



# CPVEC Sample Data

2000-2009

Ed White

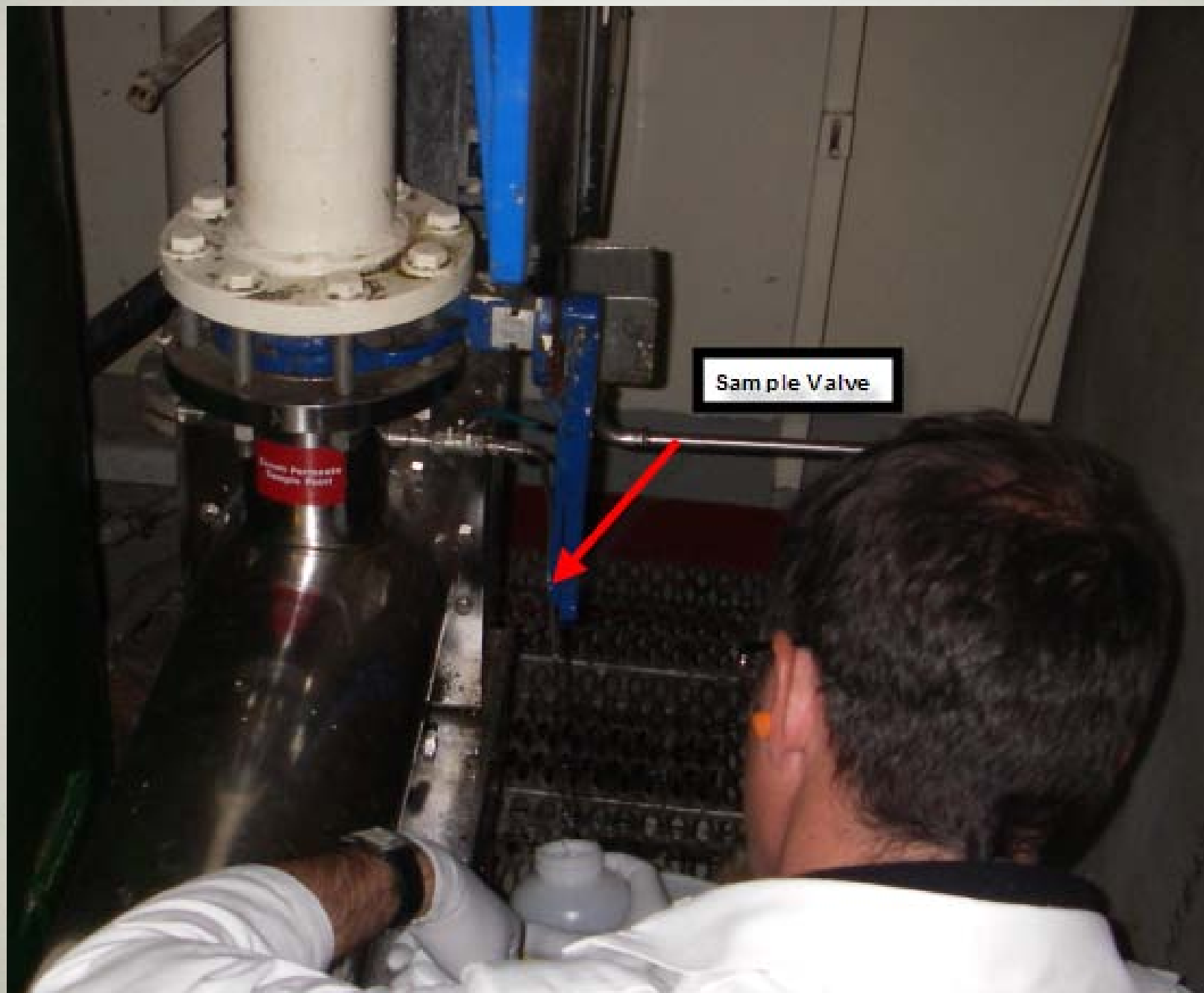
CPVEC Environmental Program Specialist

# Definitions

- Blackwater – water with human waste
- Graywater – sink, shower, galley wastewater
- mg/L - 1/1,000 gram per liter
- $\mu\text{g/L}$  - 1/1,000,000 gram per liter

