

MEMORANDUM

DATE: November 7, 2019
TO: Shelley Keen, Nick Miller, Erik Boe, and Manuel Rauhut, IDWR
FROM: Terry Scanlan and Steve Hannula
JOB NO: 270.0470
CC: Chris Meyer – Givens Pursley
Nate Runyan, P.E. – City of Nampa Public Works
Tom Points, P.E. – City of Nampa Public Works
RE: Nampa Water Right Nos. 63-32835, 63-33968, 63-34229, and 63-34742 – (1) Combined System Gap Analysis – Shoulder Season and (2) Combined Cap Analysis

Overview

On August 13, 2019, representatives of the City of Nampa (Tom Points, Nate Runyan, Terry Scanlan, and Chris Meyer) met with IDWR representatives (Shelley Keen, Nick Miller, Manuel Rauhut, and Erik Boe) at IDWR's Western Regional Office. We discussed the City of Nampa's pending license and permit applications listed below:

Potable System:

- No. 63-32835 (pending license for RAFN permit)

Non-Potable System:

- No. 63-33968 (pending permit application for Farm & City well)
- No. 63-34229 (pending permit application for 7 wells)
- No. 63-34742 (pending permit application for Midland well)

Our discussion focused largely on the "gap analyses" and, to a lesser extent, on the "cap analyses" (short for capacity analyses) the City has performed in connection with some of these pending matters. From time to time, the City has provided gap and cap analyses based on its potable system, its non-potable system alone, and its combined system.

These gap and cap analyses address only the City's ground water rights. The City's potable system is served exclusively by ground water. The non-potable system is served by a combination of ground water rights and surface supplies from irrigation districts. Previously submitted gap analyses compared ground water rights to peak irrigation demand, based on the assumption that in some instances ground water may be the only irrigation water available (due to curtailments, emergency interruptions in surface water delivery, or unavailability during the shoulder season).

At the meeting on August 13, 2019, Department staff asked the City to modify its irrigation and combined system gap analyses to address the City's ability to meet irrigation demand during the shoulder season (rather than peak summer demand). This required developing an estimate of peak demand during the relevant time of the shoulder season. The results of that analysis are presented in this memo.

In preparing this memo, we asked the City's water counsel, Chris Meyer, to prepare a legal overview and technical summary of the gap and cap analyses. A copy of that memo, dated October 30, 2019, is attached hereto as Exhibit A. That memo, and its gap analyses, relied on the analysis presented in this SPF memo with respect to shoulder season irrigation demand.

The gap analyses are relevant to each of the four pending water rights referenced above. The relevant year for the three permit applications is 2024 (the end of the five-year development period). The relevant period for the RAFN license is 2030 (the end of the planning horizon). The bottom line is that a combined system demand gap, based on peak hour demand, is demonstrated beginning in the year 2020.

In addition, this memo adopts the revised "cap analysis" set out in the Meyer memo. A cap analysis compares system-wide pumping capacity with system-wide diversion authority under the City's ground water rights for each of the three systems (potable, non-potable, and combined).

The cap analyses are relevant only to the three permit applications, but only at the time of licensing. For reasons discussed in the Meyer memo, a cap analysis is not relevant to the permitting or licensing of a RAFN right. However, if the Department determines that a cap analysis is relevant to any of the pending matters, the revised cap analysis presented in the Meyer memo shows that the City will have sufficient capacity to divert all of its water rights by 2024 (the end of the current five-year development period).

Background

In his memo dated October 30, 2019 (Exhibit A), Chris Meyer lays out a comprehensive description of a "gap analysis" that compares the total authorized diversions by the City of Nampa's water right portfolio to the forecast demand and a "cap analysis" that compares the same water right diversion authority to physically installed capacity. The memo further describes the applicability of these two types of analyses to potable systems and non-potable systems and for reasonably anticipated future needs (RAFN) and non-RAFN applications.

The memo concluded, with certain assumptions, that there is a potential for a significant shortfall (gap) between the authorized diversion rate (water rights) and the forecasted demand that would be difficult for the City to overcome without additional authorized diversion rate. The gap analyses in the Meyer memo are based on reduced irrigation season demand during the shoulder season and full peak summer demand for the potable system. In other words, the City's non-potable demand drops off during the

summer season, while its non-potable demand experiences no corresponding decline during the shoulder season.

Much of the data for the gap and cap analyses were compiled from Nampa's Irrigation Master Plan (Keller Associates, 2014) and Nampa's Water System Master Plan (Keller Associates, 2014).

Purpose

Gap Analyses: The purpose of this memo is to demonstrate that the City of Nampa will periodically experience shoulder season demand for its non-potable delivery system and its combined system that is greater than the diversion rate authorized under the City's current portfolio of water rights for those systems.

Cap Analyses: In addition, the City is providing updated information with respect to its system capacity. These analyses show that during the relevant time period (the end of the five-year development period), the City will have sufficient diversion capacity to divert the water it is authorized to divert under its portfolio of water rights, including the anticipated license and permits.

Gap Analysis

Production Rates – Non-potable System

For convenience, Figure 5.1 and Table 5.1 of the City's 2014 Irrigation Master Plan are reproduced below as Figure 1.

