



QUARTERLY REPORT BOTTLED WATER QUALITY

(January-March, 2011)



PAKISTAN COUNCIL OF RESEARCH IN WATER RESOURCES
Ministry of Science & Technology
Khyban-e-johar, H-8/1, Islamabad.
www.pcrwr.gov.pk

January-March, 2011



INTRODUCTION

Drinking water quality is deteriorating continually due to biological contamination from human waste, chemical pollutants from industries and agricultural inputs. Piped water also gets contaminated because pipes are laid very close to sewerage lines or open drains and cause many serious water borne diseases. It was found that 45% of infant deaths have been attributed to diarrhea and about 60% to overall infectious waterborne diseases in Pakistan. According to the World Health Organization (WHO) 25-30% of the diseases are gastro-intestinal in nature. The poor quality of drinking water has forced a large cross-section of citizens to buy bottled water. As a consequence of this expanding market a mushroom growth of bottled water industry in the country is witnessed during the last few years. However, many of the mineral water companies were found selling contaminated water. To monitor and improve the quality of bottled water, the government of Pakistan has designated the PCRWR as focal point agency.

1. Ministry of Science & Technology informed PCRWR Vide U.O. No. 5(21)/2004-ATA-II dated 17.10.2005 that the Cabinet in its meeting under the chairmanship of Prime Minister directed Ministry of Science & Technology to undertake regular survey/samples of bottled/mineral water at source of production, publicize the results on a quarterly basis and follow up with punitive/legal action.
2. Ministry of Science & Technology has assigned the task of quality monitoring of bottled water and publicize the results to PCRWR Vide U.O. No.1(1)/2005-Secy (MoST) dated 8.12.2005.

PCRWR SAMPLING METHODOLOGY

No. of Brands Collected	69	
No. of Cities Targeted	16 (Islamabad, Rawalpindi, Lahore, Bahawalpur, Faisalabad, D.G Khan, Multan, Sargodha, Sialkot, Sahiwal, Peshawar, Quetta, Karachi, Nawabshah, Badin and Tando Jam.)	
Composition of Sampling Team	One Research Officer and Two Laboratory Assistants	
Sampling Procedure	Samples of sixty nine commercially available brands of mineral/bottled water were collected from sixteen cities of four Provinces of Pakistan These samples were collected by the senior staff members of Head Office and Regional Offices of PCRWR from January-March, 2011. A set of four bottles of each brand was collected and sealed on site. Identification codes are allotted to all the brands according to PCRWR Bottled Water Classification System.	
Transparency	Sample No. 1	Handed over to shopkeeper at the time of sample collection;
	Sample No. 2	Preserved in the National Water Quality Laboratory of PCRWR, Islamabad for future record,
	Sample No. 3	Used for Microbiological Analysis
	Sample No. 4	Used for Physico-chemical Analysis

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PCRWR BOTTLED WATER CLASSIFICATION SYSTEM

Sr. No	Brand Name	PCRWR Code	City	Date of Collection	Date of Expiry	Claimed Bottled Water Type	Size	Name & Address of Seller/Shop Keeper	Manufacturer
1	Nestle	BWO-1	Faisalabad	18-01-11	06/2012	-	1.5 Liter	Al-Fajer Deptt, Jail Road, Faisalabad	Nestle Pakistan Ltd 308 Upper Mall Lahore 54000.
2	Kinely	BWO-2	Faisalabad	18-01-11	10/2011	-	1.5 Liter	Hafiz Pan-Shop. Lari Adda, Androon Faisalabad	Coca Cola Beverages Pakistan Ltd. D-51 Estate Avenue. S.I.T.E. Karachi
3	Aquafina	BWO-3	Faisalabad	18-01-11	12/2011	-	1.5 Liter	Raza Bakers Afshan Colony Faisalabad	Filled by Punjab Beverages Company (Pvt) Ltd. P-1590 Nisar Colony Samundari Road Faisalabad.
4	Springley	BWO-4	Faisalabad	18-01-11	04/2012	-	1.5 Liter	Raza Bakers Afshan Colony Faisalabad	Springley a brand of Qarshi Industries.(Pvt) Ltd. Hattar (KPK) Pakistan
5	Well-O	BWO-5	Faisalabad	18-01-11	09/2012	-	1.5 Liter	Hafiz Pan-Shop. Lari Adda, Androon Faisalabad	NXT International, P-4 Street # 2 Yousaf Town No. 1 Satyana Road Faisalabad
6	Natural Excellent	BWO-6	Faisalabad	18-01-11	08/2012	-	1.5 Liter	Madina Medical Store Civil Hospital Faisalabad.	Excellent Natural Faisalabad.
7	Nation	BWO-7	Faisalabad	18-01-11	12/2011	-	1.5 Liter	Naeem Pan Shop Lari Adda Inner Faisalabad	Hamza Brothers, 9-Km, G.T Road Rachna Town Shahdera Lahore. Phone # 042-37723261
8	Aqua Life	BWO-8	D.G Khan	13-01-11	12/2010	-	0.6 Liter	Mr. Aziz-ur-Rehman, City Linker Ansari Store Tonsa Road D.G Khan	Manufactured by D.R Homeo Pharma Lahore.
9	Kisan Better Life	BWO-9	D.G Khan	13-01-11	12/2011	-	1.5 Liter	Mr. Muhammad Imran, Imran Keryana Store, Traffic Chowk Main City D.G Khan	Bottled by Faisalabad Oil Refinery Drinking Water Devison.
10	Minra	BWO-10	D.G Khan	13-01-11	06/2011	-	1.5 Liter	Mr. Sheikh Noman, Al Kareem Medical Store, Near Distric Hospital Rajanpur Road D.G	Head Office Q-Enterprises Indus Highway D.G. Khan.

