December 14, 2018

Mr. Carmine Iadarola
AquaSan Network
4100 East Mississippi Avenue, Suite 500
Glendale, CO 80246

Re: Water Demand Projection for the Reserve at Hockett Gulch

Dear Mr. Iadarola:

As requested I have reviewed the information you provided on the Hockett Gulch residential project, and have generated water use estimates based on information generated from previous studies conducted by Aquacraft over the years. All of the information is empirical in nature and was obtained from surveys, billing data, field studies including data logging for disaggregation of water use into end uses.

Aquacraft has been collecting demand information on municipal water users since 1995, when we began using data loggers and proprietary software to disaggregate residential water uses into end use categories. We are specialists in demand analysis and have established techniques for determining how many gallons per day of water were used for domestic uses and irrigation. These techniques have been used in the U.S. and around the world to measure both baseline uses and the impacts of upgrades and retrofits on water use. We have also conducted numerous studies on commercial, institutional and industrial water uses, which can be reviewed and downloaded from our website www.aquacraft.com . We have attached a bibliography of the source data used for our analysis at the end of this report, and a more complete listing of our reports and publications are available in our Statement of Qualifications and my resume, which are also available on our website.

In 1996 Aquacraft was hired as the principal investigator for the American Water Works Association Research Foundation[1]study of water demands by residential customers. The purpose of this project was to do pure research into residential water demands. The project was jointly sponsored by 14 municipal water agencies and the American Water Works Association Research foundation. Our task was to quantify how much water was being used by random sets of single family residential accounts in the water agencies, and to identify the end uses to which this water was put. The water customers in the 14 study sites were surveyed and 100 homes in each group of survey respondents were data logged in order to break down the water use into individual water use events, each of which was characterized by the type of use, the volume, flow rate and duration. This information, coupled with the information from the surveys and other customer information allowed us to create mathematical models of residential water use based on the

[1] Now the Water Research Foundation

factors that were found to be most important for predicting household and per capita demands. This was applied research that has been used by the water industry since the report was published in 1999. This information was used to generate the relationships such as those shown in Figures 1 and 2 of this report.

Since 1999, when the REUWS1 study was published, Aquacraft has completed many other studies using techniques similar to those employed in the study. The six most pertinent to the current study are listed at the end of this report, along with links from which they can be downloaded.[2] A more complete list of reports and projects is attached to our statement of qualifications, which we have provided. Our clients for the 6 cited studies included the California Department of Water Resources, the U.S. EPA, the Irvine Ranch Water District, the City of Denver and the Water Research Foundation. In each case Aquacraft was hired because of our expertise in analysis of water demands and how these demands are affected by things like the number of persons in the home and the nature of the fixtures and appliances present in the homes. The data we have collected and the relationships we have identified have allowed use to generate the demand information on which our analysis of the Reserve at Hockett Gulch is based. This is the type of application for which the research was intended.

My analysis of the water demands for Hockett Gulch are based on a ground up analysis of anticipated demands based on household models rather than per capita estimates. The reason for this is because water demands are not a linear function of the number of persons in the home. My estimates include the types of uses anticipated, their physical characteristic and the anticipated population of the project. While I reviewed AquaSan's analysis, I also performed an independent analysis of my own so that the results could be compared objectively. Our analysis is based on the information we collected and analyzed in the reports we have cited.

Most recently, I have been invited by the U.S. State Department to travel to India as part of their visiting expert program to meet with water officials in Chennai, Bangalore, Hyderabad and Delhi to discuss water planning and management of municipal water systems in the United States, and how some of the approaches we have developed in our work can be applied to the serious water problems in India.

Basically, as explained below, the results of my analysis of the Reserve project largely confirm yours. Given the fact that the two estimates were derived using different methodologies, the similarity gives confidence in the results.

Description of Hockett Gulch Project

The Reserve at Hockett Gulch is a residential development in the Town of Eagle, Colorado. It will consist of a combination of multi-family apartments, single-family homes/townhomes, irrigated landscape, recreational and commercial uses. I have used the information that AquaSan provided on the project along with historical data and demand models we have generated from detailed demand analyses on thousands of residences and businesses. Our analysis is based on the maximum buildout configuration of the project.

