

Assessment of water quality parameters of BGSBU Campus

Vaseem Ahmad Shahnaz¹

¹Department of Civil Engineering, SOET, BGSB University, Rajouri, J&K

Abstract

The present study is an attempt to analyse the quality of water in BGSBU campus. The water is supplied to BGSBU campus from six different sources i.e., tap water, tube-well near boys hostel, tube-well near Sabrang, Spring near Rajouri airport, Rajouri canal upstream, and Rajouri canal downstream. The water quality parameters were analysed for all the six sources of water. The water quality tests for the water samples of six selected sources were carried out in the laboratory and the results reveal that maximum number of physical and chemical parameters were within the desirable limit, as suggested by IS 10500-2012 (second version).

Keywords: water quality, pH test, turbidity test, calcium test, sulphate test

I. INTRODUCTION

Water has a significant role in the human life. The polluted water can contribute to number of water borne diseases. The quality of water can be assessed by different laboratory tests and the contaminated water can be treated accordingly. The assessment of water quality parameters plays an important role for human welfare. Literature review reveals that number of studies pertaining to the assessment of water quality parameters have been carried out in the past [1-10]. The present study is an attempt to assess the water quality parameters of the BGSBU campus. Baba Ghulam Shah Badshah University was established in 2005 and is named after great Sufi saint Baba Ghulam shah Badshah. The Baba Ghulam shah Badshah University is located in Dhanore area which is about 9 km away from the district headquarter Rajouri. As per survey of India Rajouri lies between latitudes 33° 23' N and longitudes 74° 21' E at an altitude of 975.36 meters above the mean sea level. Students from all over the Jammu and Kashmir state are perusing education in various schools of the university. Temperature on the average varies from 7 degree Celsius to 40 degree Celsius. River flowing through Rajouri town comes from Darhal and Thanamandi area, meeting each other near Darhali Bridge at Kheora, Rajouri. The various sources of water supply in BGSBU campus are tap water, tube-well near boys hostel, tube-well near Sabrang, Rajouri canal (upstream and downstream), spring near Rajouri Airport.

II. Test Procedure

The supply of water to the BGSB University campus is from six different sources of water i.e., tap water, tube-well near boys hostel, tube-well near Sabrang, spring near Rajouri Airport, Rajouri canal upstream, and Rajouri canal downstream. The samples were collected from all the above mentioned six sources of water and various physical and chemical parameters of water samples were examined in the laboratory. The following tests were carried out in the laboratory for assessing the water quality of samples collected from different six sources:

1. Turbidity test
2. Colour
3. Odour
4. Taste
5. pH test
6. Chloride test
7. Fluoride test
8. Iron test
9. Sulphate test
10. Ammonia test
11. Calcium test

The above-mentioned tests were carried out based on standard test procedures adopted by various investigators in their past studies [1-10].

III. Results and discussions

The results of different physical and chemical parameters of water samples collected from six different locations from which the water is supplied to the Baba Ghulam shah Badshah University campus and comparison of the test results with the desirable limits as per IS 10500-2012 (second version) are given in Table 1(a)- 1(h).

Table 1(a). Test results of Turbidity in the water samples

TEST	Result	Desirable Limits (Indian Standards)	Source of water
TURBIDITY (NTU)	7.34	5 – 10 NTU	Tap water
TURBIDITY (NTU)	2.095	5 – 10 NTU	Tube-well near boys hostel
TURBIDITY (NTU)	0.4275	5 – 10 NTU	Tube-well near Sabrang
TURBIDITY (NTU)	0.335	5 – 10 NTU	Spring near Rajouri Airport
TURBIDITY (NTU)	4.515	5 – 10 NTU	Rajouri canal upstream
TURBIDITY (NTU)	9.55	5 – 10 NTU	Rajouri canal downstream

The colour, taste and odour of the samples collected from different six sources were within the desirable limits.

