

## Appendix 1: Water quality table

Below table shows water quality the last 5 years from different checking points.

Location	data	2007	2008	2009	2011	2012	Maximum concentration limitation for fisheries management
Petroleum station Balykchy city	pH	8.67	9.2	8.45	8.39	8.56	6.5-8.5
	Biochemical oxygen demand 5	1.66	2.13	2.12	0.83		3.00
	Dissolved oxygen	8.17	9.02	8.54	8.11		Not less than 6.0
	Ammonium nitrogen	<0.05	<0.05	<0.05	<0.039	<0.039	0.39
	Nitrite	<0.01			<0.01	<0.01	0.024
	Nitrate	0.05	7.6	8.2	<0.1	0.50	9.0
	Phosphorus P 5	<0.005			<0.02		
	Ferrum Fe		0.345	1.05	<0.05		
	Calcium Ca		106.8	100.6			
	Magnesium Mg		341.5	333.1			
	Natrium Na		1807.9	1630.3			
	Calium K		92.5	75.8			
	Cuprum Cu				<0.0006	<0.0006	0.001
	Zinetum Zn				<0.0005	<0.0005	0.01
	Chrome Cr		<0.007	<0.007	<0.02		
	Marganese Mn		0.006	0.008			
	Cadmium Cd				<0.0002	<0.0002	0.005
	Lead Pb				<0.0002	<0.0002	0.006
	Nickel Ni				<0.01		
	Chloride				1829		300
	Sulfate				973		100
	synthetic surface-active substance	0.02			<0.01	<0.01	0.10
	Petroleum products	<0.02			0.05	<0.05	0.05
Shiprepairing Plant, Balykchy city	pH	8.67	9.1	8.54	8.42	8.56	6.5-8.5

	Biochemical oxygen demand 5	0.57	1.85	1.69	0.32		3.00
	Dissolved oxygen	8.04	8.54	8.47	9.10		Not less than 6.0
	Ammonium nitrogen	1.02	0.2	0.2	0.20	<0.039	0.39
	Nitrite	0.032			0.01	<0.01	0.024
	Nitrate	0.48	8.8	8.8	0.90	0.60	9.0
	P	0.006					
	Fe		0.054	0.184	<0.05		
	Cd		105.9	105.9			
	Mg		340.9	329.6			
	Na		1847	1640			
	K		85.6	76.9			
	Cu				<0.0006	<0.0006	0.001
	Zn				<0.0005	<0.0005	0.01
	Cr		<0.007	<0.007	<0.02		
	Mn		<0.003	<0.003			
	Cd				<0.0002	<0.0002	0.005
	Pb				<0.0002	<0.0002	0.006
	Ni				<0.01		
	Chloride				1772		300
	Sulfate				985		100
	synthetic surface-active substance	<0.02			<0.01	<0.01	0.10
	Petroleum products	<0.02			0.07	<0.05	0.05
Yacht Club "Cruise" Cholpon-Ata City (North)	pH	8.55	9.2	8.5	8.37	8.53	6.5-8.5
	Biochemical oxygen demand 5	0.67	2.41	2.65	0.79		3.00
	Растворенный кислород	9.26	9.28	9.69	7.60		Not less than 6.0
	Ammonium nitrogen	<0.05	<0.05	<0.05	<0.039	<0.039	0.39
	Nitrite	<0.01			<0.01	<0.01	0.024
	Nitrate	<0.08	7.7	1.5	<0.1	0.70	9.0
	P	<0.005					
	Fe		<0.006	<0.006	<0.05		
	Ca		111.7	111.7			