[2] The three reports published by AWWARF must be purchased from the foundation, or the executive summaries can be downloaded free of charge. The reports published by Aquacraft are available from our website for a small charge.

Residential

At buildout the project will include 13 apartment buildings containing 396 multi-family units, of which 198 will be 1 bedroom, and 198 will be two bedrooms. These will be built in 2 phases.

The third phase of the project will consist of 104 single family units, of which 69 will be built first, and the remaining 35 will follow. We have prepared estimates for both 69 and with an additional 35 SF units.

Irrigation

There will be a total of 8.2 acres of irrigated landscape on the project, of which 4.7 will be turf or other high water use plants and 3.5 will be lower water using vegetation. The turf will have a water application rate of 30 inches (18.7 gal/sf) and the low water use vegetation will have an application allowance of 18 inches (11.2 gal/sf). All irrigation will be done using non-potable supplies and will not impact the Town water system.

Commercial

It is presently projected there will be 30,000 sf of mixed commercial space, the exact configuration of which has not been specified. Aquacraft has assumed for purposes of this report that the commercial space it will be split evenly between offices, restaurants and convenience retail/food stores.

Recreation

There will be a club house building with a pool, hot tub, restrooms, and a kitchen. We do not have exact measurements for the pools or other facilities to be included, but we can make general comparisons to other recreation facilities we have studied.

Population

It is difficult to find hard data that relate the number of occupants in multi-family apartments to the number of bedrooms in the units. The City of Irvine Ranch, California, did a detailed study of their multi-family customers as part of their water budget program. As part of this study they surveyed a large group of multi-family customers and obtained both occupancy and bedroom data. This is a valuable data set for our purposes. Irvine Ranch hired Aquacraft to analyze the water use in these units and compare their use to the water budgets so that they could evaluate how well the budgets were matching the customers' use.

In the Irvine study we had approximately 700 multi-family households in the data set. (Ref 4). Even though one study was in California and the current study is in Colorado there is no reason to think that the Irvine data should not be valid in Colorado for our purposes. Aquacraft has studied over 7000 homes, and have found that the variations in their water use are more strongly related to their occupancy and physical characteristic than their geography. So, in the absence of local data that is equal to or better we suggest using the data from Irvine Ranch.

The results of the occupancy vs bedroom analysis are shown in Figure 1. Since these values were based on actual survey data rather than assumptions, we have used them to estimate the numbers of occupants for each of the apartment units on the property. For 1 BR units the estimate is 1.4 persons per unit, and for 2 BR units the estimate is 2.6 persons per unit.

For the single family units we have used the average occupancy of 2.7 persons per home that was determined from the Residential End Uses of Water Study update. (Ref 6). We believe this is a better value than a national average from the Census because it is based on only single family homes that are similar to those that will be built in the Reserve and come from random samples of homes that provided surveys.