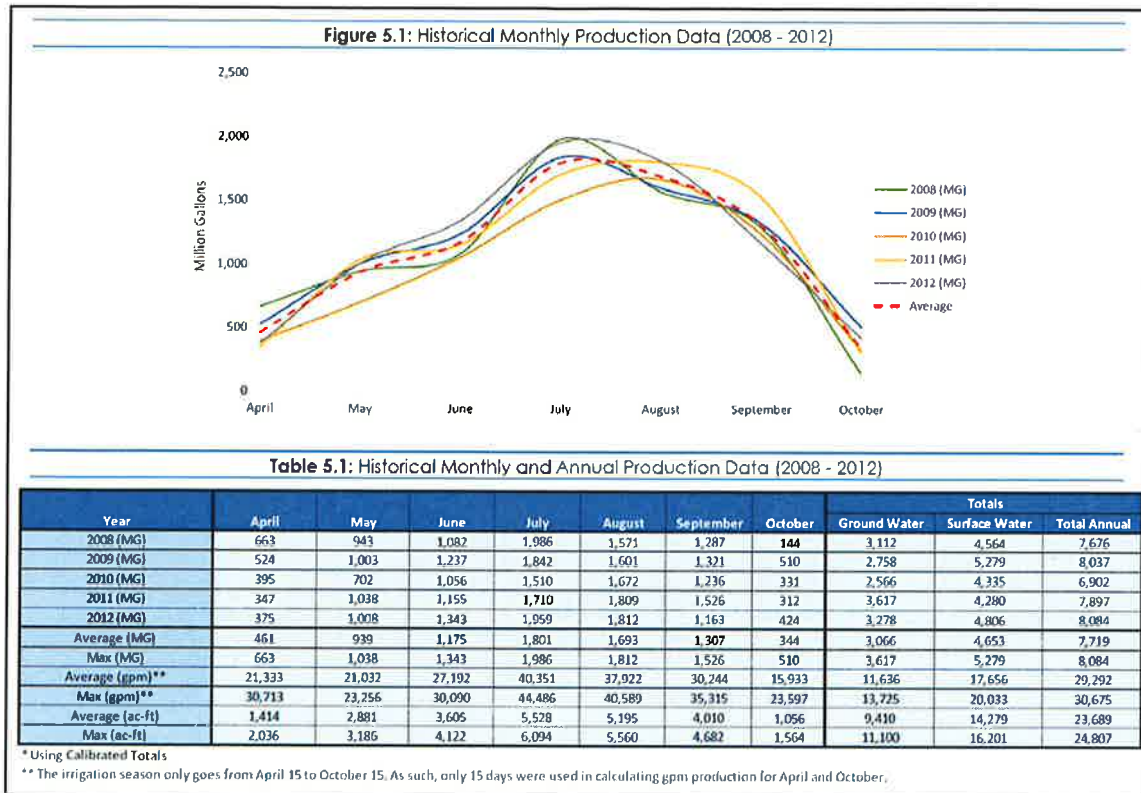


Figure 1. Figure 5.1 and Table 5.1 from the 2014 Irrigation Master Plan

The figure and table provide a compilation of Nampa's monthly production data from each of the City's non-potable system wells and surface water pump stations (2008-2012). Irrigation water is primarily supplied by surface water, with groundwater used as backup or supplement. As shown, July has the highest average monthly production of 1,801 million gallons (MG), while September's average volume was 1,307 MG. The average monthly production in September is 73% of July's monthly production rate. Production rates in September could be as high as 84% of the highest month (2011).

We asked Chris Meyer to use the more conservative 73% estimate for shoulder season demand, and to plug that number into the gap analyses he prepared. The result is shown in Exhibit C (Table C2) of the Meyer memo.

Considering that average production rates (non-potable system) in September are on-average 73% of the highest monthly production rate (up to 84% in select years), an extrapolation to 2024 indicates that the non-potable system could have a peak daily demand and peak hourly demand of 104 cfs ($0.73 * 143 = 104$) and 139 cfs ($0.73 * 191 = 139$), respectively (maintaining standard operating pressures).

The potable system does not have a strong seasonal fluctuation like the non-potable system. Review of Section 5.2 from the 2014 Water System Master Plan suggests that the historical peak day occurred in September due to early shut down of surface water

irrigation. However, review of water right records does not necessarily agree with that finding, because the highest peaking factor years (2002 and 2003 at 1.66 and 1.65, respectively) had Phyllis Canal and New York Canal deliveries into October, and Ridenbaugh Canal deliveries into October in 2003 and late September in 2002. Therefore, there seems to be no need to apply a September reduction to the potable demand. Thus, the extrapolation forecasts that the 2024 combined system would have to produce a September peak daily rate of 130 cfs, consisting of the adjusted non-potable demand ($0.73 * 143 = 104$) and the non-adjusted potable demand (26). Similarly, the 2024 combined system September peak hour demand would be 172 cfs, consisting of the adjusted non-potable demand ($0.73 * 191 = 139$) and the non-adjusted potable demand (33).

These demand calculations concur with those set in in Exhibit C (Table C1) of the Meyer memo.

Comparing the forecasted demand to the authorized diversion rates (including applications) indicates there will be a significant shortage of authorized diversion rate if groundwater is required to supply September irrigation needs, summarized in Table 1.

Table 1. September Gap Analysis

(units = cfs)	Non-Potable System		Combined System	
	Peak Day	Peak Hour	Peak Day	Peak Hour
a) Total Rights Today (incl. permits & applications)	90.34	90.34	144.89	144.89
b) 2024 Peak Irrigation Demand	143.00	191.00	143.00	191.00
c) September Portion of 'b'	104.39	139.43	104.39	139.43
d) Potable Demand	0	0	26.00	33.00
Gap: (c + d - a)	14.05	49.09	-14.50	27.54

In Table 1, a positive "Gap" indicates that demand is greater than the authorized amount. These gap calculations concur with those set in in Exhibit C (Tables C1 and C2) of the Meyer memo.

Surface Water Delivery Characteristics

IDWR requested that modest assumptions for the shoulder season demand be made. In other words, the analysis should address how likely will the non-potable or combined system have to supply all of the shoulder season irrigation demand when surface water is not available, as well as how much is that shoulder season demand.

To investigate this aspect, IDWR's online water rights accounting database was used to determine the last date of surface water delivery to Nampa in the last 40 years.

The City's sources of surface water for irrigation purposes are primarily from the New York Canal (Boise-Kuna Irrigation District and Nampa & Meridian Irrigation District), Ridenbaugh Canal (Nampa & Meridian Irrigation District), and the Phyllis Canal (Pioneer Irrigation District). Generally, surface water is delivered reliably into early- to mid-October, which minimizes the amount of shoulder season irrigation demands on the City's groundwater supply. However, periodically, curtailment or other depletion of storage supplies cause the surface water delivery to end in September or even in August.

In the last 40 years, these three canals had short seasons as summarized in Table 2. In the event that all three canals are shut down, essentially 100% of the irrigation must be supplied from groundwater. Inspection of Table 2 shows that September shutdown of all three canals occurred in 1977, 1994, and 2001, and that an August shutdown of all three canals occurred in 1992. In other years, one or two of the canals were shut down in August or September. Thus, it appears that an August/September loss of all surface water supplies might occur in approximately one of ten years

Table 2. Dates of Last Delivery from the City's Surface Water Sources.

Irrigation Year	Date of Last Delivery		
	New York Canal	Ridenbaugh Canal	Phyllis Canal
2013	Sept 5	Sept 4	Oct 1 (half rate)
2007	Oct 15	Sept 1	Oct 5
2001	Sept 11	Sept 10	Sept 5
1994	Sept 10	Sept 10	Sept 29
1992	Aug 4	Aug 5	Aug 20 (90 cfs to Sept 22)
1988	Sept 23	Aug 30	Oct 12
1977	Sept 15	Sept 19	Sept 26 (16 cfs to Oct 15)

Summary – Shoulder Season Gap Analysis

History shows that once approximately every 10 years, the City of Nampa experiences a situation where the surface water supply for irrigation is curtailed in early- to mid-September, forcing the remaining shoulder season irrigation demand to be supplied by groundwater.

The average irrigation demand in September is estimated to be 73% of the highest monthly average (July) and up to 84% in select years.

The City's non-potable system has an authorized groundwater diversion rate of up to 90.34 cfs, which is not enough to provide for a peak day or peak hourly rate if the non-potable system supplies 100% of irrigation needs in September.

Similarly, the City's combined system has an authorized diversion rate up to 144.89 cfs. If surface water is curtailed in early-September, there is insufficient authorized diversion rate for the groundwater system to satisfy both the potable and non-potable peak hour demand.

Cap Analysis

We have coordinated with Chris Meyer in his preparation of the cap analysis set out in the Meyer memo (Part VI and Exhibits D & E). We provided and have confirmed the supporting data for that analysis, which shows that the City should have sufficient system-wide capacity to divert all of its water rights (including permits and applications for permit) by the end of the five-year development period ending in 2024.

