



QUARTERLY REPORT BOTTLED WATER QUALITY

(January-March, 2014)



PAKISTAN COUNCIL OF RESEARCH IN WATER RESOURCES

Ministry of Science & Technology

Khyban-e-johar, H-8/1, Islamabad.

www.pcrwr.gov.pk

January-March, 2014

PCRWR QUARTERLY REPORT-BOTTLED WATER QUALITY



SUMMARY

The poor quality of drinking water has forced a large cross-section of citizens to buy bottled water. 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 through Ministry of Science and Technology has designated the task for quarterly monitoring of bottled/mineral water brands to PCRWR. According to the monitoring report for the quarter January-March 2014, following is the brief overview of the findings.

Quarterly Monitoring of Bottled/Mineral Water (January-March, 2014)

No. of Brands Collected	68
No. of Cities Targeted	10 (Islamabad, Rawalpindi, Lahore, Sialkot, Sahiwal, D.G.Khan, Multan, Karachi, Quetta, and Peshawar).
No. of Overall safe brands	47
Overall unsafe brands	21 (i.e. Best Water, Sea Breeze, Aab-e-Kech, Ideal Life, Natural, Standard, Aqua Hygienic, Natural Aqwah, Aquatic Fresh, Butt, Cool, Premier, Al-Sana, Effort, Aqua National, Aftab Qarshi, Nectar, Lite Aqua, Fit, Minter & Aqua Smart).
Chemically safe brands	54
Chemically unsafe brands	14 For Arsenic (8) (Natural, Butt, Cool, Premier, Al-Sana, Aqua National, Nectar and Fit) For Sodium (4) (Best Water, Aqua Hygienic, Lite Aqua and Aqua Smart) For Potassium (1) Standard TDS (1) Aqua Smart pH (1) Effort
No. of Microbiologically safe brands	60
Microbiologically unsafe brands	08 (Sea Breeze, Aab- e- Kech, Ideal Life, Natural Aqua, Aquatic Fresh, Aqua Hygienic, Aftab Qarshi & Minter)

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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 has been 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	68	
No. of Cities Targeted	10 (Islamabad, Rawalpindi, Lahore, Sialkot, Sahiwal, D.G.Khan, Multan, Karachi, Quetta, and Peshawar).	
Composition of Sampling Team	One Research Officer and Two Laboratory Assistants	
Sampling Procedure	Samples of sixty eight commercially available brands of mineral/bottled water were collected from source of production (bottled water plants) as well as from local market of ten cities of Pakistan. These samples were collected by the senior staff members of Head Office and Regional Offices of PCRWR during January-March, 2014. A set of four bottles of each brand was collected and sealed on site. Identification codes were 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	Size	Name & Address of Seller/Shop Keeper	Manufacturer
1	Ultra Pack	BWA-01	D.G Khan	03/01/2014	-	0.6 Liter	New Sunny Medical Store D.G Khan	Ultra pak water industries Shahzada sultan town near Sufi Khalil CNG Pump D.G. Khan
2	Springley	BWA-02	D.G Khan	03/01/2014	03/2015	0.5 Liter	Gulzar Medical Store D.G Khan	Springley a Brand of Qarshi industries(Pvt) Ltd Hattar Pakistan
3	Bless	BWA-03	D.G Khan	03/01/2014	04/2015	0.6 Liter	Yousaf Medical Block 9 D.G .Khan	Water World Indus Highway D.G. Khan
4	Indus Water	BWA-04	D.G Khan	03/01/2014	-	0.6 Liter	Mosa & Sons Near D.H A DG khan	DJ Enterprises:- Suite # 225, Jaskani Commercial Centre Bulakh Sarwar city JamPur Road D.G. Khan
5	First Water	BWA-05	Karachi	30/01/2014	-	0.5 Liter	Haroon Medical & General Store old Muzaffarabad Area Malir Landhi Karachi	First Water Company (Pvt) Ltd.D-38 S.I.T.E Karachi-75000
6	Drizzling	BWA-06	Karachi	30/01/2014	-	0.6 Liter	Abdul Baqi & Brother Karyana Store Quaidabad Landhi Karachi	Gadap Town Malir Karachi
7	IQRA FINU	BWA-07	Karachi	30/01/2014	12/2014	0.6 Liter	Abdul Baqi & Brother Karyana Store Main Thatta Bus Stop Quaidabad Landhi Karachi	IQRA FINU & Co.
8	Best Water	BWA-08	Karachi	31/01/2014	10/2014	1.5 Liter	Bismillah Bakery Malir Area Karachi	4/33 Sector 21 Korangi Industrial Area Karachi www.bestwater.com
9	Sea Breeze	BWA-09	Karachi	31/01/2014	12/2013	1.5 Liter	Bismillah Bakery Malir Area Karachi	Time Enterprises Saebreezewater@yahoo.com 0300-2272199
10	Spring Fresh	BWA-10	Karachi	31/01/2014	12/2015	1.5 Liter	Bismillah Bakery Malir Area Karachi	A-71/1 Sharifabad F.B Area Karachi
11	Aab- e-Kech	BWA-11	Karachi	31/01/2014	-	1.5 Liter	Bismillah Bakery Malir Area Karachi	Kech Makran & Co. Windar Distt. Lasbela Balochistan
12	Crystal Maya	BWA-12	Karachi	31/01/2014	-	1.5 Liter	Waqar Sheereen Shop 36 37 Al Ateeq Marwat Landhi Karachi	Tilon Global:- Off B-221,226 Hub ,Balochistan
13	Sunlay	BWA-13	Karachi	30/01/2014	12/2014	1.5 Liter	Al Hammad General Store Main National High way road Abdullah Goth Near Landhi Hospital	27/1 Nazimabad No. 1 Karachi www.iqra finu.com
14	Snow Drop	BWA-14	Karachi	31/01/2014	12/2014	1.5 Liter	Waqar Sheereen Shop 36 37 Al Ateeq Marwat Plot 17 Main Road Landhi Karachi	B-63 Block 17 F.B Area Karachi
15	Aqua Vida	BWA-15	Karachi	30/01/2014	09/2014	1.5 Liter	Bismillah Bakery Malir Area Karachi	Plot # 80 A,B,C Sector 27 Korangi Industrial Area Karachi

