

MEMORANDUM

TO: Water Right File – 63-9139
FROM: Erik Boe – Staff Engineer, IDWR 
DATE: January 25, 2018
SUBJECT: Field exam review

This application for permit (63-9139) was originally filed on April 17, 1978, and is currently being developed under the *Second Stipulated Agreement For Settlement in Part of Petition and Stay of Further Proceedings* (Second Agreement) accepted by the Department on January 18, 2011, in conjunction with the *Third Amendment to Second Stipulated Agreement For Settlement in Part of Petition and Stay of Further Proceedings* (Third Amendment) accepted by the Department on September 6, 2017. The associated water right permit 63-9138 has reportedly not been developed during the corresponding development period.

The field exam was completed by Terry Scanlan, P.E., P.G., of SPF Water Engineering on October 27, 2017. The field exam was submitted with the Proof of Beneficial Use form to IDWR's State Office on November 30, 2017. My review of the documentation supplied with the field exam is as follows:

Ownership: Permit 63-3139 is in the name of City of Boise Public Works Department (City).

Source, POD, POU: The source is groundwater from low temperature geothermal (LTG) aquifer(s) located between 642 and 1897 feet below ground level based on corresponding Well Driller's Reports associated with the points of diversion (PODs). Description and location of the PODs described in the field exam report appear to accurately reflect the location of the three (3) productions wells (Well Nos. 2, 3, and 4) supplying LTG water. The place of use (POU) boundary provided in the field exam report is shown relative to the Public Land Survey (PLS) to the nearest Quarter-Quarter (QQ); there are a few issues/updates that will need to be addressed during the licensing process. A map illustrating these issues/updates is provided in Figure 1 and described as follows:

- (1) Removed Government Lots (GLs) that did not contain any buildings connected to the City's LTG heating system; based on the map attached to the field exam report. These edits are illustrated in Figure 1 as overlay labeled "POU 63-9139 To Be Licensed."
- (2) Added a number of GLs that were within the proposed POU, but were not included in the POU's PLS tabular legal description.
- (3) There is a verified error in the ArcMap PLS QQ layer that occurred when generating the QQ PLS layer based on the original townsite surveys. IDWR's GIS group will update the T03N R02E S3 SESE QQ to remove the erroneous NESE label and crop the top to allow for typical QQ parcel shape. These updates will be reflected in this license.
- (4) The updated POU PLS tabular legal description for the license is presented in Table 1, and corresponds to the overlay labeled "POU 63-9139 To Be Licensed" in Figure 1.
- (5) As described in "Diversion Rate and Volume" section of this report, there are interties that supply emergency water to Boise Warm Springs Water District (BWSWD) and State of Idaho systems for heating purposes. Rather than extending the City's POU to encompass POU associated with BWSWD water right 63-5073, recommend adding language in a condition to describe these emergency uses.

Table 1: Updated PLS tabular legal description for water right license 63-9139

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	2											X						
03N	02E	3												X			X	X	
03N	02E	9				X L 3													
03N	02E	10	X	X	X	X	X	X	X L 6	X	X L 4	X L 7	X	X L 9	X	X L 3			
03N	02E	10			X L 3	X L 2	X L 5	X L 6		X L 5	X L 9	X L 8	X L 8		X L 2				
03N	02E	11					X	X	X										
03N	02E	15	X L 6	X L 5		X	X	X											
03N	02E	15					X L 2	X L 2											
03N	02E	15					X L 4												

Diversion rate and Volume:

Heating Use: Mr. Scanlan obtained diversion rate data from the City's SCADA system that records instantaneous flow rate at 1-minute intervals from the flow meter installed on the system's main line in the Well No. 2 house. Note that the flow meter in the Well No. 2 house measures the net flow supplied by all three production wells. The diversion rate of 3.78 cfs corresponds to the peak-hour diversion rate calculated from the SCADA dataset (minute interval). The highest diversion volume during the development period was 292.4 million gallons (Mgal) which occurred in the 2017 water year (October 2016 through September 2017). While the actual volume produced was less than the 310 Mgal allowed under the Second Agreement, IDAPA 37.03.02.035(j) allows for adjustments to the annual diversion volume based on the single coldest season (highest theoretical seasonal demand) over the fifty (50) year period immediately prior to submitting proof of beneficial use. To account for this volume adjustment, Mr. Scanlan utilized a generally accepted heating degree day (HDD) calculation/method based on the coldest winter season over the last fifty years (1985 water year). Based on the 50 year maximum HDD, theoretical annual diversion volumes reportedly exceeded the 310 Mgal limit during 2012, 2013, 2014, 2015, 2016, and 2017 water years. As a result, the maximum annual volume for heating use should be set at 951 af (310 Mgal) which is consistent with language in the Third Amendment and Second Agreement.

As described in the "Source, POD, POU" section of this report, the City's LTG system supplies BWSWD and State of Idaho heating systems with emergency water. The State of Idaho POU (associated with 63-9341) is within the City's LTG system POU. The BWSWD POU (associated with 63-5073) only partially overlaps with the City's LTG system POU. Water supplied to BWSWD and the State of Idaho is delivered via interties that are located within the City's LTG heating system POU. The license will need to have language in a condition that describes these emergency uses and notes that they are subject to the diversion rate and volume limits of the right.

