

**JOHN ALKE**  
**CHRISTIAN DIETRICH**  
HUGHES, KELLNER, SULLIVAN & ALKE, PLLP  
40 West Lawrence, Suite A  
P.O. Box 1166  
Helena, MT 59624-1166  
(406) 442-3690

**ATTORNEYS FOR UTILITY SOLUTIONS, LLC**

**DEPARTMENT OF PUBLIC SERVICE REGULATION  
BEFORE THE PUBLIC SERVICE COMMISSION  
OF THE STATE OF MONTANA**

\* \* \* \* \*

<b>IN THE MATTER OF</b> the Application of )	<b>UTILITY DIVISION</b>
<b>UTILITY SOLUTIONS, LLC</b> to )	
Implement Initial Rates and Charges )	<b>DOCKET NO. D2005.11.163</b>
for Water Services in its Elk Grove )	
Subdivision, Gallatin County, Montana )	
Service Area )	
)	<b>Consolidated with</b>
<b>IN THE MATTER OF</b> the Application of )	<b>UTILITY DIVISION</b>
<b>UTILITY SOLUTIONS, LLC</b> to )	
Implement Initial Rates and Charges )	<b>DOCKET NO. D2005.11.164</b>
for Wastewater Services in its Elk )	
Grove Subdivision, Gallatin County, )	
Montana Service Area )	

**POST HEARING BRIEF**

**STATEMENT OF THE CASE**

**A. Introduction**

This docket is a proceeding to establish initial rates for water and sewer service provided by Utility Solutions, LLC ("Utility Solutions") to the residents of the Elk Grove subdivision. The docket has been pending before the Commission for six years.

Utility Solutions first filed for initial rates on October 27, 2005. Its Application for initial water rates was denominated PSC Docket D2005.11.163. Its Application for initial sewer rates was denominated PSC Docket D2005.11.164. The 2005 Applications for initial rates were prepared for Utility Solutions by its rate making expert, Mr. Ronald R. Woods. Mr. Woods was a former rate analyst for the Commission.

On January 13, 2006, the Commission issued Interim Orders 6707 and 6708 in the two dockets. The Interim Orders implemented the “as filed” rates on an interim basis. Both orders required Utility Solutions to make additional filings in the dockets on July 1, 2007, to develop permanent rates using annual revenue requirements for providing water and sewer service based upon a 2006 historic test year.

The required follow-up filings were made on August 12, 2007.<sup>1</sup> The Montana Consumer Counsel petitioned for intervention in both dockets, which was granted by Notice of Staff Action dated September 18, 2007. The two dockets were consolidated into a single proceeding under a Notice of Commission Action dated November 14, 2007.

Mr. Woods, who was battling cancer, became seriously ill and tragically died on September 26, 2008. Utility Solutions had to obtain another rate making expert. Also, by that time the historic test period used in the 2007 filings (test year 2006) was out of date. On December 5, 2008, Utility Solutions filed with the Commission a motion to vacate the procedural schedule in the docket, premised upon a June 30, 2009, filing of an updated cost of service, using 2008 as the historic test year. The motion was granted.

Utility Solutions retained Ms. Sandra Barrows, also a former rate analyst for the Commission, as its new rate making expert. Ms Barrows prepared, and Utility Solutions filed,

---

<sup>1</sup> Utility Solutions sought and received permission from the Commission for the later filing date. Notices of Commission Action dated July 5, 2007.

an Amended Application for initial rates for water and sewer service, based upon a 2008 historic test year. Its Amended Application for initial rates for water service established an annual revenue requirement of \$327,499. Its Amended Application for initial rates for sewer service established an annual revenue requirement of \$356,305.

The rate making expert for the MCC in this proceeding is Mr. Paul R. Schulz. After conducting discovery in the docket, including an on-site discovery audit, Mr. Schulz developed a significantly lower cost of service for both water and sewer service. He advocated that the annual revenue requirement for water service should be limited to \$238,077. He advocated that the annual revenue requirement for sewer service should be limited to \$251,877.

The MCC filed the testimony of Mr. Schulz, on December 23, 2009. By that time this docket had been pending for four years. To bring an end to the proceedings, Utility Solutions decided to accept, rather than challenge, the lower annual revenue requirements advocated by the MCC. Accordingly, on January 8, 2010, Utility Solutions entered into a Stipulation with the MCC that accepted the litigation position of the MCC in this docket, the annual revenue requirements for water and sewer service developed by Mr. Schulz and advocated by the MCC.

Unfortunately, the difficulties Utility Solutions had in getting its rate case to hearing was followed by the Commission's difficulty in getting the case to decision. The internal workings of the Commission in the PSC proceedings involving Utility Solutions took a decidedly dark turn.<sup>2</sup> That led Utility Solutions to make a public records request to obtain the internal correspondence of the Commission, including emails, in all pending Utility Solutions cases,

---

<sup>2</sup> Utility Solutions believes that the majority of the Commission's internal problems were created by Commissioner John Vincent's very personal involvement in the Utility Solution cases pending at the PSC. It has filed concurrently with this post hearing brief a motion to disqualify Commissioner Vincent from further participation in the docket.

including this docket. Then Commission Chairman Jergeson committed to honor the public records request by letter dated February 5, 2010.

On March 3, 2010, Utility Solutions filed a request to implement the MCC advocated rate levels, on an interim basis, in accordance with the Stipulation between them. Both the MCC and the Commission Staff supported granting the motion, as did Commissioner Chairman Jergeson. The request was rejected by the Commission on March 17, 2011. The Commission's brief Notice of Commission Action provided no explanation for rejecting the request for interim rates. On March 23, 2010, Utility Solutions notified the Commission it was self implementing the stipulated rates under Section 69-3-302(2), MCA.

The contested case hearing in this docket was originally scheduled for April 7, 2010. However, the Commission neglected to issue the required public notice, and the contested case hearing had to be rescheduled for May 3, 2010.

At the close of the contested case hearing, it was agreed that the briefing schedule would not only be tied to the parties' receipt of the hearing transcript, but the receipt of the documents being produced by the Commission in response to the public records request. The Commission did not produce any documents pursuant to the public records request until June 22, 2011. On September 9, 2011, the Commission established a schedule for submitting post hearing briefs in this docket. October 14, 2011, was set as the date for the filing of post hearing briefs. At the request of Utility Solutions, that was recently extended by three more business days, to October 19, 2011.

