Effects of Gladstone Treatment at A72

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CAG Meeting

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Comparison of Zinc Data at A72, Three Time Periods

- 1999-2003, Sunnyside treated all of Cement Creek in low flow and treated AT year-round (600 gpm). Bulkhead 1 in place. Almost no flow from GK and R&B.
- 2010-2014, no treatment at Gladstone.
- 2017-2021, Treatment of GK at Gladstone.

85th Percentile of Dissolved Zinc (ug/l) at A72

		Nov.1 - Mar. 15	Mar. 16 - May 15	May 16 - July 15	July 16 - Oct. 31
		Base Flow	Early Runoff	Peak Runoff	Post Runoff/ Monsoon
	85th dZn 2010 - 2014	893	835	288	566
	85th dZn 1999 - 2003	618	726	284	444
	% of 85th of 2010-2014	-30.8%	-13.0%	-1.3%	-21.5%
	85th dZn 2017-2021	761	745	260	499
	% of 85th of 2010-2014	-14.8%	-10.8%	-9.6%	-11.9%

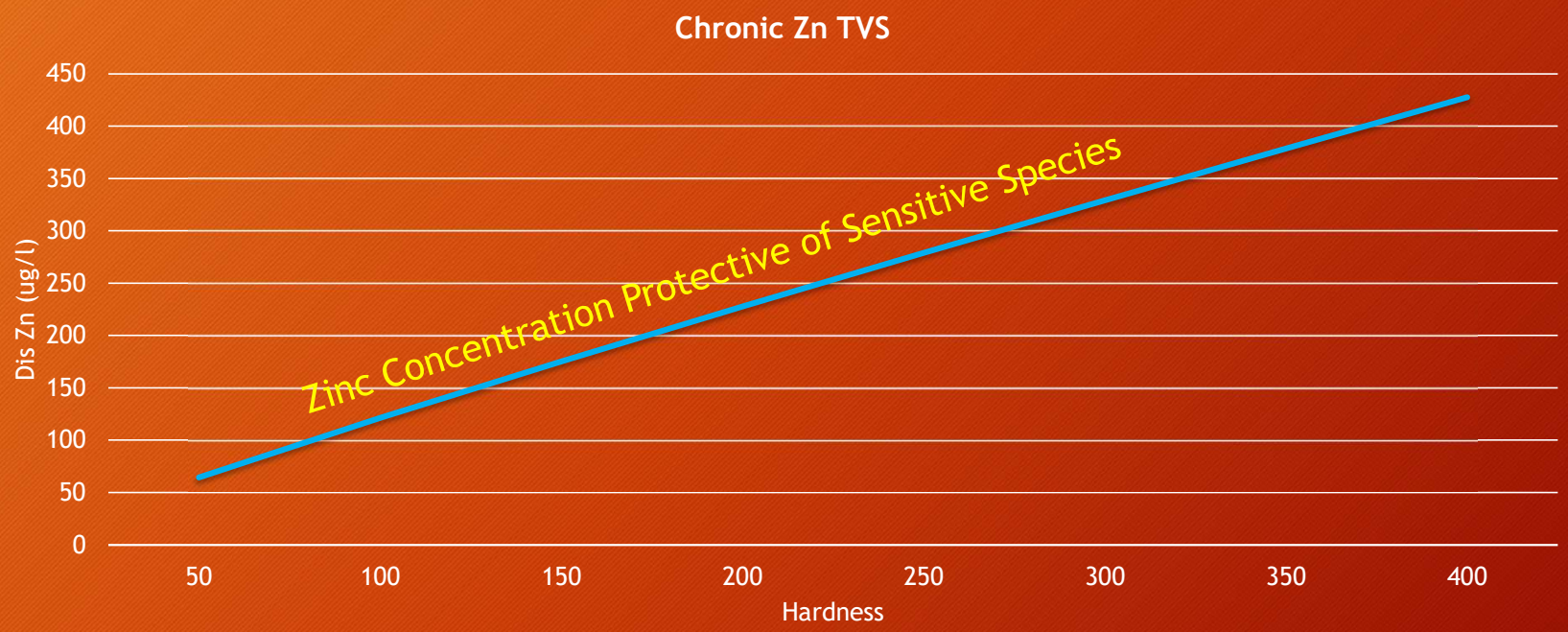
50th Percentile of Total Iron (ug/l) at A72

		Nov.1 - Mar. 15	Mar. 16 - May 15	May 16 - July 15	July 16 - Oct. 31	
		Base Flow	Early Runoff	Peak Runoff	Post Runoff/ Monsoon	
	50th Tot Iron 2010 - 2014	5386	4288	1446	2543	
	50th Tot Iron 1999 - 2003	3730	3019	1442	2215	
	% of 50th of 2010-2014	-30.7%	-29.6%	-0.2%	-12.9%	
	50th Tot Iron 2017-2021	5527	4016	869	2599	
	% of 50th of 2010-2014	2.6%	-6.4%	-39.9%	2.2%	

50th Percentile of Total Al (ug/l) at A72

		Nov.1 - Mar. 15	Mar. 16 - May 15	May 16 - July 15	July 16 - Oct. 31
		Base Flow	Early Runoff	Peak Runoff	Post Runoff/ Monsoon
	50th Tot Al 2010 - 2014	3262	2087	949	1410
Not much data	50th Tot Al 1999 - 2003	2635	1776	671	1423
	% of 50th of 2010-2014	-19.2%	-14.9%	-29.3%	1.0%
	50th Tot Al 2017-2021	2931	2058	763	1757
	% of 50th of 2010-2014	-10.1%	-1.4%	-19.6%	24.6%

Hardness vs Chronic Zn TVS



Average Hardness at A72

	Nov.1 - Mar. 15	Mar. 16 - May 15	May 16 - July 15	July 16 - Oct. 31
	Base Flow	Early Runoff	Peak Runoff	Post Runoff/ Monsoon
Ave. Hardness 2010 - 2014	284	160	89	178
Ave. Hardness 1999 - 2003	280	194	85	176
% of Ave of 2010-2014	-1.5%	21.5%	-4.9%	-1.2%
Ave. Hardness 2017 - 2021	335	210	94	246
% of Ave of 2010-2014	17.9%	31.7%	5.4%	38.1%

Sunnyside used quicklime (CaO) and had a slaker to hydrate.
EPA uses hydrated lime (CaO2).

Affect of Hardness

	Percent reductions of Zinc needed to meet TVS at A72			
	Base flow Flow	Early runoff Runoff	Peak runoff Runoff	Post Runoff/monsoon
Using Current Hardness	52%	68%	56%	45%
Using 2010 - 2014 Hardness	59%	75%	58%	59%

Takeaways

- Treatment at Gladstone makes a difference during lower flows.
- Treatment might reduce iron and aluminum more than initially thought.
- Hardness is a factor to pay attention to.