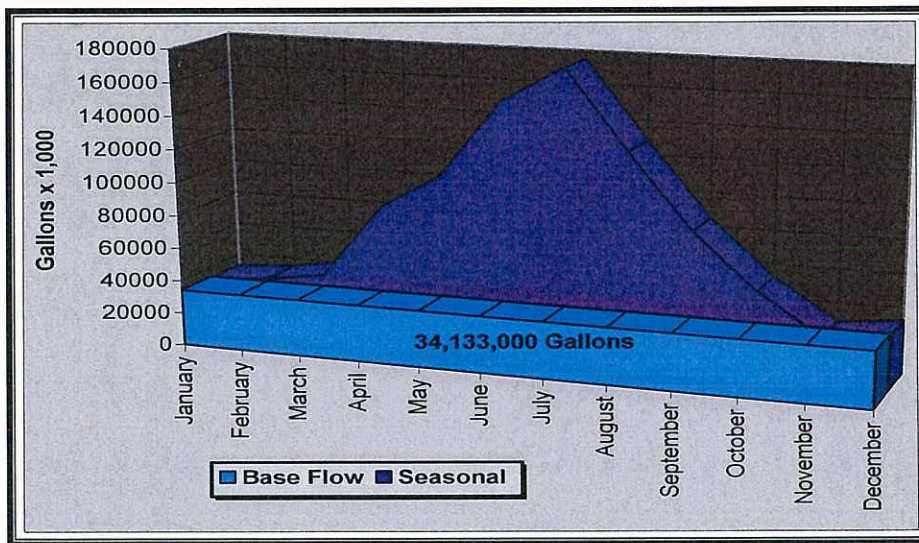


Figure III-4 Domestic and Irrigation Water Use Monthly Flow



Table III-3 Average Maximum Demand and Unit Use

Month	Residential MDD (gallons)	Commercial MDD (gallons)	System Total MDD (gallons)	Residential MDD per Unit (gallons)	Commercial MDD per Unit (gallons)	System Total MDD per Unit (gallons)
Jul. 2005	4,086,000	1,831,000	5,917,000	1,298	2,741	1,550

d. Peak Hour Demand

The City has recently installed and is beginning to utilize a SCADA system for its water production wells. This new tool will allow water production records to be kept on a daily or hourly basis. However, current information is presented as a monthly total production from each well. Prediction of a peak hour demand is therefore derived from theoretical flows for similar water systems as presented in literature common to the industry. A PHD of 150% of the maximum day is suggested in the reference *Wastewater Engineering: Treatment Disposal and Reuse* originally authored by Metcalf & Eddy and published by McGraw Hill. The PHD for the Garden City system then calculated as 750 gpcd or more appropriately 1.2 gallons per minute per connection for a current total system demand of 6,417 gallons per minute (gpm) or 9.2 MGD.

4. Existing Value and Replacement Cost

The age, type, and condition of the existing system are largely unrecorded, efforts to monitor and record facility locations are also recommended. There is a large range in the type and age of the pipes that make up American water distribution systems, depending on the population and economic booms of the previous century. For many cities, the periods of greatest population growth and urban expansion were during the late 1800s, around World War I, during the 1920s, and post-World War II. The water pipes installed during these growth periods differ in their manufacture, materials, and life span. The oldest cast iron pipes from the late 19th century are typically described as having an average useful lifespan of about 120 years because of the pipe wall thickness (AWWA, 2001; AWWSC, 2002). In the 1920s the manufacture of iron pipes changed to improve pipe strength, but the changes also produced a thinner wall. These pipes have an average life of about 100 years. Pipe manufacturing continued to evolve in the 1950s and 1960s with the introduction of ductile iron pipe that is stronger than cast iron and more resistant to corrosion. Polyvinyl chloride (PVC) pipes were introduced in the 1970s and high-density polyethylene in the 1990s. Both of these are very resistant to corrosion but they do not have the strength of ductile iron. Post-World War II pipes tend to have an average life of 75 years (AWWA, 2001; AWWSC, 2002). Approximately 20 percent of the pipe in place in North America is lined with asbestos or cement. Furthermore, the overwhelming majority of ductile iron pipe is mortar-lined and about 40 percent of cast iron pipe in place is mortar-lined. These facts may be of great importance where the life of pipe is concerned, as linings are meant to prevent corrosion and increase pipe longevity.