	Mg		414.8	414.8			
	Na		2324.9	1516.7			
	K		105.8	105.8			
	Cu				<0.0006	<0.0006	0.001
	Zn				<0.0005	<0.0005	0.01
	Cr		<0.007	<0.007	<0.02		
	Mn		<0.003	<0.003			
	Cd				<0.0002	<0.0002	0.005
	Pb				<0.0002	<0.0002	0.006
	Ni				<0.01		
	Chloride		1629	1495	1574		300
	Sulfate		1987.8	1911	1181		100
	synthetic surface-active substance	<0.02			<0.01	<0.01	0.10
	Petroleum products	<0.02			0.06	0.11	0.05
Plant “Ulan” Karakol city (North)	pH	8.5	9.0	8.7	8.39		6.5-8.5
	Biochemical oxygen demand 5	0.99	2.47	3.2	0.22		3.00
	Dissolved oxygen	7.17	9.29	10.12	7.78		Not less than 6.0
	Ammonium nitrogen	<0.05	0.06	0.05	<0.039		0.39
	Nitrite	<0.01			<0.01		0.024
	Nitrate	0.05	8.4	0.5	<0.1		9.0
	P	<0.005					
	Fe		0.594	0.032	<0.05		
	Ca		110.5	121.3			
	Mg		407.5	345.6			
	Na		2366.9	1784			
	K			85.6			
	Cu				<0.0006		0.001
	Zn				<0.0005		0.01
	Cr		<0.007	<0.007	<0.02		
	Mn		0.005	0.008			
	Ca				<0.0002		0.005
	Pb				<0.0002		0.006
	Ni				<0.01		
	Chloride		1553	1456.2	1489		300
	Sulfate		1926.8	1884.7	1164		100
	synthetic surface-active substance	0.02			<0.01		0.10
	Petroleum	<0.02			<0.04		0.05

	products						
Kagy-Sai village Beach resort "Salim" (South)	pH		9.0	8.41	8.25	8.49	6.5-8.5
	Biochemical oxygen demand 5		2.20	1.00	0.69		3.00
	Dissolved oxygen		9.43	7.54	9.30		Not less than 6.0
	Ammonium nitrogen		<0.05	<0.05	<0.039	<0.039	0.39
	Nitrite				<0.01	<0.01	0.024
	Nitrate		3.2	1.5	<0.1	0.60	9.0
	P						
	Fe		0.087	0.01	<0.05		
	Ca		113.7	121			
	Mg		317.5	308.2			
	Na		1745.9	1475.5			
	K		78.0	72.6			
	Cu				<0.0006	<0.0006	0.001
	Zn				<0.0005	<0.0005	0.01
	Cr		<0.007	<0.007	<0.02		
	Mn		0.003	<0.003			
	Cd				<0.0002	<0.0002	0.005
	Pb				<0.0002	<0.0002	0.006
	Ni				<0.01		
	Chloride		1577	1394	1616		300
	Sulfate		1973.1	1797	950		100
	synthetic surface-active substance				<0.01	<0.01	0.10
	Petroleum products				<0.04	<0.05	0.05
Tong Beach (South)	pH	8.61	9.0	8.63	8.36		6.5-8.5
	Biochemical oxygen demand 5	0.77	2.66	1.1	0.67		3.00
	Dissolved oxygen	8.25	9.54	8.04	8.61		Not less than 6.0
	Ammonium nitrogen	<0.05	<0.05	<0.05	0.039		0.39
	Nitrite	<0.01			<0.01		0.024
	Nitrate	0.04	6.0	1.5	<0.1		9.0
	P	0.018					
	Fe		0.086	0.087	<0.05		
	Ca		100.7	112			
	Mg		211.0	212.3			
	Na		1153.9	1113.5			
	K		50.1	54.6			

	Cu				<0.0006		0.001
	Zn				<0.0005		0.01
	Cr		<0.007	<0.007	<0.02		
	Mn		0.005	0.008			
	Cd				<0.0002		0.005
	Pb				<0.0002		0.006
	Ni				<0.01		
	Chloride		1053	1000.8	1560		300
	Sulfate		1336.6	1342.3	985		100
	synthetic surface-active substance	0.02			<0.01		0.10
	Petroleum products	<0.02			<0.04		0.05

Note:

The high content of sulphate and chloride is natural characteristics of Issyk-Kul Lake. Lake water sampled from the South of Issyk-Kul Lake, less mineralized than the water along the North coast. Sodium (Na), potassium (kalium K), magnesium (Mg), chlorides and sulfates (major macro-components) in the northern shore waters of the lake are on average two times higher than in the south coast waters. The ratio of anions and cations (% equivalent), i.e. internal chemicals in water, selected from different points is almost the same. The difference of salt (mg / L) in the water is probably because of the heavy river water flow from the South. The rivers which flow to the lake is classified as a calcium sulphate-carbonate.

High content of iron is probably associated with the iron cations in rivers.