FINAL

CITY OF IDAHO FALLS

WATER FACILITY PLAN APPENDICES

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APPENDIX A

Water Conservation Plan

APPENDIX A
WATER CONSERVATION PLAN

Executive Summary

This is the first formal Water Conservation Plan generated for the City of Idaho Falls (City). For years, due to the capacity of the aquifer, relatively cheap power rates, and ease of obtaining new water rights, the City has been able to provide culinary water to its residents at very reasonable rates. The desire to provide this service as economically as possible led the City years ago to decide against metering customer use of City-provided water.

However, the dynamics involving supply of unmetered water service are changing. The ability to obtain water rights from the State is currently impeded by a moratorium enacted on the issuance of new water rights in the Eastern Snake Plain Aquifer. The City's lack of metering has led to comparatively high water use as the majority of customers are charged a flat rate regardless of how much water is used. Water conservation remains a viable alternative to ensure enough water for future City growth.

This Water Conservation Plan evaluates 63 water conservation actions. Of these actions, 20 are determined as currently on-going or recommended to begin this year and 27 are recommended for implementation within 1 to 5 years. An additional 10 actions are not recommended for implementation and 6 involving metering have been deferred to City leaders due to overall expense and other implications.

Effectiveness of conservation efforts can be difficult to quantify primarily due to yearly climate variations. However, one action that has been proven throughout the nation to conserve water is the installation of water meters. If customers are required to pay for the amount of water they use, they find ways to scale back their consumption. Estimates indicate that if the City installed water meters, current water consumption could realistically be reduced by as much as 30 to 40 percent, and this pattern of reduced water use would continue throughout the City's future. Reduction in water use from the implementation of other conservation measures will most likely be marginal without the installation of water meters.

This being said, this Water Conservation Plan should not be interpreted as a recommendation to initiate City-wide metering. Rather, this plan is intended to present facts regarding culinary water use and potential actions for conservation, utilizing a comparative analysis with neighboring metered systems.

Introduction

In March, 2014, the City of Idaho Falls contracted with Murray, Smith and Associates, a civil engineering consultant, to generate a Water Facility Plan for the City's culinary water system. The Water Facility Plan is to serve as an update of the City's current water system master plan (shown in Figure 1), which was generated by CH2M Hill in January 1989.

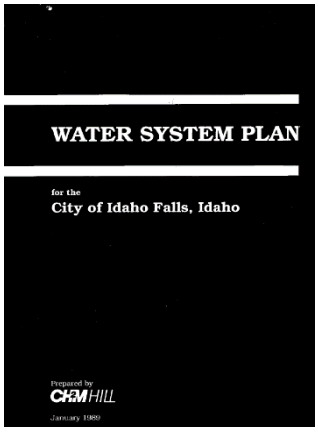

Figure 1 - Existing 1989 Water System Plan

Twenty-five years have passed since 1989. In the meantime, many changes regarding water rights and regulations have occurred, rendering the 1989 plan largely irrelevant and adding to the need of a revised, overall system plan.

The Water Facility Plan is to be a "living" document, comprised of sections that can be revisited and updated from time to time by City staff. Supplementary to the Water Facility Plan are three sections completed by City staff, of which this Water Conservation Plan is one. The other two consist of a Water Rights Plan and a City Code Analysis of Title 8, Chapter 4 – Water Service.

Water Conservation Plan Purpose and Scope

The overall purpose for creating and adopting a Water Conservation Plan is to ensure an adequate supply of clean and safe water for the citizens of the City of Idaho Falls, now and into the future. This also entails planning for future growth, ensuring a strong and vibrant economy.

The scope of the Water Conservation Plan is to supplement the Water Facility Plan. It will provide a:

- Brief description of the area and climate characteristics
- Description of regional water systems of relevance to the City
- Brief analysis of regional and City water use
- Review of City water supply
- List of current City water conservation measures
- List identifying and evaluating potential water conservation measures
- Plan to implement viable water conservation measures

The end goal of this Water Conservation Plan is to propose a selection of viable water conservation measures to be considered by the City Council that can be formally adopted for City staff to begin implementation.

Area and Climate Characteristics

Physical Setting

The City of Idaho Falls first formed around Taylor's Bridge (see Figure 2), a timber toll bridge crossing the Snake River constructed in 1865 to help traders and settlers cross the river. Initially referred to as Eagle Rock (being named after a basalt island located in the Snake River), the City's name officially changed to Idaho Falls in 1891. Idaho Falls (see Figure 3) is the county seat for Bonneville County and, with an estimated 2013 population of over 58,000, is currently the largest City in southeastern Idaho and the fourth largest City in the state.

Figure 2 – Taylor's Bridge

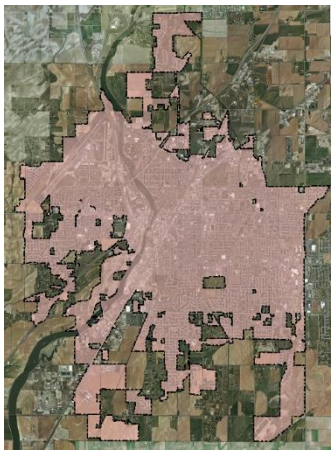

Figure 3 – Existing Idaho Falls City Limits

Idaho Falls is situated in southeastern Idaho at an elevation of approximately 4730 feet above sea level. The City resides in the Upper Snake River Basin watershed, an area classified as an alpine desert region with a semi-arid climate. Average annual daily temperatures range from a high of 58 degrees Fahrenheit to a low of 32 degrees Fahrenheit. Idaho Falls receives an average of 10 to 12 inches of annual precipitation.

Regional Water Systems of Relevance to the City

Surface Water Systems

The region surrounding Idaho Falls is mainly rural with a large agricultural presence. The Snake River crosses through the City with approximately 1/3 of the City's incorporated area lying on the west side of the river. Irrigation canals canvas the area with three irrigation districts (Idaho, Progressive, & New Sweden) supplying surface water from the Snake River to local farms and ranches.

Land irrigated by surface water that is annexed by the City and subsequently developed as private property has typically opted out of the irrigation district and switched irrigation methods from surface water to the City's culinary groundwater system. In these cases, the surface water shares for these properties are typically released back to the irrigation district. However, the City has acquired and continues to maintain surface water irrigation shares for annexed properties that are maintained by the City (ie: airport, parks, etc.) even though these properties are currently not irrigated with surface water.

Municipal Water System

The City of Idaho Falls' municipal water system (shown in Figure 4) is a public water system controlled by the City government. The system's supply stems from groundwater drawn from the Eastern Snake Plain Aquifer (ESPA). The system consists of 19 deep wells with a combined water right capacity of 58,290 gallons per minute. Source water is pumped from wells into storage tanks that allow chlorine adequate time to disinfect the water. The system maintains a combined total storage of nearly 8 million gallons. Booster pumps take finished water from the tanks and pump it through 310 miles of water main pipe to serve approximately 24,000 billed accounts and nearly 2,100 fire hydrants. For a more thorough system description of the water system and its operation, refer to Section 2 - Existing System Description of the Water Facility Plan.

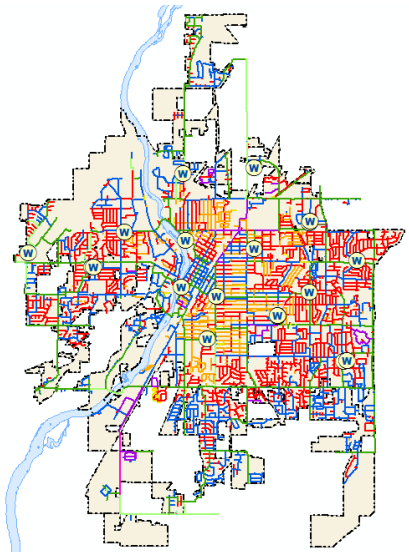

Figure 4 – Existing City of Idaho Falls Water System

Water Use Analysis

Regional Water Use

While the bulk of this plan addresses water use within the City limits of Idaho Falls, the City notes that conservation is a regional issue. Surface water and groundwater are no longer managed exclusively, but are now conjunctively managed. Currently, there is a moratorium on the issuance of new water right permits with the ESPA which can negatively impact the growth of our regional economy. Additionally, a surface water shortage within the boundary of the ESPA can now result in a water call, a process in which surface water right holders with senior rights can potentially cause groundwater users with junior rights to curtail use of their wells. As a result, water conservation has regional impacts.

The United States Geologic Survey (USGS) recently published Circular 1405 (*Estimated Water Use in the United States in 2010*), a document reporting national water use statistics for the 2010 calendar year. According to the report, all public supplies within the State of Idaho account for approximately 1.4% of the state's total groundwater withdrawals. Irrigation withdrawals for the same year (excluding irrigation by public supplies) account for 81.4% of the state's groundwater withdrawals. The remaining 17.2% account for domestic (not on public supply), livestock, aquaculture, industrial, and other uses.

Another circular published in 2005 by the USGS analyzed groundwater use in specific aquifers in the year 2000. USGS Circular 1279 (*Water Use from Selected Principal Aquifers)* indicated that in the Snake River Plain Aquifer, of which the ESPA is a portion of, public supplies account for 2.7% of groundwater withdrawals while irrigation accounts for 96.6%. The remaining 0.7% was listed as self-supplied industrial.

Additional statistics show that farmers, in efforts to make operations more efficient, have shifted from surface water to groundwater irrigation. This has created a regional dilemma in which we now live. As time has progressed, more groundwater and less surface water has been used for irrigation while surface water storage sites have remained constant. This means that excess surface water flows out of the system via the Snake River since there is no additional storage to hold it. In years of drought, this poses a severe problem as groundwater levels drop and spring and surface water users with senior rights place curtailment calls on junior right groundwater users. These curtailments can have an extensive, negative impact on the regional economy.

Given these statistics, it is vital that water be conserved regionally to maintain the sustainability of the aquifer that we all rely on. For regional conservation to be effective, it should include conservation measures for irrigation withdrawals along with a plan for groundwater recharge. This would allow excess surface water to be stored in the ESPA rather than flowing out of the basin, supporting sustainability of the aquifer.

This being said, municipalities should participate in water conservation measures. Diversified interests share the same water sources and everyone should do their part, no matter how small. Municipal water use is also more exposed to the public eye since the majority of the area's population live within city boundaries. Additionally, municipalities may have the most to gain by conserving, since conservation can free up necessary water supply required to provide for new industry thus continuing municipal growth.

Current City of Idaho Falls Water Use

For the purpose of this Water Conservation Plan, City water use will be analyzed both by domestic (indoor) and irrigation (outdoor) water uses. This helps to separate conservation-related issues and facilitate the evaluation of conservation actions. It should be noted, however, that these figures indicate a **volume** of water used and not the **rate** at which water is used. For the City of Idaho Falls, the rate at which water is consumed impacts our water rights more acutely than the total volume consumed. While typical conservation measures target the volume of water used, this Conservation Plan will also consider additional alternatives which benefit the City through decreased flow rates during peak flow times.

Since the City is largely unmetered, it is difficult to accurately determine the amount of water consumed by end users versus unconsumed water lost through system leaks, fire hydrant use, etc. Water consumption by the end users must therefore be estimated by using water production data from City well sites in comparison with production and consumption values from neighboring, metered municipalities. Water statistics for the 2012 calendar year were collected from the cities of Pocatello and Rexburg. These values were utilized to determine a percentage difference between their production and consumption values during both winter (non-irrigation) months and summer (irrigation) months.

Once percentage differences for both Pocatello and Rexburg were calculated, a weighted average of their values was utilized to determine a percentage difference for the City of Idaho Falls. The water system for the City of Idaho Falls most resembles the City of Pocatello's system in terms of size, complexity, and age. However, the City of Rexburg's water system more accurately resembles the City of Idaho Falls with respect to water pressure. Therefore, a weighted value of 70% was applied to Pocatello's water statistics and the remaining 30% weighted value was applied to Rexburg's statistics.

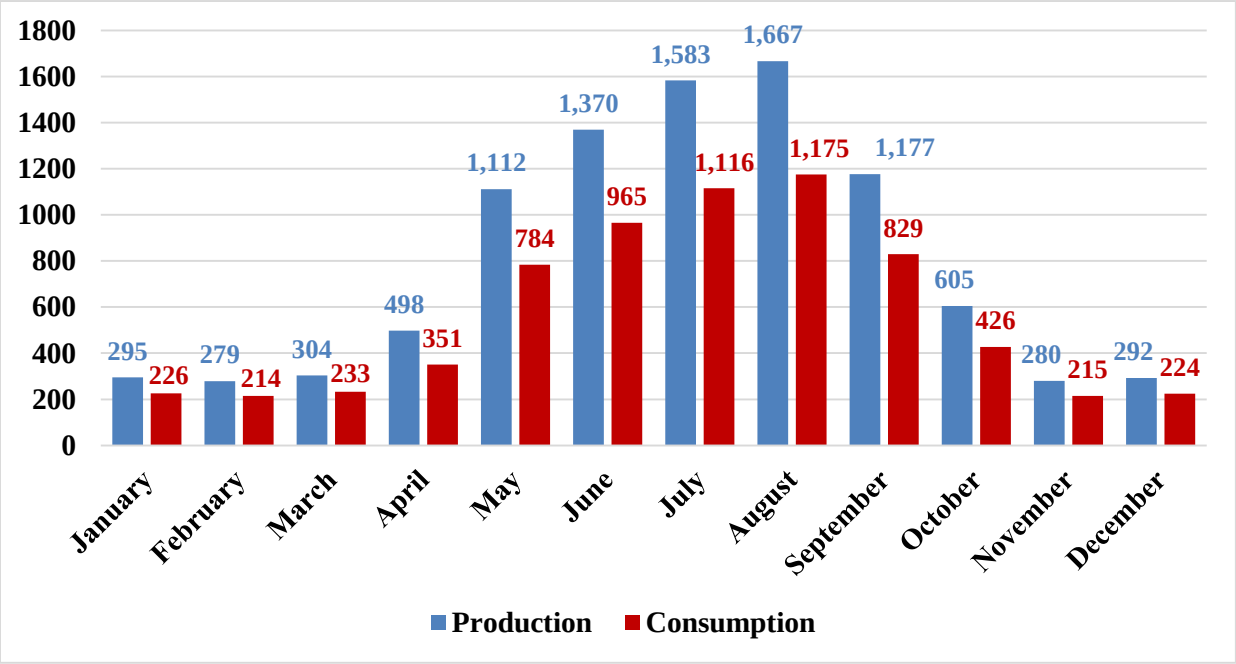

Figure 5
2012 City of Idaho Falls Water Production vs Consumption Comparison by Month (Million Gallons)

The resultant percentage drops could then be multiplied to the City of Idaho Falls' water system production values to estimate a consumption value by the end user for both winter and summer months. The resultant drop from production values to consumption values was estimated to be 30% during non-irrigation months and 42% during irrigation months. Figure 5 shows the comparison of City's known water production values to the estimated consumption values for the 2012 calendar year. An initial evaluation of the production data indicates that the City's water production during winter months levels off and is fairly constant. Data for was color coded in blue, while the estimated consumption values were colored red.

Since no irrigation occurs during the winter months, it can be assumed that all water consumed during these months by the end user is used for indoor purposes. The average indoor use during winter months can then be determined as 222.4 million gallons (MG) per month or 7.3 MG per day. This value includes all indoor uses, including commercial and industrial uses, which is consistent with the values obtained from the cities of Pocatello and Rexburg. Using a

2012 City of Idaho Falls population estimate of 58,048 persons, this equates to approximately 126 gallons per capita per day (gpcd).

Water consumption during irrigation months is estimated at an average 806.6 MG per month which equals 26.4 MG per day or 455 gpcd (3.6 times the winter indoor use). Peak summer consumption occurred during the month of August equaling 1,175 MG per month, 37.9 MG per day, or 653 gpcd (5.2 times the winter indoor use). Although the increased production during the summer months includes system losses due to leaks, seasonal variations, and fire hydrant use, the vast majority of the increase can be attributed to outdoor irrigation.

Figure 6 indicates the average amount of water used each month separated by both domestic (blue) and irrigation (green) uses. For the purposes of this plan, indoor water use is assumed

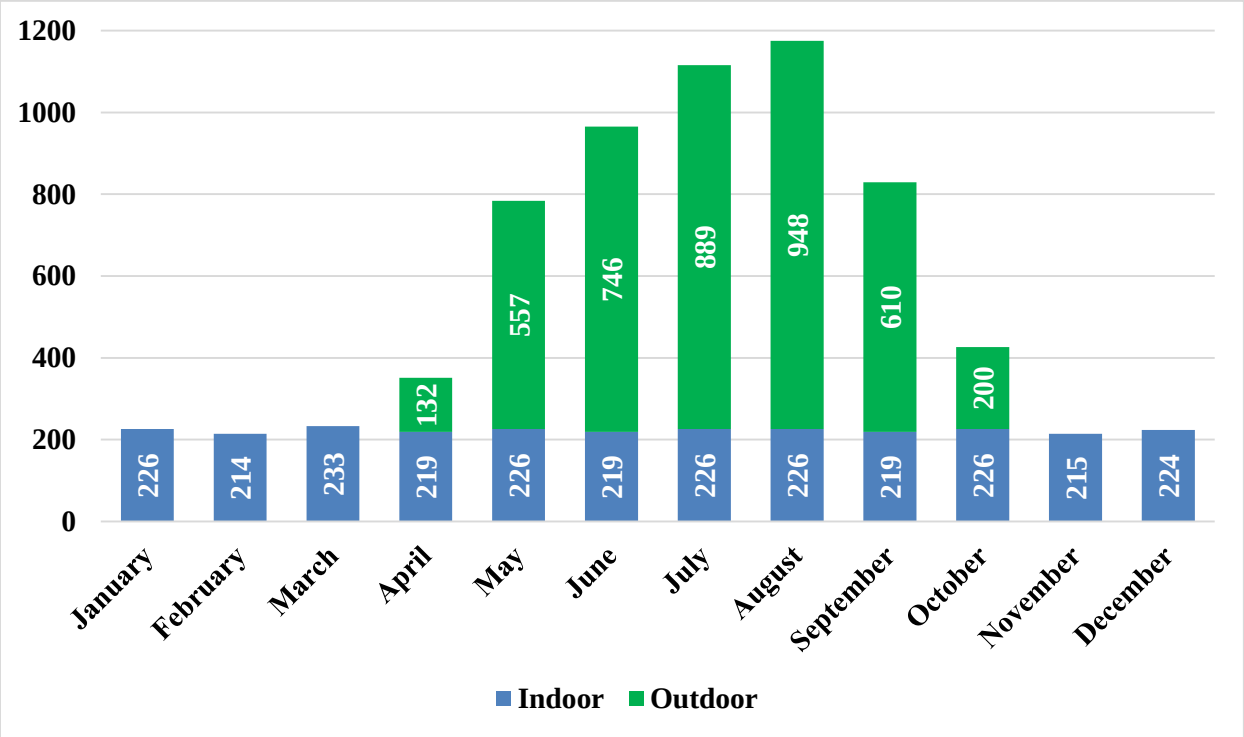

Figure 6
2011-2013 Average Indoor and Outdoor Water Consumption by Month (Million Gallons)

to remain constant throughout the irrigation season at 7.3 MG per day, which was used to calculate the monthly indoor figures during the irrigation season.

Indoor conservation benefits the City on two fronts: by reducing the amount of water pumped from City wells as well as reducing flows requiring treatment at the wastewater treatment plant. However, the majority of water conservation will most certainly be achieved outdoors. Putting these conclusions into perspective, of the City's 19 existing culinary wells, approximately 4 are utilized to provide interior domestic water while the remaining 15 wells provide water for irrigation and other outdoor uses.

In considering the rate of consumption, it's best to look at the City's peak hour demand (PHD). Using the same production data, the PHD occurred on July 30, 2012 at a rate of 3.42 MG per hour, equating to an instantaneous pumping rate of 57,000 gpm. The City's total water right withdrawal rate is established at 58,290 gpm. Finding alternatives to reduce the PHD on the City's water system will result in overall savings on future capital infrastructure expenditures such as new wells and storage tanks.

Projected City of Idaho Falls Water Use

Within the Water Facility Plan, *Section 3 - Population and Demand Projections* addresses future growth of the City as well as water use projections for the years 2020, 2035, and 2055. In Figure 3-2 of Section 3, demand projections for average day demand (ADD), maximum day demand (MDD), and peak hour demand (PHD) increase from current figures about 50% by the year 2035 and over 100% by the year 2055 without additional conservation measures.

Figure 3-2 also indicates the possible demand reductions with a comprehensive conservation program which includes metering of the City's culinary water. Water Facility Plan forecasting indicates a possible reduction of 27% in ADD and reductions in both MDD and PHD of nearly 39% over a 20-year horizon. How do these projections compare to a real-world comparison?

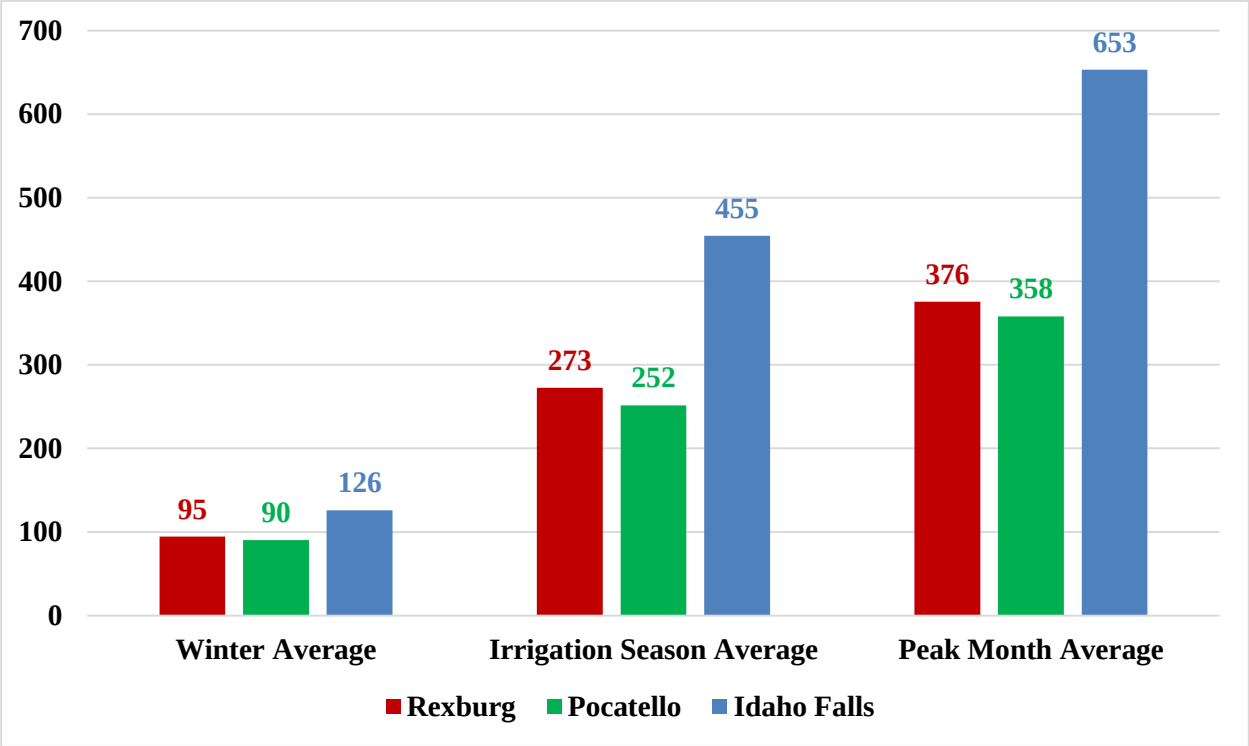

Figure 7
Comparison of Per Capita Water Use (gallons per capita day)

Figure 7 shows a direct comparison of per capita consumption for average winter, irrigation season, and peak month uses for the cities of Idaho Falls, Pocatello, and Rexburg. This direct

comparison to two metered water utilities within the region upholds this data for demand reductions cited in Section 3 of the Water Facility Plan. Metered data was supplied by the cities of Rexburg and Pocatello for comparative purposes. As previously mentioned, production values for Idaho Falls have been adjusted to estimate consumption values for use in the comparison.

During the winter, the typical citizen in Idaho Falls uses approximately 33% more water indoors than a person in Rexburg and 40% more than someone in Pocatello. Irrigation season values show that Idaho Falls' citizens use 67% and 80% more water than citizens of Rexburg and Pocatello respectively. Peak month values also indicate citizens in Idaho Falls using 74% more water than Rexburg and 82% more than Pocatello.

These values indicate that if the City of Idaho Falls were to install meters, indoor consumption values could potentially be reduced by 27% while irrigation season values could drop approximately 42%. These drops make the 39% reduction identified in Figure 3-2 of the Water Facility Plan a realistic possibility with meter installation.

Water Supply

Water supply for the City is based on water rights and shares that the City maintains, which are more thoroughly analyzed within the Water Rights Plan, another supplementary section to the Water Facility Plan. Within that plan, it is noted that the City has ample water rights to enable future growth. However, the plan also considers conservation measures as a means of stretching water supply from existing water rights. For the supply of water to be most efficient, water conservation must become a priority. For additional information regarding this evaluation, refer to the Water Rights Plan, a supplementary section to the Water Facility Plan.

Groundwater Rights

The City of Idaho Falls obtains all of its culinary water from municipal groundwater rights issued by the state to withdraw water from the ESPA. The water is abundant and of high quality, making it an ideal source for the wide variety of municipal uses as long as water rights can be obtained. Currently, 19 wells are constructed which produce culinary water for the City. Although the City has the ability to continue adding wells to existing water rights to accommodate future growth, it requires strategic planning, water right transfers, and revenue to fund capital expenditures.

Surface Water Irrigation Shares

Additional supply can be utilized from surface water irrigation shares. Approximately 1,448 acres of property maintained by the City used to be irrigated with surface water. Many of these properties are city parks that utilize the culinary water system for irrigation even though the City maintains their surface water shares. These surface water shares, currently unused, can potentially be used as a source of water supply. This could happen either through conversion of irrigation systems from groundwater to surface water or, with permission for the canal

companies, by using the surface water for groundwater recharge as mitigation for drilling a groundwater source to irrigate from.

Storage Water Rights

The City also maintains 1,180 shares of stock in Palisades Water Users, Inc. This entitles the City up to 1,180 acre feet (nearly 385 MG) of storage space in Palisades Reservoir. This full supply is available annually if the reservoir fills completely. This supply, as with surface water irrigation shares, can be used as mitigation for groundwater curtailment calls or to mitigate potential groundwater sources.

Reclaimed Water

The City of Idaho Falls owns and maintains its own wastewater treatment plant (WWTP), treating sewage to near drinking water quality prior to discharge into the Snake River. Return flow into the river from the WWTP equates to approximately 8-9 MG per day. Currently, the City does not have a plan for using reclaimed water from the WWTP although it has the right to utilize this water indefinitely. The only current benefit the City receives from this water is through irrigation of property surrounding the WWTP. Possible benefits include applying for a water right based on return flows to the river or finding a method to utilize the water for other purposes that could include groundwater recharge or industrial uses.

Water returned to the Snake River from the WWTP is treated such that it could be reclaimed and used as a surface water irrigation source. To do so would require the City to obtain a land application permit and install necessary infrastructure required to utilize the water. Included in the infrastructure would be specifically colored pipe and fixtures indicating use of reclaimed water along with appropriate signage and public education measures.

Current Water Conservation Actions

The City of Idaho Falls does not have a previously adopted Water Conservation Plan. The City currently does, however, carry out some conservation measures. These measures include:

- Issuance of low-flow shower heads to owners of electric water heaters through a program offered through Idaho Falls Power
- Public education through printing and issuance of an annual water conservation and winterization brochures to each billed customer account
- Enforcement of building codes that require the installation of low-flow toilets and other water fixtures for new construction and renovations

Figure 8
Current educational brochures

- Conversion of City park irrigation systems to an automatic, centrally controlled system
- Meetings with school district and church officials regarding water use practices
- An annual leak detection survey that rotates through the City
- Public education through participation in the annual Greater Idaho Falls Water Festival where regional 5th and 6th grade classes are taught about water and conservation
- Collaboration with Parks and Recreation to conduct informal audits of City water use and procedures and target inefficiencies at select sites
- Response to water wasting complaints and reports of leaks

Evaluation of Water Conservation Actions

Water Department personnel generated a list of potential conservation actions with definitions. The list was created utilizing conservation actions from other municipal conservation plans along with additional ideas generated by Department personnel. Table 1 contains 63 total identified conservation actions which have been defined and separated into the following 4 main categories: *General Administrative Conservation Actions, Indoor Conservation Actions, Outdoor Conservation Actions*, and *Peak Flow Reduction Actions*.

Table 1
Conservation Actions

General Administrative Conservation Actions – Utility/City Practices		
#	*Conservation Action*	*Conservation Action Definition*
1	Meter all existing water services within the City	Installation of water meters on every service connected to the City's water system could generate water use awareness as a consumer's bill would be based on the amount of water used.
2	Hire a water conservation coordinator	Other conservation actions will take personnel hours to implement. This action recommends hiring a position that would spend approximately 20 hours per week (½ FTE) dedicated to carrying out conservation actions.
3	Purchase leak detection equipment	Water leaks make noise. Mobile noise loggers can be purchased and mounted to water main isolation valves to detect system leaks. Loggers can be rotated throughout the system over time during non-irrigation months.
4	Conduct annual leak detection survey	Professional services can be hired to detect system leaks. Acoustic equipment is used to listen for and pinpoint leaks.
5	Approve a budget amount for conservation actions	Many conservation actions would require investment by the City in hopes of greater, long-term returns from reduced water use. A dedicated budgetary amount to complete these actions would be beneficial.
6	Identify alternative sources for funding conservation actions	Grant monies could potentially offset implementation costs of conservation actions. Monies acquired from grants would help supplement a conservation budget.
7	Charge water users a conservation fee	A conservation fee added to utility bills could help generate revenue to fund conservation actions.
8	Benchmark other cities' conservation actions	Comparisons can be drawn between other municipalities. Successes and Failures from other systems can help direct conservation efforts.
General Administrative Conservation Actions – Public Outreach		
#	*Conservation Action*	*Conservation Action Definition*
9	Form and/or participate in a regional water conservation group	As mentioned in the report, water conservation is also a regional issue. This action would include forming a regional group to meet and discuss regional water conservation issues.

10	Meet with IDWR regularly to discuss conservation	The Idaho Department of Water Resources is the state organization governing water rights.
11	Meet with large water users to identify conservation measures	Meetings with owners of industries or large irrigated parcels (churches and school districts) can be established to tour sites and discuss procedures to identify how water can be conserved.
12	Create and distribute educational brochures to water users	Printed brochures can be generated for distribution to all water users to educate them about specific conservation methods as well as available conservation incentives.
13	Conduct water conservation presentations to groups	Water conservation presentations can performed for schools, community groups, and associations to educate about conservation methods and available incentives.
14	Develop a web page dedicated to water conservation	A dedicated web page can be created to which water users can be directed. The page could educate about conservation methods and available incentives.
15	Develop a social media campaign for conservation	Use social media applications such as Facebook and Twitter to promote water conservation
16	Develop public service announcements and a media campaign for conservation	Generate radio and television ads to promote water conservation. Existing ads may be available from water industry advocacy organizations.
Indoor Conservation Actions – Utility/City Practices		
#	*Conservation Action*	*Conservation Action Definition*
17	Reduce water use through system pressure management	Reducing water pressure throughout the system would yield water savings. Lower pressure leads to lower flow through water fixtures and sprinklers.
18	Perform indoor water audits for City-owned facilities	Water Department personnel would tour existing City facilities to identify inefficient indoor fixtures and possibilities for indoor conservation.
19	Replace inefficient indoor fixtures at City-owned facilities	Based on completed water audits, the Water Department would generate a list of inefficient indoor fixtures recommended for replacement. The list would be provided to the appropriate Division/Department for budgeting.
20	Use high-efficiency indoor fixtures at new City facilities	All future City-owned facilities would be equipped with high-efficiency indoor water fixtures.
21	Meter water used for indoor construction activities	Temporary meters would be issued to contractors to capture all indoor water use during construction of new buildings.
22	Sub-meter individual units in apartments and strip malls	Metering individual units rather than the entire building would make the resident of each unit accountable for their own water use.
Indoor Conservation Actions – Ordinances and Rules		
#	*Conservation Action*	*Conservation Action Definition*
23	Create a tiered rate structure promoting indoor conservation	Aggressive rate structures for metered systems can encourage customers to replace even minor indoor leaks. To implement this conservation action, the water system would have to be metered.
24	Charge City-owned facilities for indoor water use	Charging other Divisions/Department for water used would encourage them to eliminate indoor inefficiencies.
25	Require installation of high-efficiency fixtures for new construction and renovations	Ensure that all future and renovated facilities would be equipped with high-efficiency indoor water fixtures.
Indoor Conservation Actions – Incentives		
#	*Conservation Action*	*Conservation Action Definition*
26	Issue awards for indoor water-conscious customers	An incentive that would promote awareness of conservation-conscious customers by issuing awards for water conserving facilities.
27	Offer customers incentives to upgrade from low to high-efficiency indoor fixtures	Monetary incentives such as rebates for exchanging low-efficiency indoor fixtures with high-efficiency ones.

28	Offer customers free high-efficiency yet low-cost indoor fixtures	City would purchase and distribute low-cost, high efficiency indoor fixtures such as faucet aerators, shower heads, etc.
Indoor Conservation Actions – Public Outreach		
#	*Conservation Action*	*Conservation Action Definition*
29	Perform indoor water audits for customers	Water Department personnel would perform indoor water audits by request from customers to identify leaks and inefficiencies.
30	Educate customers about available incentive programs	Getting word out about available incentive programs to make them more effective through advertisement in print or other media.
31	Promote use of high-efficiency indoor fixtures at local retail suppliers	Identify indoor fixtures at hardware and plumbing stores that qualify for consideration as high-efficiency. This can be done with logos marking specific displays that meet industry standards.
32	Create an indoor education area to teach customers about high efficiency indoor fixtures	A demonstration area similar to Idaho Falls Powers electrical education area would be constructed to train customers during open houses and tours.
Indoor Conservation Actions – Reclaimed Water		
#	*Conservation Action*	*Conservation Action Definition*
33	Use reclaimed water for indoor industrial uses	The City's wastewater treatment plant discharges 8-9 million gallons daily into the Snake River. This water could potentially be reused and resold for industrial uses such as cooling, offsetting treatment costs.
Outdoor Conservation Actions – Utility/City Practices		
#	*Conservation Action*	*Conservation Action Definition*
34	Reduce water used for flushing water mains	Water used for flushing mains in order to clean them would be examined to determine if procedural changes could reduce volumes.
35	Reduce water used for training fire fighters	Water used for training fire fighters would be examined to determine if volumes could be reduced.
36	Reduce City water system losses and leaks	Water lost through system leaks would be evaluated to determine what measures the Water Department could do to conserve.
37	Reduce private water system losses and leaks	An evaluation of enforcement procedures to encourage private property owners to repair known service line leaks would conserve water.
38	Perform outdoor water audits for City-owned facilities	Water Department personnel would perform outdoor water audits by request from customers to identify sprinkler system leaks and inefficiencies.
39	Meter water used for outdoor construction activities	Metering water used for outdoor construction activities such as dust control would encourage contractors to be conservation minded.
40	Acquire water rights from annexed properties	The City would benefit from obtaining all surface and groundwater rights associated with annexed properties, whether owned by the City or not.
Outdoor Conservation Actions – Ordinances and Rules		
#	*Conservation Action*	*Conservation Action Definition*
41	Create a tiered rate structure encouraging outdoor water conservation	Aggressive rate structures for metered systems can encourage customers to conserve water used outdoors. To implement this conservation action, the water system would have to be metered.
42	Charge City-owned facilities for outdoor water use	Charging other Divisions/Departments for water used would encourage them to eliminate outdoor inefficiencies.
43	Generate a xeriscape ordinance for landscaping of properties	Xeriscape is landscape decoration without water use through landscape rock, etc. An ordinance allowing xeriscape would encourage conservation.
44	Institute odd-even irrigation watering schedules	Encouraging customers to irrigate only on specific days dependent upon their address would promote conservation.
Outdoor Conservation Actions – Incentives		
#	*Conservation Action*	*Conservation Action Definition*
45	Issue awards for outdoor water-conscious customers	An incentive that would promote awareness of conservation-conscious customers by issuing awards for water conserving facilities.

46	Offer incentives to upgrade inefficient sprinkler system components	Monetary incentives such as rebates for exchanging low-efficiency sprinkler heads with high-efficiency ones. Hose-end timers and sprinkler timers could also be considered.
47	Offer customers free high-efficiency yet low cost outdoor fixtures	City would purchase and distribute low-cost, high efficiency outdoor fixtures such as hose sprayers, moisture sensors, hose-end timers etc.
48	Offer incentives to sprinkler installation contractors to use high-efficiency sprinklers	Finding a way to incentivize the installation of high-efficiency sprinkler system components on new sprinkler systems would conserve water outdoors.
Outdoor Conservation Actions – Public Outreach		
#	*Conservation Action*	*Conservation Action Definition*
49	Perform outdoor water audits for customers	Water Department personnel would perform outdoor water audits by request from customers to identify leaks, inefficiencies, and recommend alterations to watering schedules.
50	Educate customers about water-wise plants and use of xeriscape materials	Distribute conservation-minded literature to identify plants and grasses that require very little water and to educate about use of xeriscape. The latter would require a xeriscape ordinance for landscaping.
51	Create a conservation garden to educate customers on use of water-wise plants	Other water purveyors have worked with local nurseries to create a water conservation garden, educating through a demonstration of beautifying with xeriscape and plants and grasses that require little water.
52	Create an outdoor education area to teach customers efficient irrigation methods	In conjunction with a conservation garden, an outdoor demonstration area of efficient irrigation methods can educate customers on conservation.
53	Promote use of high-efficiency outdoor fixtures at local retail suppliers	Identify outdoor fixtures at hardware and plumbing stores that qualify for consideration as high-efficiency. This can be done with logos marking specific displays that meet industry standards.
Outdoor Conservation Actions – Reclaimed Water		
#	*Conservation Action*	*Conservation Action Definition*
54	Develop ability to use reclaimed water for irrigation	The City's wastewater treatment plant discharges 8-9 million gallons daily into the Snake River. This water could potentially be used in the summer to irrigate large parcels such as parks.
Peak Flow Reduction Actions – Utility/City Practices		
#	*Conservation Action*	*Conservation Action Definition*
55	Remove irrigation of large City parks from culinary water system	Large City parks are irrigated throughout the night during peak water flows. Converting these parks to irrigate with surface water or having a dedicated irrigation well would reduce peak flows on the City's culinary system.
56	Decrease the minimum service line size	Sprinkler systems are typically designed based on the amount of water the service line provides. Decreasing the minimum service line size would cause sprinkler systems to install more zones and decrease peak water use.
Peak Flow Reduction Actions – Incentives		
#	*Conservation Action*	*Conservation Action Definition*
57	Offer incentives to sprinkler contractors to design sprinkler systems with more zones	Sprinkler systems are typically designed based on the amount of water the service line provides. Increasing the number of zones would reduce the flow used to irrigate with and reduce overall peak flows.
58	Offer incentives to increase the number of sprinkler zones on a sprinkler system	Offering an incentive to customers to add zones to their existing systems by reducing the number of heads operating on each zone would decrease irrigation use during peak hours.
Peak Flow Reduction Actions – Public Outreach		
#	*Conservation Action*	*Conservation Action Definition*
59	Educate customers to adjust irrigation timers to avoid peak flows	Most sprinkler timers are set to water through the night when evaporation is low. Adjusting timers to start either earlier in the evening or later in the morning can lower peak flow on the City's culinary system.

60	Educate sprinkler installation contractors to stagger watering start times to lower peak flows	Most sprinkler timers are set to water through the night when evaporation is low. Adjusting timers to start either earlier in the evening or later in the morning can lower peak flow on the City's culinary system.
61	Educate customers about water usage and peak flows	Peak flows are crucial for municipal water right needs. Reducing peak flow usage through education would help extend existing water rights.
62	Educate Parks Department to stagger irrigation during peak flows	Parks sprinkler timers are set to water through the night when evaporation is low. Adjusting timers to start either earlier in the evening or later in the morning can lower peak flow on the City's culinary system.
63	Educate owners of large parcels to stagger irrigation during peak flows	Sprinkler timers for large parcels are set to water through the night when evaporation is low. Adjusting timers to start either earlier in the evening or later in the morning can lower peak flow on the City's culinary system.

