

State of Idaho
Department of Water Resources
Water Right License
WATER RIGHT NO. 63-33245

PRIORITY: March 23, 2009

Maximum Diversion Rate: 0.41 CFS

It is hereby certified that:

UNION BLOCK ASSOCIATES LLC 1020 W MAIN ST STE 270 BOISE ID 83702

has complied with the terms and conditions of the permit, issued pursuant to Application for Permit dated March 23, 2009, and has submitted Proof of Beneficial Use on September 14, 2016. An examination confirms water is diverted from:

SOURCE:
GROUND WATER

and a water right has been established as follows:

<u>BENEFICIAL USE</u>	<u>PERIOD OF USE</u>	<u>DIVERSION RATE</u>
HEATING	01/01 to 12/31	0.41 CFS
COOLING	01/01 to 12/31	0.15 CFS

LOCATION OF POINT(S) OF DIVERSION:

GROUND WATER NW¼NE¼ Sec. 10, Twp 03N, Rge 02E, B.M. ADA County

GROUND WATER NW¼NE¼ Sec. 10, Twp 03N, Rge 02E, B.M. ADA County

PLACE OF USE: COOLING

Twp	Rge	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
03N	02E	10		X															

PLACE OF USE: HEATING

Twp	Rge	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
03N	02E	10		X															

CONDITIONS OF APPROVAL

1. Diversion and use of water with a temperature greater than 85 degrees Fahrenheit is not authorized under this right.
2. The following rights are diverted through point(s) of diversion described above: 63-12342 and 63-33245.
3. Cooling and heating use is for the Union Block Building.
4. Use of water under this right shall be non-consumptive regarding the Boise River when evaluated with the shallow aquifer presumed to be tributary to the river.

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Water Right License
WATER RIGHT NO. 63-33245

5. Water diverted and beneficially used under this right shall be discharged to the Boise River.
6. This right does not grant any right-of-way or easement across the land of another.
7. Water bearing zone to be appropriated is 79 to 195 feet.
8. After specific notification by the Department, the right holder shall install a suitable measuring device or shall enter into an agreement with the Department to use power records to determine the amount of water diverted and shall annually report the information to the Department.
9. Rights 63-12342 and 63-33245 when combined shall not exceed a total diversion rate of 0.41 cfs and a total annual maximum diversion volume of 125.0 af.

This license is issued pursuant to the provisions of Section 42-219, Idaho Code. The water right confirmed by this license is subject to all prior water rights and shall be used in accordance with Idaho law and applicable rules of the Department of Water Resources.

Signed this 31st day of October, 2017.



SHELLEY W. KEEN
Water Rights Section Manager

State of Idaho
Department of Water Resources
Attachment to Water Right License
63-33245

This map depicts the HEATING and COOLING place of use boundary for this water right at the time of this approval and is attached to the approval document solely for illustrative purposes.

02E



-  Point of Diversion
-  Place Of Use Boundary
-  Townships
-  PLS Sections

0 0.035 0.07 0.14 Miles





State of Idaho

DEPARTMENT OF WATER RESOURCES

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

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

GARY SPACKMAN
Director

C.L. "BUTCH" OTTER
Governor

November 2, 2017

UNION BLOCK ASSOCIATES LLC
1020 W MAIN ST STE 270
BOISE ID 83702

RE: License No. 63-33245

Issuance of License

Dear Water Right Holder(s):

The Department of Water Resources has issued the enclosed Water Right License confirming that a water right has been established in accordance with your permit. Please be sure to thoroughly review the conditions of approval and remarks listed on your license.

The license is a PRELIMINARY ORDER issued by the Department pursuant to section 67-5243, Idaho Code. It can and will become a final order without further action by the Department unless a party petitions for reconsideration or files an exception and/or brief within fourteen (14) days of the service date as described in the enclosed information sheet.

Please note that water right owners are required to report any change of water right ownership and/or mailing address to the Department within 120 days of the change. Failure to report these changes could result in a \$100 late filing fee. Contact any office of the Department or visit the Department's homepage on the Internet to obtain the proper forms and instructions.

If you have any questions, please contact me at 208-287-4951.

Sincerely,

Pamela Skaggs, Water Rights Supervisor
Water Right Permits Section

Enclosure(s)

cc: SPF WATER ENGINEERING LLC

CERTIFICATE OF SERVICE

I hereby certify that on November 3, 2017 I mailed a true and correct copy, postage prepaid, of the foregoing PRELIMINARY ORDER (**Approved License**) to the person(s) listed below:

RE: WATER RIGHT NO. 63-33245

**SPF WATER ENGINEERING LLC
C/O LORI GRAVES
300 E MALLARD DR STE 350
BOISE ID 83706**

**UNION BLOCK ASSOCIATES LLC
1020 W MAIN ST STE 270
BOISE ID 83702**

A handwritten signature in black ink, reading "Darla Block". The signature is fluid and cursive, with a horizontal line extending from the end of the name.

Darla Block
Technical Records Specialist

EXPLANATORY INFORMATION TO ACCOMPANY A PRELIMINARY ORDER

(To be used in connection with actions when a hearing was **not** held)

(Required by Rule of Procedure 730.02)

The accompanying order or approved document is a "Preliminary Order" issued by the department pursuant to section 67-5243, Idaho Code. **It can and will become a final order without further action of the Department of Water Resources ("department") unless a party petitions for reconsideration, files an exception and brief, or requests a hearing as further described below:**

PETITION FOR RECONSIDERATION

Any party may file a petition for reconsideration of a preliminary order with the department within fourteen (14) days of the service date of this order. **Note: the petition must be received by the department within this fourteen (14) day period.** The department will act on a petition for reconsideration within twenty-one (21) days of its receipt, or the petition will be considered denied by operation of law. See Section 67-5243(3) Idaho Code.

EXCEPTIONS AND BRIEFS

Within fourteen (14) days after: (a) the service date of a preliminary order, (b) the service date of a denial of a petition for reconsideration from this preliminary order, or (c) the failure within twenty-one (21) days to grant or deny a petition for reconsideration from this preliminary order, any party may in writing support or take exceptions to any part of a preliminary order and may file briefs in support of the party's position on any issue in the proceeding with the Director. Otherwise, this preliminary order will become a final order of the agency.

REQUEST FOR HEARING

Unless a right to a hearing before the Department or the Water Resource Board is otherwise provided by statute, any person aggrieved by any final decision, determination, order or action of the Director of the Department and who has not previously been afforded an opportunity for a hearing on the matter may request a hearing pursuant to section 42-1701A(3), Idaho Code. A written petition contesting the action of the Director and requesting a hearing shall be filed within fifteen (15) days after receipt of the denial or conditional approval.

ORAL ARGUMENT

If the Director grants a petition to review the preliminary order, the Director shall allow all parties an opportunity to file briefs in support of or taking exceptions to the preliminary order and may schedule oral argument in the matter before issuing a final order. If oral arguments are to be heard, the Director will within a reasonable time period notify each party of the place, date and hour for the argument of the case. Unless the Director orders otherwise, all oral arguments will be heard in Boise, Idaho.

CERTIFICATE OF SERVICE

All exceptions, briefs, requests for oral argument and any other matters filed with the Director in connection with the preliminary order shall be served on all other parties to the proceedings in accordance with IDAPA Rules 37.01.01302 and 37.01.01303 (Rules of Procedure 302 and 303).

FINAL ORDER

The Director will issue a final order within fifty-six (56) days of receipt of the written briefs, oral argument or response to briefs, whichever is later, unless waived by the parties or for good cause shown. The Director may remand the matter for further evidentiary hearings if further factual development of the record is necessary before issuing a final order. The department will serve a copy of the final order on all parties of record.

Section 67-5246(5), Idaho Code, provides as follows:

Unless a different date is stated in a final order, the order is effective fourteen (14) days after its service date if a party has not filed a petition for reconsideration. If a party has filed a petition for reconsideration with the agency head, the final order becomes effective when:

- (a) The petition for reconsideration is disposed of; or
- (b) The petition is deemed denied because the agency head did not dispose of the petition within twenty-one (21) days.

APPEAL OF FINAL ORDER TO DISTRICT COURT

Pursuant to sections 67-5270 and 67-5272, Idaho Code, if this preliminary order becomes final, any party aggrieved by the final order or orders previously issued in this case may appeal the final order and all previously issued orders in this case to district court by filing a petition in the district court of the county in which:

- i. A hearing was held,
- ii. The final agency action was taken,
- iii. The party seeking review of the order resides, or
- iv. The real property or personal property that was the subject of the agency action is located.