**Why Sample?**





Sample Valve

Field test / sample event checklist

Field test kit box

AE 1713  
SATENDAM  
UNANNOUNCED  
CONVENTIONAL  
DB DISCHARGE  
8/2 0620



# Ensuring samples are representative

- Quality Assurance/Quality Control Plan
- Vessel Specific Sampling Plan
- Field notes, chain of custody
- Unannounced sampling
- Blind duplicates
- Field audits
- Lab audits

*North West CruiseShip Association*  
*Discharge of Effluents in Certain Alaska Waters by Cruise Vessel*  
*Operations*

**2009 Operating Season**  
**Quality Assurance/Quality Control Plan**  
**For**  
**Sampling and Analysis of Treated Sewage and**  
**Graywater**  
**From**  
**Commercial Passenger Vessels**

*Submitted to fulfill certain requirements of*  
*33 CFR 159 United States Title 33 Code of Federal Regulations Part*  
*159 and Alaska Statute 46.03.460 – 46.03.490 and 18 AAC 69*



# 176 Parameters Sampled

- “Conventional”- pH, Fecal Coliform, BOD, TSS, Chlorine. (16 parameters)
- “Priority”- VOCs (70), BNAs (65), metals (25).
- General Permit- Ammonia, Copper, Nickel, Zinc twice a month.

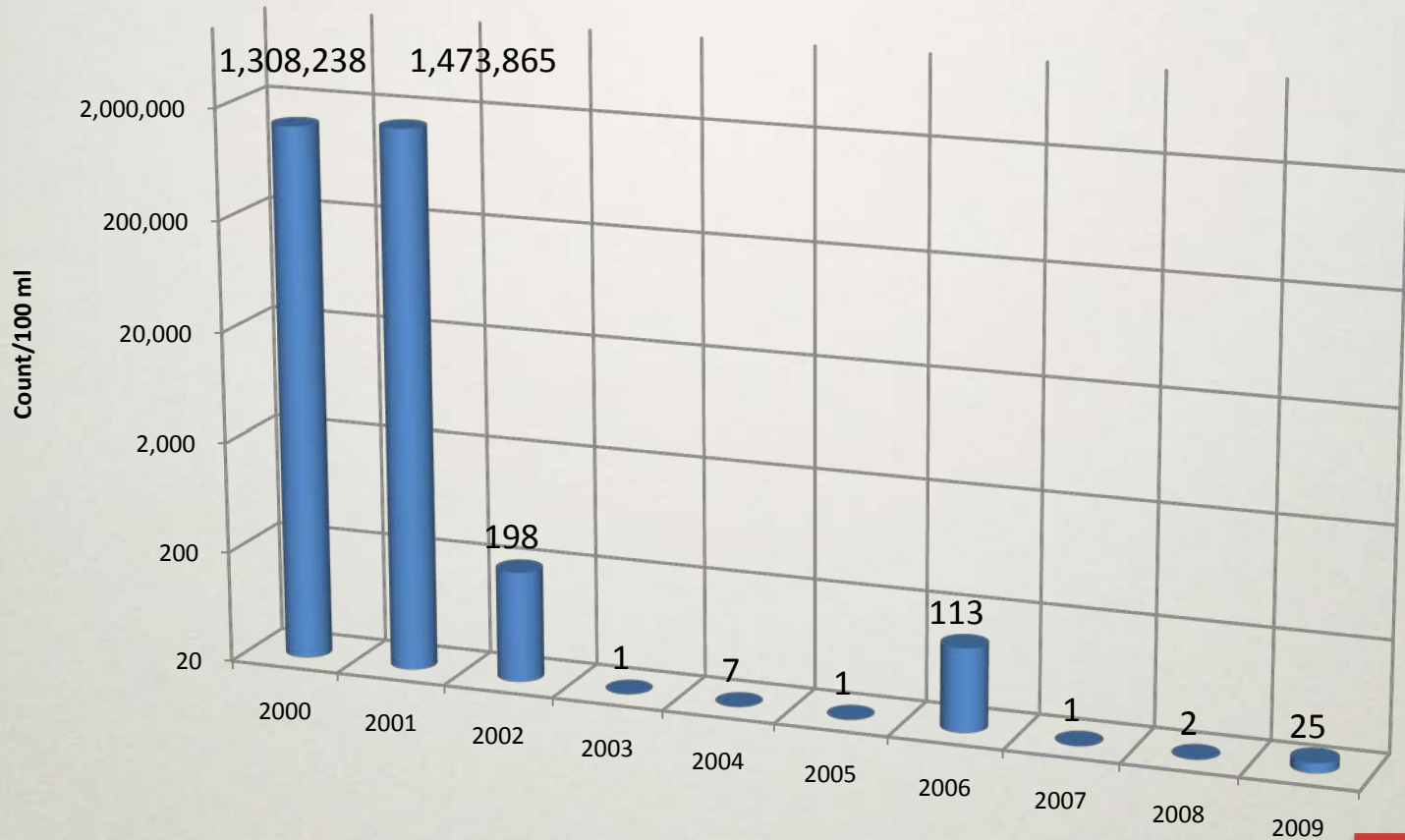
# Sample Data Notes:

- Frequency of samples taken varies over time
- Number of ships sampled changes, individual vessels change
- Metal filtering method changed

# Conventional Parameters

- pH
- Fecal Coliform
- Biochemical Oxygen Demand (BOD)
- Total Suspended Solids (TSS)
- Chlorine
- Nutrients
- Alkalinity

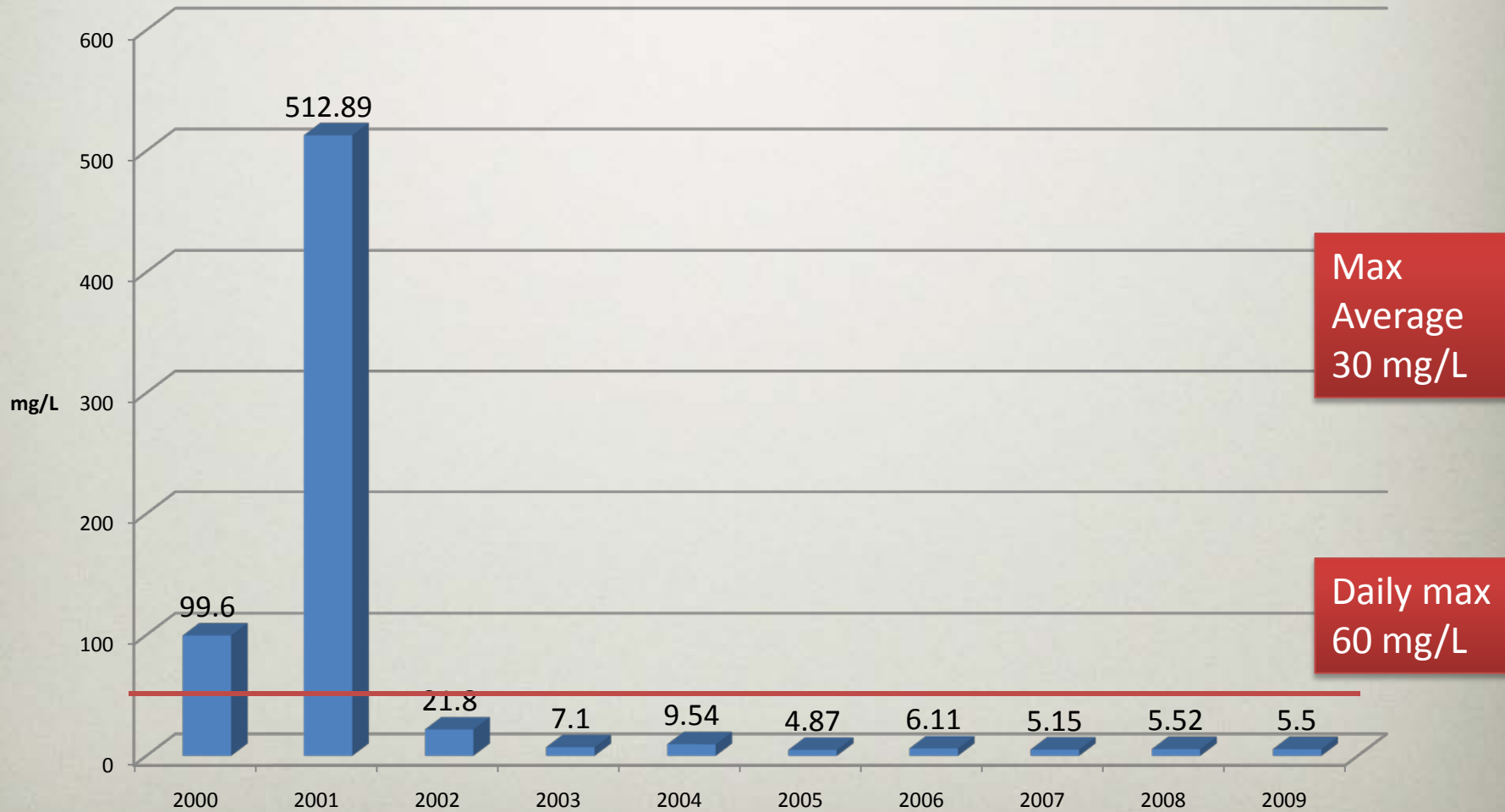
