

Hemenway, Sandy

From: Ed Squires [ed@hydrologicinc.net]
Sent: Thursday, January 16, 2014 12:55 PM
To: Hemenway, Sandy
Cc: Keen, Shelley
Subject: RE: 63-31318 Questions in reference to the City of Meridian municipal system licensing review
Attachments: 1-16-2014 Revised Page 3 of Meridian Permit No. 63-31318 Proof of Beneficial Use Exam with Typo Correction .pdf
Importance: High

Hydro Logic, Inc.

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Sandy,

I will address the questions below related to the processing of City of Meridian water right permits nos. 63-31318 and 63-31630 so those can continue to be processed. I can begin to work with the City to develop answers to your other whole system questions separately as we approach the processing of those permits subject to those conditions. I have keyed my answers below to your question numbers:

- 3) Wells #24, #25, and #28 are all active, on-line wells as shown in the water right licensing examinations.
- 6) For these municipal permits, I submitted proof for the instantaneous diversion rates during the proof of beneficial use period in the licensing examinations.
- 7) Well #24 has always pumped directly to the water distribution system and there is no reservoir nearby.
- 8) The approved water right permit no. 63-31858 associated with City Well #26 filed for all of the existing City wells to be points of diversion. Proof is due for this permit on May 1, 2014. The two permits under processing at this time do not envision Well #26, I merely listed it because that is what the application requests. Those points of diversion will be addressed during the processing of the Well #26 permit and I have been in discussions with Jeff Peppersack and Shelley Keen about that permit already.
- 9) Yes, this is a typographical error. The Well number should be the well in question, Well #24. I have attached a corrected page above.

Thanks for working on this Sandy, please call with any other questions you may have.

Ed

From: Hemenway, Sandy [mailto:Sandy.Hemenway@idwr.idaho.gov]
Sent: Thursday, January 16, 2014 8:05 AM
To: Ed Squires
Cc: Hemenway, Sandy
Subject: 63-31318 Questions in reference to the City of Meridian municipal system licensing review
Importance: High

Hi Ed,

I have a few questions from my licensing review on the City of Meridian municipal system:

- (1) In the field examination you conducted for (WR#63-31138) well # 22 on 11/9/2005, you stated that well #22 and #26 (WR#63-31858) had the same POD, yet the physical location description is different. According to the City of Meridian comments, they describe well #22 as Stoddard (Bear Creek Park) and well #26 location at Locust Grove & Dunwoody. Can you confirm which is correct?
- (2) In the field exam for well 20B, it shows a picture of well #20 and describes it as a "test well," yet we have a water right for well #20 (63-12416). My question is this: Is well #20 a supply well or a "test well?"
- (3) On the City of Meridian Water Master Plan Update, Table 3-3, Page 3-4, it describes the wells for the Meridian water system. It shows wells 7-12, 14-20, 20B – 27. Can I get an updated list showing the active and backup wells currently online and/ or under construction (including wells 20A and 28, etc)?
- (4) I see that well 23 is an emergency backup well due to high uranium. Wells 7, 8, and 12 are also shown as backup wells. Are they backup wells due to low capacity, high chemicals or other problems?
- (5) How often are the backup well exercised or online?
- (6) Can I have a spreadsheet with total diversion/flow from each well for either 2012 or 2013?
- (7) Does well #24 discharge directly to the distribution, and or to a storage reservoir? If to a reservoir, where is this located and what is its capacity?
- (8) On page 1 of your field examination for 63-31318 (well #24), you state under B. (2) that 63-31858 (well #26) has the same point of diversion. In the City of Meridian Water Master Plan Update Table 3-3, it shows well 24 at Tumble Creek & Blue Springs, and well #26 at Locust Grove & Dunwoody. My question is this: Is B(2) incorrect in having well #26 as the "same point of diversion," and should this have been left blank or had "none" as the answer?
- (9) On page 3 of your field examination for 63-31318 (well #24), under E. Narrative, in the second sentence: "The Meridian #23....." Should this be "The Meridian #24?"
- (10) Is the entire distribution for the City of Meridian a looped interconnected system, or are there areas that are independent distribution systems?
- (11) Are the following water rights, interconnected with the distribution system for the City of Meridian or stand alone systems?

Irrigation; diversion to storage	NON-MUNICIPAL	63-10921
Domestic	NON-MUNICIPAL	63-15551
Fire Protection/Municipal D24		63-31957
Irrigation	NON-MUNICIPAL	63-33318

(12) Below are water rights for wells 1-3, and 5-6 that according to the City of Meridian Water Master Plan Update are no longer on the list. I would suggest filing a transfer.