In the 20th century, most of the water systems and distribution pipes were relatively new and well within their expected lifespan. However, a recent report by the American Water Works Association (AWWA, 2001) and a white paper by the American Water Works Service Company, Inc. (AWWSC, 2002) point out that these different types of pipes, installed during different time periods, will all be reaching the end of their expected life spans in the next 30 years. Analysis of main breaks at one large Midwestern water utility that kept careful records of distribution system management documented a sharp increase in the annual number of main breaks from 1970 (approximately 250 breaks per year) to 1989 (approximately 2,200 breaks per year) (AWWSC, 2002). Thus, the water industry is entering an era where it must make substantial investments in pipe repair and pipe replacement. The trends of aging pipe and increasing numbers of main breaks are of concern because of the potential relationship between waterborne disease outbreaks and main breaks.

The current Garden City water system has an estimated value of \$43 million with the cost to replace the system estimated at \$82 million or \$180 million to replace the system and the roads lying above the water



mains. For a detailed opinion of probable cost, see the Appendix N. The majority of the value in the water system and consequently, the replacement cost is associated with the water lines.

5. Water Conservation Programs

One of the action steps in the Garden City Comprehensive Plan is to develop programs and incentives that encourage water conservation (Garden City, 2006). These programs and incentives could include the following:

- ❖ Water Schedule
- ❖ Conserving water by utility
- ❖ Non-Potable irrigation
- ❖ Metering and data management
- ❖ Accounting for unmetered users
- ❖ Reducing leakage and other losses
- ❖ Conserving water by customer
- ❖ Education
- ❖ Equipment and hardware programs
- ❖ Rates and billing practices
- ❖ Water reuse

B. Water Source, Location, and Pumping Facilities

The existing water system in Garden City is comprised of ten municipal production wells, distribution piping, chlorination facilities, operations, and auxiliary power. The following sections describe the water system following a convenient 5-point analysis of the critical areas comprising a viable water system;

- 1) Water rights
- 2) Water source
- 3) Water storage
- 4) Distribution system
- 5) Water quality treatment

In addition, several key criteria regarding the requirements for public water systems can be extracted from IDAPA 58.01.08 Idaho Rules for Public Drinking Water Systems. These criteria involve the existence and interaction of water supply sources, water storage, and emergency power generation capability. The specific criteria are:

- ❖ IDAPA 58.01.08.501.07(b) The water system must have a sufficient number of water sources with standby power to satisfy the ADD for a minimum of (8) hours plus fire flow or emergency storage of an equivalent volume (see Water Production Rates Section).
- ❖ Water Works 2003 section 3.2.1.1 and IDAPA 58.01.08.513 state: "Under normal operating conditions, with any source out of service, the remaining sources shall be capable of providing either peak hour demand of the system or maximum day demand plus equalization storage."
- ❖ IDAPA 58.01.08.501.17(a) Total system capacity including supply and storage must be sufficient to meet MDD plus Fire Flow Demand, while maintaining a 20 psi residual throughout the system.



2. Water Rights (Point 1)

A Preliminary Investigation of Garden City's water rights was performed by Forsgren Associates in 2005. A copy of the report regarding this investigation is in Appendix B.

All the waters in Idaho, when flowing in their natural channels, including the waters of all natural springs and lakes within the boundaries of the state, and ground waters of the state, are public waters by authority of the constitution and statutes of the State of Idaho. The constitution and statutes of the State of Idaho guarantee the right to appropriate the public waters of the State of Idaho. When a right to the use of public waters is established by appropriation, a water right is established. This right is a real property right much like property rights in land. With an established water right, there must be an identified Point of Diversion(s), which is the location where water is obtained. The constitution and statutes of the State of Idaho protect private property rights, including water rights.

A water right is the right to divert the public waters of the state of Idaho and put them to a beneficial use, in accordance with one's priority date (Forsgren, 2005). Acquiring a water right in the State of Idaho consists of four consecutive components:

- ❖ A Potential user must submit an application to the Department of Water Resources for specific water rights.
- ❖ The Department of Water Resources grants a conditional permit for a specific development period.
- ❖ The Potential user submits proof of beneficial use of the water.
- ❖ The Department of Water Resources then performs a beneficial use exam and issues a water right license.

a. Priority Date

A priority date is the date the IDWR issues the conditional use permit. The priority date is used to determine who gets to use water when there is a shortage. If there is not enough water available to satisfy all of the water rights, then the individual or entity with the oldest (or senior) water rights get their water rights satisfied first and so on in order until there is no water left. It is the individual or entity with the new (or junior) water rights that do not get water when there is not enough to satisfy all the water rights. This practice is often described by "first in time, first in line" under western water law (Forsgren 2005).