SPF Exhibit A

GIVENS PURSLEY LLP
Attorneys and Counselors at Law

MEMORANDUM

TO: Terry Scanlan and Steve Hannula, SPF Water Engineering

FROM: Christopher H. Meyer *che*

RE: "Gap Analysis" and "Cap Analysis" for City of Nampa Water Right Nos. 63-32835, 63-33968, 63-34229, and 63-34742

DATE: October 30, 2019

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I. PURPOSE OF THIS MEMORANDUM

I have prepared this memorandum at the request of SPF Water Engineering to address “gap analysis” and “cap analysis” issues bearing on permit applications and a licensing sought by the City of Nampa (“City”) now pending before the Idaho Department of Water Resources (“IDWR” or “Department”). I understand that SPF will submit this memorandum to IDWR in conjunction with a submission by SPF addressing water right Nos. 63-32835, 63-33968, 63-34229, and 63-34742.

This memorandum includes a revised set of gap analyses set out as Exhibit C on page 14 and a revised cap analysis set out as Exhibit E at page 19. The gap analyses display demand gap comparisons based on peak summer water for the potable system and shoulder season demand for the irrigation system. The cap analysis is based on peak summer demand.

II. THE TWO ANALYSES (BRIEF OVERVIEW)

The gap and cap analyses present important issues that have touched on a number of the City’s water right applications, and will continue to do so. This memorandum seeks to capture our evolving thinking on the subject reflecting the latest input and guidance from the Department, as well as the latest technical information from SPF. It is hoped that this memorandum will assist the Department and the City in the addressing pending matters and in shaping long-term planning to meet the City’s future needs.

A “gap analysis” compares total authorized diversions under the City’s portfolio of water rights to forecast demand. It is submitted, typically, in connection with a pending application for permit or licensing. In essence, it answers the question: “Does the City really need this new water right?” A “cap analysis,” in contrast, compares the same water right diversion authority to physical installed capacity to divert and deliver ground water. It responds, in essence, to the question: “Will the City have the physical capacity to divert this and all of its other water rights?”

The gap analyses provided here arbitrarily show the demand gap as a positive number. In other words, a positive demand gap reflects a projected shortage of water rights, not a shortage of demand.

In its guidance, IDWR employs the term “gap analysis” to describe the system-wide comparison of water rights and demand.¹ IDWR has no consistent shorthand terminology for what I call the “cap analysis” (shorthand for capacity analysis).²

¹ Mat Weaver, *Memorandum – Application Processing No. 74, Permit Processing No. 20, License Processing No. 13, Transfer Processing No. 29*, at 17-18 (3/16/2015) (replacing 11/15/2014 and 11/13/2013 versions) (“2015 Weaver Memo”).

² As discussed below, the concept of the capacity analysis is addressed only obliquely in the Department’s non-RAFN guidance, Jeff Peppersack, *Administrator’s Memorandum – Processing Applications and Amendments and Determining Beneficial Use for Non-RAFN Municipal Water Rights – Application Processing No. 18; Licensing No. 1*, at 1-2 (10/19/2009) (“2009 Peppersack Memo”). It is not discussed at all in the Department’s guidance on transfers, *Transfer Processing No. 24* (12/21/2009).

It bears emphasis that these two analyses work in the opposite direction. Under the gap analysis, the City must show a gap (*i.e.*, a shortfall) in the ability of its water right portfolio to meet system-wide demand. In contrast, under a cap analysis, the City must show that it has sufficient installed capacity, on a system-wide basis, to divert its system-wide diversion authority under its water rights, including the new right. In other words, in order to perfect a new non-RAFN appropriation, the applicant must show the existence of a demand gap and the absence of a capacity gap. (RAFN refers to “reasonably anticipated future needs.” As discussed below, the cap analysis is applicable only to non-RAFN permit applications.)

III. THE POTABLE SYSTEM, NON-POTABLE SYSTEM, AND COMBINED SYSTEM

Both the gap analysis and the cap analysis are system-wide analyses. Indeed, that is their whole point.

This system-wide approach to the evaluation of water right applications is relatively new for IDWR. Historically, municipal water right applications were evaluated in isolation, without consideration of the rest of the City’s portfolio of water rights. This led, in many cases, to the accumulation of portfolios of water rights in excess of system-wide need. In the last two decades, applicants have been required, with increasing vigor, to document how a proposed new municipal water right fits in with the rest of the applicant’s system-wide portfolio as well as its system-wide diversion capacity.

The City’s potable delivery system is served exclusively by ground water. Its non-potable delivery system is served by a combination of ground and surface water. In theory, gap and cap analysis could be applied to surface water appropriations. But the City does not appropriate surface water directly (with the sole exception of water right no. 63-7954 out of Elijah Drain). Instead, the City’s surface water supply comes from irrigation districts. Accordingly, the gap and cap analyses in this memorandum address ground water rights only.

The term “system-wide” may refer to the potable system or the non-potable system alone, or it may refer to the combined municipal ground water system. Which system is the right one to look at for water right analysis purposes remains unsettled. The City historically has thought of these as separate systems, but they are increasingly integrated. Accordingly, the City believes that combined-system analysis makes sense for water rights planning and the evaluation of permits, licenses, and transfers.

The City currently has sufficient potable system water rights to meet demand beyond the year 2040 (21 years from now), which is as far out as the City’s demand projections have looked. In contrast, the City can demonstrate a substantial current (as well as future) shortage of ground water rights to meet demand in its non-potable system. When the two systems are combined, there is a net shortage (or “gap” beginning in the year 2020 (based on peak hour demand during the shoulder season)). (See updated gap analyses attached as Exhibit C at page 14.)

The reason we are able to show such a substantial gap on the non-potable system side is we look only to non-potable system ground water rights, excluding surface rights. This is justified because of the need to provide (1) a backup to surface rights, which could be unavailable due to water shortage or delivery system problems and (2) irrigation supply during the shoulder season when surface water is unavailable.

The City previously provided to IDWR gap analyses comparing peak summer demand with its water rights portfolio. IDWR informally signed off on this demand analysis for the non-potable system in connection with No. 63-33968 (Farm & City well, non-RAFN, non-potable system permit), discussed below. *Memorandum from Erik Boe to Water Right File – 63-33968* (1/31/2018).

However, at a meeting with IDWR on 8/13/2019, Department staff asked the City to revise its gap analyses to examine the extent of the gap during the shoulder season. Accordingly, SPF undertook an analysis of demand during the shoulder season as compared to peak summer demand. It conservatively concluded that irrigation demand during the shoulder season is 73% of peak summer demand. (SPF determined that production rates could be as high as 84%, but selected the lower demand number, which makes it more difficult to demonstrate a gap.)

As for the potable system, SPF determined that there was no significant decline in demand during the shoulder season. Accordingly, the revised combined system gap analysis is based on the sum of shoulder season irrigation demand and peak summer demand for the potable system.

IV. QUANTIFICATION OF SYSTEM-WIDE DIVERSION AUTHORITY

Both the gap and cap analyses begin with the quantification of total, system-wide diversion authority (which is then compared to either demand or capacity). Total diversion authority is not just the mathematical sum of the individual diversion quantities for each water right. It is a more complicated calculation taking into account combined use conditions, volume limits, and other factors.

Fortunately, the City has few rights with combined use limits. Indeed, the only one with any practical limiting effect is the combined use limit on pending permit application No. 63-33968 (second water right for non-potable Farm & City well).