**B. Summary of Testimony**

There were only two witnesses at hearing - Ms. Barrows and Mr. Schulz.<sup>3</sup> Both testified in support of the rates which reflected the MCC's litigation position in this docket, and which had been self implemented on April 1, 2011, under Section 69-3-302(2), MCA. No member of the Commission Staff presented testimony or analysis different than that presented by Utility Solutions and the MCC.

**C. Issues**

There are no issues between the parties, and no real rate making issues in this case. The Stipulation filed by the parties in this docket is fairly unique in that it is not a negotiated settlement framed at either end by the advocacy position of the stipulating parties. In this case, Utility Solutions agreed to accept the litigation position of its adverse party, the MCC.

Ultimately, the Commission must decide whether to adopt the rates developed by the MCC as the Commission's final decision in this case. However, a Commission decision not to adopt the MCC's litigation position as the final outcome in this case would have to be supported by record evidence. There is a dearth of record evidence which would support a Commission decision rejecting the MCC's litigation position as the final outcome in this case.

**ARGUMENT**

**I. An initial perspective.**

Although the Commission prides itself as being a consumer oriented body, it does not sit in a rate case proceeding as the advocate for the consumer. By law, a public utility rate

---

<sup>3</sup> There was extensive public comment from the residents of Elk Grove, and the Elk Grove Home Owners Association ("HOA"). The Commission also likely received written public comment via email or through its website. However, public comment is not given under oath, and the parties are not allowed to cross examine public commentators. The Commission doesn't even provide the written public comments to the parties in the case (Utility Solutions and the MCC).

case must be conducted as a contested case proceeding. Section 2-4-103(4), MCA. Contested case proceedings are formal. All witness testimony must be given under oath and subject to cross examination. Section 2-4-612(4) & (5), MCA. In a rate case hearing, the rules of evidence apply. Sections 2-4-612(2), MCA.

Additionally, a public utility rate case is largely prepared and presented by expert witnesses. Accordingly, the Commission requires witness testimony be pre-filed. Procedural Order 6707c, ¶s 2, 15-16. The Commission uses pre-filed testimony as means of narrowing the issues which will be raised at hearing, *Id* at ¶ 15.

Under Montana law, when the MCC intervenes in a public utility rate case, it becomes the representative of the utility's customers, to the exclusion of the Commission.

**Role of commission when consumer counsel protests.** In any case involving an application by a regulated entity to the commission for authority to increase its rates that is actively contested by the consumer counsel, the commission shall leave representation of the interests of consumers to the consumer counsel when the consumer counsel timely petitions to become a party to the case.

Section 69-2-102, MCA.

II. **The administrative record in this case will not support the rejection of the Stipulation.**

The administrative record in this case is specified by the Montana Administrative Procedure Act, Sections 2-4-101 *et seq*, MCA ("MAPA"). Section 2-4-614, MCA defines the elements of the administrative record. In this case, the controlling aspect of the administrative record is the inescapable fact that the only two people to testify, Ms. Barrows and Mr. Schulz testified in support of the Stipulation, and the rates developed by MCC witness Schulz as the litigation position of the MCC.

There is no properly admitted evidence in this proceeding which would support a Commission decision to reject the Stipulation. The testimony of Mr. Schulz supports the rates

set forth in the Stipulation, as the Stipulation adopted the litigation position of the MCC in this docket. Mr. Schulz authored that litigation position. The testimony of Ms. Barrows supports rates higher than the rates developed by Mr. Schulz. However, the Commission is not going to reject the Stipulation in order to establish rates higher than those agreed to by the MCC and Utility Solutions.

No witness provided testimony which would support rejection of the Stipulation. Although the Commission Staff was free to propose a different outcome at hearing, it did not. A Commission Staff recommendation must be introduced as evidence at hearing. Section 2-4-614(1)(g), MCA. Although the HOA and residents of Elk Grove spoke against the Stipulation at hearing, their comments do not constitute record evidence, as they do not testify under oath, and are not subject to cross examination.

**III. The additional issue.**

On January 8, 2010, the Commission notified Utility Solutions and the MCC that it had an additional issue not addressed by the parties. The additional issue that was identified related to the conformity of the Utility Solutions rate filing to the NARUC system of accounts.

Has USLLC prepared its statements and schedules in accordance with the general classifications set forth in the NARUC System of Accounts as required by ARM 38.5.110? In the absence of a General Ledger demonstrating compliance with ARM 38.5.110, the Commission finds that there is a necessity for further examination of the records of USLLC in order to assure that there are no inappropriate charges allocated to the customers of Elk Grove Subdivision.

Notice of Additional Issue, dated January 8, 2010.

Ms. Barrows provided pre-filed testimony in response to the Notice of Additional Issue on January 21, 2010. First, she noted that the Commission had not deemed the June 30, 2009 Amended Application for Initial Rates deficient within 30 days of filing, as required by Commission rule ARM 39.5.184. She then testified that small water utilities such as Utility Solutions can not afford to maintain regulatory books in accordance with the NARUC system

of accounts, because of the significant expense that would be incurred in hiring the expertise necessary to prepare and maintain such regulatory books. Utility Solutions Ex. 5, pg 3-4. She testified that a requirement that a small water utility maintain such regulatory books would likely generate an annual expense that would be the single largest cost of doing business, a cost which would be borne by the Utility Solutions customers. Id. She strongly recommended against the adoption of such a requirement in future rate cases, because of the adverse rate impact it would have on the Utility Solutions customer.

**IV. The perils of public comment.**

The residents of Elk Grove were well organized by the HOA, and were vocal opponents to the water and sewer rates proposed by Utility Solutions. They were also vocal opponents to the water and sewer rates proposed by the MCC.

The website of the HOA indicates that it considered active intervention in this docket in August of 2009:<sup>4</sup>

August 25, 2009 – Justin Buchanan and I spoke this afternoon and as the information has unfolded in my inquiries to the PSC and MCC, he related that it has been the board’s plan to become involved as an Intervener. In discussion with Justin, he came up with the wonderful idea that to deal with the information that will be coming out of this process, a committee of motivated homeowners with particular expertise to understand the process (accountant, attorney, engineer, etc) might be the best way to take in, analyze, and present information to the homeowners and the board.