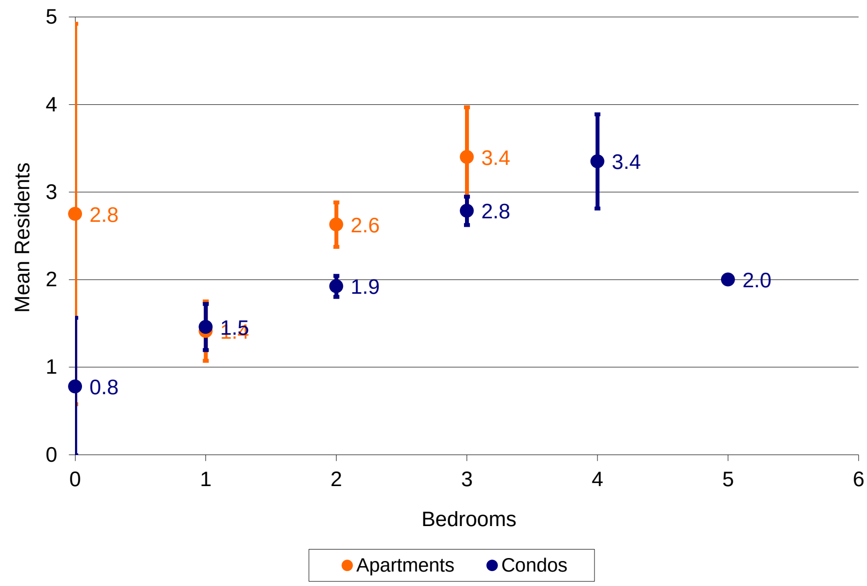


Figure 1: MF Occupancy vs number of bedrooms

Water Management Plan

According to the water management plan prepared by AquaSan all of the housing units will have best available technology for all fixtures and appliances. In addition they will have active leak detection capability provided by a combination of real time data from the water meters plus ultrasonic sensors on each supply line for the units. The water meters (Metron meter) will be linked into a cloud server and will be programmed to send alerts to property management that indicate leakage is occurring. In addition to this each unit will be equipped with a Streamlabs monitor that will identify in which units the leakage is occurring. The combination of these two monitoring devices should make it possible to hold leakage to a minimum, and especially to prevent long-term leaks that are responsible for the majority of water loss to leakage. In addition to the active leak detection:

All toilets will use 1.8 gpf or less.
Clothes washers will be rated at no more than 16 gallons per load (standard load)
Showers will have a max flow rate of 2.0 gpm
Kitchen sinks faucets will have a max flow rate of 2.2 gpm
Lavatory faucets will have a max flow rate of 0.5 gpm
Pre rinse sprayers for kitchen sinks will have a max flow rate of 0.8 gpm
Hot water system designed to deliver hot water to all fixtures within 15 seconds

We assume that the accomplishment of these items will be verified by the Town as part of its building inspection process.

Household Water Demands in New High Efficiency Homes

After having done the Residential End Use Study in 2000 the next logical step was to study groups of newer home that were built after 2001. Aquacraft did this in the Analysis of Water Use in New Homes, that was jointly funded by the U.S. EPA and the Salt Lake City Corporation, along with support from eight other water agencies located across the United States. As part of this study (Ref 5), approximately 25 homes were equipped by the builders with water using devices that match the requirements shown above for the water management plan. These were the High Efficiency New Homes, and our goal was to determine how indoor water use varied with occupancy for houses equipped with the best available plumbing fixtures and appliances. The only missing element in these homes was an active leak detection system. For each home we knew the average daily indoor water use (from data logging) and the number of residents in the home (from surveys). This allowed us to generate the relationship between the number of occupants in the home and the daily water use. This curve is shown in Figure 2.

It is important to note that the curve is not linear, but is a power curve where the indoor use varies with the number of persons in the home raised to the power of 0.53. This means that it is impossible to use a single per capita value of water use and apply it to houses of different sizes, since the per capita use varies with the number of persons in the home.

