How to Protect Students and Drivers from Infectious Disease Outbreaks on Buses

The Bugs ARE Out to Get US

Technology Can Help

National Association for Pupil Transportation Webinar March 16th. www.wilcoxevs.com
About Me!!!

- Life long New Englander. Yes, I have the accent
- Microbiologist & Engineer - Data, Data, proof of concept
- 20 years in the industry working with manufacturers, end users, state agencies, distributors, manufactures reps.....
- “Green” less toxic chemicals expert, tech, AO, HOCI
- Process & procedures, training, education, reality in the work, Systems, SOPs, Marketing Strategy.....
- Look for truth in data, marketing and claims
- Infection mitigation MUST HAPPEN!!!!!! Public Health Issue
- Technology is where this industry is headed, get onboard
What We Will be Discussing Today

- Flu, Noro, Corona & infectious diseases
- Bugs how long they live in the wild, incubate & what to do to protect yourself
- What you NEED to & can actually do NOW
- Cleaning - the removal step - less toxic
- Sanitizing & disinfecting - the kill step
  - The chemical classes. Cl bleach, quats & HOCl
  - EPA registration, dwell times
  - Needs its own step - how to find the time
- Application - hand, spray, electrostatics
- Data from the field
The Bug in the Room....Corona

- Should we be hysterical?
- Is the media making us nuts?
- Is preparing for Corona any different then the flu?
- What should you be doing?
  - Use this opportunity to leverage the hysteria & get funding to upgrade your systems and equipment
  - Bring in an expert
  - Do things right, be less toxic, be sustainable
  - Know the real facts & not the THEY SAID
Pandemic and What It Means

- Pandemic - is about how a pathogen is spreading and not about the deadliness of it. It gives governments authority to do things without as much red tape
  - Ban large gatherings where there is community spread

- In the WHO's daily briefing, Director-General Tedros Adhanom Ghebreyesus, PhD, said that the label should galvanize the world to fight

- The novel coronavirus, the first known to cause a pandemic, has infected more than 118,000 people and killed more than 4,000 in 114 countries, numbers expected only to rise

- The WHO is "deeply concerned both by the alarming levels of spread"

- SPREAD IS THE ISSUE NOW
What Does the State of Emergency Mean

- Releases money for research and supplies
- Helps put things in place to stop price gauging
- Releases money for public
- More about money and resources then sickness in this case
- Money for education
- Gives officials the authority to finalize agreements to expand testing to major health systems
- Prepare to activate the medical reserves corps
Green Cleaning & Infection Control
Apply Everywhere, Especially Now

- Schools, universities, daycares
- Office buildings, airports,
- Grocery stores, markets, restaurants
- Buses, trains, cars
- Homes, hotels, motels, B&Bs
- Hospitals, assisted living
- Apartment buildings
- Every space in our lives
Finally People are Caring About Buses

- First place many kids are in the morning & last place at end of school day
- Should be as much attention to them as the school building
- Same steps - clean then disinfect
  - Wipe down high touchpoints
  - Then disinfect v- fastest with sprayer
- Between runs? End of Day
  - Between runs, wipe clean, wipe disinfectant
  - End of day wipe clean and spray and let dry
  - Use an all purpose wipe then a disinfecting product
  - TWO STEPS IS A MUST - must remove soils and dirt
- EPA product list - use peroxide or hypochlorous acid
  - Safest on the list
  - [https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2](https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2)
This IS SERIOUS - What We DO - No Joke

- No excuses, what we do matters for public health EVERYWHERE
- *Its what we have always done* is not a reason not To know what is new, better & less toxic out there EDUCATE UR SELF
- All facilities should be cleaning AND SANITIZING / DISINFECTING EVERY DAY for flu, cold, Noro,, MRSA and Corona
- The flu & cold are serious and getting worse every year
  - *Earliest start in 16 years this year and we started with B not A this year over 120 ped deaths, up from previous years - OVER 20K DEALTHS*
  - Few years ago deadliest season in recorded history, over 80K died
  - Last year longest at 22 weeks or 4.5 months, Nov to April now, long season
- Get the money now and do what you needed to do for years
- Finally write the SOPs, train, upgrade products & equipment
How Green Cleaning & Inf. Control Work Together

- They are systems that should work together not fight each other, tools & technology can help
- Two sides of same coin - REMOVE THEN KILL
- Cleaning removes up to 90 percent of soils and microbes / pathogens (1 billion?)
- (Then why do Inf. Control Heidi????)
- Infection control kills the rest without having soil hide the little buggers. 10% = 100 million
- **It can be less toxic, easy, proactive and protective**
- Formulations, equipment, tech / innovation & training can make it happen
- Set a system that works for years & can be updated
What Little Buggers are We Talking About?