Where water rights are subject to annual volume caps, it may be appropriate to make a downward adjustment, reflecting the rate of diversion that may be sustained by “spreading out” the volume over the authorized period of use. This is particularly true in the case of water rights for use in potable delivery systems, where demand does not significantly fluctuate. Making that adjustment for water rights limited to irrigation use is trickier, because the goal is to mimic the bell-shaped curve reflecting changing demand over the course of the irrigation season.³

³ The sustainable diversion rate is the highest rate that could be sustained 24/7 throughout the authorized season of use without exceeding the annual volume. In other words, it “spreads out” the annual volume throughout the season, assuming a “flat line” level of diversion. In reality, irrigation diversion rights do not follow a “flat line.” Their use typically follows a bell-shaped curve.

An ideally quantified irrigation right would have a nominal authorized diversion rate corresponding to the peak of the bell curve, and its annual volume would correspond to the area under the curve. In ballpark numbers, that volume would be in the vicinity of 50 percent of the area of the rectangle corresponding to full diversion at the nominal diversion rate throughout the authorized season of use. Consequently, as a practical matter, the annual volume cap serves as a limitation only if the annual volume is less than 50 percent of the volume that could be pumped without a volume limit.

None of the City's rights used in its integrated potable system have volume limits, thus no adjustment is called for. However, many of the City's non-potable system water rights have volume limits and other conditions that add complexity to evaluating how much water is actually available. In these gap analyses, the City took the conservative approach of making no downward adjustment.

Summaries of all water rights serving the City's integrated water system are set out in Exhibit A at page 12 (potable system) and Exhibit B at page 13 (non-potable system). For the potable system, the "nominal diversion rate" and "effective diversion rate" are identical. For the non-potable system, they differ only with respect to No. 63-33968.

V. GAP ANALYSIS

A. Background and applicability

Under the gap analysis, the applicant must show that a "gap" between its existing portfolio and its demand. If no gap (shortage of water rights) can be shown, the application, license, or transfer may still be approved, but it will be subject to a "combined use limit" that eliminates any new system-wide diversion authority. Alternatively, new points of diversion may simply be added to existing rights already owned by the City.

This gap analysis must be undertaken in applications for both RAFN and non-RAFN municipal water rights.⁴ For RAFN rights, the gap analysis looks to demand in the long term (at the end of the Planning Horizon, many years from now). For non-RAFN rights, it is necessary to show that there is sufficient short-term demand to justify adding an additional water right to the City's portfolio. In the case of a non-RAFN appropriation application, it is necessary to show a demand gap by the end of the development period. For licensing a non-RAFN right, there must be a demand gap at the time of proof. Likewise, when transferring a non-RAFN right, there must be a demand gap at the time of transfer.⁵ For permitting, licensing, or transferring a RAFN right, there need not be a demand gap until the end of the Planning Horizon.

The regulatory basis for the gap analysis is clear. It flows from the central concept of the 1996 Municipal Water Rights Act, which allows municipal providers to obtain water rights to serve "reasonably anticipated future needs" (RAFN). The gap analysis requirement is spelled out in the Department's RAFN guidance document, the *2015 Weaver Memo* (see footnote 1 at page

⁴ Non-RAFN rights are "traditional" municipal rights that must be developed (licensed) within the five-year development period, subject to a possible extension of up to 10 additional years. RAFN rights are municipal rights that allow the City to grow into the right over a much longer period of time known as a "Planning Horizon" (potentially up to 50 years). Nampa has only two RAFN rights (Nos. 63-32835 and 63-33022), both for its potable system. At some point, we anticipate filing a system-wide transfer application to bring Nampa's system within full RAFN protection, pursuant to the 1996 Municipal Water Rights Act.

⁵ The Department's guidance on transfers does not spell out a gap analysis requirement (for either demand or installed capacity). However, it does include a requirement that the applicant include a list of other water rights that serve the same system. *Transfer Processing No. 24* (12/21/2009), page 8, subsection 4.

2). The Department took the same gap analysis concept and applied it to non-RAFN rights in its *2009 Peppersack Memo*.⁶ The RAFN guidance cites no agency rule as authority.

The non-RAFN guidance relies on IDAPA 37.03.08.040.05 (“Rule 40” of the Department’s Application Processing Rules).⁷

B. Prior gap analyses

On prior occasions, the City has submitted gap analyses to IDWR in connection with the licensing of lapsed RAFN permit No. 63-32835 and in connection with permit applications No. 63-33968, 63-34229, and 63-34742:

- Letter of 6/15/2018 from Roxanne Brown to Shelley Keen Re: Permit No. 63-32835 (City of Nampa).
- Memorandum of 9/19/2018 from Chris Meyer to Erik Boe Re: Gap Analyses for potable system Permit No. 63-32835 (RAFN), irrigation system Permit Application No. 63-33968 (non-RAFN), and irrigation system Permit Application No. 63-34229 (non-RAFN). Note: This memorandum was submitted again to IDWR on 6/7/2019 as part of the package of materials submitted in support of the City’s application for permit No. 63-34742 (Midland well).

These two submissions are consistent. However, the 9/19/2018 version is considerably more detailed. For example, it includes gap projections for more years (based on interpolation of data).

⁶ The non-RAFN guidance provides:

An applicant for a non-RAFN municipal application must demonstrate short-term needs to justify the amount of water required for appropriation.

...

The applicant must also demonstrate that the new appropriation is not intended for RAFN by providing total system capacity and existing demand within the municipal service area and comparing that capacity and demand to the entire municipal portfolio of water rights. If existing municipal water rights exceed existing demand and short-term needs, then an applicant for RAFN would be necessary for an additional appropriation of water. If the applicant desires additional points of diversion without the need for a new appropriation of water, then an application for transfer to change existing rights would be appropriate.

2009 Peppersack Memo at 3.

⁷ Rule 40 sets out “Additional Information Requirements,” which are waived for certain water rights, including those seeking 5.0 cfs or less. IDAPA 37.03.08.040.05.c. However, IDWR’s Director can eliminate the waiver and require the information “as he determines necessary.” *Id.* Rule 40 provides: “Information shall be submitted on the water requirements of the proposed project, including, but not limited to, the required diversion rate during the peak use period and the average use period, the volume to be diverted per year, the period of year that water is required, and the volume of water that will be consumptively used per year.” IDAPA 37.03.08.040.05.d.i. That information provides a foundation for a gap analysis, but does not appear to be a basis for requiring a capacity analysis.

C. Revised gap analyses

The 9/19/2018 gap analyses predated the Midland well application (No. 63-34742). A revised version of the City's gap analyses (including the new application for Midland well) is set out in Exhibit C at page 14. This boosts the size of the City's irrigation system portfolio by 4.00 cfs from 86.34 cfs to 90.34 cfs. This, in turn, reduces the size of each gap by the same amount.

More significantly, the revised version adds a shoulder-season irrigation system demand projection. (See discussion in section III beginning on page 3.)

The revised gap analysis for the combined system shows a demand gap beginning in the year 2020 (16.78 cfs) based on peak hour demand.

VI. CAP ANALYSIS

A. Background and applicability

As noted above, the cap analysis compares system-wide installed diversion capacity with system-wide diversion authority.