Ultimately, the HOA decided not to intervene. Its strategic decision allowed the HOA and the residents of Elk Grove to provide both verbal and written “comment” to the Commission without having those comments subject to the rigors of the contested case procedures required by Montana law.

---

<sup>4</sup> Attached to this Brief as Appendix 1 is an excerpt from the HOA website which contains the referenced discussion.

The HOA and the residents of Elk Grove were allowed to submit written comments to the Commission without providing copies of their comments to either Utility Solutions or the MCC. They were allowed to speak at hearing without being sworn to tell the truth, and were shielded from cross examination. Apparently unfettered by the statutory prohibition against ex parte communications, they were allowed a regular dialogue with Commissioner Vincent which has forced Utility Solutions to seek his disqualification from further participation in this docket.

The verbal comments provided by the HOA and the residents of Elk Grove at the May 3, 2010, hearing provide a vivid example of the perils of public comment. Numerous commentators indicated their fervent belief that the third water well installed by Utility Solutions at Elk Grove was unnecessary, and should be excluded from the cost of service. Although they spoke with great certainty, they were completely mistaken. The installation of three wells had been required by the Montana Department of Environmental Quality (“DEQ”) as a condition of the approval of the Elk Grove subdivision. The developer of the Elk Grove subdivision deferred the installation of the third well when he was building what was called Phase I of the Elk Grove subdivision. As the development of the subdivision proceeded through what was called Phase II, and the build out of the subdivision occurred, Utility Solutions was required to bring the water system into compliance with the DEQ imposed public water supply requirements - which included a third well. Excerpts of an engineer’s report describing the DEQ compliance requirement in exquisite detail is attached to this Brief as Appendix 2.

### **CONCLUSION**

The Commission should issue a final order which makes permanent the rates derived in this docket from the advocacy of the Montana Consumer Counsel. Those rates have been in effect, on an interim basis, since April 1, 2010.

DATED this 19th day of October, 2011.

HUGHES, KELLNER, SULLIVAN & ALKE

By: John Alke

John Alke  
Christian Dietrich  
40 W. Lawrence, Suite A  
P. O. Box 1166  
Helena, MT 59624-1166

Attorneys for Utility Solutions, LLC

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a copy of the foregoing POST HEARING BRIEF was served upon the following by mailing a true and correct copy thereof on October 19th, 2011, addressed as follows:

MONTANA CONSUMER COUNSEL  
P O BOX 201703  
HELENA MT 59620-1703

John Alke  
John Alke

August 25, 2009 — Justin Buchanan and I spoke this afternoon and as the information has unfolded in my inquiries to the PSC and MCC, he related that it has been the board's plan to become involved as an Intervener. In discussion with Justin, he came up with the wonderful idea that to deal with the information that will be coming out of this process, a committee of motivated homeowners with particular expertise to understand the process (accountant, attorney, engineer, etc) might be the best way to take in, analyze, and present information to the homeowners and the board. #3

We may find that the MCC offers focused expertise and experience, or we may find that our own representative could aid the process. Now that we know that this won't happen until after the MCC executes their role of Discovery and analysis of the results and subsequently files their written (public) testimony with the PSC, we have time for considered options.

—Jerry

## More Info about the PSC and Utility Solution's Rate Increase

August 24, 2009 — I have just finished phone calls with Donna Turkowski of the Public Service Commission (PSC) and with Mary Wright of the Montana Consumer Counsel (MCC) who have provided clarity on working with the PSC in the most efficient manner and on how the MCC participates as the consumer (that's us) advocate in such filings.

The major points are:

You can eFile comments without first setting up an eDocument account as an "intervener." The comments have the same standing before the PSC and are submitted to and read by the commission. So use the comments at <http://psc.mt.gov/Consumers/comments/> under Docket No. D2005.11.163 and D2005.11.164.

The Montana Consumer Council has already taken an interest in this rate application and has filed as an intervener. They are the constitutionally mandated advocate for the consumer. I spoke with Mary Wright, attorney for the MCC, who will be working on this rate application. The MCC feels this rate application is exceptional and will be pursuing their mandate on it. John Vincent (ex-County Commissioner) is a member of the PSC and she understands that he has an interest in this rate application as well.

The deadline of Friday is to kick off a legal process that will take at least nine months, which will include a statement of procedure from the PSC laying out the process and deadlines during that period. This includes the MCC having Discovery to investigate rates and claims by Utility Solutions (US) and then research that information and provide written testimony. Then US has their period of Discovery, research and submits their testimony in rebuttal.

There WILL be a public hearing that will be here in our neighborhood.

We can help by submitting our comments (#1, above), and by submitting to the MCC any factual information of issues and circumstances that speak against the rate increase; emotional input has no standing.

Donna Turkowski informed me that our HOA board could hire an attorney to act as an Intervener on our behalf. Of course, we would incur costs in doing so. Utility Solutions is being represented by a consultant to help secure their success. We do have the MCC working for us, but are we losing an opportunity by not having our own attorney? *[We now enter the opinion part of this article]* But perhaps this might be a better place to spend money than in such things as painting the barn? In effect, Utility Solutions has chosen to treat Elk Grove as an adversary in seeking an unconscionable rate increase.

This will be a nine month process, at the end of which, more than likely, our rates WILL go up. The degree of that change will depend upon not only the MCC, but the extent of our own effort.

Both Mary Wright and Donna Turkowski were wonderful to chat with and supportive of our needs. Both offered their availability with their direct lines should any of us have any questions:

# UTILITY SOLUTIONS, LLC

## ELK GROVE WELL #3 SUMMARY REPORT

MAY 2010

Prepared By:



UTILITY SOLUTIONS, LLC  
ELK GROVE WELL #3 SUMMARY REPORT

**TABLE OF CONTENTS**

1.0	Introduction .....	<u>1</u>
2.0	Existing Water Treatment System.....	<u>2</u>
3.0	Well #3 Improvements .....	<u>5</u>
4.0	Summary.....	<u>8</u>

**Supplemental Information**

- A. EQ#08-1496
- B. Well Logs
- C. Applicable MDEQ Regulation Pages
- D. EQ#01-2095
- E. Warranty Deed-Concinnity, LLC to Utility Solutions, LLC
- F. Project Cost Summary

Utility Solutions, LLC  
Elk Grove Well #3  
Summary Report  
May 2010

**Section 1: Introduction**

The Utility Solutions, LLC Elk Grove water supply, treatment, storage, and distribution system is located in the Four Corners area of Gallatin County. More specifically, it is situated two miles south of the Four Corners intersection of Highway 191 (Gallatin Road) and Huffine Lane/Norris Road. The water system is also located approximately eight miles west of Bozeman, Montana and ten miles south of Belgrade, Montana.

