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# Frac Water Treatment

Oil & Gas Client

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## BACKGROUND

ClearBakk was approached by an Oil & Gas disposal services company to help treat their produced and fracking water that they received from multiple producers to a level that would extend the life of their deep disposal wells.



After ClearBakk received the water analysis and a sample of the harshest waste stream the client receives we completed bench testing and FEED engineering to design a water treatment system that could handle multiple waste streams and adequate for high spikes in various constituents.

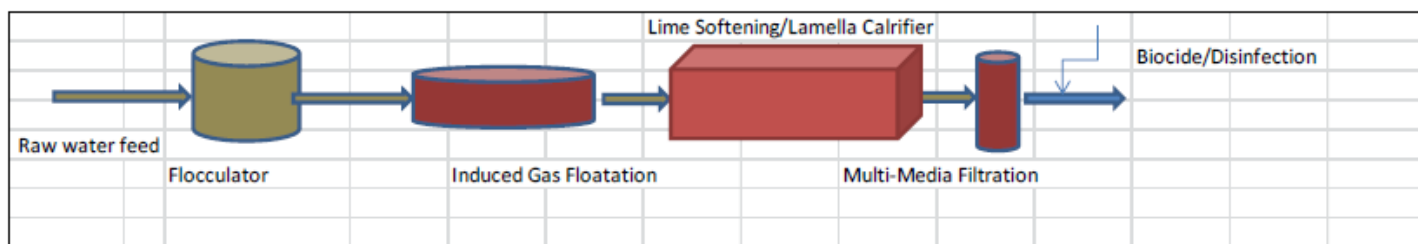


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## CHALLENGE

The produced and frac water received contains high suspended solids, high iron content, and high Total Organic Carbon (TOC). All these constituents potentially affect the injection disposal well by clogging it and increasing the bacteria formation which will impact disposal cost and affect the life span of the injection wells.



Following treatment, constituents exceeded water quality targets for reuse or disposal for frac needs. This is outlined below.

Other heavy metals were also reduced to non-detectable levels in the effluent of the treatment systems. This is outlined below.

Constituent (Average)	unit	Reported	Frac Reuse Targets (Slick Water)	CWS Reported Results
Total Dissolved Solids (TDS)	PPM	148,500	200,000 (TYP. N/R)	135,000
Total Suspended Solids (TSS)	PPM	750	150 (TYP. <50)	6
Hardness (as CaCO3)	PPM	5,000	3,000 (TYP. <50)	130
Total Iron	PPM	50	NA (TYP. <50)	<0.1
Total Organic Carbon (TOC)	PPM	6,500	NA	<10



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## SUMMARY

Water stream characteristics from each site:

- Up to 15% TDS with the majority of ions as monovalent ions.
- Moderate to high TOC, Hardness, Iron, TSS and O&G
- Water Temperature between 25-40°C.
- TDS reduction is not a requirement as chemical additives for reuse is adjusted to fit in high salinity to reuse the produced water in Frac Water applications

## TREATMENT ACHIEVED

CWS met or exceeded quality guidelines provided by the client for re-using produced water and multiple disposal streams in Frac water application.

Parameter	Influent	DAF Outlet	Final Effluent
Barium, mg/L	203	12.4	0.11
Calcium, mg/L	1520	2480	122
Iron, mg/L	28.3	17.7	0.1
Magnesium, mg/L	166	157	45.8
Manganese, mg/L	1.9	4.2	0.02
Strontium, mg/L	138	26.8	0.5