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								Khan	
11	Khaleej	BWO-11	D.G Khan	13-01-11	-	-	1.5 Liter	Mr. Ijaz Ahmad, Al-Rehman Karyana Store, Puldot, Rajanpur Road D.G Khan	Plot No. 701, 2, 3 Shah Murad Road Thatta.
12	Aqua RO 7	BWO-12	Lahore	20-01-11	01/2012	-	1.5 Liter	Waqar Haider Brothers Qadir Gaba Market 78 Macleod Road Lahore. Factory:- Hssan Kot, 75 Raiwind Lahore	Manufactured by Waqar Haider Brothers Qadir Gaba Market 78 Macleod Road Lahore. Factory:- Hssan Kot, 75 Raiwind Lahore.
13	Klinz	BWO-13	Lahore	20-01-11	12/2011	-	1.5 Liter	Klinz Food (Pvt) Ltd. 60-L Model Town Ext. Lahore. Phone 3 042-35218811	Klinz Food (Pvt) Ltd. 60-L Model Town Ext. Lahore. Phone 3 042-35218811.
14	Premier	BWO-14	Lahore	19-01-11	12/2011	-	1.5 Liter	Zafir Industries 19-Km Near Hignoon Laboratories Multan Road Lahore	Zafir Industries 19- Km Near Hignoon Laboratories Multan Road Lahore
15	Naimat	BWO-15	Lahore	19-01-11	-	-	0.6 Liter	Boby Plaza Compound, Opp. Govt. Munshi Hospital Bund Road Lahore.	Boby Plaza Compound, Opp. Govt. Munshi Hospital Bund Road Lahore.
16	Blu Water	BWO-16	Lahore	19-01-11	10/2011	-	1.5 Liter	Mohsin Cold Corner Lari Adda Adjacent Administrator Badami Bagh LHR	Al- Hilal Industries 9Pvt0 Ltd. Sultan Nagar Vehari Road Multan.
17	Aqua National	BWO-17	Lahore	19-01-11	03/2012	-	1.5 Liter	Bismillah Cold Corner Lari Adda Adjacent Administrator Badami Bagh LHR	8 Km, G-T Road Shahdera Lahore 0333-457000.
18	Sufi	BWO-18	Lahore	19-01-11	07/2011	-	1.5 Liter	Cakes n Bakes Near Adda LHR	Hadayat Food Stuffs Industries (Pvt) Ltd I-B, Garden Block Garden Town Lahore.
19	Aqua Safe	BWO-19	Lahore	19-01-11	-	-	1.5 Liter	Papu General store Clifton	96, Mcleod Road Lahore.
20	Active	BWO-20	Lahore	19-01-11	-	-	1.5 Liter	Mr. Ghulam Rasool Masha-Allah Pan Shop Near Niazi Express	160-E, Plastic Dana Market Shah Alam Market Lahore.
21	Pan Pura	BWO-21	Bahawalpur	12-01-11	12/2010	-	0.6 Liter	Mr. Muhammad Ather, Mehmood	25-Y Tariq Bin Ziad Colony Sahiwal. Phone # 040-4220350

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								Medical Store, Opposite BVH Bahawalpur	
22	Pineo	BWO-22	Bahawalpur	12-01-11	08/12011	-	0.6 Liter	Mr. M. Latif Life Medicin Company, opposite BVH Bahawalpur.	Under the Licence of Gysing Pak DDR-1, PSIE Bahawalpur
23	Avisa	BWO-23	Bahawalpur	12-01-11	04/2011	-	0.6 Liter	Mr. M. Adnan, New Shan Sweets and Backers Railway Station Chowk Bahawalpur.	Fun Factory C- 18 Al-Hilal Society, Karachi
24	Aqua Feen	BWO-24	Multan	-	07/2011	-	0.6 Liter		-
25	Lite Aqua	BWO-25	Multan	-	-	-	0.6 Liter	-	Chongi No. 7 City Square Multan. 03006355316
26	Legend	BWO-26	Multan	-	12/2012	-	0.6 Liter	-	Multifoods Industries, Plot No. D-92, Malir Industrial Area, Malir Karachi. 021-4324531-3,
27	Aqua Habib	BWO-27	Multan	-	-	-	0.6 Liter	-	0306-2996396, 0244-274158
28	Selina	BWO-28	Multan	-	12/2011	-	0.6 Liter	-	Soft Water Technology, Plot # 4-A 4/19 Nazimabad No. 4 Karachi.
29	Vital	BWO-29	Sahiwal	26-01-11	-	-	0.6 Liter	Al-Mansoor, Consumer Products, 7Km, Multan Road, Sahiwal Pakistan	Al-Mansoor, Consumer Products, 7Km, Multan Road, Sahiwal Pakistan
30	Clear	BWO-30	Sahiwal	26-01-11	12/2011	-	0.6 Liter	Mr. Ashraf, Agro Food Ind. 173/A, Small Industrial Area Sahiwal	Agro Food Ind. 173/A, Small Industrial Area Sahiwal
31	Hydra	BWO-31	Islamabad	02-02-11		-	6 Liters	Pakistan PVC limited Plot # 31A Sector 1-9 Islamaba	Pakistan PVC limited Plot # 31A Sector 1-9 Islamabad
32	Life	BWO-32	Islamabad	02-02-11	02/2012	-	0.6 Liter	167 Street # 9, Industrial AREA I-10/3 Islamabad	167 Street # 9, Industrial AREA I-10/3 Islamabad.
33	Pak zam zam	BWO-33	Islamabad	02-02-11	-	-	1.5 Liter	Plot # 195 Street No. 2 I-9/3 Islamabad.	Plot # 195 Street No. 2 I-9/3 Islamabad.
34	Spring Fresh	BWO-34	Karachi	28-01-11	12/2012	-	1.5 Liter	Mr. Qurban, A-One Milk Shope, Block- 4A, Abdul Hassan, Isfahani Road, Karachi	208 Billy's Tower Rashid Minhas Road Karachi Phone# 02136324465
35	Vey	BWO-35	Karachi	28-01-11	12/2012	-	0.6 Liter	Mr. Shakeel Medina	424, Bhayani Center Block M