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Sr. No	Brand Name	PCRWR Code	City	Date of Collection	Date of Expiry	Size	Name & Address of Seller/Shop Keeper	Manufacturer
16	Orion	BWA-16	Karachi	31/01/2014	12/2014	1.5 Liter	Al Madina General Store 52 Area Malir Karachi	Orion Food:- Site E-1 Suite # 2 Defence view Phase-II Karachi
17	Al-Massafi	BWA-17	Karachi	30/01/2014	-	0.6 Liter	Al Madina General Store 52 Area Malir Karachi	Al-Massafi Foods:- Plot# S-3 S-4 Malir City Karachi
18	Jel	BWA-18	Karachi	30/01/2014	12/2013	0.6 Liter	Haroon Medical & Store old Muzafarabad Area Machar Landhi Khi	Mega Fine Industrial A-92 Malir Industrial area Malir
19	Ideal Life	BWA-19	Karachi	29/01/2014	12/2014	0.6 Liter	Haroon Medical & Store old Muzafarabad Area Machar Landhi Khi	Ideal Food International Plot # B-9/B-1 Office # 37 S-P Chamber S.I.T.E Karachi
20	Al-Shalal	BWA-20	Sialkot	11/01/2014	11/2014	0.6 Liter	C.K Trades Sialkot Cantt.	AZO Enterprises, 14-km Aimanabad Sialkot
21	VINA	BWA-21	Sialkot	11/02/2014	01/2015	0.6 Liter	Babar Khattak General Store Cantt.	Al-Sultan Beverages Industries chaprar Road Gul Bahar Kalan Sialkot
22	Rise Water	BWA-22	Sialkot	11/01/2014	-	0.6 Liter	Punjab Store Pul aik Nekapura	Pure Foods Sialkot 3-Km Kingra Road Sialkot
23	Athar	BWA-23	Sialkot	11/01/2014	09/2014	0.5 Liter	Ali General Store Kutchery Road Sialkot	E-Mail:Ajva Rise@gmail.com
24	Aqua Save	BWA-24	Sialkot	12/02/2014	01/2015	0.6 Liter	-	SFS Mineral Water Company Wazirabad Road JalianWala Ugoki Sialkot
25	Isberg	BWA-25	Sialkot	11/01/2014	01/2015	0.6 Liter	Nirala Sweet Babar Sb Railway Road Sialkot	Premier water Refining company Dhabola Roras Road Sialkot
26	Natural	BWA-26	Sialkot	11/01/2014	06/2015	0.6 Liter	Mirza Restaurant & Photo State Opposite DPO Office, Sialkot	Natural Food Industries Multan Road Lahore
27	Standard	BWA-27	Quetta	31/01/2014	-	1.5 Liter	Alfazal Medical Store Jinnah Road Quetta	Standard (Private) Industries Ltd. Plot 48-B Eastern Industries Quetta
28	Aqua Hygienic	BWA-28	Quetta	02/02/2014	01/2015	1.5 Liter	Near BMC Hospital Quetta	Zauhras Plot # 2 Street # 12 Faisal Town Brewery Road Quetta
29	AFRA	BWA-29	Quetta	31/01/2014	12/2014	1.5 Liter	Rafiq Juice & Ice Cream, Quetta	Tower Market Hakeem Habib Road Hyderabad
30	Legend	BWA-30	Quetta	31/01/2014	12/2013	1.5 Liter	Javed Medical Store Jinnah Road Quetta	Mega fina Industries:- Plot # A-92 Malir Industrial Area Karachi
31	Natural Aqwah	BWA-31	Peshawar	05-03-2014	01/2015	1.5 Liter	Plot-141-A Industrial Estate Hayat Abad Road Peshawar	R.G. Enterprises Plot-141-A Industrial Estate Hayat Abad Road Peshawar
32	Aqua Splash	BWA-32	Peshawar	05-03-2014	01/2015	0.6 Liter	Plot-192 Industrial Estate Hayatabad Peshawar	Euro International Plot-192 Industrial Estate Hayatabad Peshawar
33	Aquatic Fresh	BWA-33	Peshawar	05-03-2014	02/2016	0.6 Liter	Plot-1/C Industrial Estate Jamrud Road Peshawar	Royal Food Industries Plot-1/C Industrial Estate Jamrud Road Peshawar
34	Moya Mineral Water	BWA-34	Peshawar	05-03-2014	01/2016	0.6 Liter	Plot-500/B Main Gulberg-I Peshawar Cantt.	Plot-500/B Main Gulberg -I Peshawar Cantt.
35	Nebraska	BWA-35	Peshawar	05-03-2014	02/2015	0.6 Liter	Dew Point Plot-12C Industrial Estate Hayat Abad	Dew Point Plot-12C Industrial Estate Hayat Abad Peshawar