b. Beneficial Use

The state defines domestic use, irrigation, stock-watering, manufacturing, mining, hydropower, municipal use, aquaculture, recreation, and fish and wildlife as beneficial uses. The amount of the water right granted is the amount of water put to beneficial use. Due to the beneficial use requirement, a water right (or a portion of a water right) may be lost if it is not used for a continuous five-year period (Forsgren, 2005).

c. Diversion

A diversion is a structure used to divert the water from its natural source. Typical diversion structures include pumps, head gates, ditches, pipelines, and dams, or some combination thereof. A diversion is generally required to establish a water right. The Idaho Water Resource Board is authorized to acquire water rights without diversions. These water rights are called "*instream flow*" water rights, and are typically authorized for purposes of protecting some public interest in a natural stream or lake, such as recreation, wildlife, or natural beauty. A water right may also be acquired to water livestock directly from the stream, which is called an "*instream livestock*" water right.

Water law in Idaho is based on the appropriation doctrine, because water rights in Idaho are based upon diversion and beneficial use of water. The appropriation doctrine has also been called "*first in time is first in right*", because the priority date determines who gets water when there is not enough to go around. The water right is said to have "appropriated" water. A water right under the law of the state of Idaho can be established only by appropriation (Forsgren, 2005).

Garden City
Utility Master Plan Water System



beneficial use right. The purpose of the statute is to provide some means to make records of water rights for which there were previously no records. However, these records are merely affidavits of the water users, and do not result in a license, decree, or other confirmation of the water right (<http://www.idwr.idaho.gov/water/rights/claim.htm>).

A Permit to Appropriate Water was issued for Well #10 on August 28, 1991, subsequently, a Beneficial Use Field Report was completed on May 30, 1997 with a recommendation to amend the service area to "municipal," however, a license still has not been issued for this water right. Water Right 63-8357 that is associated with Well 12 currently shows United Water Idaho, Inc. as the owner. This right is for domestic use in the Millstream subdivision only. The City has filed a Notice of Claim for this water right which will be heard by the District Court of the Fifth Judicial District in February, 2008. Water Right 63-9144 that is associated with Well #11 currently shows Shenandoah Park Investors as the owner. This right is for domestic and fire protection use in the Shenandoah Mobile Home Estates Park only.

Table III-4 Garden City Water Rights

Water Right	Priority Date	Well Number	Type/Beneficial Use	Max. Flow (CFS)	Max. flow (GPM)
63-2872*	1951-08-04	Groundwater Well #1	License/Municipal	1.15	516
63-2895	1952-02-13	Groundwater Well #2	License/Municipal	1.50	673
63-3124	1958-02-28	Groundwater Well #3	License/Municipal	3.56	1,598
63-5330	1927-01-01	Groundwater Well #5	Statutory Claim/Domestic and Irrigation	1.95	875
63-7805	1973-06-01	Groundwater Well #4	License/Municipal	1.11	498
63-8005	1974-07-10	Groundwater Well #9	License/Municipal	4.80	2,154
63-9134	1978-06-27	Groundwater Well #7	License/Municipal	1.43	642
93-9136	1978-07-01	Groundwater Well #6	License/Municipal	1.38	619
63-10270	1984-10-18	Groundwater Well #8	License/Municipal	3.10	1,391
63-11487	1990-10-18	Groundwater Well #10	Permit/Municipal, Irrigation, Commercial, Domestic, Fire Protection	4.5	2,020
63-9144**	1978-04-25	Groundwater Well #11	License (Shenandoah Park Investors) / Domestic and Fire Protection	1.2	539
63-8357**	1976-08-16	Groundwater Well #12	License (United Water) /Domestic	1.18	530
Total Allowable Diversion Rate Wells 3-10 (including right for #2)				23.33	10,470
Total Allowable Diversion Rate Wells 1-12				26.86	12,055

* These water rights have probably lapsed. **Garden City has filed a motion with the SBRA to reinstate the claim