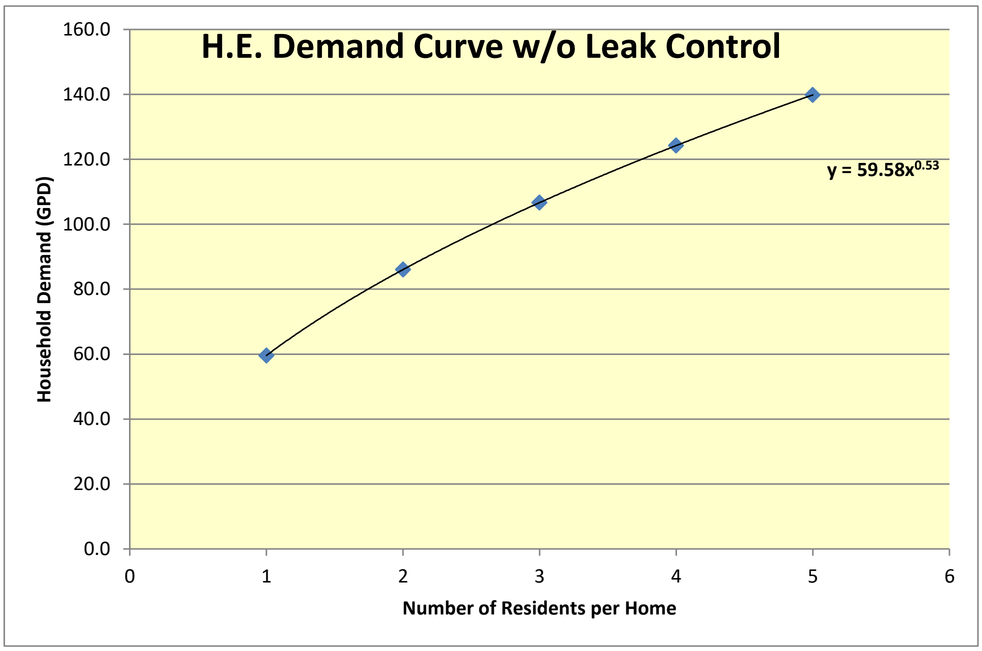


Figure 2: Household daily demands verses number of residents for high efficiency home

The relationship between residents and household use and per capita is shown in Table 1. If a single estimate of, say, 35 gpcd was used to estimate household use it will result in greatly underestimating the use in homes with fewer persons and over estimating use in homes with more persons. This same general form of demand power curve has been observed in every study of residential water use Aquacraft has done. The only difference is the value of the coefficient and the exponent. The same curve generally applies to both MF and SF homes.

Table 1: Household and per capita water use versus number of residents

Residents/Unit	Household Use (GPD)	Per Capita Use (GPCD)
1	59.6	59.6
2	86.0	43.0
3	106.7	35.6
4	124.2	31.1
5	139.8	28.0

To emphasize the fact that all homes do not use the same amount of water, and that the water use patterns of new, more efficient homes, are lower than those of the original homes studied as part of the first Residential End Uses of Water Study we have inserted a copy of a figure from the EPA New Home Study (Ref 5) as Figure 3, below. This figure shows the household use versus number of residents curves for four sets of houses, which include the high efficiency new homes curve shown in Figure 2, above. When the high efficiency demand curve is plotted along with the other curves the reduction in household water use becomes more apparent than when a single curve is plotted.

The top curve in the figure shows the curve for the homes from the REUWS1 study, which were random homes from the mid 1990's. As one would expect, these homes showed the highest indoor water use patterns of the four. This situation began to change with the passage of the 1992 Energy Policy Act[3], which mandated the use of more efficient toilets and showers. Between 2005 and 2011 when we did the New Home study the random samples of homes built after 2001, shown in green, had a significantly lower demand curve.

The most efficient homes were reflected by the pink and purple lines on the curve. These were homes that were either built with the best available fixtures and appliance already installed, the purple curve, or were new homes in which these devices were installed as retrofits as part of the study. The data on which these curves were based was collected in many different cities over many years of observations. They consistently show the same results and we believe they are trustworthy.

Many water agencies are failing to take the reductions in water demands into account in their water planning. This has resulted in oversizing of facilities and over-investment in capital projects. Using demand estimates that are too large is not really a conservative approach, since it leads to excess capital spending on plants and water resources. This excess spending must be paid for by the existing and new water customers. By using the updated demand numbers water utilities can minimize their capital spending and the amount of money they need to recover in tap fees and rates. This is the main reason why our research has been funded over the years.

[3] Even though the act was passed in 1992 it did not have a significant impact on the housing stock for several years.