Table 1(b). Test results of pH of water samples

TEST	Result	Desirable Limit (Indian Standards)	Source of water
pH	7.585	6.5-8.5	Tap water
pH	7.577	6.5-8.5	Tube-well near boys hostel
pH	7.100	6.5-8.5	Tube-well near Sabrang
pH	7.425	6.5-8.5	Spring near Rajouri Airport
pH	8.305	6.5-8.5	Rajouri canal upstream
pH	8.430	6.5-8.5	Rajouri canal downstream

Table 1(c). Test results of Chlorides in water samples

TEST	Result	Desirable Limit (Indian Standards)	Source of water
CHLORIDE (mg/l)	37.908	250 mg/L	Tap water
CHLORIDE (mg/l)	14.646	250 mg/L	Tube-well near boys hostel
CHLORIDE (mg/l)	16.352	250 mg/L	Tube-well near Sabrang
CHLORIDE (mg/l)	14.4565	250 mg/L	Spring near Rajouri Airport
CHLORIDE (mg/l)	9.1207	250 mg/L	Rajouri canal upstream
CHLORIDE (mg/l)	51.619	250 mg/L	Rajouri canal downstream

Table 1(d). Test results of Fluorides in water samples

TEST	Result	Desirable Limit (Indian Standards)	Source of water
FLUORIDE (mg/l)	0.057	1	Tap water
FLUORIDE (mg/l)	0.028	1	Tube-well near boys hostel
FLUORIDE (mg/l)	0.056	1	Tube-well near Sabrang
FLUORIDE (mg/l)	0.01945	1	Spring near Rajouri Airport
FLUORIDE (mg/l)	0.0465	1	Rajouri canal upstream
FLUORIDE (mg/l)	0.03175	1	Rajouri canal downstream

Table 1(e). Test results of Iron in water samples

TEST	Result	Desirable Limit (Indian Standards)	Source of water
IRON (mg/l)	Nil	0.3	Tap water
IRON (mg/l)	0.35	0.3	Tube-well near boys hostel
IRON (mg/l)	0.0662	0.3	Tube-well near Sabrang
IRON (mg/l)	0.1562	0.3	Spring near Rajouri Airport
IRON (mg/l)	0.0365	0.3	Rajouri canal upstream
IRON (mg/l)	0.016	0.3	Rajouri canal downstream

Table 1(f). Test results of Sulphates in water samples

TEST	Result	Desirable Limit (Indian Standards)	Source of water
SULFATE (mg/l)	0.4035	200	Tap water
SULFATE (mg/l)	0.33075	200	Tube-well near boys hostel
SULFATE (mg/l)	0.2875	200	Tube-well near Sabrang
SULFATE (mg/l)	0.28925	200	Spring near Rajouri Airport
SULFATE (mg/l)	0.23275	200	Rajouri canal upstream
SULFATE (mg/l)	0.0565	200	Rajouri canal downstream

Table 1(g). Test results of Ammonia in water samples

TEST	Result	Desirable Limit (Indian Standards)	Source of water
AMMONIA (mg/l)	0.07625	0.5	Tap water
AMMONIA (mg/l)	0.06625	0.5	Tube-well near boys hostel
AMMONIA (mg/l)	0.043	0.5	Tube-well near Sabrang
AMMONIA (mg/l)	Nil	0.5	Spring near Rajouri Airport
AMMONIA (mg/l)	0.3085	0.5	Rajouri canal upstream
AMMONIA (mg/l)	0.019	0.5	Rajouri canal downstream

Table 1(h). Test results of Calcium in water samples

TEST	Result	Desirable Limit (Indian Standards)	Source of water
CALCIUM (mg/l)	60.918	75	Tap water
CALCIUM (mg/l)	72.29675	75	Tube-well near boys hostel
CALCIUM (mg/l)	74.305	75	Tube-well near Sabrang
CALCIUM (mg/l)	26.47625	75	Spring near Rajouri Airport
CALCIUM (mg/l)	32.80013	75	Rajouri canal upstream
CALCIUM (mg/l)	20.79163	75	Rajouri canal downstream

The variation of turbidity, pH, chlorides, fluorides, iron, sulphate, ammonia, and calcium with respect to their respective desirable limits of samples collected from different water sample locations are shown in Table 1(a)-1(h).

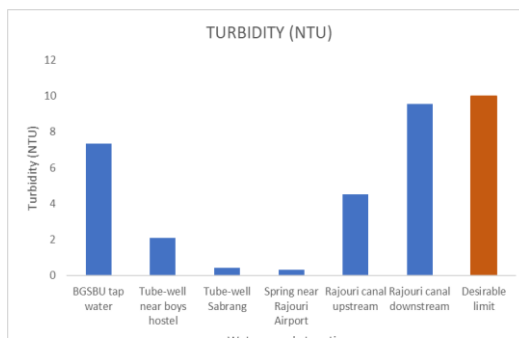


Figure 1(a) Variation of turbidity with respect to desirable limits at different water sample locations