- Different facilities may see the following:
  - **K-12 schools** = cold, flu, mrsa, noro, strep, food poisoning
    - Cold and flu earlier every year
    - MRSA - athletics, gym matting
    - Food poisoning - cafeterias
    - Now Corona - students studying abroad
  - **ALL OF THIS ON BUSES TOO**
  - Hospital - much more HIV, HEP, C DIFF and others
  - Office Buildings - cold, flu, Noro, strep, food poisoning
  - Hotels - cold, flu, blood borne depending on use and location
  - Gyms, spas - cold flu, MRSA, strep, staph, foot fungus
How Long do Germs Live in the Wild?

- **Cold Virus** - days on hard surfaces, infectious for at least 24 hrs
- **Flu virus** - air for hours, hard surfaces for 24 hours
- **Norovirus** - highly contagious, **weeks** on hard surfaces
- **MRSA** - **days or weeks** on hard surfaces. Good without moisture
  - Athletics, locker rooms, wrestling mats
- **Corona virus** - 9 to 10 days on surfaces if not removed or killed
  - 9 to 10 day incubation period when exposed
  - Quarantines necessary
- Live on soft surfaces, in the air and on hard surfaces
- If you do not have an infection mitigation program you need to - careless business if you don’t
The Flu on the Move

![Flu map 2018-19 Influenza Season Week 6 ending Feb 09, 2019]

![Flu map 2018-19 Influenza Season Week 7 ending Feb 16, 2019]
SO What DO You Do??????

- Do the right thing! Sometimes the hard thing! Change
- Use Technology - investigate and try it
- Push your vendors - ask for new technology
- Research & talk to peers - events, online sites & mags
- Set up a system that is streamlined and works
- Sustainability - its time to embrace
- Learn about products, their additives & toxicity
- Stop using the Pink Stuff - its toxic
- Look into Onsite Generation
Here is Your Answer....Are You Ready?

- Inventory & know what you use & why
- Check if you have SOPs, if not write some - get help
- Clean the right way ...TRAIN
- Use the right things - be sustainable, be less toxic, LEARN
- In the school and on the buses
- BUSES MATTER MORE THEN PEOPLE THINK
- NOW IS YOUR TIME TO ASK FOR RESOURCES
Buses/ transportation NOW is the TIME!!!!

- Ask for money and help while they are inclined to give it
- Don’t make it too difficult
  - Between runs - wipe seat backs, seat belts and railing upstairs with an all purpose cleaner or a wipe not a disinfectant one
  - Then wipe with a less hazardous wipe like Diversey Oxivir wipes. Peroxide based. On EPA list
- End of day protocol the same
  - I recommend spraying all the bus down with a sprayer and hypochlorous acid, on EPA list - Madentech Klorocept tablets, have them in US as Brulin Brutabs
  - Use electrostatics. None to be had right now, Use pump sprayer
What other States are Doing

- Ohio - non aerosol disinfectant can be on bus
  - They should have a general purpose cleaner in a spray bottle with a microfiber cloth
  - Or an all purpose like Clorox Green works wipe and a peroxide wipe or hypochlorous acid to spray
  - ALWAYS a 2 STEP PROCESS

- Seminole County Florida
  - Cleaning seatbelts, walls, seats and steering columns
    - What about railing up stairs
    - When doing this? Between runs and at end of day?

- Corona is easy to kill on surfaces. No need to chemical bomb
What is Onsite Generation??