The Elk Grove water system operates under the Montana Department of Environmental Quality (MDEQ) public water supply system PWSID MT0004248. It serves 3 residential phases with 299 single family lots along with a day care lot and 1 commercial phase with 12 lots contained in the Elk Grove Subdivision PUD. Water facilities were put in place by the developers of the subdivision to facilitate platting of the properties. In 2003, the water and wastewater systems for the Elk Grove Subdivision were sold to Utility Solutions, LLC by the developer, Concinnity, LLC.

Utility Solutions, LLC (USLLC) has provided public water utility service for the Elk Grove Subdivision from 2003 to present day. The central water facilities are owned, maintained, and operated by:

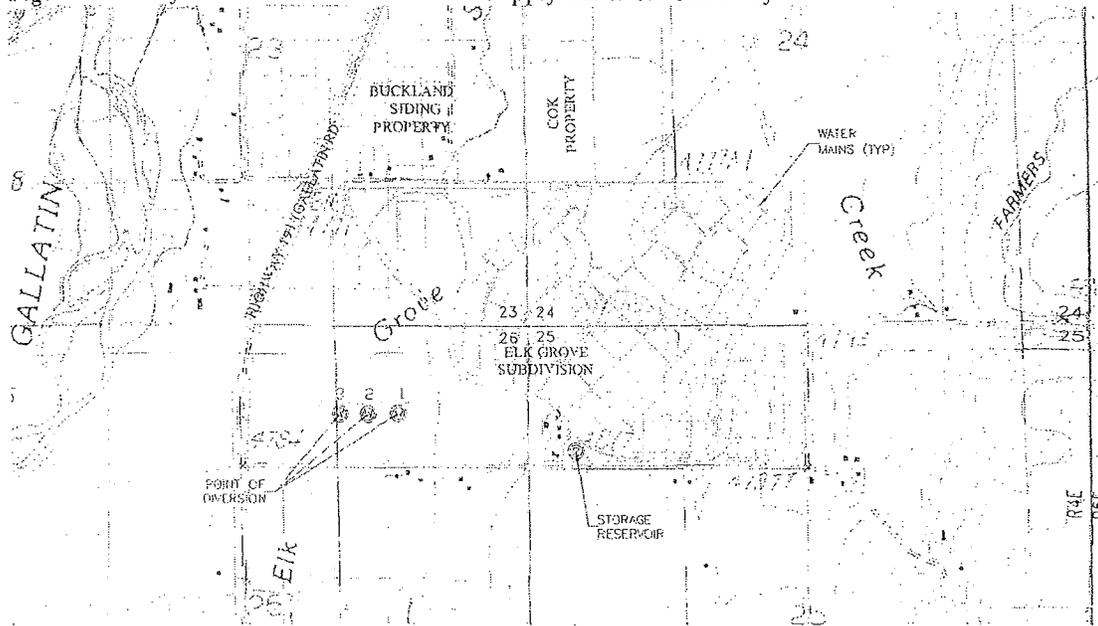


P.O. Box 10098  
Bozeman, MT 59719

The Elk Grove water system is a stand-alone system and is not physically connected to the water infrastructure serving all other USLLC service areas in Four Corners. Properties outside of Elk Grove Subdivision are served by the USLLC Northstar water supply and distribution infrastructure under PWSID MT0004396. There is no water supply by the Elk Grove water system to properties outside of the Elk Grove Subdivision. The Elk Grove water supply and distribution system is shown schematically in Figure 1.

The water usage demands placed on the Elk Grove water system have increased as the Elk Grove Subdivision approaches full build-out. A direct result of those increasing demands created the need for additional water source development in the form of a third well. The history of engineering design and MDEQ approvals for the well supplies will be discussed further in this report.

Figure 1: Utility Solutions Elk Grove Water Supply and Distribution System



## Section 2: Existing Water Treatment System

Supply, treatment, storage, and distribution of water for the Elk Grove Subdivision is provided by three groundwater supply wells, a chlorination disinfection system, a 246,000 gallon storage reservoir, a booster pump station with backup power, and distribution water mains. Of those components, Morrison-Maierle, Inc. (MMI) provided engineering design for and USLLC completed installation of Well #3, well connection piping, chlorination disinfection, and backup power in 2009. The engineer of record for the original water system improvements is Fluidyne, Inc.

Demands that are met by the public water infrastructure include potable, irrigation, and fire protection for all properties in the Elk Grove Subdivision. Calculations of the demands were originally calculated by Fluidyne, Inc. in an Engineer's report for the Elk Grove Water System dated 12/16/99 with MDEQ approval (EQ#01-2195) of the report on 3/15/00. Maximum day demand anticipated in Table 1 of that report is 355,400 gpd. Based on that, three wells with pumping capacity of 180 gpm each were proposed to satisfy peak potable and irrigation demand. Two wells were to be built for Phase 1 of the subdivision and the third would be built with Phase 2 of the subdivision. Phase 2 of the subdivision was final platted on 9/2/2003.

In 2007, the USLLC water operator began to experience situations where the two wells were running at near capacity during the summer irrigation season and he was concerned about the potential of a problem with one of the wells at any time. If one well were to have a failure, the water supply would not keep up with demand. Another issue causing concern was power outages. In the event of a power outage, the water system could be depressurized without pumps. This would allow for potential contamination of the water system due to backflow. In addition, without pumps, basic water service could be

interrupted and fire hydrants could be unpressurized. The operator did experience power outage events and had valid concerns about keeping the water system on-line. With both of these issues, the operator's concerns were substantiated by the fact that a third well and backup power were originally proposed for the Elk Grove water system in EQ#01-2195, but never implemented during construction of the subdivision improvements.