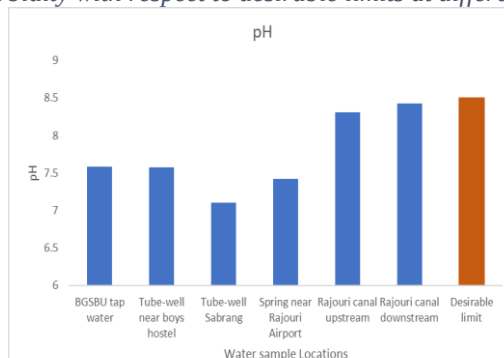


Figure 1(b) Variation of pH with respect to desirable limits at different water sample locations

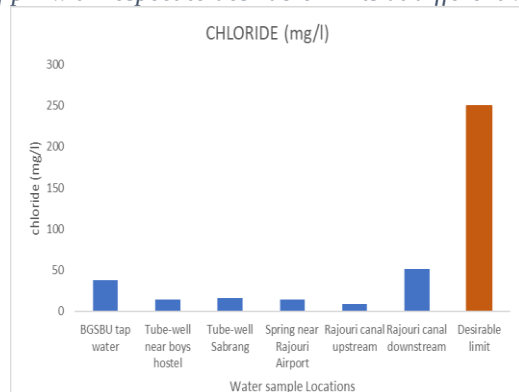


Figure 1(c) Variation of chlorides with respect to desirable limits at different water sample locations

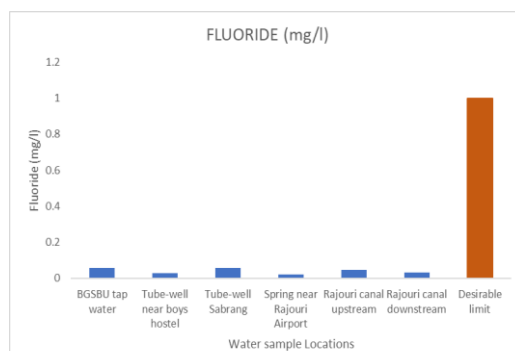


Figure 1(d) Variation of fluorides with respect to desirable limits at different water sample locations

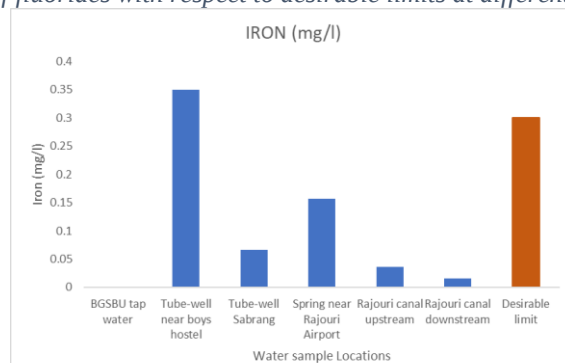


Figure 1(e) Variation of iron with respect to desirable limits at different water sample locations

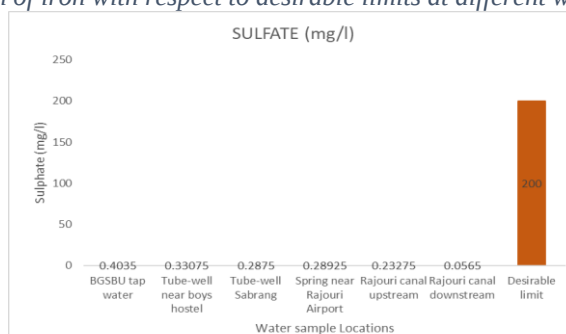


Figure 1(f) Variation of sulphates with respect to desirable limits at different water sample locations

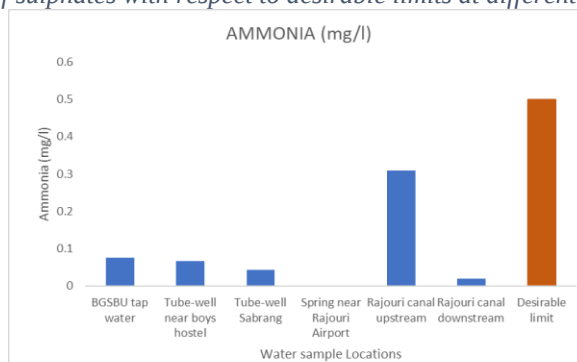


Figure 1(g) Variation of ammonia with respect to desirable limits at different water sample locations