Prior submissions by the City to IDWR have addressed the cap analysis solely on the basis of the non-potable system. However, as with the gap analysis, the cap analysis may be prepared on the basis of the potable or the non-potable system standing alone, or by looking to the combined system.

In contrast to the gap analysis, which is clearly grounded in the 1996 Municipal Water Rights Act and the Department's guidance, it is much less clear on what basis the Department requires the cap analysis. It is also unclear at what stage in the permitting/licensing process this analysis must be performed.

There are no formally adopted rules addressing capacity analysis. The non-RAFN guidance (*2009 Peppersack Memo*) references the "additional information" provision in IDWR's "Rule 40" on permitting, but that rule contains no reference to information about installed capacity. See footnote 7 at page 6.

The Department's RAFN guidance (*2015 Weaver Memo*) addresses the "full capacity constructed" standard in the context of licensing, but it does not call for a "capacity analysis." Rather, it explores the requirement in the 1996 Municipal Water Rights Act that the quantity at licensing correspond to the "full capacity of the system constructed or used."⁸

⁸ "A key distinction of the RAFN right is the allowance of components of the water right, namely the diversion rate, to be perfected without physically completing diversion and use in establishing beneficial use during the development period of the permit." *2015 Weaver Memo* at 4. The guidance sets out detailed guidelines on how the "full capacity constructed" is measured. "Full capacity constructed means significant infrastructure has been constructed to accommodate delivery of water throughout the RAFN service area. Full capacity constructed entails more than engineering plans or in-place financing." *2015 Weaver Memo* at 19. In short, in order to license the full permitted quantity of a RAFN right, there must be more than a plan to complete the full delivery system. Something must be built, but it may be less than full installed capacity.

The non-RAFN guidance is quite clear that installed capacity matters (for purposes of quantifying the diversion rate) at the time licensing:

When licensing a permit for a municipal use for an entity serving an incorporated city, the extent of beneficial use established under a non-RAFN permit should be determined based on the installed capacity developed and operational during the development period of the permit and cannot exceed the amount permitted.

2009 Peppersack Memo at 5 (see footnote 2 at page 2).

There is no such requirement, however, at the time of permit application or permit approval. The only reference to system capacity is found in this provision of the non-RAFN guidance:

The applicant must also demonstrate that the new appropriation is not intended for RAFN by providing total system capacity and existing demand within the municipal service area and comparing that capacity and demand to the entire municipal portfolio of water rights.

2009 Peppersack Memo at 3.

The quoted statement clearly requires a gap analysis (to show sufficient demand) at the time of permit application, but it is difficult to decipher what the reference to system capacity means.

At the time the non-RAFN guidance was issued, I met extensively with its author, Jeff Peppersack. At that time, we agreed on the following explanation of his guidance, which was incorporated into my *Idaho Water Law Handbook*. It suggests that, at the time of permitting a non-RAFN right, the focus is on system-wide demand, not system capacity:

The diversion rate for the permit may not exceed the anticipated increment of new system-wide diversion capacity (compared to the existing system-wide diversion capacity in place and authorized by prior rights, permits, or decrees before the new permit) shown to be necessary to serve needs during the five-year development period of the permit. This increment of new capacity includes both new capacity that will be built during the development period of the permit and existing capacity that, for one reason or another, is not covered by existing rights, permits, or decrees. Although the language of the guidance references both system capacity and demand (which are entirely different things), the Department looks primarily to a showing that short term customer demand (not physical diversion capacity) is or will very soon be in excess of authority to divert under the applicant's existing rights. System capacity comes into play more prominently at the licensing stage.

The diversion rate may be further limited as necessary to protect the local public interest or to address other special circumstances

Christopher Meyer, *Summary of Administrator's Memorandum, App. Processing No. 18, Licensing No. 1.*

In sum, I read the Department's guidance to require no cap analysis for a RAFN right (either at permitting or licensing). Instead, the City will be required to meet the "full capacity constructed" standard at licensing.⁹ Despite the similarity of wording, this is not the same thing as the cap analysis. The "full capacity constructed" licensing standard requires a showing of the construction of significant infrastructure. In other words, it is really aimed at "potential capacity." (For example, it may be sufficient to install the pump stations, but not the pumps.) Although this is evolving toward a more rigorous standard (see footnote 8 at page 7), it is still substantially less rigorous than a cap analysis. Moreover, there is no cap analysis or "full capacity constructed" showing required for a transfer involving RAFN rights.

I read the Department's guidance to require a cap analysis for non-RAFN rights at the time of licensing, but not at the time of permit application or permit approval.

The latter conclusion, however, is at odds with IDWR's information requests in two recent non-RAFN permit applications (Nos. 63-32835 and 63-33022), as discussed in detail below. The City did not challenge IDWR on IDWR's request for a cap analysis at the time of permit application. Instead, it provided the requested capacity analyses in connection with those water permit applications. In the most recent application for Midland well, however, the City did not include a cap analysis in the application itself.

B. Quantification of system-wide capacity

The City's system-wide capacity submissions are based on the sum of individual well capacities. SPF explains the City's calculation of installed capacity in its 9/19/2018 letter to Erik Boe in connection with the permit application for No. 63-34229.

If required to do so, the City could justify higher system-wide capacity numbers based on hydraulic models of the potable and non-potable systems.

To date, all calculations of well capacity are based on well operations under normal conditions (approximately 60-65 psi). This is consistent with IDEQ's regulatory requirements for municipal wells within the potable system. Terry Scanlan's view is that for purposes of the cap analysis, the City would be justified in employing capacity numbers based on a lower psi that would reflect conditions if fire hydrants were in operation. Likewise, high irrigation demand for

⁹ This standard derives from this provision of the 1996 Municipal Water Rights Act: A license may be issued to a municipal provider for an amount up to the full capacity of the system constructed or used in accordance with the original permit provided that the director determines that the amount is reasonably necessary to provide for the existing uses and reasonably anticipated future needs within the service area and otherwise satisfies the definitions and requirements specified in this chapter for such use.

Idaho Code § 42-219(1) (emphasis supplied).

ground water during the shoulder season would lower pressure within the non-potable system. The reduced pressure would increase well production, and would more realistically measure water production conditions during times of high demand while simultaneously fighting multiple fires (in the potable system) and high irrigation demand (in the non-potable system). Using the resulting higher capacity numbers would, in turn, result in higher “surplus capacity” numbers than are presented in cap analysis set out in Exhibit E at page 19.

C. Prior cap analysis

On 11/25/2016, Erik Boe of IDWR requested a cap analysis in the context of two applications for non-RAFN, non-potable system rights: Nos. 63-33968 (to cover additional pumping capacity out of the Farm & City well) and 63-34229 (to cover seven wells with no water rights). (The letters also request a gap analysis.)

In both letters, Erik Boe stated that this system capacity information is required by the Department’s non-RAFN guidance. As discussed above, I believe that this guidance requires this information only at licensing, not at the application stage.¹⁰ Nevertheless, the City provided the information sought, which IDWR ultimately determined was acceptable.¹¹

In submissions on 11/27/2017 and 9/19/2018, the City provided identical capacity analyses for the non-potable system alone.¹² The City acknowledged that there was, at that time, a current shortage of system-wide capacity within the non-potable system of 18.22 cfs. However, it explained that the shortfall would be eliminated by the end of the five-year development period (2018-2023) with four future wells¹³ totaling 20.00 cfs, resulting in excess capacity of 1.78 cfs.

