

5.44 Tagish - Community Water Fill Station

The Tagish Community Fill Station is located in the Taku Subdivision at km 2 on the east side of Reid Road near the Tagish Firehall (Building #1953). The Tagish Community Fill Station sources water from a groundwater well (Well TFHW 02), which was drilled in 2013 to replace the old Firehall well (THFW-01 called Well 1953 in previous studies). Treatment includes iron and manganese removal, and chlorine disinfection. The system is a self-serve water supply for local residents to obtain potable water. The system is governed under the Sections 12.1 (a) and (b) and 17 of the Public Health and Safety Act and Section 5 of the Public Health Regulations (C.O. 1958/079, O.I.C. 2009/194), which require safety measures and inspection for water and water sources for systems that provide for human consumption.

5.44.1 Data Compilation Methodology

Tetra Tech approached stakeholders including YG departments, water system operators and owners to let them know the project was in progress and to request their assistance in compiling the most complete data set possible. Through the process of compiling the data, Tetra Tech obtained data regarding the Tagish Community Water Fill Station from the following proponents:

- YG Community Services (the client) – YG CS provided data for the Tagish Community Water Fill Station as this system is owned and operated by YG CS. The YG CS operator provided review comments and edits for the final summary to ensure completeness and accuracy.

5.44.2 Hydrogeology

From existing well logs, the Tagish glaciolacustrine overburden in the vicinity of the site is relatively deep with a silt/clay layer beginning at about 7.5 m bgs and extending to about 29 m bgs (Tetra Tech 2013a).

No permafrost was encountered during the drilling of any of the wells on the site. Overburden sediments encountered varied from silt with some sand and clay with some silt, to sand and gravel. Sediment material became saturated at about 29 m bgs, and a sand and gravel aquifer was encountered at 44.5 m bgs. No bedrock was encountered. Groundwater elevations in TFHW-02 were observed to be influenced by the pumping at Well TFHW-01 indicating that the new well, TFHW-02, is completed in the same sand and gravel confined overburden aquifer as the original Tagish Community Firehall well, TFHW-01 (Tetra Tech 2013a).

Another new well (TFHW-03) intended to provide water for fire protection only to the Tagish Fire Hall was drilled in 2016 and there are plans to connect it to the Fire hall in 2017.

Pumping test results from the wells indicate an aquifer transmissivity in the order of 6.5×10^{-5} to 6×10^{-3} m²/s (5.6 to 518.4 m²/day) (Tetra Tech 2013a, Tetra Tech 2017).

The groundwater flow direction in the vicinity of the Tagish Firehall is inferred to be in an east to north-easterly direction, towards 6 Mile River and Marsh Lake.

5.44.3 Well Summary

The well logs for Well TFHW-02 and THFW-03 are included in the GIS map and database portion of this project. The following tables summarize the completion characteristics of the wells.

Table 5-112: Tagish Firehall, Well TFHW-02 Summary		
Well Construction Parameters	Details	Source
Date of construction	Well was completed by Impact Well Drilling Ltd. in August 2013	Well log
Total well depth	46.8 m bgs	
Casing	6" (152 mm) ID Steel Well Casing	
Casing depth	45.5 m bgs	
Well screen	1.3 m 30 slot (0.76 mm) stainless steel well screen from 45.5 m to 46.8 m bgs	
Static water level	11.3 m bgs (September 4, 2013)	Tetra Tech 2013a
Sanitary seal	Bentonite sanitary seal to 6 m bgs	Well log and Tetra Tech 2013a
Wellhead completion	Pitless unit with >1 m stickup	Tetra Tech onsite observation, 2016
Wellhead stickup	0.7 m ags	Tetra Tech 2013a
Well rated capacity	3.8 L/s (50 IGPM)	
Well GUDI status	Non-GUDI	
Well Construction Comments:	Well was constructed to meet Canadian Groundwater Association Well Construction Guidelines.	