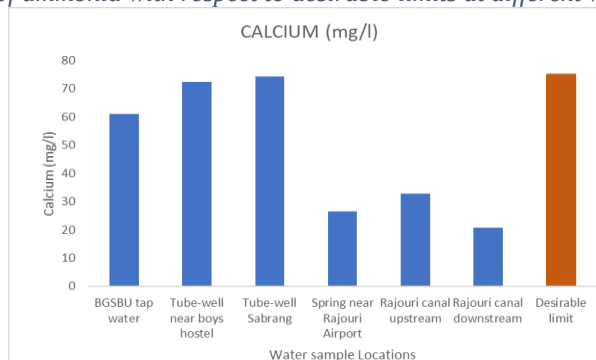


Figure 1(h) Variation of calcium with respect to desirable limits at different water sample locations

The laboratory results reveal that all the physical and chemical parameters of the water samples collected from different six sources were in desirable limits as per IS: 10500-2012 (Second version) except the water sample collected from tube-well near boys hostel of BGSBU campus contains excess concentration of iron.

IV. Conclusions

The present study was carried out for assessing the water quality parameters of Baba Ghulam Shah Badshah University campus. Water samples were taken from all the sources of water supply and tested accordingly for their physical as chemical parameters in the laboratory.

The present study based on laboratory results can be summed as follows:

1. Physical parameters like colour, odour and taste of the water samples were in desirable limits and hence needs no further treatment.
2. Chemical parameters like pH, Chloride, Fluoride, Iron, Sulphate, ammonia, and Calcium were in desirable limits as per bureau of Indian standards IS: 10500-2012 (Second version) except tube-well near boys hostel contains excess concentration of iron than the desirable limits. The water taken from the tube-well near boys hostel needs to be treated for the excess concentration of iron before supplying to for drinking purpose.

REFERENCES

1. **Kallol Dey, S.C. Mohapatra and Bidyabati Misra**, Assessment Of Water Quality Parameters Of The River Brahmani at Rourkela, Journal Of Industrial Pollution Control 21 (2) (2005) Pp 299- 304.
2. **Pradyusa Samantray, Basanta K. Mishra, Chitta R. Panda and Swoyam P. Rout**, Assessment of Water Quality Index in Mahanadi and Atharabanki Rivers and Taldanda Canal in Paradip Area, India, J Hum Ecol, 26 (3): 153-161 (2009).
3. **Mehrunisa Memon, Mohammed Saleh Soomro, Mohammad Saleem Akhtar, Kazi Suleman Memon**, Drinking water quality assessment in Southern Sindh (Pakistan), Environmental Monitoring Assessment DOI 10.1007/s10661-010-1616-z.
4. **A.N. Amadi, P.I. Olasehinde, E.A. Okosun and J. Yisa**, Assessment of the Water Quality Index of Otamiri and Oramiriukwa Rivers, Physics International 1 (2): 116-123, 2010, ISSN 1948-9803.
5. **Nitin Gupta, S.M. Nafees, M.K. Jain and S. Kalpana**, Physico-Chemical Assessment Of Water Quality Of River Chambal In Kota City Area Of Rajasthan State (India), Rasayan J. chem., Vol.4, No.2 (2011), 686-692 ISSN: 0974-1496.
6. **M. Y. Khan, Mir Shabeer, Imtiyaz A. Raja & Nazir A. Wani**, Physico-Chemical Analysis of River Jhelum, Global Journal of Science Frontier Research Interdisciplinary Volume 12 Issue 1 Version 1.0 May 2012, Double Blind Peer Reviewed International Research Journal Publisher: Global Journals Inc. (USA) Online ISSN: 2249-4626 & Print ISSN: 0975-5896.
7. **Akubugwo E. I, Nwachukwu M.I, Odika P.C, Duru M.K.C**, Water Quality Assessment of Njaba River, Nigeria, IOSR Journal Of Environmental Science, Toxicology And Food Technology (IOSR-JESTFT) e-ISSN: 2319-2402,p-ISSN: 2319-2399. Volume 4, Issue 6 (Jul. - Aug. 2013), PP 33-37.
8. **Abbas J. Kadhém**, Assessment of Water Quality in Tigris River-Iraq by Using GIS Mapping, Natural Resources, 2013, 4, 441-448, 2013.
9. **A. K. Haritash, Shalini Gaur, Sakshi Garg**, Assessment of water quality and suitability analysis of River Ganga in Rishikesh, India, Applied Water Sciences (2016) 6:383–392.
10. **Sayar Yaseen, Ashok K. Pandit, Javaid Ahmad Shah**, the water quality index (WQI) of five fresh water streams feeding Wular lake, International Journal of Water Resources and Environmental Engineering, vol.7(4), pp. 50-57, April 2015.
11. IS 10500: 2012 Drinking Water — Specification (Second Revision)