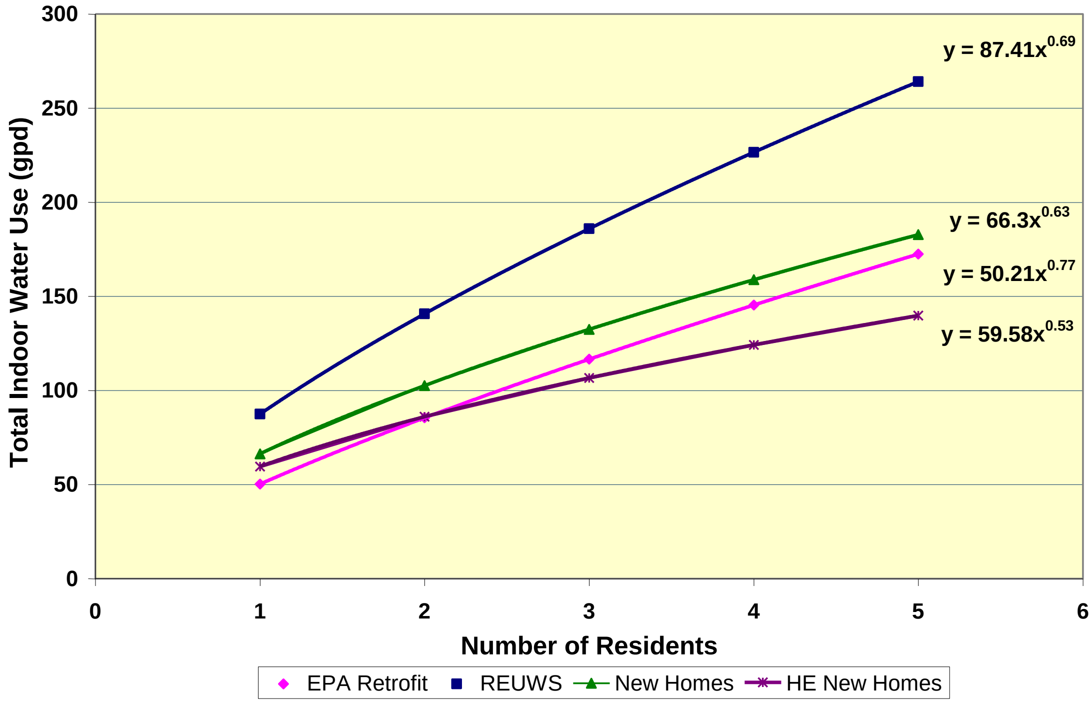


Figure 3: Comparison of residential indoor use vs residents (from EPA New Home Study)

Correction for Leak Control

The high efficiency homes used to generate the curve shown in Figure 2 did not contain any active leak control devices. The disaggregation of end uses in the homes, done using the flow trace data obtained from the water meters, showed average daily leakage rates of 19.2 gallons per day. Because the homes in the Reserve project will have an advanced system of active leak control we have adjusted the household use calculated from the populations and demand curves to show the effect of the leak control. For MF units we have reduced the leakage from 19.2 to 4.2 gpd, which is close to the median value. For SF units we reduced the leakage to 9.2 gpd. Single family homes always have more opportunities for leakage including some outdoor hose bibs, which is the reason why we used a lower reduction for SF homes than MF homes.

Irrigation Demands

In order to determine the water demands for irrigation the same application rates used for the Town EQR allocations were used to calculate the water requirements for turf (30 inches or 18.7 gpsf) and low water use plants (18 inches or 11.2 gpsf). These rates were multiplied by the respective areas of high and low water use vegetation obtained from the landscape plans, and the annual irrigation water demand was obtained.

The Town has pointed out that the code does not make provisions for having landscape that includes low water using plants. This is not a technically defensible position, because it is well known that landscapes can be designed to include a wide variety of plant types that have a similarly wide range of water demands. So, stating that the landscapes will be designed to use less water by intentionally choosing the right mix of high and low water using plants is a totally valid assertion. Furthermore, requiring landscapes to contain nothing but high water using plants (i.e. turf) is a very wasteful practice when most agencies are encouraging just the opposite approach.

Finally, the fact that the project will rely on a non-potable irrigation system where water will be drawn from Brush Creek makes the discussion of irrigation demands irrelevant, since no water from the Town system will be used for irrigation. In our analysis we have added in the irrigation demands into the gross demands, but then deducted them from the net demands.

Commercial Demands

Immediately after completion of the Residential End Use study in 1999, Aquacraft was chosen as one of the lead investigators on the AWWRF study of Commercial and Institutional End Uses of Water (Ref 2). As part of this study water use and survey data from a large sample of commercial customers in Phoenix and Southern California were analyzed. These data were then normalized on a square foot basis by percentiles ranging from 10% (the lowest users) to 90th percentile (the highest users). For our purposes we have used the 25th percentile use to estimate water use for the commercial uses on the site, which we are assuming will be 30,000 sf split evenly into 10,000 sf of offices, restaurants and food stores. The use of the 25th percentiles is justified given the fact that the new commercial uses on the site will all be new and use the best available fixtures and appliances. As in the case of the occupancy for multi-family residences, we believe that in the absence of good locally derived data, these data from the Water Research Foundation ICI study provide reliable guidance for commercial demands.

