

Water Treatment at the Kensington Mine

- Gold mine near Juneau
 - Operated by Coeur Alaska
1. *Seep water treatment plant*
 2. *Treatment plant at tailings treatment facility (TTF)*
 3. *Comet Beach water treatment plant*
 4. *Comet Beach nitrogen removal plant*



Acknowledgements

- Coeur Alaska: Clyde Gillespie, Luke Russell, Tod Thurber, Kevin Eppers and many others
- Veolia Water Technologies personnel



1. Kensington Mine Seep Water Treatment Plant

- Technologies: Lime precipitation (RCTS), clarification and filtration
- Built in 2009
- Essentially a package plant assembled on-site, treating ARD
- Capacity: 60 gpm
- Typical flow: 20 gpm
- Discharge limits:
 - Cd: 0.64 ug/L dissolved
 - Al: 87 ug/L total
 - Mn: 50 ug/L dissolved
 - Zn: 379 ug/L dissolved















2. Kensington Tailings Treatment Facility WTP

- Technologies: Coagulation, Actiflo clarification, multimedia filtration and activated carbon filtration
- Built in 2010
- Capacity: 1500 gpm
- Typical flow: 500-1000 gpm
- Discharge limits:
 - Al: 71 ug/L
 - Fe: 800 ug/L
 - Cd: 0.10 ug/L
 - Cu: 1.9 ug/L
 - Pb: 0.5 ug/L
 - Zn: 18 ug/L
 - Turbidity: <5.3 NTU





TTF WTP Results

- Adequate capacity, thanks to equalization pond
- Continually met discharge limits
- Evaluated technologies for sulfate and manganese removal

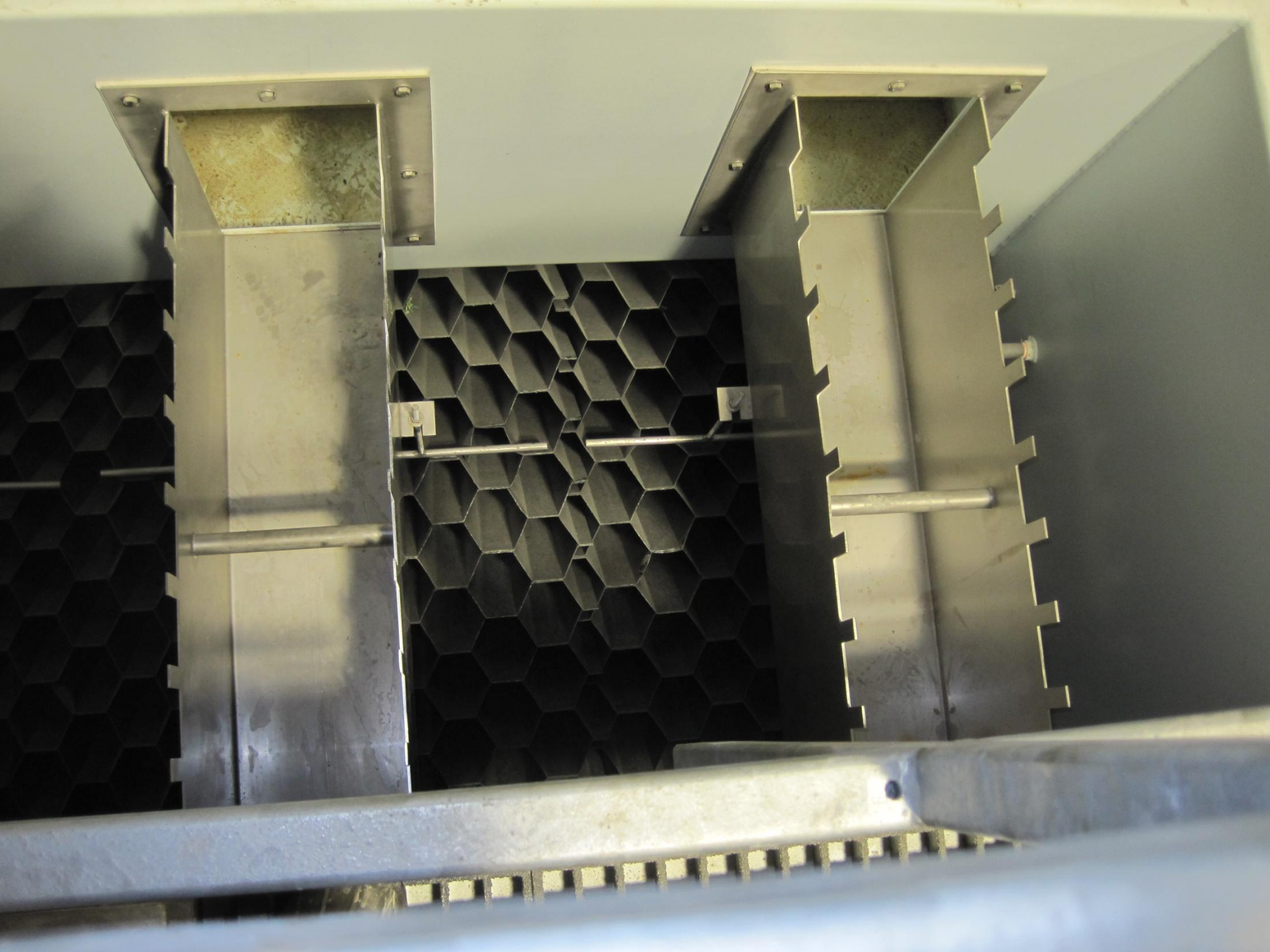


3. Kensington Comet Beach MWTP

- Technologies: Coagulation, clarification and multimedia filtration
- Built in late 2010
- Capacity: 1500 gpm
- Typical flow: 500-1000 gpm
- In addition to existing Comet MWTP (1500 gpm)
- Discharge limits:
 - Same as TTF WTP









SOLUTIONS

CROWN SOLUTIONS

CROWN SOLUTIONS

4. Kensington Comet Beach Nitrogen Removal Plant

- Technologies: Biological nitrification and denitrification
- Capacity: 1000 gpm
- Typical flow: 1000 gpm
- Construction is on hold
- Discharge limits:
 - $\text{NH}_3\text{-N}$: 2 mg/L
 - $\text{NO}_3\text{-N}$: 10 mg/L
 - Turbidity: 5.3 NTU







Lessons Learned

1. Effective treatment systems can be assembled at remote sites.
2. Good used equipment is available.
3. Low metals limits can be achieved with different levels of sophistication.
4. Capital expenditures can greatly reduce operator requirements.