Each of the 4 main categories have been further divided into as many as 5 subcategories:

- Utility/City Practices
- Ordinances & Rules
- Incentives
- Public Outreach
- Reclaimed Water

Individual actions have been placed within the appropriate category and subcategory. Then each action has been evaluated by the City's current practice, estimated cost to implement, estimated benefit to the City, and ease of implementation. Costs of each action have been evaluated as:

- Low = $0 – 10,000
- Medium = $10,001 – $50,000
- High = $50,001 - $100,000
- Very High = Over $100,000

Benefits to the City and ease of implementation are each evaluated as Low, Medium, High, and Very High. It must be noted that it is difficult to determine the overall benefit when comparing differing results such as water saved, public awareness, and public education. Therefore, a best-guess evaluation of the benefits was performed. The list and evaluations of potential actions are located in Table 2.

Recommended Plan

Following the evaluation of potential conservation actions, recommendations for implementation were assigned. Conservation action recommendations have been listed as:

- Already occurring
- Begin within 1-5 years
- Do not implement
- Recommendation left for City Leaders

All recommendations can be found in Table 2 where additional notation briefly explains the rationale for the recommendation.

Table 2
Conservation Action Evaluation

General Administrative Conservation Actions – Utility/City Practices						
#	*Conservation Action*	*Current City Practice*	*Cost to Implement*	*Benefit to City*	*Ease of Implementation*	*Recommendation for Implementation*
1	Meter all existing water services within the City	All new and 10% of existing commercial customers are metered	Very High	Very High	Low	**Recommendation left to City Leaders**; Due to implications; Facility Plan evaluates cost/benefit
2	Hire a water conservation coordinator	No position is currently dedicated to water conservation	Medium	Medium	Medium	**Begin within 1-5 years**; Recommended actions within this plan require time to implement; Recommend ½ FTE dedicated to conservation
3	Purchase leak detection equipment	Purchase of noise data loggers is scheduled for 2015/16 fiscal year	Medium	High	High	**Begin within 1-5 years**; Water Department plans to purchase equipment in 2015/16 fiscal year
4	Conduct annual leak detection survey	City has an annual leak detection contract, although it is small	Low	Medium	Very High	**Already occurring**; Recommend augmenting current contract amount for leak detection to $10k
5	Approve a budget amount for conservation actions	No specific budget line dollar amount identified for conservation	Medium	High	Medium	**Begin this year**; Recommended actions within this plan will require funding; Start slow and build
6	Identify alternative sources for funding conservation actions	No grant monies are currently pursued for conservation	Low	Very High	Very High	**Begin this year**; Water Department staff will work with City grant administrator to identify availability
7	Charge water users a conservation fee	No fee is charged to water users to promote conservation	Low	Low	Medium	**Do not implement**; Conservation costs should be included in rates but not as a separate fee
8	Benchmark other cities' conservation actions	No benchmarking for conservation is currently conducted	Low	Medium	Very High	**Begin this year**; Check proposed actions with other municipalities to help determine efficacy
General Administrative Conservation Actions – Public Outreach						
#	*Conservation Action*	*Current City Practice*	*Cost to Implement*	*Benefit to City*	*Ease of Implementation*	*Recommendation for Implementation*
9	Form and/or participate in a regional water conservation group	Personnel participate with Earth Day and the Greater Idaho Falls Water Festival	Low	Low	Very High	**Begin this year**; City should join Idaho Groundwater Appropriators (IGWA) or Bonneville/Jefferson Groundwater District
10	Meet with IDWR regularly to discuss conservation	No meetings are currently held with IDWR	Low	Low	Very High	**Do no implement**; Little benefit derived regarding conservation

11	Meet with large water users to identify conservation measures	City has occasionally met with local church and school district employees as needed	Low	High	Very High	**Already occurring**; Recommend augmenting by establishing annual meetings and identifying areas of conservation to budget for
12	Create and distribute educational brochures to water users	Annual brochures for conservation and freeze protection are printed and distributed	Low	Low	High	**Already occurring**; Recommend augmenting by creating additional brochures to better educate consumers
13	Conduct water conservation presentations to groups	Presentations currently performed as requested by groups	Low	Medium	High	**Already occurring**; Recommend augmenting by finding new venues and focusing on conservation
14	Develop a web page dedicated to water conservation	Existing Water Department web page has links to conservation sites	Low	Low	Medium	**Already occurring**; Recommend augmenting by creating separate page rather than just links
15	Develop a social media campaign for conservation	Social media is not currently used to promote water conservation	Low	Medium	High	**Begin within 1-5 years**; Consult with City's IPO to determine possibilities
16	Develop public service announcements and a media campaign for conservation	No public service announcements are currently generated for water conservation	Low	High	Medium	**Begin within 1-5 years**; Investigate availability of existing PSA's from industry organizations that could be utilized
Indoor Conservation Actions – Utility/City Practices						
#	***Conservation Action***	***Current City Practice***	***Cost to Implement***	***Benefit to City***	***Ease of Implementation***	***Recommendation for Implementation***
17	Reduce water use through system pressure management	System pressures currently operate between 45 to 80 psi	Very High	High	Low	**Do not implement**; Water pressure is currently low and is established by height of elevated tower
18	Perform indoor water audits for City-owned facilities	Indoor water audits are not performed at City facilities	Low	High	High	**Begin this year**; Water Department will establish tours of City facilities to identify areas to conserve
19	Replace inefficient indoor fixtures at City-owned facilities	Inefficient fixtures are replaced as needed based on their functionality	Medium	Medium	High	**Begin this year**; Outdated fixtures found from indoor audits will be recommended for replacement
20	Use high-efficiency indoor fixtures at new City facilities	Plumbing code requires installation of efficient fixtures	Low	Low	Very High	**Already occurring**; Building Department enforces current plumbing code which requires installation
21	Meter water used for indoor construction activities	Indoor construction water is not metered	Low	Low	Medium	**Recommendation left to City Leaders**; Revisit if decision is made to meter water system

22	Sub-meter individual units in apartments and strip malls	Individual units and strip malls are not metered	High	Low	Low	**Recommendation left to City Leaders**; Revisit if decision is made to meter water system
Indoor Conservation Actions – Ordinances and Rules						
#	***Conservation Action***	***Current City Practice***	***Cost to Implement***	***Benefit to City***	***Ease of Implementation***	***Recommendation for Implementation***
23	Create a tiered rate structure promoting indoor conservation	Some commercial rates are tiered; requires metering to be effective	Medium	Very High	High	**Recommendation left to City Leaders**; Revisit if decision is made to meter water system
24	Charge City-owned facilities for indoor water use	City-owned facilities are not charged an indoor water bill	Medium	Medium	High	**Do not implement**; Most facilities funded from General Fund lack revenue generation
25	Require installation of high-efficiency fixtures for new construction and renovations	Plumbing code requires installation of efficient fixtures	Low	Medium	Very High	**Already occurring**; Building Department enforces current plumbing code which requires installation
Indoor Conservation Actions – Incentives						
#	***Conservation Action***	***Current City Practice***	***Cost to Implement***	***Benefit to City***	***Ease of Implementation***	***Recommendation for Implementation***
26	Issue awards for indoor water-conscious customers	No awards for indoor water conservation are issued	Low	Low	High	**Do not implement**; Little benefit derived from issuance of awards
27	Offer customers incentives to upgrade from low to high-efficiency indoor fixtures	No incentives are available to upgrade from low to high-efficiency fixtures	Medium	Medium	Medium	**Begin within 1-5 years**; Once conservation budget is established, determine which fixtures to incentivize
28	Offer customers free high-efficiency yet low-cost indoor fixtures	Customers are not offered free indoor conservation fixtures	Low	Low	High	**Begin within 1-5 years**; Once conservation budget is established, determine which fixtures to purchase and distribute
Indoor Conservation Actions – Public Outreach						
#	***Conservation Action***	***Current City Practice***	***Cost to Implement***	***Benefit to City***	***Ease of Implementation***	***Recommendation for Implementation***
29	Perform indoor water audits for customers	No indoor conservation audits are performed for customers	Medium	Low	Medium	**Begin within 1-5 years**; Time requirements for audits will require a conservation coordinator
30	Educate customers about available incentive programs	No education for incentives; Incentive program must be implemented first	Low	High	High	**Begin within 1-5 years**; Once incentives have been established, educate public via media, social media, brochures, etc.

31	Promote use of high-efficiency indoor fixtures at local retail suppliers	No promotion of high-efficiency indoor fixtures is available	Low	Medium	Medium	**Begin within 1-5 years**; Once incentives have been established, generate logos or displays to post at local retail suppliers
32	Create an indoor education area to teach customers about high efficiency indoor fixtures	No public education area available to teach customers about indoor conservation	Medium	Medium	Medium	**Begin within 1-5 years**; Create hands-on displays for customers to learn about indoor water use and conservation
Indoor Conservation Actions – Reclaimed Water						
#	***Conservation Action***	***Current City Practice***	***Cost to Implement***	***Benefit to City***	***Ease of Implementation***	***Recommendation for Implementation***
33	Use reclaimed water for indoor industrial uses	Reclaimed water currently not used; Discharged to Snake River	High	Very High	Low	**Begin within 1-5 years**; Large potential for reuse of water while marketing for industrial growth for City
Outdoor Conservation Actions – Utility/City Practices						
#	***Conservation Action***	***Current City Practice***	***Cost to Implement***	***Benefit to City***	***Ease of Implementation***	***Recommendation for Implementation***
34	Reduce water used for flushing water mains	Mains flushed after repairs or as needed or requested	Low	Low	High	**Do not implement**; Appropriate flushing of water mains is determined by pipe size and length
35	Reduce water used for training fire fighters	Fire Department trains with both surface and culinary water	Low	Low	High	**Do not implement**; However, encourage Fire Department to use surface water whenever possible
36	Reduce City water system losses and leaks	City replaces about 1 mile of water main/yr; Leaks fixed once found	Medium	Medium	High	**Already occurring**; Continue to repair leaks as soon as they are discovered
37	Reduce private water system losses and leaks	Work with owner to fix leaks once discovered; Can shut off water	Low	High	Medium	**Already occurring**; Augment by investigating insurance policy for service line repair; Consider ordinance fines for not repairing
38	Perform outdoor water audits for City-owned facilities	Recent informal audits completed at Ryder Park and Tautphaus Zoo	Low	High	High	**Begin this year**; Water Department personnel will schedule walk-throughs with other City Departments
39	Meter water used for outdoor construction activities	Water for outdoor construction is not metered	Medium	High	Medium	**Recommendation left to City Leaders**; Revisit if decision is made to meter water system
40	Acquire water rights from annexed properties	Water rights acquired for annexed properties maintained by City	Low	Very High	High	**Already occurring**; Augment by investigating if surface water rights can be acquired from private property annexed into City

Outdoor Conservation Actions – Ordinances and Rules						
#	*Conservation Action*	*Current City Practice*	*Cost to Implement*	*Benefit to City*	*Ease of Implementation*	*Recommendation for Implementation*
41	Create a tiered rate structure encouraging outdoor water conservation	No tiered rates exist for outdoor water use; requires metering to be effective	Low	Very High	High	**Recommendation left to City Leaders**; Revisit if decision is made to meter water system
42	Charge City-owned facilities for outdoor water use	City-owned facilities are not charged an outdoor water bill	High	Very High	Low	**Do not implement**; Most facilities funded from General Fund lack revenue generation
43	Generate a xeriscape ordinance for landscaping of properties	City does not have a xeriscape ordinance for landscaping	Low	Medium	Medium	**Begin within 1-5 years**; Conservation coordinator will compare other Cities' policies and discuss w/ P&Z
44	Institute odd-even irrigation watering schedules	City does not require odd-even watering days	Low	Medium	Medium	**Begin this year**; Watering schedule should be voluntary; Some cities in implementing watering schedules have actually experience an increase in overall water use
Outdoor Conservation Actions – Incentives						
#	*Conservation Action*	*Current City Practice*	*Cost to Implement*	*Benefit to City*	*Ease of Implementation*	*Recommendation for Implementation*
45	Issue awards for outdoor water-conscious customers	No awards for outdoor water conservation are issued	Low	Low	High	**Do not implement**; Little benefit derived from issuance of awards
46	Offer incentives to upgrade inefficient sprinkler system components	No incentives are available to upgrade sprinkler system components	Medium	High	Medium	**Begin within 1-5 years**; Once conservation budget is established, determine which fixtures to incentivize
47	Offer customers free high-efficiency yet low cost outdoor fixtures	Customers are not offered free outdoor water fixtures	Low	Medium	High	**Begin within 1-5 years**; Once conservation budget is established, determine which fixtures to purchase and distribute
48	Offer incentives to sprinkler installation contractors to use high-efficiency sprinklers	No incentives are available for sprinkler contractors to install high-efficiency sprinklers	Low	High	High	**Begin within 1-5 years**; Once conservation budget is established, determine which incentives to offer contractors
Outdoor Conservation Actions – Public Outreach						
#	*Conservation Action*	*Current City Practice*	*Cost to Implement*	*Benefit to City*	*Ease of Implementation*	*Recommendation for Implementation*

49	Perform outdoor water audits for customers	No outdoor conservation audits are performed for customers	Medium	High	Medium	**Begin within 1-5 years**; Time requirements for audits will require a conservation coordinator
50	Educate customers about water-wise plants and use of xeriscape materials	No education provided to customers about water-wise plants and xeriscape	Low	High	High	**Begin within 1-5 years**; Once xeriscape ordinance has been established, educate public via media, social media, brochures, etc.
51	Create a conservation garden to educate customers on use of water-wise plants	City does not have a conservation garden to educate customers	Medium	High	Medium	**Begin within 1-5 years**; Create garden display for customers to learn about indoor water use and conservation
52	Create an outdoor education area to teach customers efficient irrigation methods	City does not have an outdoor education area to educate customers	Medium	High	Medium	**Begin within 1-5 years**; Create hands-on displays for customers to learn about outdoor water use and conservation; Complete with conservation garden
53	Promote use of high-efficiency outdoor fixtures at local retail suppliers	No promotion of high-efficiency outdoor fixtures is available	Low	Medium	Medium	**Begin within 1-5 years**; Once incentives have been established, generate logos or displays to post at local retail suppliers
Outdoor Conservation Actions – Reclaimed Water						
#	***Conservation Action***	***Current City Practice***	***Cost to Implement***	***Benefit to City***	***Ease of Implementation***	***Recommendation for Implementation***
54	Develop ability to use reclaimed water for irrigation	Reclaimed water currently not used; Discharged to Snake River	High	Very High	Low	**Begin within 1-5 years**; Reuse water while taking irrigated acres off of culinary water system
Peak Flow Reduction Actions – Utility/City Practices						
#	***Conservation Action***	***Current City Practice***	***Cost to Implement***	***Benefit to City***	***Ease of Implementation***	***Recommendation for Implementation***
55	Remove irrigation of large City parks from culinary water system	Many city parks are watered from City culinary system; Few use surface water for irrigation	High	Very High	Low	**Begin within 1-5 years**; Identify irrigated parks that can be removed from the culinary water system; Convert to surface water or to dedicated wells
56	Decrease the minimum service line size	City's minimum water service line size is 1" diameter	Low	High	Medium	**Do not implement**; Reduction in size will create problems for existing sprinkler systems
Peak Flow Reduction Actions – Incentives						
#	***Conservation Action***	***Current City Practice***	***Cost to Implement***	***Benefit to City***	***Ease of Implementation***	***Recommendation for Implementation***

57	Offer incentives to sprinkler contractors to design sprinkler systems with more zones	No incentives available to contractors to increase number of zones in new sprinkler systems	Low	High	High	**Begin within 1-5 years**; Once conservation coordinator is hired, educate contractors through annual training meeting
58	Offer incentives to increase the number of sprinkler zones on an existing sprinkler system	No incentives available to increase the number of zones on a sprinkling system	Medium	High	Medium	**Begin within 1-5 years**; Once conservation budget is established, identify feasible methods to incentivize
Peak Flow Reduction Actions – Public Outreach						
#	***Conservation Action***	***Current City Practice***	***Cost to Implement***	***Benefit to City***	***Ease of Implementation***	***Recommendation for Implementation***
59	Educate customers to adjust irrigation timers to avoid peak flows	No education provided to customer about avoiding peak flows with irrigation systems	Low	High	High	**Begin within 1-5 years**; Once conservation coordinator is hired, educate public via media, social media, brochures, etc.
60	Educate sprinkler installation contractors to stagger watering start times to lower peak flows	No education provided to sprinkler contractors about staggering watering start times	Low	High	High	**Begin within 1-5 years**; Once conservation coordinator is hired, educate contractors through annual training meeting
61	Educate customers about water usage and peak flows	No education provided to customers about peak flow usage	Low	High	High	**Begin within 1-5 years**; Once conservation coordinator is hired, educate public via media, social media, brochures, etc.
62	Educate Parks Department to stagger irrigation during peak flows	Recent discussions with Parks Department irrigation crews regarding peak flow usage	Low	Very High	High	**Already occurring**; Augment through annual meetings with Parks Department irrigation crews
63	Educate owners of large parcels to stagger irrigation during peak flows	City has occasionally met to discuss peak flow issues with local church and school district employees	Low	Very High	Medium	**Already occurring**; Augment with conservation coordinator by scheduling regular meetings with owners

Murray, Smith & Associates, Inc.
Engineers/Planners

APPENDIX B

Water Rights Plan

APPENDIX B
WATER RIGHTS PLAN

Foreword/Executive Summary

This is the first formal Water Right Plan generated for the City of Idaho Falls (City). Although the acquisition of water rights in the past was relatively easy, the current legal environment has complicated matters. To ensure future growth of the City, alternatives to acquire new water rights, use existing rights more efficiently, and pursue conservation measures were all evaluated. The evaluation of 12 water right alternatives resulted on the following recommendations:

1. Complete water right transfers adding points of diversion to existing water rights with senior priority dates.
2. Construct large storage tanks at all new well sites to help offset peak flow demands. This can allow the City to, in effect, double its production capabilities from rights mentioned in recommendation #1.
3. Identify and implement alternative sources of irrigation water for large City parks, whether from existing surface water shares or from separate irrigation wells.
4. Implement a water conservation program (evaluated in a separate section of the Facility Plan) to become more efficient through less water use.

The full evaluation of all 12 water right alternatives can be found in Sections 4 and 5 of this Water Right Plan and full recommendations can be found in Section 6.

Introduction

Background

Idaho Falls is a community of nearly 60,000 nestled in the southeast portion of the state approximately midway between the state's borders with Montana and Utah. It is located in a high desert region, receiving on average between 10 to 12 inches of annual precipitation. Given its arid climate and low precipitation rate, there is little doubt that water plays a vital role in the City's economy.

Idaho Falls is situated atop one of the nation's largest groundwater aquifers, the Eastern Snake Plain Aquifer (ESPA), from which it draws water for use within its service boundary. The ESPA stretches from Ashton on its northeasterly boundary to near Twin Falls at its southwesterly limit, where its water discharges from the aquifer into the Snake River at Thousand Springs. Water from the ESPA serves a variety of diverse interests, of which include agricultural, industrial, municipal, hydropower, and commercial.

All water within the State of Idaho is owned and regulated by the state. The right to divert water in Idaho is controlled by the Idaho Department of Water Resources (IDWR) and is based

on the prior appropriation doctrine, or "first in time, first in right." Each water right has an assigned a priority date to help the state administer them. Before water may be diverted for any use, an application for a water right must be submitted to the IDWR. The application is reviewed, advertised, and opened for public comment or contestation. Once the application is approved, a permit to divert the water for a designated beneficial use is issued. When the diversion is completed and beneficial use verified, the permit then becomes a water right and is issued a priority date for when the permit was originally requested. That priority date dictates who has the right to divert the water first. Water users with senior (older) water rights have priority over those who have junior (newer) rights.

History

When Southeast Idaho was settled in the mid to late 1800's, the initial settlements were located around spring discharges in the Magic Valley near Twin Falls. The city of Eagle Rock formed around Taylor's Bridge, a wooden bridge created in 1865 to help settlers cross the mighty Snake River. Eagle Rock later became the City of Idaho Falls in 1891. No springs were located near the area, so the initial source of water for the town was from the Snake River.

Settlers began installing diversions from local creeks and the Snake River to farm the ground. The first surface water rights established in the Idaho Falls area were from the Willow Creek drainage in 1874. Ditches were constructed throughout Southeast Idaho to transmit the water from natural channels to provide irrigation. Leakage of water through the canal bottoms helped lead to incidental recharge of the ESPA, which over time would cause the aquifer levels to surge above normal historical levels.

In 1878, the railroad reached Eagle Rock and precipitated dramatic municipal growth in the area. The town periodically began hiring the Sanborn Map & Publishing Company in 1884 to generate maps of the City. The 1888 map of Eagle Rock shows the first signs of a municipal water system, with a surface water diversion established on the Snake River that pumped to two 35,000 gallon storage tanks.

The City of Idaho Falls later took notice of the ESPA in 1921 when its first well, then known as the 10th Street Well, was dug and licensed near the intersection of Boulevard and 10th Street. Due to its purity, groundwater soon began replacing surface water as the City's preferred source for culinary water. New wells were dug every few years as the City continued to grow. During these years, groundwater and surface water were considered functionally separate and were administered accordingly.

During the 1950's, the state made a comprehensive effort to quantify the flow of water from the springs near Thousand Springs. With all of the incidental recharge from surface water

irrigation canals, the aquifer's discharge to the springs had never been higher. These spring users were issued water rights for the springs that were in excess of historical values. Around the same time, cheap electricity and better technology made the construction of wells vastly easier. Since then, wells have sprung up across the ESPA for a variety of purposes including the irrigation of parcels that surface water could not otherwise reach.

Wells were not originally required to be licensed due the "Constitutional Appropriation" doctrine which allowed for water to be constructed and diverted without a license. This began to change in the 1960's when the state required all wells that were previously constructed to become licensed. In 1963, a single water right with a 1963 priority date was established for city wells #2 through #8 and an annual volume restriction was placed on the right.

Cities and agriculture continued to grow across Southeast Idaho. In efforts to become more efficient, many farms switched from flood irrigation to sprinkler irrigation to decrease evaporation losses and labor expenses. This practice, although vastly more efficient, has eliminated much of the incidental recharge provided to the aquifer through surface irrigation, and when combined with the number of new wells drilled, aquifer levels began to drop.

Severe drought hit Southeast Idaho in the 1980's which led to water right litigation. As a result of the litigation, a ruling was issued by the judge affirming the prior appropriation doctrine but stating that groundwater and surface water were too interconnected within the ESPA and that they must be managed together rather than separately. This ruling led to the inception of "Conjunctive Management" of both ground and surface water rights within the ESPA, and in the 1990's the IDWR released its rules on the conjunctive management of the resources.

Although surface and groundwater rights were originally issued and managed separately, the court ruling requiring conjunctive management upended the status quo for holders of groundwater rights. Since most surface water rights were issued prior to the development of groundwater rights, groundwater users now find themselves behind surface water users when it comes to administration of the prior appropriation doctrine. This, combined with recent droughts and a moratorium on the issuance of new groundwater rights within the ESPA, have created difficulties for groundwater users.

To assist the IDWR with the conjunctive management process, the State of Idaho created a computerized groundwater model for the ESPA. The model (ESPAM) is currently utilized to understand impacts of water right transfers within the ESPA. Unfortunately, surface water and spring users with senior water rights have used ESPAM to their benefit to bolster legal claims against junior groundwater right holders.

Cities now find themselves toward the rear of the line with regards to water right administration and legally beholden to most surface water and spring users who are submitting claims that their senior water right allotments are being damaged by junior groundwater users. These claims, or water right calls, require the IDWR to determine if curtailment of junior rights are necessary to satisfy the needs of senior right holders. For cities to best avoid curtailment and

ensure future growth, they must identify multiple options to acquire new water rights, utilize existing rights more efficiently, conserve water, and mitigate against future water calls by senior water right holders.

Water Right Plan Purpose and Scope

The purpose of the Water Rights Plan is to ensure that there is ample water to support future growth of the City. The plan evaluates existing rights as well as options for acquiring additional rights. The scope includes a description of the City's existing water rights and shares, a determination of which water rights are directly or indirectly pertinent to the City's culinary drinking water system, an evaluation of existing rights' capability to satisfy current and future culinary water demands, an identification of alternatives for maximizing the City's existing rights to meet future demands, and recommendations of action items to be carried out to ensure that the City's future water demands will be met.

Description of Existing Water Rights and Shares

The City of Idaho Falls has a varied portfolio of water rights and shares. Included in this portfolio are hydropower rights; municipal groundwater rights; miscellaneous groundwater rights; surface water irrigation shares; and storage water shares. Each of these types will be discussed individually along with its applicability, whether direct or indirect, to the City's culinary drinking water system.

1. ***Hydropower Rights***

   The City of Idaho Falls owns and operates four hydroelectric, power generating dams on the Snake River. Each of these hydropower facilities is required to have water rights for the capability of diverting water from the Snake River for the purpose of generating electricity. Every right has an associated water right number issued by the IDWR and a corresponding priority date and diversion rate. Priority dates for the hydropower rights span from April 1900 to April 1980 with diversion rates that range from as low as 48 cubic feet per second (cfs) to as much as 5,000 cfs. Table 1 contains a list of the City's existing hydropower rights along with their pertinent information. Hydropower rights have no direct or indirect impact on the City's culinary water system except for budgetary concerns with regards to power expenditure, therefore this plan will not address them further.

Right #	Source	Priority Date	Diversion Rate (CFS)	Location
01-00040	Snake River	04/20/1900	140	Central Power Plant
01-00041	Snake River	10/22/1904	48	Central Power Plant
01-00281	Snake River	12/29/1905	1,500	Lower Power Plant
01-02014	Snake River	12/03/1907	485	Central Power Plant
01-04002	Snake River	02/05/1915	388	Central Power Plant
01-00360	Snake River	07/18/1919	394	Central Power Plant
01-00361	Snake River	10/05/1923	485	Central Power Plant
01-02047	Snake River	10/28/1927	500	Upper Power Plant
01-04003	Snake River	05/03/1930	580	Upper Power Plant
01-02049	Snake River	02/14/1936	1,080	Upper Power Plant
01-04001	Snake River	10/05/1940	1,240	Lower Power Plant
01-07013	Snake River	11/09/1977	260	Upper Power Plant
01-07014	Snake River	11/09/1977	4,800	Lower Power Plant
07-07015	Snake River	11/09/1977	2,600	Central Power Plant
01-07018	Snake River	03/17/1978	5,000	Gem State Plant
01-07023	Snake River	02/15/1979	1,240	Upper Power Plant
01-07024	Snake River	02/15/1979	1,460	Central Power Plant
01-07051	Snake River	04/09/1980	3,000	Gem State Plant
01-07025	Snake River	02/15/1979	900	Lower Power Plant (Relinquished)
		Totals:	**27,540**	**77,784**

Table 1 – City of Idaho Falls Hydropower Rights

2. ***Municipal Groundwater Rights***

Water rights with a municipal use are unique in the fact that they can serve a variety of uses including domestic, irrigation, commercial, and industrial uses. Municipal groundwater rights primarily cover the wells drilled by the City for growth and expansion of the culinary drinking water system, and are therefore the most applicable to this plan. The City has grown over the years, and to accommodate the water demand generated by growth, it has filed applications for municipal groundwater rights through the IDWR. Some existing rights are individual (ie: one right per well), some are joined (multiple rights for one well), and one is combined (one right for multiple wells). Table 2 identifies each existing municipal groundwater right along with corresponding information.

Right # or Permit # (P)	Wells	Priority Date	Instantaneous Flow (CFS; GPM)	Annual Volume (Acre-feet)
25-02095	#1	02/25/1927	5.20; 2,340	3,758;
25-02142 & 35-03020	#2, #3, #4, #5, #7, #8 & #6	04/08/1963	50.20; 22,590	20,200
25-02143	#9, #10	11/22/1963	17.10; 8,019	12,358
35-07001	#11	07/13/1967	8.90; 4,005	6,432
25-07022	#12	01/18/1972	7.35; 3,308	5,312
25-07058	#13, #13-B	08/22/1974	6.14; 2,763	4,437
35-07841	#14	02/07/1979	7.35; 3,308	5,312
25-07298 & 25-07398	#15	12/23/1982 01/11/1985	3.35; 1,503 1.55; 696	2,421 1,120
25-07654 (P)	#15-B	09/03/1997	6.70; 3,015	4,842
35-08682	#16	02/10/1988	8.02; 3,609	5,796
25-07467	#17	09/09/1988	8.02; 3,609	5,796
		Totals:	**129.88; 58,765**	**77,784**

Table 2 – City of Idaho Falls Municipal Groundwater Rights

3. ***Miscellaneous Groundwater Rights***

Many of the City's existing groundwater rights have been acquired over time for a variety of uses, including irrigation, domestic, stock water, etc. These rights are typically used for specific uses at specific locations such as irrigation of Sand Creek golf course, stock water at Sandy Downs, dust control at Noise Park, etc. The majority of these rights are currently being put to beneficial use. Their priority dates vary and diversion rates are typically small, making them of little use except for their current uses.

4. ***Surface Water Irrigation Shares***

The City of Idaho Falls maintains surface water shares in three local irrigation districts: Idaho, Progressive, and New Sweden irrigation districts. The City has accumulated property once irrigated with surface water to provide services (ie: airport, zoo, parks, cemeteries, etc.). The City pays assessments to the irrigation districts to maintain these shares, even for properties that are no longer irrigated with surface water. These shares could still be utilized for surface water irrigation which directly benefits water supply, or potentially for groundwater recharge projects as indirect benefits. A list of these shares is indicated in Table 3.

Water Irrigation District	Total Water Shares (Acres)	Notable Areas Formerly Irrigated With Surface Water
Snake River Valley Irrigation District	25.00	Gem State Power Plant
Idaho Irrigation District	777.40	Tautphaus Park, Pinecrest Golf Course, Sandy Downs, Gem State Power Plant
New Sweden Irrigation District	449.50	Idaho Falls Regional Airport, Ryder Park, West Side Substation
Progressive Irrigation District	195.90	Hatch Pit Landfill, Jenkins Gravel Pit
Totals:	1,447.80	

Table 3 – City of Idaho Falls Surface Water Irrigation Shares

5. ***Storage Water Shares***

The City of Idaho Falls purchased 1,180 shares of stock in Palisades Water Users, Inc. This entitles the City to up to 1,180 acre feet of stored water, although the volume available each year is proportional to the percentage Palisades Reservoir is filled for the upcoming water season. These shares may be leased, released as mitigation for water calls, or potentially utilized for groundwater recharge projects which could indirectly boost water supply.

SECTION 4 – WATER RIGHT OPTIONS AND ALTERNATIVES

There have been times during the heat of the summer that the City has approached its maximum limit for instantaneous flow. This creates an issue for accommodation of new growth. In order to produce more culinary water for growing the local economy, the City is left with three options:

1) Acquire additional water rights
2) Use existing rights more efficiently
3) Pursue conservation measures

Each option has a variety of alternatives which will be discussed below. Discussion will include a description of each alternative along with its pros and cons.

Option 1. *ACQUIRE ADDITIONAL WATER RIGHTS*

- ***Alternative 1 – Apply for New Groundwater Rights***
  - **Description**: As in years past, the City could apply for new municipal water rights through the IDWR. Once the application and fees are paid, IDWR advertises the application. If no protests occur, the application can be approved allowing IDWR to grant the City a permit and time frame in which to construct a new well. Once the well is placed into beneficial use and tested, the permit can become a licensed water right.
  - **Pros**: Under normal circumstances, the process is relatively straightforward and inexpensive. It requires little personnel involvement and has great, year-round benefit to the system.
  - **Cons**: As mentioned previously, there is a current moratorium on the issuance of new rights in the ESPA. Until the moratorium is lifted, this alternative is futile. Additionally, new rights will most certainly be protested by a coalition of water users near the Twin Falls area, causing increased time duration and funding. They will also be met with stringent mitigation requirements imposed by IDWR. New water rights will also have priority dates that are extremely junior to other existing rights, making them more susceptible to curtailment.

- ***Alternative 2 – Purchase and Transfer Existing Rights***
  - **Description**: Existing groundwater rights can be purchased from other right holders. These rights are typically irrigation rights maintained by regional farmers. The City can purchase these rights when they are placed on the market and have them transferred for use within the City's service area.
  - **Pros**: When available, this alternative can be a quick solution to increased production, having a great benefit to the water system when it is most needed: the irrigation season. Transferring existing rights has less likelihood of being protested since new rights are not being added, although there is still the possibility.

- **Cons**: Irrigation rights are not always available and are expensive to purchase. They have can have use restrictions, varying flow rates, volume limitations, and junior priority dates. Transfers must be processed through the states ESPA groundwater model (ESPAM) to determine impacts that the transfer may have on sections of the river and the flow rates/volumes of the rights may be impacted negatively.

- ***Alternative 3 – Apply for Reasonably Anticipated Future Needs Rights***
  - **Description**: State laws allow for municipalities to apply for water rights in order to meet growth based on reasonably anticipated future needs (RAFN). The application must be supported with documentation including growth projections and water demands. RAFN documentation must also be updated on a regular basis in order to prove to the IDWR the continuing need for additional water to meet growth.
  - **Pros**: RAFN rights are targeted to help municipalities support future growth. The IDWR is encouraging municipalities in need of additional water rights to pursue RAFN applications. Theoretically, obtaining the rights could be inexpensive and provide great benefit.
  - **Cons**: There is a lot of skepticism regarding RAFN rights despite IDWR encouragement. To date, no RAFN application has been approved. Previous applications have been met with legal protests and additional demands, causing increased financial burden and time delays. New RAFN rights will also have junior priority dates susceptible to water right calls and curtailment.

- ***Alternative 4 – Rent Groundwater from the Rental Pool***
  - **Description**: Existing water right holders have the option of placing water not being utilized into IDWR's water bank, allowing it to be rented to other users.
  - **Pros**: If water is available in the rental pool, this could be a good, short-term solution to water supply needs, buying time to find a more reliable solution.
  - **Cons**: Rental from the pool is not a guarantee every year and could not be counted on in years of drought. Costs would be incurred for rental and delivery fees that would not be incurred if the City owned the water right outright.

Option 2. ***USE EXISTING RIGHTS MORE EFFICIENTLY***

- ***Alternative 5 – Build Additional Storage***
  - **Description**: Municipal groundwater rights typically do not have an imposed volume restriction, allowing the right holder to feasibly operate the well 365 days of the year for 24 hours per day. For this reason, the City only utilizes about 1/3 of its allotted volume due to seasonal shut-down of wells even though the City nearly maximizes its instantaneous withdrawal rate during peak hours. City peak production rates occur at night during summertime irrigation. By building larger storage tanks at existing sites or around town, the City could pump more water into the system during peak production periods and use existing rights to fill the tanks during off-peak hours when wells are normally shut down.
  - **Pros**: Additional storage is a guaranteed solution to water right issues that is completely within the City's control. Since no new rights are required, there would be no legal protest. The additional storage could be added as necessary by the City.
  - **Cons**: Additional storage can be an expensive alternative dependent upon construction costs and property values. Careful engineering will be required to ensure that storage tanks are capable of being refilled during off-peak hours. Additional emphasis would be required on preventive maintenance of existing wells since they would run for longer periods of time.

- ***Alternative 6 – Convert Parks to Surface Water Irrigation***
  - **Description**: Currently, Pinecrest Golf Course and many City parks are irrigated with water from the culinary water system. The City maintains surface water shares for many of these sites. City parks with a vicinity near surface water sources could be converted back to surface water irrigation, taking their load off of peak production periods for the culinary system.
  - **Pros**: Conversion of parks to surface water irrigation is another guaranteed alternative requiring no new rights and having no potential for legal protest. Flow and volume will both be reduced, allowing the City to stretch its existing groundwater rights into the future. Since the City already pays fees to maintain the surface water shares, using the water to irrigate keeps those payments from being wasted.
  - **Cons**: The City will need to work with irrigation companies to verify that existing canals have the capacity to carry the additional water required to irrigate the parks. Costs for diversion works and sprinkler head replacements will be incurred. Parks irrigated with surface water may be exposed to more weed germination than those on groundwater. During dry years, the water system may still need to provide irrigation water before water is turned into or after water is removed from the canals. Parks with surface water irrigation will require labels to indicate that irrigation water is non potable and additional personnel time would be required to

clean screens and plugged heads. If used for irrigation, surface water shares would not be available for other potential uses such as mitigation and groundwater recharge.

- ***Alternative 7 – Adjustments to Existing Wells***
  - **Description**: Some wells in the center of town can produce more water than is needed for the surrounding location. Well pumps and motors could be downsized at these locations to meet the needs of the area. In doing so, the excess water right no longer being used could be transferred to an additional point of diversion at a new location.
  - **Pros**: Adjusting existing wells allows the City to more efficiently use those rights. Rather than forcing too much water into the system and creating artificially high pressures at these locations, the water would be used where most needed. As with adding points of diversion, this alternative is within the City's control and would avoid many legal challenges.
  - **Cons**: The amount to be transferred would need to be modeled to verify that areas in the center of town do not get shorted water. The City would incur multiple costs: those to downsize existing sites and those to construct new sites. Costs incurred to downgrade existing motors, pumps, and electrical cabinetry could be offset by completing the project when the existing well site is scheduled for full electrical replacement.

- ***Alternative 8 – Add Points of Diversion to Existing Water Rights***
  - **Description**: Each municipal groundwater right can have multiple points of diversion (wells) with the stipulation that only one well can be in operation at any given time. The City currently a few sites that have two wells each. If each well has its own water right, an additional point of diversion can be added to one of the rights in a location more beneficial to the City. The original well whose right was transferred can then be declared an emergency well which does not require a water right.
  - **Pros**: This alternative could be a great tool for utilizing water rights in a more effective manner. New wells can be drilled and added to existing rights. Couple the new well with a large storage tank and it is easily feasible to double the production of an existing right so long as both wells do not run simultaneously. It is completely within the City's control and would avoid legal challenges from surface water users.
  - **Cons**: To be effective, the transfer of the water right to drill a well at a new location should be accompanied by the construction of a large storage tank to maximize the benefit of the transfer and allow for increased flows during times of peak demand. This would add additional costs to the transfer.

Option 3. ***WATER CONSERVATION MEASURES***

- ***Alternative 9 – Aquifer Recharge Banking***
  - **Description**: Aquifer recharge is currently a hot topic in the state of Idaho. There are current discussions regarding how to establish a framework that will allow private sector groups to participate in and help fund an aquifer recharge program. Water from qualifying rights could be sent to recharge sites as mitigation for new wells. If legislation is passed, storage water rights and surface water shares maintained by the City could potentially be used for aquifer recharge in exchange for drilling future wells.
  - **Pros**: Aquifer recharge would potentially allow the City a direct annual benefit for storage water rights that are currently held as insurance against potential water calls. Additional possibility exists to bank surface water shares in the aquifer in exchange for drilling future irrigation wells for large parks, cemeteries, or golf courses. The aquifer itself will benefit from any recharge.
  - **Cons**: Establishing the framework for establishing credits through aquifer recharge banking is in the early stages. Although it was to be presented to the Idaho legislature for consideration, surface water users near Twin Falls withdrew their support of the proposed legislation, effectively killing the bill. A renewed effort is currently underway to bring the legislation before the legislature this year. This could be a game-changer for water rights and aquifer stabilization if support is garnered.

- ***Alternative 10 – Water Conservation Program***
  - **Description**: The City can stretch water rights by implementing a water conservation program. The conservation program could include subprograms for watering restrictions, water conservation education for the public and private entities, indoor water use audits, and outdoor water use audits. Additionally, credit can be given to residents who change out wasteful appliances for water efficient ones.
  - **Pros**: Over time, conservation programs can change the mindset people have regarding water use. Regardless of effectiveness, conservation programs indicate to the public that the water purveyor is serious about water use, and often public opinion can make a very big difference.
  - **Cons**: Results of conservation programs are difficult to quantify. Seasonal fluctuations of temperature and precipitation can impact water use, giving a false impression that a conservation program is either working well or not working at all. Overall effectiveness of a water conservation program will be marginal without the installation of water meters. Good conservation programs are labor intensive, requiring increased staffing and resources.