Table 2: Water Use for Commercial Uses

Commercial Use	**25th Percentile use (gal/sf/year)**
Restaurants (full service)	163
Offices	9.4
Food stores	24

Recreation Uses

We know that the Reserve is to have a recreation facility and club house, but the precise configuration of the facility has not been determined. Aquacraft did detailed water audits for 36 urban recreation centers for the City of Denver (Ref 3). As part of the audits the average daily use was determined for a series of end uses on the sites. We have listed the average for the 36 audits for the end uses that we believe are applicable to the club house at the reserve project in Table 3. These centers were large urban recreation centers with large pools and locker rooms that served populations of thousands of persons, which are much larger than the few hundred to be served by the Reserve club house. We therefore, believe it reasonable to adjust the annual demands down to 25% of the Denver center demands, which results in an annual demand estimate of 326,219 for the club house.

Table 3: Recreation end uses from Denver Rec Centers

End Use	Average gpd for 36 recreation facilities
Kitchen and faucet use	53
Showers	423
Toilets	344
Urinals	104
Pools/hot tubs	2261
Leaks and other	390
Total gpd	3575
Total gpy	1,304,875
Estimate for the Reserve (25%)	326,219

Water Use Calculations

The detailed water use calculations for the Reserve project are shown in Table 4. The residential demands start with the number of occupants per unit obtained from Figure 1, from which the household demands are calculated using the power curve from Figure 2 and correcting for the active leak control systems to be employed by the developer. The MF units are shown in Phase 1 and 2 sections of the table. The SF units are shown in Phase 3. The table uses 104 single family units to generate the SF demands. The irrigation demands are based on the areas and application rates described above. (These are included even though this water will be supplied from the non-potable irrigation system). The commercial demands are estimated using the data from the AWWARF CII study. Finally, the demands for the recreation facility have been estimated using the audit data from the 36 recreation centers in Denver, as adjusted to account for the smaller population served by the Reserve clubhouse.

Table 4 shows the estimate for the annual water use for the Reserve project, as designed with 500 housing units, is 21.40 mg/yr. When the calculations are run with 465 units the annual demands are 20.24 mg/yr. The next step is to convert these annual demands into equivalent residential units. These gross demands include 5.5 mg/yr for irrigation that will be delivered from the non-potable irrigation system, not from the Town water supply.

Table 4: Water demand calculations (500 units)

	Water Use for High Efficiency Homes	Occupants	Buildings		
	Indoor Demands		Type 1	Type 2	Totals (Buildings & Gal)
	Bedrooms				
Phase 1	1 BR	1.4	12	18	
	2 BR	2.6	12	18	
	Units/Bldg		24	36	
	Total Occupants		48	72	120
	Total No. Bldgs Phase		2	4	

	Water Use for High Efficiency Homes	Occupants	Buildings		
	Indoor Demands		Type 1	Type 2	Totals (Buildings & Gal)
	Total 1BR Units				96
	Total 2 BR Units				96
	Total Units in Phase		48	144	192
	GPD for Each Building by type		1681	2521	
	GPY for Each Building by type		613,528	920,291	
	GPY for Phase 1		1,227,055	3,681,166	4,908,221
Phase 2	1 BR	1.4	12	18	
	2 BR	2.6	12	18	
	Units/Bldg		24	36	
	Total Occupants		48	72	120
	Total No. Bldgs Phase		4	3	
	Total 1BR Units				102
	Total 2 BR Units				102
	Total Units in Phase		96	108	204
	GPD for Each Building by type		1681	2521	
	GPY for Each Building by type		613,528	920,291	
	GPY for Phase 2		2,454,110	2,760,874	5,214,985
Phase 3	SF Homes	2.7		104	280.8
	Total GPD for SF Homes			9450	
	Total GPY for SF Homes				3,449,084
Irrigation	Irrigation		High	Low	
	Acres		4.7	3.5	8.2
	SF		204732	152460	357,192
	Application Rate (inches)		30	18	
	Application Rate (gpsf)		18.70	11.22	
	Total Annual Irr Demand (gal)		3,829,152	1,710,898	5,540,050
Commercial	Commercial	SF	Gal/SF	GPY	
	Restaurants (sf)	10000	163	1,630,000	
	Offices (sf)	10000	9.4	94,000	
	Markets (sf)	10000	24	240,000	