The appeal must be filed within twenty-eight (28) days of this preliminary order becoming final. See section 67-5273, Idaho Code. The filing of an appeal to district court does not itself stay the effectiveness or enforcement of the order under appeal.

MEMORANDUM

Date: October 27, 2017
To: Water Right File 63-33245
From: Michele Edl
Re: licensing review memo

Background

This permit is the second water right for climate control purposes in the Union Block Building. It authorized a total of 0.41 cfs to be diverted from ground water for heating and cooling purposes. The permitted uses are an addition to Licensed Right 63-12342 which authorized only cooling use by the same heat exchanger system.

Permit 63-33245 fills out the cooling diversion rate already shown to be used and authorizes a diversion for heating use.

Applicant

According to IDSOS website, Parklane Company Inc. (IDSOS #C79894) was dissolved on January 10, 2014. The permit was assigned from Parklane Company, Inc. to Union Block Associates, LLC., on June 2, 2014.

IDSOS lists Union Block Associates, LLC as #W1563. It was an active entity in 2014. But it was administratively dissolved on December 16, 2015 and then reinstated on February 24, 2016. The proof statement was signed by K Howell, on August, 8, 2016. Kenneth G. Howell has the authority to file for both entities. He is listed as president of Parklane Company, Inc. and as the manager of Union Block Associates, LLC.

Source and Point-of-Diversion

The source water for this water right is cool ground water from two wells. One POD is a production well which is an authorized POD for licensed right 63-12342. The second well is a re-purposed injection well which was originally intended to accept the spent water from the heating/cooling system. It has been deepened twice, supplied with a submersible pump and is now the back-up well for the heating/cooling system and both 63-12342 and 63-33245. The injection well permit was made inactive September 2017.

The two well-PODs are located within the Boise Front Ground Water Management Area but the wells are less than 300 feet deep and therefore not subject to that management plan.

The PODs are also located within the Basin 63 Groundwater Restricted Area. The well driller's log for production well #1 indicates that it is 90 feet deep and screened from 79 to 89 feet. Production well #2 is the re-purposed injection well. The well driller's logs for it shows that it has been deepened to 195 feet and has been screened from 185 to 195 feet, from 167 to 183 feet and from 150 to 165 feet. Ground water shallower than 200 feet is considered tributary to the Boise River and this permit would normally have required mitigation.

Companion Transfer 73971 (approved in September 2011) authorized an additional POD; a new 'injection' point for the spent heating/cooling water. The transfer authorized the right holder to discharge into an ACHD storm water drain which then discharges to the Boise River. Returning the water directly to the Boise River was expected to mitigate any injury to the aquifer which provides the source water for this right.

I queried the hydrologic database and IDWR hydrologists who monitor the Boise River aquifer. Although the data is limited, it does not show an impact to the aquifer due to the changes in the diversion and discharge points of this system.

The point-of-diversion shapes are based on existing points, aerial photography and the map attached to the field exam report.

Priority Date

The Proof of Beneficial Use statement and a completed Beneficial Use Field Report were submitted to the State office on September 14, 2016. The report was assigned to a reviewer, screened, and considered acceptable in October 2016.

I found that I needed additional information from the examiner in order to complete the licensing review. The additional information was supplied timely. There was no advancement to the priority of this right.

Water Use

Evaluating the water use has been complicated by the number of water sources available to the Union Block building. The building also utilizes low temperature geothermal water from the City of Boise for heating purposes year-round. Potable water is provided through a connection to the municipal water system. And both of those sources could supply water to the heating/cooling system. Please refer to the attached diagram of the system which was excerpted from the field examiner's report on 63-12342.

On July 14, 2016, the certified water right's examiner Terry Scanlan (Principal Engineer, SPF Water Engineering, LLC) confirmed a beneficial use of water but did not measure the flow. On August 18, another engineer from SPF attempted to measure the flow at several locations on the system, but was not successful.

It's not likely that the system was being used for heating at the time of either visit because the outside high temperatures in Boise were in the 90's those days. However, the system was in place and some heating use could be assumed if other sources of heat were not available. That assumption is challenged by the records of geothermal water use which were provided to me by the City of Boise's geothermal coordinator, Jon Gunnerson P.E. Only after the information from the city was reconciled with the examiner's report could I consider that a beneficial heating use had occurred.

Rate

The 'proof' statement lists the rate at 0.41 cfs for this right and that rate is also the examiner's recommendation. Flow metering of this cool water diversion was not a requirement of the permit. So the examiner's recommendation is based on a calculation which uses the equipment specs, and estimates of system operation. The calculations use reasonable parameters and the recommendation follows logically.

I concur with the examiner with respect to the rates used for heating and cooling. The total diversion rate for the cool ground water which supplies this heating/cooling system is 0.41 cfs. 0.15 cfs is recommended for cooling use (0.25 cfs is already authorized under 63-12342) and 0.41 cfs for heating use.

Volume

The licensed volume of water under right 63-12342 for cooling use from this same system is 125 AF and very generous. In a January 5, 2011 letter, the applicant's consultant stated that the "volume licensed to associated water right 63-12342 was sufficient for annual operation of the heating and cooling system." However, Angie Grimm's review and memo to companion Transfer 76971 recommended that the volume for this right not be limited to 125 AF. She recognized that the applicant could divert an additional increment of volume based on the increased diversion rate for cooling and the year-round season-of-use authorized by Permit 63-33245.

Use of low temperature geothermal water accounts for much of the heat supplied to the Union Block building. The geothermal system and the cool water systems are used interchangeably, not together. The operator of the two systems uses the cool water system for heating in preference to the geothermal system until the outside temperatures approach 20 °F at night. At those temperatures, the cool water system can't keep up with the heating demand and the operator switches the cool water system off and

the geothermal system on for the duration of the heating season. He doesn't switch back and forth between the systems to adapt to short-term weather changes. (The City of Boise's data which shows geothermal water use in the Union Block Building during the summer months has not been explained.) During the summer cooling season and the shoulder seasons between summer and winter, the cool water system is used exclusively. The heat pumps on the building side of the exchanger can provide either cooling or heating, depending on the need.

Continuous running of 0.41 cfs, (the recommended rate), yields 297 AF. The previously licensed volume for water use through the same system was for 125 AF, leaving an absolute maximum of 172 AF available for this license. In his report, the examiner recommended a volume of 171.8 AF of cool water used for heating and cooling purposes. That recommendation did not consider any use of low-temperature geothermal water for heating. Because records provided to me by the City of Boise showed that geothermal water was used, the examiner's volume recommendation was unacceptable.

I forwarded the City of Boise's data to the examiner and requested a revised volume recommendation. The examiner proposed other volumes for the license based on well-pump capacities combined with a SOU that was the inverse of the season for geothermal flow. The cool water pumps and wells are oversized and can deliver more water than can be beneficially used by the system. So the volume recommendations relying on them were also unacceptably high.

Period-of-record temperatures for the Boise NWS station indicate that average minimum temperatures during December, January and February are in the 20's. During the 90 days from December 1 – February 28, the operator of the Union Block Building's heating systems would typically switch to using low temperature geothermal water exclusively. Removing 90 days from consideration in the estimate for a volume leaves 275 days. If the cool water system runs continuously for 275 days at the authorized rate, the volume of water diverted would be 223.6 AF. 125 AF has already been authorized by Water Right 63-12342. That leaves 98.6 AF of additional volume possible from this license based on flow rate alone and is less than any of the examiner's volume recommendations.

Calculations based on heat transfer rates yield much smaller volumes of water beneficially used. An energy-based water use calculation was provided to SPF on January 8, 2008, by the mechanical engineer for the system, Kartchner Engineering. In that document, the water use by the system for cooling purposes was estimated to be 15 AF of water. And the water use by the system for heating purposes was estimated to be 12.4 AF. The calculations used the same run time of 8544 hours out of 8760 possible per year so the heating volume and cooling volume would not be additive. It is not clear why the examiner did not refer to these design engineering calculations. But energy-based volumes are significantly less than the volume of water already authorized for use by this heating and cooling system through licensed right 63-12342.

I made calculations of heating and cooling water use using three different heat transfer-based methods and all of them resulted in volumes of water which were less than that which is already authorized. I believe that the statement in SPF's January 5, 2011 letter to Angie Grimm is correct. The "volume licensed to associated water right 63-12342 was sufficient for annual operation of the heating and cooling system." Therefore, I am not recommending any additional volume for this license.