Figure III-6 Garden City Existing Wells

Garden City
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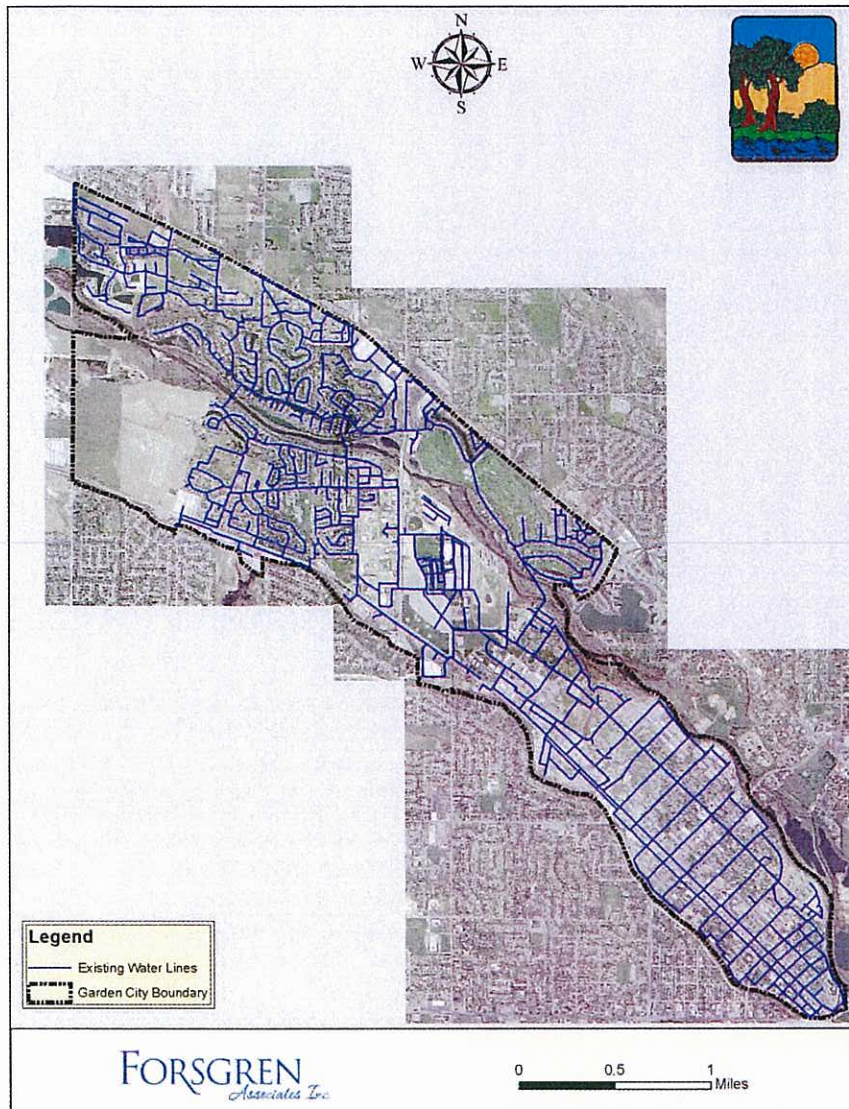
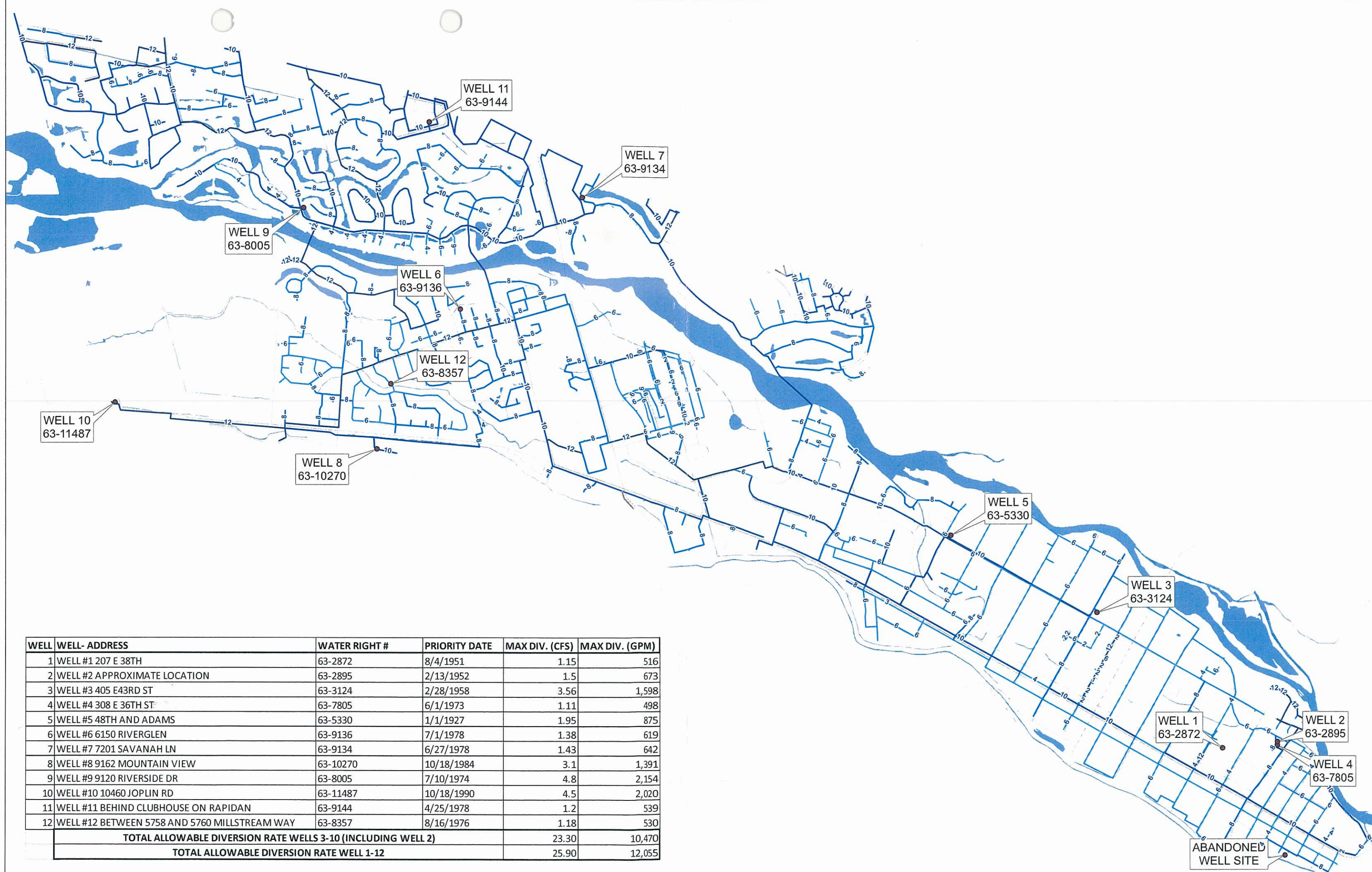