	Water Use for High Efficiency Homes	Occupants	Buildings		
	Indoor Demands		Type 1	Type 2	Totals (Buildings & Gal)
	Annual Demand for Commercial (gal)				1,964,000
Rec	Club House (pool and hot tub)				326,219
Summary	Total 1 BR Units				198
	Total 2 BR Units				198
	Total MF Units				396
	Total SF Units				104
	Total Housing Units				500
	Total Population				520.8
	Total Annual Water Demand (gal)				21,402,558
	Total EQR				167.53

Note: 1 EQR = 350 gpd, or 127,750 gal/yr

EQR Conversion

In order to convert from gallons per year to EQR's we need to know the annual water use of the typical residential customer served by the town of Eagle's water system, since this is the accepted method of determining the EQR value.

What is an EQR?

In the comments of the Town Engineer to the AquaSan report it was correctly pointed out that "The EQR represents a widely accepted methodology for equitably determining the cost to buy into the existing system." I agree with this completely, but for the system to be equitable the value of the EQR must be directly related the amount of water used by the average household in the water system under consideration. An EQR is not an arbitrary number.

There is a very good definition of the EQR by the Washington State Department of Health[4], which I believe captures the general understanding of the definition by the water industry. It states:

> "When designing or evaluating a water system, we compare non-residential and multifamily water demands to the typical amount of water a single-family residential unit uses. We use the term 'equivalent residential unit' (EQR) as a basis for this comparison."

This means that for the EQR system to be valid and have a claim on equity the annual volume needs to be based on empirical data from the Town of Eagle on the average annual water use of the existing single family homes.

[4] https://www.doh.wa.gov/portals/1/Documents/pubs/331-441.pdf

In response to the client's request, the town provided the billing data for their residential customers for the period from December 2016 through November 2018. Based on this information the average number of residential accounts on the system was 1962 units and the average annual water delivery was 243,195,500 gallons. This means that the EQR is 123,827 gallons per year. The town data was not separated into single family and multi family accounts, so if there are a large number of multi-family residences on the system this would increase the number of relative to the number of accounts, and thus decrease the EQR value to some degree. Without exact information on this, however, it is not possible for us to make a precise determination, so we have used the value of 123,827 as the EQR value from the billing data. This value is slightly lower than the EQR estimate recently provided by the town of 350 gal/day or 127,750 gal/yr. Given the fact that the two values are so close to each other, we believe they confirm each other.

Problems with the Existing Table of Equivalent Units

The existing PIF ordinance contains contradictions and inconsistencies that we found difficult to reconcile. The ordinance defines a single family residence equal to 1 EQR, but it does not state how many gallons per year this unit is allocated. It does say that the EQR is to include 2500 sf of irrigated landscape. Since we know that the Town assumes an application rate of 30" of water, and each inch is equivalent to 0.623 gallons per square foot, this implies the annual volume for irrigation will be 2500 sf x 30 x 0.623 gpsf = 46,750 gpy for irrigation[5]. So the volume of the EQR appears to be the sum of the domestic use by the average single family house plus 46,750 gal for irrigation. This gives us a hint but does not answer the question.

The single family home table does include information on the ratio of gallons per EQR in that it states the each 1000 sf of irrigated area is equivalent to 0.25 EQR. We know that 1000 sf of irrigated are will require a volume of 18,700 gallons. So this implies that the EQR consists of 18,700 gallons/0.25 EQR = 74,800 gallons. If this is correct then by the Town's definition a single family residence has an annual water demand of **1 EQR = 74,800 gallons/yr**, which is **28,050 for indoor use and 46,750 for irrigation**. This is equivalent to 77 gallons per household per day for indoor uses or 28.5 gallons per person per day. I have no idea if this is the correct value, but it is what the ordinance is implying.

The ordinance defines the water use of a 1 bedroom/1 bathroom apartment as 0.6 EQR including 500 sf of irrigation. At the rate of 74,800 gal/EQR, this suggests that the anticipated water use for a 1 bedroom apartment will be 44,880 gallon per year of which 9350 gallons (500 x 18.7) will be for irrigation and 35,530 gallons will for indoor use. The implication is that the typical single family home will use 28,050 gallons per year for indoor uses and a 1 bedroom apartment will use 1.3 times this amount or 35,530 gallons per year. This does not seem reasonable.