Place-of-Use

Available Ada County tax parcel information shows that the property is owned by Union Block Associates LLC. The examiner's POU map depicts the entire Union Block building and that building is the place-of-use for the senior right 63-12342. The POU is located within lots 2, 3, 4 and a bit in lot 5 of block 43, Boise City Original Townsite (BCOT). The physical address is 730 W Idaho St.

The place-of-use is actually where the water becomes heat. That transfer occurs in a heat exchanger rather than the whole building. But for consistency in the shapes between the two rights, I kept the existing tax parcel shape as the POU shape for this right.

The basement of the Union Block building has two heat exchangers. One for the cool ground water and

a separate one for the low-temperature geothermal water. The two exchangers are connected by piping but a valve isolates them. The examiner determined that the operator of the two systems does not use the cool water system and geothermal water system at the same time.

Status and Combined Use

The PODs are located within an area of concern but not currently under any watermaster's control.

Existing license 63-12342 recognized a portion of the cooling use delivered by this same system. Combined limits to the rate and volume will be maintained on both rights.

The cool-water heat exchanger system was developed to be supplemental to the low-temperature geothermal water system.

Recommendations

I concur with Terry Scanlan's (Certified Water Rights Examiner 129) recommendation for the license rate but not with his recommendation for the license volume.

I recommend 0.41 cfs for heating, and an additional 0.15 cfs for cooling.

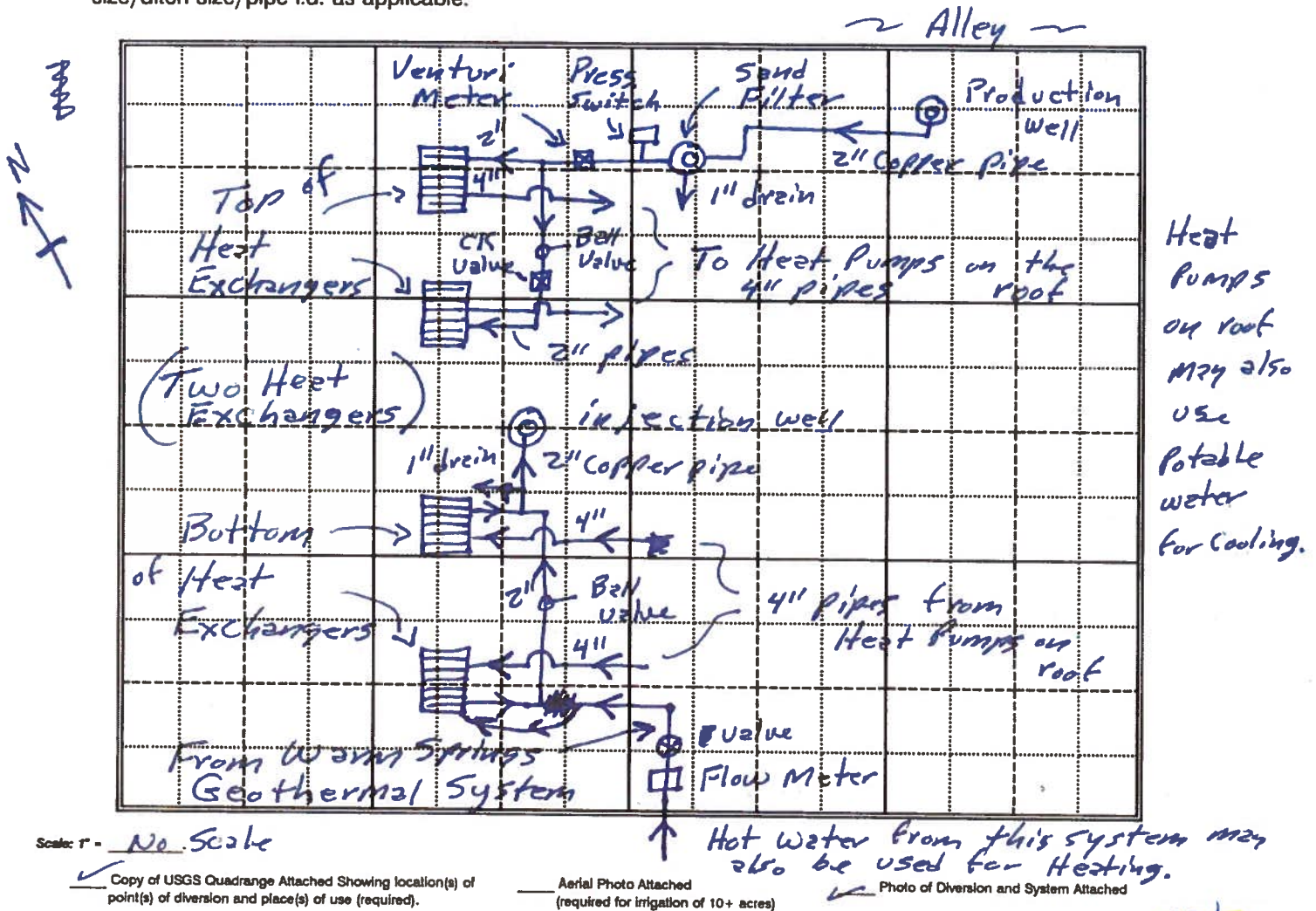
I recommend no additional volume for the license of this right.

I understand that the building owner wants to stop using low-temperature geothermal water as the primary source for heating. If the cool water system is used exclusively year-round by discontinuing all use of the low-temperature geothermal water, then another water right will be required.

Conditions

I drafted conditions for this right, 63-33245 which are nearly identical to the conditions which were placed on License 63-12342.

3. **Delivery System Diagram:** Indicate all major components and distances between components. Indicate weir size/ditch size/pipe I.D. as applicable.



4. THIS SYSTEM DIAGRAM WAS EXCERPTED FROM THE FIELD EXAM FOR 63-12342

Well or Diversion Identification No.*	Motor Make	Hp	Motor Serial No.	Pump Make	Pump Serial No. or Discharge Size
		10		Caron Pump Co.	

*Code to correspond with No. on map and aerial photo

D. FLOW MEASUREMENTS

1.

Measurement Equipment	Type	Make	Model No.	Serial No.	Size	Calib. Date

2. Measurements: None - There is a Venturi Meter Installation on the 2" line from the well, but the probes and electrical system has not be installed. No flow measurement possible.

MEMORANDUM

Date: Oct 11, 2017
To: Water Right File 63-33245
From: Michele Edl
Re: operation data phone log

Phone call with Terry Scanlan this morning RE volume for this right.

Operator switches seasonally not weekly monthly. Although could switch more frequently and Owner would like more cool water used. Another permit will be required if geothermal is discontinued.

Actual geothermal use documented. The inverse is the basis of Terry's volume recommendation see 9/28/2017 email.

Don't know the reason for summertime geothermal use. Preheating hot water?

Edl, Michele

From: Terry Scanlan <TScanlan@spfwater.com>
Sent: Saturday, September 16, 2017 5:51 PM
To: Edl, Michele
Cc: Kenneth Howell; Lori Graves
Subject: RE: [External] RE: union block
Attachments: Copy of UB Geo 11.11-12.16(9-2017 update).xlsx

WR 63-33245

Michele –

We think we have this figured out.

The City of Boise Geothermal data supplied to me by Parklane's bookkeeper mistakenly showed use in gallons starting in March 2013, but it turns out it should have been gallons x 100. On the attached spreadsheet, I have multiplied those values by 100, and summed them for fiscal years 2014 through 2016 and they match the City's reported use. So it appears that the Union Block is still using geothermal. This was news to both me and Ken Howell.

We quizzed the building operator at length. We were surprised to hear that when it gets too cold out, he turns off the cold water system and turns on the geothermal system. He said that some of the building heat pumps shut off when the loop temperature falls below about 60F, and the 65F well water can't keep up when it gets below about 20 degrees at night. At that point, he goes 100% geothermal until the weather warms up and he turns off the geothermal. It is a bit of a mystery why there is still geothermal use in some of the warmer months.