- Make cleaning & sanitizing & disinfection products on site
  - Think soda stream, a coffee maker
- Two Types
  - Aqueous Ozone, AO & Hypochlorous Acid, HOCl
- Neutral pH - both
- For ME - HOCl least toxic EPA registered sanitizer & disinfectant in our industry - THE HOLY GRAIL!!!
- Non synthetic - no fragrance or dyes in either
- Biodegradable - no residue
- Sustainable - saves resources
Let's Talk Aqueous Ozone

- O3, smell after a lightening storm
- Non Synthetic - no fragrances, dyes or residue
- Great cleaner, deodorizer
- Onsite technology, sustainable & biodegradable
- Air emissions data show no significant exposure over 8 hrs.
- Can replace glass, stainless, all purpose & floor cleaner
- Saves time, more ergonomic, safer for workers
- Can reduce chemical use & solid waste by up to 70 percent - Clemson
- Soil removals up to 90 percent plus - Data & testing in field
- Not Stabilized - no need - ask me!!!
CleanCore Solutions

- Inventor of on demand AO
- They changed the game
- Great customer service
- If you don’t know them, you should
- Omaha
- Equipment saves Time & Money - ask me, ask them, ask end users
- Doing it right
- Testing, proof of concept
- Here for the end-user
Enozo3

- May have seen the bottle before
- New day, new company ownership
- Engineered in US, MA
- Drop tested, durable
- Company working on doing it Right
- Investing in testing
- Great remote uses
- Continuously improving
Superbug War
Disinfection / Sanitizing

- Antimicrobial Pesticides - ALWAYS HAZARDS / TOXIC
  - HOCl least toxic compared to quats & chlorine bleach
  - Never non toxic, least or less toxic
  - Never chemical free water is a chemical

- Cleaning vs. Disinfecting & Sanitizing
  - Removal of soils & biologics - cleaning (up to 90%)
  - Sanitizer - lower concentration, shorter dwell time, 99.9
  - Disinfectant - higher conc., kills more, longer dwell time, 99.999

- One product can be both sanitizer / disinfectant
  HOCl
**EPA List of Disinfectants for Corona**

- List N: EPA’s Registered Antimicrobial Products for Use Against Novel Coronavirus SARS-CoV-2, the Cause of COVID-19 [https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2](https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2)

- Have you seen this list?
- Do you know what it means?
- What are best products to use off of it and why?
  - Diversey Oxivir line - peroxide
  - Madentech Klorcept tablets / Bruin Brutabs - makes HOCl
- Why these and no others? *Glad you asked*
  - Least toxic, don’t promote superbug formation, not on AOEC list for asthmagen chemicals
What is Hypochlorous acid, HOCl

- The answer to less toxic sanitizing and disinfecting
- The product of salt, NaCl, & water, H2O, & electricity = HOCl & NaOH
- Its sustainable since it is made on site, less plastic and cardboard
- Can be applied electrostatically, quats & chlorine bleach should not
- Non synthetic, not fragrance or dyes added
- Non caustic, does not bleach color out of materials
- Kills a wide range of pathogens
- Can be used on soft surfaces, low concentrations
- Sanitizer and disinfectant, pH neutral
WHY ARE CHLORINE BLEACH / QUATS BAD? Glad You Asked

- **Chlorine Bleach** - sodium hypochlorite -OCL
  - Caustic, high pH, causes burns, bleaches color
  - Not stable, once diluted only good for hours
  - Not diluted good for weeks only
  - Harmful to skin, eyes, lungs
  - Bleach is a verb - to make things whiter or lighter in color

- **Quaternary Ammonium Cmpds** - N-Alkyl* dimethyl benzyl ammonium chloride
  - Causes asthma, can cause new cases
  - Caustic, bad for the env & animals (fish)
  - Harmful to skin, eyes, lungs
  - Synthetic fragrances and DYES
# Quats, Chlorine Bleach & HOCl Comparison

## EPA Registered Disinfectant Comparison Table

<table>
<thead>
<tr>
<th></th>
<th>Chlorine Bleach</th>
<th>Quaternary ammonium compounds</th>
<th>Hypochlorous acid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asthmagen</td>
<td>Y*</td>
<td>Y^</td>
<td>N</td>
</tr>
<tr>
<td>pH</td>
<td>13</td>
<td>13</td>
<td>6.5-7</td>
</tr>
<tr>
<td>EPA Registered</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>No Rinse Food Contact Sanitizer</td>
<td>N</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Needs a Rinse</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Fragrances &amp; Dyes - synthetic</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Can leave residue behind</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>Sustainable</td>
<td>N</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Onsite generation</td>
<td>N</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Biodegradable</td>
<td>N</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Can cause Superbug formation by the mode of killing microbes</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
</tr>
</tbody>
</table>