- ***Alternative 11 – Installation of Water Meters***
  - **Description**: Without a doubt, water meters have proven to conserve water and thus stretch water rights. When users have to pay for the water they consume, the amount of water used declines. Declines in consumption will allow existing water rights and infrastructure to supply needs for future growth.
  - **Pros**: Water meters help keep rates equitable with each consumer paying for the quantity of water used. Leaks are no longer left unattended. An unmetered system such as Idaho Falls could feasibly reduce annual consumption by up to 40% with the installation of water meters.
  - **Cons**: The City of Idaho Falls has been largely unmetered throughout its existence. Political fallout from full meter installation could be huge. The price tag for full meter installation is a definite hurdle. Until recently, the City did not even install meter pits. Costs to install pits on existing service lines would be greater than the cost of the meter itself. Meter installation would also require additional personnel and equipment to read, maintain, and replace meters.

- ***Alternative 12 – Install a Secondary Irrigation System***
  - **Description**: In certain areas, new development is required to install pressurized secondary irrigation systems. In this manner, existing surface water rights and shares continue to be utilized once a property develops, preserving groundwater rights for interior water use only.
  - **Pros**: Secondary irrigation systems can be effective tools to stretch water rights. The majority of the City's water rights are used to supply irrigation in the summer. A secondary system would reserve City groundwater rights for interior, domestic uses only, allowing the City's existing water rights to stretch well into the future.
  - **Cons**: Secondary systems include a host of concerns. Citizens can create cross connections between potable and non-potable systems, potentially contaminating the drinking water system. There is also public concern that children will drink from hoses attached to the secondary system and become ill. Secondary systems are best as master planned utilities, and established communities such as Idaho Falls can face major capital costs to install the required infrastructure. If not master planned, individual systems will be installed in newly-developed areas that will not work well if interconnected. Management of the systems is also cause for concern. In Utah, irrigation/canal companies have ownership and management of pressurized irrigation systems, but in Southeast Idaho the canal companies want management to be assumed by cities. Seasonal work such as this would pose difficulties for municipalities to keep trained employees during the off-season.

SECTION 5 – EVALUATION OF OPTIONS AND ALTERNATIVES

In order to properly evaluate all of the mentioned alternatives, a decision matrix was created. The decision matrix ranked each of the 12 alternatives on a scale of 1 (best) to 10 (worst) based on the following categories: Cost, Time, Control, Legal, Personnel, and Effectiveness. The far right column totals the rating sum of each ranked alternative. The results of the decision matrix are shown in Table 4.

Alternatives		Cost	Time	Control	Legal	Personnel	Effectiveness	Total Rating
Option 1: Acquire Additional Water Rights	1) Apply for New Groundwater Rights	1	10	10	10	1	1	33
	2) Purchase and Transfer Existing Rights	8	5	4	3	2	4	26
	3) Apply for RAFN Water Rights	2	7	5	8	2	4	28
	4) Rent Groundwater from Rental Pool	3	2	4	2	2	5	18
Option 2: Use Existing Rights More Efficiently	5) Build Additional Storage	8	4	1	1	3	3	20
	6) Convert Parks to Surface Water Irr.	5	3	1	2	6	2	19
	7) Adjustments to Existing Wells	7	4	1	1	4	6	23
	8) Add POD's to Existing Water Rights	9	2	1	1	1	1	15
Option 3: Water Conservation Measures	9) Aquifer Recharge Banking	2	4	5	5	2	3	21
	10) Water Conservation Program	4	1	1	1	7	10	24
	11) Installation of Water Meters	10	9	2	3	8	2	34
	12) Install a Secondary Irrigation System	10	10	2	3	10	3	38

Table 4 – Water Right Alternative Decision Matrix

SECTION 6 – RECOMMENDATION OF ALTERNATIVES

Based on the results of the completed decision matrix, the best overall alternatives involve more effectively using existing groundwater rights. None of the alternatives should be considered a fix-all solution to the City's water rights. Rather, the City should use the decision matrix as a tool to build a portfolio of the best alternatives to continue stretching the City's existing water rights well into the future.

Currently, a CIP list of proposed future projects should include a mix of the best alternatives. For instance, additional point of diversion can be added to existing groundwater rights allowing the City to drill a new well. The future well site should include the installation of a large storage tank, which can help offset peak demands. The exact water rights to use for process must be selected carefully and the computerized water model used to simulate the end product to verify that there are not any adverse effects to the system prior to construction. Additional projects in following years could include the removal of large irrigated parks from the culinary system by converting them to surface water or potentially drilling their own wells. These large-scale projects could be coupled with an annual, comprehensive water conservation program which is evaluated in a separate section of the facility plan.

As a stop-gap measure, the addition of points of diversion to existing rights is the clearest alternative. Initially, water rights with senior priority dates should be selected to better protect the City against future water calls or curtailment orders. Water right numbers 25-02142, 25-02143, and 35-07001 are the most likely candidates to which new points of diversion can be added.

As secondary measures, the City should implement a conservation plan (evaluated in a separate section of the facility plan) and consider new sources of irrigation for parks that are currently irrigated from the culinary system. Large parks currently irrigated with culinary water include Pinecrest Golf Course, Tautphaus Park, Freeman Park, Community Park, Sunnyside Park, and the soccer complex on Old Butte Road. An evaluation should be completed to determine the feasibility of converting these parks to either surface water irrigation or to separate groundwater wells through banking via groundwater recharge projects.

All other alternatives should be considered over time. Alternatives that are currently not recommended in this plan may become more viable over time. For instance, RAFN rights, although currently a legal hurdle that will potentially take a lot of time and effort to overcome, can be worthwhile if the current legal environment changes. This holds true for all alternatives mentioned in this Water Rights plan. Additionally, the matrix should be regularly reevaluated since the current legal environment is subject to change in the future.

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APPENDIX C

Hydraulic Model Calibration

APPENDIX C
HYDRAULIC MODEL CALIBRATION

Model calibration typically involves adjusting the model parameters to improve the accuracy in matching field data, such as pressure and flow measurements recorded at system fire hydrants. The required level of model accuracy can vary according to the intended use of the model, the type and size of water system, the available data, and the way the system is controlled and operated.

The model's accuracy depends on the accuracy of the data, particularly the input data that describes the pipes, facilities and demand in the system. Accurate system modeling assumes correct pipe connectivity, diameter, internal roughness and length. Knowing the status of system facilities, typically obtained from supervisory control and data acquisition (SCADA) information, including pump status and reservoir levels, referred to as "boundary conditions" is also critically important during calibration.

Fire Flow Testing

The first step in calibrating any system is to match field-measured pressures and fire hydrant flows with model-simulated system pressures and flows. This calibration process tests the accuracy of model pipeline friction factors, demand distribution, valve status, network configuration, and facility parameters such as tank elevations and pump controls and curves.

Fire flow testing consists of recording static pressure at a hydrant and then "stressing" the system by flowing an adjacent hydrant. While the adjacent hydrant is flowing, residual pressure is measured at the first hydrant to determine the pressure drop that occurs when the system is "stressed". Boundary condition data, such as reservoir levels and pump on/off status, must also be known to accurately model the system conditions during the time of the flow test. The recorded time of each fire hydrant flow test was used to collect boundary condition information from the City's SCADA system.

Calibration Results

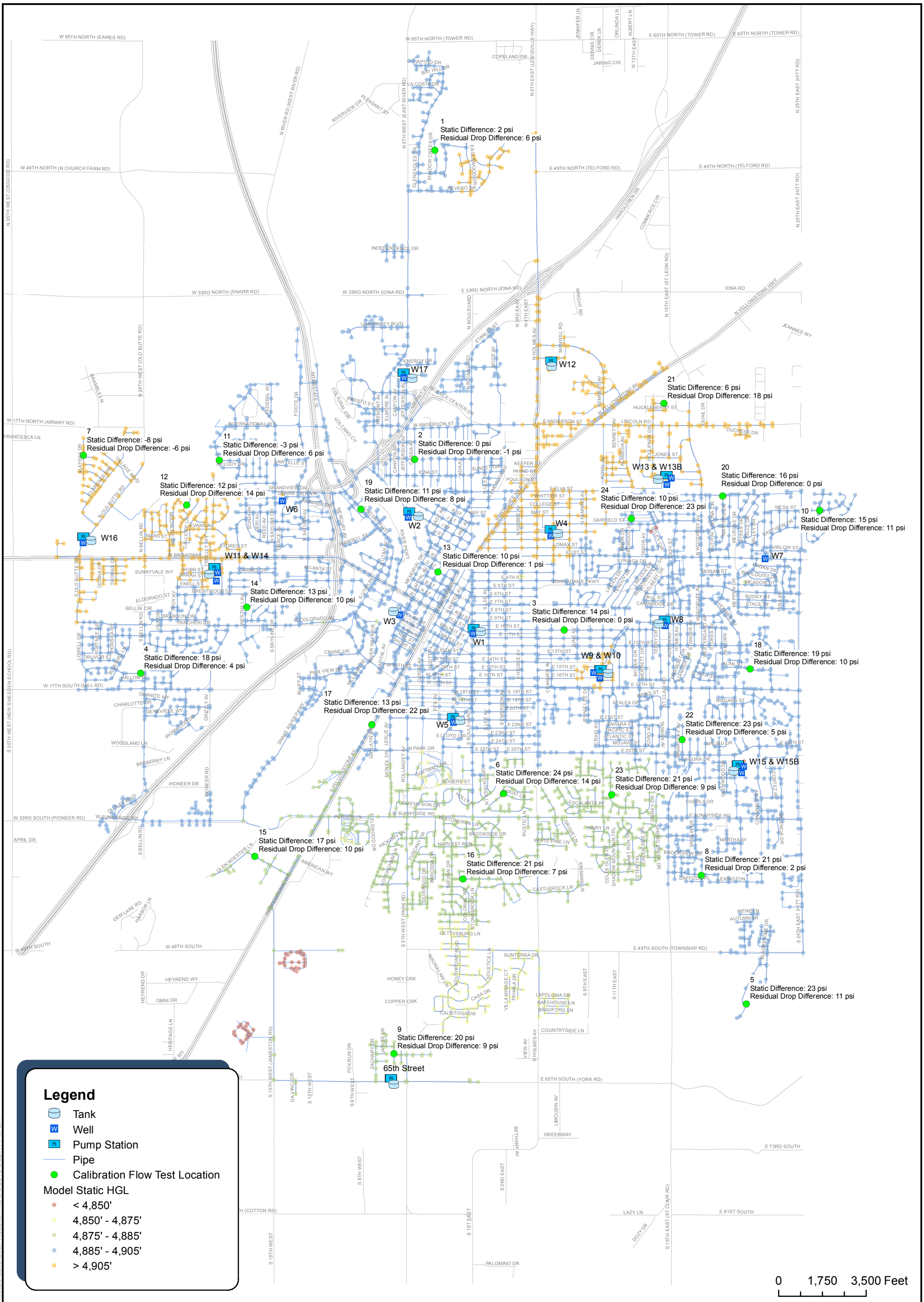
For any system, a portion of the data describing the distribution system will be missing or inaccurate, and assumptions will be required. This does not necessarily mean that the accuracy of the hydraulic model will be compromised. Depending on the accuracy and completeness of the available information, some pressure zones may achieve a higher degree of calibration than others. Models that do not meet the highest degree of calibration can still be useful for planning purposes.

Calibration was done as part of the model update completed in 2012, prior to the Water Facility Plan. Hydrant flow tests were conducted on August 15, 2012. Twenty-four tests were done throughout the system. The locations and the calibration results are in Figure C-1. Two measurements are compared between the model and field results as part of the calibration,

the difference in the static pressure and the difference in the drop in residual pressure when the hydrant is being flowed. The results in Figure C-1 indicate that the model generally had higher static pressures and smaller pressure drops compared to the field results. Through discussion with City staff there are some suspected reasons for these differences that merit further investigation for future calibration efforts:

- Time stamp differences between SCADA and field tests
- Suspicious SCADA reporting at some facilities, including long periods without changes in SCADA readings
- Unknown closed valve locations throughout the system
- Demand allocation limitations due to lack of customer metering

Although there are differences in the model and field values, the model is useful for planning-level analysis to determine general areas of the system with low pressures and capacity limitations. As the data available to the City improves, the calibration of the model can continue to improve.



Idaho Falls
Model Calibration

Figure C-1
Calibration Results

Murray, Smith & Associates, Inc.

Oct 2012 12-1302

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APPENDIX D

Pump Station Inspection Tasks

Pump Station Inspection Tasks

This pump station inspection tasks list is presented to help the City generate their own inspection checklist. An inspection checklist should allow the operator or electronic monitoring equipment (SCADA) to record the operating parameters of the pumps for further review to allow trends or changes to be identified. Trends and observations may allow the operator to schedule maintenance tasks to address deterioration. Pump and equipment manufacturers' operation and maintenance documents should be reviewed for specific tasks and included during the generation of the City's checklist.

The following inspection tasks and recommended frequencies were taken from pages 12.16 – 12.17 of the *Pump Handbook*, 3rd ed. (McGraw-Hill, 2001) and MSA checklist documents.

Daily

1. Bearing temperature.
2. Seal leakage.
3. Pump sound while running.
4. Pressure gauge values.
5. Flow meters.
6. Power consumption.
7. Vibration.
8. Check any warning lights or alarms for low pressure, pump failure, intrusion, power outage, etc.

Weekly

1. Check motor for unusual pump motor conditions.
2. Check pump house interior and grounds for general cleanliness and condition.
3. Check pumps for leaks or seepage for pumps that are not water-lubricated.
4. Check pump cycle rate – troubleshoot excessive pump cycling (about 6 cycles per hour).
5. Verify start and stop pressure settings and operability of water pressure gauges – reference the O&M manual.
6. Check pump run hours if this information is available.
7. Check condition of the pump house and booster pump stations for damage and deterioration.
8. Check area around the pump house and booster station for security concerns, vandalism, or unauthorized access.

Monthly

1. Check oil or grease lubricant reservoirs for proper levels and any leakage or unusual conditions.
2. Measure the pump capacity, compare with the expected output – from performance records or design parameter.

3. Perform routine operation of emergency generator (diesel, gas or propane) per manufacturer's instructions.
4. Check condition of emergency generator batteries, fuel levels, oil levels, instruments and controls.
5. Check that existing pressure gauges, pump run meters and flow meters are functioning properly.
6. Check that pump controls are functioning properly – reference the O&M manual.
7. Check pump house lighting, ventilation, heating and animal proofing (bats, birds, rodents).

Semiannually

1. For pumps equipped with shaft packing, the free movement of stuffing box gland should be checked, gland bolts should be cleaned and lubricated and the packing should be inspected to determine whether it requires replacement.
2. The pump and driver alignment should be checked and corrected if necessary.
3. Housings for oil-lubricated bearings should be drained, flushed and refilled with fresh oil.
4. Grease-lubricated bearings should be checked to see that they contain the correct amount of grease and that it is still of suitable consistency.

Annually

1. Vibration trends should be reviewed and acted upon if trending towards unacceptable levels.
2. For pump equipped with shaft packing, the packing should be removed and the shaft sleeves – or shaft, if no sleeves are used- should be examined for wear.
3. For pumps equipped with mechanical seals, if the seals were indicating signs of leaking they should be removed and replaced/refurbished.
4. When coupling halves are disconnected for an alignment check, the vertical shaft movement of a pump with sleeve (journal) bearings should be checked at both ends with packing seals removed.
5. All auxiliary piping such as drains and seal water piping should be checked and flushed.
6. Pump equipped with stuffing boxes should be repacked, and the pump and driver should be realigned and reconnected.
7. All instruments and flow-metering devices should be re-calibrated, when feasible and whenever possible the pump should be tested to determine whether proper performance is being obtained.

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APPENDIX E

Operator Facility Assessment Survey, September 2014

Description:

The purpose of this questionnaire is to utilize operator knowledge about the well facilities to help establish a baseline condition assesment of each facility for the Water Facility Master Plan. This survey includes the applicable questions and anwers recieved from the opearations staff during a 2012 VFD study.

Instructions:

Please provide comments and a rating between 1 and 3 (1 = good or not applicable, 2 = average, 3 = poor) describing the condition in each question. Please confirm the response, or re-rate the questions previously asked in 2012.

Pump House Facility Assessment

1. **Rate the existing condition of the facility structure ventilation. Does building require open doors or supplemental ventilation to stay cool?**

2012 Response: Structure is old, ventilation is two screen doors.	2
Additional Comments: (3) yes	(3)

2. **Rate the existing condition of the facility structure lighting.**

2012 Response: Lighting is good.	2
Additional Comments: (2) Flouressent Lighting	(2)

3. **Rate the existing condition of the facility structure plumbing.**

2012 Response: NA	2
Additional Comments: (2) Not Rusted - Galvanized in small piping	(2)

4. **Are there any structural deficiencies apparent at the pump house?**
Examples: Cracked concrete, cracked brick or block walls, rotted timbers or corroded structural steel?

Additional Comments: Brick And Motar is old and paint is silver in color (2)	(2)

5. **Does the pump house need floor drains, is ponding water an issue, are pipe chases flooded?**

Additional Comments: (2) Has one floor drain for pump that goes into pipe chase.	(2)

6. **Does the pump house have any safety concerns?**
Examples: Missing handrails, access ladders, access/approach steps, non-slip surfaces?

(3) no push bars on doors, chlorine room in back corner of building (3)

Additional Comments:	

Site Assessment

7. Rate the existing condition of the site and site accessibility.

2012 Response: The site is on a corner of 2 streets with homes to the east, businesses to the south, parking lot to the north. The lot is small compared to out other well sites with a rise in elevation to the north across the property. It is attached to a larger building which is our Building Maintenance Shop.	3
Additional Comments: Same - No change	(3)

8. Does the pump house and site provide protection from trespassers, vandals and saboteurs?

Examples: Adequate exterior lighting, egress door locks, site fencing, locks on access hatches?

Additional Comments: (3) only Screens are closed in Summer.	(3)

Equipment Assessment

9. Rate the existing condition of the pumps.

2012 Response: Seems to run strong with minimal breakdowns.	1
Additional Comments: (1) Deepwell was pulled not to long ago.	(1)

10. Rate the existing condition of the piping, valving, pressure gauges, meters and other appurtenances.

2012 Response: The piping is old but the control valve is about 8 to 10 years old.	2
Additional Comments: (2) Sprinkler System was new in July 2014	(2)

11. Rate the existing condition of the motor.

2012 Response: The motor has not had anything done to it for at least 12 years.	1
Additional Comments: (1) No problems	(1)

12. Are pump, valving and motor components maintained at manufacturer reccomended schedules? (1) on regular schedule well And Booster motors are checked for Heat build up (1)

Additional Comments:	

13. **Describe any concerns regarding the operation of pumps, valves & piping.**
Example: Are pump seals leaking/failing, do any valves stick or not operate?

Additional Comments: (2) Valve Gearing is slower than other Control values we have in System	(2)

14. **Describe any equipment access or maintenance concerns.**

Example: Are there any pumps that cannot be removed due to interference, are there valves/pipes that would be hard to replace due to location and access?

Additional Comments: (2) Can we afford to upgrade to piping out of Concrete foundation	(2)

Chlorination System Assessment

15. **Is the gas chlorination equipment located in a separate room, vented to the outside, and provided with working Cl leak detection alarms?**

Additional Comments: (1) yes to all parts	(1)

16. **Does the gas chlorine feed automatically switch to a full tank when empty?**

Additional Comments: (3) 16 And 17 wells are the only Two that were ever setup to do that.	(3)

Water Assessment

17. **Describe any water quality issues associated with the well.**
Examples: Sand production, e-coli, turbidity

Additional Comments: (1) Seems to be in very Good condition	(1)

18. **Describe any water quantity concerns.**

2012 Comments: Well is seldom run.

Additional Comments: (1) See Last Question	(1)

Electrical Assessment

19. **Rate existing condition of motor controls.**

(2) One breaker on Deep well burnt And other Breaker on (2)

2012 Comments: Well electrical was upgraded within the last 10 years (2002).	1
Additional Comments:	

20. Rate existing condition of the electrical system.

2012 Comments: The whole electrical system, MCC, building lights, control cabinet was upgraded within the last 10 years (2002).	1
Additional Comments: (3) Burnt Deepwell Main Breaker and Had to Replace it all. Booster Main Breaker Keeps Tripping on Power Bumps - Seems weak	(3)

21. Do control cabinets require open door venting to remain operational?

Additional Comments: (2) Don't Run it as much but when we were we had to open the doors	(2)

22. Does chlorine room have gas detection sensors? How is the alarm announced locally? Does the alarm notify operators via SCADA callout?

Additional Comments: (1) yes, yes, yes	(1)

23. Is facility generator backed? Is switchover sutomatic? Are operators notified of this condition via SCADA callout?

Additional Comments: N/A	(3)

24. For generator backed facilities; is the generator/ATS able to power all wells and booster pumps simultaneously?

Additional Comments: NO	(3)

25. Does the well have; well water depth sensor?, discharge pressure sensor?, discharge flow sensor?

Additional Comments: (2) ~~yes, yes~~, ~~yes~~, yes, NO, NO	(2)

Description:

The purpose of this questionnaire is to utilize operator knowledge about the well facilities to help establish a baseline condition assesment of each facility for the Water Facility Master Plan. This survey includes the applicable questions and anwers recieved from the opearations staff during a 2012 VFD

Instructions:

Please provide comments and a rating between 1 and 3 (1 = good or not applicable, 2 = average, 3 = poor) describing the condition in each question. Please confirm the response, or re-rate the questions previously asked in 2012.

Pump House Facility Assessment

1. **Rate the existing condition of the facility structure ventilation. Does building require open doors or supplemental ventilation to stay cool?**

2012 Response: New ventilation fans in 2011 upgrade.	1
Additional Comments: ① everything is new	①

2. **Rate the existing condition of the facility structure lighting.**

2012 Response: New building in 2011 including lighting.	1
Additional Comments: ① Has Floresent Lighting (new)	①

57 3. **Rate the existing condition of the facility structure plumbing.**

2012 Response: New building in 2011 including plumbing.	1
Additional Comments: ① All new plumbing	①

4. **Are there any structural deficiencies apparent at the pump house?**
Examples: Cracked concrete, cracked brick or block walls, rotted timbers or corroded structural steel?

Additional Comments: ① none - new building ①

5. **Does the pump house need floor drains, is ponding water an issue, are pipe chases flooded?**

Additional Comments: ① no problems - new building and drains ①

84 6. **Does the pump house have any safety concerns?**
Examples: Missing handrails, access ladders, access/approach steps, non-slip surfaces? ① no - new building ①

Additional Comments:	

Site Assessment

7. Rate the existing condition of the site and site accessibility.

2012 Response: New building and landscaping, good access.	3
Additional Comments: ① - New building - no fence.	①

8. Does the pump house and site provide protection from trespassers, vandals and saboteurs?

Examples: Adequate exterior lighting, egress door locks, site fencing, locks on access hatches?

Additional Comments: ① - new building - all doors and Hatches are locked	①

Equipment Assessment

9. Rate the existing condition of the pumps.

2012 Response: Horizontal motor.	1
Additional Comments: ① - Deep well has not been pulled and checked in more than 20 years	①

10. Rate the existing condition of the piping, valving, pressure gauges, meters and

2012 Response: Upgraded with Magmeter and piping from deepwell.	1
Additional Comments: ① New meter and guage	①

11. Rate the existing condition of the motor.

2012 Response: The motor has not required any repair from over 10 years (2002).	1
Additional Comments: ② Don't Know on Deep well or Booster Hasn't Been pulled in a while,	②

12. Are pump, valving and motor components maintained at manufacturer reccomended schedules?

Additional Comments: ② Maintained Through Routine oil changes and Lubrications.	②

13. Describe any concerns regarding the operation of pumps, valves & piping.

Example: Are pump seals leaking/failing, do any valves stick or not operate?

② Control valve gearing is very low Like well #1 compared to our other wells	②

Additional Comments:	

14. Describe any equipment access or maintenance concerns.

Example: Are there any pumps that cannot be removed due to interference, are there valves/pipes that would be hard to replace due to location and access?

Additional Comments: ① None	①

Chlorination System Assessment

15. Is the gas chlorination equipment located in a separate room, vented to the outside, and provided with working Cl leak detection alarms?

Additional Comments: ① yes to All	①

16. Does the gas chlorine feed automatically switch to a full tank when empty?

Additional Comments: ③ no	③

Water Assessment

17. Describe any water quality issues associated with the well.

Examples: Sand production, e-coli, turbidity

Additional Comments: ① no	①

18. Describe any water quantity concerns.

2012 Comments: Well is seldom run.

Additional Comments: ① None	①

Electrical Assessment

19. Rate existing condition of motor controls.

2012 Comments: Well electrical was upgraded within the last 10 years (2002).	1
Additional Comments: ① All new with New building and Piping	①

20. Rate existing condition of the electrical system.

① Same as above - all new ①

2012 Comments: Upgraded within the last 10 years (2002). Additional Comments:	1

21. **Do control cabinets require open door venting to remain operational?**

Additional Comments: ① NO	①

22. **Does chlorine room have gas detection sensors? How is the alarm announced locally? Does the alarm notify operators via SCADA callout?**

Additional Comments: ① yes, yes, yes	①

23. **Is facility generator backed? Is switchover sutomatic? Are operators notified of this condition via SCADA callout?**

Additional Comments: ③ NO, NO, NO	③

24. **For generator backed facilities; is the generator/ATS able to power all wells and booster pumps simultaneously?**

Additional Comments: N/A	③

25. **Does the well have; well water depth sensor?, discharge pressure sensor?, discharge flow sensor?**

Additional Comments: ① yes, yes, yes	①

Description:

The purpose of this questionnaire is to utilize operator knowledge about the well facilities to help establish a baseline condition assesment of each facility for the Water Facility Master Plan. This survey includes the applicable questions and anwers recieved from the opearations staff during a 2012 VFD study.

Instructions:

Please provide comments and a rating between 1 and 3 (1 = good or not applicable, 2 = average, 3 = poor) describing the condition in each question. Please confirm the response, or re-rate the questions previously asked in 2012.

Pump House Facility Assessment

1. **Rate the existing condition of the facility structure ventilation. Does building require open doors or supplemental ventilation to stay cool?**

2012 Response: No comments.	3
Additional Comments: Windows are only ventilation	(3)

2. **Rate the existing condition of the facility structure lighting.**

2012 Response: Lighting is old.	3
Additional Comments: HAS incadescent Lighting	(3)

3. **Rate the existing condition of the facility structure plumbing.**

2012 Response: APlumbing is old.	3
Additional Comments: (2) Some piping was Replaced 2014	(2)

4. **Are there any structural deficiencies apparent at the pump house?**
Examples: Cracked concrete, cracked brick or block walls, rotted timbers or corroded structural steel?

Additional Comments: (3) Structure is original cinder Block - Steel floor beam joists are Exposed through concrete (3)

5. **Does the pump house need floor drains, is ponding water an issue, are pipe chases flooded?**

Additional Comments: (3) water runs down into pipe chase (3)

6. **Does the pump house have any safety concerns?**
Examples: Missing handrails, access ladders, access/approach steps, non-slip surfaces? (3) floor joists comming through concrete floor - Pipe chase Diamond plate cover does not fit any more (3)

Additional Comments:	

Site Assessment

7. Rate the existing condition of the site and site accessibility.

2012 Response: Under water tower. Surrounded by electric division equipment and supplies.	3
Additional Comments: New piping from well house to to tower and to Distribution System in June 2014 - Paved Sourounding parking lot. (1)	(1)

8. Does the pump house and site provide protection from trespassers, vandals and saboteurs?

Examples: Adequate exterior lighting, egress door locks, site fencing, locks on access hatches?

Additional Comments: (3) No, Sight is semi fenced by Idaho falls power property fence and locks, yard lights, but doors have no Egress and tower Ladder ALARMS Have not been Re connected.	(3)

Equipment Assessment

9. Rate the existing condition of the pumps.

2012 Response: The pump has not received or required work for over 10 years (2012).	2
Additional Comments: (3) pump is not made anymore and we have no information on depth of well or where pump bowls set or size of or Type of Caseing or Column pipe.	(3)

7 4 **10. Rate the existing condition of the piping, valving, pressure gauges, meters and other appurtenances.**

2012 Response: Very old and has not been serviced for a long time.	3
Additional Comments: (2) new pump discharge pipe, air Relief, flow meter, chlorine injection from new pump to injector and piping.	(2)

11. Rate the existing condition of the motor.

2012 Response: The pump has not received or required work for over 10 years (2002).	1
Additional Comments: (2) Motor Has not been checked for over 10 years either.	(2)

12. Are pump, valving and motor components maintained at manufacturer reccomended schedules?

(2) Yes, Annual oil change, grease bearrings Wipedown As needed.	(2)
Additional Comments:	

7,10,13 13.

Describe any concerns regarding the operation of pumps, valves & piping.

Example: Are pump seals leaking/failing, do any valves stick or not operate?

Additional Comments: ① no problems - new piping, values Pump discharge	①

7,10,13, 14. **Describe any equipment access or maintenance concerns.**

Example: Are there any pumps that cannot be removed due to interference, are there valves/pipes that would be hard to replace due to location and access?

Additional Comments: ① new piping, values, valveboxes, Vault Box and flow meter.	①

Chlorination System Assessment

15. **Is the gas chlorination equipment located in a separate room, vented to the outside, and provided with working Cl leak detection alarms?**

Additional Comments: ① yes on all questions	①

16. **Does the gas chlorine feed automatically switch to a full tank when empty?**

Additional Comments: ③ NO - has never been set up with that system.	③

Water Assessment

17. **Describe any water quality issues associated with the well.**

Examples: Sand production, e-coli, turbidity

Additional Comments: ③ well has not been pulled and checked in over 20 years. Debris has bridged between well wall and casing. don't know how much and how far down.	③

17 18. **Describe any water quantity concerns.**

2012 Comments: Well discharges to water tower.

Additional Comments: See question 17 ③	③

Electrical Assessment

19. **Rate existing condition of motor controls.**

2012 Comments: One of the oldest in operation. Push button START/STOP. 3

③ Not changed since 2012 ③

Additional Comments:	

19 E 1

20. Rate existing condition of the electrical system.

2012 Comments: Has not received upgrade in over 20 years (1992).	3
Additional Comments: (3) We CANNOT find when last upgrade occured.	(3)

21. Do control cabinets require open door venting to remain operational?

Additional Comments: (3) NO but only ventalation comes from windows being opened.	(3)

15 4

22. Does chlorine room have gas detection sensors? How is the alarm announced locally? Does the alarm notify operators via SCADA callout?

Additional Comments: (2) yes there is gas detection sensors announced locally and it comes in on Scada.	(2)

23. Is facility generator backed? Is switchover sutomatic? Are operators notified of this condition via SCADA callout?

Additional Comments: (3) NO – NO Emergency Gen Set at this site	(3)

24. For generator backed facilities; is the generator/ATS able to power all wells and booster pumps simultaneously?

Additional Comments: N/A	(3)

25. Does the well have; well water depth sensor?, discharge pressure sensor?, discharge flow sensor?

Additional Comments (2) Has discharge pressure, flow but no water Depth Sensor.	(2)

Description:

The purpose of this questionnaire is to utilize operator knowledge about the well facilities to help establish a baseline condition assesment of each facility for the Water Facility Master Plan. This survey includes the applicable questions and anwers recieved from the opearations staff during a 2012 VFD study.

Instructions:

Please provide comments and a rating between 1 and 3 (1 = good or not applicable, 2 = average, 3 = poor) describing the condition in each question. Please confirm the response, or re-rate the questions previously asked in 2012.

Pump House Facility Assessment

1. **Rate the existing condition of the facility structure ventilation. Does building require open doors or supplemental ventilation to stay cool?**

2012 Response: Ventilation is windows and door. Building is cinderblock.	3
Additional Comments: poor Ventilation -	3

2. **Rate the existing condition of the facility structure lighting.**

2012 Response: Old lighting.	3
Additional Comments: needs Replaced. Still incandecent.	3

3. **Rate the existing condition of the facility structure plumbing.**

2012 Response: Old piping.	3
Additional Comments: plumbing showing age - at present time in good working Condition.	3

4. **Are there any structural deficiencies apparent at the pump house?**
Examples: Cracked concrete, cracked brick or block walls, rotted timbers or corroded structural steel? NO.

Additional Comments: Building showing age.	2

5. **Does the pump house need floor drains, is ponding water an issue, are pipe chases flooded?** NO

Additional Comments: Drains into pipe chase.	2

6. **Does the pump house have any safety concerns?**
Examples: Missing handrails, access ladders, access/approach steps, non-slip surfaces? NO

Additional Comments:	2

Site Assessment

7. Rate the existing condition of the site and site accessibility.

2012 Response: Site is on the corner of a City park and open around it except for a few trees.	2
Additional Comments: Well site on Nice City PARK.	2

8. Does the pump house and site provide protection from trespassers, vandals and saboteurs?

Examples: Adequate exterior lighting, egress door locks, site fencing, locks on access hatches?

Additional Comments: needs Lighting - wire mesh over open windows for ventilation.	2

Equipment Assessment

9. Rate the existing condition of the pumps.

2012 Response: The pump requires very little or no repairs over the past 20 years (1992). It is however old.	2
Additional Comments: pump Has been repaired in the past 2013 Years - Good working condition.	3

10. Rate the existing condition of the piping, valving, pressure gauges, meters and other appurtenances.

2012 Response: The piping is only and has not required more than painting.	2
Additional Comments: Good working Condition.	2

11. Rate the existing condition of the motor.

2012 Response: The horizontal pump motor runs strong and required repair in the last 10 years (2012).	1
Additional Comments: Booster pump leaking oil. Rebuilt in 2013.	1

12. Are pump, valving and motor components maintained at manufacturer reccomended schedules?

Additional Comments: yes, oil changed annually and Greased Bearing oil checked daily	1

13. **Describe any concerns regarding the operation of pumps, valves & piping.**
Example: Are pump seals leaking/failing, do any valves stick or not operate?

Additional Comments:	
Booster pump leaking oil.	2

14. **Describe any equipment access or maintenance concerns.**

Example: Are there any pumps that cannot be removed due to interference, are there valves/pipes that would be hard to replace due to location and access?

Additional Comments:	
check valve is in concrete cradle Replacement would be challenging	2

Chlorination System Assessment

15. **Is the gas chlorination equipment located in a separate room, vented to the outside, and provided with working Cl leak detection alarms?** YES

Additional Comments:	
	1

16. **Does the gas chlorine feed automatically switch to a full tank when empty?** NO

Additional Comments:	
that System never was installed	3

Water Assessment

17. **Describe any water quality issues associated with the well.**
Examples: Sand production, e-coli, turbidity NONE
Additional Comments:

18. **Describe any water quantity concerns.**

2012 Comments: Large capacity pump and used only during very high demands.	
Additional Comments: Good working condition. Pump runs in High demand months.	1

Electrical Assessment

19. **Rate existing condition of motor controls.**

2012 Comments: Controls and electrical were upgraded within the last 15 years.	1

Additional Comments: Good working Condition.	1

20. Rate existing condition of the electrical system.

2012 Comments: MCC's and control cabinets were upgraded within the last 12-15 years (1990).	2
Additional Comments: Good working Condition	2

21. Do control cabinets require open door venting to remain operational? NO

Additional Comments: occasionaly when temperatures get really High for long periods we have had to open Cabinet Doors! But NOT all the time.	1

22. Does chlorine room have gas detection sensors? How is the alarm announced locally? Does the alarm notify operators via SCADA callout? Yes.

Additional Comments: Alarm is announced locally by a Siren and Strobe light, It comes in on SCADA and will alarm on computer.	1

23. Is facility generator backed? Is switchover sutomatic? Are operators notified of this condition via SCADA callout? NO

Additional Comments: No Generater at this site	3

24. For generator backed facilities; is the generator/ATS able to power all wells and booster pumps simultaneously? NO

Additional Comments: N/A	3

25. Does the well have; well water depth sensor?, discharge pressure sensor?, discharge flow sensor? Yes.

Additional Comments: Well has transducer, Rosemount Pressure Transmitter and Flow Transmitter	1

Description:

The purpose of this questionnaire is to utilize operator knowledge about the well facilities to help establish a baseline condition assesment of each facility for the Water Facility Master Plan. This survey includes the applicable questions and anwers recieved from the opearations staff during a 2012 VFD study.

Instructions:

Please provide comments and a rating between 1 and 3 (1 = good or not applicable, 2 = average, 3 = poor) describing the condition in each question. Please confirm the response, or re-rate the questions previously asked in 2012.

Pump House Facility Assessment

1. **Rate the existing condition of the facility structure ventilation. Does building require open doors or supplemental ventilation to stay cool?**

2012 Response: Ventilation is windows and doors. 2

Additional Comments: (3) All Doors and windows That can be opened are opened during watering season (summer months). (3)

2. **Rate the existing condition of the facility structure lighting.**

2012 Response: Lighting is fair. 2

Additional Comments: Still Has incandescent Lighting and has not been upgraded in quite some time. (3)

3. **Rate the existing condition of the facility structure plumbing.**

2012 Response: Plumbing is semi-old. 2

Additional Comments: Most of plumbing in facility is original. (2)

4. **Are there any structural deficiencies apparent at the pump house?**

Examples: Cracked concrete, cracked brick or block walls, rotted timbers or corroded structural steel?

Additional Comments: The Ceiling in Some places is on The List for Repair. 3

5. **Does the pump house need floor drains, is ponding water an issue, are pipe chases flooded?**

Additional Comments: The drainage mostly runs into pipe chase - No Drains in floors. (3) (3)

6. **Does the pump house have any safety concerns?**

Examples: Missing handrails, access ladders, access/approach steps, non-slip surfaces? Steps were Replaced 2013 (1) (1)

Additional Comments:

Site Assessment

7. **Rate the existing condition of the site and site accessibility.**

2012 Response: Building is fair, site accessibility is good. 2

Additional Comments: No fence, So Site has open Accessibility. (2)

8. **Does the pump house and site provide protection from trespassers, vandals and saboteurs?**

Examples: Adequate exterior lighting, egress door locks, site fencing, locks on access hatches?

Additional Comments: NO - With no fence only Door Hatch, and Building provide protection. (3) NO Egress but There is locks on doors, Hatches.

Equipment Assessment

9. **Rate the existing condition of the pumps.**

2012 Response: The pump has been worked on within the last 15 years. 2

Additional Comments: (2) Same as 2012 (2)

10. **Rate the existing condition of the piping, valving, pressure gauges, meters and other appurtenances.**

2012 Response: Still has old piping and gauges but has new control valve. 2

Additional Comments: (2) Same as 2012 Plus new (2) control cabinet with Readings coming Through Operator Interface Terminal for flows, Pressure etc

11. **Rate the existing condition of the motor.**

2012 Response: The motor has no work done for at least 15 years. 1

Additional Comments: Same as 2012 (2) Grease annualy, check connections for Heat (2)

12. **Are pump, valving and motor components maintained at manufacturer reccomended schedules?**

Additional Comments: (1) yes As far As we know what (1) They are,

13. **Describe any concerns regarding the operation of pumps, valves & piping.**

Example: Are pump seals leaking/failing, do any valves stick or not operate?

Additional Comments:

14. Describe any equipment access or maintenance concerns.

Example: Are there any pumps that cannot be removed due to interference, are there valves/pipes that would be hard to replace due to location and access?

Additional Comments: ② yes, The control value is in the pipe chase and check value is there also. Replacement of check value could be cumbersome. ②

Chlorination System Assessment

15. Is the gas chlorination equipment located in a separate room, vented to the outside, and provided with working Cl leak detection alarms?

Additional Comments: yes, it is in a separate room but has no outside Access. ② ②

16. Does the gas chlorine feed automatically switch to a full tank when empty?

Additional Comments: NO, That Kind of System Has never been Installed ③ ③

Water Assessment

17. Describe any water quality issues associated with the well.

Examples: Sand production, e-coli, turbidity

Additional Comments: ① None That We Know of ①

18. Describe any water quantity concerns.

2012 Comments: This is the highest producing well and when demand is enough, it is started and put into 'MANUAL' to keep the well from cycling.