Figure III-25 Garden City Existing Water Lines





State of Idaho

DEPARTMENT OF WATER RESOURCES

322 East Front Street • P.O. Box 83720 • Boise, Idaho 83720-0098

Phone: (208) 287-4800 • Fax: (208) 287-6700 • Web Site: www.idwr.idaho.gov

July 17, 2009

C. L. "BUTCH" OTTER
Governor

DAVID R. TUTHILL, JR.
Director

CITY OF GARDEN CITY
C/O FRANK WALKER
6015 GLENWOOD ST
GARDEN CITY ID 83714-1347

RE: Water Right Permit No. 63-11487

Dear Mr. Walker,

The Department of Water Resources (Department) received your letter dated June 13, 2008, requesting that the Department issue a license for water right permit no. 63-11487 (permit) for the City of Garden City (City).

On August 28, 1991, the Department issued permit no. 63-10487 authorizing development of a water right for irrigation, commercial, municipal, domestic, and fire protection purposes with a maximum diversion rate of 4.50 cubic feet per second (cfs). On August 19, 1996, the Department received proof of beneficial use indicating the City completed the development authorized by the permit. On December 12, 1996, a Department examiner conducted a field examination to confirm the beneficial use. The field examiner reported that water is pumped from the Joplin Well No. 10 into a 12-inch diameter mainline that supplies water to Garden City for municipal use. The field examiner recommended the issuance of a license for municipal purposes with a maximum diversion rate of 4.50 cfs. However, before the Department can issue a license, additional information is needed to determine the extent of beneficial use during the authorized development period.

The City holds nine other water rights for municipal use; 63-2872 (1.15 cfs), 63-2895 (1.50 cfs), 63-3124 (3.56 cfs), 63-7805 (1.11 cfs), 63-8005 (4.80 cfs), 63-8357 (1.18 cfs), 63-9134 (1.43 cfs), 63-9136 (1.38 cfs), and 63-10270 (3.10 cfs). The total combined diversion rate authorized by these rights is 19.21 cfs. The Department can issue a water right license only for the use established in excess of the City's other municipal water rights.

Please provide:

- Evidence of the municipal water delivery system capacity and peak customer demand, and
- Information illustrating the interconnectivity of the water supply system and production wells

Please provide the requested information within thirty (30) days to aid the Department in evaluating the extent of use developed under the permit during the authorized development period (prior to August 19, 1996). If you have any questions, please contact me at (208) 287-4943.

Sincerely,

Aaron Marshall
Sr. Water Resource Agent

C: Steve Lester – IDWR Western Region