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								General Store, Block 03 Gulstan-e-Johar	North Nazimabad Karachi 74700 Pakistan
36	Sun Lay	BWO-36	Karachi	28-01-11				0.6 Liter	Mr. Muhammad Afzal, Bismillah Bakery & General Store Maryam Manzil M. Khan Jamot Road Nayabad, Karachi. Hani Patel Enterprise R-82 Sector 35, University Road Karachi.
37	Max Fresh	BWO-37	Karachi	28-01-11				0.6 Liter	Mr. Ammanullah, Mashallah Store, Block-13 Gulistan-e-Johar. Karachi. Mah Enterprises, A-190, Panama Shoping Center Hasan Squair Karachi.
38	Glow	BWO-38	Karachi	28-01-11				0.6 Liter	Iqbal Kiryana Store, Gali # 1 Liaquat Colony, Shah Waliullah Road Lyari, Karachi. 1/6 M 2 nd floor Block 6 P.E.C.H.S Karachi.
39	Jel	BWO-39	Karachi	28-01-11	12/2012			0.6 Liter	Mr. Muhammad Afzal, Bismillah Bakery & General Store Maryam ManzilM. Khan Jamot Road Nayabad, Karachi. Multifoods Industries Plot No. D-92, Malir Industrial area Karachi.
40	Aqua Nasa	BWO-40	Karachi	28-01-11	-			0.6 Liter	Mr. Dilbar Hussain, G-3 Bell Arcade Gulstan-e-Johar University Road Karachi. Plot No. C-11 Gulzar-e-Hizri Scheme-33 Gulistan Town Karachi. 0214641829.
41	Marjan	BWO-41	Karachi	28-01-11	-			0.6 Liter	Mushtaq Bakers and General Store, Gali # 2, Shawaliullah Road Niyaabad, Layari Karachi. Plot # AK 68 S-2 Lyari Town Karachi.
42	Aqua Vie	BWO-42	Karachi	28-01-11	-			1.5 Liter	Mr. Rizwan, Rizwan Milk Shop Block-13 Gulistan-e-Johar. Karachi. SK Enterprises Karachi
43	Zindigi plus	BWO-43	Karachi	28-01-11	12/2013			1.5 Liter	Mr Hizbullah. Iqbalkiryana store, Gali # 1Liaquat colony shah wali Ullah road. Soft Water Technology, Plot # 4-A 4/19 Nazimabad No. 4 Karachi.

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								layari Karachi.	
44	Liza	BWO-44	Karachi	28-01-11	11/2011	-	1.5 Liter	Mashallah Crockery and General Store, Block-12 Gulstan-e-Johar Karachi.	Filled by Miracle Laboratories.
45	A-ONE	BWO-45	Rawalpindi	02.02.11	12/2011	-	1.5 Liter	Plot No.152 street No.8 Al-Noor Colony RWP	Plot No.152 street No.8 Al-Noor Colony RWP
46	Tahoor	BWO-46	Quetta	24-01-11	-	-	1.5 Liter	New Sammad Medical Store, Opposite Civil Casualty, M.A Jinnah Road Quetta	A.S Enterprises, Plot # 518-519 Block-36 Defense Garden D.H.A Phase I Karachi
47	Aqua Hygienic	BWO-47	Quetta	24-01-11	10/2011	-	1.5 Liter	New Medical Store Opposite Civil Casualty, M.A Jinnah Road Quetta	Marketed by Zahras Pvt Ltd. A-one City Street # 7 Brewery Road Quetta
48	First Water	BWO-48	Quetta	24-01-11	04/2012	-	1.5 Liter	Kausar Medical Store, Opposite Civil Casualty, M.A Jinnah Road Quetta	D-38, S.I.T.E. Karachi 75700 Phone, 021-2573605-9
49	Asal Pio Na	BWO-49	Quetta	24-01-11	09/2012		1.5 Liter	Bukhara Medical Store, Opposite Civil Casualty, M.A Jinnah Road Quetta	Tower MARKET Hakim Habib Road Hyderabad, 0300-3032505
50	Ab-e-Hayat	BWO-50	Tando Jam	03-02-11	-	-	0.5 Liter	Abdul Rahim. Abdul Rahim super & super store nawa hut bazaar Tando jam.	Pakistan Mineral Water Bottling Plant (Pvt) Ltd 185/G Road L-9 Garden Industrial Estate, KPK.
51	Hyderopsy	BWO-51	Tando Jam	03-02-11	02/2012	-	0.6 Liter	Mr, Rehmat. New Rehmat sweet & bakers nawa hut bazaar Tando jam.	Head Office USA, Karachi 092-216377654, Hyderabad, 092-222783582-3
52	Kerry	BWO-52	Tando Jam	03-02-11	06/2011	--	0.6 Liter	Tariq Ahmed. Al Aziz medical store Tando jam.	Korangi Industrial Area 8 Karachi
53	Via	BWO53	Tando Jam	03-02-11	12/2011	-	0.6 Liter	Mr. Rehmat, New Rehmat Sweets Nawa Hut Bazaar Tandojam	Marketed by U.N Brothers, S.I.T.E Karachi
54	Noble	BWO-54	Tando Jam	03-02-11	-	-	0.6 Liter	Mr. Rehmat, New Rehmat Sweets Nawa Hut Bazaar Tandojam	Tower MARKET Hakim Habib Road Hyderabad,
55	Aqua Sure	BWO-55	Peshawar	20-01-11	2012	-	0.6 Liter	Shakeel Ahmad Service Road Haji Camp	G.T Road Nasir Pura Peshawar Cell # 0334-913184

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								Adda Peshawar	
56	Khyber Aqua	BWO-56	Peshawar	20-01-11	12/2011	-	0.6 Liter	Sonrana General Store, Ph IV, Opp. HMC, Hayatabad Peshawar	H-47, St. 3 1 Eidgah Colony Charsadda Road Peshawar.
57	Natural Aqua	BWO-57	Peshawar	20-01-11	07/2011	-	0.6 Liter	Avion Super Store University Town Peshawar	Nasir Bagh Road University Board Peshawar, 091-5840171
58	Sparklet	BWO-58	Peshawar	20-01-11	10/2011	-	1.5 Liter	Yasir General Store Phase II Chowke Peshawar	64-Khayaban-e-Suharwady G-6/4 Islamabad
59	Nectar	BWO-59	Islamabad	08-02-11	11/2012	-	1.5 Liter	Plot No 14/10 Markaz G-7 Islamabad	Plot No 14/10 Markaz G-7 Islamabad
60	Splash Dew	BWO-60	Islamabad	08-02-11	06/2011	-	1.5 Liter	Plot # 139, I-10/3 Islamabad	Plot # 139, I-10/3 Islamabad
61	Good Ly	BWO-61	Badin	08-02-11	12/2011	-	0.6 Liter	Makka Sweets and General Store Gharibabad, Qazia Pul, Badin	Good Ly Karachi Pakistan
62	Khush Abb	BWO-62	Sargodha	07-02-11	-	-	0.6 Liter	University Pharmacy, Sargodha	University of Sargodha
63	Gourmet	BWO-63	Sargodha	07-02-11	05/2011	-	0.5 Liter	Bismillah Medical Store Sargodha, 0300-4753712	1-5 Sunder Industrial Estate , Lahore
64	Morning Mist	BWO-64	Sargodha	07-02-11	04/2011	-	1.5 Liter	Muhammad Aslam, Lari Adder Sargodha. 0343-5991598	M/S Hashwi International Awan Height 7-8 Railway Road Sargodha
65	Aqua Save	BWO-65	Sialkot	10-02-11	05/2011	-	1.5 Liter	SFS Mineral Water Company Waziraabad Road Julianwala Ugoki Sialkot	SFS Mineral Water Company Waziraabad Road Julianwala Ugoki Sialkot
66	Al-Shalal	BWO-66	Sialkot	10-02-11	-	-	1.5 Liter	14 Km Seokay Adda Emanabad Road Sialkot	14 Km Seokay Adda Emanabad Road Sialkot
67	Isberg	BWO-67	Sialkot	10-02-11	1/2012	-	0.6 Liter	Dhobola Roadras Road Sialkot	Premier Water Refining Company Sialkot
68	Eco Water	BWO-68	Sialkot	10-02-11	5/2011	-	0.6 Liter	Roras Road Naul Chowk Sialkot	Roras Road Naul Chowk Sialkot
69	Aqua One	BWO-69	Sialkot	10-02-11	05/2012	-	0.6 Liter	Talen Sport Adda Sialkot	Daska Road Sialkot



