LAKEHAVEN WATER & SEWER DISTRICT - 2016 REPORT - INORGANIC CHEMICAL (IOC) ANALYSIS

(RAW)= Natural Untreated Water Sample
(TE)= Treated Effluent Water Sample

LUD / DEPARTMENT OF HEALTH (DOH) WELL SOURCE NUMBER

EPA REGULATED PRIMARY INORGANIC CHEMICALS	MCL mg/L	SRL mg/L	(TE) Well 7 S04	(TE) Well 9 S07	(TE) Well 10 S09	(TE) Well 10A S10	(RAW) Well 10C S30	(RAW) Well 15 S12	(RAW) Well 15A S13	(RAW) Well 16 S14	(TE) Well 17 S15	(TE) Well 17A S16	(TE) Well 17B S31	(TE) Well 18 S17	(TE) Well 19 S25	(TE) Well 19A S26	(TE) Well 20 S18	(TE) Well 20A S19	(TE) Well 21 S20	(RAW) Well 22 S21	(RAW) Well 22A S22	(TE) Well 22B S34	(TE) Well 23 S23	(TE) Well 23A S24	(TE) Well 25 S29	(TE) Well 29 S35	(TE) Well 33 S36	(TE) TACOMA SSP S33	AVERAGE	FLOW WEIGHTED AVERAGE
ARSENIC	0.01	0.0014	0.0047	0.003	0.0021	0.002	ND	ND	ND	0.003	0.007	0.007	0.007	0.0016	0.0017	0.0017	0.0017	0.0017	0.004	<0.01	ND	ND	0.0025	0.0025	<0.0014	ND	ND	ND	0.00	0.00
BARIUM (Phase II)	2.0	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	0.00
CADMIUM (Phase II)	0.005	0.001	0.0014	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	0.00
CHROMIUM (Phase II)	0.1	0.007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	0.00
MERCURY (Phase II)	0.002	0.000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	0.00
SELENIUM (Phase II)	0.05	0.002	0.0023	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	0.00
BERYLLIUM (Phase V)	0.004	0.000	0.00144	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	0.00
ANTIMONY (Phase V)	0.006	0.003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	0.00
THALLIUM (Phase V)	0.002	0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	0.00
CYANIDE (Phase V)	0.2	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	0.00
FLUORIDE	4.0	0.5	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	0.3	0.3	ND	ND	ND	ND	0.2	0.2	ND	ND	ND	ND	ND	0.65	0.06	0.48
NITRITE as N (Phase II)	1.0	0.1	ND	ND	13	0.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.5	0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.56	0.35
NITRATE as N (Phase II)	10.0	0.5	ND	ND	ND	ND	ND	ND	ND	2.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.2	ND	ND	ND	0.18	0.02
TOTAL NITRATE & NITRITE	10.0	0.5	ND	ND	1.3	0.6	ND	ND	ND	2.4	ND	ND	ND	ND	ND	ND	0.5	0.5	ND	ND	ND	ND	ND	ND	2.2	ND	ND	ND	0.29	0.14

LUD / DEPARTMENT OF HEALTH (DOH) WELL SOURCE NUMBER

EPA REGULATED SECONDARY INORGANIC CHEMICALS	MCL mg/L	SRL mg/L	Well 7 S04	Well 9 S07	Well 10 S09	Well 10A S10	Well 10C S30	Well 15 S12	Well 15A S13	Well 16 S14	Well 17 S15	Well 17A S16	Well 17B S31	Well 18 S17	Well 19 S25	Well 19A S26	Well 20 S18	Well 20A S19	Well 21 S20	Well 22 S21	Well 22A S22	Well 22B S34	Well 23 S23	Well 23A S24	Well 25 S29	Well 29 S35	Well 33 S36	TACOMA SSP S33	AVERAGE	FLOW WEIGHTED AVERAGE
IRON	0.3	0.1	ND	ND	ND	0.12	ND	ND	ND	0.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.21	0.16	ND	ND	ND	ND	ND	ND	ND	0.02	0.01
MANGANESE	0.05	0.01	0.049	ND	ND	0.064	0.078	0.025	ND	ND	ND	ND	ND	0.073	ND	ND	ND	ND	ND	0.087	ND	ND	ND	ND	ND	0.037	ND	ND	0.02	0.01
SILVER	0.1	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	0.00
CHLORIDE	250	20	ND	4	ND	ND	2	4	ND	7	ND	ND	ND	ND	ND	ND	ND	ND	5	2	4	4	ND	ND	ND	ND	7	ND	1.50	0.11
SULFATE	250	50	ND	3	ND	ND		10	ND	7	ND	ND	ND	ND	ND	ND	ND	ND	14	2	5	3	ND	ND	ND	ND	17	ND	2.44	0.10
ZINC	5.0	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	0.00