Today, the development period reaches another year out, to 2024. Accordingly, it is appropriate to add the Cherry Lane well, which is planned to be constructed in 2024. That will add 5.00 cfs of capacity. It is also appropriate to reduce the quantity for the Midland Well to 4.00 cfs, based on the quantity sought for that right in pending permit application No. 63-34742. Finally, the Locust Lane well is now in production (which simply moves the 5.00 cfs for that well

¹⁰ Accordingly, in the City’s permit application for Midland well, the City determined not to include a cap analysis in its application. Instead, it provided an “Application Narrative” stating that none was required at the permitting stage.

¹¹ See Erik Boe memo to the file dated 1/31/2018 (as to No. 63-33968) and Anna Kaiser letter dated 1/31/2019 (as to No. 63-34229). The latter does not specifically say that the information is acceptable, but indicated that the application will be processed.

¹² In a letter dated 11/27/2017 (pages 3-4, Tables 2 & 3), SPF provided the capacity analysis (and other information sought by Eric Boe) as to No. 63-33968. The same capacity analysis (as well as other information) was provided by SPF with respect to No. 63-34429 in a letter dated 9/19/2018 (pages 8-9, Tables 2 & 3).

SPF’s submission contains no Capacity Analysis table as such. Rather, it is a narrative explaining a current under-capacity of 18.22 cfs offset by anticipated future wells of 20 cfs, which would yield a capacity surplus of 1.78 cfs.

On 9/19/2018, the City also submitted a letter from me to Erik Boe updating the gap analysis in connection with No. 63-33968 and two other water rights.

¹³ The letters named Midland well, Locust Lane well, Iowa Ave. well, and 1st St./14th Ave. North well, each at 5.0 cfs, based on the 2014 *Irrigation Master Plan*.

from the future wells list to the existing well list, without affecting the bottom line for the cap analysis.)

In addition, SPF has revised the table of existing well capacities to reflect the latest and most accurate information available. This results in a modest increase in existing system-wide well capacity for the irrigation system to 69.76 cfs (compared to 68.12 cfs identified in the 2017/2018 submissions).

D. Revised cap analysis

Accordingly, I have prepared a revised cap analysis, which is presented in Exhibit E at page 19. Unlike the 2017/2018 submissions, this cap analysis displays capacity information for the potable system, the non-potable system, and the combined systems. In each case, it shows that a modest surplus of capacity is anticipated by the end of the five-year development period in 2024.

As noted above in section VI.B at page 9, the cap analysis would show even higher surplus capacity numbers if the City employed capacity numbers based on lower psi conditions.

As explained in section VI.A beginning on page 7, my view is that the cap analysis is relevant and applicable only to non-RAFN water rights and only at the licensing stage. Accordingly, the City does not believe it is pertinent to any of the three pending permit applications or to the licensing of the RAFN right.

However, given that information on the cap analysis was presented in 2017 and 2018, the City believes it is appropriate to update the information at this time. In any event, the City is in a position to show that it will have sufficient capacity to divert all of its water rights by the end of the development period.

cc: Tom Points, Director, Public Works Department
Nate W. Runyan, Deputy Director (Water), Public Works Department
Daniel Badger, City Engineer

Exhibit A **POTABLE SYSTEM WATER RIGHTS (INTEGRATED SYSTEM)**

Water Right No. (Highlighted if IDWR action pending)	Combined Use Condition	Basis	RAFN	Nominal Diversion Rate (cfs)	Effective Diversion Rate (cfs)
Potable System Ground Water Rights					
63-02779	No	Decree	Non-RAFN	2.00	2.00
63-02781	No	Decree	Non-RAFN	3.00	3.00
63-05258	No	Decree	Non-RAFN	2.10	2.10
63-07567	No	Decree	Non-RAFN	2.79	2.79
63-08324	No	Decree	Non-RAFN	3.00	3.00
63-09180	No	Decree	Non-RAFN	4.00	4.00
63-10212	No	Decree	Non-RAFN	2.23	2.23
63-11729	No	Licence	Non-RAFN	2.68	2.68
63-12463	No	Licence	Non-RAFN	3.00	3.00
63-12474	No	Licence	Non-RAFN	3.50	3.50
63-12506	No	Licence	Non-RAFN	3.50	3.50
63-12543	No	Licence	Non-RAFN	4.00	4.00
63-12591	No	Licence	Non-RAFN	3.50	3.50
63-28219	No	Decree	Non-RAFN	1.22	1.22
63-28220	No	Decree	Non-RAFN	1.93	1.93
63-31243	No	Licence	Non-RAFN	2.60	2.60
63-32835	No	Permit	RAFN	5.00	5.00
63-33022	No	Licence	RAFN	4.50	4.50
TOTAL (applications for permit)				0.00	0.00
TOTAL (permits)				5.00	5.00
TOTAL (licensed & decreed)				49.55	49.55
GRAND TOTAL (all rights, permits & apps)				54.55	54.55

Exhibit B NON-POTABLE SYSTEM WATER RIGHTS (INTEGRATED SYSTEM)

Water Right No. (Highlighted if IDWR action pending)	Combined Use Condition	Basis	RAFN	Nominal Diversion Rate (cfs)	Effective Diversion Rate (cfs)
<i>Non-Potable System Ground Water Rights</i>					
63-02449	No	SRBA Decree	Non-RAFN	0.80	0.80
63-02450	No	SRBA Decree	Non-RAFN	1.00	1.00
63-02484	No	SRBA Decree	Non-RAFN	1.62	1.62
63-02780	No	SRBA Decree	Non-RAFN	2.50	2.50
63-02787	No	SRBA Decree	Non-RAFN	30.00	30.00
63-02943	No	SRBA Decree	Non-RAFN	1.74	1.74
63-03257	No	SRBA Decree	Non-RAFN	0.58	0.58
63-05257	No	SRBA Decree	Non-RAFN	0.30	0.30
63-07003	No	SRBA Decree	Non-RAFN	7.68	7.68
63-07708	No	SRBA Decree	Non-RAFN	0.40	0.40
63-08312	No	SRBA Decree	Non-RAFN	0.50	0.50
63-08539	Yes	SRBA Decree	Non-RAFN	0.78	0.78
63-09853	No	SRBA Decree	Non-RAFN	1.00	1.00
63-09889	No	SRBA Decree	Non-RAFN	1.50	1.50
63-10211	No	License	Non-RAFN	7.71	7.71
63-10319	No	License	Non-RAFN	2.05	2.05
63-11511	No	License	Non-RAFN	1.50	1.50
63-11894	No	License	Non-RAFN	0.51	0.51
63-12322	No	License	Non-RAFN	0.84	0.84
63-31504	No	License	Non-RAFN	3.73	3.73
63-31598	Yes	License	Non-RAFN	0.20	0.20
63-31949	No	License	Non-RAFN	3.40	3.40
63-31961	No	License	Non-RAFN	1.46	1.46
63-32179	No	License	Non-RAFN	0.24	0.24
63-32337	No	License	Non-RAFN	5.00	5.00
63-33968	Yes	Application for Permit	Non-RAFN	4.00	2.30
63-34229	No	Application for Permit	Non-RAFN	7.00	7.00
63-34742	No	Application for Permit	Non-RAFN	4.00	4.00
TOTAL (applications for permit)				15.00	13.30
TOTAL (permits)				0.00	0.00
TOTAL (licensed & decreed)				77.04	77.04
GRAND TOTAL (all rights, permits & apps)				92.04	90.34

Exhibit C GAP ANALYSES

Table C1: Water rights portfolio and demand data

Note: Totals for potable system water rights are based on information in Exhibit A at page 12.
Totals for non-potable system rights are based on information in Exhibit B at page 13.