Additional Minor Uses: A relatively minor amount of the above described annual volume of LTG water utilized for heating use is also utilized for what Mr. Scanlan described as municipal use. These relatively minor additional uses reportedly utilize the heat value of water to (1) stimulate processes and clean pipes in the City's wastewater treatment plant system, and (2) clean out frozen storm drains. Water is delivered to the wastewater plant located on the west

end of town and to storm drains located throughout the city via water trucks that are filled within the City's LTG heating system POU. Since the minor additional uses all utilize the heat value of the water, they should be considered heating uses under this right, and not under a separate municipal use.

Overlap Review: As listed in the Section B1 narrative of the field exam report, there are a number of additional users (buildings) within the place of use boundary that have water rights to utilize low temperature geothermal water for heating use. All but two of the additional users (1) have difference points of diversion and (2) utilize low temperature geothermal water to heat different buildings within the above described place of use boundary. The two exceptions are BWSWD (63-5073) and State of Idaho (63-9341) whom both have a separate agreement with the City to supply emergency water via interties located within the City's LTG POU.

Summary: I have reviewed the field exam that was submitted and find the document to appear complete and accurate, with a few exceptions noted above. 63-9139 and 63-9138 were filed to supply heating, cooling, irrigation, and municipal beneficial uses with a priority date of April 17, 1978. During the development period, 63-9139 was developed for heating use. 63-9138 was not developed and will reportedly be relinquished upon licensing of 63-9139. Results of the field exam support the following recommendations: (1) 63-9139 heating use should be licensed with diversion rate of 3.78 cfs, and a maximum annual volume of 951 af (310 Mgal), (2) the additional minor uses for BWSWD and State of Idaho systems should be included within the above defined diversion rate and maximum annual volume limit, and (3) add language in condition that describes the BWSWD and State of Idaho emergency uses.

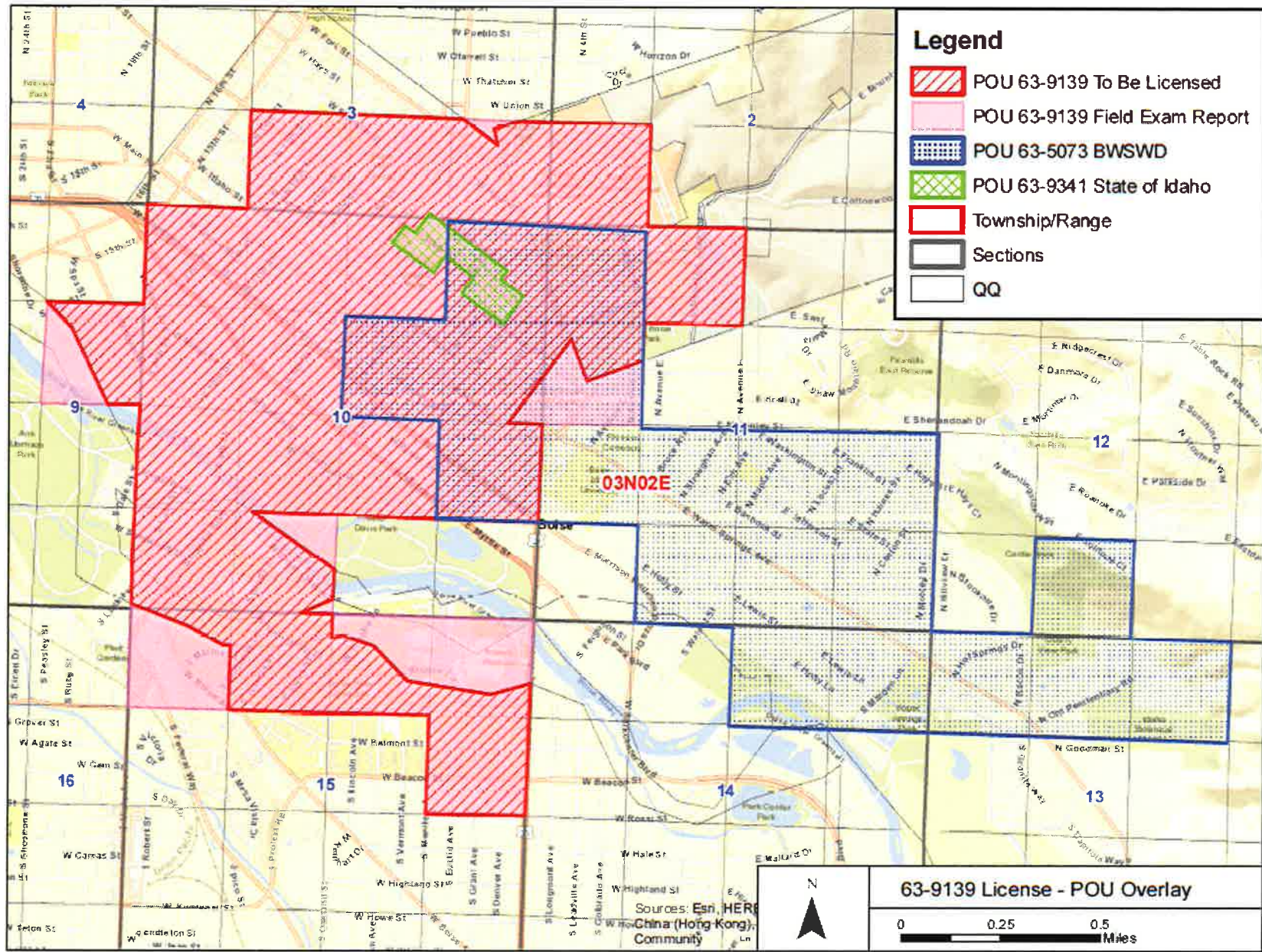


Figure 1: POU overlay associated with City of Boise LTG heating system.