Additional Comments: ② Quantity is Holding well ①

Electrical Assessment

19. Rate existing condition of motor controls.

2012 Comments: Electrical MCC cabinets were upgraded within the last 15 years.

1

① Same as 2012 only New Control cabinet controlls with New ScADA System in 2013 and 2014 ①

Additional Comments:

19 20. **Rate existing condition of the electrical system.**

2012 Comments: MCC's and control cabinets were upgraded within the last 20 years (1994). 2

Additional Comments: ① New control cabinet with new Scada system in 2013 and 2014 ①

21. **Do control cabinets require open door venting to remain operational?**

Additional Comments: only once in a while when ambient temperatures Exceed 100°F ②

22. **Does chlorine room have gas detection sensors? How is the alarm announced locally? Does the alarm notify operators via SCADA callout?**

Additional Comments: ① yes, it is announced through a Sirene in The next Room. No but it can if enabled. ①

23. **Is facility generator backed? Is switchover sutomatic? Are operators notified of this condition via SCADA callout?**

Additional Comments: ③ NO Generator at this site ③

24. **For generator backed facilities; is the generator/ATS able to power all wells and booster pumps simultaneously?**

Additional Comments: ③ N/A ③

25. **Does the well have; well water depth sensor?, discharge pressure sensor?, discharge flow sensor?**

Additional Comments: yes, yes, yes ① ①

Description:

The purpose of this questionnaire is to utilize operator knowledge about the well facilities to help establish a baseline condition assesment of each facility for the Water Facility Master Plan. This survey includes the applicable questions and anwers recieved from the opearations staff during a 2012 VFD study.

Instructions:

Please provide comments and a rating between 1 and 3 (1 = good or not applicable, 2 = average, 3 = poor) describing the condition in each question. Please confirm the response, or re-rate the questions previously asked in 2012.

Pump House Facility Assessment

1. **Rate the existing condition of the facility structure ventilation. Does building require open doors or supplemental ventilation to stay cool?**

2012 Response: Upgrade scheduled for 2012.	2
Additional Comments: (2) up Grade was done but Roof fan seems to be undersized for full ventilation - Building doors still need to be left open in Summer	(2)

2. **Rate the existing condition of the facility structure lighting.**

2012 Response: Upgrade scheduled for 2012.	2
Additional Comments: (1) Lighting is good - Flourescent Lights were Installed.	(1)

3. **Rate the existing condition of the facility structure plumbing.**

2012 Response: Upgrade scheduled for 2012.	2
Additional Comments: (1) plumbing in building was Redone except Discharge Piping.	(1)

4. **Are there any structural deficiencies apparent at the pump house?**
Examples: Cracked concrete, cracked brick or block walls, rotted timbers or corroded structural steel?

Additional Comments: (3) Brick Vaneer is Cracked at NW Corner of building	(3)

5. **Does the pump house need floor drains, is ponding water an issue, are pipe chases flooded?**

Additional Comments: floor drains into basement (2) Pond is not an issue.	(2)

6. **Does the pump house have any safety concerns?**
Examples: Missing handrails, access ladders, access/approach steps, non-slip surfaces? (2) Building is Small, No Egress doors (2)

Additional Comments:	

Site Assessment

7. Rate the existing condition of the site and site accessibility.

2012 Response: Site is fenced and good access all around pump house.	1
Additional Comments: Same as 2012 (1)	(1)

8. Does the pump house and site provide protection from trespassers, vandals and saboteurs?

Examples: Adequate exterior lighting, egress door locks, site fencing, locks on access hatches?

Additional Comments: (3) no egress doors or	(3)

Equipment Assessment

9. Rate the existing condition of the pumps.

2012 Response: Was out of ground within last 5 years (2007) and received service.	1
Additional Comments: (1) was pulled within last 10 years	(1)

10. Rate the existing condition of the piping, valving, pressure gauges, meters and other appurtenances.

2012 Response: Some piping will be changed (2012) to accept Magmeter an rest is old piping and valves. Pressure gauges will be upgraded in 2012.	2
Additional Comments: (1) New Flow meter and Pressure is sent through new Operator Interface Terminal	(1)

11. Rate the existing condition of the motor.

2012 Response: Was checked within the last 5 years (2007).	1
Additional Comments: (1) was pulled and checked within last 10 years	(1)

12. Are pump, valving and motor components maintained at manufacturer reccomended schedules?

Additional Comments: (1) yes As Much as we know about. Service is done annually and condition checked daily	(1)

9,10,12,

13. **Describe any concerns regarding the operation of pumps, valves & piping.**

Example: Are pump seals leaking/failing, do any valves stick or not operate?

Additional Comments: ① Pump and booster are same, Deep well pumps into Tank into System.	①

14. **Describe any equipment access or maintenance concerns.**

Example: Are there any pumps that cannot be removed due to interference, are there valves/pipes that would be hard to replace due to location and access?

Additional Comments: ② no Egress door locks	②

Chlorination System Assessment

15. **Is the gas chlorination equipment located in a separate room, vented to the outside, and provided with working Cl leak detection alarms?**

Additional Comments: ① yes	①

16. **Does the gas chlorine feed automatically switch to a full tank when empty?**

Additional Comments: ③ That System has never been Installed at this location	③

Water Assessment

17. **Describe any water quality issues associated with the well.**

Examples: Sand production, e-coli, turbidity

Additional Comments: ① none	①

18. **Describe any water quantity concerns.**

2012 Comments: Pump has operated 24hr/day- 7days/week for many years.

Additional Comments: ② only produces 1200 Gpm We could use more if it could produce more,	②

Electrical Assessment

19. **Rate existing condition of motor controls.**

2012 Comments: Upgrades planned for 2012.	1

New Control and MCC panels in 2012 ①

Additional Comments:

20. **Rate existing condition of the electrical system.**

2012 Comments: Upgrades planned for 2012.

2

Additional Comments: (1) New upGrade with in last 5 years

(1)

21. **Do control cabinets require open door venting to remain operational?**

Additional Comments: (1) NO but building doors Must be open all Summer for additional ventilation

(1)

22. **Does chlorine room have gas detection sensors? How is the alarm announced locally? Does the alarm notify operators via SCADA callout?**

Additional Comments: (1) yes, Announced through Siren, it can if enabled.

(1)

23. **Is facility generator backed? Is switchover sutomatic? Are operators notified of this condition via SCADA callout?**

Additional Comments: (3) No generator at this Site

(3)

24. **For generator backed facilities; is the generator/ATS able to power all wells and booster pumps simultaneously?**

Additional Comments: (3) N/A

(3)

25. **Does the well have; well water depth sensor?, discharge pressure sensor?, discharge flow sensor?**

Additional Comments: yes, yes, yes (1)

(1)

Description:

The purpose of this questionnaire is to utilize operator knowledge about the well facilities to help establish a baseline condition assesment of each facility for the Water Facility Master Plan. This survey includes the applicable questions and anwers recieved from the opearations staff during a 2012 VFD study.

Instructions:

Please provide comments and a rating between 1 and 3 (1 = good or not applicable, 2 = average, 3 = poor) describing the condition in each question. Please confirm the response, or re-rate the questions previously asked in 2012.

Pump House Facility Assessment

1. **Rate the existing condition of the facility structure ventilation. Does building require open doors or supplemental ventilation to stay cool?**

2012 Response: Building is good it is brick and block. Ventilation is an overhead door.	2
Additional Comments: Building vents poorly.	3

2. **Rate the existing condition of the facility structure lighting.**

2012 Response: Lights are incandecent.	2
Additional Comments: They are still incandecent	2

3. **Rate the existing condition of the facility structure plumbing.**

2012 Response: Plumbing is old but not in need of repair, some drains were replaced in 2011.	2
Additional Comments: Bulding floor drains flows openly to basement causing constant wet conditions. Sump pumps basement sump pit to outside building.	(2)

4. **Are there any structural deficiencies apparent at the pump house?**
Examples: Cracked concrete, cracked brick or block walls, rotted timbers or corroded structural steel?

Additional Comments: (3) yes Brick Vaneer and roof have Brick and mortar disinagration in places. (3)

5. **Does the pump house need floor drains, is ponding water an issue, are pipe chases flooded?**

Additional Comments: floor drains are in place, but they need work to keep basement floors dry and clean. (3)

6. **Does the pump house have any safety concerns?**
Examples: Missing handrails, access ladders, access/approach steps, non-slip surfaces?

Additional Comments: basement Stairs are Steep.	(2)

Site Assessment

7. Rate the existing condition of the site and site accessibility.

2012 Response: Reconstruction onsite to remove a substation has helped greatly with accesibility and condition.	2
Additional Comments: Easy to access	(1)

8. Does the pump house and site provide protection from trespassers, vandals and saboteurs?

Examples: Adequate exterior lighting, egress door locks, site fencing, locks on access hatches?

Additional Comments: NO. Current venting System effictively removes all Security.	(3)

Equipment Assessment

9. Rate the existing condition of the pumps.

2012 Response: The pump was rebuilt within the last 10 years (2002).	1
Additional Comments: Still operating adequately as of 7-22-14. Pump house is hot	(2)

10. Rate the existing condition of the piping, valving, pressure gauges, meters and other appurtenances.

2012 Response: Piping is good and does not need any work other than paint. New Limitourqe control valve installed within last 10 years (2002). Rosemount	2
Additional Comments: Pressure meter and flow meter readings seem incorrect	(2)

11. Rate the existing condition of the motor.

2012 Response: The motor runs well and has not needed repair. It was replaced new in 2002.	1
Additional Comments: Seems to be working fine. Building does not vent well. Heat build up is a Problem	(1)

12. Are pump, valving and motor components maintained at manufacturer reccomended schedules?

Additional Comments: yes as best we know of. lube & Grease annually, clean and adjust as needed and check daily all year.	(1)

13. **Describe any concerns regarding the operation of pumps, valves & piping.**

Example: Are pump seals leaking/failing, do any valves stick or not operate?

Additional Comments: Sand volume seems to be in smaller and smaller amounts. Down by 90% over last 20 years. accumulate 1" or less per year in bottom of tank (1)
no concerns

14. **Describe any equipment access or maintenance concerns.**

Example: Are there any pumps that cannot be removed due to interference, are there valves/pipes that would be hard to replace due to location and access?

Additional Comments: All seems to be accessable with Minimum maintenance (1)
no concerns

Chlorination System Assessment

15. **Is the gas chlorination equipment located in a separate room, vented to the outside, and provided with working Cl leak detection alarms?**

Additional Comments: Yes (1)

16. **Does the gas chlorine feed automatically switch to a full tank when empty?**

Additional Comments: This system Has never had that Kind of System installed. (3)
no switchover.

Water Assessment

17. **Describe any water quality issues associated with the well.**

Examples: Sand production, e-coli, turbidity

Additional Comments: Pumps Sand on Start-up (1)
but accumulates only less than 1" per year in bottom of tank

18. **Describe any water quantity concerns.**

2012 Comments: Well pumps silty water when cycling.

Additional Comments: Pumps 1200 GPM ~~Sand~~ on Start-up (2)
and consistantly

Electrical Assessment

19. **Rate existing condition of motor controls.**

2012 Comments: Upgraded in 2000 and 2001. 1

Less than 15 years old (1)

Additional Comments: work well, was pulled and checked with in last 5 years	(1)

20. Rate existing condition of the electrical system.

2012 Comments: Electrical system was upgraded in 2000 and 2001.	1
Additional Comments: Works well, was upgraded with in last 15 years	(1)

21. Do control cabinets require open door venting to remain operational?

Additional Comments: no, But Building doors must be left open for better ventillation	(1)

22. Does chlorine room have gas detection sensors? How is the alarm announced locally? Does the alarm notify operators via SCADA callout?

Additional Comments: Yes, audible, Yes if Enabled in SCADA Program	(1)

23. Is facility generator backed? Is switchover sutomatic? Are operators notified of this condition via SCADA callout?

Additional Comments: No, notified if Power fails Site Has NO Emergency Generator.	(3)

24. For generator backed facilities; is the generator/ATS able to power all wells and booster pumps simultaneously?

Additional Comments: N/A	(3)

25. Does the well have; well water depth sensor?, discharge pressure sensor?, discharge flow sensor?

Additional Comments: Yes, Yes, Yes	(1)

Description:

The purpose of this questionnaire is to utilize operator knowledge about the well facilities to help establish a baseline condition assesment of each facility for the Water Facility Master Plan. This survey includes the applicable questions and anwers recieved from the opearations staff during a 2012 VFD study.

Instructions:

Please provide comments and a rating between 1 and 3 (1 = good or not applicable, 2 = average, 3 = poor) describing the condition in each question. Please confirm the response, or re-rate the questions previously asked in 2012.

Pump House Facility Assessment

1. **Rate the existing condition of the facility structure ventilation. Does building require open doors or supplemental ventilation to stay cool?**

2012 Response: Structure has big ventilation fan that runs continuously with doors as inlets.	2
Additional Comments: yes, Coolant fan Runs alot with doors open, Temperatures run high inbuilding all Summer long.	(3)

2. **Rate the existing condition of the facility structure lighting.**

2012 Response: Lights are incandecent.	2
Additional Comments: Building has opeque' lense covers on incadescent Lighting.	(3)

3. **Rate the existing condition of the facility structure plumbing.**

2012 Response: Plumbing is old.	2
Additional Comments: No plumbing has been changed for 20 plus years.	(2)

4. **Are there any structural deficiencies apparent at the pump house?**
Examples: Cracked concrete, cracked brick or block walls, rotted timbers or corroded structural steel?

Additional Comments: Brick is starting to deteriate on parts and Mortor also. (2)

5. **Does the pump house need floor drains, is ponding water an issue, are pipe chases flooded?**

Additional Comments: Drainage is into basement Through Floor drains. (2)

6. **Does the pump house have any safety concerns?**
Examples: Missing handrails, access ladders, access/approach steps, non-slip surfaces? No Egress doors and locks (2)

Additional Comments:	

Site Assessment

7. Rate the existing condition of the site and site accessibility.

2012 Response: Brick structure and fair room around building. At dead end of street.	1
Additional Comments: Site has good accessability	①

8. Does the pump house and site provide protection from trespassers, vandals and saboteurs?

Examples: Adequate exterior lighting, egress door locks, site fencing, locks on access hatches?

Additional Comments: Has padlocks and Hasps on doors no frontal fence to properly	②

Equipment Assessment

9. Rate the existing condition of the pumps.

2012 Response: Have required no work for over 10 years (2002).	1
Additional Comments: Well #10 was pulled within last 10 years And #9 within last 5 years. Booster #10 Had its Babbot Bearings Replaced within last 5 years	①

10. Rate the existing condition of the piping, valving, pressure gauges, meters and other appurtenances.

2012 Response: Has new Limitorque control valve and Rosemont pressure and flow transmitters. Seems to work well.	1
Additional Comments: All transmitters send info through new control touchscreen in New control Cabinet,	②

11. Rate the existing condition of the motor.

2012 Response: Well #9 motor runs well, sounds good, large horizontal Fairbanks Morse. Well #10 received new bearings in 2011, motor was dipped and baked.	1
Additional Comments: Well #9 and well #10 and #10 Booster Motors have been pulled within last 10 years.	①

12. Are pump, valving and motor components maintained at manufacturer reccomended schedules? yes, as well as we know Annual oil change and check daily, clean and adjust as needed. ①

Additional Comments:	

13. **Describe any concerns regarding the operation of pumps, valves & piping.**
Example: Are pump seals leaking/failing, do any valves stick or not operate?

Additional Comments: ① All are working good	①

14. **Describe any equipment access or maintenance concerns.**

Example: Are there any pumps that cannot be removed due to interference, are there valves/pipes that would be hard to replace due to location and access?

Additional Comments: Good HATches for access to pumps AND motors	①

Chlorination System Assessment

15. **Is the gas chlorination equipment located in a separate room, vented to the outside, and provided with working Cl leak detection alarms?**

Additional Comments: yes	①

16. **Does the gas chlorine feed automatically switch to a full tank when empty?**

Additional Comments: NO, that type of system was never set up at this site	(3)

Water Assessment

17. **Describe any water quality issues associated with the well.**
Examples: Sand production, e-coli, turbidity

Additional Comments: None - The water has very good quality and always tests well	①

18. **Describe any water quantity concerns.**

2012 Comments: Pump runs in conjunction with Booster 10 in high demand months, the rest of the time it is not needed.

Additional Comments: The Deep wells and Boosters are producing what they were designed or near what they were designed to do	①

Electrical Assessment

19. **Rate existing condition of motor controls.**
They are old and the Breakers are hard to find (3)

2012 Comments: Controls are old and outdated. Hard time sourcing parts.	3
Additional Comments:	

20. Rate existing condition of the electrical system.

2012 Comments: Old cabinets, fixtures and wiring .	3
Additional Comments: Control Cabinet AND SCADA is New But Electrical System's Breakers are hard to find, fixtures and wiring is more than 20 years old.	(3)

21. Do control cabinets require open door venting to remain operational?

Additional Comments: NOT for a while but when Temperatures Stay close to 100°F then we open them for ventilation	(3)

22. Does chlorine room have gas detection sensors? How is the alarm announced locally? Does the alarm notify operators via SCADA callout?

Additional Comments: yes, Announced with Siren, yes will notify Through SCADA if we Enable that alarm in Auto Dialer.	(1)

23. Is facility generator backed? Is switchover sutomatic? Are operators notified of this condition via SCADA callout?

Additional Comments: yes, yes, yes	(2)

24. For generator backed facilities; is the generator/ATS able to power all wells and booster pumps simultaneously?

Additional Comments: no it can only run 1 well and 1 Booster at a time.	(3)

25. Does the well have; well water depth sensor?, discharge pressure sensor?, discharge flow sensor?

Additional Comments: yes, yes, yes	(1)

Description:

The purpose of this questionnaire is to utilize operator knowledge about the well facilities to help establish a baseline condition assesment of each facility for the Water Facility Master Plan. This survey includes the applicable questions and anwers recieved from the opearations staff during a 2012 VFD study.

Instructions:

Please provide comments and a rating between 1 and 3 (1 = good or not applicable, 2 = average, 3 = poor) describing the condition in each question. Please confirm the response, or re-rate the questions previously asked in 2012.

Pump House Facility Assessment

1. **Rate the existing condition of the facility structure ventilation. Does building require open doors or supplemental ventilation to stay cool?**

2012 Response: Good brick and block structure. Very little ventilation with small vent openings.	2
Additional Comments: yes, But ventilation is such That when Temperatures reach close to 100°F for long Periods we have opened doors to Help cool, No Screen doors	(3)

2. **Rate the existing condition of the facility structure lighting.**

2012 Response: No comment.	
Additional Comments: Still Has incadescent lighting and facility is in pretty good condition	2 (2)

3. **Rate the existing condition of the facility structure plumbing.**

2012 Response: No comment.	
Additional Comments: plumbing is all original Except chlorine line to well #14.	2 (2)

4. **Are there any structural deficiencies apparent at the pump house?**
Examples: Cracked concrete, cracked brick or block walls, rotted timbers or corroded structural steel?

Additional Comments: NO, Building and Tank is Structurally Sound but Tank Has no Overflow that we have found. (2)

5. **Does the pump house need floor drains, is ponding water an issue, are pipe chases flooded?**

Additional Comments: Drains all work in pumphouse (1)

6. **Does the pump house have any safety concerns?**
Examples: Missing handrails, access ladders, access/approach steps, non-slip surfaces? (2)

Has no Egress door system and only one EXIT.

Additional Comments:	

Site Assessment

7. Rate the existing condition of the site and site accessibility.

2012 Response: Structure is in alleyway with housing in three sides and canal on other. Site is small.	2
Additional Comments: is fenced but only with a 4' fence - New fence is planned for 2014	(2)

8. Does the pump house and site provide protection from trespassers, vandals and saboteurs?

Examples: Adequate exterior lighting, egress door locks, site fencing, locks on access hatches?

Additional Comments: doors all lock but no egress doors and only 4' fence Securing Property.	(2)

Equipment Assessment

9. Rate the existing condition of the pumps.

2012 Response: Pump #11 was removed and rebuilt in April 2012. Pump #14 has not been worked on for over 10 years (2002) and still runs strong.	1
Additional Comments: Good #11 Deep well" was just pulled in 2012 and Deepwell #14 was Changed from Submersable to above ground turbine in 2011	(1)

10. Rate the existing condition of the piping, valving, pressure gauges, meters and other appurtenances.

2012 Response: Piping is good, less than 10 years old (2002). New Limitorque control valve and Rosemont pressure and flow transmitters. Seems to work well.	1
Additional Comments: Piping is original, Tank level and control values are controled by Miltronics because Major rewiring is Required to change to New SCADA.	(2)

11. Rate the existing condition of the motor.

2012 Response: Well #11 motor was dipped and baked less than 10 years ago (2002). Well #14 has older style motor, still operates quietly and has no noticable vibration problems.	1
Additional Comments: Motor on Deepwell was pulled in 2012 and pump base rebuilt with Discharge pipe.	(1)

12. Are pump, valving and motor components maintained at manufacturer reccomended schedules? yes oil changed annually, greased and cleaned and adjusted as needed. (1)

Additional Comments:	

13. **Describe any concerns regarding the operation of pumps, valves & piping.**
Example: Are pump seals leaking/failing, do any valves stick or not operate?

Additional Comments: Piping is original Except Chlorine Line to Well #14 Deep well and Bearing Lube Line to well #14 they are new.	①

14. **Describe any equipment access or maintenance concerns.**

Example: Are there any pumps that cannot be removed due to interference, are there valves/pipes that would be hard to replace due to location and access?

Additional Comments: no, good Access to All	①

Chlorination System Assessment

15. **Is the gas chlorination equipment located in a separate room, vented to the outside, and provided with working Cl leak detection alarms?**

Additional Comments: yes, yes	①

16. **Does the gas chlorine feed automatically switch to a full tank when empty?**

Additional Comments: NO, That Type of System has never been installed at This Site	③

Water Assessment

17. **Describe any water quality issues associated with the well.**
Examples: Sand production, e-coli, turbidity

Additional Comments: No water quality concerns	①

18. **Describe any water quantity concerns.**

2012 Comments: Facility has miltronic sensor in tank which does not allow operation in winter. Tank level becomes uncontrollable due to sensor seeing fog.

Additional Comments: Same problems as in 2012 with equipment but we Ran This Site most all of Last Winter With No problems	①

Electrical Assessment

19. Rate existing condition of motor controls.

2012 Comments: Upgraded in 2011.	1
Additional Comments: Controls are for most part New except it is still controled from Powers Valve controller Instead of New OIT Touchscreen	①

20. Rate existing condition of the electrical system.

2012 Comments: Upgraded in 2011/2012.	1
Additional Comments: for the most part it is all new	①

21. Do control cabinets require open door venting to remain operational?

Additional Comments: NO but ventilation to building is very limited	③

22. Does chlorine room have gas detection sensors? How is the alarm announced locally? Does the alarm notify operators via SCADA callout?

Additional Comments: yes, Alarm is through a Small Siren In Control Box. Alarm can notify operators if Enabled.	①

23. Is facility generator backed? Is switchover sutomatic? Are operators notified of this condition via SCADA callout?

Additional Comments: yes, yes, yes	①

24. For generator backed facilities; is the generator/ATS able to power all wells and booster pumps simultaneously?

Additional Comments: NO, Deepwell And Booster must be Selected at a Selector Switch - #II or #I4	③

25. Does the well have; well water depth sensor?, discharge pressure sensor?, discharge flow sensor?

Additional Comments: yes, yes, yes	①

Description:

The purpose of this questionnaire is to utilize operator knowledge about the well facilities to help establish a baseline condition assesment of each facility for the Water Facility Master Plan. This survey includes the applicable questions and anwers recieved from the opearations staff during a 2012 VFD study.

Instructions:

Please provide comments and a rating between 1 and 3 (1 = good or not applicable, 2 = average, 3 = poor) describing the condition in each question. Please confirm the response, or re-rate the questions previously asked in 2012.

Pump House Facility Assessment

1. **Rate the existing condition of the facility structure ventilation. Does building require open doors or supplemental ventilation to stay cool?**

2012 Response: Sound brick and block structure. Ventilation is from two small fans that are on oppsite walls, both blow out.	3
Additional Comments: Fan on South wall was Reconfigured to Draw in so building is a little cooler but still very much in need of more ventilation.	(3)

2. **Rate the existing condition of the facility structure lighting.**

2012 Response: Lights are poor with incadecent bulbs.	3
Additional Comments: The lighting is still incadecent bulbs style and bulb mostly have been exchanged for flourescent bulbs.	(3)

3. **Rate the existing condition of the facility structure plumbing.**

2012 Response: Plumbing is fair.	3
Additional Comments: Plumbing is all original but in fair shape	

4. **Are there any structural deficiencies apparent at the pump house?**
Examples: Cracked concrete, cracked brick or block walls, rotted timbers or corroded structural steel?

Additional Comments: Structure is sound and in good shape	(1)

5. **Does the pump house need floor drains, is ponding water an issue, are pipe chases flooded?**

Additional Comments: It has floor drains but seem to go to a french drain or something. They will Take Bearing lube water but little else!	(3)

6. **Does the pump house have any safety concerns?**
Examples: Missing handrails, access ladders, access/approach steps, non-slip surfaces?

Additional Comments: only one exit and no egress doors	3

Site Assessment

7. Rate the existing condition of the site and site accessibility.

2012 Response: Site is open except for south side that borders street department office building.	1
Additional Comments: Site is with no fence and has good accessability for most of 3 sides	①

8. Does the pump house and site provide protection from trespassers, vandals and saboteurs?

Examples: Adequate exterior lighting, egress door locks, site fencing, locks on access hatches?

Additional Comments: Hatch is bolted on, lighting is Good with Street Department offices less than 50' away, no Egress Door locks, no fencing	③

Equipment Assessment

9. Rate the existing condition of the pumps.

2012 Response: Pump has been good with no problems.	1
Additional Comments: Pump is in good condition and was pulled within last 10 years	①

10. Rate the existing condition of the piping, valving, pressure gauges, meters and other appurtenances.

2012 Response: Has good piping and Rosemont pressure and flow transmitters that seems to work well. Tank level does not work in winter.	2
Additional Comments: Pressure & Flow Transmitters are still same but work with new ScaDA Equipment for Reporting and Monitoring	②

11. Rate the existing condition of the motor.

2012 Response: Motor runs hot all of the time.	2
Additional Comments: motor was pulled and checked, Rewound in July 2014 when it Burned up. (Deepwell motor) Voltage was increased by Power Co.	①

12. Are pump, valving and motor components maintained at manufacturer reccomended schedules?

Additional Comments: yes, oil changed, cleaned and adjusted.	①

13. **Describe any concerns regarding the operation of pumps, valves & piping.**

Example: Are pump seals leaking/failing, do any valves stick or not operate?

Additional Comments: Ventilation shortfalls allow motors to run HOT. Valves and piping are good. (3)

14. **Describe any equipment access or maintenance concerns.**

Example: Are there any pumps that cannot be removed due to interference, are there valves/pipes that would be hard to replace due to location and access?

Additional Comments: Control cabinets of VFD are almost to large to fit through doors if ever needed to be Replaced. (3)

Chlorination System Assessment

15. **Is the gas chlorination equipment located in a separate room, vented to the outside, and provided with working Cl leak detection alarms?**

Additional Comments: yes, yes, yes
Alarm controls are new (1)

16. **Does the gas chlorine feed automatically switch to a full tank when empty?**

Additional Comments: no, that system has never been installed at this site. (3)

Water Assessment

17. **Describe any water quality issues associated with the well.**

Examples: Sand production, e-coli, turbidity

Additional Comments: no, quality concerns (1)

18. **Describe any water quantity concerns.**

2012 Comments: VFD controlled with start and stops set to keep running.

Additional Comments: Tank still has Miltronics sonar in tank that controls and reads tank level. IT reads fog and cannot be used in the winter. (3)

Electrical Assessment

19. **Rate existing condition of motor controls.**

2012 Comments: Motor controlls are new, about 10-12 yeas old (2000). 1

Controls were put in new about 12-14 years ago when VFD was Installed (1)

Additional Comments:	

19 (20 ~~17~~) **Rate existing condition of the electrical system.**

2012 Comments: All new with VFD and electrical upgrades in 1999.	1
Additional Comments: Electrical System was installed 12-14 years ago when VFD was installed.	①

21. Do control cabinets require open door venting to remain operational?

Additional Comments: yes, This year when temperatures neared 100° Ambient we opened Cabinet Doors To Help with ventilation.	③

22. Does chlorine room have gas detection sensors? How is the alarm announced locally? Does the alarm notify operators via SCADA callout?

Additional Comments: yes, New Sensors, Alarm System is announced through a Siren in control box and it will notify operators if enabled in Scada program	①

23. Is facility generator backed? Is switchover sutomatic? Are operators notified of this condition via SCADA callout?

Additional Comments: NO, NO, NO	③

24. For generator backed facilities; is the generator/ATS able to power all wells and booster pumps simultaneously?

Additional Comments: N/A

25. Does the well have; well water depth sensor?, discharge pressure sensor?, discharge flow sensor?

Additional Comments: NO Transducer Hits Something in The well when inserting it. Has discharge flow and Pressure Sensors.	②

Description:

The purpose of this questionnaire is to utilize operator knowledge about the well facilities to help establish a baseline condition assesment of each facility for the Water Facility Master Plan. This survey includes the applicable questions and anwers recieved from the opearations staff during a 2012 VFD study.

Instructions:

Please provide comments and a rating between 1 and 3 (1 = good or not applicable, 2 = average, 3 = poor) describing the condition in each question. Please confirm the response, or re-rate the questions previously asked in 2012.

Pump House Facility Assessment

1. **Rate the existing condition of the facility structure ventilation. Does building require open doors or supplemental ventilation to stay cool?**

2012 Response: Brick and block building. Ventilation is better than most of the other wells.	1
Additional Comments: Pretty Good ventilation with louvers on North wall and ventilation fan in Ceiling on west end of Roof. No open doors Required	(1)

2. **Rate the existing condition of the facility structure lighting.**

2012 Response: Lighting was upgraded about 10 years ago (2002).	1
Additional Comments: Lighting is flourescent Tube	(1)

3. **Rate the existing condition of the facility structure plumbing.**

2012 Response: Plumbing was upgraded about 10 years ago (2002).	1
Additional Comments: Piping is original Except from 13 Deepwell to pump to waste which was new when 13B was added to This Site.	(1)

4. **Are there any structural deficiencies apparent at the pump house?**
Examples: Cracked concrete, cracked brick or block walls, rotted timbers or corroded structural steel?

Additional Comments: Roof Eves on South of Roof are showing some break up.	(2)

5. **Does the pump house need floor drains, is ponding water an issue, are pipe chases flooded?**

Additional Comments: No, floor drains drain to pit South of Site, They are cleaned when needed.	(1)

6. **Does the pump house have any safety concerns?**
Examples: Missing handrails, access ladders, access/approach steps, non-slip surfaces? Doors are not Egress lock doors, No Non Slip Surface floors (2)

Additional Comments:	

Site Assessment

7. Rate the existing condition of the site and site accessibility.

2012 Response: Good access. Site is very open all around.	1
Additional Comments: Has Good Access all around buildings And Site is fenced with 2 access points	①

8. Does the pump house and site provide protection from trespassers, vandals and saboteurs?

Examples: Adequate exterior lighting, egress door locks, site fencing, locks on access hatches?

Additional Comments: yes, both fenced and locks on doors and gates, no Egress door locks	②

Equipment Assessment

9. Rate the existing condition of the pumps.

2012 Response: Booster 1 and 2 have not needed work for over 10 years (2002). Booster 3 is about 10 years old.	1
Additional Comments: #13 Deepwell pump was pulled and checked in 2011 - 2012 and Deepwell #13B is only about 12 years old.	①

10. Rate the existing condition of the piping, valving, pressure gauges, meters and other appurtenances.

2012 Response: Most everything was updated when Well #13B and Booster 3 was added.	1
Additional Comments: Pressure & Flow meters are Routed Through new Scada Touch Screen.	①

11. Rate the existing condition of the motor.

2012 Response: All three booster motors work fine.	1
Additional Comments: Deepwell #13 motor was checked 2012 and Deepwell #13B was put in about 2002.	①

12. Are pump, valving and motor components maintained at manufacturer reccomended schedules?

Additional Comments: yes, oil changes, greased, cleaned and adjusted.	①

13. **Describe any concerns regarding the operation of pumps, valves & piping.**

Example: Are pump seals leaking/failing, do any valves stick or not operate?

Additional Comments:	
NO CONCERNS All WORK Good and Show NO problems	①

14. **Describe any equipment access or maintenance concerns.**

Example: Are there any pumps that cannot be removed due to interference, are there valves/pipes that would be hard to replace due to location and access?

Additional Comments:	
Good Acess to All	①

Chlorination System Assessment

15. **Is the gas chlorination equipment located in a separate room, vented to the outside, and provided with working Cl leak detection alarms?**

Additional Comments:	
yes, yes, yes	①

16. **Does the gas chlorine feed automatically switch to a full tank when empty?**

Additional Comments:	
NO, That type of system has never been installed at this Site	③

Water Assessment

17. **Describe any water quality issues associated with the well.**

Examples: Sand production, e-coli, turbidity

Additional Comments: NO CONCERNS ①

18. **Describe any water quantity concerns.**

2012 Comments: Booster 1 runs steady untill demand starts to cycle Booster 2. Then Booster 2 runs steady and Booster 1 jocky's to meet demand. When Booster 1 and 2 are running constantly, Booster 3 is turned on and 1 or 2 are used as jocky's.

Additional Comments:	
Runs as in 2012 and gives us NO Concerns.	①

Electrical Assessment

19. **Rate existing condition of motor controls.**

2012 Comments: Motor controlls are about 10 years old (2002). 1

The Same as 2012 With few Component Replacements ie motorSavers, Breakers, Heaters. ①

Additional Comments:	

20. Rate existing condition of the electrical system.

2012 Comments: New MCC's, control cabinet and generator controls were installed.	1
Additional Comments: New Electrical System Put in around 2002. Still in good condition	①

21. Do control cabinets require open door venting to remain operational?

Additional Comments: Not Normally. Only when Ambient Temperatures Reach 100° F or Near.	①

22. Does chlorine room have gas detection sensors? How is the alarm announced locally? Does the alarm notify operators via SCADA callout?

Additional Comments: yes, new Sensors, Control, and wiring. Alarm is announced through Siren in Control Box. Alarm will notify Operators if it is Enabled in Scada Program	①

23. Is facility generator backed? Is switchover sutomatic? Are operators notified of this condition via SCADA callout?

Additional Comments: yes, yes, yes	①

24. For generator backed facilities; is the generator/ATS able to power all wells and booster pumps simultaneously?

Additional Comments: NO, Deep well Must be selected 13 or 13B. Boosters #1 and #2 will Run with Well #13 and Booster #3 will Run with 13B.	③

25. Does the well have; well water depth sensor?, discharge pressure sensor?, discharge flow sensor?

Additional Comments: yes, yes, yes	①

Description:

The purpose of this questionnaire is to utilize operator knowledge about the well facilities to help establish a baseline condition assesment of each facility for the Water Facility Master Plan. This survey includes the applicable questions and anwers recieved from the opearations staff during a 2012 VFD study.

Instructions:

Please provide comments and a rating between 1 and 3 (1 = good or not applicable, 2 = average, 3 = poor) describing the condition in each question. Please confirm the response, or re-rate the questions previously asked in 2012.

Pump House Facility Assessment

1. **Rate the existing condition of the facility structure ventilation. Does building require open doors or supplemental ventilation to stay cool?**

2012 Response: Good brick and block building. Ventilation is good with big louvers on both ends of building and big ventilation fan.	1
Additional Comments: Same as in 2012, no change	①

2. **Rate the existing condition of the facility structure lighting.**

2012 Response: Lighting is flouressent.	1
Additional Comments: Same As in 2012, no change	①

3. **Rate the existing condition of the facility structure plumbing.**

2012 Response: Plumbing is good.	1
Additional Comments: Same as in 2012	①

4. **Are there any structural deficiencies apparent at the pump house?**
Examples: Cracked concrete, cracked brick or block walls, rotted timbers or corroded structural steel?

Additional Comments: no deficiencies, building is sound	①

5. **Does the pump house need floor drains, is ponding water an issue, are pipe chases flooded?**

Additional Comments: No problems Drains drain in good into pond to the north of property.	①

6. **Does the pump house have any safety concerns?**
Examples: Missing handrails, access ladders, access/approach steps, non-slip surfaces? No egress door locks only one entrance ②

Additional Comments:	

Site Assessment

7. Rate the existing condition of the site and site accessibility.

2012 Response: Large fenced site with good distance to structures all around.	1
Additional Comments: 4' fenced site And good access to #15 on 3 sides. Generator sits on 4th side 15B has Good Access on 2 sides with storm pond on others	(1)

8. Does the pump house and site provide protection from trespassers, vandals and saboteurs?

Examples: Adequate exterior lighting, egress door locks, site fencing, locks on access hatches?

Additional Comments: No Egress door locks, no ladder to Tank, Hatch has padlock. One Access door to building.	(2)

Equipment Assessment

9. Rate the existing condition of the pumps.

2012 Response: Well #15 has not needed work for over 5 years (2007).	1
Additional Comments: Well #15 Deepwell was pulled and checked, bearings Replaced etc IN 2013	(1)

10. Rate the existing condition of the piping, valving, pressure gauges, meters and other appurtenances.

2012 Response: The three control valves all need to be rebuilt. They are Cla-val style valves and leak 90-95% of the time. Rosemont pressure and flow meters, they have required work. The flow meter has problems calibrating.	3
Additional Comments: Same as 2012 no change except flow meter is calibrated and is working fine.	(3)

11. Rate the existing condition of the motor.

2012 Response: All three booster motors work fine.	1
Additional Comments: Deepwell is Good, it was pulled and Redone in 2013, Boosters have not Been checked for over 10 years.	(1)

12. Are pump, valving and motor components maintained at manufacturer reccomended schedules? yes, oil changed, greased cleaned and adjusted (1)

Additional Comments:

13. **Describe any concerns regarding the operation of pumps, valves & piping.**
Example: Are pump seals leaking/failing, do any valves stick or not operate?

Additional Comments: OCV Valves have worked correctly very little since new. Need Replaced. (3)

14. **Describe any equipment access or maintenance concerns.**

Example: Are there any pumps that cannot be removed due to interference, are there valves/pipes that would be hard to replace due to location and access?

Additional Comments: Access is good but maintenance on OCV valves has been a nightmare. (3)

Chlorination System Assessment

15. **Is the gas chlorination equipment located in a separate room, vented to the outside, and provided with working Cl leak detection alarms?**

Additional Comments: yes, yes, yes (1)

16. **Does the gas chlorine feed automatically switch to a full tank when empty?**

Additional Comments: no, that system has never been installed in this site. (3)

Water Assessment

17. **Describe any water quality issues associated with the well.**
Examples: Sand production, e-coli, turbidity

Additional Comments: none (1)

18. **Describe any water quantity concerns.**

2012 Comments: Booster 1 runs steady untill demand starts to cycle Booster 2. Then Booster 2 runs steady and Booster 1 jocky's to meet demand. When Booster 1 and 2 are running constantly, Booster 3 is turned on and 1 or 2 are used as jocky's.

Additional Comments: The Boosters have never put out the full amount they are supposed to. They should put out between 5 and 6 Thousand GPM with all three running, but only 4-4500 GPM (2)

Electrical Assessment

19. Rate existing condition of motor controls.

2012 Comments: Have had a hard time replacing breakers. A few components are new from the additon of the generator.	3
Additional Comments: Same as 2012 only 2years older	(3)

20. Rate existing condition of the electrical system.

2012 Comments: The electrical system is getting close to 30+ years old with no upgrades.	2
Additional Comments: Same AS 2012	(3)

21. Do control cabinets require open door venting to remain operational?

Additional Comments: NOT usually because building has Pretty Good ventilation. But when AMbient temperaturs Exceed 100°F We have opened cabinet doors IN The past	(2)

22. Does chlorine room have gas detection sensors? How is the alarm announced locally? Does the alarm notify operators via SCADA callout?