WATER RIGHT PORTFOLIO (Diversion capacity based on mathematical sum of authorized diversion rates, taking into account combined use conditions)											
	Licensed & decreed (cfs)	Permits (cfs)	Appli- cations (cfs)	Total (cfs)							
Potable System Rights	49.55	5.00	0.00	54.55							
Non-Potable System Rights	77.04	0.00	13.30	90.34							
TOTAL	126.59	5.00	13.30	144.89							

PEAK DAY DEMAND (cfs)	2012	2020	2022	2023	2024	2025	2030	2035	2040	Buildout
Potable - summer peak day	18.00	24.00	25.00	25.00	26.00	26.00	29.00	32.00	35.00	100.00
Irrigation - summer peak day	116.00	134.00	138.00	141.00	143.00	145.00	157.00	172.00	191.00	534.00
Irrigation - shoulder season day (73%)	84.68	97.82	100.74	102.93	104.39	105.85	114.61	125.56	139.43	389.82
TOTAL - SUMMER PEAK DAY	134.00	158.00	163.00	166.00	169.00	171.00	186.00	204.00	226.00	634.00
TOTAL - SHOULDER SEASON DAY	102.68	121.82	125.74	127.93	130.39	131.85	143.61	157.56	174.43	489.82

PEAK HOUR DEMAND (cfs)	2012	2020	2022	2023	2024	2025	2030	2035	2040	Buildout
Potable - summer peak hour	24.00	31.00	32.00	33.00	33.00	34.00	38.00	42.00	45.00	129.00
Irrigation - summer peak hour	155.00	179.00	185.00	188.00	191.00	194.00	210.00	230.00	255.00	714.00
Irrigation - shoulder season hour (73%)	113.15	130.67	135.05	137.24	139.43	141.62	153.30	167.90	186.15	521.22
TOTAL - SUMMER PEAK HOUR	179.00	210.00	217.00	221.00	224.00	228.00	248.00	272.00	300.00	843.00
TOTAL - SHOULDER SEASON HOUR	137.15	161.67	167.05	170.24	172.43	175.62	191.30	209.90	231.15	650.22

Table C2: Gap Analyses

Note: A positive number reflects a gap (demand exceeds water rights). In other words, a positive number means there is a shortfall of available water rights.

POTABLE SYSTEM GAP ANALYSES (cfs)	2012	2020	2022	2023	2024	2025	2030	2035	2040	Buildout
Gap (based on summer peak day demand)										
DIFFERENCE (peak day gap) (licensed & decreed)	-31.55	-25.55	-24.55	-24.55	-23.55	-23.55	-20.55	-17.55	-14.55	50.45
DIFFERENCE (peak day gap) (licensed, decreed & permits)	-36.55	-30.55	-29.55	-29.55	-28.55	-28.55	-25.55	-22.55	-19.55	45.45
DIFFERENCE (peak day gap) (licensed, decreed, permits & applications)	-36.55	-30.55	-29.55	-29.55	-28.55	-28.55	-25.55	-22.55	-19.55	45.45
Gap (based on summer peak hour demand)										
DIFFERENCE (peak hour gap) (licensed & decreed)	-25.55	-18.55	-17.55	-16.55	-16.55	-15.55	-11.55	-7.55	-4.55	79.45
DIFFERENCE (peak hour gap) (licensed, decreed & permits)	-30.55	-23.55	-22.55	-21.55	-21.55	-20.55	-16.55	-12.55	-9.55	74.45
DIFFERENCE (peak hour gap) (licensed, decreed, permits & applications)	-30.55	-23.55	-22.55	-21.55	-21.55	-20.55	-16.55	-12.55	-9.55	74.45
NON-POTABLE SYSTEM GAP ANALYSES (cfs)	2012	2020	2022	2023	2024	2025	2030	2035	2040	Buildout
Gap (based on summer peak day demand)										
DIFFERENCE (peak day gap) (licensed & decreed)	38.96	56.96	60.96	63.96	65.96	67.96	79.96	94.96	113.96	456.96
DIFFERENCE (peak day gap) (licensed, decreed & permits)	38.96	56.96	60.96	63.96	65.96	67.96	79.96	94.96	113.96	456.96
DIFFERENCE (peak day gap) (licensed, decreed, permits & applications)	25.66	43.66	47.66	50.66	52.66	54.66	66.66	81.66	100.66	443.66
Gap (based on summer peak hour demand)										
DIFFERENCE (peak hour gap) (licensed & decreed)	77.96	101.96	107.96	110.96	113.96	116.96	132.96	152.96	177.96	636.96
DIFFERENCE (peak hour gap) (licensed, decreed & permits)	77.96	101.96	107.96	110.96	113.96	116.96	132.96	152.96	177.96	636.96
DIFFERENCE (peak hour gap) (licensed, decreed, permits & applications)	64.66	88.66	94.66	97.66	100.66	103.66	119.66	139.66	164.66	623.66
Gap (based on shoulder peak day demand)										
DIFFERENCE (peak hour gap) (licensed & decreed)	7.64	20.78	23.70	25.89	27.35	28.81	37.57	48.52	62.39	312.78
DIFFERENCE (peak hour gap) (licensed, decreed & permits)	7.64	20.78	23.70	25.89	27.35	28.81	37.57	48.52	62.39	312.78
DIFFERENCE (peak hour gap) (licensed, decreed, permits & applications)	-5.66	7.48	10.40	12.59	14.05	15.51	24.27	35.22	49.09	299.48
Gap (based on shoulder peak hour demand)										
DIFFERENCE (peak hour gap) (licensed & decreed)	36.11	53.63	58.01	60.20	62.39	64.58	76.26	90.86	109.11	444.18
DIFFERENCE (peak hour gap) (licensed, decreed & permits)	36.11	53.63	58.01	60.20	62.39	64.58	76.26	90.86	109.11	444.18
DIFFERENCE (peak hour gap) (licensed, decreed, permits & applications)	22.81	40.33	44.71	46.90	49.09	51.28	62.96	77.56	95.81	430.88
COMBINED SYSTEM GAP ANALYSIS (cfs)	2012	2020	2022	2023	2024	2025	2030	2035	2040	Buildout
Gap (based on summer peak day demand)										
DIFFERENCE (peak day gap) (licensed & decreed)	7.41	31.41	36.41	39.41	42.41	44.41	59.41	77.41	99.41	507.41
DIFFERENCE (peak day gap) (licensed, decreed & permits)	2.41	26.41	31.41	34.41	37.41	39.41	54.41	72.41	94.41	502.41
DIFFERENCE (peak day gap) (licensed, decreed, permits & applications)	-10.89	13.11	18.11	21.11	24.11	26.11	41.11	59.11	81.11	489.11
Gap (based on summer peak hour demand)										
DIFFERENCE (peak hour gap) (licensed & decreed)	52.41	83.41	90.41	94.41	97.41	101.41	121.41	145.41	173.41	716.41
DIFFERENCE (peak hour gap) (licensed, decreed & permits)	47.41	78.41	85.41	89.41	92.41	96.41	116.41	140.41	168.41	711.41
DIFFERENCE (peak hour gap) (licensed, decreed, permits & applications)	34.11	65.11	72.11	76.11	79.11	83.11	103.11	127.11	155.11	698.11
Gap (based on shoulder peak day demand)										
DIFFERENCE (peak day gap) (licensed & decreed)	-23.91	-4.77	-0.85	1.34	3.80	5.26	17.02	30.97	47.84	363.23
DIFFERENCE (peak day gap) (licensed, decreed & permits)	-28.91	-9.77	-5.85	-3.66	-1.20	0.26	12.02	25.97	42.84	358.23
DIFFERENCE (peak day gap) (licensed, decreed, permits & applications)	-42.21	-23.07	-19.15	-16.96	-14.50	-13.04	-1.28	12.67	29.54	344.93
Gap (based on shoulder peak hour demand)										
DIFFERENCE (peak hour gap) (licensed & decreed)	10.56	35.08	40.46	43.65	45.84	49.03	64.71	83.31	104.56	523.63
DIFFERENCE (peak hour gap) (licensed, decreed & permits)	5.56	30.08	35.46	38.65	40.84	44.03	59.71	78.31	99.56	518.63
DIFFERENCE (peak hour gap) (licensed, decreed, permits & applications)	-7.74	16.78	22.16	25.35	27.54	30.73	46.41	65.01	86.26	505.33