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Sr. No	Brand Name	PCRWR Code	City	Date of Collection	Date of Expiry	Size	Name & Address of Seller/Shop Keeper	Manufacturer
							Peshawar	
36	Butt	BWA-36	Lahore	28-02-2014	01/2015	1.5 Liter	Machload Road Lakshami Chowk Lahore	A Product of azhar & Co Gulberg-III Lahore
37	Cool	BWA-37	Lahore	27-02-2014	06/2015	1.5 Liter	Zulfiqar Pan Shop Larri Adda Lahore	M.T Mineral Water Co. B-7 Marghzar Housing Society Lahore
38	Kinley	BWA-38	Lahore	06-03-2014	01/2015	1.5 Liter	Bismillah Juice Corner Liaqat Chowk Sabzazar	Coca Cola beverage Pakistan Ltd. ICC. BPL 5-E-11 Gulberg III Lahore
39	Nestle	BWA-39	Lahore	27-02-2014	08/2014	1.5 Liter	Ikhlaq Medical & General Store Pull Badle Darya Pari Road Lahore	308-Upper Mall Lahore Pakistan
40	Doce	BWA-40	Lahore	06-03-2014	02/2015	1.5 Liter	Doce Liaqat Chowk Lahore	48-M Quaid-e-Azam Industries Estate Kot Lakhpat Lahore
41	Gourmet	BWA-41	Lahore	06-03-2014	08/2014	1.5 Liter	Gourmet bakers & Sweet Liaqat Chowk Lahore	Gourmet Foods Gate # 1 Plot 1-5 Sunder Industrial Estate Raiwind Sunder Road Lahore
42	Aqua RO7	BWA-42	Lahore	14-03-2014	12/2015	1.5 Liter	Yasir sweet & Bakers Adda Arian Raiwind Road Lahore.	Waqar Haider Brothers:-Hassan Kot 7.5 Raiwind Road Lahore
43	Kisan Batter Life	BWA-43	Lahore	14-03-2014	09/2014	1.5 Liter	Exhibition at Lahore international expo center	Faisalabad Oil refinery (Pvt) Ltd www.kisan .com.pk
44	Jami Water	BWA-44	Lahore	09-03-2014	01/2015	0.6 Liter	Khokhar Chowk College road Township Lahore	Jami Water Services Khokhar chowk College Road township Lahore
45	Sufi	BWA-45	Lahore	09-03-2014	11/2015	0.6 Liter	Rafique Sweets & Bakers GT Road Chowk Jallo Mor Lahore	Hadayat food stuffs industries (Pvt) Ltd 1-B Garden Block Garden Town Lahore
46	Premier	BWA-46	Lahore	09-03-2014	06/2015	0.6 Liter	Jinnah Hospital Cafeteria Lahore	Zafir Industries 19-km Near High noon Laboratories Multan Road Lahore
47	Blu'in	BWA-47	Lahore	09-03-2014	01/2015	0.6 Liter	Emergency Cafeteria Meyo Hospital Lahore	Bahawalpur road chuburji Lahore
48	Al-Sana	BWA-48	Lahore	09-03-2014	02/2015	0.6 Liter	Sameer Pan Shop Pata Pur Road Manawan Opposite Brook Field Group of College	mh Foods & Beverages Canal bank Jallo Park Road Lahore Mffood786@gmail.com
49	Effort	BWA-49	Lahore	09-03-2014	11/2014	0.6 Liter	M Hanif Sons Medical Store & Homeopathics Store Boherwala Chowk Lahore	Effort Corporation 83-A Shadman II ,Lahore
50	Aqua National	BWA-50	Lahore	28-02-2014	08/2015	1.5 Liter	Nasir Pan Shop Lari Adda Lahore	Milli Brother 8-km G.T Road Shahdra Lahore
51	Higen H2O	BWA-51	Lahore	28-02-2014	12/2014	1.5 Liter	Ideal Bakers Kharak Stop Lahore	Hygiene Food & Beverages (Pvt) Ltd 4-km Raiwind road Lahore
52	Aftab Qarshi	BWA-52	Lahore	28-02-2014	05/2014	1.5 Liter	Ghosia Pan Shop Shahpur , Lahore	Aftab Qarshi Herbal Laboratories Water Division Muzamil Town Multan Road, Lahore

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Sr. No	Brand Name	PCRWR Code	City	Date of Collection	Date of Expiry	Size	Name & Address of Seller/Shop Keeper	Manufacturer
53	Mashmoom Aqua	BWA-53	Lahore	28-02-2014	-	1.5 Liter	Medifast Mansoor Market Lahore	Mashmoom (Pvt) Ltd Plot # 154/3 154/4 Phase V Industrial Estate Hattar
54	Aqua Anza	BWA-54	Lahore	09-03-2014	09/2015	1.5 Liter	Kothi Stop Bata Pur Lahore	All Pro Foods (Pvt) Ltd 730/731 Urban Spura bridge Canal road Lahore
55	Sparkle	BWA-55	Lahore	09-03-2014	01/2014	1.5 Liter	Punjab Medical Store 73 Jail Road Lahore	Fajar Technical trading:- Plot # 11-12 Water Avenue off Katcha jail Road Kot Lakhpat Lahore
56	Nectar	BWA-56	Multan	31-03-2014	-	0.6 Liter	Aziz Ghani Karyana Store Dara Ada Multan	E-mail:- Necterenterprises@live.com Cell # 03006324373
57	Lite Aqua	BWA-57	Multan	31-03-2014	-	0.6 Liter	Shafiq General Store Abdali Road Multan	Lite Aqua Minerals: - D-8-1-Mehmood-abad, Multan. www.liteaqua.com
58	Fit	BWA-58	Multan	31-03-2014	-	0.6 Liter	Tanveer Drink Corner Lari Adda Multan	Fit Purification I-D/1, Old Shujjabad Road Multan
59	Murree Sparkletts	BWA-59	Multan	31-03-2014	03/2015	0.6 Liter	Abdul Qadir General Store 9 # Chongi Multan	Murree Sparkletts (A Division of Murree Brewery co. Ltd.) Plot No. 10/2, Phase III Industrial Estate Hattar.
60	Nectar	BWA-60	Islamabad	31-03-2014	-	0.6 Liter	Plot # 14/10, Markaz G-7 Islamabad.	Plot # 14/10, Markaz G-7 Islamabad.
61	Fresh Life	BWA-61	Islamabad	31-03-2014	10/2014	1.5 Liter	T& S Islamabad Office # 01, main Hall Pindori Road Main Khanna Dhak Islamabad	T& S Islamabad Office # 01, main Hall Pindori Road Main Khanna Dhak Islamabad
62	Hydra	BWA-62	Islamabad	31-03-2014	-	1.5 Liter	Plot # 31-A, I-9 Industrial Area Islamabad	Plot # 31-A, I-9 Industrial Area Islamabad
63	Verbena	BWA-63	Rawalpindi	31-03-2014	03/2015	0.5 Liter	Vizor Pharma (Pvt)Ltd. 82 Lalazar Estate Rawalpindi	Vizor Pharma (Pvt)Ltd. 82 Lalazar Estate Rawalpindi
64	Refresh Water	BWA-64	Islamabad	31-03-2014	10/2014	1.5 Liter	Ghuri Town-1 Ali Akbar Plaza, Islamabad	Ghuri Town-1 Ali Akbar Plaza, Islamabad
65	Minter	BWA-65	Sahiwal	27-03-2014	07/2014	0.6 Liter	Iqbal Sweets and Bakers, Oak Pattasa Chowk, Sahiwal	Petals Foods:- 561/B VII, Police Line Road Sahiwal 040-4222882
66	Aqua Smart	BWA-66	Sahiwal	27-03-2014	12/2014	0.6 Liter	Malik Tuck Shop, Faisal Movers Bus Stand Sahiwal	Dr. Ramey Homeo Pharma Industry Faisalabad Road, 2 Km Chichawatni, Sahiwal
67	Clear	BWA-67	Sahiwal	27-03-2014	04/2015	0.6 Liter	Hasan Agro Food Hafi Industries173/A, Small Industrial Estate Sahiwal	Hasan Agro Food Hafi Industries173/A, Small Industrial Estate Sahiwal.
68	Vital Happy Life	BWA-68	Sahiwal	27-03-2014	12/2014	0.6 Liter	7-Km,Multan Road Sahiwal	Al-Mansoor Consumer Products 7-Km,Multan Road Sahiwal