WATER QUALITY PARAMETERS AND METHODS USED FOR ANALYSIS

Sr. #	PARAMETERS	ANALYTICAL METHOD
1.	Alkalinity (m.mol/l as CaCO ₃)	2320, Standard method (1992)
2.	Arsenic (ppb)	AAS Vario 6, Analytik Jena AG
3.	Bicarbonate	2320, Standard method (1992)
4.	Calcium (mg/l)	3500-Ca-D, Standard Method (1992)
5.	Carbonate (mg/l)	2320, Standard method (1992)
6.	Chloride (mg/l)	Titration (Silver Nitrate), Standard Method (1992)
7.	Color (TCU)	Sensory Test
8.	Conductivity (µS/cm)	E.C meter, Hach-44600-00, USA
9.	Hardness (mg/l)	EDTA Titration, Standard Method (1992)
10.	Magnesium (mg/l)	2340-C, Standard Method (1992)
11.	Nitrate Nitrogen (mg/l)	Cd. Reduction (Hach-8171) by Spectrophotometer
12.	Odor	Sensory Test
13.	pH	pH Meter, Hanna Instrument, Model 8519, Italy
14.	Potassium (mg/l)	Flame photometer PFP7, UK
15.	Sodium (mg/l)	Flame photometer PFP7, UK
16.	Sulfate (mg/l)	SulfaVer4 (Hach-8051) by Spectrophotometer
17.	Phosphate (mg/l)	8190 and 8048 (Hach)
18.	Taste	Sensory Test
19.	TDS (mg/l)	2540C, Standard method (1992)
20.	Turbidity (NTU)	Turbidity Meter, Lamotte, Model 2008, USA
21.	Fluoride (mg/l)	4500-F C. ion-Selective Electrode Method Standard method (1992)
22.	Iron (mg/l)	FerroVer method (HACH Cat. 21057-69)
23.	Total Coliform (MPN/100ml)	9221-B, Multiple tube fermentation Technique, Standard Methods for the Examination of Water and Waste Water
24.	E. Coli (MPN/100ml)	9221-E, Multiple tube fermentation Technique, Standard Methods for the Examination of Water and Waste Water
25.	Total Plate Count (TPC) (CFU/ml)	9215-B, Heterotrophic Plate Count. Standard Methods for the Examination of Water and Waste Water

WATER QUALITY PERMISSIBLE LIMITS FOR BOTTLED WATER

Sr. #	Parameter	Units	Permissible Limits		
			WHO	IBWA	PSQCA
1.	Alkalinity	(m.mol/l)	NGVS	NGVS	NGVS
2.	Bicarbonate	(mg/l)	NGVS	NGVS	NGVS
3.	Calcium	(mg/l)	NGVS	NGVS	100
4.	Carbonate	(mg/l)	NGVS	NGVS	NGVS
5.	Chloride	(mg/l)	250	250	250
6.	Co lour	(TCU)	15	NGVS	5
7.	Conductivity	(µS/cm)	NGVS	NGVS	NGVS
8.	Fluoride	(mg/l)	1.5	3	0.7
9.	Hardness	(mg/l)	NGVS	NGVS	NGVS
10.	Iron	(mg/l)	0.3	0.3	0.3
11.	Magnesium	(mg/l)	NGVS	NGVS	50

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12.	Odor	-	Odorless	NGVS	Unobjectionable
13.	Nitrate-N	(mg/l)	10	10	10
14.	pH	-	6.5-8.5	NGVS	6.5-8.5
15.	Potassium	(mg/l)	NGVS	NGVS	10
16.	Sodium	(mg/l)	200	NGVS	50
17.	Sulfate	(mg/l)	250	250	250
18.	Taste	-	Unobject.	NGVS	Unobjectionable
19.	TDS	(mg/l)	1000	500	500
20.	Turbidity	(NTU)	5	NGVS	0.5
21.	Phosphate	(mg/l)	NGVS	NGVS	NGVS
22.	Arsenic	ppb	10	10	10
23.	Total Coliform	MPN/100ml	0	0	0
24.	E-Coli	MPN/100ml	0	0	0
25.	Total Plate Count	CFU/ml	-	-	At 22°C= <100/ml At 35°C=< 20/ml

WHO World Health Organization
IBWA International Bottled Water Association
PSQCA Pakistan Standards and Quality Control Authority

SUMMARY OF RESULTS OF PCRWR MONITORING

CONTAMINANTS OF POTENTIAL CONCERNS FOUND IN BOTTLED WATER BRANDS

Arsenic (Safe Limit : 10ppb)

Sr. No	Brand Name	Code	City of Manufacturing	Unit	Results
1.	Nation	BWO-7	Lahore	ppb	39
2.	Naimat	BWO-15	Lahore	ppb	24
3.	Aqua National	BWO-17	Lahore	ppb	54
4.	Active	BWO-20	Lahore	ppb	24
5.	Pan Pura	BWO-21	Sahiwal	ppb	36
6.	Pineo	BWO-22	Bahawalpur	ppb	12
7.	Lite Aqua	BWO-25	Multan	ppb	13

Sodium (Safe Limit : 50ppm)

Sr. No	Brand Name	Code	City of Manufacturing	Unit	Results
1.	Nation	BWO-7	Lahore	ppm	62
2.	Aqua Life	BWO-8	Lahore	ppm	84
3.	Klinz	BWO-13	Lahore	ppm	100
4.	Aqua Safe	BWO-19	Lahore	ppm	61
5.	Max Fresh	BWO-37	Karachi	ppm	68
6.	Glow	BWO-38	Karachi	ppm	74
7.	Zindagi Plus	BWO-43	Karachi	ppm	76
8.	Asal Pio na	BWO-49	Hyderabad	ppm	135