Additional Comments: Yes The alarm is announced through a Siren in the control BOX. yes The alarm can notify The operators through the SCADA if Enabled in the program.	(1)

23. Is facility generator backed? Is switchover sutomatic? Are operators notified of this condition via SCADA callout?

Additional Comments: yes, yes, yes	(1)

24. For generator backed facilities; is the generator/ATS able to power all wells and booster pumps simultaneously?

Additional Comments: NO, but Generator is large enough.	(1)

25. Does the well have; well water depth sensor?, discharge pressure sensor?, discharge flow sensor?

Additional Comments: yes, yes, yes	(1)

Description:

The purpose of this questionnaire is to utilize operator knowledge about the well facilities to help establish a baseline condition assesment of each facility for the Water Facility Master Plan. This survey includes the applicable questions and anwers recieved from the opearations staff during a 2012 VFD study.

Instructions:

Please provide comments and a rating between 1 and 3 (1 = good or not applicable, 2 = average, 3 = poor) describing the condition in each question. Please confirm the response, or re-rate the questions previously asked in 2012.

Pump House Facility Assessment

1. **Rate the existing condition of the facility structure ventilation. Does building require open doors or supplemental ventilation to stay cool?**

2012 Response: Ventilation is good with good air exchange.	1
Additional Comments: Ventilation is good for most of the time Except when Ambient Temperatures are near 100°F for extended Periods.	①

2. **Rate the existing condition of the facility structure lighting.**

2012 Response: Lights are flourescent.	1
Additional Comments: Same as 2012	①

3. **Rate the existing condition of the facility structure plumbing.**

2012 Response: Plumbing is fairly new.	1
Additional Comments: Plumbing is in good Condition As The well is one of our newer wells	①

4. **Are there any structural deficiencies apparent at the pump house?**
Examples: Cracked concrete, cracked brick or block walls, rotted timbers or corroded structural steel?

Additional Comments: none ①

5. **Does the pump house need floor drains, is ponding water an issue, are pipe chases flooded?**

Additional Comments: no, Floor drains work well no pipe chases ①

6. **Does the pump house have any safety concerns?**
Examples: Missing handrails, access ladders, access/approach steps, non-slip surfaces? no problems ①

Additional Comments:	

Site Assessment

7. Rate the existing condition of the site and site accessibility.

2012 Response: Site is fenced and at least 50 yards from nearest structure.	1
Additional Comments: Site is very accessible	①

8. Does the pump house and site provide protection from trespassers, vandals and saboteurs?

Examples: Adequate exterior lighting, egress door locks, site fencing, locks on access hatches?

Additional Comments: yes, no Egress door locks, All Hatches are locked	①

Equipment Assessment

9. Rate the existing condition of the pumps.

2012 Response: They have both been checked within the last 15 years.	1
Additional Comments: Deepwell was pulled in 2012 and All Bearings Replaced in Column. Rest was checked.	①

10. Rate the existing condition of the piping, valving, pressure gauges, meters and other appurtenances.

2012 Response: All piping and valving are fairly new. Rosemont pressure and flow transmitters, seem to be fine.	1
Additional Comments: Same as 2012	①

11. Rate the existing condition of the motor.

2012 Response: Have not had any problems.	1
Additional Comments: Rehabilitated in 2012	①

12. Are pump, valving and motor components maintained at manufacturer reccomended schedules?

Additional Comments: yes, oil changed, greased, cleaned and adjusted	①

13. **Describe any concerns regarding the operation of pumps, valves & piping.**
Example: Are pump seals leaking/failing, do any valves stick or not operate?

Additional Comments:	
NO CONCERNS	①

14. **Describe any equipment access or maintenance concerns.**

Example: Are there any pumps that cannot be removed due to interference, are there valves/pipes that would be hard to replace due to location and access?

Additional Comments:	
Good access	①

Chlorination System Assessment

15. **Is the gas chlorination equipment located in a separate room, vented to the outside, and provided with working Cl leak detection alarms?**

Additional Comments:	
yes, yes, yes	①

16. **Does the gas chlorine feed automatically switch to a full tank when empty?**

Additional Comments:	
no, that type of system has never been installed	③

Water Assessment

17. **Describe any water quality issues associated with the well.**
Examples: Sand production, e-coli, turbidity

Additional Comments:	
none	①

18. **Describe any water quantity concerns.**

2012 Comments: Well #16 is main well, runs most of the time with booster 1. When larger demand is required booster 2 runs steady and booster 1 jocky's.	
Additional Comments: used same as in 2012	①

Electrical Assessment

19. **Rate existing condition of motor controls.**

2012 Comments: Function well.	1
Same as 2012, Working well	①

Additional Comments:	

20. Rate existing condition of the electrical system.

2012 Comments: Function well.	1
Additional Comments: All components work well	①

21. Do control cabinets require open door venting to remain operational?

Additional Comments: Not usually - only when Ambient Temperatures exceed 100° for a period of time.	①

22. Does chlorine room have gas detection sensors? How is the alarm announced locally? Does the alarm notify operators via SCADA callout?

Additional Comments: yes, New control and sensor, The alarm is announced by a Siren in control Box, The alarm will notify operators Through SCADA if Enabled	①

23. Is facility generator backed? Is switchover sutomatic? Are operators notified of this condition via SCADA callout?

Additional Comments: No Generator at this site	③

24. For generator backed facilities; is the generator/ATS able to power all wells and booster pumps simultaneously?

Additional Comments: N/A	(-)

25. Does the well have; well water depth sensor?, discharge pressure sensor?, discharge flow sensor?

Additional Comments: yes, yes, yes	①

Description:

The purpose of this questionnaire is to utilize operator knowledge about the well facilities to help establish a baseline condition assesment of each facility for the Water Facility Master Plan. This survey includes the applicable questions and anwers recieved from the opearations staff during a 2012 VFD study.

Instructions:

Please provide comments and a rating between 1 and 3 (1 = good or not applicable, 2 = average, 3 = poor) describing the condition in each question. Please confirm the response, or re-rate the questions previously asked in 2012.

Pump House Facility Assessment

1. **Rate the existing condition of the facility structure ventilation. Does building require open doors or supplemental ventilation to stay cool?**

2012 Response: Brick & block structure. Ventilation is good with good air exchange.	1
Additional Comments: Same as in 2012	1

2. **Rate the existing condition of the facility structure lighting.**

2012 Response: Lights are flourescent.	1
Additional Comments: Same as in 2012	1

3. **Rate the existing condition of the facility structure plumbing.**

2012 Response: Plumbing is new.	1
Additional Comments: Same as in 2012	1

4. **Are there any structural deficiencies apparent at the pump house?**
Examples: Cracked concrete, cracked brick or block walls, rotted timbers or corroded structural steel?

Additional Comments: None

1

5. **Does the pump house need floor drains, is ponding water an issue, are pipe chases flooded?**

Additional Comments: Good floor and drains, no water ponding, no pipe chase	1

6. **Does the pump house have any safety concerns?**
Examples: Missing handrails, access ladders, access/approach steps, non-slip surfaces?

Doors are not Egress doors

2

Additional Comments:	

Site Assessment

7. Rate the existing condition of the site and site accessibility.

2012 Response: Site is fenced prperly and at least 100 yards from nearest structure.	1
Additional Comments: Same as 2012 and has drainditch Problem through site. Ditch is Lower than the passing Drain Ditch outside of Property.	①

8. Does the pump house and site provide protection from trespassers, vandals and saboteurs?

Examples: Adequate exterior lighting, egress door locks, site fencing, locks on access hatches?

Additional Comments: Doors Are NOT Egress Equipted	②

Equipment Assessment

9. Rate the existing condition of the pumps.

2012 Response: All pumps are new, less than 15 years old (1999).	1
Additional Comments: Same as 2012	①

10. Rate the existing condition of the piping, valving, pressure gauges, meters and other appurtenances.

2012 Response: All piping and valving are fairly new. Rosemont pressure and flow transmitters, work well. Both boosters have limitorque control valves.	1
Additional Comments: Same as 2012	①

11. Rate the existing condition of the motor.

2012 Response: Both motors are in good condition and run with no problems.	1
Additional Comments: Same as 2012 only 2 years older	①

12. Are pump, valving and motor components maintained at manufacturer reccomended schedules?

Additional Comments: yes, oil changed, greased, cleaned and adjusted as needed.	①

13. **Describe any concerns regarding the operation of pumps, valves & piping.**
Example: Are pump seals leaking/failing, do any valves stick or not operate?

Additional Comments: No concerns, All work well	①

14. **Describe any equipment access or maintenance concerns.**

Example: Are there any pumps that cannot be removed due to interference, are there valves/pipes that would be hard to replace due to location and access?

Additional Comments: No problems, Good access	①

Chlorination System Assessment

15. **Is the gas chlorination equipment located in a separate room, vented to the outside, and provided with working Cl leak detection alarms?**

Additional Comments: yes, yes, yes	①

16. **Does the gas chlorine feed automatically switch to a full tank when empty?**

Additional Comments: yes, That system was installed AT this site and can be Revived. We dont use it any more.	①

Water Assessment

17. **Describe any water quality issues associated with the well.**
Examples: Sand production, e-coli, turbidity

Additional Comments: none - Good water	①

18. **Describe any water quantity concerns.**

2012 Comments: Well #17 and the 2 booster pumps are generally not needed in winter months.	
Additional Comments: Same as in 2012	①

Electrical Assessment

19. **Rate existing condition of motor controls.**

2012 Comments: Good condition, function well.	1
Motor Controls are good and work well	①

Additional Comments:	

20. Rate existing condition of the electrical system.

2012 Comments: Good condition, function well.	1
Additional Comments: Electrical System Has given us good service	0

21. Do control cabinets require open door venting to remain operational?

Additional Comments: Building is fairly well vent'd/lated	0

22. Does chlorine room have gas detection sensors? How is the alarm announced locally? Does the alarm notify operators via SCADA callout?

Additional Comments: yes, Alarm is announced through Siren in Control Box. Alarm will notify Scada System and go to operators if Enabled in Programming.	0

23. Is facility generator backed? Is switchover sutomatic? Are operators notified of this condition via SCADA callout?

Additional Comments: NO generator at this Site	3

24. For generator backed facilities; is the generator/ATS able to power all wells and booster pumps simultaneously?

Additional Comments: N/A	3

25. Does the well have; well water depth sensor?, discharge pressure sensor?, discharge flow sensor?

Additional Comments: yes, yes, yes	0

MSA
Murray, Smith & Associates, Inc.
Engineers/Planners

APPENDIX F

Operator VFD Conversion Assessment Survey, May 2012

IDAHO FALLS VFD CONVERSION
FACILITY NAME: BOOSTER #1

1. SHOULD THIS FACILITY BE CONVERTED TO VFD?		
1	2	3
YES	MAYBE	(NO)
COMMENT: Puts out around 3500 gpm and is only used in Summer months when water consumption is high.		

2. HOW OFTEN IS FACILITY RUN MANUALLY (NOT USING AUTOMATIC SETPOINTS)		
1	2	3
ALWAYS	(SOMETIMES)	NEVER
COMMENT: When Consumption needs or Requires all on near full capacity and smaller pumps can Adjust Demand easier.		

3. RATE THE EXISTING CONDITION OF THE PUMPS		
1	2	3
(GOOD)	FAIR	POOR
COMMENT: This one seems to Run strong with minimal Break downs.		

FACILITY NAME: BOOSTER #1

4. RATE THE EXISTING CONDITION OF THE PIPING, VALVING, PRESSURE GAUGES, METERS AND OTHER APPURTENANCES

1	(2)	3
GOOD	FAIR	POOR

COMMENT: The piping etc is old but the control valve is about ~~8 to~~ 10 years old.

5. RATE THE EXISTING CONDITION OF THE MOTOR

(1)	2	3
GOOD	FAIR	POOR

COMMENT: it hasn't had to have anything done to it for at least 12 years

6. RATE THE EXISTING CONDITION OF THE MOTOR CONTROLS

(1)	2	3
GOOD	FAIR	POOR

COMMENT: The well Electrical was upgraged within the last 10 years

FACILITY NAME: BOOSTER #1

7. RATE THE EXISTING CONDITION OF THE ELECTRICAL SYSTEM		
(1)	2	3
GOOD	FAIR	POOR

COMMENT: The whole electrical system - MCC, Building Lighting, Control Cabinet were upgraded within the last 10 years.

8. RATE THE EXISTING CONDITION OF THE FACILITY STRUCTURE (INCLUDING VENTILATION LIGHTS, PLUMBING)		
1	(2)	3
GOOD	FAIR	POOR

COMMENT: The structure is old, the ventalation is 2 screen doors but the lighting is good.

9. RATE THE EXISTING CONDITION OF THE SITE AND SITE ACCESSIBILITY		
1	2	(3)
GOOD	FAIR	POOR

COMMENT: The site is on corner of 2 streets with Homes To the East, Buisness to South, Parking lot to North. The Lot is small compared to our other wellsites with Rise in Elevation to north across the property. It is Attached to a larger building which is our Building maintanence shop.

IDAHO FALLS VFD CONVERSION
FACILITY NAME: BOOSTER #2

1. SHOULD THIS FACILITY BE CONVERTED TO VFD?		
1	(2)	3
YES	MAYBE	NO
COMMENT: To get more use out of it.		

2. HOW OFTEN IS FACILITY RUN MANUALLY (NOT USING AUTOMATIC SETPOINTS)		
1	2	(3)
ALWAYS	SOMETIMES	NEVER
COMMENT: It is seldom Ran Because of other wells have been able to Take care of the demand.		

3. RATE THE EXISTING CONDITION OF THE PUMPS		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: Horizonal motor		

FACILITY NAME: BOOSTER #2

4. RATE THE EXISTING CONDITION OF THE PIPING, VALVING, PRESSURE GAUGES, METERS AND OTHER APPURTENANCES		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: up Graded with MAg Meter and Piping from deepwell		

5. RATE THE EXISTING CONDITION OF THE MOTOR		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: Has not Required any Repair for over 10 years		

6. RATE THE EXISTING CONDITION OF THE MOTOR CONTROLS		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: up graded within 10 years		

FACILITY NAME: BOOSTER #2

7. RATE THE EXISTING CONDITION OF THE ELECTRICAL SYSTEM		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: upgraded within 10 years		

8. RATE THE EXISTING CONDITION OF THE FACILITY STRUCTURE (INCLUDING VENTILATION LIGHTS, PLUMBING)		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: New ventilation FANS with upgrade in 2011 NewBuilding in 2011 - includes lighting and plumbing and ventilation.		

9. RATE THE EXISTING CONDITION OF THE SITE AND SITE ACCESSIBILITY		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: New building and Landscaping - great access,		

IDAHO FALLS VFD CONVERSION
FACILITY NAME: WELL #3

1. SHOULD THIS FACILITY BE CONVERTED TO VFD?		
1	2	(3)
YES	MAYBE	NO
COMMENT: Well mainly Keeps water tower full		

2. HOW OFTEN IS FACILITY RUN MANUALLY (NOT USING AUTOMATIC SETPOINTS)		
1	2	(3)
ALWAYS	SOMETIMES	NEVER
COMMENT: Has to turn off when water tower is full		

3. RATE THE EXISTING CONDITION OF THE PUMPS		
1	(2)	3
GOOD	FAIR	POOR
COMMENT: It has not had a Required work on pumps for over 10 years		

FACILITY NAME: WELL #3

4. RATE THE EXISTING CONDITION OF THE PIPING, VALVING, PRESSURE GAUGES, METERS AND OTHER APPURTENANCES		
1	2	(3)
GOOD	FAIR	POOR
COMMENT: very old and has not been out of service for very long time.		

5. RATE THE EXISTING CONDITION OF THE MOTOR		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: Has not been worked on or Required work for over 10 years		

6. RATE THE EXISTING CONDITION OF THE MOTOR CONTROLS		
1	2	(3)
GOOD	FAIR	POOR
COMMENT: one of our oldest in operation and The only one with push button start and stop.		

FACILITY NAME: WELL #3

7. RATE THE EXISTING CONDITION OF THE ELECTRICAL SYSTEM		
1	2	(3)
GOOD	FAIR	POOR
COMMENT: HAS NOT had an up grade in over 20 years		

8. RATE THE EXISTING CONDITION OF THE FACILITY STRUCTURE (INCLUDING VENTILATION LIGHTS, PLUMBING)		
1	2	(3)
GOOD	FAIR	POOR
COMMENT: All plumping and Lighting are old		

9. RATE THE EXISTING CONDITION OF THE SITE AND SITE ACCESSIBILITY		
1	2	(3)
GOOD	FAIR	POOR
COMMENT: Next to under The water Tower, Surrounded by Electric division Equiptment and Supplies		

IDAHO FALLS VFD CONVERSION
FACILITY NAME: BOOSTER #4

1. SHOULD THIS FACILITY BE CONVERTED TO VFD?

1	2	(3)
YES	MAYBE	NO

COMMENT: IT is a large capacity pump and used only during very high demand.

2. HOW OFTEN IS FACILITY RUN MANUALLY (NOT USING AUTOMATIC SETPOINTS)

1	(2)	3
ALWAYS	SOMETIMES	NEVER

COMMENT: When demand is High but Rain storms drop demand slightly causing it to Cycle.

3. RATE THE EXISTING CONDITION OF THE PUMPS

1	(2)	3
GOOD	FAIR	POOR

COMMENT: The Pump seems to Require very LITTLE or NO Repairs At least for over 20 years, IT is old however,

FACILITY NAME: BOOSTER #4

4. RATE THE EXISTING CONDITION OF THE PIPING, VALVING, PRESSURE GAUGES, METERS AND OTHER APPURTENANCES		
1	(2)	3
GOOD	FAIR	POOR
COMMENT: The piping is old and has NOT Required More than painting		

5. RATE THE EXISTING CONDITION OF THE MOTOR		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: it is A Horrizonal motor and runs strong. no Repair required in at least 10 years		

6. RATE THE EXISTING CONDITION OF THE MOTOR CONTROLS		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: Controls And Electrical were up graded within Last 15 years,		

FACILITY NAME: BOOSTER #4

7. RATE THE EXISTING CONDITION OF THE ELECTRICAL SYSTEM		
1	(2)	3
GOOD	FAIR	POOR
COMMENT: MCC and Control cabinets were upgraded with in last 12-15 years.		

8. RATE THE EXISTING CONDITION OF THE FACILITY STRUCTURE (INCLUDING VENTILATION LIGHTS, PLUMBING)		
1	2	(3)
GOOD	FAIR	POOR
COMMENT: old piping and lighting, ventilation is windows and door. Building is Cinderblock		

9. RATE THE EXISTING CONDITION OF THE SITE AND SITE ACCESSIBILITY		
1	(2)	3
GOOD	FAIR	POOR
COMMENT: Site is on the corner of a City park and open around, except for a few trees.		

IDAHO FALLS VFD CONVERSION
FACILITY NAME: BOOSTER #5

1. SHOULD THIS FACILITY BE CONVERTED TO VFD?		
1	2	(3)
YES	MAYBE	NO
COMMENT: IT is our Highest producing well and when demand is Enough, it is started and put in Manual to Keep deep well from Cycling.		

2. HOW OFTEN IS FACILITY RUN MANUALLY (NOT USING AUTOMATIC SETPOINTS)		
1	(2)	3
ALWAYS	SOMETIMES	NEVER
COMMENT: only during Summer High demand months,		

3. RATE THE EXISTING CONDITION OF THE PUMPS		
1	(2)	3
GOOD	FAIR	POOR
COMMENT: IT has been worked on with in The last 15 years		

FACILITY NAME: BOOSTER #5

4. RATE THE EXISTING CONDITION OF THE PIPING, VALVING, PRESSURE GAUGES, METERS AND OTHER APPURTENANCES		
1	(2)	3
GOOD	FAIR	POOR
COMMENT: still has the old piping and gauges but has new control valve.		

5. RATE THE EXISTING CONDITION OF THE MOTOR		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: It has had no work done on the motor for at least 10 years		

6. RATE THE EXISTING CONDITION OF THE MOTOR CONTROLS		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: Electrical MCC cabinets were upgraded within the last 20 years		

FACILITY NAME: BOOSTER #5

7. RATE THE EXISTING CONDITION OF THE ELECTRICAL SYSTEM		
1	(2)	3
GOOD	FAIR	POOR
COMMENT: The mcc and control cabinets have been upgraded within the last 20 years		

8. RATE THE EXISTING CONDITION OF THE FACILITY STRUCTURE (INCLUDING VENTILATION LIGHTS, PLUMBING)		
1	(2)	3
GOOD	FAIR	POOR
COMMENT: Lighting is fair, ventilation is windows and doors Plumbing is semi-old.		

9. RATE THE EXISTING CONDITION OF THE SITE AND SITE ACCESSIBILITY		
1	(2)	3
GOOD	FAIR	POOR
COMMENT: building is fair, Site Accessibility is good		

IDAHO FALLS VFD CONVERSION
FACILITY NAME: WELL #6

1. SHOULD THIS FACILITY BE CONVERTED TO VFD?		
1	(2)	3
YES	MAYBE	NO
COMMENT: it has been ran 24-7 for many years and is in process of electrical upgrade.		

2. HOW OFTEN IS FACILITY RUN MANUALLY (NOT USING AUTOMATIC SETPOINTS)		
1	2	(3)
ALWAYS	SOMETIMES	NEVER
COMMENT: but set points are set so it runs constantly		

3. RATE THE EXISTING CONDITION OF THE PUMPS		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: was out of ground within last 5 years and went through.		

FACILITY NAME: WELL #6

4. RATE THE EXISTING CONDITION OF THE PIPING, VALVING, PRESSURE GAUGES, METERS AND OTHER APPURTENANCES		
1	(2)	3
GOOD	FAIR	POOR
COMMENT: Some of piping will be changed to accept MAG Meter and rest is old piping and values, Pressure guages will be new as it is upgraded in 2012		

5. RATE THE EXISTING CONDITION OF THE MOTOR		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: was checked within last 5 years		

6. RATE THE EXISTING CONDITION OF THE MOTOR CONTROLS		
1	2	(3)
GOOD	FAIR	POOR
COMMENT: They are under contract to be upgraded 2012.		

FACILITY NAME: WELL #6

7. RATE THE EXISTING CONDITION OF THE ELECTRICAL SYSTEM		
1	2	(3)
GOOD	FAIR	POOR
COMMENT: It is scheduled to be upgraded 2012		

8. RATE THE EXISTING CONDITION OF THE FACILITY STRUCTURE (INCLUDING VENTILATION LIGHTS, PLUMBING)		
1	(2)	3
GOOD	FAIR	POOR
COMMENT: Ventilation Lights and needed plumbing are scheduled to be upgraded in 2012		

9. RATE THE EXISTING CONDITION OF THE SITE AND SITE ACCESSIBILITY		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: fenced site and good access all around pump house		

IDAHO FALLS VFD CONVERSION
FACILITY NAME: WELL #7

1. SHOULD THIS FACILITY BE CONVERTED TO VFD?		
1	2	(3)
YES	MAYBE	NO
COMMENT: it does not Run at all 365 days a year.		

2. HOW OFTEN IS FACILITY RUN MANUALLY (NOT USING AUTOMATIC SETPOINTS)		
1	2	(3)
ALWAYS	SOMETIMES	NEVER
COMMENT: a 90' draw down creates milky water, So we do not Run it. It is inoperable at this Time.		

3. RATE THE EXISTING CONDITION OF THE PUMPS		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: Has not Ran much at all Singe it was out of the ground and checked.		

FACILITY NAME: WELL #7

4. RATE THE EXISTING CONDITION OF THE PIPING, VALVING, PRESSURE GAUGES, METERS AND OTHER APPURTENANCES

1	2	(3)
GOOD	FAIR	POOR

COMMENT: Well has been cannibalized since we dont run it.

5. RATE THE EXISTING CONDITION OF THE MOTOR

(1)	2	3
GOOD	FAIR	POOR

COMMENT: IT ran good last time we Ran it.

6. RATE THE EXISTING CONDITION OF THE MOTOR CONTROLS

1	2	(3)
GOOD	FAIR	POOR

COMMENT: They are old and have not been upgraded in over 20 years

FACILITY NAME: WELL #7

7. RATE THE EXISTING CONDITION OF THE ELECTRICAL SYSTEM		
1	2	(3)
GOOD	FAIR	POOR
COMMENT: It is old and has had no upgrades		

8. RATE THE EXISTING CONDITION OF THE FACILITY STRUCTURE (INCLUDING VENTILATION LIGHTS, PLUMBING)		
1	(2)	3
GOOD	FAIR	POOR
COMMENT: Building is good but has only door for ventilation.		

9. RATE THE EXISTING CONDITION OF THE SITE AND SITE ACCESSIBILITY		
1	2	(3)
GOOD	FAIR	POOR
COMMENT: It sits back in behind Residential homes and site is small with only a narrow drive for access.		

IDAHO FALLS VFD CONVERSION
FACILITY NAME: BOOSTER #8

1. SHOULD THIS FACILITY BE CONVERTED TO VFD?

1	2	(3)
YES	MAYBE	NO

COMMENT: Has a Horizontal motor and we think a VFD would cause Deep well to cycle. This well pumps silt when cycling.

2. HOW OFTEN IS FACILITY RUN MANUALLY (NOT USING AUTOMATIC SETPOINTS)

(1)	2	3
ALWAYS	SOMETIMES	NEVER

COMMENT: When we start it we put it in Manual and leave it to run steady till full, then we can shut it off and clean tank.

3. RATE THE EXISTING CONDITION OF THE PUMPS

(1)	2	3
GOOD	FAIR	POOR

COMMENT: It was Rebuilt within the last 10 years and New motor put on.

FACILITY NAME: BOOSTER #8

4. RATE THE EXISTING CONDITION OF THE PIPING, VALVING, PRESSURE GAUGES, METERS AND OTHER APPURTENANCES

1	(2)	3
GOOD	FAIR	POOR

COMMENT: Piping is good and not needed any work other than paint. Has new Limitorque control valve installed with in last 10 years. IT has Rosemount flow and pressure Transmitters.

5. RATE THE EXISTING CONDITION OF THE MOTOR

(1)	2	3
GOOD	FAIR	POOR

COMMENT: the motor runs good and has NOT needed Repair in that IT was new with in last 10 years

6. RATE THE EXISTING CONDITION OF THE MOTOR CONTROLS

(1)	2	3
GOOD	FAIR	POOR

COMMENT: up graded in 2000 and 2001

FACILITY NAME: BOOSTER #8

7. RATE THE EXISTING CONDITION OF THE ELECTRICAL SYSTEM		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: Electrical System upgraded in 2000 and 2001		

8. RATE THE EXISTING CONDITION OF THE FACILITY STRUCTURE (INCLUDING VENTILATION LIGHTS, PLUMBING)		
1	(2)	3
GOOD	FAIR	POOR
COMMENT: building is good it is Brick and Block, Ventilation is overhead door, lights are incadessent plumbing is old but not in need of Repair. Some of the drains were Replumbed in 2011		

9. RATE THE EXISTING CONDITION OF THE SITE AND SITE ACCESSIBILITY		
1	(2)	3
GOOD	FAIR	POOR
COMMENT: Reconstruction on Site to Remove a Substation has helped greatly with accessibility And condition		

IDAHO FALLS VFD CONVERSION
FACILITY NAME: BOOSTER #9

1. SHOULD THIS FACILITY BE CONVERTED TO VFD?		
1	2	(3)
YES	MAYBE	NO

COMMENT: Motor is Large Horizontal Fairbanks morse and runs in conjunction with Booster 10 in high demand months Rest of year is not needed.

2. HOW OFTEN IS FACILITY RUN MANUALLY (NOT USING AUTOMATIC SETPOINTS)		
1	2	(3)
ALWAYS	SOMETIMES	NEVER

COMMENT: Comes on between July and August at night when Sprinkler demand is most high. Set to come on only if Booster 10 cannot keep up.

3. RATE THE EXISTING CONDITION OF THE PUMPS		
(1)	2	3
GOOD	FAIR	POOR

COMMENT: have Required no work for over 10 years

FACILITY NAME: BOOSTER #9

4. RATE THE EXISTING CONDITION OF THE PIPING, VALVING, PRESSURE GAUGES, METERS AND OTHER APPURTENANCES

(1)	2	3
GOOD	FAIR	POOR

COMMENT: has new Limitorque control valve, Pressure & flow transmitters are Rosemount and seem to work good

5. RATE THE EXISTING CONDITION OF THE MOTOR

(1)	2	3
GOOD	FAIR	POOR

COMMENT: runs good Sounds good

6. RATE THE EXISTING CONDITION OF THE MOTOR CONTROLS

1	2	(3)
GOOD	FAIR	POOR

COMMENT: are old and out dated. have hard time find parts.

FACILITY NAME: BOOSTER #9

7. RATE THE EXISTING CONDITION OF THE ELECTRICAL SYSTEM		
1	2	(3)
GOOD	FAIR	POOR
COMMENT: has old Cabinets, fixtures, and wiring		

8. RATE THE EXISTING CONDITION OF THE FACILITY STRUCTURE (INCLUDING VENTILATION LIGHTS, PLUMBING)		
1	(2)	3
GOOD	FAIR	POOR
COMMENT: has big ventilation fan but runs most continuous with only doors as inlets, Lights Are incadecent and plumbing is old		

9. RATE THE EXISTING CONDITION OF THE SITE AND SITE ACCESSIBILITY		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: Brick structure and fair room around building And at Dead end of street		

IDAHO FALLS VFD CONVERSION
FACILITY NAME: BOOSTER #10

1. SHOULD THIS FACILITY BE CONVERTED TO VFD?		
1	2	(3)
YES	MAYBE	NO
COMMENT: Horizontal motor and runs wide open when used High capacity and runs from late June to September.		

2. HOW OFTEN IS FACILITY RUN MANUALLY (NOT USING AUTOMATIC SETPOINTS)		
1	(2)	3
ALWAYS	SOMETIMES	NEVER
COMMENT: Mostly ran AT when demand reaches a certain level Then runs AS close to continuous AS possible.		

3. RATE THE EXISTING CONDITION OF THE PUMPS		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: Rebuilt in 2010 or 2009		

FACILITY NAME: BOOSTER #10

4. RATE THE EXISTING CONDITION OF THE PIPING, VALVING, PRESSURE GAUGES, METERS AND OTHER APPURTENANCES		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: has new Limitorque control valve, Rosemount Pressure, and Flow Transmitters. They are working good		

5. RATE THE EXISTING CONDITION OF THE MOTOR		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: New Bearings in 2011, Dipped & Baked		

6. RATE THE EXISTING CONDITION OF THE MOTOR CONTROLS		
1	2	(3)
GOOD	FAIR	POOR
COMMENT: are old and outdated, We have a hard time getting Replacement parts. Can't find them.		

FACILITY NAME: BOOSTER #10

7. RATE THE EXISTING CONDITION OF THE ELECTRICAL SYSTEM		
1	2	(3)
GOOD	FAIR	POOR
COMMENT: Has old cabinets fixtures and wiring.		

8. RATE THE EXISTING CONDITION OF THE FACILITY STRUCTURE (INCLUDING VENTILATION LIGHTS, PLUMBING)		
1	(2)	3
GOOD	FAIR	POOR
COMMENT: Has poor ventalation due to only doors for inlet Air. It has large exhaust fan but not enough airflow.		

9. RATE THE EXISTING CONDITION OF THE SITE AND SITE ACCESSIBILITY		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: Brick pump house and fair Accessibility around building		

IDAHO FALLS VFD CONVERSION
FACILITY NAME: BOOSTER #11

1. SHOULD THIS FACILITY BE CONVERTED TO VFD?		
1	2	(3)
YES	MAYBE	NO
COMMENT: has Miltronic Sonar in Tank which does not allow operation in winter months much. Tank level is uncontrolable due to Miltronics seeing fog in Tank.		

2. HOW OFTEN IS FACILITY RUN MANUALLY (NOT USING AUTOMATIC SETPOINTS)		
1	(2)	3
ALWAYS	SOMETIMES	NEVER
COMMENT: in Summer months when demand reaches high enough it is Turned on and put in MANual. IT is also a high capacity pump.		

3. RATE THE EXISTING CONDITION OF THE PUMPS		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: pulled and Rebuilt April 2012		

FACILITY NAME: BOOSTER #11

4. RATE THE EXISTING CONDITION OF THE PIPING, VALVING, PRESSURE GAUGES, METERS AND OTHER APPURTENANCES		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: Piping Seems to be good with less than 10 year old Limitorque Control valve. Rosemount Pressure And flow Transmitters that seem to be working fine.		

5. RATE THE EXISTING CONDITION OF THE MOTOR		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: was Dipped And baked less than 10 years ago		

6. RATE THE EXISTING CONDITION OF THE MOTOR CONTROLS		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: upgraded in 2011		

FACILITY NAME: BOOSTER #11

7. RATE THE EXISTING CONDITION OF THE ELECTRICAL SYSTEM		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: All was upgraded in 2011		

8. RATE THE EXISTING CONDITION OF THE FACILITY STRUCTURE (INCLUDING VENTILATION LIGHTS, PLUMBING)		
1	(2)	3
GOOD	FAIR	POOR
COMMENT: Brick & Block Building but very little ventilation		

9. RATE THE EXISTING CONDITION OF THE SITE AND SITE ACCESSIBILITY		
1	(2)	3
GOOD	FAIR	POOR
COMMENT: IT sits up an alley way with housing on 3 sides and canal on other.		

IDAHO FALLS VFD CONVERSION
FACILITY NAME: BOOSTER #12

1. SHOULD THIS FACILITY BE CONVERTED TO VFD?		
(1)	2	3
YES	MAYBE	NO
COMMENT: it already is VFD		

2. HOW OFTEN IS FACILITY RUN MANUALLY (NOT USING AUTOMATIC SETPOINTS)		
1	2	(3)
ALWAYS	SOMETIMES	NEVER
COMMENT: starts and stops are set to keep it running		

3. RATE THE EXISTING CONDITION OF THE PUMPS		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: Pump has been good with NO problems		

FACILITY NAME: BOOSTER #12

4. RATE THE EXISTING CONDITION OF THE PIPING, VALVING, PRESSURE GAUGES, METERS AND OTHER APPURTENANCES		
1	(2)	3
GOOD	FAIR	POOR
COMMENT: has good piping and Rosemount pressure and flow transmitters that seem to work well. Tank level does not work in Winter		

5. RATE THE EXISTING CONDITION OF THE MOTOR		
1	(2)	3
GOOD	FAIR	POOR
COMMENT: it runs hot all the time		

6. RATE THE EXISTING CONDITION OF THE MOTOR CONTROLS		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: Motor controls are new with about 10-12 years old.		

FACILITY NAME: BOOSTER #12

7. RATE THE EXISTING CONDITION OF THE ELECTRICAL SYSTEM		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: All New with VFD and Electrical upgrade in 1999		

8. RATE THE EXISTING CONDITION OF THE FACILITY STRUCTURE (INCLUDING VENTILATION LIGHTS, PLUMBING)		
1	2	(3)
GOOD	FAIR	POOR
COMMENT: Ventilation is from 2 small fans that are on opposite walls both Blowing out. Structure is Sound. Lights are poor with incadecent bulbs. Plumbing is fair.		

9. RATE THE EXISTING CONDITION OF THE SITE AND SITE ACCESSIBILITY		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: Site is open Except for South Side that borders Street department offices building. Brick and Block Structure		

IDAHO FALLS VFD CONVERSION
FACILITY NAME: BOOSTER #13

1. SHOULD THIS FACILITY BE CONVERTED TO VFD?		
1	(2)	3
YES	MAYBE	NO

COMMENT: has 3 Boosters - one could be VFD and Run the others steady

2. HOW OFTEN IS FACILITY RUN MANUALLY (NOT USING AUTOMATIC SETPOINTS)		
1	2	(3)
ALWAYS	SOMETIMES	NEVER

COMMENT: Booster one runs steady and is swapped with 2 when demand Reaches point where 2 starts to cycle. 2 then runs most and 1 picks up slack. when 1 and 2 run most of the time then 3 is brought on and set to run steady with either 1 on steady or 2 and the odd one picking up slack depending on demand.

3. RATE THE EXISTING CONDITION OF THE PUMPS		
(1)	2	3
GOOD	FAIR	POOR

COMMENT: Booster 3 is about 10 years old Boosters 1 and 2 have not needed work on them for over 10 years

FACILITY NAME: BOOSTER #13

4. RATE THE EXISTING CONDITION OF THE PIPING, VALVING, PRESSURE GAUGES, METERS AND OTHER APPURTENANCES		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: Most everything was up dated when 13B and Booster 3 was added.		

5. RATE THE EXISTING CONDITION OF THE MOTOR		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: all three motors work fine with 3 being about 10 years old		

6. RATE THE EXISTING CONDITION OF THE MOTOR CONTROLS		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: All were put in new about 10 years ago		

FACILITY NAME: BOOSTER #13

7. RATE THE EXISTING CONDITION OF THE ELECTRICAL SYSTEM		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: New MCC's, control cabinet and generator controls were installed		

8. RATE THE EXISTING CONDITION OF THE FACILITY STRUCTURE (INCLUDING VENTILATION LIGHTS, PLUMBING)		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: Lighting and plumbing was upgraded about 10 years ago and ventilation is better than most of the other wells		

9. RATE THE EXISTING CONDITION OF THE SITE AND SITE ACCESSIBILITY		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: Good access and brick/Block building Sits very open all around it.		

IDAHO FALLS VFD CONVERSION
FACILITY NAME: BOOSTER #14

1. SHOULD THIS FACILITY BE CONVERTED TO VFD?		
1	(2)	3
YES	MAYBE	NO

COMMENT: Possiby where #11 runs steady when demand Reached a certain level then #14 could adjust if more demand was Required.

2. HOW OFTEN IS FACILITY RUN MANUALLY (NOT USING AUTOMATIC SETPOINTS)		
1	2	(3)
ALWAYS	SOMETIMES	NEVER

COMMENT: #14 is used when demand over powers what #11 can Produce. The period usually lasts a few hours then #14 would shut down leaving #11 to keep running

3. RATE THE EXISTING CONDITION OF THE PUMPS		
(1)	2	3
GOOD	FAIR	POOR

COMMENT: has not been worked on in over 10 years and still runs strong.

FACILITY NAME: BOOSTER #14

4. RATE THE EXISTING CONDITION OF THE PIPING, VALVING, PRESSURE GAUGES, METERS AND OTHER APPURTENANCES		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: New Limitorque valves were put in about 10 years ago and pressure and flow transmitters are Rosemount. They seem to be working fine.		

5. RATE THE EXISTING CONDITION OF THE MOTOR		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: older motor style but is still quite and has no noticable vibration problems.		

6. RATE THE EXISTING CONDITION OF THE MOTOR CONTROLS		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: MCC's were upgraded in 2011		

FACILITY NAME: BOOSTER #14

7. RATE THE EXISTING CONDITION OF THE ELECTRICAL SYSTEM		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: upgraded in 2012		

8. RATE THE EXISTING CONDITION OF THE FACILITY STRUCTURE (INCLUDING VENTILATION LIGHTS, PLUMBING)		
1	(2)	3
GOOD	FAIR	POOR
COMMENT: Good Block/Brick building, Ventilation is shy with small vent openings. Lighting is		

9. RATE THE EXISTING CONDITION OF THE SITE AND SITE ACCESSIBILITY		
1	(2)	3
GOOD	FAIR	POOR
COMMENT: Housing on 3 sides with canal on other with alley way Access. Site is small		

IDAHO FALLS VFD CONVERSION
FACILITY NAME: BOOSTER #15

1. SHOULD THIS FACILITY BE CONVERTED TO VFD?		
1	(2)	3
YES	MAYBE	NO
COMMENT: Has 3 Booster pumps. Maybe one could be VFD with other 2 running steady		

2. HOW OFTEN IS FACILITY RUN MANUALLY (NOT USING AUTOMATIC SETPOINTS)		
1	(2)	3
ALWAYS	SOMETIMES	NEVER
COMMENT: Partly because Booster 1 is Ran 24-7 in Manual Till Demand Reaches the need for about a Thousand more GPM then Booster 1 and Booster 2 are swapped with Booster 2 Running steady 24-7 and Booster 1 picks up slack. Then when 1000 more Demand is needed Booster 3 is Brought on with Booster 2.		