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WATER QUALITY PARAMETERS AND METHODS USED FOR ANALYSIS

Sr. #	PARAMETERS	ANALYTICAL METHOD
1.	Alkalinity (mg/l as CaCO ₃)	2320, Standard method (2005) APHA
2.	Arsenic (ppb)	AAS Vario 6, Analytik Jena AG
3.	Bicarbonate	2320, Standard method (2005) APHA
4.	Calcium (mg/l)	3500-Ca-D, Standard Method (2005) APHA
5.	Carbonate (mg/l)	2320, Standard method (2005)
6.	Chloride (mg/l)	Titration (Silver Nitrate), Standard Method (2005) APHA
7.	Color (TCU)	Sensory Test
8.	Conductivity (μS/cm)	E.C meter, Hach-44600-00, USA
9.	Hardness (mg/l)	EDTA Titration, Standard Method (2005) APHA
10.	Magnesium (mg/l)	2340-C, Standard Method (2005) APHA
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 (2005) APHA
20.	Turbidity (NTU)	Turbidity Meter, Lamotte, Model 2008, USA
21.	Fluoride (mg/l)	4500-F C. ion-Selective Electrode Method Standard method (2005) APHA
22.	Iron (mg/l)	FerroVer method (HACH Cat. 21057-69)
23.	Total Coliforms (MPN/100ml)	9221-B,C&D, Standard Methods (2005) APHA
24.	E. Coli (MPN/100ml)	9221-B,C&D, Standard Methods (2005) APHA

WATER QUALITY PERMISSIBLE LIMITS FOR BOTTLED WATER

Sr. #	Parameter	Units	Permissible Limits		
			WHO	IBWA	PSQCA
1.	Alkalinity	(mg/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
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

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Sr. #	Parameter	Units	Permissible Limits		
			WHO	IBWA	PSQCA
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 Coliforms	MPN/100ml	0	0	0
24.	E-Coli	MPN/100ml	0	0	0

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 : 10 parts per billion (ppb)

Sr. No	Brand Name	Code	City of Manufacturing	Unit	Results
1.	Natural	BWA-26	Lahore	ppb	35
2.	Butt	BWA-36	Lahore	ppb	18
3.	Cool	BWA-37	Lahore	ppb	66
4.	Premier	BWA-46	Lahore	ppb	14.5
5.	Al-Sana	BWA-48	Lahore	ppb	17.5
6.	Aqua National	BWA-50	Lahore	ppb	39
7.	Nectar	BWA-56	Multan	ppb	17
8.	Fit	BWA-58	Multan	ppb	14

Potassium (Safe Limit : 10 parts per millions (ppm)

Sr. No	Brand Name	Code	City of Manufacturing	Unit	Results
1.	Standard	BWA-27	Quetta	ppm	12

pH (Safe Limit : 6.5-8.5)

Sr. No	Brand Name	Code	City of Manufacturing	Unit	Results
1.	Effort	BWA-49	Lahore	-	6.15

Sodium (Safe Limit : 50 parts per million (ppm)

Sr. No	Brand Name	Code	City of Manufacturing	Unit	Results
1.	Best water	BWA-08	Karachi	ppm	68
2.	Aqua Hygienic	BWA-28	Quetta	ppm	80
3.	Lite Aqua	BWA-57	Multan	ppm	95
4.	Aqua Smart	BWA-66	Sahiwal	ppm	105

Total Dissolved Solids: TDS (Safe Limit : 500 parts per million (ppm)

Sr. No	Brand Name	Code	City of Manufacturing	Unit	Results
1.	Aqua Smart	BWA-66	Sahiwal	ppm	529