Since the approval under EQ#01-2195 expired on 5/22/04, new design plans and specifications had to be resubmitted and approved prior to the commencement of construction. Updated demand calculations were compiled by MMI to produce design plans and specifications for the Well #3 improvements using MDEQ requirements current in 2008 and with use of available existing flow data from USLLC. During the permitting review process, a flow of 160 gpd/dwelling unit on the single family units was established with MDEQ based on actual flow data available for the water system. The updated demands used for design are as follows:

Domestic Demand:

Elk Grove Subdivision Residential:

- Total number of single family lots in Elk Grove Subdivision: 300 lots containing 1 home with 1 EDU usage each

$$(300 \text{ dwellings})(160 \text{ gpd/dwelling unit}) = 48,000 \text{ gpd (33.3 gpm)}$$

Elk Grove Subdivision Commercial:

- Total area of commercial district: 15.82 acres
- Anticipated commercial density for commercial district = 30 employees/acre
- Office wastewater generation equal to 10 gpd/employee (DEQ-4, Table 5-1)

$$(15.82 \text{ acres})(30 \text{ employees/acre})(10 \text{ gpd/employee}) = 4,746 \text{ gpd (3.3 gpm)}$$

$$\text{Total Elk Grove Subdivision} = 52,746 \text{ gpd (36.6 gpm)}$$

The maximum day demand is computed below based on standard peaking factors for a similar population given in Table 26.4 of *Land Development Handbook, Planning Engineering, and Surveying, Second Edition*, Dewberry, 2002:

$$\text{Maximum Day Demand} = (36.6 \text{ gpm})(3.0) = 109.8 \text{ gpm}$$

Irrigation Demand:

Residential irrigation and commercial irrigation of select landscaping is expected to occur at night or early morning. Elk Grove includes 125.2 acres of irrigable landscaping with an irrigation rate of 1.55 acre-ft/acre. An irrigation volume of 63,350,353 gallons/year was used in the updated demand prediction.

$$(63,350,353 \text{ gallons/year}) / (365 \text{ days/year}) / (1,440 \text{ minutes/day}) = 120.5 \text{ gpm}$$

$$\text{Maximum Day Demand} = (120.5 \text{ gpm})(3.0) = 361.5 \text{ gpm}$$

**Table 1: Demand Summary**

	Potable Demand (gpm)	Irrigation Demand (gpm)	Total Demand (gpm)
Average Day	36.6	127.5	164.1
Maximum Day	109.8	361.5	471.3

In order to add Well #3 to the existing water system, it had to meet the most current MDEQ requirements at the time of design submittal. There were changes to the MDEQ design requirements between the time of the original Fluidync MDEQ approval and the Well #3 MDEQ approval in 2008. As noted previously, the original plan approval could not be used because MDEQ approvals expire after three years. USLLC was able to continue using the existing water rights obtained for the subdivision by the developer under permit 41H-110168-00. These water rights allow for the use of 404 ac-ft of water with 28 ac-ft for commercial, 84 ac-ft for multiple domestic, and 292 ac-ft for irrigation at a maximum flow rate of 525 gpm.

Every effort was made by MMI and USLLC to integrate the new Well #3 into the existing Elk Grove water system in the most efficient and cost effective approach, but there were some challenges in dealing with regulations that had changed since the original design and approval of the existing water system. Two deviations from standards were granted by MDEQ based on engineering justifications with relation to the total developed groundwater source capacity and minimum allowable storage. The general idea of a deviation is to maintain an adequate level of public safety while allowing for some flexibility of design. This flexibility was needed to deal with the design requirements of the original water system compared to the design requirements at the time of Well #3 review.

Total developed groundwater source capacity, according to MDEQ requirements at the time of the Well #3 design, was to provide enough water to supply the maximum day demand with the largest well out of service. In this case, the maximum day demand is 471.3 gpm. The two existing wells are designed to produce 180-185 gpm each and the combination of the two would theoretically produce up to 370 gpm. That is not enough production to meet the maximum day demand. To meet the requirement, one of the existing wells would need to run in combination with the new Well #3 for a production of up to 525 gpm, which is the maximum diversion rate on the water right. Worst case scenario would have been to construct a fourth well or re-drill one of the existing wells with expanded production capacity to provide two wells with higher capacity to meet the requirement. After communication with MDEQ, a deviation was granted to allow the new well to be used with the existing well field, but a spare pump for the new higher production well must be kept in stock for quick replacement if a failure occurs.

During the design and review of the Elk Grove Well #3 improvements, there were also concerns raised by MDEQ about the capacity of the existing 256,000 gallon water storage reservoir. The basic requirement at the time of Well #3 design was for reservoirs to store the 24-hour average day demand plus fire flow volume. Average day demand for the Elk Grove water system is 226,310 gallons including potable and irrigation volume and the fire protection volume is 120,000 gallons for a total of 346,310 gallons. A deviation was granted by MDEQ based on an engineering analysis that shows the tank will maintain a fire protection volume of 120,000 gallons even during maximum day conditions from potable and irrigation usage. That deviation averted the potential need for an increase in storage capacity, increased well field production, and/or additional permanent backup power requirements at the well field site.

### **Section 3: Well #3 Improvements**

Original plans for Elk Grove Subdivision called for three public supply wells as approved by MDEQ under EQ#01-2095. Only two of the three wells were constructed along with the subdivision improvements. The improvements described herein detail the construction and installation of Well #3. The initial project consisted of installing a new groundwater well for public water supply, a metering vault, and an extension of the existing water supply main to connect the new well to the existing system. Chlorine disinfection and backup power were added in order to obtain MDEQ approval to proceed with construction during the review process.

Each component of the improvements will be discussed with respect to its function, applicable regulatory (MDEQ) requirements, benefit to the overall public water system, and cost. A detailed cost summary is included in Appendix F.