3. RATE THE EXISTING CONDITION OF THE PUMPS		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: Have had no need for work for over 5 years		

FACILITY NAME: BOOSTER #15

4. RATE THE EXISTING CONDITION OF THE PIPING, VALVING, PRESSURE GAUGES, METERS AND OTHER APPURTENANCES

1	2	(3)
GOOD	FAIR	POOR

COMMENT: The 3 control values All need Rebuilt. They are cla-val style values and have 90-95% of the time leaked. Pressure And flow Meters are Rosemount and have been worked on. We have problems calibrating Flow Meter.

5. RATE THE EXISTING CONDITION OF THE MOTOR

(1)	2	3
GOOD	FAIR	POOR

COMMENT: Motors seem to be good with #3 being Rebuilt Most Recent, about 10 years ago

6. RATE THE EXISTING CONDITION OF THE MOTOR CONTROLS

1	2	(3)
GOOD	FAIR	POOR

COMMENT: have had a hard time Replaceing Breakers Some components are new from adding a generator but very few.

FACILITY NAME: BOOSTER #15

7. RATE THE EXISTING CONDITION OF THE ELECTRICAL SYSTEM		
1	(2)	3
GOOD	FAIR	POOR
COMMENT: The electrical system is getting close to 30+ years old with no upgrades.		

8. RATE THE EXISTING CONDITION OF THE FACILITY STRUCTURE (INCLUDING VENTILATION LIGHTS, PLUMBING)		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: The facility is good with a Block structure and Lighting is floressent. Ventilation is good with Big louvers on Both ends of Building and Big ventilation fan in front of one Set of louvers. Plumbing is good		

9. RATE THE EXISTING CONDITION OF THE SITE AND SITE ACCESSIBILITY		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: has large fenced site with good distance to structures all the way around.		

IDAHO FALLS VFD CONVERSION
FACILITY NAME: BOOSTER #16

1. SHOULD THIS FACILITY BE CONVERTED TO VFD?		
1	(2)	3
YES	MAYBE	NO

COMMENT: has 2 Boosters and is a main well ON west side of IDAHO falls. Has good flow away from well and #1 Booster runs most of the time Till larger Demand is Required. Then #2 is Brought ON and swapped with Pump 1. Pump 2 Runs steady and Pump 1 Picks up slack.

2. HOW OFTEN IS FACILITY RUN MANUALLY (NOT USING AUTOMATIC SETPOINTS)		
1	(2)	3
ALWAYS	SOMETIMES	NEVER

COMMENT: Just when demand is such that it starts to cycle. Then we may put it in manual and let smaller pumps cycle.

3. RATE THE EXISTING CONDITION OF THE PUMPS		
(1)	2	3
GOOD	FAIR	POOR

COMMENT: they have both been checked with in the last 15 years

FACILITY NAME: BOOSTER #16

4. RATE THE EXISTING CONDITION OF THE PIPING, VALVING, PRESSURE GAUGES, METERS AND OTHER APPURTENANCES		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: All piping, valving are fairly new and pressure and flow transmitters are Rosemount. They seem to be working fine.		

5. RATE THE EXISTING CONDITION OF THE MOTOR		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: Have had no problems and nothing indicating a problem.		

6. RATE THE EXISTING CONDITION OF THE MOTOR CONTROLS		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: All functions well		

FACILITY NAME: BOOSTER #16

7. RATE THE EXISTING CONDITION OF THE ELECTRICAL SYSTEM		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: Well #16 is one of our newer wells. All the electrical is in good shape.		

8. RATE THE EXISTING CONDITION OF THE FACILITY STRUCTURE (INCLUDING VENTILATION LIGHTS, PLUMBING)		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: ventilation is good with pretty good air Exchange. Lights are florescent type and plumbing is fairly new.		

9. RATE THE EXISTING CONDITION OF THE SITE AND SITE ACCESSIBILITY		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: Site is fenced and at least 50 yards from nearest structure.		

IDAHO FALLS VFD CONVERSION
FACILITY NAME: BOOSTER #17

1. SHOULD THIS FACILITY BE CONVERTED TO VFD?		
1	(2)	3
YES	MAYBE	NO

COMMENT:
Well #17 has 2 Booster pumps also but is NOT Generally needed in the winter months. IT Runs off a pressure point that controls water pressure Somewhat to the North of Idaho Falls.

2. HOW OFTEN IS FACILITY RUN MANUALLY (NOT USING AUTOMATIC SETPOINTS)		
1	2	(3)
ALWAYS	SOMETIMES	NEVER

COMMENT: when it is needed, usually in Summer months it is Ran with Booster 1 running constantly with Booster 2 picking up slack in Early morning hours when Sprinkler demand is Highest.

3. RATE THE EXISTING CONDITION OF THE PUMPS		
(1)	2	3
GOOD	FAIR	POOR

COMMENT:
All pumps are new - less than 15 years old.

FACILITY NAME: BOOSTER #17

4. RATE THE EXISTING CONDITION OF THE PIPING, VALVING, PRESSURE GAUGES, METERS AND OTHER APPURTENANCES		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: Both Boosters have Lim. Torque control values and all Piping is new condition. Pressure & flow guages or Transmitters are Rosemount and work well.		

5. RATE THE EXISTING CONDITION OF THE MOTOR		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: Both Motors are in good condition and Run with no problems.		

6. RATE THE EXISTING CONDITION OF THE MOTOR CONTROLS		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: MCC's are fairly new or our newer well Components we have had very little work done or needed to Repair any Problems with The motor controls.		

FACILITY NAME: BOOSTER #17

7. RATE THE EXISTING CONDITION OF THE ELECTRICAL SYSTEM		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: The electrical system is fairly new - Great condition.		

8. RATE THE EXISTING CONDITION OF THE FACILITY STRUCTURE (INCLUDING VENTILATION LIGHTS, PLUMBING)		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: Block/Brick structure with good ventilation that has good air exchange. Lights are florescent and plumbing is in new condition.		

9. RATE THE EXISTING CONDITION OF THE SITE AND SITE ACCESSIBILITY		
(1)	2	3
GOOD	FAIR	POOR
COMMENT: Site has fenced property with no other structures within 100 yards of Pumphouse or tank. Good accessibility.		

Murray, Smith & Associates, Inc.
Engineers/Planners

APPENDIX G

Meter Program Cost Estimating Methodology

APPENDIX G
METER PROGRAM COST ESTIMATING METHODOLOGY

Introduction

This appendix summarizes the approach used in development of conceptual costs used in the City of Idaho Falls (City) water service meter budget analysis.

Cost Estimating

The probable costs estimated for the addition of meters to water services is based on average costs from City input and information provided by local suppliers. All costs identified in this section reference U.S. dollars. The *Engineering News Record* Construction Cost Index (ENR CCI) basis is 9846 (20-City Average, August 2014).

Project cost estimates were prepared in accordance with the guidelines of AACE International, formerly the Association for the Advancement of Cost Engineering International. (*AACE International Recommended Practice No. 56R-08 Cost Estimate Classification System - As Applied For The Building and General Construction Industries - TCM Framework: 7.3 - Cost Estimating and Budgeting Rev. December 31, 2011*). The project cost estimates are categorized Class 5, as defined by AACE International:

> *Class 5 estimates are generally prepared based on very limited information, and subsequently have wide accuracy ranges. As such, some companies and organizations have elected to determine that due to the inherent inaccuracies, such estimates cannot be classified in a conventional and systemic manner.*
>
> *Class 5 estimates are prepared for any number of strategic business planning purposes, such as but not limited to market studies, assessment of initial viability, evaluation of alternate schemes, project screening, project location studies, evaluation of resource needs and budgeting, long-range capital planning, etc.*
>
> *Typical accuracy ranges for Class 5 estimates are -20% to -30% on the low side, and +30% to +50% on the high side, depending on the construction complexity of the project, appropriate reference information and other risks (after inclusion of an appropriate contingency determination). Ranges could exceed those shown if there are unusual risks.*

The cost estimates in this write-up represent planning-level accuracy and opinions of costs (+50%, -30%). Specifics of design including project definition, scope and specific information (e.g., meter size) should be verified during detailed design. The final cost will depend on actual labor and material costs, site conditions, competitive market conditions, regulatory requirements, project schedule and other factors. Because of these factors, project

feasibility and risks must be carefully reviewed prior to making specific financial decisions or establishing project budgets to help ensure proper project evaluation and adequate funding.

The project costs presented in this write-up include estimated construction costs. A contingency factor is also added to each cost to help account for any unanticipated components of the project costs. Construction costs are based on the preliminary concepts of the system components.

Total estimated construction project costs were developed through a progression of steps and multiple methodologies. The steps included development of component unit costs and then construction project costs. The component unit cost includes the sum of materials, labor and equipment of the project's basic features. The construction cost is the sum of component costs and mark-ups to determine the probable cost of construction (i.e., the contractor bid price).

Component Unit Costs

Water Meter and Pit – Material and Installation

A specific cost has been identified for each service diameter. For all pipe installations, the cost is assumed to include:

- Excavation
- Native backfill
- Imported bedding and zone material
- Waste of the material associated with trenching (which includes haul, load and dump fees)
- Testing
- Curb stop
- Curb box
- Coupling
- Pit
- Lockable pit lid
- Pit insulation
- Couplings
- Grip Joint
- Meter
- AMI Endpoint

Surface Restoration

Surface restoration of construction sites is required based on the existing surface condition of the project area. All installations will be required to repair the surface back to original conditions.

Construction Cost Allowances

The construction cost is the sum of materials, labor, equipment, mobilization, contractor's overhead and profit, and contingency for each project. Table G-1 presents the additional allowances associated with the construction costs.

Traffic Control

Minor traffic control will be required from time to time while installing water meters. The cost and level of traffic control should be evaluated on a case-by-case basis for each meter installation. For planning purposes, the cost of traffic control is estimated at 0.1% for all installation. Traffic control mark-up accounts for the cost of signage, flagging and temporary barriers, pavement markings, lane delineators and lighting at flagging locations.

Erosion Control

While each water meter installation is small in area, the combined excavation area for all locations will be a significant area. Depending on the way the project is phased, Erosion a Sediment Control Plans may be adequate or Stormwater Pollution Prevention Plan may necessary. For planning purposes, erosion control is estimated at 1% of the construction costs. Erosion control mark-up accounts for materials and practices to protect adjacent property, stormwater systems, and surface water in accordance with regulatory requirements.

Construction Contractor Overhead and Profit

This 10% mark-up accounts for the contractor's indirect project costs and anticipated profit.

Construction Mobilization

A 10% mobilization mark-up accounts for the cost of the contractor's administrative and direct expenses to mobilize equipment, materials and labor to the work site.

Construction Contingency

A 30% increase was added in each project's construction cost to account for a contingency factor to cover the uncertainties inherent to planning-level development. The contingency is provided to account for factors such as:

- Unanticipated landscaping and surface features;

- Relocation and connection to existing infrastructure;
- Minor elements of work not addressed in component unit cost development;
- Details of construction;
- Changes in site conditions;
- Variability in construction bid climate.

The contingency excludes:

- Major scope changes such as end product specification, capacities and location of project;
- Extraordinary events such as strikes or natural disasters;
- Management reserves;
- Escalation and currency effects;
- Valves and stems on main not working or breaking during isolation of pipelines;
- Surface Restoration and Landscaping beyond simple landscape;
- Repair of service lines due to poor condition (i.e. connection cannot be made due condition);
- Rock excavation;
- Exploratory digging (assumes City knows alignment of each service line).

A summary of construction mark-ups is provided in Table G-1.

Table G-1
Additional Construction Costs

Additional Cost Factor	Percent
Traffic Control	0.1%
Erosion Control	1%
Contractor Overhead and Profit	10%
Mobilization	10%
Contingency	30%

Cost Summary

Based on the methodology described above, total cost estimates were developed for installation of 1-inch and 2-inch meters. The cost of each meter installation was applied to the number of unmetered customers within each class. The majority of residential customers, located both inside and outside the City, are serviced with a 1-inch line and will require installation of a 1-inch meter. The costs for meter pit development were tracked separately for this service line size, since a small number of residential customers already have a meter pit. The cost for those without meter pits is approximately $3,000, while the cost to install a meter if the customer already has a meter pit is $450. These costs are for the conversion of existing customers and do not include any costs for new customers.

Most commercial customers, as well as residential apartments (assumed to serve approximately 4 units), will require a 2-inch meter. The approximate cost for installation is $8,500. Table G-2 summarizes the cost of meter installation by customer class, including a total conceptual cost estimate of $77.68 million in current dollars.

Table G-2
Water Metering Project Summary

Water Account	Number of Billed Accounts	Meters to be Installed	Service Size	Unit Cost	Total Construction Cost
Residential House	17,374	-		-	-
(with meter pit already installed)	(575)	575	1-inch	$450	$258,750
(without meter pit)	(16,799)	16,799		$3,000	$50,397,000
Residential Apartments	4,137	1,035	2-inch	$8,500	$8,797,500
Commercial	2,079	2,079	2-inch	$8,500	$17,671,500
Outside City Limits	185	185	1-inch	$3,000	$555,000
Metered Accounts	247	0	2-inch	-	-
Total	**24,022**	**20,673**	**-**	**-**	**$77,680,000**

Murray, Smith & Associates, Inc.
Engineers/Planners

APPENDIX H

CIP Cost Estimating Methodology

APPENDIX H
CIP COST ESTIMATING METHODOLOGY

Introduction

This appendix summarizes the approach used to develop unit costs and project costs used in the Capital Improvement Program (CIP) for the City of Idaho Falls' (City's) Water Facility Plan (WFP).

Cost Estimating

The probable costs estimated for each improvement are based on average costs from the *2014 RS Means Heavy Construction Cost Data* (RSMeans), City input, construction costs for similar projects in the City and across the Northwest, and information provided by local suppliers. All costs identified in this section reference 2014 U.S. dollars. The *Engineering News Record Construction Cost Index* (*ENR CCI*) basis is 9870 (20-city average, November 2014).

Project cost estimates were prepared in accordance with the guidelines of AACE International, formerly the Association for the Advancement of Cost Engineering International. (*AACE International Recommended Practice No. 56R-08 Cost Estimate Classification System - As Applied for the Building and General Construction Industries - TCM Framework: 7.3 - Cost Estimating and Budgeting* Rev. December 31, 2011). The project cost estimates in this WFP are categorized Class 5, as defined by AACE International:

> Class 5 estimates are generally prepared based on very limited information, and subsequently have wide accuracy ranges. As such, some companies and organizations have elected to determine that due to the inherent inaccuracies, such estimates cannot be classified in a conventional and systemic manner.
>
> Class 5 estimates are prepared for any number of strategic business planning purposes, such as but not limited to market studies, assessment of initial viability, evaluation of alternate schemes, project screening, project location studies, evaluation of resource needs and budgeting, long-range capital planning, etc.
>
> Typical accuracy ranges for Class 5 estimates are -20% to -30% on the low side, and +30% to +50% on the high side, depending on the construction complexity of the project, appropriate reference information and other risks (after inclusion of an appropriate contingency determination). Ranges could exceed those shown if there are unusual risks.

All project descriptions and cost estimates in this WFP represent planning-level accuracy and opinions of costs (+50%, -30%). During the design phase of each improvement project, project definition, scope, and specific information (e.g., pipe diameter and length) should be verified. The final cost of individual projects will depend on actual labor and material costs, site conditions, competitive market conditions, regulatory requirements, project schedule, and other factors. Because of these factors, project feasibility and risks must be carefully reviewed prior to making specific financial decisions or establishing project budgets to help ensure proper project evaluation and adequate funding.

The project costs presented in this WFP include estimated construction costs, and allowances for permitting, legal, administrative, and engineering fees. A contingency factor is also added in anticipation of any unforeseen project costs. Construction costs are based on the preliminary concepts and layouts of the system components developed during the system analysis.

Total estimated project costs were determined through a progression of steps and multiple methodologies, which included development of:

- component unit costs (includes the sum of materials, labor, and equipment of a project's basic features);
- construction costs (the sum of component costs and markups such as the contractor's bid price to determine the probable cost of construction); and
- project costs (the sum of construction costs plus additional cost allowances for engineering, legal, and administrative fees to determine the total project cost to the City).

The following costs are not included:

- Land or right-of-way acquisition, unless directed by the City.
- Water system studies, planning, or modeling.
- Borrowing or finance charges during the planning, design, or construction of assets.
- Improvements to distribution or treatment facilities in response to changes in regulatory standards or rules.
- Remediation or fines associated with system violations.
- Water right acquisition or transfers.

Component Unit Costs

Pipelines

The estimates for water system piping include the costs for pipe, fittings, valves, and water service connections. The pipe material assumed for new waterlines was CL 50 ductile iron for 6- to 24-inch pipes.

For all pipeline installations including new and replacement projects, the cost is based on a cover depth of six feet, and includes:

- Excavation.
- Waste of the material associated with the trenching (which includes haul, load and dump fees).
- Imported bedding and zone material.
- Native backfill (which includes minimal haul and compaction of material).
- Fittings and valves (accounts for 30% of pipe costs).
- Testing and disinfection (as a percentage of total cost).

For replacement of existing waterlines, additional costs include replacing water service lines (10% of pipe costs), which includes excavation, construction materials, backfill, and surface restoration to the right-of-way.

As the diameter of pipe and the trench width increase, the costs also increase. Therefore, a specific cost has been identified for each pipe diameter. Table H-1 presents pipeline construction costs.

Table H-1
Water Pipeline Costs per Linear Foot

Pipe Diameter (inch)	Ductile Iron Pipe ($/lf)
6	$39
8	$52
10	$59
12	$67
14	$80
16	$94
18	$104
20	$114
24	$135

Bedrock

There is typically rock in the project areas. Excavation costs were calculated for each pipe size, reflecting an 85% increase in pipeline unit cost due to rock excavation. For planning purposes, rock excavation cost has been applied to projects as 5% of the project length.

Special Pipe Crossings

Special pipe crossings are required for crossing rivers, canals, railroads and highways, or areas where traditional open-cut construction is not possible. An additional 100% is applied to pipeline costs for any projects with these conditions. The special pipe crossing factor was also applied for projects within the airport security fence.

Surface Restoration

Surface restoration of construction sites is required to complete every project. As with the pipe installation costs, these restoration costs increase with the size of the pipe due to the larger trench that will need to be dug. Therefore, a unit surface restoration cost has been developed for each pipe diameter. Table H-2 tabulates costs associated with residential and commercial asphalt roadways, and unpaved surfaces, as developed from local supplier costs and RSMeans.

Table H-2
Surface Restoration Costs per Linear Foot

Pipe Diameter (inch)	Surface Condition Cost ($/lf)		
	Residential[1]	Commercial[2]	Unpaved[3]
6	$11	$16	$3
8	$12	$17	$3
10	$12	$17	$3
12	$12	$18	$3
14	$13	$18	$3
16	$13	$19	$3
18	$13	$19	$3
20	$14	$20	$3
24	$14	$21	$3

[1] *Road repair and replacement along trench. 2-inch asphalt, 6 inches of base course (¾-inch minus).*
[2] *Road repair and replacement along trench. 4-inch asphalt and 10 inches of base course (¾-inch minus).*
[3] *Repair and replacement of trench using rock backfill to ground surface along trench cross-country.*

Facility Improvements

Improvement project costs were developed for each facility, as identified in Section 5—System Condition and Code Evaluation. Specific facility improvements were developed based on facility conditions related issues identified during the Section 5 analysis.

Facility improvements were developed to meet current *Idaho Rules for Public Drinking Water Systems* standards; costs vary between each facility based on its condition, age, and operation. Component upgrades included pumps and motors, mechanical piping and valves, HVAC, general electrical, service electrical, and building and storage tank access/structural improvements.

Estimated project costs were developed from RS Means, equipment suppliers, and specific price quotes supplied by the City.

New Water Supply Wells

Costs for water supply wells are based on recent City construction experience, and include drilling a test well and a production well, basic site civil, mechanical, building, electrical, backup power, and instrumentation and control facilities. A cost curve has been developed based on a well capacity and total project cost, and is summarized in the following equation:

New Water Supply Well Total Project Cost = 8601*gpm^0.6221

Storage Facilities

Proposed storage facility project costs were prepared for AWWA D110 – Type 1 pre-stressed concrete tanks based on recent City construction experience. It was assumed that proposed reservoirs will be circular, at-grade structures with an exterior wall height between 25 and 35 feet. Project cost estimates for pre-stressed concrete construction were based on a base cost of $1,000,000 per million gallons of storage volume.

New Booster Pump Station

Costs for new booster pump stations are based on recent City construction experience, and include drilling basic site civil, mechanical, building, electrical, backup power, and instrumentation and control facilities. A cost curve has been developed based on a booster pump station capacity and total project cost, and is summarized in the following equation:

New Booster Pump Station Total Project Cost = 11503*gpm^0.6

Increases in Booster Pump Station Capacity

Increasing booster pump station capacity will require replacement of pumps with larger pumps or, if space permits, increasing the number of pumps at a facility. A cost curve for total project costs has been developed based on horsepower for a replacement pump or new pump. The construction cost accounts for demolition and removal of the existing pump, addition of new pump, motor, and VFD, and modifications to pipes and valves. The following equation summarizes the total cost of increasing booster pump station capacity:

Increases in Booster Pump Station Capacity Total Project Cost = 153,894+306.9*HP

When the number of pumps increases (where there are no available pump cans), the "new" booster station cost will be used.

Construction Cost Allowances

The construction cost is the sum of materials, labor, equipment, mobilization, contractor's overhead and profit, and contingency for each project. Tables H-3 and H-4 present the additional allowances associated with the construction costs and project costs, respectively.

Traffic Control

Traffic control will be required for all projects that occur on roadways. Its cost should be evaluated based on the scope and size of each project, and as local conditions at the time of construction dictate. For planning purposes, the cost of traffic control is estimated at 0.5% for residential roads and 2% for commercial roads. Traffic control markup includes the cost of signage, flagging, temporary barriers, street widening, pavement markings, lane delineators, and lighting at flagging locations.

Erosion Control

Erosion control will be required for all projects, and is estimated at 1% of the construction costs. Erosion control markup includes materials and practices to protect adjacent property, storm water systems, and surface water in accordance with regulatory requirements. The level of effort and cost for erosion control depends on the size and scope of a project, and the local conditions at the time of construction.

Dewatering

Dewatering groundwater will likely be necessary when construction is near water drainage areas as identified by the City, and is estimated at 1% of the construction costs for projects located in these areas.

Construction Contractor Overhead and Profit

A 10% markup accounts for the contractor's indirect project costs and anticipated profit.

Construction Mobilization

Mobilization markup covers the contractor's administrative and direct expenses to mobilize equipment, materials, and labor to the worksite. The cost allowance of mobilization is 10% for pipeline projects and new facilities, and 15% for specialized construction and equipment needed for repair and rehabilitation projects.

Construction Contingency

A 30% increase was added to each project's construction contingency cost in anticipation of uncertainties inherent in planning-level development. Contingency costs include:

- Unanticipated utilities.
- Relocation and connection to existing infrastructure.
- Minor elements of work not addressed in component unit cost development.
- Details of construction.
- Changes in site conditions.
- Variability in construction bid climate.

The contingency excludes:

- Major scope changes such as end-product specification, capacities, and location of project.
- Extraordinary events such as strikes or natural disasters.
- Management reserves.
- Escalation and currency effects.

A summary of construction markups is provided in Table H-3.

Table H-3
Additional Construction Costs

Additional Cost Factor	Percent
Low Traffic Control	0.5%
High Traffic Control	2%
Erosion Control	1%
Dewatering	1%
Contractor Overhead and Profit	10%
Mobilization – Pipeline Project	10%
Mobilization – Repair and Rehabilitation Projects	15%
Contingency	30%

Total Project Cost

The total project cost is the sum of construction costs with additional cost allowances for engineering, legal, and administrative fees, as presented in Table H-4. Engineering costs

include design and surveying; construction administration is the cost associated with managing the construction of the project; and the administrative and legal costs are those associated with the City's financial and legal oversight of the contract.

Table H-4
Summary of Additional Costs

Additional Cost Factor	Percent
Construction Administration	5%
Engineering	15%
Legal and Administrative	10%

Murray, Smith & Associates, Inc.
Engineers/Planners

APPENDIX I

CIP Pipeline Summary

APPENDIX I
CIP PIPELINE SUMMARY

This appendix presents the Capital Improvement Program (CIP) pipeline project summary, and provides additional detail for each proposed pipeline project identified in Section 7—Capital Improvement Program. The location of each project can be seen in Figure 7-1 of Section 7.

As applicable, each project summary includes the following information:

- Project ID: Unique identification number designated for the project.
- Approximate Location: Nearest intersection or reach of road (provided to aid in locating projects in Figure 7-1).
- Implementation Timeframe: When the project is recommended to be carried out.
- Whether the pipeline is new or upgraded.
- Condition Assessment Replacement Priority.
- Deficiency: Classification or reason for project (e.g., existing fire flow).
- Diameter: Pipe size in inches.
- Length: Pipeline project's total linear feet (lf).
- Crossing Type: Crossings of atypical features that are significant and specific to the project (e.g., canal).
- Crossing Length: Length of crossing in linear feet.
- Total Project Cost: The opinion of project costs based on planning-level preliminary estimates for the year 2014.

Table I-1
Pipe Projects

Pipeline Project ID Number	Approximate Location	Deficiency Timeline	Implementation Timeframe	New or Upgraded Pipeline	Condition Assessment Replacement Priority	Deficiency	Diameter (in)	Total Length (lf)	Crossing Length (lf)	Crossing Type	Total Project Cost
P-101	NE of Russet St, along Tendoy Dr, Holbrook Dr, and Lincoln Dr	Existing	2020 (0 to 5-Year)	Upgraded	High	Existing Fire Flow	8	6,174	-	-	$1,111,000
P-102	Along E 2nd St, E 3rd St, and E 4th St	Existing	2020 (0 to 5-Year)	New and Upgraded Portions	High Low New Improvement	Existing Fire Flow 2020 Peak Hour Demand	8	3,306	-	-	$578,000
P-103	Along E 11th St, E 12th St, and E 13th St, intersecting with S Holmes Ave	Existing	2020 (0 to 5-Year)	Upgraded	High Low	Existing Fire Flow	8	5,194	-	-	$947,000
P-104	Along E 12th St and E 13th St, intersecting with June Ave and Cranmer Ave	Existing	2020 (0 to 5-Year)	New and Upgraded Portions	High Low New Improvement	Existing Fire Flow	8	7,339	-	-	$1,306,000
P-105	Along E 22nd St, intersecting with S Emerson Ave	Existing	2020 (0 to 5-Year)	Upgraded	High Low	Existing Fire Flow	8	1,865	-	-	$336,000
P-106	Along Calkins Ave and neighborhood of W 16th St through 20th St	Existing	2020 (0 to 5-Year)	New and Upgraded Portions	High Low New Improvement	Existing Fire Flow	8	4,232	-	-	$694,000
P-107	Gladstone St & N Emerson Ave; N Emerson Ave N of Northgate Mile	Existing	2020 (0 to 5-Year)	New and Upgraded Portions	High New Improvement	Existing Fire Flow	8, 10	1,181	-	-	$218,000
P-108	Neighborhood of J St and L St, intersecting with Shipp Ave and Willow Ave	Existing	2020 (0 to 5-Year)	New and Upgraded Portions	High Medium Low New Improvement	Existing Fire Flow	8	2,698	-	-	$473,000
P-109	Along N Saturn Ave, Mountain View Ln, and N Colorado Ave	Existing	2020 (0 to 5-Year)	Upgraded	Medium Low	Existing Fire Flow	10	2,559	-	-	$505,000
P-110	Along Riverside Dr	Existing	2020 (0 to 5-Year)	New	New Improvement	Existing Fire Flow	8	1,187	-	-	$208,000
P-111	Loops south of N Morningside Dr	Existing	2020 (0 to 5-Year)	Upgraded	High Low	Existing Fire Flow	8	4,016	-	-	$704,000
P-112	Along James Pl	Existing	2020 (0 to 5-Year)	Upgraded	High	Existing Fire Flow	8	257	-	-	$45,000
P-113	North of John Adams Pkwy, along Ronglyn Ave, Majacq Ave, and Chatham Ave	Existing	2020 (0 to 5-Year)	Upgraded	High Low	Existing Fire Flow	8	4,040	-	-	$693,000
P-114	Between S Lee Ave and S Holmes Ave, along E 7th St, E 8th St, and E 9th St	Existing	2020 (0 to 5-Year)	Upgraded	High Medium Low	Existing Fire Flow	8	4,820	-	-	$875,000
P-115	Along Juniper Dr	Existing	2020 (0 to 5-Year)	Upgraded	High	Existing Fire Flow	8	1,642	-	-	$296,000
P-116	South of Elm St, along N Corner Ave and S Placer Ave	Existing	2020 (0 to 5-Year)	Upgraded	High	Existing Fire Flow	8	1,659	-	-	$296,000

Pipeline Project ID Number	Approximate Location	Deficiency Timeline	Implementation Timeframe	New or Upgraded Pipeline	Condition Assessment Replacement Priority	Deficiency	Diameter (in)	Total Length (lf)	Crossing Length (lf)	Crossing Type	Total Project Cost
P-117	Intersection of E 16th St and S Lee Ave	Existing	2020 (0 to 5-Year)	Upgraded	High Medium	Existing Fire Flow	8	1,764	-	-	$314,000
P-118	Along E 19th St	Existing	2020 (0 to 5-Year)	Upgraded	High Low	Existing Fire Flow	8	1,306	-	-	$235,000
P-119	NE of W Elva St, in the neighborhood of Sunset Dr	Existing	2020 (0 to 5-Year)	Upgraded	High Medium	Existing Fire Flow	8	5,176	-	-	$923,000
P-120	South of E Anderson St, along Wadsworth Dr	Existing	2020 (0 to 5-Year)	Upgraded	High Medium	Existing Fire Flow	8	1,214	-	-	$214,000
P-121	Along Westland Ave, east of Claire View Ln	Existing	2020 (0 to 5-Year)	Upgraded	High	Existing Fire Flow	8	928	-	-	$167,000
P-123	Along S Higbee Ave, north of E 22nd St intersection	Existing	2020 (0 to 5-Year)	Upgraded	High Medium	Existing Fire Flow	8	500	-	-	$89,000
P-125	Loop north of W 25th St, completed by Gallatin Ave and Leslie Ave	Existing	2020 (0 to 5-Year)	New and Upgraded Portions	Medium New Improvement	Existing Fire Flow	10, 12	2,461	-	-	$501,000
P-126	East of S Yellowstone Ave and south of W 25th St	Existing	2020 (0 to 5-Year)	New	New Improvement	Existing Fire Flow	8	2,302	-	-	$334,000
P-127	South of Pop Kroll Wy, west of Well 12	Existing	2020 (0 to 5-Year)	Upgraded	Medium Low	Existing Fire Flow	10	334	-	-	$67,000
P-128	Vassar Wy north to the intersection with (including) Tulane St	Existing	2020 (0 to 5-Year)	Upgraded	Medium	Existing Fire Flow	8	697	-	-	$126,000
P-130	Evergeen Dr, north of intersection with Redwood St	Existing	2020 (0 to 5-Year)	New and Upgraded Portions	Medium Low New Improvement	Existing Fire Flow	8	435	-	-	$73,000
P-131	S Saturn Ave, including intersections with Dartmouth Dr and Albany St	Existing	2020 (0 to 5-Year)	New	New Improvement	Existing Fire Flow	8	1,900	-	-	$311,000
P-132	On Whittier Cir, south of E Elva St	Existing	2020 (0 to 5-Year)	Upgraded	Medium	Existing Fire Flow	8	342	-	-	$62,000
P-133	Crane Drive	Existing	2020 (0 to 5-Year)	New	New Improvement	Existing Fire Flow	8	853	-	-	$150,000
P-134	North of W Broadway, east of Trolley Wy	Existing	2020 (0 to 5-Year)	New	New Improvement	Existing Fire Flow	8	435	-	-	$72,000
P-135	Along Stanley St, to intersect with N Holmes Ave	Existing	2020 (0 to 5-Year)	New	New Improvement	Existing Fire Flow	12	1,637	-	-	$359,000
P-136	Along Stosich Ln, east of Grizzly Ave	Existing	2020 (0 to 5-Year)	New	New Improvement	Existing Fire Flow	8	888	-	-	$146,000
P-138	Area between Rogers St and N Park Dr	Existing	2020 (0 to 5-Year)	New and Upgraded Portions	Low New Improvement	Existing Fire Flow 2035 Peak Hour Demand	8	4,910	-	-	$824,000
P-139	South of area between E 1st St and Meppen Dr	Existing	2020 (0 to 5-Year)	New	New Improvement	Existing Fire Flow and 2035 Peak Hour Demand	10	273	-	-	$50,000
P-141	Intersection of N Yellowstone Hwy and N Woodruff Ave	Existing	2020 (0 to 5-Year)	New	New Improvement	Existing Fire Flow	8, 12	2,477	-	-	$529,000

Pipeline Project ID Number	Approximate Location	Deficiency Timeline	Implementation Timeframe	New or Upgraded Pipeline	Condition Assessment Replacement Priority	Deficiency	Diameter (in)	Total Length (lf)	Crossing Length (lf)	Crossing Type	Total Project Cost
P-142	Vicinity of Well 17, north of Science Center Dr	Existing	2020 (0 to 5-Year)	New	New Improvement	Existing Fire Flow	8	1,053	-	-	$167,000
P-143	Bennet Ave and Lincoln Rd intersection	Existing	2020 (0 to 5-Year)	New	New Improvement	Existing Fire Flow	8	346	-	-	$57,000
P-144	Northeast of Mesa St and N 25th East (Hitt Rd) intersection	Existing	2020 (0 to 5-Year)	New	New Improvement	Existing Fire Flow	8	874	-	-	$127,000
P-145	West of S Yellowstone Ave, north of W Sunnyside Rd	Existing	2020 (0 to 5-Year)	New and Upgraded Portions	Low New Improvement	Existing Fire Flow	8	730	-	-	$121,000
P-146	East of Ashment Ave, west of Van Cir	Existing	2020 (0 to 5-Year)	New	New Improvement	Existing Fire Flow	6	97	-	-	$11,000
P-149	Southwest of Hollipark Dr and Lincoln Rd intersection	Existing	2020 (0 to 5-Year)	Upgraded	Low	Existing Fire Flow	8	498	-	-	$88,000
P-151	South of Ashment Ave and E 12th St junction	Existing	2020 (0 to 5-Year)	Upgraded	Low	Existing Fire Flow	8	326	-	-	$57,000
P-152	East of Hoopes Ave and Van Cir intersection	Existing	2020 (0 to 5-Year)	Upgraded	Low	Existing Fire Flow	8	492	-	-	$87,000
P-154	Between Irene Ln and Lexington	Existing	2020 (0 to 5-Year)	New	New Improvement	Existing Fire Flow	8	1,222	-	-	$178,000
P-156	Along Elizabeth Circle	Existing	2020 (0 to 5-Year)	Upgraded	Low	Existing Fire Flow	8	416	-	-	$73,000
P-158	Northeast of Borah Ave and International Wy intersection	Existing	2020 (0 to 5-Year)	Upgraded	Low	Existing Fire Flow	8	1,055	1,055	Airport	$291,000
P-159	East of N Skyline Dr and north along Foote Dr	Existing	2020 (0 to 5-Year)	Upgraded	Low	Existing Fire Flow	12	3,369	-	-	$721,000
P-160	Woodbridge Circle	Existing	2020 (0 to 5-Year)	Upgraded	Low	Existing Fire Flow	8	199	-	-	$35,000
P-161	Intersection of Bombardier Ave and Pedersen St	Existing	2020 (0 to 5-Year)	Upgraded	Low	Existing Fire Flow	8, 12	1,768	-	-	$375,000
P-165	Along W 49th South (Township Rd), southeast of intersection with S 15th West (Jameston Rd), north intersection with S 5th West (Park Rd)	Existing	2020 (0 to 5-Year)	New	New Improvement	Existing Fire Flow	12	5,278	50	Canal	$1,081,000
P-167	Southwest of University Blvd, crosses Science Center Dr	Existing	2020 (0 to 5-Year)	New	New Improvement	Existing Fire Flow	8	940	170	Railroad	$154,000
P-201	Riviera Cir	2020	2035 (6 to 20-Year)	Upgraded	High Medium	2020 Fire Flow	8	206	-	-	$36,000
P-202	Intersection of Hemmert Ave and Browning St	2020	2035 (6 to 20-Year)	Upgraded	Medium	2020 Fire Flow	8	469	-	-	$82,000
P-203	Intersection of Lincoln Rd and N 25th East (Hitt Rd)	2020	2035 (6 to 20-Year)	New	New Improvement	2020 Operating Pressure	12, 16	3,803	-	-	$1,033,000
P-204	Intersection of Hartert Dr and Springwood Ln	2020	2035 (6 to 20-Year)	Upgraded	Low	2020 Fire Flow	8	789	-	-	$138,000

Pipeline Project ID Number	Approximate Location	Deficiency Timeline	Implementation Timeframe	New or Upgraded Pipeline	Condition Assessment Replacement Priority	Deficiency	Diameter (in)	Total Length (lf)	Crossing Length (lf)	Crossing Type	Total Project Cost
P-205	Junction of Springwood Ln and Homestead Ln	2020	2035 (6 to 20-Year)	Upgraded	Low	2020 Fire Flow	8	65	-	-	$12,000
P-206	Springwood Ln, south of Lariat Ln	2020	2035 (6 to 20-Year)	Upgraded	Low	2020 Fire Flow	8	63	-	-	$11,000
P-207	W 65th South (York Rd), east from Tank W18	2020	2035 (6 to 20-Year)	New	New Improvement	2020 New Supply	24	3,450	-	-	Included in facility project F-1
P-208	Along Kearney St to intersection with N Woodruff Ave	2020	2035 (6 to 20-Year)	Upgraded	High Medium	2020 New Supply	18	3,988	-	-	Included in facility project F-2
P-301	Between S Boulevard and W 18th St and W 19th St	2035	2035 (6 to 20-Year)	Upgraded	Low	2035 Peak Hour Demand	6	381	-	-	$46,000
P-302	Intersection of Waterford Ln and E 25th St	2035	2035 (6 to 20-Year)	Upgraded	Low	2035 Peak Hour Demand	8	572	-	-	$100,000
P-304	Off Meadow St and Stanger Dr (separate locations)	2035	2035 (6 to 20-Year)	Upgraded	Low	2035 Peak Hour Demand	6	117	-	-	$16,000
P-305	Intersection of E 65th South (York Rd) and S Holmes Ave	2035	2035 (6 to 20-Year)	New	New Improvement	2035 Operating Pressure	12, 16	4,897	75	Canal	$1,253,000
P-306	Intersection of E 49th North (Telford Rd) and N 25th East (Hitt Rd)	2035	2035 (6 to 20-Year)	New	New Improvement	2035 Operating Pressure	12, 16	22,249	1,900	Railroad	$6,746,000
P-307	N 5th West (East River Rd) north to W 65th North (Tower Rd) east to N 5th East (Lewisville Hwy)	2035	2035 (6 to 20-Year)	New	New Improvement	2035 New Supply	16	14,635	-	-	Included in facility project F-18
P-308	E 49th South (Township Rd)	2035	2035 (6 to 20-Year)	New	New Improvement	2035 Operating Pressure	12	5,329	170	Canal	$1,191,000
P-309	Calkins Ave, between W 15th St and W 16th St	2035	2035 (6 to 20-Year)	New	New Improvement	2035 Peak Hour Demand	8	513	-	-	$75,000
P-310	South of intersection of E 49th South (Township Rd) and S 9th East	2035	2035 (6 to 20-Year)	New	New Improvement	2035 Operating Pressure	12	4,609	-	-	$946,000
P-311	Intersection of S Holmes Way and Castlerock Ln	2035	2035 (6 to 20-Year)	New	New Improvement	2035 Operating Pressure	12	2,295	-	-	$504,000
P-312	Intersection of S 15th East (St Clair Rd) and E 49th South (Township Rd)	2035	2035 (6 to 20-Year)	New	New Improvement	2035 Operating Pressure	12	4,691	60	Canal	$1,037,000
P-313	Intersection of S 15th East (St Clair Rd) and Prairie Ln	2035	2035 (6 to 20-Year)	New	New Improvement	2035 Operating Pressure	12	1,462	-	-	$274,000
P-314	South of intersection between S Old Butte Rd and Pancheri Dr	2035	2035 (6 to 20-Year)	New	New Improvement	2035 New Supply	16	2,692	-	-	$698,000
P-315	Between W 33rd South (Pioneer Rd) and Pancheri Dr	2035	2035 (6 to 20-Year)	New	New Improvement	2035 New Supply	16	8,854	185	Canal	$2,362,000
P-129P	Blue Sky Dr, west of S Skyline Dr	Existing	2055 (21 to 40-Year)	Upgraded	Privately Owned Pipelines	Existing Fire Flow	8	740	-	-	$134,000

Pipeline Project ID Number	Approximate Location	Deficiency Timeline	Implementation Timeframe	New or Upgraded Pipeline	Condition Assessment Replacement Priority	Deficiency	Diameter (in)	Total Length (lf)	Crossing Length (lf)	Crossing Type	Total Project Cost
P-137P	Northeast of intersection of E 21st St and Jennie Lee Dr	Existing	2055 (21 to 40-Year)	New and Upgraded Portions	Private and New Improvement	Existing Fire Flow	8	418	-	-	$74,000
P-140P	Southeast of Environmental Wy and Hemmert Ave	Existing	2055 (21 to 40-Year)	Upgraded	Privately Owned Pipelines	Existing Fire Flow	10	151	-	-	$26,000
P-147P	Hemmert Ave, north of Cottle Dr intersection	Existing	2055 (21 to 40-Year)	New	Private and New Improvement	Existing Fire Flow	8	146	-	-	$26,000
P-148P	Northeast of Lindsay Blvd and Burgess St intersection	Existing	2055 (21 to 40-Year)	New	Private and New Improvement	Existing Fire Flow	8	416	-	-	$68,000
P-150P	Along Woodruff Park, east of intersection with N Woodruff Ave	Existing	2055 (21 to 40-Year)	Upgraded	Privately Owned Pipelines	Existing Fire Flow	8	415	-	-	$73,000
P-153P	Northwest of Environmental Wy and Hemmert Ave intersection	Existing	2055 (21 to 40-Year)	Upgraded	Privately Owned Pipelines	Existing Fire Flow	12	329	-	-	$72,000
P-155P	Northeast of Coronado St and Channing Wy	Existing	2055 (21 to 40-Year)	Upgraded	Privately Owned Pipelines	Existing Fire Flow	8	1,995	-	-	$348,000
P-157P	Northeast of W Anderson St and Bannock Ave intersection	Existing	2055 (21 to 40-Year)	Upgraded	Privately Owned Pipelines	Existing Fire Flow	8	332	-	-	$58,000
P-162P	Loop south of W Sunnyside Rd, east of S Yellowstone Ave	Existing	2055 (21 to 40-Year)	Upgraded	Privately Owned Pipelines	Existing Fire Flow	10	3,644	-	-	$732,000
P-163P	Between Ashment Ave and S 25th East (Hitt Rd)	Existing	2055 (21 to 40-Year)	Upgraded	Privately Owned Pipelines	Existing Fire Flow	12	2,473	-	-	$549,000
P-164P	S 25th East (Hitt Rd), south of Jafer Ct	Existing	2055 (21 to 40-Year)	Upgraded	Privately Owned Pipelines	Existing Fire Flow	8	1,052	-	-	$169,000
P-166P	Southwest of S Saturn Ave and Teton View Ln intersection	Existing	2055 (21 to 40-Year)	Upgraded	Privately Owned Pipelines	Existing Fire Flow	8	438	-	-	$77,000
Not Defined	Pipeline Replacement Program	None	-	Upgraded	City and Privately Owned Pipelines	Condition	2, 4, 6, 8, 10, 12, 14, 16		-	-	$3,140,000

Murray, Smith & Associates, Inc.
Engineers/Planners

APPENDIX J

CIP Detailed Cost Sheets

APPENDIX J
CIP DETAILED COST SHEETS

This appendix presents cost sheets that provide the estimated cost and pertinent information of each proposed facility project identified in Section 7—Capital Improvement Program. These CIP cost sheets provide additional detail and context for each project as they progress from planning stage to actual construction.