Format: Degrees minutes seconds

<u>Well/Description</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Div. Rate</u>	<u>Drilled</u>	<u>Water Right #</u>	<u>Priority Date</u>	<u>Comm</u>
#1, NWSW Sec 7, T3N, R1E	not acquired	not acquired	1.67 cfs	1910	63-32567	4/22/1910	Meridia
#2, NWSW Sec 7, T3N, R1E	not acquired	not acquired	0.78 cfs	unknown	63-32568	2/1/1928	Meridia

#3, SESE Sec 12, T3N,
R1W

N43.60831

W116.39385

0.78 cfs
never

May-52

63-2893

2/11/1952

11 W B

#4

not acquired

not acquired

used

well ab

#5, NESW Sec 7, T3N R1E

not acquired

not acquired

1.66 cfs

10/7/1961

63-3252

8/3/1961

well ab

#6 NENW Sec 12, T3N,
R1W

not acquired

not acquired

0.70 cfs

3/20/1973

63-7105

5/13/1968

well ab

E. NARRATIVE/REMARKS/COMMENTS

The field examination for this permit was carried out on December 22, 2011 by Ed Squires and Carlton Parker (hydrogeologists with Hydro Logic, Inc), accompanied by Mr. Tracy Ballantyne, Water Quality Program Manager with the Meridian Water Department (Appendix B). The Meridian #24 well is housed inside of a 29.5-foot by 28-foot cinder block pump house (Figure 6). The 17.4-inch (outside) diameter PVC well (Figure 7) is equipped with a "FloWay Pumps", 4-stage, Model 14DKH deep well turbine pump (Figure 8) set on 129.5-feet of 10-inch pump column with a 13.5-foot long pump/ intake assembly (includes 11-feet of suction pipe). The pump is driven by a 150 hp, 460 volt, 1785 rpm, U.S. Electrical Motors – High Thrust motor (Figure 4). The 10-inch diameter discharge- piping is comprised of a series of 10-inch plumbing fittings and fixtures, including check-valve, tees, couplings, flow-meter, and control valve (Figures 4 and 5) prior to exiting through the pump-house floor where it joins with the City's distribution system mainline running along and under North Linder Road. The pumping plant is equipped with a variable speed drive (VFD) unit designed to pump directly to the pressurized water distribution system. The flow-meter on the 10-inch discharge records all discharges from the Well # 24 to the distribution system. The well pump is set to operate within a predetermined pressure range in the distribution system that varies with demand; typically 60-to-90 psi. Of course the pump produces more water against less system pressure compared to when system pressure is higher.

When we arrived on-site, the Well #24 pump was operating at 850 gpm, a line pressure of 75 psi, a pumping water level of 22.5 feet below ground level (26.12 feet below measuring point), and with a motor frequency of 47.5 Hertz (cycles per second) which is approximately 80% of full speed on the VFD . Water-level measurements are facilitated through a 2-inch diameter measuring port protruding from the thrust block (Figure 4). Well #24 is the primary (lead) well in this distribution system pressure zone and apparently could not be shut off at the time of the licensing examination according to Tracy Ballantyne with the Meridian Water Department. However, Ed Squires measured the non-pumping water level in the Well #24 on 11-29-2011 at 14.1 feet above ground level after the water level in the well had recovered for 26 days while the well was being cleaned (Figure 9) and HLI recorded additional non-pumping water levels on 11/3/2011 and 7/30/2002 (Appendix B). Therefore, we use an average non-pumping water level of 10.87 feet above ground level for all calculations of this report to best simulate actual conditions. The volume-pumped totalizer read-out of the flow-meter was 510,364,500 gallons when we arrived at the site for the licensing exam (Figure 3). We had the system operators manually increase the pumping rate to simulate higher demand (summer) conditions and we measured pumping water level and line pressure for about a half hour when the pumping water level was drawn down to 66.39 feet bgl (70.51 feet bmp) at a discharge of 1,800 gpm, a system pressure of 76 psi, and full speed on the pump at an observed frequency of 60 Hertz (Hz) out of 60 Hz available (Appendix B). In other words, the pump motor was running at full speed, an important distinction because we do not need to compensate for motor speed in the determination of maximum yield; i.e. one less variable. According to our observations, the pump should have been operating on its "full speed" performance curve (Figure 10) because we observed that the VFD was operating at full speed of 60 Hz. However, when comparing our site measurements to the pump performance curve supplied by the City, for the originally installed pump that had just been refurbished within manufacturer's impeller tolerance, our measurements did not fit the curve (Figure 11). Indeed, the indicated design point on the City-furnished curve did not precisely comport with the performance curve itself? We considered whether the pressure gage on the water main may have been in error so we obtained pressure recordings (Figure 12) from the City from an in-line pressure sensor