Total Dissolved Solids (TDS) (Safe Limit : 500ppm)					
Sr. No	Brand Name	Code	City of Manufacturing	Unit	Results
1.	Asal Pio na	BWO-49	Hyderabad	ppm	803

Bacteriological (Safe Limit : Nil)				
Sr. No	Brand Name	Code	Results	
			Total Coliforms MPN/100ml	Fecal Coliforms MPN/100ml
1.	Well-O	BWO-40	05	Nil
2.	Natural Excellent	BWO-55	07	Nil

All the bottled/Mineral water brands were also tested for Total Plate Count. The criteria of PSQCA and most of the international bottled water standards is to collect and analyze the samples within 12- 24 hours of production and compare the results with the permissible limit for Total Plate Count recommended by PSQCA and other international standards. Out of total 51 brands, 53 brands found beyond the PSQCA limit of 20 CFU /ml for Total Plate Count at 37°C, are listed below:

BACTERIOLOGICAL: (Total Coliforms & Total Plate Count)				
Sr. No	Brand Name	Code	Results	
			Total Coliforms CFU/100ml	Total Plate Count CFU/ml
1.	Well-O	BWO-5	Nil	37
2.	Natural Excellent	BWO-6	Nil	107
3.	Nation	BWO-7	Nil	95
4.	Aqua Life	BWO-8	Nil	97
5.	Kisan Better Life	BWO-9	Nil	45
6.	Minra	BWO-10	Nil	22
7.	Aqua RO 7	BWO-12	Nil	88
8.	Klinz	BWO-13	Nil	78
9.	Premier	BWO-14	Nil	315
10.	Naimat	BWO-15	Nil	245
11.	Blu Water	BWO-16	Nil	67
12.	Aqua National	BWO-17	Nil	78
13.	Aqua Safe	BWO-19	Nil	145
14.	Active	BWO-20	Nil	152
15.	Pineo	BWO-22	Nil	167
16.	Avisa	BWO-23	Nil	52
17.	Aqua Feen	BWO-24	Nil	147
18.	Lite Aqua	BWO-25	Nil	73
19.	Legend	BWO-26	Nil	127
20.	Aqua Habib	BWO-27	Nil	104
21.	Selina	BWO-28	Nil	113
22.	Vital	BWO-29	Nil	39
23.	Clear	BWO-30	Nil	105
24.	Hydra	BWO-31	Nil	358
25.	Life	BWO-32	Nil	76
26.	Pak zam zam	BWO-33	Nil	225
27.	Spring Fresh	BWO-34	Nil	38



28.	Sun Lay	BWO-36	Nil	143
29.	Max Fresh	BWO-37	Nil	22
30.	Glow	BWO-38	Nil	116
31.	Jel	BWO-39	Nil	285
32.	Aqua Nasa	BWO-40	05	38
33.	Marjan	BWO-41	Nil	113
34.	Zindigi plus	BWO-43	Nil	34
35.	Liza	BWO-44	Nil	48
36.	Tahoor	BWO-46	Nil	33
37.	Aqua Hygienic	BWO-47	Nil	22
38.	First Water	BWO-48	Nil	27
39.	Asal Pio Na	BWO-49	Nil	79
40.	Hyderopsy	BWO-51	Nil	207
41.	Kerry	BWO-52	Nil	53
42.	Via	BWO53	Nil	147
43.	Neble	BWO-54	Nil	97
44.	Aqua Sure	BWO-55	07	93
45.	Khyber Aqua	BWO-56	Nil	245
46.	Natural Aqua	BWO-57	Nil	23
47.	Nectar	BWO-59	Nil	56
48.	Splash Dew	BWO-60	Nil	67
49.	Good Ly	BWO-61	Nil	97
50.	Aqua Save	BWO-65	Nil	44
51.	Al-Shalal	BWO-66	Nil	25
52.	Isberg	BWO-67	Nil	32
53.	Eco Water	BWO-68	Nil	48

The excessive level of Total Plate Count indicate the overall sanitation quality, water treatment plant efficiency, after growth in transmission lines and the general bacterial composition of source water.(Judith Whittier, 2008).

As most of the samples of bottled/mineral water brands were not collected within 12-24 hours of production. Therefore, we have not considered these brands in the category of unsafe bottled water brands. In the same context, the recommendations of Pakistan Standards Quality Control Authority (PSQCA), International Bottled Water Association (IBWA) and European Union are as following:

1. According to Pakistan Standards Quality Control Authority (PSQCA), Ministry of Science and Technology, the limit for Total Plate Count i.e. <100 CFU/ml at 20-22 °C and <20 CFU/ml at 37 °C is subjected to monitor within 12 hours of bottling (Pakistan Standards Specification for Bottled Drinking Water, 3rd Revision).
2. The International Bottled water Association (IBWA) recommends that plants meet a level of <30 cfu/ml at bottling, and <200 cfu/ml in 90% of samples tested 5 days after bottling (NRDC, 2000).
3. The European Union (EU) has adopted an enforceable bottled water standard of 100 colonies per 100 ml (at 22oC) at bottling (NRDC, 2000).