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BACTERIOLOGICAL: (Total Coliforms & E Coli) (Safe Limit: 0/100ml)				
Sr. No	Brand Name	Code	Results	
			Total Coliforms (MPN/100ml)	E. Coli (MPN/100ml)
1.	Sea Breeze	BWA-09	01	Nil
2.	Aab-e-Kech	BWA-11	09	01
3.	Ideal Life	BWA-19	08	06
4.	Aqua Hygienic	BWA-28	02	Nil
5.	Natural Aqwah	BWA-31	02	Nil
6.	Aquatic Fresh	BWA-33	02	Nil
7.	Aftab Qarshi	BWA-52	02	Nil
8.	Minter	BWA-65	03	Nil

PCRWR TESTING: SAFE BRANDS

Sr. No	Brand Name	Code	Quality (Safe/Unsafe)	
			Chemical	Microbiological
1.	Ultra Pack	BWA-01	Safe	Safe
2.	Springley	BWA-02	Safe	Safe
3.	Bless	BWA-03	Safe	Safe
4.	Indus Water	BWA-04	Safe	Safe
5.	First Water	BWA-05	Safe	Safe
6.	Drizzling	BWA-06	Safe	Safe
7.	IQRA FINU	BWA-07	Safe	Safe
8.	Spring Fresh	BWA-10	Safe	Safe
9.	Crystal Maya	BWA-12	Safe	Safe
10.	Sunlay	BWA-13	Safe	Safe
11.	Snow Drop	BWA-14	Safe	Safe
12.	Aqua Vida	BWA-15	Safe	Safe
13.	Orion	BWA-16	Safe	Safe
14.	Al-Massafi	BWA-17	Safe	Safe
15.	Jel	BWA-18	Safe	Safe
16.	Al-Shalal	BWA-20	Safe	Safe
17.	VINA	BWA-21	Safe	Safe
18.	Rise Water	BWA-22	Safe	Safe
19.	Athar	BWA-23	Safe	Safe
20.	Aqua Save	BWA-24	Safe	Safe
21.	Isberg	BWA-25	Safe	Safe
22.	AFRA	BWA-29	Safe	Safe
23.	Legend	BWA-30	Safe	Safe
24.	Aqua Splash	BWA-32	Safe	Safe
25.	Moya Mineral Water	BWA-34	Safe	Safe
26.	Nebraska	BWA-35	Safe	Safe
27.	Kinley	BWA-38	Safe	Safe
28.	Nestle	BWA-39	Safe	Safe
29.	Doce	BWA-40	Safe	Safe
30.	Gourmet	BWA-41	Safe	Safe
31.	Aqua RO7	BWA-42	Safe	Safe

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Sr. No	Brand Name	Code	Quality (Safe/Unsafe)	
			Chemical	Microbiological
32.	Kisan Batter Life	BWA-43	Safe	Safe
33.	Jami Water	BWA-44	Safe	Safe
34.	Sufi	BWA-45	Safe	Safe
35.	Blu'in	BWA-47	Safe	Safe
36.	Higen H2O	BWA-51	Safe	Safe
37.	Mashmoom Aqua	BWA-53	Safe	Safe
38.	Aqua Anza	BWA-54	Safe	Safe
39.	Sparkle	BWA-55	Safe	Safe
40.	Murree Sparkletts	BWA-59	Safe	Safe
41.	Nectar	BWA-60	Safe	Safe
42.	Fresh Life	BWA-61	Safe	Safe
43.	Hydra	BWA-62	Safe	Safe
44.	Verbena	BWA-63	Safe	Safe
45.	Refresh Water	BWA-64	Safe	Safe
46.	Clear	BWA-67	Safe	Safe
47.	Vital Happy Life	BWA-68	Safe	Safe

PCRWR TESTING: UNSAFE BRANDS

Sr. No	Brand Name	Code	Address/ Manufacturer	Quality (Safe/Unsafe)	
				Chemical	Microbiological
1.	Best Water	BWA-08	4/33 Sector 21 Korangi Industrial Area Karachi. www. Bestwater.com	Unsafe	Safe
2.	Sea Breeze	BWA-09	Time Enterprises Saebreezewater@yahoo.com 0300-2272199.	Safe	Unsafe
3.	Aab- e- Kech	BWA-11	Kech Makran & Co. Windar Distt. Lasbela Balochistan	Safe	Unsafe
4.	Ideal Life	BWA-19	Ideal Foods International Plot # B-9/B-1 Office # 37 S-P Chamber S.I.T.E Karachi	Safe	Unsafe
5.	Natural	BWA-26	Natural Food Industries Multan Road Lahore	Unsafe	Safe
6.	Standard	BWA-27	Standard (Private) Industries Ltd. Plot 48-B Eastern Industries Quetta	Unsafe	Safe
7.	Aqua Hygienic	BWA-28	Zauhras Plot # 2 Street # 12 Faisal Town Brewery Road Quetta	Unsafe	Unsafe
8.	Natural Aqwah	BWA-31	R.G. Enterprises Plot-141-A Industrial Estate Hayat Abad Road Peshawar	Safe	Unsafe
9.	Aquatic Fresh	BWA-33	Royal Food Industries Plot-1/C Industrial Estate Jamrud Road Peshawar	Safe	Unsafe
10.	Butt	BWA-36	A Product of Azhar & Co Gulberg-III Lahore	Unsafe	Safe
11.	Cool	BWA-37	M.T Mineral Water Co. B-7 Marghzar Housing Society Lahore	Unsafe	Safe
12.	Premier	BWA-46	Zafir Industries 19-km Near High Noon Laboratories Multan Road Lahore	Unsafe	Safe
13.	Al-Sana	BWA-48	Mh foods & beverages Canal Bank Jallo Park Road Lahore Mffood786@gmail.com	Unsafe	Safe
14.	Effort	BWA-49	Effort Corporation 83-A Shadman II ,Lahore	Unsafe	Safe
15.	Aqua National	BWA-50	Milli Brother 8-km G.T Road	Unsafe	Safe