So where does that leave us? There is of course no change to the volume for cooling (previously calculated as 145.7 AF). For heating, however, it looks like we can justify (from the geothermal billing records) heating for April through October 2013 (1225 HDD), and for May through most of November 2015 (approx. 1500 HDD). The average total HDD for Boise is 5514 based on the NOAA data submitted with the field exam. This suggests that cold water was used for about 25% of the annual heating needs for the building in 2013 and 2015. The total heating demand calculation in the field exam was 853.1 AF; 25% would be 213.3 AF. So total volume would be $145.7 + 213.3 = 359$ AF. This value is more than the volume that can be produced by the wells ($0.41 \text{ cfs} \times 1.9835 \times 365 = 296.8$ AF). So I think the license volume should be $296.8 \text{ AF} - 125 \text{ AF} = 171.8 \text{ AF}$. Let me know if you see it otherwise.

Also, let me know if you need any additional information regarding your letter of September 8, 2017. It is my understanding that there is no mixing of the cold and geothermal water. All City geothermal water is returned to the City collection system, and all cold groundwater diverted under permit 63-33245 is discharged to the storm drainage system.

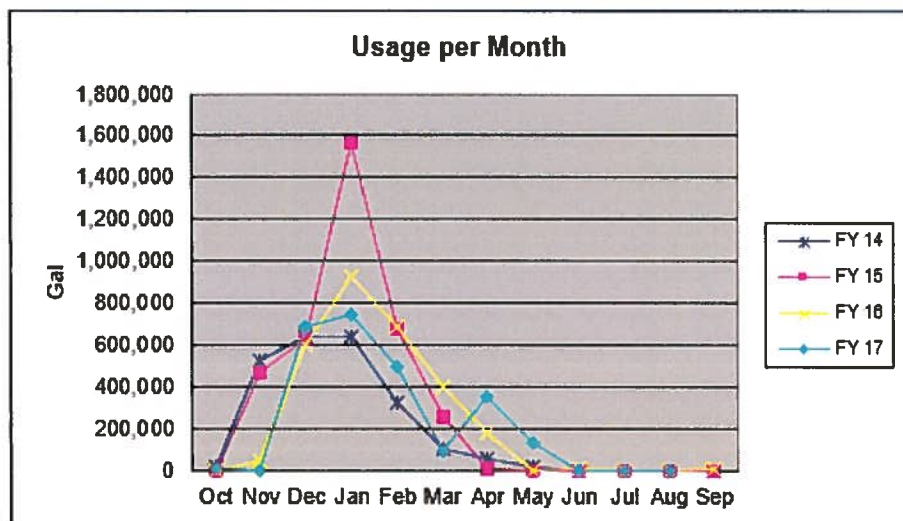
Terry

From: Terry Scanlan
Sent: Wednesday, September 6, 2017 6:43 PM
To: 'Edl, Michele' <Michele.Edl@idwr.idaho.gov>
Cc: Kenneth Howell <kghowell@parklaneco.com>; Lori Graves <LGraves@spfwater.com>
Subject: RE: [External] RE: union block

It has been more than a year since I did the exam, but my recollection is that there are two heat exchangers in that building as shown on the attached photo. The unit on the right can use geothermal water from the City and unit on the left uses cold water from the two wells. I was told that the use of geothermal water is minimized due to cost.

1		Building:	Number	name					Address			ft²	City Proj
2			11	Union Block	Building	720 W Idaho						15,000	GEO 058
3													
4	Usage	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul		
5	FY 14	14,600	520,300	641,000	637,900	320,400	105,300	57,200	21,700	100			
6	FY 15	2,100	465,700	628,800	1,570,600	673,900	260,700	10,300	0	0			
7	FY 16	0	47,400	600,200	921,100	684,900	401,700	183,800	3,000	7,500	3,800		
8	FY 17	12,100	0	682,400	748,000	494,900	90,200	349,000	135,900	2,400	2,200		
9													

I have not received any notification that they will stop using geothermal water. In fact, they are positioned to use just over 2.5 million gallons this year, which is comparable to past years.



All used geothermal water is collected again, through a second set of pipelines, and piped over to the City's injection well. Buildings (on the City's system) are not responsible for disposal of the water. Every gallon that I pump, in theory, is a gallon that I reinject. The City's system is a closed system.

Hope this helps, let me know if you need anything additional, or feel free to give me a call.

Thanks,



CITYOFBOISE.ORG

Jon Gunnerson, P.E.
Geothermal Coordinator
Public Works
Office: (208)608-7173
jgunnerson@cityofboise.org

Making Boise the most livable city in the country.

The excel spreadsheet attached to my email of March 27, 2017 is the geothermal usage data provided to me by Parklane Management Company. It indicates usage of 2.76 Mgal in 2012, 0.89 Mgal in 2013, 0.02 Mgal in 2014, 0.03 Mgal in 2015, and 0.03 Mgal in 2016. This data is consistent with the conversion of use from geothermal for heating to cold groundwater as the primary source for heating.

I don't know why the City's data is different from the data provided to me by Parklane. I am copying Kenneth Howell in the hope that he can shed some light on this matter.

From: Edl, Michele [<mailto:Michele.Edl@idwr.idaho.gov>]
Sent: Wednesday, September 6, 2017 6:08 PM
To: Terry Scanlan <TScanlan@spfwater.com>
Subject: FW: [External] RE: union block

Terry Scanlan,

I have circled around to the license review for 63-33245 (heating and cooling use in the Union Block Building). I understood from our previous email exchanges, that the cold water-sourced system authorized by this permit was the primary or only source of heat for the building and that the geothermal water from the City of Boise was rarely if ever used.

I spoke to Nate Fischer, a hydrogeologist in IDWR's ground water protection group, this morning. He spent a good part of the last week converting an expiring injection well permit into a production well permit for this building. The (now) two permitted production wells deliver water to the cool water-sourced climate control system. In the well permit conversion process, the building manager told Nate that they were NOT using geothermal water.

This afternoon, I received the email below from the City of Boise's geothermal coordinator in response to a question that I posed. Based on this spreadsheet and my follow-up discussion with him, the Union Block Building is still using a lot of geothermal water. So I have conflicting information.

Have I misunderstood your statements about how the heating systems work in this building? It does not appear that this heat exchanger system is the primary system for space heating in the Union Block building. So are there two open loop systems? One that's more or less a direct use of low temp geothermal water and another open loop that is cool water for the ground water sourced system (aka a geothermal heat pump system)?

I'm sorry to make you repeat yourself. But when you get a minute, would you please clarify the water sources for the 63-33245 heat exchanger system one more time?

Sincerely,
Michele Edl
208-287-4946

From: Jon Gunnerson [<mailto:Jgunnerson@cityofboise.org>]
Sent: Wednesday, September 06, 2017 3:40 PM
To: Edl, Michele <Michele.Edl@idwr.idaho.gov>
Subject: RE: [External] RE: union block

Hi Michele –

The building in which I refer as the Union Block Building is located at 720 W Idaho Street. (I assume we are talking about the same building)

This building IS currently using geothermal water based on monthly meter readings. Last month (August) they used 2400 gallons on geothermal water.

Month	KGAL			City (Mgal)
11/1/2011	17,000	17,000		
12/1/2011	428,300	428,300		
1/1/2012	762,800	762,800		
2/1/2012	596,200	596,200	FY2012	
3/1/2012	749,600	749,600	2,830,400	
4/1/2012	276,500	276,500		
12/1/2012	375,300	375,300		
1/1/2013	491,000	491,000	FY2013	
2/1/2013	388,700	388,700	2,146,700	
KGL	4,085,400			
Month	GAL			
3/1/2013	7,086	708,600		
4/1/2013	1,831	183,100		
12/1/2013	5,203	520,300		
1/1/2014	6,410	641,000		
2/1/2014	6,379	637,900	FY2014	
3/1/2014	3,204	320,400	2,303,800	2.32
4/1/2014	1,053	105,300		
5/1/2014	572	57,200		
6/1/2014	217	21,700		
12/1/2014	4,657	465,700		
1/1/2015	6,288	628,800		
2/1/2015	15,706	1,570,600	FY2015	
3/1/2015	6,739	673,900	3,610,000	3.61
4/1/2015	2,607	260,700		
5/1/2015	103	10,300		
12/1/2015	474	47,400		
1/1/2016	6,002	600,200		
2/1/2016	9,211	921,100	FY2016	
3/1/2016	6,849	684,900	2,854,200	2.86
4/1/2016	4,017	401,700		
5/1/2016	1,838	183,800		
6/1/2016	30	3,000		
7/1/2016	75	7,500		
8/1/2016	38	3,800		
9/1/2016	8	800		
10/1/2016	52	5,200		
11/1/2016	121	12,100		
12/1/2016	1,775			
	98,545			

Edl, Michele

From: Edl, Michele
Sent: Thursday, September 07, 2017 4:19 PM
To: 'Terry Scanlan'
Subject: Permit 63-33245
Attachments: AIR ltr2.pdf

Terry Scanlan,
The attached letter will be mailed from the state office tomorrow.
Respectfully,
Michele Edl



State of Idaho

DEPARTMENT OF WATER RESOURCES

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

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

GARY SPACKMAN
Director

C.L. "BUTCH" OTTER
Governor

September 8, 2017

UNION BLOCK ASSOCIATES, LLC
1020 W MAIN ST STE 270
BOISE ID 83702

RE: Water Right No. 63-33245

Dear Permit Holder:

I have been assigned to complete the review of the Beneficial Use Field Report for 63-33245 that SPF Water Engineering, LLC., submitted on behalf of Union Block Associates, LLC. I have found that IDWR will need additional information before a license can be issued for the use. This letter describes the additional information needed and sets a timeline for you to provide it.