PCRWR TESTING: SAFE BRANDS

Sr. No	Brand Name	Code	Quality (Safe/Unsafe)	
			Chemical	Microbiological
1.	Nestle	BWO-1	Safe	Safe
2.	Kinely	BWO-2	Safe	Safe
3.	Aquafina	BWO-3	Safe	Safe
4.	Springley	BWO-4	Safe	Safe
5.	Well-O	BWO-5	Safe	Safe
6.	Natural Excellent	BWO-6	Safe	Safe
7.	Kisan (Better Life)	BWO-9	Safe	Safe
8.	Minra	BWO-10	Safe	Safe
9.	Khaleej	BWO-11	Safe	Safe
10.	Aqua RO 7	BWO-12	Safe	Safe
11.	Premier	BWO-14	Safe	Safe
12.	Blu-Water	BWO-16	Safe	Safe
13.	Sufi	BWO-18	Safe	Safe
14.	Avisa	BWO-23	Safe	Safe
15.	Aqua Feen	BWO-24	Safe	Safe
16.	Legend	BWO-26	Safe	Safe
17.	Aqua Habib	BWO-27	Safe	Safe
18.	Selina	BWO-28	Safe	Safe
19.	Vital	BWO-29	Safe	Safe
20.	Clear	BWO-30	Safe	Safe
21.	Hydra	BWO-31	Safe	Safe
22.	Life	BWO-32	Safe	Safe
23.	Pak zam zam	BWO-33	Safe	Safe
24.	Spring Fresh	BWO-34	Safe	Safe
25.	Vey	BWO-35	Safe	Safe
26.	Sun Lay	BWO-36	Safe	Safe
27.	Jel	BWO-39	Safe	Safe
28.	Marjan	BWO-41	Safe	Safe
29.	Aqua Vie	BWO-42	Safe	Safe
30.	Liza	BWO-44	Safe	Safe
31.	A-ONE	BWO-45	Safe	Safe
32.	Tahoor	BWO-46	Safe	Safe
33.	Aqua Hygienic	BWO-47	Safe	Safe
34.	First Water	BWO-48	Safe	Safe
35.	Ab-e- Hayat	BWO-50	Safe	Safe
36.	Hydropsy	BWO-51	Safe	Safe
37.	Kerry	BWO-52	Safe	Safe
38.	Via	BWO-53	Safe	Safe
39.	Neble	BWO-54	Safe	Safe
40.	Khyber Aqua	BWO-56	Safe	Safe
41.	Natural Aqua	BWO-57	Safe	Safe
42.	Sparklet	BWO-58	Safe	Safe

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43.	Nectar	BWO-59	Safe	Safe
44.	Splash Dew	BWO-60	Safe	Safe
45.	Good Ly	BWO-61	Safe	Safe
46.	Khush Abb	BWO-62	Safe	Safe
47.	Gourmet	BWO-63	Safe	Safe
48.	Morning Mist	BWO-64	Safe	Safe
49.	Aqua Save	BWO-65	Safe	Safe
50.	Al-Shalal	BWO-66	Safe	Safe
51.	Isberg	BWO-67	Safe	Safe
52.	Eco Water	BWO-68	Safe	Safe
53.	Aqua One	BWO-69	Safe	Safe

PCRWR TESTING: UNSAFE BRANDS

Sr. No	Brand Name	Code	Quality (Safe/Unsafe)	
			Chemical	Microbiological
1.	Nation	BWO-7	Unsafe	Safe
2.	Aqua Life	BWO-8	Unsafe	Safe
3.	Klinz	BWO-13	Unsafe	Safe
4.	Naimat	BWO-15	Unsafe	Safe
5.	Aqua National	BWO-17	Unsafe	Safe
6.	Aqua Safe	BWO-19	Unsafe	Safe
7.	Active	BWO-20	Unsafe	Safe
8.	Pan Pura	BWO-21	Unsafe	Safe
9.	Pineo	BWO-22	Unsafe	Safe
10.	Lite Aqua	BWO-25	Unsafe	Safe
11.	Max Fresh	BWO-37	Unsafe	Safe
12.	Glow	BWO-38	Unsafe	Safe
13.	Aqua Nasa	BWO-40	Safe	Unsafe
14.	Zindagi Plus	BWO-43	Unsafe	Safe
15.	Asal Pio na	BWO-49	Unsafe	Safe
16.	Aqua Sure	BWO-55	Safe	Unsafe

MARKET CONSISTENCY IN TWO NEIGHBORING QUARTERS

Sr. No	Consistent Brands	New Brands	Unavailable Brands
1.	Hydra	Well-O	Puurle Water
2.	Life	Natural Excellent	Klassic Valley
3.	Splash	Aqua Life	T.W.T
4.	Pak Zam Zam	Kisan (Better life)	HydR-8
5.	Active	Minra	IVA Pure
6.	Premier	Khaleej	Ripple
7.	Kinley	Aqua RO 7	Atlantis
8.	Nation	Klinz	Aspen Aqua
9.	Naimat	Blu Water	Piyaas

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10.	National	Aqua Safe	Standard
11.	Springley	Aqua Feen	Pak Life
12.	Sufi	Lite Aqua	Ab-e-Zain
13.	Aquafina	Legend	De-Aar
14.	Nestle	Aqua Habib	Aqua Nas
15.	Aqua Save	Vital	Life Natural Water
16.	Natural Aqwah	Clear	Al Hayat
17.	Khyber Aquah	Glow	
18.	A-One	Aqua Nasa	
19.	Nectar	Marjan	
20.	Pineo	Zindagi Plus	
21.	Pan Pura	Aqua Hygenic	
22.	Avisa	First Water	
23.	Tahoor	Kerry	
24.	Asal Peo na	Neble	
25.	Via	Aqua Sure	
26.	Ab-e-Hayat	Sparklet	
27.	Hydropsy	Good Ly	
28.	Jel	Khush Abb	
29.	Vey	Gourmet	
30.	Liza	Morning Mist	
31.	Sun Lay	Al-Shalal	
32.	Aqua Vie	Isberg	
33.	Spring Fresh	Eco Water	
34.	Selina	Aqua-one	
35.	Max Fresh		

DISEASE POTENTIAL FROM CONTAMINATED BOTTLED WATER

Sr. No	Contaminant	Diseases Impacts
1.	Bacteriological Contamination	Cholera, Diarrhea, Dysentery, Hepatitis, Typhoid
2.	Arsenic	Cancer (lungs, bladder, skin, prostate, kidney, nose and liver), diabetes kidney diseases, hypertension, heart diseases, birth defects, black foot diseases.
3.	Sodium	Hypertension
4.	TDS	Salty or bitter taste



CONCLUSIONS

Sr. No	Item	Conclusion	
		No.	% age
1.	Total No. Brands Collected	69	-
2.	Overall safe brands	53	77
3.	No. of overall unsafe brands	16	23
4.	No. of Chemically safe brands	55	80
5.	No. of Chemically unsafe brands	14	20
6.	No. of Microbiologically safe brands	67	97
7.	No. of Microbiologically unsafe brands	02	03
8.	No. of Consistent brands in Market	35	51
9.	No. of brands disappeared from market	16	23
10.	No. of new brands	34	49

Detailed water quality status of each bottled water brand is available at Annexure-1