* Can exacerbate respiratory issues

^ Can cause primary asthma with one exposure, AOEC list

- Y*: Can exacerbate respiratory issues
- Y^: Can cause primary asthma with one exposure, AOEC list
## What HOCl Kills

### SPORES

<table>
<thead>
<tr>
<th>Spores</th>
<th>ATCC and/or Strain number</th>
<th>Disease/Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clostridium difficile</td>
<td>ATCC 43598</td>
<td>Colitis</td>
</tr>
</tbody>
</table>

### BACTERIA

<table>
<thead>
<tr>
<th>Bacteria</th>
<th>ATCC and/or Strain number</th>
<th>Disease/Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pseudomonas aeruginosa</td>
<td>ATCC 16442</td>
<td>Septicemia</td>
</tr>
<tr>
<td>Salmonella enterica</td>
<td>ATCC 10708</td>
<td>Food poisoning</td>
</tr>
<tr>
<td>Staphylococcus aureus</td>
<td>ATCC 6533</td>
<td>Wound infections etc.</td>
</tr>
<tr>
<td>Enterococcus faecalis VRE</td>
<td>ATCC 51299</td>
<td>Enteritis etc.</td>
</tr>
<tr>
<td>Escherichia coli 0157:H7</td>
<td>ATCC 35150</td>
<td>Food poisoning</td>
</tr>
<tr>
<td>Klebsiella pneumoniae</td>
<td>ATCC 4952</td>
<td>Pneumonia</td>
</tr>
<tr>
<td>Staphylococcus aureus MRSA &amp; GRSA</td>
<td>ATCC 33592</td>
<td>Wound infections etc.</td>
</tr>
<tr>
<td>Staphylococcus epidermis</td>
<td>ATCC 51624</td>
<td>Wound infections etc.</td>
</tr>
</tbody>
</table>

### VIRUSES

<table>
<thead>
<tr>
<th>Viruses</th>
<th>ATCC and/or Strain number</th>
<th>Disease/Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influenza Virus (H1N1)</td>
<td>ATCC VR-99</td>
<td>Swine flu</td>
</tr>
<tr>
<td>Respiratory syncytial virus</td>
<td>ATCC VR-26, Strain Long</td>
<td>Common cold</td>
</tr>
<tr>
<td>Canine distemper</td>
<td>ATCC VR-128, Strain Lederle</td>
<td>Canine distemper</td>
</tr>
<tr>
<td>Hepatitis B (Duck)</td>
<td>Strain Grimaud</td>
<td>Hepatitis B</td>
</tr>
<tr>
<td>Herpes simplex Type 1</td>
<td>ATCC VR-723, Strain F(1)</td>
<td>Herpes</td>
</tr>
<tr>
<td>Human Immunodeficiency Type 1</td>
<td>Strain HTLV-IIIa</td>
<td>AIDS</td>
</tr>
<tr>
<td>Newcastle disease</td>
<td>ATCC VR-108, Strain B1 Hitcher or Blackburg</td>
<td>Newcastle disease</td>
</tr>
<tr>
<td>Pseudorabies</td>
<td>ATCC VR-135, Strain Aujeszky</td>
<td>Aujeszky’s disease</td>
</tr>
<tr>
<td>Canine parvovirus</td>
<td>ATCC VR-2017, Strain Cornell</td>
<td>Parvovirus disease</td>
</tr>
<tr>
<td>Hepatitis A (Hepadnavirus)</td>
<td>Strain HM-175</td>
<td>Hepatitis</td>
</tr>
<tr>
<td>Norovirus</td>
<td>Surrogate virus – Feline calicivirus ATCC VR-762, Strain F-9</td>
<td>Gastroenteritis</td>
</tr>
<tr>
<td>Poliovirus Type 1</td>
<td>ATCC VR-1000, Strain Brunhilde</td>
<td>Polio</td>
</tr>
</tbody>
</table>