# Fecal Coliform Averages 2000-2009



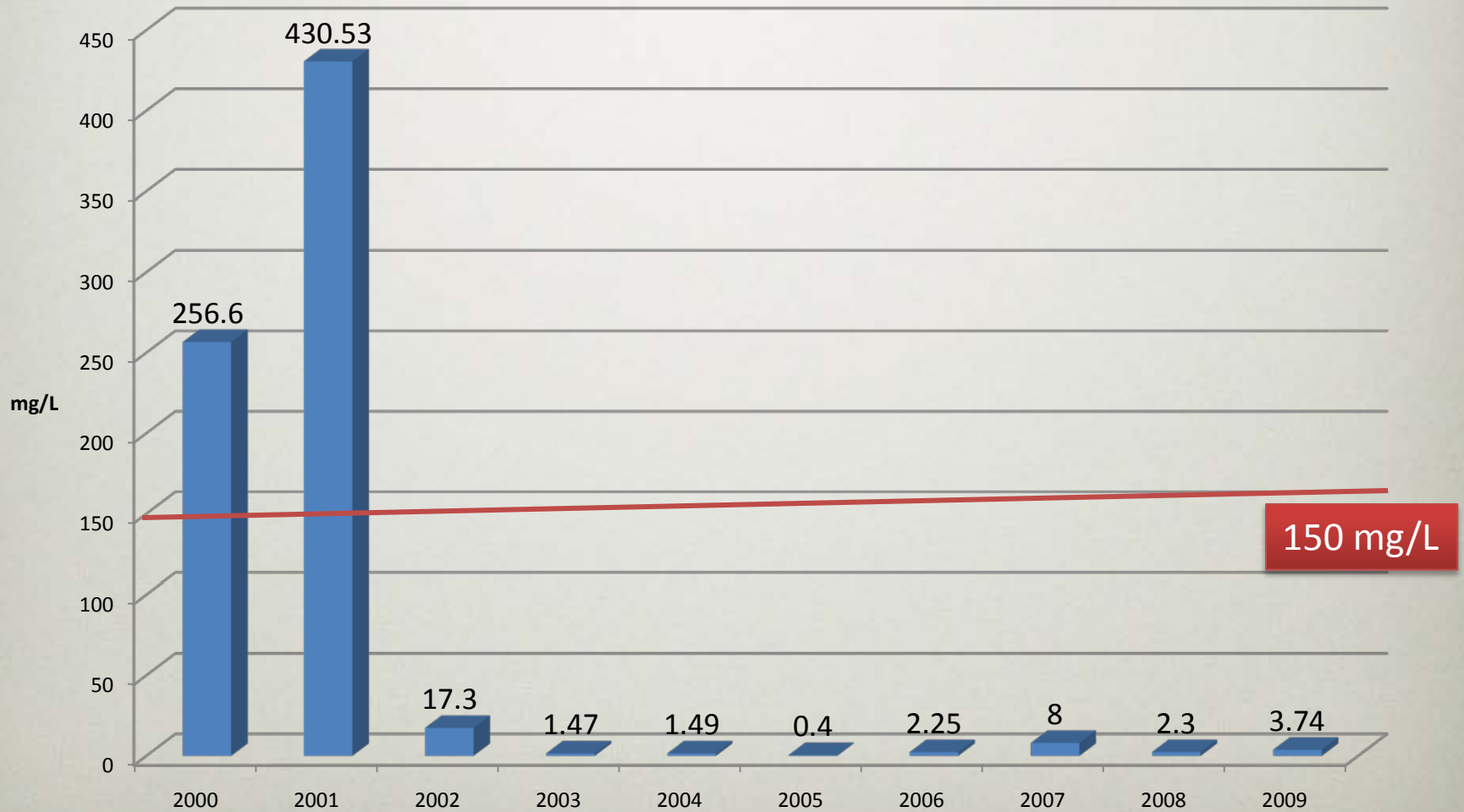
2002- 2009 includes only AWTs systems

Average  
14 FC/100 mL  
Daily Max  
43FC/100ml