LUD / DEPARTMENT OF HEALTH (DOH) WELL SOURCE NUMBER

STATE REGULATED INORGANIC CHEMICALS	MCL mg/L	SRL mg/L	Well 7 S04	Well 9 S07	Well 10 S09	Well 10A S10	Well 10C S30	Well 15 S12	Well 15A S13	Well 16 S14	Well 17 S15	Well 17A S16	Well 17B S31	Well 18 S17	Well 19 S25	Well 19A S26	Well 20 S18	Well 20A S19	Well 21 S20	Well 22 S21	Well 22A S22	Well 22B S34	Well 23 S23	Well 23A S24	Well 25 S29	Well 29 S35	Well 33 S36	TACOMA SSP S33	AVERAGE	FLOW WEIGHTED AVERAGE
SODIUM	20 (1)	5	7.6	6	12	5.6	6	7	22	8	7.9	7.9	7.9	21	17	17	7.5	7.5	7	6	6	7	7.5	7.5	8	7.1	7	9.9	9.27	9.31
HARDNESS (mg/l as CaCO3)	NR	10	150	67	110	26	71	91	88	92	77	77	77	100	99	99	120	120	87	57	60	58	120	120	130	66	105	15	87.77	31.67
CONDUCTIVITY umhos/cm	700	70	300	107	260	78	154	195	240	217	160	160	160	270	260	260	270	270	167	142	112	87	260	260	280	150	204	110	197.42	128.44
TURBIDITY	1 NTU (2)	0.1	0.26	0.4	0.12	0.89	0.5	0.3	0.59	0.3	0.34	0.34	0.34	0.26	0.11	0.11	0.2	0.2	0.2	0.5	1.2	ND	0.17	0.17	1.3	1.2	ND	0.79	0.42	0.70
COLOR	15 CU (3)	15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	0.00
TOTAL DISSOLVED SOLIDS (TDS)	500	100	170	114.9	150	62	92.4	117	160	130.2	140	140	140	180	170	170	160	160	109	85.2	96	110	170	170	160	100	161	ND	131.45	32.50
NICKEL (Phase V)	0.1	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00	0.00

LUD / DEPARTMENT OF HEALTH (DOH) WELL SOURCE NUMBER

OTHER PHYSICAL & CHEMICAL PARAMETERS	MCL mg/L	SRL mg/L	Well 7 S04	Well 9 S07	Well 10 S09	Well 10A S10	Well 10C S30	Well 15 S12	Well 15A S13	Well 16 S14	Well 17 S15	Well 17A S16	Well 17B S31	Well 18 S17	Well 19 S25	Well 19A S26	Well 20 S18	Well 20A S19	Well 21 S20	Well 22 S21	Well 22A S22	Well 22B S34	Well 23 S23	Well 23A S24	Well 25 S29	Well 29 S35	Well 33 S36	TACOMA SSP S33	AVERAGE	FLOW WEIGHTED AVERAGE
SILICA	NR	1	26	37	15	16	NA	NA	26	NA	21	21	21	NA	NA	NA	27	27	NA	NA	NA	46	NA	NA	NA	NA	31	15	12.65	15.04
ALKALINITY (mg/l as CaCO3)	NR	10	120	80	96	NA	78	73	88	85	80	80	80	NA	NA	NA	96	96	71	65	64	61	NA	NA	NA	NA	92	22.1	54.89	26.79
pH	NR	NR	7.5	7.4	7.2	7.5	8.5	6.64	7.5	7.3	8	8	8	7.3	7.2	7.2	7.3	7.3	7.6	8.03	7.73	7.8	7.5	7.5	7.4	7.9	7.24	8	7.56	7.86
TEMPERATURE (Celsius)	NR	NR	10	14	12	12		12	10.9	14	11	11	11	13	12	12	12	12	9.4	11.3	10.7	12	11	11	12	11	10.5	8.2	11.42	9.17
CALCIUM	NR	0.5	34	44	20	7	19	32	17	24	18	18	18	NA	NA	NA	22	22	28	15	15	38	NA	NA	NA	NA	22	4.7	16.07	6.78
TOTAL ORGANIC CARBON	NR	0.5	0.46	1	3.9	1.2		0.6	0.5		1.8	1.8	1.8	<0.5	0.55	0.55	3.3	3.3	0.6	0.6	0.2	0.7	<0.5	<0.5	<0.5	0.58	ND	NA	0.98	0.41
MAGNESIUM	NR	0.01	15	5.6	15	2.1	6	3	11	8	7.9	7.9	7.9	NA	NA	NA	17	17	1	5	6	4.9	NA	NA	NA	NA	13.8	0.81	5.96	2.35
CORROSIVITY (LSI)	NR	NR	-1.10	-1.13	-1.66	NA	-0.76	-2.13	-1.5043833	-1.48	-1.00892	-1.00892	-1.0089219	NA	NA	NA	-1.53	-1.53	-1.29228	-1.1098	-1.43822	-0.96	NA	NA	NA	NA	-1.64354	NA	-0.86	-0.17
DATE OF SAMPLE COLLECTION			8/14	8/09	5/14	7/14	4/01	4/03	6/16	8/13	9/16	9/16	9/16	8/13	8/13	8/13	5/14	5/14	3/09	3/04	8/09	8/09	8/13	8/13	8/13	8/13	7/12	4/15		