#### Well #3

This component consists of an 8-inch vertical well casing to a depth of 45.5 feet below the ground surface with a 10.6 foot stainless steel screen. A 20 hp pump with a 6" drop pipe moves water from the bottom of the well up to a metering vault. This configuration was necessary to produce 340 gpm which, in combination with one of the other existing wells, will produce 525 gpm. Installation work included pump testing the well and well development to reduce sand production and increase hydraulic efficiency. This item also included a spare pump that was required by MDEQ as part of a deviation from standards request. Since the 2 existing wells have a lower supply capability, the well field cannot meet the maximum day demand with the largest well (Well #3) out of service and a spare pump was required to reduce down time if the Well #3 pump or motor fails. The well was designed to satisfy MDEQ Circular DEQ-1 requirements in Chapter 3.2 for groundwater sources.

Addition of the 340 gpm Well #3 to the well field allows USLLC to pump groundwater to the water storage reservoir at a rate equal to the 525 gpm maximum diversion rate listed on the water right which will serve the maximum day demands of the Elk Grove Subdivision based on the calculations listed previously in this document. The 525 gpm is

a combined flow rate of Well #3 and one of the existing wells operating together. An 8" casing was used for Well #3. The casing had to be sized to accept a test pump capable of producing 1.5 times the final pumping rate in accordance with DEQ 1.3.2.4. The tested rate of 510 gpm was required to allow for the final pump design yield of 340 gpm. Pumping equipment to produce a yield of 510 gpm requires a pump with a minimum effective diameter of 7 inches. A submersible pump, Goulds 7TLC-2, was specified in order to fulfill both the pump testing requirement of 510 gpm and the final pumping requirement of 340 gpm. This allowed for a reduced cost to the project as the drilling contractor did not need to provide a separate submersible test pump for testing and reduced the amount of labor involved as the production pump was used for testing, negating the need to install and remove temporary testing equipment. Further reasoning on the choice of an 8-inch casing of over a 6-inch casing was in head losses and velocity of water at the pump motor. Use of an 8-inch casing well reduces the head losses and velocities which improves expected equipment life and decreases pumping head requirements and pumping costs.

Cost of \$31,201.40 to Haggerty Drilling, Inc. (Well #3)

Cost of \$3,779.00 to Haggerty Drilling, Inc. (Existing Well Pump Replacement)

### Well Site

Improvements at the well site include a new fence, site electrical, controls, a well valve vault, and piping to connect Well #3 with the existing well main line approximately 270 feet east at the existing wells.

Fencing to protect the new well from potential sources of contamination was needed to meet MDEQ Circular DEQ-1 Chapter 3.2.3.2. In this case, the property around the well is used for livestock grazing periodically and the fencing was deemed necessary to maintain the 100-foot protection radius around the well.

Site electrical improvements provided the wiring and panels needed to supply Well #3 with power to run the well pump, flow meter, and controls. The power wires had to be run from an existing electrical service meter and breaker panel location approximately 270 feet to the east adjacent to existing Well #2.

Controls and Telemetry for Well #3 consist of a control panel and radio communication with the booster pump building where the tank level determines the need for a well run signal. Hard wiring originally installed between the booster pump building and the existing wells was direct bury and experienced failure due to rodents chewing it up.

The metering vault generally consists of a buried precast concrete vault with piping, a flow meter, a flow control/check valve, sampling provision, isolation valving, and water blow-off capability. The metering vault was designed to satisfy MDEQ Circular DEQ-1 requirements in Chapter 3.2.7.3 for discharge piping and appurtenances.

Piping to connect Well #3 to existing well piping is 6" and 8" PVC water main with isolation valves. A live tapping tee was used to connect to the existing water main to maintain service from the existing wells during construction as no isolation valve for future extension to Well #3 was provided in the existing pipeline. The whole well supply pipeline from the well field to the booster pump building would have been drained without the live tapping procedure that was used. Another cost of construction for this component was dewatering. Static groundwater level on the construction site was higher than the pipe installation elevation and groundwater was pumped away from the site. The connection piping was designed to satisfy MDEQ Circular DEQ-1 requirements in Chapter 8 for transmission mains, distribution systems, piping, & appurtenances.

Cost of \$81,758.00 to Williams Civil Division (Well #3)

### Booster Station

Improvements at the booster station include electrical, controls, a chlorination disinfection system, safety equipment, a flow meter, a chlorine residual analyzer, ventilation, spill containment, and access provisions.

The chlorination disinfection system consists of a peristaltic pump, plumbing, a sodium hypochlorite storage tank, and injection tap on the water main feeding from the wells to the storage reservoir. Safety equipment provided includes personal protective devices, an eye wash/shower, tempered water, and ventilation. These safety precautions are required with the chlorination disinfection system to protect the operator in accordance with the Material Safety Data Sheet (MSDS) for the chemical. A new flow meter was installed on the water main feeding from wells to the storage reservoir to replace an inoperable existing flow meter and to provide a unit with outputs that are used to flow pace the chlorinator pump. A chlorine residual analyzer was installed to monitor water leaving the booster pump station to ensure adequate levels of disinfectant in the water. Electrical and controls work was completed to provide a working installation for the chlorination disinfection system, ventilation, and flowmeter along with communication with the well field. These improvements are in accordance with MDEQ Circular DEQ-1 requirements in Chapters 3.2.5.2.c, 4.3, and 5.

Disinfection of groundwater sources was required by MDEQ at the time of design review for the Well #3 project. The first submittal of the Well #3 improvements did not include a disinfection system. MDEQ reviewers commented that a disinfection system was required due to the static water level of groundwater being less than a depth of 25 feet below the ground surface at the well field site. Under the original Elk Grove Subdivision improvements approval (EQ#01-2095), disinfection was not required and the regulations changed from that time until 2008 when the Well #3 project was reviewed.

Cost of \$55,504.00 to Williams Civil Division (Well #3)

Cost of \$1,562.78 to Tryon General Electric (Well and Booster Pump Maintenance)

### Backup Power

Backup power was installed at the booster pump station to allow the pumps to continue running even if there is a Northwestern Energy power service outage in the area. This improvement included a natural gas powered generator set on a concrete pad along with an automatic transfer switch and a natural gas service feed installation.

The backup power was provided to satisfy MDEQ Circular DEQ-1 requirements in Chapter 6.6.6 for pumping facilities. Backup power maintains essential water service including fire protection water in the event of power failure. A backup power generator was also part of the Elk Grove Subdivision improvements plans under EQ#01-2095.