**Wilcox EVS**
## Materials Compatibility

<table>
<thead>
<tr>
<th>Plastics</th>
<th>Compatibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABS</td>
<td>A</td>
</tr>
<tr>
<td>CPVC</td>
<td>A</td>
</tr>
<tr>
<td>Hytrel®</td>
<td>A</td>
</tr>
<tr>
<td>HDPE</td>
<td>A</td>
</tr>
<tr>
<td>LDPE</td>
<td>A</td>
</tr>
<tr>
<td>Noryl®</td>
<td>A</td>
</tr>
<tr>
<td>Polycarbonate</td>
<td>A</td>
</tr>
<tr>
<td>Polypropylene</td>
<td>A</td>
</tr>
<tr>
<td>PPS</td>
<td>A</td>
</tr>
<tr>
<td>PTFE</td>
<td>A</td>
</tr>
<tr>
<td>PVC</td>
<td>A</td>
</tr>
<tr>
<td>PVDF</td>
<td>A</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Elastomers</th>
<th>Compatibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrile (Buna N)</td>
<td>A</td>
</tr>
<tr>
<td>EPDM</td>
<td>A</td>
</tr>
<tr>
<td>Hypalon®</td>
<td>A</td>
</tr>
<tr>
<td>Kel-F®</td>
<td>A</td>
</tr>
<tr>
<td>Santoprene®</td>
<td>A</td>
</tr>
<tr>
<td>Silicone</td>
<td>B</td>
</tr>
<tr>
<td>Tygon®</td>
<td>A</td>
</tr>
<tr>
<td>Viton®</td>
<td>A</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Metals</th>
<th>Compatibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS 304</td>
<td>A</td>
</tr>
<tr>
<td>SS 316</td>
<td>A</td>
</tr>
<tr>
<td>Aluminum</td>
<td>B</td>
</tr>
<tr>
<td>Brass</td>
<td>B</td>
</tr>
<tr>
<td>Bronze</td>
<td>B</td>
</tr>
<tr>
<td>Carbon Steel</td>
<td>C</td>
</tr>
<tr>
<td>Cast iron</td>
<td>C</td>
</tr>
<tr>
<td>Hasteloy C®</td>
<td>A</td>
</tr>
<tr>
<td>Titanium</td>
<td>A</td>
</tr>
<tr>
<td>Nonmetals</td>
<td>Compatibility</td>
</tr>
<tr>
<td>Carbon graphite</td>
<td>A</td>
</tr>
<tr>
<td>Ceramic A1203</td>
<td>A</td>
</tr>
<tr>
<td>Ceramic magnet</td>
<td>A</td>
</tr>
</tbody>
</table>

### Explanation of Ratings — Chemical Effect
- **A** = Excellent
- **B** = Good – Minor Effect, slight corrosion or discoloration.
- **C** = Fair – Moderate Effect, OK for short term use.
- **D** = Severe Effect, not recommended for any use.
- **Not recommended for continuous use. Some pitting may occur.**
HOCL DOES NOT PROMOTE SUPERBUG FORMATION

- Tissue eating bacteria
- HAI’s now payable by healthcare not insurance
- **Bugs can NOT adapt to the HOCl kill - Major pro**
- Many bugs mutating so they can beat the way chlorine bleach and quats kill
  - Girl in Carolina, zip lining into water, got a flesh-eating bacteria infection lost both legs
  - Women gives birth gets and HAI and looses all 4 limbs
  - Women IN Texas has infection none of the 28 antibiotics we have would work
- Flu, cold stomach bug - teachers, workers, kids out of work and school - billions lost a year
- Norovirus - highly contagious, stomach bug...poop, puke, flush aerosolized into the air
- **THE SOLUTION IS HOCl - I going to keep saying it**
Sustainability & Public Health

- Onsite technologies help to:
  - Reduce solid waste
  - Reduce shipments & diesel fuel emissions
  - Save time - receiving, unpack, dilute
  - Reduce chemical use and exposure
  - Reduce potential env impacts
  - Save time and money overall
  - Raise the bar in same or less time
  - Increase Indoor Air Quality, IAQ
  - Healthier workers & clients
Brulin Brutabs to make HOCl