Water Right Permit 63-33245 authorized water for heating and cooling uses that would be in addition to the amounts established by Licensed Right 63-12342. In the Beneficial Use Field Report for that senior right, (63-12342) the IDWR examiner found a heat exchanger system in place and utilizing water for the cooling purposes that had been authorized by the permit. He also found, diagramed and noted in his report that the heat exchanger system was also connected to and could receive low temperature geothermal water. And he mentioned that the heat exchanger system had access to potable water from the City of Boise.

That examiner's account complements a statement in the Application for Permit 63-33245, (the right that I am reviewing now). In your response to question 10, you stated "City of Boise geothermal water and municipal water can also be used through the exchange system."

I have reviewed SPF's Beneficial Use Field Report for 63-33245. I asked for and promptly received, information from the field examiner about the sources of water that were found to be used by the heat exchanger system during the development period. The examiner stated that municipal water was not used by the heat exchanger system during the development period due to its high cost. He also stated that geothermal water use was now only supplemental to the use of cool water in the system and provided information from you that indicated a phasing out of the geothermal water use.

That geothermal use information is inconsistent with information that I have received from the City of Boise's geothermal coordinator. The City of Boise geothermal system is still delivering a large quantity of geothermal water to the Union Block Building. Please refer to the attached spreadsheet. Recent geothermal water deliveries do not appear to have changed enough to support a supplemental only use.

SPF's engineers visited the mechanical room of the Union Block Building during the summer of 2016. It would have been difficult to confirm beneficial heating use at that time of year. However, the system was in place and some heating use could be assumed to occur if no other sources of heat were available. That assumption is challenged by the records of geothermal water use which were provided to me.

Based on the piping and valve diagram provided in the senior water right file 63-12342, the two heat exchangers in the mechanical room are connected and both can access geothermal water having temperatures greater than 100 degrees F. Condition 11. of Permit 63-33245 states: "Diversion and use of water with a temperature greater than 85 degrees Fahrenheit is not authorized under this right."

If the two heat exchangers were in place and in use during the development period of this permit, and if those heat exchangers were and are isolated from one another, then IDWR needs to understand how much of the heating use was provided by the heat exchanger system which uses only cool ground water. So before I can recommend that this permit be licensed, I need additional information. I need to understand how this heating use has been developed.

- 1) It's unclear whether a cool water system was used for heating the Union Block Building at any time during the development period. I need evidence confirming that a heating use from cool ground water was developed. I understand that the geothermal water has significantly different water chemistry. Water samples taken from the injection drain could identify which water source was in use during a heating incident.
- 2) Low temperature geothermal water is still being delivered to the Union Block building. Is that water source isolated from the cool water system in compliance with conditions on both the licensed right and the permit which is now under review? Or are you considering requesting a waiver of the condition? I understand that the city's geothermal system relies on the Union Block Building to continue its use of geothermal water.
- 3) If low temperature geothermal water can and was utilized by the heat exchanger system, then what was the maximum amount of cool water diverted for the heating use?
- 4) The cool water well and pump system appears to be capable of delivering more water than has been authorized to date. Is another permit needed to cover the full use?

IDWR's Beneficial Use Examination Rule IDAPA 37.03.02. 35.02.c. states in relevant part:

If the Director determines that a field report prepared by a certified water right examiner is acceptable but that additional information is needed to clarify the field report, he will notify the examiner in writing of the information required. If the additional information is not submitted within thirty (30) days or within the time specified in the written notice, the priority date of the permit will be advanced one (1) day for each day the information submittal is late. Failure to submit the required information within one (1) year of the date of the department's request is cause for the Director to take action to cancel the permit.

Please provide the requested information within 30-days, on or before Friday, October 6, 2017. If I do not hear from you, I will begin the process of voiding the permit.

If you have questions about this request or my review, please call me at 208-287-4946 or email me at Michele.Edl@idwr.idaho.gov

Sincerely,



Michele D. Edl

Enclosure(s)

EC: Terry M. Scanlan, SPF Water Engineering LLC

From: Jon Gunnerson [mailto:Jgunnerson@cityofboise.org]

Sent: Wednesday, September 06, 2017 3:40 PM

To: Edl, Michele <Michele.Edl@idwr.idaho.gov>

Subject: RE: [External] RE: union block

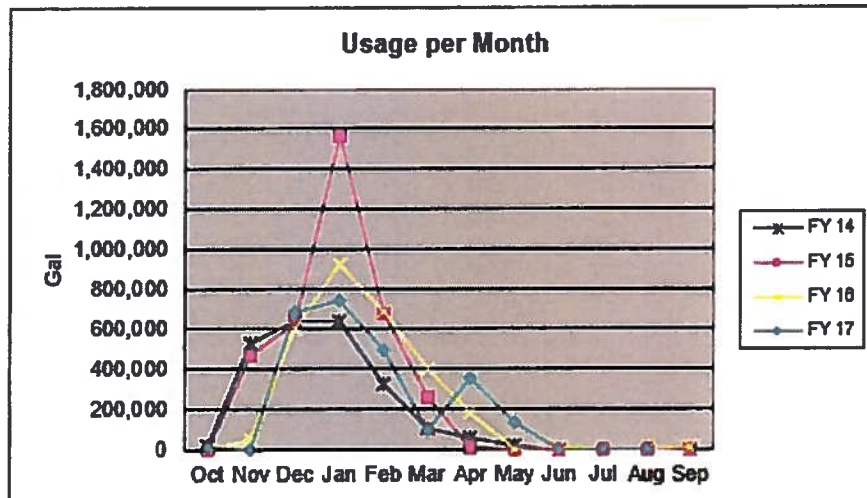
Hi Michele –

The building in which I refer as the Union Block Building is located at 720 W Idaho Street. (I assume we are talking about the same building)

This building IS currently using geothermal water based on monthly meter readings. Last month (August) they used 2400 gallons on geothermal water.

1	Building:		Number	Name	Address		ft ²		City Proj #					
2			11	Union Block Building	720 W Idaho		15,000		GEO 058					
3														
4	Usage	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
5	FY 14	14,600	520,300	641,000	637,900	320,400	105,300	57,200	21,700	100	0	100	1,900	2.32
6	FY 15	2,100	465,700	628,800	1,570,600	673,900	260,700	10,300	0	0	0	0	0	3.61
7	FY 16	0	47,400	600,200	921,100	684,900	401,700	183,800	3,000	7,500	3,800	800	5,200	2.86
8	FY 17	12,100	0	682,400	748,000	494,900	90,200	349,000	135,900	2,400	2,200	2,400	#N/A	#N/A
9														

I have not received any notification that they will stop using geothermal water. In fact, they are positioned to use just over 2.5 million gallons this year, which is comparable to past years.



All used geothermal water is collected again, through a second set of pipelines, and piped over to the City's injection well. Buildings (on the City's system) are not responsible for disposal of the water. Every gallon that I pump, in theory, is a gallon that I reinject. The City's system is a closed system.

Hope this helps, let me know if you need anything additional, or feel free to give me a call.

Thanks,



CITYOFBOISE.ORG

Jon Gunnerson, P.E.
 Geothermal Coordinator
 Public Works
 Office: (208)608-7173
jgunnerson@cityofboise.org

Making Boise the most livable city in the country.