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Sr. No	Brand Name	Code	Address/ Manufacturer	Quality (Safe/Unsafe)	
				Chemical	Microbiological
			Shahdra, Lahore		
16.	Aftab Qarshi	BWA-52	Aftab Qarshi Herbal Laboratories Water Division Muzamil Town 20 Km Multan Road, Lahore	Safe	Unsafe
17.	Nectar	BWA-56	E-mail:- Necterenterprises@live.com Cell # 03006324373	Unsafe	Safe
18.	Lite Aqua	BWA-57	Lite Aqua Minerals: - D-8-1- Mehmood-abad, Multan. www.liteaqua.com	Unsafe	Safe
19.	Fit	BWA-58	Fit Purification I-D/1, Old Shujjabad Road Multan	Unsafe	Safe
20.	Minter	BWA-65	Petals Foods: - 561/B VII, Police Line Road Sahiwal. 040-4222882	Safe	Unsafe
21.	Aqua Smart	BWA-66	Dr. Ramey Homeo Pharma Industry Faisalabad Road, 2 Km Chichawatni, Sahiwal	Unsafe	Safe

MARKET CONSISTENCY IN TWO NEIGHBORING QUARTERS

Sr. No	Consistent Brands	New Brands	Unavailable Brands
1.	Ultra Pack	Indus Water	Hi-Fresh
2.	Springley	First Water	Aqua
3.	Bless	Best Water	Super Natural
4.	Drizzling	Sea Breeze	Active Pure Drinking Water
5.	IQRA FINU	Aab- e- Kech	Khush Aab
6.	Spring Fresh	Sunlay	Crystal Pure Water
7.	Crystal Maya	Snow Drop	Blu Water
8.	Aqua Vida	Athar	Safi
9.	Orion	AFRA	Himalaya Cool
10.	Al-Massafi	Legend	Crystal Clear
11.	Jel	Aqua RO7	NN Water
12.	Ideal Life	Blu'in	Vaskaro
13.	Al-Shalal	Al-Sana	Noble
14.	VINA	Aqua National	Pureza
15.	Rise Water	Higen H2O	Kalash Pure Water
16.	Aqua Save	Aftab Qarshi	Aquafina
17.	Isberg	Mashmoom Aqua	Panda
18.	Standard	Aqua Anza	Aqua 7
19.	Aqua Hygienic	Nectar (Multan)	Fine Soul
20.	Natural Aqwah	Fit	Oasis
21.	Aqua Splash	Murree Sparkletts	Healthy Water
22.	Aquatic Fresh	Fresh Life	Crystal Lite
23.	Moya Mineral Water	Refresh Water	OSLO
24.	Nebraska	Aqua Smart	Pearl
25.	Butt	Clear	Al-Habib
26.	Cool	Natural	Vey
27.	Kinley		Miracle
28.	Nestle		Zindagi
29.	Doce		Sprinkle
30.	Gourmet		Pineo
31.	Kisan Batter Life		ECO
32.	Sufi		Life

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33.	Premier		Oxigzyzer
34.	Effort		Cannon
35.	Sparkle		Aqua Blue
36.	Lite Aqua		Aqua Pure
37.	Nectar		Naimat
38.	Hydra		Bliss Water
39.	Verbena		Rahat
40.	Minter		Aqua National
41.	Vital Happy Life		Aqua Safe
42.	Jami Water		OxyWater
43.			TOTAL
44.			Classic
45.			Water Plus
46.			Venora
47.			Water Empire
48.			Deosai
49.			Valley
50.			Hayat
51.			Aab-e-Taskeen
52.			Freshly
53.			Aqua Life

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.	Potassium	Hyperkalemia

CONCLUSIONS

Sr. No	Item	Conclusion	
		No.	% age
1.	Total No. of Brands Collected	68	-
2.	Overall safe brands	47	69
3.	No. of overall unsafe brands	21	31
4.	No. of Chemically safe brands	54	79
5.	No. of Chemically unsafe brands	14	21
6.	No. of Microbiologically safe brands	60	88
7.	No. of Microbiologically unsafe brands	08	12
8.	No. of Consistent brands in Market	42	62
9.	No. of brands disappeared from market	53	78
10.	No. of new brands	26	38