Table 5-113: Tagish Firehall, Well TFHW-03 Summary		
Well Construction Parameters	Details	Source
Date of construction	Well was completed by Cathway Water Resources in September 2016	Well log
Total well depth	54.7 m bgs	
Casing	6" (152 mm) ID Steel Well Casing	
Casing depth	53.5 m bgs	
Well screen	1.2 m 20 slot (0.508 mm) stainless steel well screen from 53.5 m to 54.7 m bgs	
Static water level	13.2 m bgs (October 7, 2016)	Tetra Tech 2017
Sanitary seal	Bentonite sanitary seal to 4.5 m bgs	Well log and Tetra Tech 2017
Wellhead completion	Not yet complete	Tetra Tech 2017
Wellhead stickup	0.7 m ags (at well completion)	
Well rated capacity	3.8 L/s (50 IGPM)	
Well GUDI status	Non-GUDI	

Table 5-113: Tagish Firehall, Well TFHW-03 Summary		
Well Construction Parameters	Details	Source
Well Construction Comments:	Well was constructed in general accordance with Canadian Groundwater Association Well Construction Guidelines.	

5.44.4 Source Water Quality

The chemical water quality data of Well TFHW-02 and TFHW-03 are very similar and can be summarized as follows (Tetra Tech 2013a, Tetra Tech 2017):

- The groundwater source is hard (274 mg/L as CaCO₃) and can be characterized as calcium-magnesium-bicarbonate type water which is the same as water analyzed from TFHW-01 (228 mg/L to 263 mg/L as CaCO₃ on the dates sampled). The elevated hardness is considered to be generally poor for aesthetic purposes;
- The analytical results for the water samples collected on September 11, 2013 indicate that the water from the well meets the GCDWQ for all parameters analyzed with the exceptions of colour, iron and manganese:
- The colour of the water sample (26 CU) exceeds the GCDWQ AO of 5 CU;
- The reported iron concentration, at 0.669 mg/L, exceeds the GCDWQ AO of 0.3 mg/L; and,
- The reported manganese concentration, 0.069 mg/L, exceeds the GCDWQ AO of 0.05 mg/L.

5.44.5 Water Treatment and Distribution

A new water treatment plant was commissioned at this site in 2015. From preliminary design records, Tetra Tech has summarized the characteristics of the water treatment and distribution.

Table 5-114: Tagish Community Fill Station Water System Treatment and Distribution Details		
	Details	Source
Owner/Operator	Government of Yukon	Tetra Tech 2013a
Water source	Groundwater	
Wells serving the system	Tagish Firehall Well TFHW-02	
Treatment type	Iron and manganese removal by press filtration, chlorination	p.c. Nick Barnett 2017
Delivery method	Self-serve fill station	Tetra Tech 2013a p.c. Nick Barnett 2017
Age of system/last known major work	New water treatment plant commissioned in 2015, new water well completed in 2013	Tetra Tech 2017

5.44.6 Source Water Protection Planning

Tetra Tech did not find any records indicating that a SWPP has been completed for the Tagish Firehall Well TFHW-02. Though the well is completed in a confined aquifer, the well serves as a public water fill for the residents of Tagish and a SWPP would provide a valuable tool for identifying, monitoring and managing risks to the well and aquifer.

Tetra Tech completed a Phase 1 GUDI screening for the well and based on the screening results, well TFHW 02 is considered to be a groundwater source, and not under the direct influence of surface water (i.e., non-GUDI) for the following reasons (Tetra Tech 201b):

- The well was drilled and completed in the same aquifer as the existing well; a deep confined aquifer with a very low vulnerability to surface sources of contamination;
- The new well is not a vulnerable type or in a vulnerable location and is constructed in accordance with the Y DPWR and CGWA's Well Construction Guidelines; in particular it has a sanitary seal and adequate stick-up;
- The nearest waterbodies are greater than 600 m from the new well; and
- The groundwater quality is substantially different than nearby surface water quality, and water samples from the existing well (completed in the same aquifer) had only 1 in 60 bacteriological test results positive for total coliform; and re-test results were negative.

5.44.7 Water Supply Information Data Gaps

For the purpose of this study, Tetra Tech identified the following data gaps:

- There is no source water protection planning in place for this system. As the system supplies potable water to the public, a SWPP would provide a valuable additional protection for the groundwater resource.