Edl, Michele

From: Owsley, Dennis
Sent: Wednesday, September 06, 2017 4:18 PM
To: Edl, Michele
Subject: water levels in Municipal Park

WR 63-33245

Michele

I looked at the hydrographs for the monitoring well over by the Fish and Game Headquarters (well #03N 02E 14ABC1-5). I did not see any declines that I would consider out of the ordinary for any of the five zones that we monitor. I'll ask Lin in the morning if he knows of any monitoring sites closer to your project and get back to you.

Dennis

Edl, Michele

From: Terry Scanlan <TScanlan@spfwater.com>
Sent: Wednesday, September 06, 2017 6:43 PM
To: Edl, Michele
Cc: Kenneth Howell; Lori Graves
Subject: RE: [External] RE: union block
Attachments: IMG_1664.jpg; RE: Permit 63-33245

It has been more than a year since I did the exam, but my recollection is that there are two heat exchangers in that building as shown on the attached photo. The unit on the right can use geothermal water from the City and unit on the left uses cold water from the two wells. I was told that the use of geothermal water is minimized due to cost.

The excel spreadsheet attached to my email of March 27, 2017 is the geothermal usage data provided to me by Parklane Management Company. It indicates usage of 2.76 Mgal in 2012, 0.89 Mgal in 2013, 0.02 Mgal in 2014, 0.03 Mgal in 2015, and 0.03 Mgal in 2016. This data is consistent with the conversion of use from geothermal for heating to cold groundwater as the primary source for heating.

I don't know why the City's data is different from the data provided to me by Parklane. I am copying Kenneth Howell in the hope that he can shed some light on this matter.

From: Edl, Michele [mailto:Michele.Edl@idwr.idaho.gov]
Sent: Wednesday, September 6, 2017 6:08 PM
To: Terry Scanlan <TScanlan@spfwater.com>
Subject: FW: [External] RE: union block

Terry Scanlan,

I have circled around to the license review for 63-33245 (heating and cooling use in the Union Block Building). I understood from our previous email exchanges, that the cold water-sourced system authorized by this permit was the primary or only source of heat for the building and that the geothermal water from the City of Boise was rarely if ever used.

I spoke to Nate Fischer, a hydrogeologist in IDWR's ground water protection group, this morning. He spent a good part of the last week converting an expiring injection well permit into a production well permit for this building. The (now) two permitted production wells deliver water to the cool water-sourced climate control system. In the well permit conversion process, the building manager told Nate that they were NOT using geothermal water.

This afternoon, I received the email below from the City of Boise's geothermal coordinator in response to a question that I posed. Based on this spreadsheet and my follow-up discussion with him, the Union Block Building is still using a lot of geothermal water. So I have conflicting information.

Have I misunderstood your statements about how the heating systems work in this building? It does not appear that this heat exchanger system is the primary system for space heating in the Union Block building. So are there two open loop systems? One that's more or less a direct use of low temp geothermal water and another open loop that is cool water for the ground water sourced system (aka a geothermal heat pump system)?

I'm sorry to make you repeat yourself. But when you get a minute, would you please clarify the water sources for the 63-33245 heat exchanger system one more time?

Sincerely,
Michele Edl
208-287-4946

From: Jon Gunnerson [<mailto:Jgunnerson@cityofboise.org>]

Sent: Wednesday, September 06, 2017 3:40 PM

To: Edl, Michele <Michele.Edl@idwr.idaho.gov>

Subject: RE: [External] RE: union block

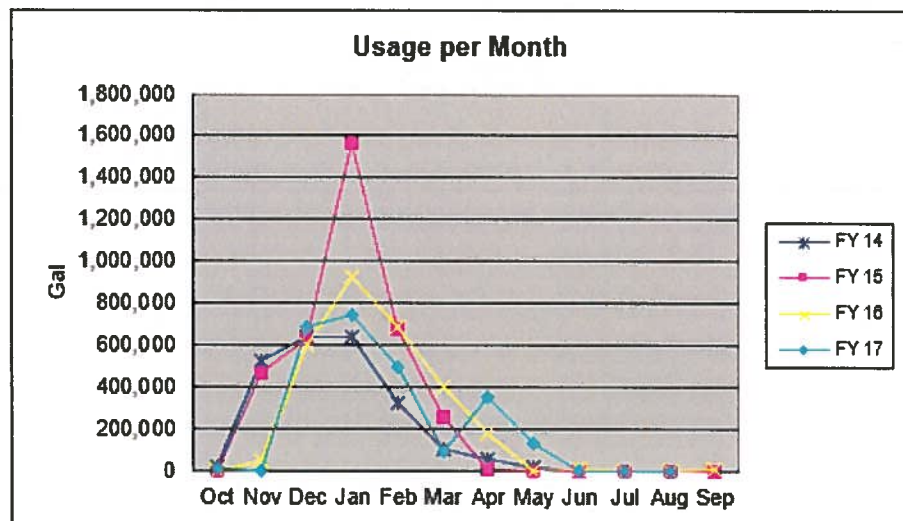
Hi Michele –

The building in which I refer as the Union Block Building is located at 720 W Idaho Street. (I assume we are talking about the same building)

This building IS currently using geothermal water based on monthly meter readings. Last month (August) they used 2400 gallons on geothermal water.

1		Building:	Number	Name	Address				ft²		City Proj
2			11	Union Block Building	720 W Idaho				15,000		GEO 058
3											
4	Usage	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
5	FY 14	14,600	520,300	641,000	637,900	320,400	105,300	57,200	21,700	100	
6	FY 15	2,100	465,700	628,800	1,570,600	673,900	260,700	10,300	0	0	
7	FY 16	0	47,400	600,200	921,100	684,900	401,700	183,800	3,000	7,500	3,800
8	FY 17	12,100	0	682,400	748,000	494,900	90,200	349,000	135,900	2,400	2,200
9											

I have not received any notification that they will stop using geothermal water. In fact, they are positioned to use just over 2.5 million gallons this year, which is comparable to past years.



All used geothermal water is collected again, through a second set of pipelines, and piped over to the City's injection well. Buildings (on the City's system) are not responsible for disposal of the water. Every gallon that I pump, in theory, is a gallon that I reinject. The City's system is a closed system.

Hope this helps, let me know if you need anything additional, or feel free to give me a call.

Thanks,



CITYOFBOISE.ORG

Jon Gunnerson, P.E.
Geothermal Coordinator
Public Works
Office: (208)608-7173
jgunnerson@cityofboise.org

Making Boise the most livable city in the country.



Edl, Michele

From: Jon Gunnerson <Jgunnerson@cityofboise.org>
Sent: Wednesday, April 12, 2017 12:58 PM
To: Edl, Michele
Subject: union block
Attachments: union.xlsx

WR 63-33245

Jon Gunnerson, P.E.
Geothermal Coordinator
City of Boise Public Works
208-384-3935



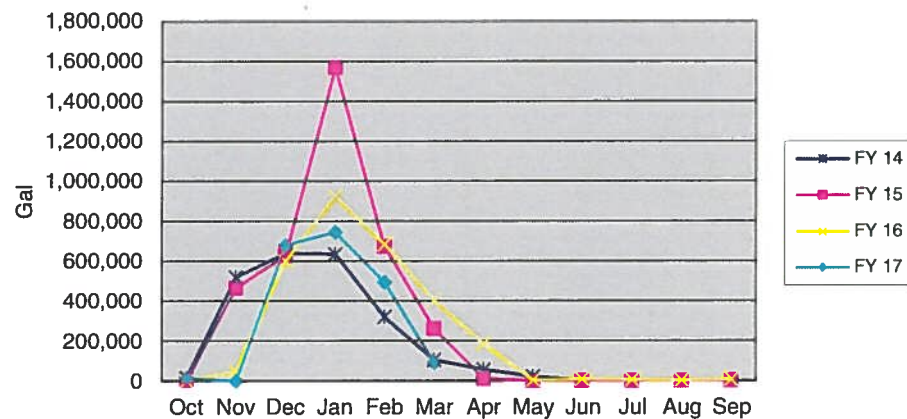
Building:	Number	Name	Address	ft ²	City Proj #
	11	Union Block Building	720 W Idaho	15,000	GEO 058

Usage	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
FY 14	14,600	520,300	641,000	637,900	320,400	105,300	57,200	21,700	100	0	100	1,900	2.32
FY 15	2,100	465,700	628,800	1,570,600	673,900	260,700	10,300	0	0	0	0	0	3.61
FY 16	0	47,400	600,200	921,100	684,900	401,700	183,800	3,000	7,500	3,800	800	5,200	2.86
FY 17	12,100	0	682,400	748,000	494,900	90,200	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A