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	CO ₃	Cl	Na	F	PO ₄	Fe	K	NO ₃	SO ₄	As	* Microbiological Contaminants	
																				Total Coli forms 0/100 ml	E-Coli 0/100 ml
PSQCA Bottled Water Standards	-	0.5	6.5 - 8.5	NGVS	500	100	50	NGVS	NGVS	NGVS	250	50	0.7	NGVS	0.3	10	10	250	10	-	-
Detection Limits	-	0.2	0.02	0.287	-	2	1	5	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	ppm	ppb	MPN /100ml	MPN /100ml
Ultra Pack	BWA-01	BDL	7.15	304	167	40	0	100	70	Nil	42	22	BDL	BDL	BDL	0.3	0.6	29	BDL	Nil	Nil
Springley	BWA-02	BDL	7.84	510	281	76	15	250	250	Nil	12	17	0.25	BDL	BDL	0.9	3.4	40	BDL	Nil	Nil
Bless	BWA-03	BDL	6.79	386	212	40	12	150	45	Nil	78	12	0.04	BDL	BDL	BDL	0.7	31	BDL	Nil	Nil
Indus Water	BWA-04	BDL	7.70	378	208	50	9	160	140	Nil	15	17	0.14	BDL	BDL	4.2	0.4	39	0.52	Nil	Nil
First Water	BWA-05	BDL	6.89	314	173	40	13	155	50	Nil	71	2	BDL	BDL	BDL	3.9	0.4	26	BDL	Nil	Nil
Drizzling	BWA-06	BDL	7.66	240	130	13	10	75	45	Nil	40	25	0.07	BDL	BDL	1.6	2	12	BDL	Nil	Nil
IQRA FINU	BWA-07	BDL	7.50	385	212	24	10	100	90	Nil	44	38	0.14	BDL	BDL	1.9	3.1	40	BDL	Nil	Nil
Best Water	BWA-08	BDL	6.72	495	272	20	12	100	50	Nil	106	68	0.51	BDL	BDL	2.0	4.4	21	BDL	Nil	Nil
Sea Breeze	BWA-09	BDL	7.21	360	198	40	11	145	30	Nil	73	17	0.18	BDL	BDL	1.2	0.8	30	BDL	01	Nil
Spring Fresh	BWA-10	BDL	6.87	323	178	30	11	120	80	Nil	54	25	BDL	BDL	BDL	0.7	0.6	4	0.22	Nil	Nil
Aab- e -Kech	BWA-11	BDL	7.02	90	50	4	2	20	15	Nil	6	13	BDL	BDL	BDL	0.3	1.4	16	BDL	09	01
Crystal Maya	BWA-12	BDL	6.75	425	234	24	12	110	100	Nil	66	48	0.23	BDL	BDL	0.7	0.8	8.5	0.19	Nil	Nil
Sunlay	BWA-13	BDL	7.25	427	235	24	19	140	100	Nil	42	38	0.21	BDL	BDL	1.9	3.4	30	BDL	Nil	Nil
Snow Drop	BWA-14	BDL	6.56	343	189	44	10	150	20	Nil	85	10	BDL	BDL	BDL	0.6	0.6	23	BDL	Nil	Nil
Aqua Vida	BWA-15	BDL	7.40	320	176	42	11	150	70	Nil	50	12	BDL	BDL	BDL	BDL	BDL	25	BDL	Nil	Nil
Orion	BWA-16	BDL	7.08	294	162	36	2	100	50	Nil	61	34	BDL	BDL	BDL	1.8	2.6	24	0.14	Nil	Nil
Al-Massafi	BWA-17	BDL	7.22	340	187	16	24	140	35	Nil	83	15	0.13	BDL	BDL	3.5	2.6	4	BDL	Nil	Nil
Jel	BWA-18	BDL	7.18	308	169	42	1	110	35	Nil	71	25	BDL	BDL	BDL	1.5	2.4	7	BDL	Nil	Nil
Ideal Life	BWA-19	BDL	7.02	198	109	8	9	50	40	Nil	28	25	0.07	BDL	BDL	0.6	1.2	14	BDL	08	06
Al-Shalal	BWA-20	BDL	7.78	427	235	50	21	210	240	Nil	7	16	BDL	BDL	BDL	3.7	0.1	25	9.58	Nil	Nil
VINA	BWA-21	BDL	6.98	302	166	40	12	150	40	Nil	58	11	BDL	BDL	BDL	BDL	0.9	37	0.62	Nil	Nil

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Rise Water	BWA-22	BDL	7.50	320	176	40	12	150	140	Nil	19	17	0.21	BDL	BDL	1.8	BDL	33	1.96	Nil	Nil
Athar	BWA-23	BDL	7.90	456	251	40	22	190	230	Nil	07	36	0.41	BDL	BDL	4.0	0.7	54	0.53	Nil	Nil
Aqua Save	BWA-24	BDL	6.86	314	173	40	12	150	20	Nil	71	5	0.04	BDL	BDL	BDL	1.1	24	0.54	Nil	Nil
Isberg	BWA-25	BDL	7.48	294	162	40	10	140	50	Nil	40	5	0.06	BDL	BDL	2.1	BDL	54	6.75	Nil	Nil
Natural	BWA-26	BDL	7.95	492	271	40	22	190	200	Nil	21	38	0.41	BDL	BDL	2.4	0.2	38	35	Nil	Nil
Standard	BWA-27	BDL	7.48	307	169	36	10	130	30	Nil	52	8	0.40	BDL	BDL	12	0.5	42	0.52	Nil	Nil
Aqua Hygienic	BWA-28	BDL	8.14	544	299	40	5	120	110	Nil	80	80	0.21	BDL	BDL	0.6	1.1	41	1.10	02	Nil
AFRA	BWA-29	BDL	7.59	441	243	28	10	140	70	Nil	68	46	0.05	BDL	BDL	2.7	0.4	59	1.25	Nil	Nil
Legend	BWA-30	BDL	7.41	398	219	44	17	140	40	Nil	85	50	0.09	BDL	BDL	1.3	3.9	15	2.12	Nil	Nil
Natural Aqwah	BWA-31	BDL	7.92	465	256	40	22	200	170	Nil	13	15	0.05	BDL	BDL	1.4	0.7	49	0.99	02	Nil
Aqua Splash	BWA-32	BDL	6.99	354	195	50	10	140	50	Nil	75	9	0.34	BDL	BDL	0.4	3.8	5	0.23	Nil	Nil
Aquatic Fresh	BWA-33	BDL	7.73	557	306	36	35	270	160	Nil	50	14	BDL	BDL	BDL	1.8	8.5	28	0.43	02	Nil
Moya Mineral Water	BWA-34	BDL	7.00	240	132	56	10	130	40	Nil	38	3	0.04	BDL	BDL	0.3	1.7	35	0.54	Nil	Nil
Nebraska	BWA-35	BDL	7.26	380	209	40	10	180	45	Nil	85	8	BDL	BDL	BDL	BDL	0.5	35	BDL	Nil	Nil
Butt	BWA-36	BDL	7.28	414	228	56	10	140	70	Nil	83	17	0.13	BDL	BDL	2.1	0.5	11	18	Nil	Nil
Cool	BWA-37	BDL	7.95	521	287	60	15	200	240	Nil	24	34	0.21	BDL	BDL	4.1	0.2	10	66	Nil	Nil
Kinley	BWA-38	BDL	7.20	479	263	48	12	200	30	Nil	118	26	0.06	BDL	BDL	2.5	1	17	0.22	Nil	Nil
Nestle	BWA-39	BDL	7.60	352	194	40	10	160	30	Nil	97	8	0.04	BDL	BDL	BDL	0.4	10	4.11	Nil	Nil
Doce	BWA-40	BDL	6.68	321	177	40	12	150	40	Nil	61	14	0.18	BDL	BDL	BDL	0.3	31	0.78	Nil	Nil
Gourmet	BWA-41	BDL	6.75	360	198	60	12	150	40	Nil	78	14	0.21	BDL	BDL	BDL	0.1	34	0.49	Nil	Nil
Aqua RO7	BWA-42	BDL	6.92	516	284	60	22	240	50	Nil	120	13	BDL	BDL	BDL	BDL	1.6	29	6.61	Nil	Nil
Kisan Better Life	BWA-43	BDL	7.40	407	224	40	10	160	40	Nil	78	17	0.23	BDL	BDL	0.7	0.2	56	BDL	Nil	Nil
Jami Water	BWA-44	BDL	7.14	353	194	40	12	150	70	Nil	52	28	BDL	BDL	BDL	BDL	2	22	BDL	Nil	Nil
Sufi	BWA-45	BDL	7.51	363	200	40	12	150	45	Nil	60	8	BDL	BDL	BDL	BDL	0.15	41	BDL	Nil	Nil
Premier	BWA-46	BDL	7.50	571	314	32	24	180	195	Nil	38	40	0.08	BDL	BDL	2.2	0.3	28	14.5	Nil	Nil
Blu'in	BWA-47	BDL	7.42	331	182	40	10	140	80	Nil	42	50	0.15	BDL	BDL	1.1	0.2	38	6.35	Nil	Nil
Al-Sana	BWA-48	BDL	7.70	685	377	60	32	280	300	Nil	6	25	0.16	BDL	BDL	4.8	2.7	51	17.52	Nil	Nil
Effort	BWA-49	BDL	6.15	240	132	32	15	140	50	Nil	60	BDL	BDL	BDL	BDL	0.2	0.6	8	0.78	Nil	Nil
Aqua National	BWA-50	BDL	7.78	265	146	40	10	140	120	Nil	07	6	0.14	BDL	BDL	1.5	0.8	20	39	Nil	Nil