Cost of \$33,486.00 to Williams Civil Division (Well #3)

### Miscellaneous Costs

Cost of \$65,700.22 to Morrison-Maierle, Inc. for engineering services including research of existing water system, topography survey of sites, design of a public water supply well, water main transmission piping, disinfection system, backup power, booster station site grading, electrical, controls, PWS-6 Source Water Protection Plan, storage reservoir analysis, MDEQ submittals, contract documents, construction inspection, pump testing, startup, certification, and as-built drawings. (Well #3).

Cost of \$18,174.33 to Morrison-Maierle, Inc. for engineering services including general consultation with USLLC concerning on-going water system MDEQ compliance, hydraulics, electrical, controls, and maintenance. (Water System Consultant Engineering).

Cost of \$23,384.56 to Double-Tree, Inc. for project management (Well #3).

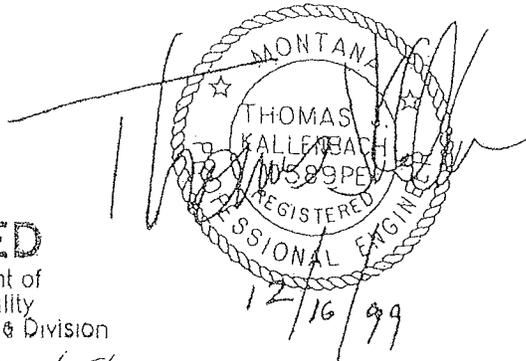
The cost of the Elk Grove Well #3 project was \$291,034.18 and the cost of maintenance on the existing wells and booster pumps was \$23,516.11 for a combined expense total of \$314,550.29.

### **Section 4: Summary**

USLLC operates the Elk Grove water system according to public water system rules and requirements as administered by the MDEQ. Water system engineering design for Well #3 was intended to meet the regulatory requirements for a public water system and provide a level of service that is consistent with normal expectations of the water users. For the Elk Grove water system, the uses include potable, irrigation, and fire protection uses. The improvements constructed for Elk Grove Well #3 along with the chlorination disinfection system and backup power were necessary to meet MDEQ rules and requirements at the time of design approval and provide the Elk Grove water users with safe and reliable public water system service for many years to come.

# ELK GROVE WATER SUPPLY SYSTEM

SUBMITTAL TO MONTANA DEPARTMENT  
OF ENVIRONMENTAL QUALITY



**APPROVED**  
Montana Department of  
Environmental Quality  
Permitting and Compliance Division

*Greg W. Payel* 3/15/00  
Reviewer Date

Prepared by:  
FLUIDYNE Inc.  
December 15, 1999

**RECEIVED**

DEC 20 1999

25 N. Willson Ave., Suite F  
Bozeman, MT 59715

MONTANA  
DEPT. OF ENVIRONMENTAL QUALITY  
COMMUNITY SERVICES BUREAU

# WATER SUPPLY SYSTEM SUBMITTAL

## ENGINEER'S REPORT

### General

The proposed public water supply system will serve a proposed 322 lot subdivision named Elk Grove. This report deals with the 550,000 GPD water supply system that will eventually serve this development. Elk Grove Subdivision will be a phased development and the capacity of the supply system will reference time frames related to the phase of the development.

This water supply system will be privately owned and installed by:

Concinnity Corporation  
C/O FLUIDYNE  
25 North Willson, Suite F  
Bozeman, MT 59715

All financial aspects of installation and start-up operation are the sole responsibility of Concinnity Corporation until ownership is transferred to the utility company.

This report addresses the water supply system providing water for Elk Grove Subdivision. In general the capacity of the system will exceed requirements of Elk Grove alone and the system capacity will be described as an average day demand that the system is capable of providing at reasonable pressure. It is the goal of Concinnity Corporation to operate this supply as a local utility and provide distribution and service as required.

Distribution mains delivering water to Elk Grove Subdivision will be designed as they are required. This report will completely identify water supply issues so that as long as capacity exists, future main extensions will not be required to re-visit this issue. Therefore this report will clearly and fully describe the water supply system capacity.

A layout of the water supply system is provided on Sheet C2.0.

### Extent of Water Works System

The proposed water supply system consists of 3 groundwater wells, discharge piping, water storage tank, and water supply pump house. Future water main extensions will connect to the outlet line from the pump house.

Well pumps in the water supply wells will be controlled by water tank level with lead/lag operation. The well pumps are manifolded to a single 8" diameter line running into the pump house. Flow is metered and sample ports are provided before water enters the storage tank.

The storage tank is a factory constructed bolted-steel tank meeting AWWA D103. The storage tank is approximately 42 feet in diameter and 24 feet tall. The capacity below the overflow is approximately 240,000 gallons. A 12" outlet provides water to the water supply pumps.

The water supply pumps are variable speed centrifugal pumps. The three pumps are comprised of: a small lead pump for flows of 0 to 120 gpm, and two large lag pumps each capable of pumping 620 gpm at 55 psi, for a total flow of 1360 gpm at 55 psi. An additional connection for another large pump is provided for future expansion. A sample port and hose bib is provided on the high-pressure side of the pumps.

Power outages in this area are rare and usually of short duration. Montana Power the power provider for this area, claims that a 6-8 hour power outage is a 10 year event, and a 24 hour outage is a 20 year event. Emergency power is provided for the smallest booster pump in order to supply limited domestic flow to residents during outages. A draft line capable of providing emergency water supply for a fire truck connection, is provided on the north side of the pump house.

The groundwater supply, storage tank, and water supply pumps will be addressed in their respective design reports.

#### Water Use Data

Water use from Elk Grove consists of domestic water use for 300 residential houses and 22 commercial lots, irrigation uses, and fire flows. The domestic water use from 300 residential lots is estimated using an average day usage of 250 gallons per day without irrigation. Irrigation demands of 1 inch per week on a 7000 sq. ft lawn is 620 gallons per day per lot. The maximum day demand occurs during irrigation and is the sum of the average domestic use and irrigation use, or  $250+620=870$  gpd. The water use from 22 commercial lots is unknown at this time but the maximum day demand is generously estimated at 25,000 gallons per day including irrigation. Water use for irrigation of park land at 1" per week is approximately 3900 gallons per day per acre. Table 1 shows the estimated water use and system capacity.