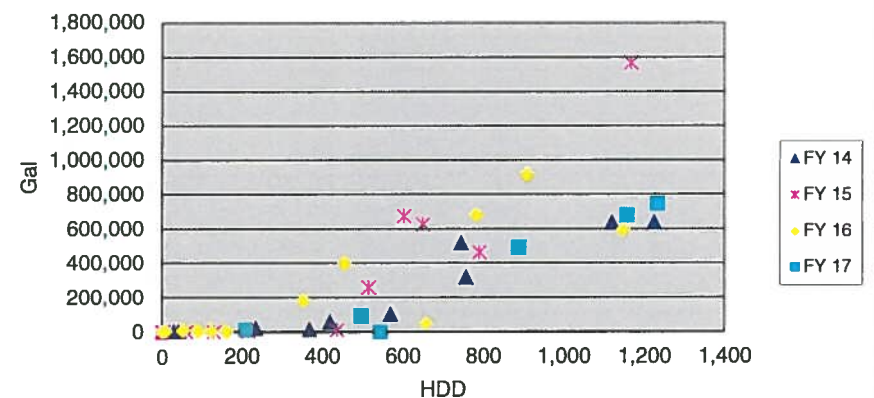
HDD	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
FY 14	367	744	1,225	1,120	756	570	418	233	40	0	0	29	5,502
FY 15	215	790	650	1,168	602	515	436	129	3	0	0	60	4,568
FY 16	123	657	1,149	908	782	454	352	160	52	8	0	89	4,734
FY 17	208	544	1,158	1,234	889	496	0	0	0	0	0	0	4,529

	FY 14	FY 15	FY 16	FY 17
Gal/Ft ²	154.7	240.8	190.6	#N/A
Gal/100Ft ² /HDD	2.812	5.272	4.027	#N/A
3 Year Avg/HDD	4.037	#N/A		
Avg Year Total MG	3.55			

Usage per Month



Usage per HDD



Edl, Michele

From: Terry Scanlan <TScanlan@spfwater.com>
Sent: Wednesday, March 29, 2017 1:02 PM
To: Edl, Michele
Cc: Lori Graves; kghowell@parklaneco.com; tisha@parklaneco.com
Subject: RE: Permit 63-33245
Attachments: UB Geo 11.11-12.16.xlsx

Michele –

Listed below are the questions in your letter dated March 23, 2017, along with answers in italics. The answers were developed with input from the permit holder, Union Block Associates, LLC.

1. If low temperature geothermal water is still being delivered to the Union Block building, is that water source still the primary source of heat for the building? If not, when did that primacy end?

Geothermal water is still used at the Union Block, but only to supplement the heat exchange system that uses cold groundwater. Supplementation is needed at times of extremely low temperature or in the event of a pump failure. It appears that geothermal water has not been used as the primary source of heat since the winter of 2012-13, following approval of permit 63-33245 and transfer of water right 63-12342 (to allow discharge of the water to the Boise River). Since that time, the system has had adequate hydraulic capacity and water right to use the on-site wells as the primary source of heat. Use of the on-site wells is more cost effective than use of the City of Boise geothermal water.

2. If low temperature geothermal water can be utilized by the heat exchanger system, was it directed through that system during the development period? If so, in what quantity?

Yes. I have attached data received today from Parklane Management Co for the period of November 2011 through December 2016. My interpretation of this spreadsheet suggests that use ranged from a minimum of 0.07 acre feet (22,492 gallons) in 2014 to a maximum of 8.47 acre feet (2.76 Mgal) in 2012.

3. If municipal water can also be used by the heat exchanger system, was it directed through that system during the development period and if so, in what quantity?

Municipal water can be used by the heat exchanger system in the event of a pump failure. Municipal water was not used during the development period. Due to cost, there is a strong incentive to not use municipal water.

Please let me know if you have any additional questions. Thanks.

Terry M. Scanlan, P.E., P.G. | Principal Engineer/Hydrogeologist

SPF Water Engineering, LLC

300 E Mallard Drive, Suite 350 | Boise, ID 83706

p. 208.383.4140 | f. 208.383.4156 | d. 208.489.2121

e. tscanlan@spfwater.com | w. www.spfwater.com

From: Edl, Michele [mailto:Michele.Edl@idwr.idaho.gov]

Sent: Thursday, March 23, 2017 11:10 AM

To: Terry Scanlan <TScanlan@spfwater.com>

Cc: Lori Graves <LGraves@spfwater.com>
Subject: Permit 63-33245

Terry Scanlan, Lori Graves,

I have recently been assigned to pick up where Ashley Newbry left off in IDWR's review of your beneficial exam and report on Permit 63-33245 (Union Block Associates, LLC)

I have attached an early bird copy of a letter which should be mailed from this office later today.

Sincerely
Michele Edl
287-4946

Month	KGAL
11/1/2011	17,000
12/1/2011	428,300
1/1/2012	762,800
2/1/2012	596,200
3/1/2012	749,600
4/1/2012	276,500
12/1/2012	375,300
1/1/2013	491,000
2/1/2013	388,700
KGL	4,085,400

Month	GAL
3/1/2013	7,086
4/1/2013	1,831
12/1/2013	5,203
1/1/2014	6,410
2/1/2014	6,379
3/1/2014	3,204
4/1/2014	1,053
5/1/2014	572
6/1/2014	217
12/1/2014	4,657
1/1/2015	6,288
2/1/2015	15,706
3/1/2015	6,739
4/1/2015	2,607
5/1/2015	103
12/1/2015	474
1/1/2016	6,002
2/1/2016	9,211
3/1/2016	6,849
4/1/2016	4,017
5/1/2016	1,838
6/1/2016	30
7/1/2016	75
8/1/2016	38
9/1/2016	8
10/1/2016	52
11/1/2016	121
12/1/2016	1,775

98,545



State of Idaho

DEPARTMENT OF WATER RESOURCES

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

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

GARY SPACKMAN
Director

C.L. "BUTCH" OTTER
Governor

March 23, 2017

TERRY SCANLAN
SPF WATER ENGINEERING
300 E MALLARD DR STE 350
BOISE ID 83706

RE: Additional Information Request: Permit No. 63-33245

Mr. Scanlan:

I have been assigned to complete the review of the Beneficial Use Field Report for 63-33245 that SPF Water Engineering submitted on behalf of Union Block Associates, LLC. Based on a preliminary check, I found that IDWR will need additional information before a license can be issued for the uses. This letter describes the additional information needed and sets a timeline for you to provide it.

As you know, Water Right Permit 63-33245 authorized water for heating and cooling uses that would be in addition to the amounts established by Licensed Right 63-12342. In the Beneficial Use Field Report for Right 63-12342, the IDWR examiner found a heat exchanger system in place and utilizing water for the cooling purposes that had been authorized by the permit. He found, diagramed and noted in his report that the heat exchanger system was connected to and could receive low temperature geothermal water. He also mentions that the heat exchanger system has access to potable water from the City of Boise.

The examiner's account complements a statement in the Application for Permit 63-33242. In his response to question 10, the applicant stated "City of Boise geothermal water and municipal water can also be used through the exchange system."

I have reviewed SPF's Beneficial Use Field Report for 63-33245. I found no mention of either low temperature geothermal water or of municipal water with respect to this heating and cooling system. So it's unclear whether the heat exchanger system used any other water sources during the development period of this permit and if so, in what quantities.

If two heating systems were in place and in use during the development period of this permit, then IDWR needs to understand how much of the heating use was provided by

the heat exchanger system from the cool ground water source. So before I can recommend this permit be licensed, I need additional information. More specifically:

- 1) If low temperature geothermal water is still being delivered to the Union Block building, is that water source still the primary source of heat for the building? If not, when did that primacy end?
- 2) If low temperature geothermal water can be utilized by the heat exchanger system, was it directed through that system during the development period? If so, in what quantity?
- 3) If municipal water can also be used by the heat exchanger system, was it ever directed through that system during the development period and if so, in what quantity?

IDWR's Beneficial Use Examination Rule IDAPA 37.03.02. 35.02.c. states in relevant part:

If the Director determines that a field report prepared by a certified water right examiner is acceptable but that additional information is needed to clarify the field report, he will notify the examiner in writing of the information required. If the additional information is not submitted within thirty (30) days or within the time specified in the written notice, the priority date of the permit will be advanced one (1) day for each day the information submittal is late. Failure to submit the required information within one (1) year of the date of the department's request is cause for the Director to take action to cancel the permit.