As applicable, every cost sheet includes a project ID number, project name, and total project cost based on planning-level preliminary estimates for the year 2014.

The cost sheets also break project costs into the following general categories, with line items for every task occurring under each category:

Upgrade projects recommended due to condition assessment:

- Site improvements
- Building improvements
- Reservoir improvements
- Pumping and piping improvements.
- Electrical improvements
- Safety improvements

Projects recommended due to hydraulic analysis:

- Well.
- Storage.
- Booster station (new booster station facility or pump upgrade).
- Supply piping (if new dedicated supply piping is included in project).

MSA

Probable Cost of Construction
F-1 : New 65th Well (Project 1)

Project: City Idaho Falls, Water Facility Plan
Submittal: Capital Improvement Program
Owner: City of Idaho Falls
Project No.: 14-1550
Date: February 5, 2015

Item No.	Item	Quantity		Unit Costs			Total Cost
				Material	Labor/Equipment (L/E)	Total	
Well							
A1	Well - 4,500 gpm	1	EA			$794,850.00	$794,850
A1							
				Subtotal:			**$794,850**
Storage							
B1							
B2							
				Subtotal:			**$0**
Booster Station							
C1							
C2							
				Subtotal:			**$0**
Supply Piping							
D1	Supply Piping P-207: 24-in 3,450 lf	1	EA			$709,025.00	$709,025
D2							
				Subtotal:			**$709,025**

Material & Labor Total:		**$1,503,875**
Bonds and Insurance:	0%	$0
Mobilization:	10%	$150,388
Material Sales Tax:	6%	$0
Contractor's Overhead & Profit:	10%	$150,388
Subtotal		**$1,804,650**
Contingency:	*30%*	*$541,395*
Environmental Mitigation	*Not included*	
Right of Way Acquisition	*Not included*	
Estimated Construction Cost		***$2,346,000***
Admin and Legal:	10%	$234,600
Engineering:	15%	$351,900
Construction Admin:	5%	$117,300
Estimated Project Cost		***$3,050,000***

MSA

Probable Cost of Construction
F-2 : New Well Facility at Well 13 and 13B Facility

Project: City Idaho Falls, Water Facility Plan
Submittal: Capital Improvement Program
Owner: City of Idaho Falls
Project No.: 14-1550
Date: February 5, 2015

Item No.	Item	Quantity		Unit Costs			Total Cost
				Material	Labor/Equipment (L/E)	Total	
Well							
A1	Well - 3,000 gpm	1	EA			$617,800.00	$617,800
A1							
				Subtotal:			**$617,800**
Storage							
B1	Storage - 1.25 MG	1	EA			$616,340.00	$616,340
B2						$3.00	
				Subtotal:			**$616,340**
Booster Station							
C1	Booster Station - 3,000 gpm	1	EA			$692,300.00	$692,300
C2							
				Subtotal:			**$692,300**
Supply Piping							
D1	Supply Piping P-208: 18-in 4,000 lf	1	EA			$655,300.00	$655,300
D2							
				Subtotal:			**$655,300**

Material & Labor Total:		**$2,581,740**
Bonds and Insurance:	0%	$0
Mobilization:	10%	$258,174
Material Sales Tax:	6%	$0
Contractor's Overhead & Profit:	10%	$258,174
Subtotal		**$3,098,088**
Contingency:	*30%*	*$929,426*
Environmental Mitigation	*Not included*	
Right of Way Acquisition	*Not included*	
Estimated Construction Cost		***$4,028,000***
Admin and Legal:	10%	$402,800
Engineering:	15%	$604,200
Construction Admin:	5%	$201,400
Estimated Project Cost		***$5,236,000***

MSA

Probable Cost of Construction
F-3 : Well 9 and 10 Upgrades

Project: City Idaho Falls, Water Facility Plan
Submittal: Capital Improvement Program
Owner: City of Idaho Falls
Project No.: 14-1550
Date: February 5, 2015

Item No.	Item	Quantity		Unit Costs			Total Cost
				Material	Labor/Equipment (L/E)	Total	
Site Improvements							
A1	Security fencing, 8ft high	43	LF	$31.00	$6.51	$37.51	$1,613
A2	Double swing gate, 8ft high, 12ft opening	1	EA	$460.00	$960.00	$1,420.00	$1,420
				Subtotal:			**$3,033**
Building Improvements							
B1	Exterior brick repair	1	EA	$2,000.00	$1,000.00	$3,000.00	$3,000
B2	Brick pump house, 10ft x 12 ft (Well 10)	120	SF	$30.75	$9.23	$39.98	$4,797
B3	Motorized damper, 6ft x 6ft	1	EA	$1,600.00	$1,600.00	$3,200.00	$3,200
B4	Ventilation fan, 48in, 3/4Hp, 16,000cfm	1	EA	$1,500.00	$1,500.00	$3,000.00	$3,000
B5	Electric heater (50 MBH)	1	EA	$1,500.00	$1,500.00	$3,000.00	$3,000
				Subtotal:			**$16,997**
Reservoir Improvements							
C1	Access hatch, 36in x 36in	1	EA	$2,500.00	$2,500.00	$5,000.00	$5,000
C2	Stainless steel tank ladder, 10ft high	1	EA	$1,500.00	$1,500.00	$3,000.00	$3,000
C3	Overflow air-gap improvements	1	EA	$2,000.00	$2,000.00	$4,000.00	$4,000
C4	Submersible level transmitter, display & power	1	EA	$1,808.00	$1,808.00	$3,616.00	$3,616
C5							
				Subtotal:			**$15,616**
Pumping and Piping Improvements							
D1	Replace Well #10 Submersible with vertical turbine	1	EA	$135,000.00	$20,000.00	$155,000.00	$155,000
D2	Control valve sequencing programming	1	EA	$0.00	$10,000.00	$10,000.00	$10,000
D3	Pump to waste, 14in DI piping (pump 9 & 10)	60	LF	$93.00	$23.49	$116.49	$6,989
D4	Pump to waste, 14" DI Tee (pump 9 & 10)	2	EA	$2,600.00	$352.00	$2,952.00	$5,904
D5	Pump to waste, 14in DI 90deg (pump 9 & 10)	4	EA	$1,200.00	$235.50	$1,435.50	$5,742
D6	Pump to waste, 14in 45deg (pump 9 & 10)	2	EA	$1,200.00	$235.50	$1,435.50	$2,871
D7	Pump to waste, 14" butterfly valve	2	EA	$3,075.00	$674.00	$3,749.00	$7,498
D8	Pump to waste roadway repair	16	SY	$18.00	$7.00	$25.00	$400
D9	Pump to waste pipe trenching, 3ft deep	35	CY	$0.00	$11.90	$11.90	$417
D10	Extend well casing & pedestal 24in above floor	1	EA	$2,000.00	$7,000.00	$9,000.00	$9,000
D11	Insertion Flow Sensor	1	EA	$8,000.00	$2,400.00	$10,400.00	$10,400
D11							
				Subtotal:			**$214,221**
Electrical Improvements							
E1	Complete electrical gear, MCC.	1	EA	$105,000.00	$15,000.00	$120,000.00	$120,000
E2	Conductor and service equipment	1	EA	$10,000.00	$10,000.00	$20,000.00	$20,000
E3	Generator, 750 kW	1	EA	$200,000.00	$28,000.00	$228,000.00	$228,000
E4	Automatic transfer switch	1	EA	$50,000.00	$20,000.00	$70,000.00	$70,000
E5							
				Subtotal:			**$438,000**
Safety Improvements							
F1	Emergency eye wash, self-contained unit	1	EA	$560.00	$200.00	$760.00	$760
F2	SCBA Equipment, wall mount	1	EA	$2,200.00	$200.00	$2,400.00	$2,400
F3							
				Subtotal:			**$3,160**

Material & Labor Total:		**$691,027**
Bonds and Insurance:	0%	$0
Mobilization:	15%	$103,654
Material Sales Tax:	6%	$33,424
Contractor's Overhead & Profit:	10%	$69,103
Subtotal		**$897,208**
Contingency:	*30%*	*$269,162*
Environmental Mitigation	*Not included*	
Right of Way Acquisition	*Not included*	
Estimated Construction Cost		***$1,166,000***
Admin and Legal:	10%	$116,600
Engineering:	15%	$174,900
Construction Admin:	5%	$58,300
Estimated Project Cost		***$1,516,000***

MSA

Probable Cost of Construction
F-4.1 : Well 3 Upgrades (Project 1)

Project: City Idaho Falls, Water Facility Plan
Submittal: Capital Improvement Program
Owner: City of Idaho Falls
Project No.: 14-1550
Date: February 13, 2015

Item No.	Item	Quantity		Unit Costs			Total Cost
				Material	Labor/Equipment (L/E)	Total	
Building Improvements							
B1	Chlorine room exterior access door	1	EA	$1,300.00	$470.00	$1,770.00	$1,770
B2	Replace building windows	3	EA	$1,225.00	$84.00	$1,309.00	$3,927
B3	Lighting	4	EA	$50.00	$82.50	$132.50	$530
B4	Motorized damper, 5ft x 5ft	1	EA	$900.00	$900.00	$1,800.00	$1,800
B5	Ventilation fan, 36in, 1/2Hp, 9,000cfm	1	EA	$1,200.00	$1,200.00	$2,400.00	$2,400
B6	Wired door alarm	2	EA	$300.00	$300.00	$600.00	$1,200
B7	Wired motion sensor	2	EA	$300.00	$300.00	$600.00	$1,200
				Subtotal:			**$12,827**
Well Improvements							
C1	Sanitary seal	1	EA	$200,000.00	$200,000.00	$400,000.00	$400,000
C2	Well casing replacement, 24in	6090	Lb	$1.21	$1.23	$2.44	$14,860
C3	Well water level sensor	1	EA	$1,808.00	$1,808.00	$3,616.00	$3,616
C4							
C5							
				Subtotal:			**$418,476**
Pumping and Piping Improvements							
D1	Pump to waste, 14in DI piping	100	LF	$93.00	$23.49	$116.49	$11,649
D2	Pump to waste, 14" DI Tee	1	EA	$2,600.00	$352.00	$2,952.00	$2,952
D3	Pump to waste, 14in DI 90deg	1	EA	$1,200.00	$235.50	$1,435.50	$1,436
D4	Pump to waste, 14" butterfly valve	1	EA	$3,075.00	$674.00	$3,749.00	$3,749
D5							
				Subtotal:			**$19,786**
Electrical Improvements							
E1	Pump MCP, 400 Hp	1	EA	$30,000.00	$7,500.00	$37,500.00	$37,500
				Subtotal:			**$37,500**
Safety Improvements							
F1	Emergency eye wash, self-contained unit	1	EA	$560.00	$200.00	$760.00	$760
F2	SCBA Equipment, wall mount	1	EA	$2,200.00	$200.00	$2,400.00	$2,400
F3							
				Subtotal:			**$3,160**

Material & Labor Total:		**$491,748**
Bonds and Insurance:	0%	$0
Mobilization:	15%	$73,762
Material Sales Tax:	6%	$15,995
Contractor's Overhead & Profit:	10%	$49,175
Subtotal		**$630,680**
Contingency:	*30%*	*$189,204*
Environmental Mitigation	*Not included*	
Right of Way Acquisition	*Not included*	
Estimated Construction Cost		***$820,000***
Admin and Legal:	10%	$82,000
Engineering:	15%	$123,000
Construction Admin:	5%	$41,000
Estimated Project Cost		***$1,066,000***

MSA

Probable Cost of Construction
F-4.2 : Replacement of Well 3 Reservoir (Project 2)

Project: City Idaho Falls, Water Facility Plan
Submittal: Capital Improvement Program
Owner: City of Idaho Falls
Project No.: 14-1550
Date: February 13, 2015

Item No.	Item	Quantity		Unit Costs			Total Cost
				Material	Labor/Equipment (L/E)	Total	
Elevated Reservoir							
A1	1 MG Multi-Column Elevated Tank	1	LS	$2,500,000.00	$0.00	$2,500,000.00	$2,500,000
A2	Tank Foundation	1	EA	$200,000.00	$60,000.00	$260,000.00	$260,000
A3	Supply & outfall piping, 14in DI	900	LF	$93.00	$23.49	$116.49	$104,841
				Subtotal:			**$2,864,841**
Building Improvements							
B1							
				Subtotal:			**$0**
Well Improvements							
C1							
				Subtotal:			**$0**
Pumping and Piping Improvements							
D1							
				Subtotal:			**$0**
Electrical Improvements							
E1							
				Subtotal:			**$0**
Safety Improvements							
F1							
				Subtotal:			**$0**

Assumption: Reservoir demolition cost is offset by the contractor salvaging and selling the steel from the old reservoir.

Material & Labor Total:		**$2,864,841**
Bonds and Insurance:	0%	$0
Mobilization:	15%	$429,726
Material Sales Tax:	6%	$167,022
Contractor's Overhead & Profit:	10%	$286,484
Subtotal		**$3,748,073**
Contingency:	*30%*	*$1,124,422*
Environmental Mitigation	*Not included*	
Right of Way Acquisition	*Not included*	
Estimated Construction Cost		***$4,872,000***
Admin and Legal:	10%	$487,200
Engineering:	15%	$730,800
Construction Admin:	5%	$243,600
Estimated Project Cost		***$6,334,000***

MSA

Probable Cost of Construction
F-5 : Well 1 Upgrades

Project: City Idaho Falls, Water Facility Plan
Submittal: Capital Improvement Program
Owner: City of Idaho Falls
Project No.: 14-1550
Date: February 5, 2015

Item No.	Item	Quantity		Unit Costs			Total Cost
				Material	Labor/Equipment (L/E)	Total	
Site Improvements							
A1	Chlorine room egress grading & tree removal	1	EA	$500.00	$1,500.00	$2,000.00	$2,000
				Subtotal:			**$2,000**
Building Improvements							
B1	Chlorine room egress door	1	EA	$1,300.00	$470.00	$1,770.00	$1,770
B2	Replace building windows	4	EA	$1,225.00	$84.00	$1,309.00	$5,236
B3	Aluminum grating on pipe chases.	140	SF	$45.00	$3.07	$48.07	$6,730
B4	Motorized damper, 4ft x 4ft	1	EA	$800.00	$800.00	$1,600.00	$1,600
B5	Ventilation fan, 30in, 1/3Hp, 6,000cfm	1	EA	$1,000.00	$1,000.00	$2,000.00	$2,000
B6	Wired door alarm	2	EA	$300.00	$300.00	$600.00	$1,200
B7	Wired motion sensor	2	EA	$300.00	$300.00	$600.00	$1,200
B8							
				Subtotal:			**$19,736**
Reservoir Improvements							
C1	Access hatch, 36in x 36in	1	EA	$2,500.00	$2,500.00	$5,000.00	$5,000
C2	Stainless steel tank ladder, 10ft high	1	EA	$1,500.00	$1,500.00	$3,000.00	$3,000
C3	Overflow, 12in pipe through side of tank	1	EA	$1,000.00	$4,000.00	$5,000.00	$5,000
C4	Overflow, 12in DI 90 deg	3	EA	$880.00	$223.00	$1,103.00	$3,309
C5	Overflow, 12in DI piping	40	LF	$79.00	$22.35	$101.35	$4,054
C6	Overflow, 12in butterfly valve for drain	1	EA	$1,600.00	$450.00	$2,050.00	$2,050
C7	Manhole access to creek discharge, 6' Diam, 8' deep	1	EA	$2,400.00	$903.00	$3,303.00	$3,303
C8	Street and wall repair for manhole replacement	1	EA	$3,000.00	$3,000.00	$6,000.00	$6,000
C9	Submersible level transmitter, display & power	1	EA	$1,808.00	$1,808.00	$3,616.00	$3,616
C10	Membrane roofing	22	SQ	$125.00	$64.00	$189.00	$4,158
				Subtotal:			**$39,490**
Pumping and Piping Improvements							
D1	Replace submersible with vertical turbine	1	EA	$135,000.00	$20,000.00	$155,000.00	$155,000
D2	Pump to waste, 14in DI piping	70	LF	$93.00	$24.00	$117.00	$8,190
D3	Pump to waste, 14" DI Tee	1	EA	$2,600.00	$352.00	$2,952.00	$2,952
D4	Pump to waste, 14in DI 90deg	1	EA	$1,200.00	$234.00	$1,434.00	$1,434
D5	Pump to waste, 14" butterfly valve	1	EA	$3,075.00	$674.00	$3,749.00	$3,749
D6	Extend well casing & pedestal 24in above floor	1	EA	$2,000.00	$7,000.00	$9,000.00	$9,000
D7	Insertion Flow Sensor	1	EA	$8,000.00	$2,400.00	$10,400.00	$10,400
D8	Move pump 14in discharge piping above floor.	50	LF	$93.00	$24.00	$117.00	$5,850
				Subtotal:			**$196,575**
Electrical Improvements							
E1	Complete electrical gear, MCC	1	EA	$45,000.00	$10,000.00	$55,000.00	$55,000
E2	Conductors & service equipment	1	EA	$2,500.00	$2,500.00	$5,000.00	$5,000
E3							
				Subtotal:			**$60,000**
Safety Improvements							
F1	Emergency eye wash, self-contained unit	1	EA	$560.00	$200.00	$760.00	$760
F2	SCBA Equipment, wall mount	1	EA	$2,200.00	$200.00	$2,400.00	$2,400
F3							
				Subtotal:			**$3,160**

Material & Labor Total:		**$320,961**
Bonds and Insurance:	0%	$0
Mobilization:	15%	$48,144
Material Sales Tax:	6%	$15,099
Contractor's Overhead & Profit:	10%	$32,096
Subtotal		**$416,300**
Contingency:	*30%*	*$124,890*
Environmental Mitigation	*Not included*	
Right of Way Acquisition	*Not included*	
Estimated Construction Cost		***$541,000***
Admin and Legal:	10%	$54,100
Engineering:	15%	$81,150
Construction Admin:	5%	$27,050
Estimated Project Cost		***$703,000***

MSA

Probable Cost or Construction
F-6 : Well 4

Project: City Idaho Falls, Water Facility Plan
Submittal: Capital Improvement Program
Owner: City of Idaho Falls
Project No.: 14-1550
Date: February 5, 2015

Item No.	Item	Quantity		Unit Costs			Total Cost
				Material	Labor/Equipment (L/E)	Total	
Site Improvements							
A1	Security fencing, 8ft high	400	LF	$31.00	$6.51	$37.51	$15,004
A2	Double swing gate, 8ft high, 12ft opening	1	EA	$460.00	$960.00	$1,420.00	$1,420
A3	Exterior lighting (Outdoor 110W LED)	1	EA	$765.00	$44.00	$809.00	$809
A4							
				SubTotal:			**$17,233**
Building Improvements							
B1	New chlorine room building, 10ft x 12ft.	120	SF	$30.75	$9.23	$39.98	$4,798
B2	Skylight replacement.	1	EA	$445.00	$249.00	$694.00	$694
B3	Interior lighting.	6	EA	$50.00	$82.50	$132.50	$795
B4	Aluminum grating on pipe chases.	100	SF	$45.00	$3.07	$48.07	$4,807
B5	Motorized damper, 7ft x 7ft	1	EA	$1,600.00	$1,600.00	$3,200.00	$3,200
B6	Ventilation fan, 48in, 1Hp, 20,000cfm	1	EA	$1,600.00	$1,600.00	$3,200.00	$3,200
B7	Wired door alarm.	2	EA	$300.00	$300.00	$600.00	$1,200
B8	Wired motion sensor.	1	EA	$300.00	$300.00	$600.00	$600
B9	Building structural inspection.	1	EA	$0.00	$10,000.00	$10,000.00	$10,000
B10							
				SubTotal:			**$29,294**
Reservoir Improvements							
C1	Access hatch, 36in x 36in	1	EA	$2,500.00	$2,500.00	$5,000.00	$5,000.00
C2	Stainless steel tank ladder, 10ft high	1	EA	$1,500.00	$1,500.00	$3,000.00	$3,000.00
C3	Submersible level transmitter, display & power	1	EA	$1,808.00	$1,808.00	$3,616.00	$3,616.00
C4	Overflow air-gap dissipation pad.	1	EA	$1,000.00	$2,000.00	$3,000.00	$3,000.00
C5	Overflow, 12in pipe through side of tank	1	EA	$1,000.00	$4,000.00	$5,000.00	$5,000.00
C6	Overflow, 12in DI 90 deg	1	EA	$880.00	$223.00	$1,103.00	$1,103.00
C7	Overflow, 12in DI piping	60	LF	$79.00	$22.35	$101.35	$6,081.00
C8	Membrane roofing	20	SQ	$125.00	$63.45	$188.45	$3,769.00
				SubTotal:			**$30,569**
Pumping and Piping Improvements							
D1	Pump to waste, 18in DI piping	20	LF	$126.00	$33.85	$159.85	$3,197.00
D2	Pump to waste, 18in DI Tee	1	EA	$3,900.00	$513.00	$4,413.00	$4,413.00
D3	Pump to waste, 18in DI 90deg	1	EA	$2,125.00	$340.50	$2,465.50	$2,465.50
D4	Pump to waste, 16in butterfly valve	1	EA	$4,700.00	$674.00	$5,374.00	$5,374.00
D5	Extend well casing 24in above floor	1	EA	$400.00	$7,000.00	$7,400.00	$7,400.00
D6	Insertion Flow Sensor	1	EA	$8,000.00	$2,400.00	$10,400.00	$10,400.00
D7	Discharge piping above floor, 16in DI	10	LF	$126.00	$33.85	$159.85	$1,599
D8	Replace submersible pump with vertical turbine.	1	EA	$135,000.00	$20,000.00	$155,000.00	$155,000
				SubTotal:			**$189,848**
Electrical Improvements							
E1	Complete electrical gear, MCC	1	EA	$55,000.00	$10,000.00	$65,000.00	$65,000.00
E2	Conductor & service equipment	1	EA	$2,500.00	$2,500.00	$5,000.00	$5,000.00
E3	Generator, 650 kW	1	EA	$140,000.00	$15,000.00	$155,000.00	$155,000.00
E4	Automatic transfer switch	1	EA	$15,000.00	$8,000.00	$23,000.00	$23,000.00
				Subtotal:			**$248,000**

Safety Improvements							
F1	Emergency eye wash, self-contained unit	1	EA	$560.00	$200.00	$760.00	$760.00
F2	SCBA Equipment, wall mount	1	EA	$2,200.00	$200.00	$2,400.00	$2,400.00
F3							
				Subtotal:			**$3,160**

Material & Labor Total:		**$518,104**
Bonds and Insurance:	0%	$0
Mobilization:	15%	$77,716
Material Sales Tax:	6%	$24,945
Contractor's Overhead & Profit:	10%	$51,810
Subtotal		**$672,575**
Contingency:	*30%*	*$201,772.40*
Environmental Mitigation	*Not included*	
Right of Way Acquisition	*Not included*	
Estimated Construction Cost		***$874,000***
Admin and Legal:	10%	$87,400
Engineering:	15%	$131,100
Construction Admin:	5%	$43,700
Estimated Project Cost		***$1,136,000***

MSA

Probable Cost of Construction
F-7 : Well 8 Upgrades

Project: City Idaho Falls, Water Facility Plan
Submittal: Capital Improvement Program
Owner: City of Idaho Falls
Project No.: 14-1550
Date: February 5, 2015

Item No.	Item	Quantity		Unit Costs			Total Cost
				Material	Labor/Equipment (L/E)	Total	
Site Improvements							
A1	Exterior lighting (Outdoor 110W LED)	2	EA	$765.00	$44.00	$809.00	$1,618
A2	Sump pump discharge, 2in piping, trench, asphalt	80	LF	$12.88	$14.79	$27.67	$2,214
				Subtotal:			**$3,832**
Building Improvements							
B1	Exterior brick repair	1	EA	$2,000.00	$1,000.00	$3,000.00	$3,000
B2	Building structural inspection.	1	EA	$0.00	$10,000.00	$10,000.00	$10,000
B3	Motorized damper, 4ft x 4ft	1	EA	$800.00	$800.00	$1,600.00	$1,600
B4	Ventilation fan, 24in, 1/3Hp, 5,000cfm	1	EA	$800.00	$800.00	$1,600.00	$1,600
B5	Replace building windows	4	EA	$1,225.00	$84.00	$1,309.00	$5,236
B6	Aluminum grating on pipe chases.	60	SF	$45.00	$3.07	$48.07	$2,884
B7	Interior lighting	4	EA	$50.00	$82.50	$132.50	$530
				Subtotal:			**$24,850**
Reservoir Improvements							
C1	Access hatch, 36in x 36in	1	EA	$2,500.00	$2,500.00	$5,000.00	$5,000
C2	Stainless steel tank ladder, 10ft high	1	EA	$1,500.00	$1,500.00	$3,000.00	$3,000
C3	Overflow air-gap improvements	1	EA	$2,000.00	$2,000.00	$4,000.00	$4,000
C4							
				Subtotal:			**$12,000**
Pumping and Piping Improvements							
D1	Booster pump balance and inspect.	1	EA	$0.00	$3,500.00	$3,500.00	$3,500
D2	Discharge piping above floor, 14in DI.	10	LF	$93.00	$23.49	$116.49	$1,165
D3	Discharge piping above floor, 14in 90deg	2	EA	$1,200.00	$235.50	$1,435.50	$2,871
D4	Extend well casing & pedestal 24in above floor	1	EA	$2,000.00	$7,000.00	$9,000.00	$9,000
D5	Insertion Flow Sensor	1	EA	$8,000.00	$2,400.00	$10,400.00	$10,400
D6							
				Subtotal:			**$26,936**
Electrical Improvements							
E1	Complete electrical gear, MCC	1	EA	$40,000.00	$10,000.00	$50,000.00	$50,000
E3	Conductor & service equipment	1	EA	$5,000.00	$5,000.00	$10,000.00	$10,000
E6							
				Subtotal:			**$60,000**
Safety Improvements							
F1	Emergency eye wash, self-contained unit	1	EA	$560.00	$200.00	$760.00	$760
F2	SCBA Equipment, wall mount	1	EA	$2,200.00	$200.00	$2,400.00	$2,400
F3							
				Subtotal:			**$3,160**

Material & Labor Total:		**$130,778**
Bonds and Insurance:	0%	$0
Mobilization:	15%	$19,617
Material Sales Tax:	6%	$4,863
Contractor's Overhead & Profit:	10%	$13,078
Subtotal		**$168,335**
Contingency:	*30%*	*$50,501*
Environmental Mitigation	*Not included*	
Right of Way Acquisition	*Not included*	
Estimated Construction Cost		***$219,000***
Admin and Legal:	10%	$21,900
Engineering:	15%	$32,850
Construction Admin:	5%	$10,950
Estimated Project Cost		***$285,000***

MSA

Probable Cost of Construction
F-8 : Well 13 and 13B VFD Installation (Project 1)

Project: City Idaho Falls, Water Facility Plan
Submittal: Capital Improvement Program
Owner: City of Idaho Falls
Project No.: 14-1550
Date: February 5, 2015

Item No.	Item	Quantity		Unit Costs			Total Cost
				Material	Labor/Equipment (L/E)	Total	
Site Improvements							
A1							
A2							
				Subtotal:			**$0**
Building Improvements							
B1							
B2							
				Subtotal:			**$0**
Reservoir Improvements							
C1							
C2							
				Subtotal:			**$0**
Pumping and Piping Improvements							
D1	Replace booster motor & pump 13-1 & 13-2, 75 Hp	1	EA	$35,075.00	$10,000.00	$45,075.00	$45,075
D2							
				Subtotal:			**$45,075**
Electrical Improvements							
E1	Booster 13-1, 13-2 VFD with line reactor, 75 Hp	2	EA	$11,800.00	$5,000.00	$16,800.00	$33,600
E2	Sine wave filter	1	EA	$2,000.00	$2,000.00	$4,000.00	$4,000
E3	Breakers and enclosures	1	EA	$4,000.00	$2,000.00	$6,000.00	$6,000
E4	Generator, 750 kW	1	EA	$200,000.00	$28,000.00	$228,000.00	$228,000
E5	Automatic transfer switch	1	EA	$50,000.00	$20,000.00	$70,000.00	$70,000
E5	Remaining electrical gear, MCC	1	EA	$65,000.00	$10,000.00	$75,000.00	$75,000
E6	Conductor & service equipment	1	EA	$2,500.00	$2,500.00	$5,000.00	$5,000
E7							
				Subtotal:			**$421,600**
Safety Improvements							
F1	Emergency eye wash, self-contained unit	1	EA	$560.00	$200.00	$760.00	$760
F2	SCBA Equipment, wall mount	1	EA	$2,200.00	$200.00	$2,400.00	$2,400
F3							
				Subtotal:			**$3,160**

Material & Labor Total:		**$469,835**
Bonds and Insurance:	0%	$0
Mobilization:	15%	$70,475
Material Sales Tax:	6%	$23,096
Contractor's Overhead & Profit:	10%	$46,984
Subtotal		**$610,390**
Contingency:	*30%*	*$183,117*
Environmental Mitigation	*Not included*	
Right of Way Acquisition	*Not included*	
Estimated Construction Cost		***$794,000***
Admin and Legal:	10%	$79,400
Engineering:	15%	$119,100
Construction Admin:	5%	$39,700
Estimated Project Cost		***$1,032,000***

MSA

Probable Cost of Construction
F-9 : Well 16 VFD Installation (Project 1)

Project: City Idaho Falls, Water Facility Plan
Submittal: Capital Improvement Program
Owner: City of Idaho Falls
Project No.: 14-1550
Date: February 5, 2015

Item No.	Item	Quantity		Unit Costs			Total Cost
				Material	Labor/Equipment (L/E)	Total	
Site Improvements							
A1							
				Subtotal:			**$0**
Building Improvements							
B1							
B2							
				Subtotal:			**$0**
Reservoir Improvements							
C1			EA				
				Subtotal:			**$0**
Pumping and Piping Improvements							
D1	Insertion Flow Sensor	1	EA	$8,000.00	$2,400.00	$10,400.00	$10,400
D2	Replace booster pump 16-1 seals and bearings	1	EA	$5,000.00	$11,000.00	$16,000.00	$16,000
D3							
				Subtotal:			**$26,400**
Electrical Improvements							
E1	Booster 16-1, 16-2 VFD with line reactor, 75 Hp, 150Hp	2	EA	$15,000.00	$5,000.00	$20,000.00	$40,000
E2	Booster 16-1, 16-2 motor rewind	2	EA	$0.00	$3,800.00	$3,800.00	$7,600
E3	Sine wave filter	1	EA	$2,000.00	$2,000.00	$4,000.00	$4,000
E4	Breakers and enclosures	2	EA	$3,000.00	$2,000.00	$5,000.00	$10,000
E6	Remaining electrical gear, MCC	1	EA	$30,000.00	$10,000.00	$40,000.00	$40,000
E7	Conductor & service equipment	1	EA	$2,500.00	$2,500.00	$5,000.00	$5,000
				Subtotal:			**$106,600**
Safety Improvements							
F1	Emergency eye wash, self-contained unit	1	EA	$560.00	$200.00	$760.00	$760
F2	SCBA Equipment, wall mount	1	EA	$2,200.00	$200.00	$2,400.00	$2,400
F3							
				Subtotal:			**$3,160**

Material & Labor Total:		**$136,160**
Bonds and Insurance:	0%	$0
Mobilization:	15%	$20,424
Material Sales Tax:	6%	$5,176
Contractor's Overhead & Profit:	10%	$13,616
Subtotal		**$175,376**
Contingency:	*30%*	*$52,613*
Environmental Mitigation	*Not included*	
Right of Way Acquisition	*Not included*	
Estimated Construction Cost		***$228,000***
Admin and Legal:	10%	$22,800
Engineering:	15%	$34,200
Construction Admin:	5%	$11,400
Estimated Project Cost		***$296,000***

MSA

Probable Cost of Construction
F-10 : All Facilities : Door Replacement

Project: City Idaho Falls, Water Facility Plan
Submittal: Capital Improvement Program
Owner: City of Idaho Falls
Project No.: 14-1550
Date: February 5, 2015

Item No.	Item	Quantity		Unit Costs			Total Cost
				Material	Labor/Equipment (L/E)	Total	
Door Replacement							
A1	Door Replacement - Year 1	1	LS			$75,000.00	$75,000
A1	Door Replacement - Year 2	1	LS			$75,000.00	$75,000
A1	Door Replacement - Year 3	1	LS			$75,000.00	$75,000
				Subtotal:			**$225,000**

Material & Labor Total:	**$225,000**
Bonds and Insurance: *Not included - City Performing Work*	
Mobilization: *Not included - City Performing Work*	
Material Sales Tax: *Not included - City Performing Work*	
Contractor's Overhead & Profit: *Not included - City Performing Work*	
Subtotal	**$225,000**
Contingency: Not included - City Performing Work	
Environmental Mitigation Not included - City Performing Work	
Right of Way Acquisition Not included - City Performing Work	
Estimated Construction Cost	***$225,000***
Admin and Legal: *Not included - City Performing Work*	
Engineering: *Not included - City Performing Work*	
Construction Admin: *Not included - City Performing Work*	
Estimated Project Cost	***$225,000***

MSA

Probable Cost of Construction
F-11 : All Facilities : SCADA Upgrade

Project: City Idaho Falls, Water Facility Plan
Submittal: Capital Improvement Program
Owner: City of Idaho Falls
Project No.: 14-1550
Date: February 5, 2015

Item No.	Item	Quantity		Unit Costs			Total Cost
				Material	Labor/Equipment (L/E)	Total	
SCADA Upgrade							
A1	Conversion from Radio SCADA to Fiber SCADA - Year 1	1	LS			$40,000.00	$40,000
A1	Conversion from Radio SCADA to Fiber SCADA - Year 2	1	LS			$40,000.00	$40,000
A1	Conversion from Radio SCADA to Fiber SCADA - Year 3	1	LS			$40,000.00	$40,000
				Subtotal:			**$120,000**

Material & Labor Total:	**$120,000**
Bonds and Insurance: *Not included - City Performing Work*	
Mobilization: *Not included - City Performing Work*	
Material Sales Tax: *Not included - City Performing Work*	
Contractor's Overhead & Profit: *Not included - City Performing Work*	
Subtotal	**$120,000**
Contingency: Not included - City Performing Work	
Environmental Mitigation Not included - City Performing Work	
Right of Way Acquisition Not included - City Performing Work	
Estimated Construction Cost	***$120,000***
Admin and Legal: *Not included - City Performing Work*	
Engineering: *Not included - City Performing Work*	
Construction Admin: *Not included - City Performing Work*	
Estimated Project Cost	***$120,000***

MSA

Probable Cost of Construction
F-12 : All Facilities : Concrete Maintenance

Project: City Idaho Falls, Water Facility Plan
Submittal: Capital Improvement Program
Owner: City of Idaho Falls
Project No.: 14-1550
Date: February 5, 2015

Item No.	Item	Quantity		Unit Costs			Total Cost
				Material	Labor/Equipment (L/E)	Total	
Concrete Maintenance							
A1	Concrete Maintenance - Year 1	1	LS			$10,000.00	$10,000
A1	Concrete Maintenance - Year 2	1	LS			$10,000.00	$10,000
A1	Concrete Maintenance - Year 3	1	LS			$10,000.00	$10,000
A1	Concrete Maintenance - Year 4	1	LS			$10,000.00	$10,000
A1	Concrete Maintenance - Year 5	1	LS			$10,000.00	$10,000
				Subtotal:			**$50,000**

Material & Labor Total:	**$50,000**
Bonds and Insurance: *Not included - City Performing Work*	
Mobilization: *Not included - City Performing Work*	
Material Sales Tax: *Not included - City Performing Work*	
Contractor's Overhead & Profit: *Not included - City Performing Work*	
Subtotal	**$50,000**
Contingency: Not included - City Performing Work	
Environmental Mitigation Not included - City Performing Work	
Right of Way Acquisition Not included - City Performing Work	
Estimated Construction Cost	***$50,000***
Admin and Legal: *Not included - City Performing Work*	
Engineering: *Not included - City Performing Work*	
Construction Admin: *Not included - City Performing Work*	
Estimated Project Cost	***$50,000***

MSA

Probable Cost of Construction
F-13 : Upgrade Well 16 (Project 2)