Annexure-1

Chemical and Microbiological Quality of Bottled/Mineral Water Brands

Brand Name	Brand Code	Turbidity	pH	EC	TDS	Ca	Mg	Hard	HCO ₃	Cl	Na	F	PO ₄	Fe	K	NO ₃	SO ₄	As	Total Coliforms	Fecal Coliforms	Total Plate Count
PSQCA Bottled Water Standards	-	0.5	6.5 - 8.5	NGVS	500	100	50	NGVS	NGVS	250	50	0.7	NGVS	0.3	10	10	250	10	0/100 ml	0/100ml	<20 at 37°C
Detection Limits	-	0.2	0.02	0.287	-	2	1	5	5	2	1	0.03	0.03	0.03	0.2	0.06	0.4	0.1	-	-	-
Units	-	NTU		µS/cm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppb	CFU /100ml	CFU /100ml	CFU /ml
Nestle	BWO-1	BDL	6.98	362	199	44	4	125	40	77	12	0.32	BDL	BDL	0.3	BDL	17	4	Nil	Nil	0
Kinely	BWO-2	BDL	6.25	532	293	38	13	150	25	127	32	BDL	BDL	BDL	2.1	BDL	26	BDL	Nil	Nil	1
Aqua Fina	BWO-3	BDL	6.99	212	117	2	12	55	15	24	17	BDL	BDL	BDL	0.8	BDL	50	BDL	Nil	Nil	0
Springley	BWO-4	BDL	7.75	523	288	68	15	230	245	8	19	0.08	BDL	BDL	1.0	3	13	0.3	Nil	Nil	0
Well-O	BWO-5	BDL	7.12	330	182	24	9	95	45	57	21	0.06	BDL	BDL	BDL	0.8	22	BDL	Nil	Nil	37
Natural Excellent	BWO-6	BDL	7.03	356	196	20	5	70	45	66	37	0.28	BDL	BDL	1.0	0.7	17	1	Nil	Nil	107
Nation	BWO-7	BDL	7.85	493	271	30	10	115	220	14	62	0.04	BDL	BDL	2.5	0.1	33	39	Nil	Nil	95
Aqua Life	BWO-8	BDL	7.88	705	388	36	9	125	130	53	84	0.31	BDL	BDL	2.1	BDL	130	1	Nil	Nil	97
Kisan Better Life	BWO-9	BDL	7.43	500	275	66	4	180	30	126	12	0.13	BDL	BDL	0.5	BDL	6	1	Nil	Nil	45
Minra	BWO-10	BDL	7.50	745	410	84	34	350	330	13	24	0.17	BDL	BDL	6.4	BDL	54	2	Nil	Nil	22
Khaleej	BWO-11	BDL	7.55	296	163	10	5	45	30	59	39	0.07	BDL	BDL	1.5	0.4	10	1	Nil	Nil	0
Aqua RO 7	BWO-12	BDL	6.90	357	196	36	7	120	35	66	15	BDL	BDL	BDL	BDL	BDL	24	1	Nil	Nil	88
Klinz	BWO-13	BDL	7.56	606	333	20	12	100	265	7	100	0.18	BDL	BDL	2.9	BDL	61	9	Nil	Nil	78
Premier	BWO-14	BDL	7.00	353	194	18	1	50	85	45	50	BDL	BDL	BDL	0.3	0.1	14	2	Nil	Nil	315
Naimat	BWO-15	BDL	7.89	322	177	30	11	120	145	10	19	0.05	BDL	BDL	1.5	0.2	11	24	Nil	Nil	245
Blu Water	BWO-16	BDL	7.40	293	161	26	6	90	25	52	13	0.17	BDL	BDL	0.4	BDL	25	0.5	Nil	Nil	67
Aqua National	BWO-17	BDL	7.75	279	153	32	11	125	125	2	7	0.22	BDL	BDL	1.6	0.2	15	54	Nil	Nil	78
Sufi	BWO-18	BDL	7.65	339	186	42	5	125	30	71	9	BDL	BDL	BDL	BDL	BDL	14	0.2	Nil	Nil	02

The highlighted results indicate the concentration level beyond the PSQCA Bottled Water Standards.

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Aqua Safe	BWO-19	BDL	7.48	600	330	28	19	150	85	70	61	0.14	BDL	BDL	2.9	BDL	100	5	Nil	Nil	145
Active	BWO-20	BDL	7.86	291	160	22	13	110	135	2	16	0.43	BDL	BDL	1.9	0.1	11	24	Nil	Nil	152
Pan Pura	BWO-21	BDL	7.69	368	202	38	5	115	85	39	25	0.21	BDL	BDL	1.5	BDL	33	36	Nil	Nil	5
Pineo	BWO-22	BDL	7.68	413	227	46	12	165	145	31	16	0.24	BDL	BDL	4.7	BDL	23	12	Nil	Nil	167
Avisa	BWO-23	BDL	7.79	299	164	38	2	105	10	70	3	0.09	BDL	BDL	2.0	BDL	3	0.3	Nil	Nil	52
Aqua Feen	BWO-24	BDL	7.64	389	214	44	16	175	155	15	11	BDL	BDL	BDL	1.5	3	21	0.5	Nil	Nil	147
Lite Aqua	BWO-25	BDL	7.51	352	194	14	6	60	110	14	49	0.18	BDL	BDL	1.3	BDL	52	13	Nil	Nil	73
Legend	BWO-26	BDL	6.75	140	77	8	2	30	20	27	16	0.13	BDL	BDL	1.2	2	4	0.16	Nil	Nil	127
Aqua Habib	BWO-27	BDL	6.98	376	207	22	7	85	70	43	42	0.26	BDL	BDL	2.9	BDL	52	0.45	Nil	Nil	104
Selina	BWO-28	BDL	6.90	249	137	18	11	90	25	41	13	0.09	BDL	BDL	0.3	0.1	44	BDL	Nil	Nil	113
Vital	BWO-29	BDL	7.01	389	214	38	9	130	30	89	16	0.23	BDL	BDL	2.8	BDL	17	0.5	Nil	Nil	39
Clear	BWO-30	BDL	6.59	400	220	56		150	15	104	6	0.05	BDL	BDL	BDL	BDL	10	1	Nil	Nil	105
Hydra	BWO-31	BDL	6.59	488	268	58	11	190	240	14	29	0.17	BDL	BDL	0.8	BDL	15	0.4	Nil	Nil	358
Life	BWO-32	BDL	7.58	625	344	76	18	265	280	20	33	0.30	BDL	BDL	1.1	4	35	0.6	Nil	Nil	76
Pak zam zam	BWO-33	BDL	6.99	300	165	36	11	135	140	12	11	0.10	BDL	BDL	0.4	2	9	0.2	Nil	Nil	225
Spring Fresh	BWO-34	BDL	7.09	421	232	36	10	130	120	36	34	0.22	BDL	BDL	2.6	4	46	0.3	Nil	Nil	38
Vey	BWO-35	BDL	6.75	348	191	32	12	130	20	67	5	0.05	BDL	BDL	7.1	0.3	34	BDL	Nil	Nil	03
Sun Lay	BWO-36	BDL	6.85	76	42	4		10	15	16	9	0.11	BDL	BDL	0.6	BDL	3	0.3	Nil	Nil	143
Max Fresh	BWO-37	BDL	7.15	563	310	36	6	115	70	102	68	0.15	BDL	BDL	1.7	3	41	0.2	Nil	Nil	22
Glow	BWO-38	BDL	7.48	717	394	46	16	180	110	90	74	0.30	BDL	BDL	6.3	0.5	81	3	Nil	Nil	116
Jel	BWO-39	BDL	6.99	139	76	8	2	30	20	27	16	BDL	BDL	BDL	1.2	2	4	BDL	Nil	Nil	285
Aqua Nasa	BWO-40	BDL	6.78	365	201	28	1	75	25	76	37	0.13	BDL	BDL	1.8	0.5	37	0.5	05	Nil	38
Marjan	BWO-41	BDL	6.59	370	204	22	9	90	40	69	30	0.18	BDL	BDL	3.3	2	26	BDL	Nil	Nil	113
Aqua Vie	BWO-42	BDL	7.20	145	80	12	5	50	20	27	7	0.12	BDL	BDL	0.3	BDL	8	0.3	Nil	Nil	02
Zindigi plus	BWO-43	BDL	7.00	451	248	12	2	40	115	63	76	0.17	BDL	BDL	2.2	1	14	0.3	Nil	Nil	34
Liza	BWO-44	BDL	6.69	270	146	6	23	110	15	69	5	0.06	BDL	BDL	0.2	BDL	8	BDL	Nil	Nil	48
A-One	BWO-45	BDL	6.80	306	168	28	15	130	45	48	12	BDL	0.03	BDL	BDL	0.3	28	0.2	Nil	Nil	5
Tahoor	BWO-46	BDL	6.87	238	131	28	7	100	30	37	4	0.19	BDL	BDL	1.1	1	33	0.3	Nil	Nil	33
Aqua Hygienic	BWO-47	BDL	7.49	308	169	30	7	105	55	56	16	0.14	BDL	BDL	0.2	0.2	6	BDL	Nil	Nil	22
First Water	BWO-48	BDL	7.24	317	174	32	7	110	30	61	5	BDL	BDL	BDL	8.2	0.3	23	BDL	Nil	Nil	27
Asal Pio Na	BWO-49	BDL	7.97	1339	803	74	56	415	150	175	135	0.42	BDL	BDL	8.6	1	244	2	Nil	Nil	79