Please provide the requested information within 30-days, on or before Monday, April 24, 2017.

If you have questions about this permit please call me at 208-287-4946 or email me at Michele.Edl@idwr.idaho.gov

Sincerely,



Michele D. Edl
Water Resource Agent Senior

Edl, Michele

From: Lori Graves [LGraves@spfwater.com]
Sent: Wednesday, December 14, 2016 8:09 AM
To: Edl, Michele
Cc: Terry Scanlan
Subject: FW: Union Block Permit 63-33245
Attachments: Karcher 1-8-2008 letter Attachment.pdf

Good Morning Michele,

Below is the information we sent in response to Ashley's request. Sorry for the Department's loss.

From: Lori Graves
Sent: Tuesday, November 22, 2016 11:43 AM
To: 'Newbry, Ashley' <Ashley.Newbry@idwr.idaho.gov>
Cc: kghowell@parklaneco.com; Terry Scanlan <TScanlan@spfwater.com>
Subject: Union Block Permit 63-33245

Good Morning Ashley,

This email is in response to your information request letter dated November 21, 2016.

Yes, the Karcher volume estimates included with our licensing exam for permit 63-33245 refer to an open loop heat and cooling exchange system. Attached is additional data that Karcher Engineering provided to support their volume estimates. Please note, the 186, 93 or 11.5 acre feet (af) estimates are for cooling only; with 186 af representing "wild flow" conditions, 93 af representing "realistic flow" conditions and 11.5 af representing very "conservative flow" conditions. The Karcher letter further lists 9.6 af as a volume estimate for heating based on conservative flow conditions. Assuming 8X this amount for a realistic heating flow volume equates to 76.8 af. This is the same correlation Karcher used for cooling (11.5 af x 8 = 93 af).

SPF recommended 171.8 af for heating and cooling uses based on NOAA data and calculations the Department used in licensing overlapping right 63-12342. This amount is very close to the Karcher combined theoretical volume calculations for heating and cooling based on realistic flow conditions (76.8 af + 93 af = 169.8 af).

Please let me know if you have any further questions Ashley and/or if I can provide additional information.

Regards,
Lori

Lori Graves | Water Rights Specialist

SPF Water Engineering, LLC
300 E Mallard Drive, Suite 350 | Boise, ID 83706
p. 208.383.4140 | f. 208.383.4156 | c. 208.850.4601
e. lgraves@spfwater.com | w. www.spfwater.com

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UNION BLOCK BUILDING ENERGY CALCULATION & WATER CONSUMPTION

As requested by SPF Water Engineering, this paper summarizes energy calculations, IDWR assumptions for energy usage, and predicted future water usage.

IDWR calculations assume a peak load of 225,120 Btuh. IDWR determines that at this peak flow rate an annual water consumption of 23 Acre Feet (AF) is required. It is unclear how the 23 AF is derived because if the peak load of 115 gpm is run continuously the Union Block building could use 181 AF in one year. See attached IDWR memo from 08/15/96.

Energy calculations attached show a peak cooling load of 831,000 Btuh and an annual water consumption of 15 AF as shown below. An energy usage factor is shown in the calculations and adds an operational safety factor assuming that perfect controls and 100% efficiency are not attainable with the well pump and heat exchanger. If the well is used for heating, probable water usage is also shown below.

$$\text{Cooling} = 344,690,000 \frac{\text{BTU}}{\text{YR}} / 8,544 \frac{\text{Hours}}{\text{Year}} / 500 / 11 \text{ Deg} \times 512,640 \frac{\text{min}}{\text{Year}} = 2,520,650 \frac{\text{Gal}}{\text{Year}} = 11.5 \text{ Acre Foot}$$

$$11.5 \text{ Acre Feet} \times \text{Water Usage Factor} = 11.5 \times 1.3 = 15 \text{ Acre Feet}$$

$$\text{Heating} = 233,510,000 \frac{\text{BTU}}{\text{YR}} / 8,544 \frac{\text{Hours}}{\text{Year}} / 500 / 9 \text{ Deg} \times 512,640 \frac{\text{min}}{\text{Year}} = 3,113,467 \frac{\text{Gal}}{\text{Year}} = 9.6 \text{ Acre Foot}$$

$$9.6 \text{ Acre Feet} \times \text{Water Usage Factor} = 9.6 \times 1.3 = 12.4 \text{ Acre Feet}$$

Energy calculations also show comparison of the existing system against a typical four pipe fan coil system. A typical fan coil system would use approximately 13.5 AF for cooling, and approximately 30.9 AF for heating.

Assumptions:

- ☐ 1 AF = 325,850 Gal
- ☐ Heat pump loop operates between 85 and 55 degrees.
- ☐ 69 Degree well temperature
- ☐ Cooling Assumes a 5 degree approach on the plate to plate heat exchanger. (80-69=11 degree)
- ☐ Heating Assumes a 5 degree approach on the plate to plate heat exchanger. (60-69=9 degree)

Monthly Water Usage for Union Block Building

Month	Cooling Kwh	Cooling Btu	Acre Feet	Usage Factor	Acre Feet
Jan	7995.8	27281669.6	0.9	1.3	1.2
Feb	6954.0	23727048.0	0.8	1.3	1.0
March	5456.6	18617919.2	0.6	1.3	0.8
April	4599.6	15693835.2	0.5	1.3	0.7
May	6413.0	21881156.0	0.7	1.3	1.0
June	10186.9	34757702.8	1.2	1.3	1.5
July	20045.0	68393540.0	2.3	1.3	3.0
August	15107.0	51545084.0	1.7	1.3	2.2
Sep	7317.9	24968674.8	0.8	1.3	1.1
Oct	4930.5	16822866.0	0.6	1.3	0.7
Nov	5684.2	19394490.4	0.6	1.3	0.8
Dec	6332.4	21606148.8	0.7	1.3	0.9
Total	101022.9	344690134.8	11.5		15.0

Month	Heating Kwh	Heating Btu	Acre Feet	Usage Factor	Acre Feet
Jan		99050000.0	4.053	1.300	5.269
Feb		84480000.0	3.457	1.300	4.494
March		13280000.0	0.543	1.300	0.706
April		2500000.0	0.102	1.300	0.133
May		0.0	0.000	1.300	0.000
June		0.0	0.000	1.300	0.000
July		0.0	0.000	1.300	0.000
August		0.0	0.000	1.300	0.000
Sep		0.0	0.000	1.300	0.000
Oct		0.0	0.000	1.300	0.000
Nov		15000000.0	0.614	1.300	0.798
Dec		19200000.0	0.786	1.300	1.021
Total	0.0	233510000.0	9.6		12.4

Fan Coil Load Calc Cool	309696662	10.4	1.3	13.5
Fan Coil Load Calc Heat	581660000	23.8	1.3	30.9



State of Idaho

DEPARTMENT OF WATER RESOURCES

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C.L. "BUTCH" OTTER
Governor

GARY SPACKMAN
Director

November 21, 2016

SPF WATER ENGINEERING
300 E MALLARD DR STE 350
BOISE ID 83706

Dear Mr. Scanlan & Ms. Graves:

We have received and reviewed your field exam submittal for water right permit 63-33245 on behalf of Union Block Associates. One of your attachments includes a detailed letter from Karchner Engineering, the system design engineer. On the second page of the letter, under "Annual Water Volume Requirement," Mr. Karchner describes three methods of system operation. Each method corresponds to an estimate of the system's annual water usage in acre-feet.

Annual Water Volume Requirement – 186, 93, or 11.5 acre feet. This diverse annual water volume requirement is determined by flow control methods, i.e. unchecked with partial manual shut-off, standard controls, and theoretical controls matching demand respectively. The theoretical number can be determined by estimating the number of operating hours per year for the system using a "Trane Trace" modeling program based on the average degree-days per month for cooling in conjunction with equipment type used to accomplish the cooling.

Please confirm that this paragraph refers to the open-loop heat exchange system which corresponds with water right permit 63-33245. In addition, please specify which of the flow control methods above most closely corresponds to the way Union Block Associates personnel are actually running the system.

Please respond by December 9, 2016. If no response is received, the Department may take action to void water right permit 63-33245. Please direct your correspondence to Michele Edl michele.edl@idwr.idaho.gov as she is also familiar with your submittal.

Thank you,

Ashley Newbry, PE
Staff Engineer