TABLE 1. Elk Grove Water Demand and System Capacity

Water Use			
Residential Domestic	300 lots	250 gpd/lot	75,000 gpd
Residential Irrigation	300 lots	620 gpd/lot	186,000 gpd
Commercial with Irrigation	22 units	1,100 gpd/unit	24,200 gpd
Park Irrigation	18 acres	3,900 gpd/acre	70,200 gpd
Anticipated Maximum Day Demand			355,400 gpd
Water Supply Capacity			
3 Supply Wells	Maximum pumping rate = 525 gpm		756,000 gpd
Proposed System Capacity with Storage Tank			550,000 gpd

Water use is expressed as an instantaneous demand using a demand time and a peaking factor. Domestic use will occur during a 960 minute interval between 6 AM and 10 PM. Using a peaking factor of 3.8 (provided from DEQ 2 for this population), a peak flow of 393 gpm is calculated. Irrigation use will be essentially constant and occur at night when domestic demands are minimal, from 10 PM to 6 AM, 480 minutes. The flow rate at night due to irrigation is 533 gpm.

Gallatin Gateway Rural Fire Department, the entity responsible for providing fire protection to this site, requires a fire hydrant flow of 1000 GPM with a residual pressure of 20 PSI. This flow rate in addition to domestic demands represents the maximum capacity of the system.

#### Hydraulic Analysis

The elevation of the bottom of the water tank is 4808' with a water surface at 4831'. The elevation of the wells is 4787'. A pumping water depth of approximately 50' below grade is estimated. The total static head predicted on the well pumps is approximately 94'. A system curve showing the operating point of the well pumps is provided in figure 1. With one pump running the flow rate into the tank is 185 gpm, with two pumps 360 gpm, and with all three pumps running, 525 gpm.

### Well Pump and System Curves

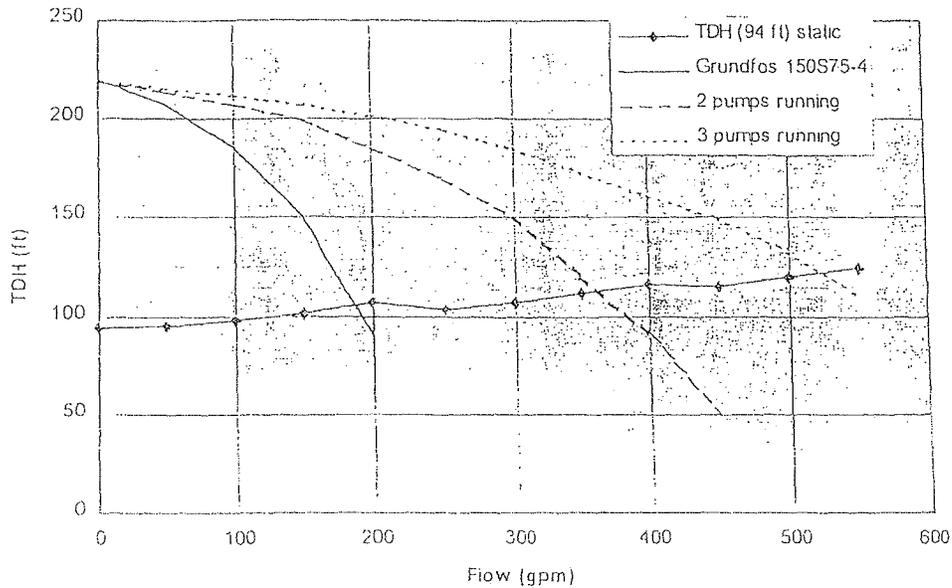
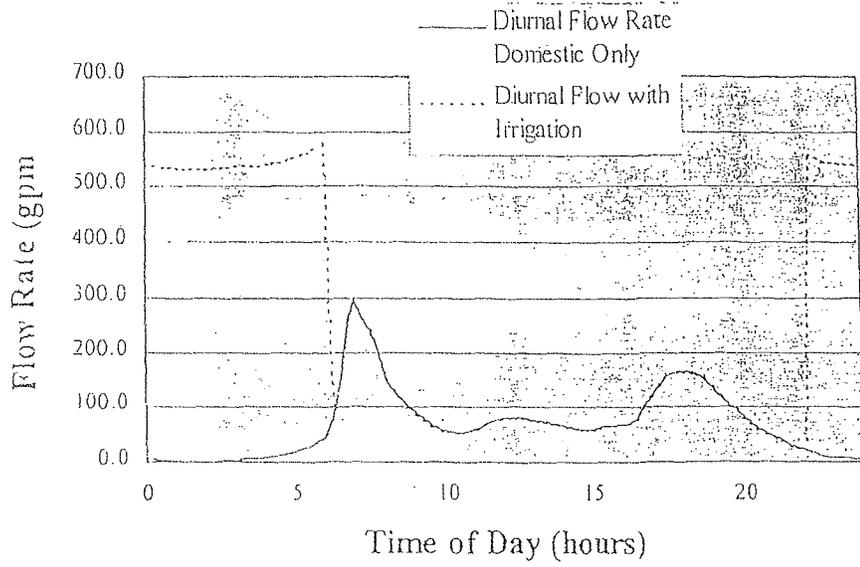


Figure 1. Well Pump (Grundfos 150S75) System Curves, for 3-pump system.

The water supply pumps will be set to provide a constant 55 psi at the pump house, el. 4806. The elevation of the highest anticipated service at grade is 4812', and the lowest anticipated service is 4768', a pressure difference of 19 psi, therefore system pressure at static conditions will range from about 52 psi to 71 psi. This pressure can be maintained up to flows of  $120+620+620 = 1360$  gpm. With all three pumps running at a residual pressure of 35 min psi (fire flows) the three pumps are capable of supplying 1590 gpm. Water main design will use these parameters to determine main sizes and distribution pressures at various demands. With properly designed water mains, the supply pressure and capacity is adequate to overcome most average water main pressure losses and provide water services with adequate pressures under all demands.

The water levels in the storage tank are predicted using the flow rates discussed earlier combined with the supply from the wells. The domestic flows were distributed during a day using an approximated diurnal curve. The diurnal curve shown in Figure 2 matches a peaking factor of 3.8 as described earlier.

## Diurnal Flow Rate



## Diurnal Flow and Water Tank Level