Project: City Idaho Falls, Water Facility Plan
Submittal: Capital Improvement Program
Owner: City of Idaho Falls
Project No.: 14-1550
Date: February 5, 2015

Item No.	Item	Quantity		Unit Costs			Total Cost
				Material	Labor/Equipment (L/E)	Total	
Well							
A1	Well - 3,600 gpm	1	EA			$691,775.00	$691,775
A1							
				Subtotal:			**$691,775**
Storage							
B1	Storage - 1.25 MG	1	EA			$616,350.00	$616,350
B2							
				Subtotal:			**$616,350**
Booster Station							
C1	Booster Station - 7,200 gpm	1	EA			$1,170,050.00	$1,170,050
C2							
				Subtotal:			**$1,170,050**

Material & Labor Total:		**$2,478,175**
Bonds and Insurance:	0%	$0
Mobilization:	10%	$247,818
Material Sales Tax:	6%	$0
Contractor's Overhead & Profit:	10%	$247,818
Subtotal		**$2,973,810**
Contingency:	*30%*	*$892,143*
Environmental Mitigation	*Not included*	
Right of Way Acquisition	*Not included*	
Estimated Construction Cost		***$3,866,000***
Admin and Legal:	10%	$386,600
Engineering:	15%	$579,900
Construction Admin:	5%	$193,300
Estimated Project Cost		***$5,026,000***

MSA

Probable Cost of Construction
F-14 : New Well Facility Near Well 6

Project: City Idaho Falls, Water Facility Plan
Submittal: Capital Improvement Program
Owner: City of Idaho Falls
Project No.: 14-1550
Date: February 5, 2015

Item No.	Item	Quantity		Unit Costs			Total Cost
				Material	Labor/Equipment (L/E)	Total	
Well							
A1	Well - 1,500 gpm	1	EA			$401,350.00	$401,350
A1							
				Subtotal:			**$401,350**
Storage							
B1	Storage - 0.1 MG	1	EA			$49,350.00	$49,350
B2							
				Subtotal:			**$49,350**
Booster Station							
C1	Booster Station - 1,500 gpm	1	EA			$456,575.00	$456,575
C2							
				Subtotal:			**$456,575**

Material & Labor Total:		**$907,275**
Bonds and Insurance:	0%	$0
Mobilization:	10%	$90,728
Material Sales Tax:	6%	$0
Contractor's Overhead & Profit:	10%	$90,728
Subtotal		**$1,088,730**
Contingency:	*30%*	*$326,619*
Environmental Mitigation	*Not included*	
Right of Way Acquisition	*Not included*	
Estimated Construction Cost		***$1,415,000***
Admin and Legal:	10%	$141,500
Engineering:	15%	$212,250
Construction Admin:	5%	$70,750
Estimated Project Cost		***$1,840,000***

MSA

Probable Cost of Construction
F-15 : 65th Street Booster Station Upgrades (Project 2)

Project: City Idaho Falls, Water Facility Plan
Submittal: Capital Improvement Program
Owner: City of Idaho Falls
Project No.: 14-1550
Date: February 5, 2015

Item No.	Item	Quantity		Unit Costs			Total Cost
				Material	Labor/Equipment (L/E)	Total	
Well							
A1							
A1							
				Subtotal:			**$0**
Storage							
B1							
B2							
				Subtotal:			**$0**
Booster Station							
C1	Booster Station - Replace existing pumps (900, 2000, 2000 gpm) and add fourth (2,500 gpm)	1	EA			$389,712.00	$389,712
C2							
				Subtotal:			**$389,712**

Material & Labor Total:		**$389,712**
Bonds and Insurance:	0%	$0
Mobilization:	10%	$38,971
Material Sales Tax:	6%	$0
Contractor's Overhead & Profit:	10%	$38,971
Subtotal		**$467,654**
Contingency:	*30%*	*$140,296*
Environmental Mitigation	*Not included*	
Right of Way Acquisition	*Not included*	
Estimated Construction Cost		***$608,000***
Admin and Legal:	10%	$60,800
Engineering:	15%	$91,200
Construction Admin:	5%	$30,400
Estimated Project Cost		***$790,000***

MSA

Probable Cost of Construction
F-16 : Well 5 Booster Station Replacement

Project: City Idaho Falls, Water Facility Plan
Submittal: Capital Improvement Program
Owner: City of Idaho Falls
Project No.: 14-1550
Date: February 5, 2015

Item No.	Item	Quantity		Unit Costs			Total Cost
				Material	Labor/Equipment (L/E)	Total	
Well							
A1							
A1							
				Subtotal:			**$0**
Storage							
B1							
B2							
				Subtotal:			**$0**
Booster Station							
C1	Booster Station - 6,000 gpm	1	EA			$1,048,691.00	$1,048,691
C2							
				Subtotal:			**$1,048,691**

Material & Labor Total:		**$1,048,691**
Bonds and Insurance:	0%	$0
Mobilization:	10%	$104,869
Material Sales Tax:	6%	$0
Contractor's Overhead & Profit:	10%	$104,869
Subtotal		**$1,258,429**
Contingency:	*30%*	*$377,529*
Environmental Mitigation	*Not included*	
Right of Way Acquisition	*Not included*	
Estimated Construction Cost		***$1,636,000***
Admin and Legal:	10%	$163,600
Engineering:	15%	$245,400
Construction Admin:	5%	$81,800
Estimated Project Cost		***$2,127,000***

MSA

Probable Cost of Construction
F-17 : New Booster Pump at New Well Facility at Well 13 and 13B (Project 2)

Project: City Idaho Falls, Water Facility Plan
Submittal: Capital Improvement Program
Owner: City of Idaho Falls
Project No.: 14-1550
Date: February 5, 2015

Item No.	Item	Quantity		Unit Costs			Total Cost
				Material	Labor/Equipment (L/E)	Total	
Well							
A1							
A1							
				Subtotal:			**$0**
Storage							
B1							
B2							
				Subtotal:			**$0**
Booster Station							
C1	Booster Station - Pump Upgrade 1,500 gpm	1	EA			$88,547.82	$88,548
C2							
				Subtotal:			**$88,548**

Material & Labor Total:		**$88,548**
Bonds and Insurance:	0%	$0
Mobilization:	10%	$8,855
Material Sales Tax:	6%	$0
Contractor's Overhead & Profit:	10%	$8,855
Subtotal		**$106,257**
Contingency:	*30%*	*$31,877*
Environmental Mitigation	*Not included*	
Right of Way Acquisition	*Not included*	
Estimated Construction Cost		***$138,000***
Admin and Legal:	10%	$13,800
Engineering:	15%	$20,700
Construction Admin:	5%	$6,900
Estimated Project Cost		***$180,000***

MSA

Probable Cost of Construction
F-18 : New Well Facillty Near East River Road and Tower Road

Project: City Idaho Falls, Water Facility Plan
Submittal: Capital Improvement Program
Owner: City of Idaho Falls
Project No.: 14-1550
Date: February 5, 2015

Item No.	Item	Quantity		Unit Costs			Total Cost
				Material	Labor/Equipment (L/E)	Total	
Well							
A1	Well - 3,000 gpm	1	EA			$617,850.00	$617,850
A1							
				Subtotal:			**$617,850**
Storage							
B1	Storage - 1MG	1	EA			$493,100.00	$493,100
B2							
				Subtotal:			**$493,100**
Booster Station							
C1	Booster Station - 3,000 gpm	1	EA			$692,300.00	$692,300
C2							
				Subtotal:			**$692,300**
Supply Piping							
D1	Supply Piping P-307: 16-in 14,650 lf	1	EA			$2,124,650.00	$2,124,650
D2							
				Subtotal:			**$2,124,650**

Material & Labor Total:		**$3,927,900**
Bonds and Insurance:	0%	$0
Mobilization:	10%	$392,790
Material Sales Tax:	6%	$0
Contractor's Overhead & Profit:	10%	$392,790
Subtotal		**$4,713,480**
Contingency:	*30%*	*$1,414,044*
Environmental Mitigation	*Not included*	
Right of Way Acquisition	*Not included*	
Estimated Construction Cost		***$6,128,000***
Admin and Legal:	10%	$612,800
Engineering:	15%	$919,200
Construction Admin:	5%	$306,400
Estimated Project Cost		***$7,966,000***

MSA

Probable Cost of Construction
F-19 : Well 12 Upgrades

Project: City Idaho Falls, Water Facility Plan
Submittal: Capital Improvement Program
Owner: City of Idaho Falls
Project No.: 14-1550
Date: February 5, 2015

Item No.	Item	Quantity		Unit Costs			Total Cost
				Material	Labor/Equipment (L/E)	Total	
Site Improvements							
A1	Security fencing, 8ft high	600	LF	$31.00	$6.51	$37.51	$22,506
A2	Double swing gate, 8ft high, 12ft opening	1	EA	$460.00	$960.00	$1,420.00	$1,420
A3							
				SubTotal:			**$23,926**
Building Improvements							
B1	Motorized damper, 5ft x 5ft	1	EA	$1,600.00	$1,600.00	$3,200.00	$3,200
B2	Ventilation fan, 36in, 1/2Hp, 10,000cfm	1	EA	$1,500.00	$1,500.00	$3,000.00	$3,000
B3	Wired door alarm.	2	EA	$300.00	$300.00	$600.00	$1,200
B5	Wired motion sensor.	2	EA	$300.00	$300.00	$600.00	$1,200
B6							
				SubTotal:			**$8,600**
Reservoir Improvements							
C1	Aluminum geodesic dome.	1	EA	$150,000.00	$75,000.00	$225,000.00	$225,000
C2	Stainless steel tank ladder, 10ft high	2	EA	$1,500.00	$1,500.00	$3,000.00	$6,000
C3	Submersible level transmitter, display & power	1	EA	$1,808.00	$1,808.00	$3,616.00	$3,616
C4	Overflow, 12in pipe through side of tank	1	EA	$1,000.00	$4,000.00	$5,000.00	$5,000
C5	Overflow, 12in DI 90 deg	2	EA	$880.00	$223.00	$1,103.00	$2,206
C6	Overflow, 12in DI piping	20	LF	$79.00	$22.35	$101.35	$2,027
C7	Overflow air-gap dissipation pad	1	LS	$1,000.00	$1,000.00	$2,000.00	$2,000
C8							
C9							
				SubTotal:			**$245,849**
Pumping and Piping Improvements							
D1	Insertion Flow Sensor	1	EA	$8,000.00	$2,400.00	$10,400.00	$10,400
D2	Pump to waste, 14in DI piping	60	LF	$93.00	$23.49	$116.49	$6,989
D3	Pump to waste, 14" DI Tee	1	EA	$2,600.00	$352.00	$2,952.00	$2,952
D4	Pump to waste, 14in DI 90deg	7	EA	$1,200.00	$235.50	$1,435.50	$10,049
D5	Pump to waste, 14" butterfly valve	1	EA	$3,075.00	$674.00	$3,749.00	$3,749
D6	Rotate pump 90deg to accommodate pump to wast	1	EA	$500.00	$2,000.00	$2,500.00	$2,500
D7	Repair deep well stilling well	1	LS	$500.00	$3,000.00	$3,500.00	$3,500
D8	Submersible level transmitter, display & power	1	EA	$1,808.00	$1,808.00	$3,616.00	$3,616
D9				$0.00	$0.00		
				SubTotal:			**$43,755**
Electrical Improvements							
E1	Complete electrical gear, MCC	1	EA	$60,000.00	$10,000.00	$70,000.00	$70,000
E2	Conductor & service equipment	1	EA	$2,500.00	$2,500.00	$5,000.00	$5,000
E3							
E4							
				Subtotal:			**$75,000**
Safety Improvements							
F1	Emergency eye wash, self-contained unit	1	EA	$560.00	$200.00	$760.00	$760
F2	SCBA Equipment, wall mount	1	EA	$2,200.00	$200.00	$2,400.00	$2,400
F3							
				Subtotal:			**$3,160**

Material & Labor Total:		**$400,290**
Bonds and Insurance:	0%	$0
Mobilization:	15%	$60,043
Material Sales Tax:	6%	$16,754
Contractor's Overhead & Profit:	10%	$40,029
Subtotal		**$517,116**
Contingency:	*30%*	*$155,135*
Environmental Mitigation	*Not included*	
Right of Way Acquisition	*Not included*	
Estimated Construction Cost		***$672,000***
Admin and Legal:	10%	$67,200
Engineering:	15%	$100,800
Construction Admin:	5%	$33,600
Estimated Project Cost		***$874,000***

MSA

Probable Cost of Construction
F-20 : Well 11 & 14 Upgrades

Project: City Idaho Falls, Water Facility Plan
Submittal: Capital Improvement Program
Owner: City of Idaho Falls
Project No.: 14-1550
Date: February 5, 2015

Item No.	Item	Quantity		Unit Costs			Total Cost
				Material	Labor/Equipment (L/E)	Total	
Site Improvements							
A1	Security fencing, 8ft high	800	LF	$31.00	$6.51	$37.51	$30,008
A2	Double swing gate, 8ft high, 12ft opening	1	EA	$460.00	$960.00	$1,420.00	$1,420
A3							
				SubTotal:			**$31,428**
Building Improvements							
B1	Motorized damper, 6ft x 6ft	1	EA	$1,600.00	$1,600.00	$3,200.00	$3,200
B2	Ventilation fan, 48in, 3/4Hp, 15,000cfm	1	EA	$1,500.00	$1,500.00	$3,000.00	$3,000
B3							
B5							
B6							
				SubTotal:			**$6,200**
Reservoir Improvements							
C1	Aluminum geodesic dome.	1	EA	$150,000.00	$75,000.00	$225,000.00	$225,000
C2	Stainless steel tank ladder, 10ft high	2	EA	$1,500.00	$1,500.00	$3,000.00	$6,000
C3	Submersible level transmitter, display & power	1	EA	$1,808.00	$1,808.00	$3,616.00	$3,616
C4	Overflow, 12in pipe through side of tank	1	EA	$1,000.00	$4,000.00	$5,000.00	$5,000
C5	Overflow, 12in DI 90 deg	2	EA	$880.00	$223.00	$1,103.00	$2,206
C6	Overflow, 12in DI piping	80	LF	$79.00	$22.35	$101.35	$8,108
C7	V-Ditch grading to canal	10	CY	$0.00	$16.05	$16.05	$161
C8	Grouted rip-rap for v-ditch	25	SY	$40.00	$75.00	$115.00	$2,875
C9					$0.00		
				SubTotal:			**$252,966**
Pumping and Piping Improvements							
D1	Insertion Flow Sensor	1	EA	$8,000.00	$2,400.00	$10,400.00	$10,400
D2	Pump to waste, 14in DI piping (pump 11)	35	LF	$93.00	$23.49	$116.49	$4,077
D3	Pump to waste, 14" DI Tee (pump 11)	1	EA	$2,600.00	$352.00	$2,952.00	$2,952
D4	Pump to waste, 14in DI 90deg (pump 11)	4	EA	$1,200.00	$235.50	$1,435.50	$5,742
D5	Pump to waste, 14" butterfly valve (pump 11)	1	EA	$3,075.00	$674.00	$3,749.00	$3,749
D6	Pump to waste, 14in DI piping (pump 14)	180	LF	$93.00	$23.49	$116.49	$20,968
D7	Pump to waste, 14" DI Tee (pump 14)	1	EA	$2,600.00	$352.00	$2,952.00	$2,952
D8	Pump to waste, 14in DI 90deg (pump 14)	3	EA	$1,200.00	$235.50	$1,435.50	$4,307
D9	Pump to waste, 14in 45deg (pump 14)	3	EA	$1,200.00	$235.50	$1,435.50	$4,307
D10	Pump to waste, 14" butterfly valve (pump 14)	1	EA	$3,075.00	$674.00	$3,749.00	$3,749
D11				$0.00	$0.00		
				SubTotal:			**$63,202**
Electrical Improvements							
E1	Complete electrical gear, MCC	1	EA	$105,000.00	$15,000.00	$120,000.00	$120,000
E2	Conductor & service equipment	1	EA	$10,000.00	$10,000.00	$20,000.00	$20,000
E3	Generator, 750 kW	1	EA	$200,000.00	$28,000.00	$228,000.00	$228,000
E4	Automatic transfer switch	1	EA	$50,000.00	$20,000.00	$70,000.00	$70,000
				Subtotal:			**$438,000**
Safety Improvements							
F1							
F2							
F3							
				Subtotal:			**$0**

Material & Labor Total:		**$791,796**
Bonds and Insurance:	0%	$0
Mobilization:	15%	$118,769
Material Sales Tax:	6%	$36,576
Contractor's Overhead & Profit:	10%	$79,180
Subtotal		**$1,026,320**
Contingency:	*30%*	*$307,896*
Environmental Mitigation	*Not included*	
Right of Way Acquisition	*Not included*	
Estimated Construction Cost		***$1,334,000***
Admin and Legal:	10%	$133,400
Engineering:	15%	$200,100
Construction Admin:	5%	$66,700
Estimated Project Cost		***$1,734,000***

MSA

Opinion of Probable Construction Cost
F-21 : Well 13 and 13B Upgrades (Project 2)

Project: City Idaho Falls, Water Facility Plan
Submittal: Capital Improvement Program
Owner: City of Idaho Falls
Project No.: 14-1550
Date: February 5, 2015

Item No.	Item	Quantity		Unit Costs			Total Cost
				Material	Labor/Equipment (L/E)	Total	
Site Improvements							
A1	Exterior lighting (Outdoor 110W LED)	4	EA	$765.00	$44.00	$809.00	$3,236
A2							
				Subtotal:			**$3,236**
Building Improvements							
B1	Booster Building, motorized damper, 5ft x 5ft	1	EA	$900.00	$900.00	$1,800.00	$1,800
B2	Booster Building, ventilation fan, 36in, 3/4Hp, 11,000cfm	1	EA	$1,000.00	$1,000.00	$2,000.00	$2,000
B3							
				Subtotal:			**$3,800**
Reservoir Improvements							
C1	Aluminum Geodesic Dome	1	EA	$150,000.00	$75,000.00	$225,000.00	$225,000
C2	Stainless steel tank ladder, 10ft high	2	EA	$1,500.00	$1,500.00	$3,000.00	$6,000
C3	Raise overflow pipe for proper air-gap.	1	LS	$1,000.00	$3,000.00	$4,000.00	$4,000
C4							
				Subtotal:			**$235,000**
Pumping and Piping Improvements							
D1	Insertion Flow Sensor	1	EA	$8,000.00	$2,400.00	$10,400.00	$10,400
D4							
D5							
				Subtotal:			**$10,400**
Electrical Improvements							
E1							
E2							
				Subtotal:			**$0**
Safety Improvements							
F1							
F2							
				Subtotal:			**$0**

Material & Labor Total:		**$252,436**
Bonds and Insurance:	0%	$0
Mobilization:	15%	$37,865
Material Sales Tax:	6%	$10,018
Contractor's Overhead & Profit:	10%	$25,244
Subtotal		**$325,563**
Contingency:	*30%*	*$97,669*
Environmental Mitigation	*Not included*	
Right of Way Acquisition	*Not included*	
Estimated Construction Cost		***$423,000***
Admin and Legal:	10%	$42,300
Engineering:	15%	$63,450
Construction Admin:	5%	$21,150
Estimated Project Cost		***$550,000***

MSA

Probable Cost of Construction
F-22 : Well 6 Upgrades

Project: City Idaho Falls, Water Facility Plan
Submittal: Capital Improvement Program
Owner: City of Idaho Falls
Project No.: 14-1550
Date: February 5, 2015

Item No.	Item	Quantity		Unit Costs			Total Cost
				Material	Labor/Equipment (L/E)	Total	
Site Improvements							
A1	Security fencing, 8ft high	700	LF	$31.00	$6.51	$37.51	$26,257
A2	Double swing gate, 8ft high, 12ft opening	1	EA	$460.00	$960.00	$1,420.00	$1,420
A3	Exterior lighting (outdoor 110W LED)	3	EA	$765.00	$44.00	$809.00	$2,427
A4							
				SubTotal:			**$30,104**
Building Improvements							
B1	Motorized damper, 3ft x 3ft	1	EA	$600.00	$600.00	$1,200.00	$1,200
B2	Ventilation fan, 24in, 1/3Hp, 4,000cfm	1	EA	$800.00	$800.00	$1,600.00	$1,600
B3	Structural inspection	1	LS	$0.00	$10,000.00	$10,000.00	$10,000
B4	Interior lighting	4	EA	$50.00	$82.50	$132.50	$530
B5	Enlarge building (12' x 8'), move flow meter AFF	96	SF	$30.75	$9.23	$39.98	$3,838
B6	Aluminum grating on pipe chase.	18	SF	$45.00	$3.07	$48.07	$865
				SubTotal:			**$18,033**
Reservoir Improvements							
C1					$0.00		
C2					$0.00		
				SubTotal:			**$0**
Pumping and Piping Improvements							
D1	Well water level sensor	1	EA	$1,808.00	$1,808.00	$3,616.00	$3,616
D2	Insertion Flow Sensor	1	EA	$8,000.00	$2,400.00	$10,400.00	$10,400
D3	Pump to waste, 8in DI piping	120	LF	$44.50	$17.60	$62.10	$7,452
D4	Pump to waste, 8in DI Tee	1	EA	$850.00	$206.00	$1,056.00	$1,056
D5	Pump to waste, 8in DI 90deg	1	EA	$450.00	$137.00	$587.00	$587
D6	Pump to waste, 8in butterfly valve	1	EA	$835.00	$339.50	$1,174.50	$1,175
D7	Move discharge piping above ground	20	LF	$44.50	$17.60	$62.10	$1,242
D8							
				SubTotal:			**$25,528**
Electrical Improvements							
E1	Pump MCP, 150HP	1	EA	$12,000.00	$4,000.00	$16,000.00	$16,000
E2							
				Subtotal:			**$16,000**
Safety Improvements							
F1	Emergency eye wash, self-contained unit	1	EA	$560.00	$200.00	$760.00	$760
F2	SCBA Equipment, wall mount	1	EA	$2,200.00	$200.00	$2,400.00	$2,400
F3							
				Subtotal:			**$3,160**

Material & Labor Total:			**$92,825**
Bonds and Insurance:	0%		$0
Mobilization:	15%		$13,924
Material Sales Tax:	6%		$3,765
Contractor's Overhead & Profit:	10%		$9,282
Subtotal			**$119,796**
Contingency:	*30%*		*$35,939*
Environmental Mitigation	*Not included*		
Right of Way Acquisition	*Not included*		
Estimated Construction Cost			***$156,000***
Admin and Legal:	10%		$15,600
Engineering:	15%		$23,400
Construction Admin:	5%		$7,800
Estimated Project Cost			***$203,000***

MSA

Probable Cost or Construction
F-23 : Well 17 Upgrades

Project: City Idaho Falls, Water Facility Plan
Submittal: Capital Improvement Program
Owner: City of Idaho Falls
Project No.: 14-1550
Date: February 5, 2015

Item No.	Item	Quantity		Unit Costs			Total Cost
				Material	Labor/Equipment (L/E)	Total	
Site Improvements							
A1							
				SubTotal:			**$0**
Building Improvements							
B1							
				SubTotal:			**$0**
Reservoir Improvements							
C1	Access hatch, 36in x 36in	1	EA	$2,500.00	$2,500.00	$5,000.00	$5,000
C2	Stainless steel tank ladder, 10ft high	1	EA	$1,500.00	$1,500.00	$3,000.00	$3,000
C3	Overflow, 12in DI piping	2	LF	$79.00	$22.35	$101.35	$203
C4	Membrane roofing	22	SQ	$125.00	$63.45	$188.45	$4,146
				SubTotal:			**$12,349**
Pumping and Piping Improvements							
D1	Insertion Flow Sensor	1	EA	$8,000.00	$2,400.00	$10,400.00	$10,400
D2							
				SubTotal:			**$10,400**
Electrical Improvements							
E1	Complete electrical gear, MCC	1	EA	$75,000.00	$12,000.00	$87,000.00	$87,000
E2	Conductor & service equipment	1	EA	$3,000.00	$2,500.00	$5,500.00	$5,500
E3							
				Subtotal:			**$92,500**
Safety Improvements							
F1							
				Subtotal:			**$0**

Material & Labor Total:		**$115,249**
Bonds and Insurance:	0%	$0
Mobilization:	15%	$17,287
Material Sales Tax:	6%	$5,574
Contractor's Overhead & Profit:	10%	$11,525
Subtotal		**$149,635**
Contingency:	*30%*	*$44,891*
Environmental Mitigation	*Not included*	
Right of Way Acquisition	*Not included*	
Estimated Construction Cost		***$195,000***
Admin and Legal:	10%	$19,500
Engineering:	15%	$29,250
Construction Admin:	5%	$9,750
Estimated Project Cost		***$254,000***

MSA

Probable Cost or Construction
F-24 : Well 2 Upgrades

Project: City Idaho Falls, Water Facility Plan
Submittal: Capital Improvement Program
Owner: City of Idaho Falls
Project No.: 14-1550
Date: February 5, 2015

Item No.	Item	Quantity		Unit Costs			Total Cost
				Material	Labor/Equipment (L/E)	Total	
Site Improvements							
A1	Security fencing, 8ft high	600	LF	$31.00	$6.51	$37.51	$22,506
A2	Double swing gate, 8ft high, 12ft opening	1	EA	$460.00	$960.00	$1,420.00	$1,420
A3							
A4							
				SubTotal:			**$23,926**
Building Improvements							
B1	Motorized damper, 5ft x 5ft	1	EA	$900.00	$900.00	$1,800.00	$1,800
B2	Ventilation fan, 36in, 1/2Hp, 9,000cfm	1	EA	$1,200.00	$1,200.00	$2,400.00	$2,400
B3							
				SubTotal:			**$4,200**
Reservoir Improvements							
C1	Access hatch, 36in x 36in	1	EA	$2,500.00	$2,500.00	$5,000.00	$5,000
C2	Stainless steel tank ladder, 10ft high	1	EA	$1,500.00	$1,500.00	$3,000.00	$3,000
C3	Overflow air-gap dissipation pad.	1	EA	$1,000.00	$2,000.00	$3,000.00	$3,000
C4	Overflow, 12in pipe through side of tank	1	EA	$1,000.00	$4,000.00	$5,000.00	$5,000
C5	Overflow, 12in DI 90 deg	2	EA	$880.00	$223.00	$1,103.00	$2,206
C6	Overflow, 12in DI piping under roadway	100	LF	$79.00	$22.35	$101.35	$10,135
C7	Roadway repair	150	SQ	$25.00	$63.45	$88.45	$13,268
				SubTotal:			**$41,609**
Pumping and Piping Improvements							
D1	Extend well casing 24in above floor	1	EA	$400.00	$7,000.00	$7,400.00	$7,400
D2	Insertion Flow Sensor	1	EA	$8,000.00	$2,400.00	$10,400.00	$10,400
D3	Well water level sensor	1	EA	$1,808.00	$1,808.00	$3,616.00	$3,616
D4							
				SubTotal:			**$21,416**
Electrical Improvements							
E1	Complete electrical gear, MCC	1	EA	$45,000.00	$10,000.00	$55,000.00	$55,000
E2	Conductor & service equipment	1	EA	$2,500.00	$2,500.00	$5,000.00	$5,000
E3							
				Subtotal:			**$60,000**
Safety Improvements							
F1	Emergency eye wash, self-contained unit	1	EA	$560.00	$200.00	$760.00	$760
F2	SCBA Equipment, wall mount	1	EA	$2,200.00	$200.00	$2,400.00	$2,400
F3							
				Subtotal:			**$3,160**

Material & Labor Total:			**$154,311**
Bonds and Insurance:	0%		$0
Mobilization:	15%		$23,147
Material Sales Tax:	6%		$6,062
Contractor's Overhead & Profit:	10%		$15,431
Subtotal			**$198,950**
Contingency:	*30%*		*$59,685*
Environmental Mitigation	*Not included*		
Right of Way Acquisition	*Not included*		
Estimated Construction Cost			***$259,000***
Admin and Legal:	10%		$25,900
Engineering:	15%		$38,850
Construction Admin:	5%		$12,950
Estimated Project Cost			***$337,000***

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Probable Cost of Construction
F-25 : Well 15 and 15B Reservoir Upgrades

Project: City Idaho Falls, Water Facility Plan
Submittal: Capital Improvement Program
Owner: City of Idaho Falls
Project No.: 14-1550
Date: February 5, 2015

Item No.	Item	Quantity		Unit Costs			Total Cost
				Material	Labor/Equipment (L/E)	Total	
Site Improvements							
A1							
A2							
				Subtotal:			**$0**
Building Improvements							
B1	Exterior lighting (outdoor 110W LED)	3	EA	$765.00	$44.00	$809.00	$2,427
B2							
				Subtotal:			**$2,427**
Reservoir Improvements							
C1	Access hatch, 36in x 36in	1	EA	$2,500.00	$2,500.00	$5,000.00	$5,000
C2	Stainless steel tank ladder, 10ft high	1	EA	$1,500.00	$1,500.00	$3,000.00	$3,000
C3							
				Subtotal:			**$8,000**
Pumping and Piping Improvements							
D1							
D2							
				Subtotal:			**$0**
Electrical Improvements							
E1							
E2							
				Subtotal:			**$0**
Safety Improvements							
F1							
F2							
F3							
				Subtotal:			**$0**

Material & Labor Total:		**$10,427**
Bonds and Insurance:	0%	$0
Mobilization:	15%	$1,564
Material Sales Tax:	6%	$378
Contractor's Overhead & Profit:	10%	$1,043
Subtotal		**$13,411**
Contingency:	*30%*	*$4,023*
Environmental Mitigation	*Not included*	
Right of Way Acquisition	*Not included*	
Estimated Construction Cost		***$17,000***
Admin and Legal:	10%	$1,700
Engineering:	15%	$2,550
Construction Admin:	5%	$850
Estimated Project Cost		***$22,000***

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Probable Cost or Construction
F-26 : Abandon Well 7

Project: City Idaho Falls, Water Facility Plan
Submittal: Capital Improvement Program
Owner: City of Idaho Falls
Project No.: 14-1550
Date: February 5, 2015

Item No.	Item	Quantity		Unit Costs			Total Cost
				Material	Labor/Equipment (L/E)	Total	
Site Improvements							
A1	Remove 30k gal buried tank	1	LS	$2,000.00	$10,000.00	$12,000.00	$12,000
A2							
				SubTotal:			**$12,000**
Building Improvements							
B1							
				SubTotal:			**$0**
Reservoir Improvements							
C1							
				SubTotal:			**$0**
Pumping and Piping Improvements							
D1	Abandon existing well.	1	EA	$15,000.00	$15,000.00	$30,000.00	$30,000
D2							
				SubTotal:			**$30,000**
Electrical Improvements							
E1							
				Subtotal:			**$0**
Safety Improvements							
F1							
				Subtotal:			**$0**

Material & Labor Total:		**$42,000**
Bonds and Insurance:	0%	$0
Mobilization:	15%	$6,300
Material Sales Tax:	6%	$1,020
Contractor's Overhead & Profit:	10%	$4,200
Subtotal		**$53,520**
Contingency:	*30%*	*$16,056*
Environmental Mitigation	*Not included*	
Right of Way Acquisition	*Not included*	
Estimated Construction Cost		***$70,000***
Admin and Legal:	10%	$7,000
Engineering:	15%	$10,500
Construction Admin:	5%	$3,500
Estimated Project Cost		***$91,000***

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Murray, Smith & Associates, Inc.
Engineers/Planners

APPENDIX K

Alternative Rate Evaluation Matrix

Evaluation of Rate Options based on Policy Objectives

Residential Indoor Rates

			Matrix of Raw Scores (1-10)			*Weighted Scores*		
	Policy Objectives	**Weight**	**Rate Option #1**	**Rate Option #2**	**Rate Option #3**	**Rate Option #1**	**Rate Option #2**	**Rate Option #3**
	TOTAL:	**100.0%**	45.9	57.0	52.4	**5.791**	**7.127**	**6.596**
1	**Equitable** - Rate structure reflects average cost of providing service to different groups based on area, function, customer class, and service characteristics-- *to the extent data allows*	**14.7%**	3.6	6.4	8.1	0.525	0.946	1.198
2	**Understandable** - Rates and fees are transparent and easy for general public to understand and calculate based on information provided	**16.6%**	7.9	7.4	5.9	1.306	1.235	0.974
3	**Implementable** - Rates can be implemented without significant resources to develop or assign characteristics (such as square footage or number of plumbing fixtures, for example) to each customer account	**9.8%**	8.4	7.9	4.0	0.822	0.766	0.390
4	**Administrative Ease** - Rate or fee structure can be updated and maintained for each customer with little effort	**13.8%**	8.4	8.0	5.6	1.159	1.100	0.766
5	**Affordable** - Rates are affordable to community, or if not affordable to a segment of the community, a program is in place to provide relief or assistance	**11.5%**	4.9	7.0	7.9	0.559	0.805	0.904
6	**Defensible** - Rate development process reflects attempt to identify water usage differences among various customer categories with limited data available	**11.8%**	3.4	6.6	8.0	0.404	0.775	0.943
7	**Public Acceptance** - Recommended alternative is perceived as fair and generally equitable by diverse customer groups	**10.9%**	4.4	6.7	6.4	0.482	0.730	0.699
8	**Political Support** - Rate development process and recommended alternative represents a solution that will be supported by Mayor and Council	**11.0%**	4.9	7.0	6.6	0.534	0.770	0.723

Evaluation of Rate Options based on Policy Objectives

Residential Outdoor Rates

			Matrix of Raw Scores (1-10)				*Weighted Scores*			
	Policy Objectives	**Weight**	**Rate Option #1**	**Rate Option #2**	**Rate Option #3**	**Rate Option #4**	**Rate Option #1**	**Rate Option #2**	**Rate Option #3**	**Rate Option #4**
	TOTAL:	**100.0%**	44.3	52.6	55.9	55.7	**5.593**	**6.600**	**6.995**	**6.971**
1	**Equitable** - Rate structure reflects average cost of providing service to different groups based on area, function, customer class, and service characteristics-- *to the extent data allows*	**14.7%**	3.4	6.3	7.1	8.6	0.504	0.925	1.051	1.261
2	**Understandable** - Rates and fees are transparent and easy for general public to understand and calculate based on information provided	**16.6%**	7.7	7.1	7.3	6.4	1.283	1.188	1.211	1.069
3	**Implementable** - Rates can be implemented without significant resources to develop or assign characteristics (such as square footage or number of plumbing fixtures, for example) to each customer account	**9.8%**	8.0	6.6	6.9	5.3	0.780	0.641	0.669	0.515
4	**Administrative Ease** - Rate or fee structure can be updated and maintained for each customer with little effort	**13.8%**	7.6	6.9	6.4	4.9	1.041	0.943	0.884	0.668
5	**Affordable** - Rates are affordable to community, or if not affordable to a segment of the community, a program is in place to provide relief or assistance	**11.5%**	5.0	7.0	7.6	8.3	0.575	0.805	0.871	0.953
6	**Defensible** - Rate development process reflects attempt to identify water usage differences among various customer categories with limited data available	**11.8%**	4.0	6.1	7.0	8.0	0.472	0.724	0.825	0.943
7	**Public Acceptance** - Recommended alternative is perceived as fair and generally equitable by diverse customer groups	**10.9%**	3.9	6.3	6.7	7.4	0.419	0.684	0.730	0.808
8	**Political Support** - Rate development process and recommended alternative represents a solution that will be supported by Mayor and Council	**11.0%**	4.7	6.3	6.9	6.9	0.519	0.691	0.754	0.754

Evaluation of Rate Options based on Policy Objectives

Non-Residential Indoor Rates

			Matrix of Raw Scores (1-10)					*Weighted Scores*				
	Policy Objectives	**Weight**	**Rate Option #1**	**Rate Option #2**	**Rate Option #3**	**Rate Option #4**	**Rate Option #5**	**Rate Option #1**	**Rate Option #2**	**Rate Option #3**	**Rate Option #4**	**Rate Option #5**
	TOTAL:	**100.0%**	43.1	48.0	53.4	55.4	52.4	**5.408**	**6.003**	**6.685**	**6.930**	**6.583**
1	**Equitable** - Rate structure reflects average cost of providing service to different groups based on area, function, customer class, and service characteristics-- *to the extent data allows*	**14.7%**	3.7	5.4	6.9	7.6	8.3	0.546	0.798	1.009	1.114	1.219
2	**Understandable** - Rates and fees are transparent and easy for general public to understand and calculate based on information provided	**16.6%**	6.7	6.7	7.0	7.0	6.4	1.116	1.116	1.164	1.164	1.069
3	**Implementable** - Rates can be implemented without significant resources to develop or assign characteristics (such as square footage or number of plumbing fixtures, for example) to each customer account	**9.8%**	8.1	7.4	7.4	6.9	6.0	0.794	0.724	0.724	0.669	0.585
4	**Administrative Ease** - Rate or fee structure can be updated and maintained for each customer with little effort	**13.8%**	7.1	6.1	6.4	5.7	5.1	0.982	0.845	0.884	0.786	0.707
5	**Affordable** - Rates are affordable to community, or if not affordable to a segment of the community, a program is in place to provide relief or assistance	**11.5%**	4.3	5.7	6.4	7.3	7.4	0.493	0.657	0.739	0.838	0.854
6	**Defensible** - Rate development process reflects attempt to identify water usage differences among various customer categories with limited data available	**11.8%**	4.6	5.9	6.6	7.4	6.6	0.539	0.691	0.775	0.876	0.775
7	**Public Acceptance** - Recommended alternative is perceived as fair and generally equitable by diverse customer groups	**10.9%**	4.3	5.4	6.4	7.0	6.6	0.466	0.590	0.699	0.761	0.715
8	**Political Support** - Rate development process and recommended alternative represents a solution that will be supported by Mayor and Council	**11.0%**	4.3	5.3	6.3	6.6	6.0	0.471	0.581	0.691	0.723	0.660

Evaluation of Rate Options based on Policy Objectives

Non-Residential Outdoor Rates

			Matrix of Raw Scores (1-10)					*Weighted Scores*				
	Policy Objectives	**Weight**	**Rate Option #1**	**Rate Option #2**	**Rate Option #3**	**Rate Option #4**	**Rate Option #5**	**Rate Option #1**	**Rate Option #2**	**Rate Option #3**	**Rate Option #4**	**Rate Option #5**
	TOTAL:	**100.0%**	45.0	48.1	52.1	50.3	55.1	**5.671**	**6.064**	**6.536**	**6.297**	**6.951**
1	**Equitable** - Rate structure reflects average cost of providing service to different groups based on area, function, customer class, and service characteristics-- *to the extent data allows*	**14.7%**	4.7	6.1	7.1	6.9	8.6	0.693	0.904	1.051	1.009	1.261
2	**Understandable** - Rates and fees are transparent and easy for general public to understand and calculate based on information provided	**16.6%**	7.1	7.1	6.7	6.3	7.4	1.188	1.188	1.116	1.045	1.235
3	**Implementable** - Rates can be implemented without significant resources to develop or assign characteristics (such as square footage or number of plumbing fixtures, for example) to each customer account	**9.8%**	8.3	6.3	7.0	6.4	5.7	0.808	0.613	0.683	0.627	0.557
4	**Administrative Ease** - Rate or fee structure can be updated and maintained for each customer with little effort	**13.8%**	7.1	5.4	6.3	6.0	4.7	0.982	0.746	0.864	0.825	0.648
5	**Affordable** - Rates are affordable to community, or if not affordable to a segment of the community, a program is in place to provide relief or assistance	**11.5%**	5.3	6.1	6.6	7.0	8.0	0.608	0.706	0.756	0.805	0.920
6	**Defensible** - Rate development process reflects attempt to identify water usage differences among various customer categories with limited data available	**11.8%**	3.9	5.6	6.0	5.7	7.6	0.455	0.657	0.708	0.674	0.893
7	**Public Acceptance** - Recommended alternative is perceived as fair and generally equitable by diverse customer groups	**10.9%**	4.0	5.7	6.1	5.9	7.1	0.435	0.621	0.668	0.637	0.777
8	**Political Support** - Rate development process and recommended alternative represents a solution that will be supported by Mayor and Council	**11.0%**	4.6	5.7	6.3	6.1	6.0	0.503	0.629	0.691	0.676	0.660

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