General Session IV: Associates Focus

“Treatment Technologies to Remove Organic Contaminants in Source Water from Forest Fires”

David Siebert, P.E.
Forest fires in watersheds that supply our drinking water can be a significant issue.
Not to worry...it’s been studied!
However, it is more about......
Stage 2 D/DBPs Rule is a “Game Changer”

- Stage 1 compliance based on system running annual average
- Stage 2 compliance based on a locational running annual average (LRAA)
  - The greater system size, the greater number of monitoring points
- Must be proactive to meet compliance
- For Valley of the Sun: TTHMs are the challenge
Today’s Focus – TTHM Compliance

1. TTHM result from a reaction between TOC and chlorine (the Valley’s primary disinfectant)

2. TTHMs are impacted by TOC levels, chlorine dosage, time, and temperature

3. Fires have increased Raw Water TOC levels

DBPs
What does this mean in terms of water treatment?
The 1st Tool out of the box is...

“Planning”
The next Tools are...

Pre-chlorination

- Chlorine Dioxide
- Ozone
- PAC
The next Tool out of the box is...

Enhanced Coagulation
Enhanced Coagulation

- Alum vs. Ferric
- w/ pH Control
- Biggest bang for $
The next Tool is...

Granular Activated Carbon (GAC)
GAC works by “adsorbing” Organics

- GAC Filter Adsorbers
- Postfiltration GAC Contactors
- Dependent on contact time
- Virgin or Reactivated
- $$$$
The next Tool out of the box is...

Biologically Active Filtration
Biofiltration is modified conventional granular media filtration
Biofiltration is modified conventional granular media filtration

Active Processes
1. Growth
2. Decay
3. Attachment
4. Detachment
5. Biodegradation
6. Filtration

Engineered BAF
The next Tool out of the box is...

UV Disinfection
Post-Treatment Techniques

- Distribution System Flushing
- Reservoir Aeration
- Hotspot Treatment
Individual Treatment Processes
Remove Different Amounts of TOC
TTHM Formation in WTP Impacted by Chlorine and TOC

TTHMs

No prechlorination

Ferric

Chlorine

Graph showing the formation of TTHMs in a water treatment plant (WTP) impacted by chlorine and TOC (Total Organic Carbon). The diagram illustrates the treatment stages including Canal, Screen, Pretreatment, Strainers, Contact Channel, Immersed Membrane Filtration, GAC Contactors, and Finished Water Reservoirs, with a note indicating no prechlorination.
One technique that shouldn’t be overlooked.....
Acknowledgements

City of Phoenix
Chemviron Carbon
Puretech Industrial Waters
Ozone Technology, Inc
Disney - ABC Domestic Television
Disney
Sears
Gnurf
Chemistry Land
Desdemonia Despair
Salient News
Christopher Leign Studios
ABC15.com
Aquaray
Unknown
Troy Hayes
Chance Lauderdale
Mark Gross
Teressa Linke
Questions?