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Higen H₂O	BWA-51	BDL	6.88	370	204	40	11	145	50	Nil	78	18	0.24	BDL	BDL	BDL	1	19	0.5	Nil	Nil
Aftab Qarshi	BWA-52	BDL	7.35	386	212	40	11	145	30	Nil	78	6	0.04	BDL	BDL	BDL	0.2	5	7	02	Nil
Mashmoom Aqua	BWA-53	BDL	7.64	435	239	60	22	240	210	Nil	12	13	BDL	BDL	BDL	1.0	2.6	33	0.70	Nil	Nil
Aqua Anza	BWA-54	BDL	7.48	435	239	40	15	160	160	Nil	35	50	0.23	BDL	BDL	2.5	0.08	47	1	Nil	Nil
Sparkle	BWA-55	BDL	7.10	345	190	40	10	140	50	Nil	71	20	0.09	BDL	BDL	0.3	BDL	18	0.4	Nil	Nil
Nectar	BWA-56	BDL	7.60	438	241	40	12	150	120	Nil	30	27	0.15	BDL	BDL	1.2	0.4	64	17	Nil	Nil
Lite Aqua	BWA-57	BDL	7.42	873	480	88	19	300	340	Nil	11	95	0.24	BDL	BDL	5	0.2	149	6.16	Nil	Nil
Fit	BWA -58	BDL	7.66	305	168	32	12	130	100	Nil	14	14	0.09	BDL	BDL	2	0.2	47	14	Nil	Nil
Murree Sparkletts	BWA -59	BDL	7.70	378	208	60	12	200	180	Nil	12	15	0.34	BDL	BDL	2.2	2.7	21	0.28	Nil	Nil
Nectar	BWA -60	BDL	7.29	403	222	72	02	190	150	Nil	24	17	0.04	BDL	BDL	1.8	5.6	31	BDL	Nil	Nil
Fresh Life	BWA -61	BDL	7.28	297	163	46	06	140	110	Nil	14	8	0.40	BDL	BDL	1.2	1.6	30	BDL	Nil	Nil
Hydra	BWA-62	BDL	7.40	297	163	52	05	150	140	Nil	12	20	0.36	BDL	BDL	2.5	2	20	BDL	Nil	Nil
Verbena	BWA-63	BDL	6.61	395	217	48	24	220	70	Nil	76	12	0.04	BDL	BDL	1.2	1	50	BDL	Nil	Nil
Refresh Water	BWA-64	BDL	7.40	298	164	44	15	170	120	Nil	13	11	0.26	BDL	BDL	2.7	1.7	35	BDL	Nil	Nil
Minter	BWA-65	BDL	7.40	276	152	40	02	110	50	Nil	50	12	0.48	BDL	BDL	2	BDL	23	6.90	03	Nil
Aqua Smart	BWA-66	BDL	7.98	961	529	50	12	175	200	Nil	90	105	0.21	BDL	BDL	8	BDL	50	2.97	Nil	Nil
Clear	BWA-67	BDL	7.12	375	206	40	15	160	25	Nil	78	16	0.20	BDL	BDL	6	BDL	50	BDL	Nil	Nil
Vital Happy Life	BWA-68	BDL	6.99	305	168	36	12	140	30	Nil	66	10	0.11	BDL	BDL	1.7	BDL	27	BDL	Nil	Nil

NGVS =No Guideline Value Set

BDL = Below Detection Limits

* Microbiological results have also been verified by IDEXX (Quanti-Tray/2000 USA) and Membrane Filtration (CFU/100ml, 9222-B&D APHA) Methods.