The highlighted results indicate the concentration level beyond the PSQCA Bottled Water Standards.

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Ab-e-Hayat	BWO-50	BDL	7.70	352	194	12	9	65	65	60	43	0.21	BDL	BDL	0.6	0.3	20	0.2	Nil	Nil	0
Hyderopsy	BWO-51	BDL	7.45	316	179	24	5	80	40	51	30	BDL	BDL	BDL	3.7	4	36	0.2	Nil	Nil	207
Kerry	BWO-52	BDL	7.20	504	277	38	6	120	55	69	43	BDL	BDL	BDL	7.3	8	31	BDL	Nil	Nil	53
Via	BWO-53	BDL	7.35	527	290	14	18	110	70	97	50	0.25	BDL	BDL	9.2	3	33	1	Nil	Nil	147
Noble	BWO-54	BDL	6.86	429	236	46	10	155	40	65	16	0.17	BDL	BDL	4.1	1	61	BDL	Nil	Nil	97
Aqua Sure	BWO-55	BDL	7.51	483	266	34	33	220	215	14	17	0.22	BDL	BDL	1.3	BDL	49	1	07	Nil	93
Khyber Aqua	BWO-56	BDL	7.31	409	225	38	19	175	175	12	16	0.19	BDL	BDL	1.7	4	24	0.3	Nil	Nil	245
Natural Aqua	BWO-57	BDL	7.77	356	196	32	18	155	170	6	16	0.26	BDL	BDL	1.2	2.5	16	0.4	Nil	Nil	23
Spark let	BWO-58	BDL	7.64	319	175	40	9	135	160	6	15	0.15	BDL	BDL	1.7	2	3	0.3	Nil	Nil	19
Nectar	BWO-59	BDL	7.30	405	223	58	11	190	200	7	13	0.23	BDL	BDL	0.6	1.3	9	0.4	Nil	Nil	56
Splash Dew	BWO-60	BDL	7.41	369	203	44	11	155	170	9	16	0.17	BDL	BDL	0.9	2	13	0.3	Nil	Nil	67
Good Ly	BWO-61	BDL	6.83	323	178	38	2	105	25	78	12	0.09	BDL	BDL	1.3	BDL	7	0.2	Nil	Nil	97
Khush Abb	BWO-62	BDL	7.20	459	252	56	7	170	35	99	13	BDL	0.04	BDL	BDL	0.3	24	0.3	Nil	Nil	0
Gourmet	BWO-63	BDL	7.07	342	188	28	9	105	55	57	24	0.07	BDL	BDL	BDL	0.2	37	0.3	Nil	Nil	15
Morning Mist	BWO-64	BDL	6.50	184	101	10	1	30	25	34	23	0.11	0.03	BDL	2.5	4.3	1	BDL	Nil	Nil	02
Aqua Save	BWO-65	BDL	6.50	309	170	40	6	125	15	73	3	0.14	BDL	BDL	2.1	0.3	12	0.5	Nil	Nil	44
Al-Shalal	BWO-66	BDL	7.30	366	198	44	15	170	195	2	15	0.21	BDL	BDL	3.3	0.4	BDL	5	Nil	Nil	25
Isberg	BWO-67	BDL	7.70	322	177	32	12	130	105	43	10	0.48	BDL	BDL	4.5	0.2	2	8	Nil	Nil	32
Eco Water	BWO-68	BDL	7.04	165	91	2	10	45	50	1	14	0.12	BDL	BDL	BDL	0.3	37	2	Nil	Nil	48
Aqua One	BWO-69	BDL	7.80	378	208	48	12	170	190	10	12	0.30	BDL	BDL	3.4	0.3	6	10	Nil	Nil	0

NGVS =No Guideline Value Set
BDL = Below Detection Limits

The highlighted results indicate the concentration level beyond the PSQCA Bottled Water Standards.

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