- Tablet you can buy when added to water makes hypochlorous acid in different concentrations
- Cheapest way to get into hypochlorous acid
- Best sanitizer and disinfectant on the market
- Tabs stable on shelf for 3 years
- Dilute in buddy jugs and lasts 30 days or longer
- Fill spray bottles and sprayers with it
- On EPA list
- www.BHC.com
<table>
<thead>
<tr>
<th>1st floor girl’s bathroom across from gym</th>
<th>ATP reading location</th>
<th>ATP reading before cleaning, end of school day</th>
<th>ATP reading cleaning</th>
<th>% ATP reduction cleaning</th>
<th>ATP reading after sanitizing with HOCL 100 ppm</th>
<th>% ATP reduction sanitizing w/ 100 ppm HOCL using electrostatic sprayer</th>
</tr>
</thead>
<tbody>
<tr>
<td>counter</td>
<td>98</td>
<td>6</td>
<td>94</td>
<td>1</td>
<td>83</td>
<td>83</td>
</tr>
<tr>
<td>dryer</td>
<td>1150</td>
<td>144</td>
<td>87</td>
<td>10</td>
<td>93</td>
<td>93</td>
</tr>
<tr>
<td>1st sink faucet</td>
<td>71</td>
<td>7</td>
<td>90</td>
<td>2</td>
<td>71</td>
<td>71</td>
</tr>
<tr>
<td>middle soap dispenser</td>
<td>41</td>
<td>6</td>
<td>85</td>
<td>1</td>
<td>83</td>
<td>83</td>
</tr>
<tr>
<td>2nd from back wall sink sides</td>
<td>647</td>
<td>102</td>
<td>84</td>
<td>11</td>
<td>89</td>
<td>89</td>
</tr>
<tr>
<td>handicap stall rail above tp holder</td>
<td>256</td>
<td>15</td>
<td>94</td>
<td>3</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>personal hygiene holder 2nd from back stall</td>
<td>240</td>
<td>38</td>
<td>84</td>
<td>5</td>
<td>87</td>
<td>87</td>
</tr>
<tr>
<td>2nd stall from front toilet seat cover dispenser</td>
<td>18</td>
<td>3</td>
<td>83</td>
<td>1</td>
<td>67</td>
<td>67</td>
</tr>
<tr>
<td>first stall inside latch</td>
<td>633</td>
<td>104</td>
<td>84</td>
<td>14</td>
<td>87</td>
<td>87</td>
</tr>
<tr>
<td>2nd stall outside latch</td>
<td>105</td>
<td>14</td>
<td>87</td>
<td>2</td>
<td>86</td>
<td>86</td>
</tr>
<tr>
<td>top of door 3rd stall</td>
<td>141</td>
<td>18</td>
<td>87</td>
<td>3</td>
<td>83</td>
<td>83</td>
</tr>
<tr>
<td>paper holder handicap stall</td>
<td>292</td>
<td>43</td>
<td>85</td>
<td>8</td>
<td>81</td>
<td>81</td>
</tr>
</tbody>
</table>

*Testing performed by Third Party scientist from ASE Services / Wilcox EVS*
AO and / vs HOCl

- Aqueous ozone, AO
  - Cleaner, some sanitizing claims, deodorizer
  - No synthetic chemicals, deodorizer, no residue
  - New technology handles biodegradability issues

- Hypochlorous acid, HOCl
  - EPA registered sanitizer / disinfectant - kills
  - Tablet or onsite generator (cleaner stream not as good as AO)
  - No residue, neutral pH, made in our immune systems
  - No superbug promotion

- Great DUO, Sustainable, look at real ROI
  - Packaging, chemicals, time ordering, receiving, stocking, diluting etc.
Application Matters

- Microfiber
- Trigger spray bottle
- Pressurized bottle - AO
- Electrostatic sprayer
  - Hand held
  - Back pack
  - Cart
Clorox 360 System

- Use cart not solution
- Solution is a quaternary ammonium compound or QUAT
- Dangerous
- Should NEVER be sprayed in the air
- Can cause primary asthma
- Needs to be rinsed off
- Leaves residue behind
- Hurts air quality
Thank You!! Questions?

Heidi Wilcox, M.Sc.
Wilcox EVS Solutions
Heidi@wilcoxevs.com
www.wilcoxevs.com
781 640 6401