

“How Dry I Am”

Solutions for the Pharmaceutical Industry To Meet
the new NC Water Restrictions

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Site Energy Engineer
Merck & Co., Inc.



Merck Company Overview

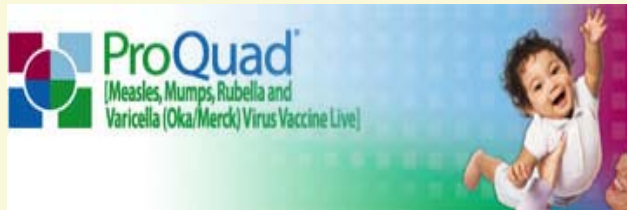
- **Merck discovers, develops, manufactures and markets vaccines and medicines to address unmet medical needs**
 - **Corporate headquarters:** One Merck Drive, Whitehouse Station, N.J. 08889
 - **Number of employees worldwide:** 60,000
 - **Research and development investment:** \$4.8 billion in 2006
 - **Sales:** \$22.6 billion in 2006
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- *SINGULAIR® - once-a-day oral medicine for the treatment of asthma, allergic rhinitis and exercise-induced bronchoconstriction*
 - *COZAAR/HYZAAR® - medicines for the treatment of hypertension*
 - *FOSAMAX® - medicine for the treatment of osteoporosis*
 - *Pediatric Vaccines – vaccination for measles, mumps, rubella and varicella*
 - *GARDASIL® - vaccine for the prevention of cervical cancer and genital warts caused by certain types of HPV*
 - *JANUVIA® - medicine for the treatment of type 2 diabetes*

Merck Vaccine Manufacturing Facility

Our Products



Chickenpox Can Be Serious—Treat It That Way



Vaccines for Measles, Mumps, Rubella, Chicken Pox, and
Shingles

~\$1.5B in annual sales

MMD – Durham Plant Site





Site Facts

- **The current status is engineering/ validation phase. Begin Manufacturing at the end of 2009**
- **Phase 1 groundbreaking to licensure time = 5 years!**
- **The plant employs 110 people as of Jan 2008, which will grow to 175-225 with the announced Phase 2 expansion**
- **Peak construction employment exceeded 550 during Phase I**
- **Phase 2 construction begins this spring**
- **Current size is 263,000 sq.ft. (378,000 sq.ft after Phase 2 addition**
- **Phase I capacity is ~28 mm doses, Phase II will add another ~25 mm doses**
- **Current daily water usage is approximately 75,000 gallons/day**



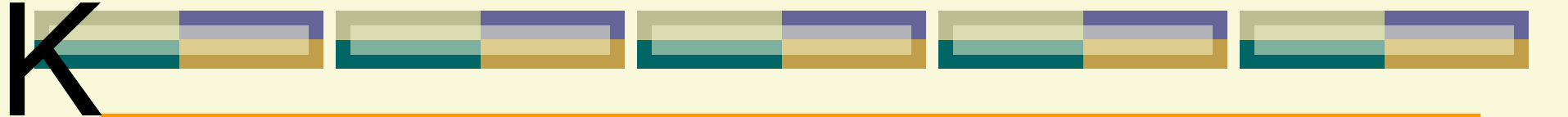
This facility was originally designed to be water efficient....

- ❖ Low flow toilets and shower heads
- ❖ IR water activated sinks
- ❖ RO reject water reuse for the cooling towers
(10 gpm = 14,400 gal/day)
- ❖ Closed circuit cooling pumps instead of once through cooling water
- ❖ Minimal water sanitization cycles
- ❖ Steam condensate recovery
- ❖ Blowdown steam flash recovery
- ❖ Cooling tower blow down will be used as the primary source for cooling boiler system sample coolers and direct quenching of boiler blow down in lieu of once through fresh water

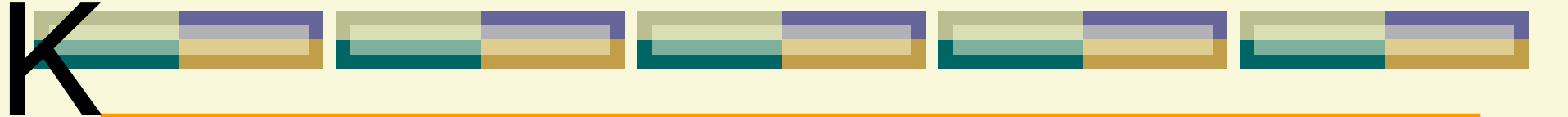


We also designed into the facility...

- ❖ Cooling tower side stream filters are high efficiency filters requiring lower backwash quantities.
- ❖ We use softened water in lieu of demineralized water for boiler feed water make-up. This significantly reduces the quantity of waste water generated and therefore water use
- ❖ The installation of variable frequency drives on cooling tower fans reduces water drift (water savings)



In an engineering evaluation performed in June of 2004, during the design of this facility, it was estimated that we would avoid consuming approximately 8.5 million gallons per year



In addition to implementing design engineering solutions, the site recognizes the importance of reducing water from an operations perspective.....

- ❖ Raise employee awareness via site wide email communication and facilitated open forum discussions promoting conservation efforts.
- ❖ Energy Center wash downs will cease (100 gallons per day savings).
- ❖ Reduce fire pump run time from 30 minutes per week to 5 minutes per week. This saves an additional 1000 gallons per week
- ❖ Non-GMP air handlers will have time of day scheduling implemented to reduce the need of steam heating during non-occupied hours (1500 gallons per day savings during summer months).



Questions?