LUD / DEPARTMENT OF HEALTH (DOH) WELL SOURCE NUMBER

WELL INFORMATION	Well 7 S04	Well 9 S07	Well 10 S09	Well 10A S10	Well 10C S30	Well 15 S12	Well 15A S13	Well 16 S14	Well 17 S15	Well 17A S16	Well 17B S31	Well 18 S17	Well 19 S25	Well 19A S26	Well 20 S18	Well 20A S19	Well 21 S20	Well 22 S21	Well 22A S22	Well 22B S34	Well 23 S23	Well 23A S24	Well 25 S29	Well 29 S35	Well 33 S36	TACOMA SSP S33		
AQUIFER	RMC	EUA	RMC	RMC	EUA	RMC	RMC	EUA	RMC	RMC	DEEP	RMC	DEEP	RMC	MLA	RMC	RMC	EUA	EUA	EUA	MLA	RMC	MLA	EUA	DEEP	Green River		
SURFACE TO TOP OF WELL SCREEN (FEET)	205	357	191	170	401	50	88	138	136	151	823	140	762	114	309	190	93	261	192	268	451	145	350	595	833			
SURFACE TO STATIC WATER LEVEL (FEET)	164	279.4	28	30	285	23	15	119	73	73	245	113	226	60	186	117	21	77	77	77	154	85	288	399	307		TOTAL	
WELL PUMP RATE (GPM)	150	220	2,000	2,600	400	1,300	1250	260	700	700	2000	680	1075	1700	2,200	1,200	1000	275	100	275	1,500	1,000	1750	295	300	4200	29,130	GPM
% CONTRIBUTION TO THE DISTRIBUTION SYS.	0.0%	0.0%	2%	10%	0%	0%	1%	1%	0%	0%	2%	0%	0%	0%	4%	1%	0%	0%	0%	1%	3%	2%	0%	0%	0%	73%	100%	

SRL = State Reporting Level - The minimum reporting level required by the Washington Department of Health (DOH)
mg/L = milligrams per litter - consider same as Parts Per Million (ppm) MCL = Maximum Contaminant Level
(1) RECOMMENDED PER AMERICAN HEART ASSOCIATION - NO EPA MCL
(2) NTU = NEPHELOMETRIC TURBIDITY UNIT 0.1 = GOAL, <1.0 = STANDARD, >5.0 NTU = FILTRATION
(3) CU = COLOR UNITS
ND = Not Detected - The compound was analyzed and not detected at a level greater than or equal to the SRL
NR = Not Regulated
NA = Not Analyzed

Color Code Legend

0.00 = "On-Line" source in 2016 but no full IOC analysis was required by DOH.
0.00 = "On-Line" source in 2016 with new full IOC analysis.
0.00 = "Off-Line" source in 2016
0.00 = A (TE) sample was analyzed in 2016 just for this analyte.