According to the ordinance a 2 bedroom/2 bathroom apartment is assumed to use 0.8 EQR or 59,840 gallons per year. This will include the same 500 sf of irrigated area per unit, so the indoor/outdoor breakdown would be 50,490 gallons for indoor use and 9350 gpy for irrigation. So in this instance the indoor use of a 2 bedroom apartment is assumed to be 1.8 times that of a single family residence, which also seems unreasonable.

[5] This is based on an application rate of 2.5 feet where 1 ft of applied water = 0.623 gal/inch

The situation with credits for non potable irrigation is equally confusing. When the developer purchases EQRs for irrigation the buy-in rate is 0.25 EQR/(1000 sf x .0187 kgal/sf[6])=0.0134 EQR/kgal. When the credits are given for installing a non-potable irrigation system the calculation is 0.25 EQR/(2500 sf x 0.187 kgal/sf) = .0053 EQR/kgal. So the credit is only 39.5% of the buy in cost. There is no explanation for the discrepancy. It seems that if anything, the savings from water use from non-potable irrigation would be more valuable since they reduce the peak day demand, which has a direct bearing on the water treatment plant capacity.

Rather than try to reconcile the inconsistencies in the ordinance we believe it would make more sense to simply use the value of 127,750 gallons per year per EQR obtained from the Town for determining both the buy-in and the credits for the non-potable irrigation system.

Allocation of Costs/EQR

The water fees assign a cost of $8,050/EQR for potable water and $10,000 per EQR for wastewater. The Reserve project will require a maximum of 167.53 EQRs of water based on the gross anticipated annual demand of 21,402,558 gallons of water. This equates to 167.53 x ($8050 + $10,000) = $3,023,917 for water and wastewater. The non-potable irrigation system will supply 5,540,050 gallons of water for which neither water nor wastewater fees should be charged. This is equivalent to 43.36 EQRs., which equates to a credit of 43.36 x ($8050 + $10,000) = $782,648. The net amount due for the entire project would be $3,023,917 – $782,648 = $2,241,269..

Summary

In this report we have performed a ground-up estimate of annual water demands for the Reserve at Hockett Gultch project. We have based our estimate on the numbers of households and their respective occupancy rates. The indoor water demands for these were calculated using the power curve relationship for household water demand for high efficiency homes obtained from the cited studies. These demands were adjusted to account for the fact that the households in the reserve project will all be equipped with active leak detection devices that will recognize long term leaks and alert the project managers of their presence. Annual demands were also determined for irrigation, recreation and commercial uses on the project. The resulting demand estimates were 158.45 EQRs for 465 housing units and 167.53 EQRs for 500 units. The developer should receive a credit for 44.74 EQRs based on the water saved by the non-potable irrigation system.

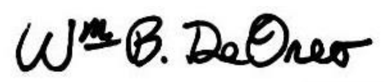
The average ratio of EQRs per housing unit based on our projections is 0.33 EQRs. The reasons this value is lower than the estimate in the Town ordinance, which range from 0.6, 0.8 and 1.0 for 1BR and 2BR apartments and single family homes respectively are: first, due to the high efficiency fixtures and appliances (including lead detection devices), and ,second, due to the non-potable irrigation system.

[6] 18.7 gallons/sf = .0187 kgal/sf

Aquacraft conducted this independent engineering review of the Hockett Gutch project's water demands separately from AquaSan's report. The results were not compared until our independent analysis was completed. Our estimates were based on the assurance that the development would follow the water plan outlined by AquaSan. Furthermore, if the actual water use for the development exceeds the estimate based on the water plan, then the PIF charges should be adjusted accordingly so that both the Town and the Developer are protected.

We appreciate the opportunity to assist you with this project, and are available to meet in person or by phone to answer any questions you, your client or the Town of Eagle may have on our work.

Sincerely,



William B. DeOreo, M.S., P.E.
President
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Aquacraft
WATER ENGINEERING & MANAGEMENT

References for Aquacraft reports cited in this document:

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