Exhibit D **WELL CAPACITIES**

Table D1: Potable System Wells Capacities (Existing)

Well Name	Water Right Originally Associated with Well	Well Capacity
Well #4	63-2781	1.78
Well #5	63-28220	1.45
Well #6	63-5258	2.23
Well #7	63-10212	2.23
Well #8	63-7567	2.23
Well #9	63-8324	4.46
Well #10	63-9180	6.69
Well #11	63-12474	4.01
Well #12	63-11729	2.68
Well #14	63-12591	4.47
Well #15	63-12506	4.55
(Coventry Place)		
Well #16	63-12543	8.50
	63-33022	
Well #17	63-12463	3.03
(formerly Carriage Hill)		
Well # 18	63-31243	2.60
(formerly Belmont Heights)		
Well #20	63-32835	5.00
(formerly Coyote Springs)		
TOTAL - Integrated		55.91

Table D2: Non-Potable System Wells Capacities (Existing)

Well Name	Water Right Originally Associated with Well	Well Capacity (cfs)
Mayor's	63-02449	1.00
6th St. South	63-02484	1.16
Lakeview	63-02780	1.34
14th Ave. South	63-02787	1.11
19th Ave. South	63-02787	1.78
4th St. South	63-02787	1.45
5th & Phyllis (aka Phyllis)	63-02787	1.34
Chestnut	63-02787	1.52
Fern	63-02787	1.11
High St.	63-02787	1.78
Holly	63-02787	2.01
Hudson	63-02787	1.11
Indian Creek	63-02787	0.77
Kohler (aka Cemetery #1)	63-02787	1.24
Kurtz	63-02787	1.65
Maple	63-02787	1.11
Meyer	63-02787	0.89
Sugar St. (aka East Powerline)	63-02787	0.82
Canyon	63-02943	1.78
13th Ave. North	63-05257	0.89
Birds Eye	63-07003	3.08
State St.	63-07708	0.78
Morgan	63-08312	1.11
Midway Park (aka Martens Farm)	63-08539	0.89
Grange Park	63-09853	1.00
Colorado	63-09889	1.45
Boone Ave.	63-10211	1.11
Juniper Square	63-10211	0.67
Meadowbrook 1	63-10211	0.78
Sweetwood Circle	63-10211	0.36
Venice	63-10211	1.34
West Park	63-10211	0.78
Winther Ave.	63-10211	0.94
Young Ave.	63-10211	0.56
Centennial (golf course)	63-10319	2.23
Augusta	63-11894	1.11
Pheasant Hollow	63-12322	1.34
Amity Ave.	63-31504	2.90
Karcher Interchange	63-31598	0.45
Vista Ridge	63-31949	3.34
Farm & City	63-31961	4.46
Farm & City	63-32179	0.00
Happy Valley	63-32337	5.37
Farm & City	63-33968	0.00
Birch	63-34229	0.67
Brant (aka Brandt's Landing)	63-34229	0.67
Canterbury	63-34229	0.89
Costco	63-34229	0.89
King's Rd. (aka King's Rd.	63-34229	2.45
South Valley	63-34229	1.11
Sugar Manor	63-34229	1.17
Locust Lane	63-02449	5.00
(formerly Tio Lane)	63-02450	
	63-02484	
	63-02780	
	63-02787	
	63-02943	
	63-05257	
	63-07003	
	63-07708	
	63-09853	
	63-09853	
	63-09889	
TOTAL - Existing Irr. Wells:		74.76

Table D3: Non-Potable System Wells Capacities (Future)

Well Name	Water Right Orignially Associated with Well	Anticipated Well Capacity (cfs)	Anticipated Construction Date	2014 Irr. Master Plan (Table 8.1 on page 8-3)
Midland	63-34742	4.00	Soon	CIP ID #1.13
Iowa Ave.		5.00	2020	CIP ID #2.1
1st St./14th Ave. North		5.00	2021	CIP ID #2.10
Cherry Lane		5.00	2024	CIP ID #3.2
TOTAL (2020 through 2024)		19.00		
Franklin		5.00	2029	CIP ID #2.5
TOTAL (2020 through 2029)		24.00		

Exhibit E CAP ANALYSIS

Note: A positive number reflects a surplus of capacity (capacity exceeds water rights). In other words, a positive number means there is more than enough capacity to divert all water rights.

	Total Diversion Authority (Water Rights, Permits & Apps) (cfs) ¹⁴	Current Capacity (existing wells) (cfs) ¹⁵	Future Wells (within development period) (cfs) ¹⁶	Capacity at end of development period (cfs)	Capacity Surplus at end of development period (cfs)
Non-Potable System	90.34	74.76	19.00	93.76	3.42
Potable System	54.55	55.91	0.00	55.91	1.36
Combined System	144.89	130.67	19.00	149.67	4.78

¹⁴ "Total Diversion Authority" is the sum of authorized diversion rates from all licenses, decrees, permits, and applications for permit based, adjusted for combined use conditions on rate. These numbers correspond to the totals set out under the column labeled "Effective Diversion Rate (cfs)" in Exhibit A at page 12 (potable system rights) and Exhibit B at page 13 (non-potable system rights).

¹⁵ "Current Capacity" is the sum of the quantities under the column labeled "Well Capacity" listed in Exhibit D (Tables D1 and D2) beginning on page 16.

¹⁶ Future Wells is the sum of quantities under the column labeled "Anticipated Well Capacity" listed in Exhibit D (Table D3) beginning on page 16.