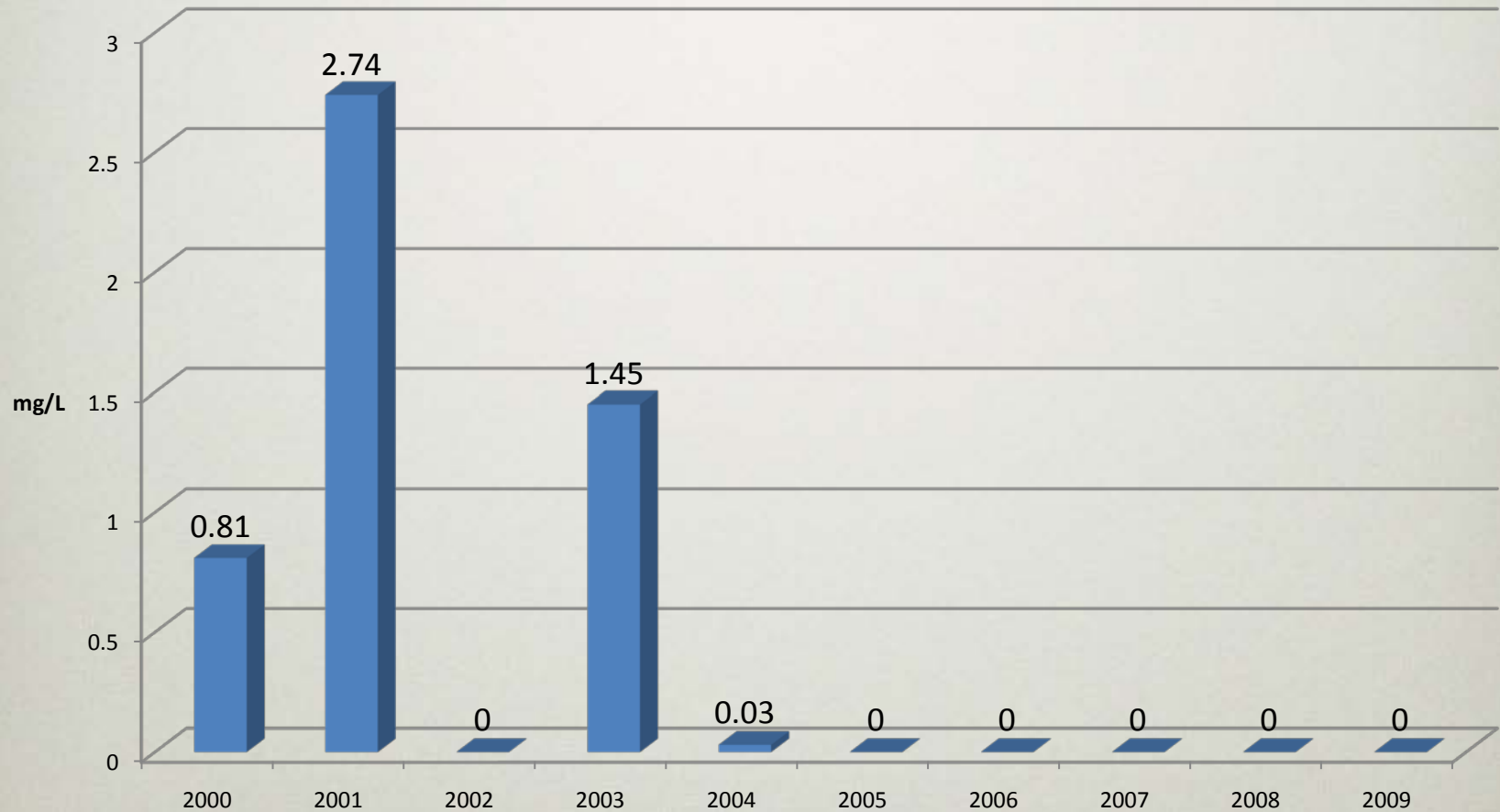
# Biochemical Oxygen Demand



# Total Suspended Solids (TSS)

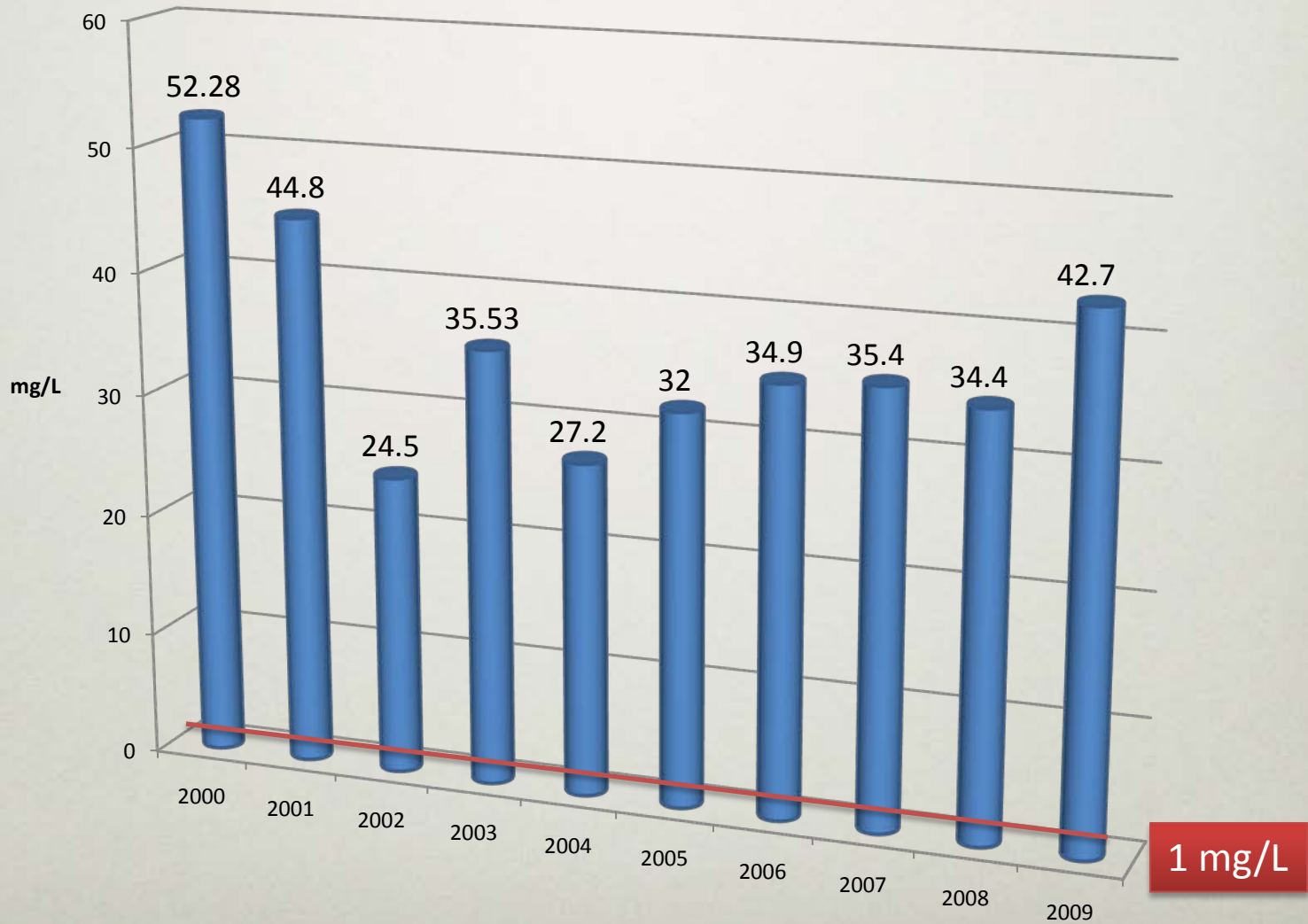


# Chlorine Averages 2000-2009



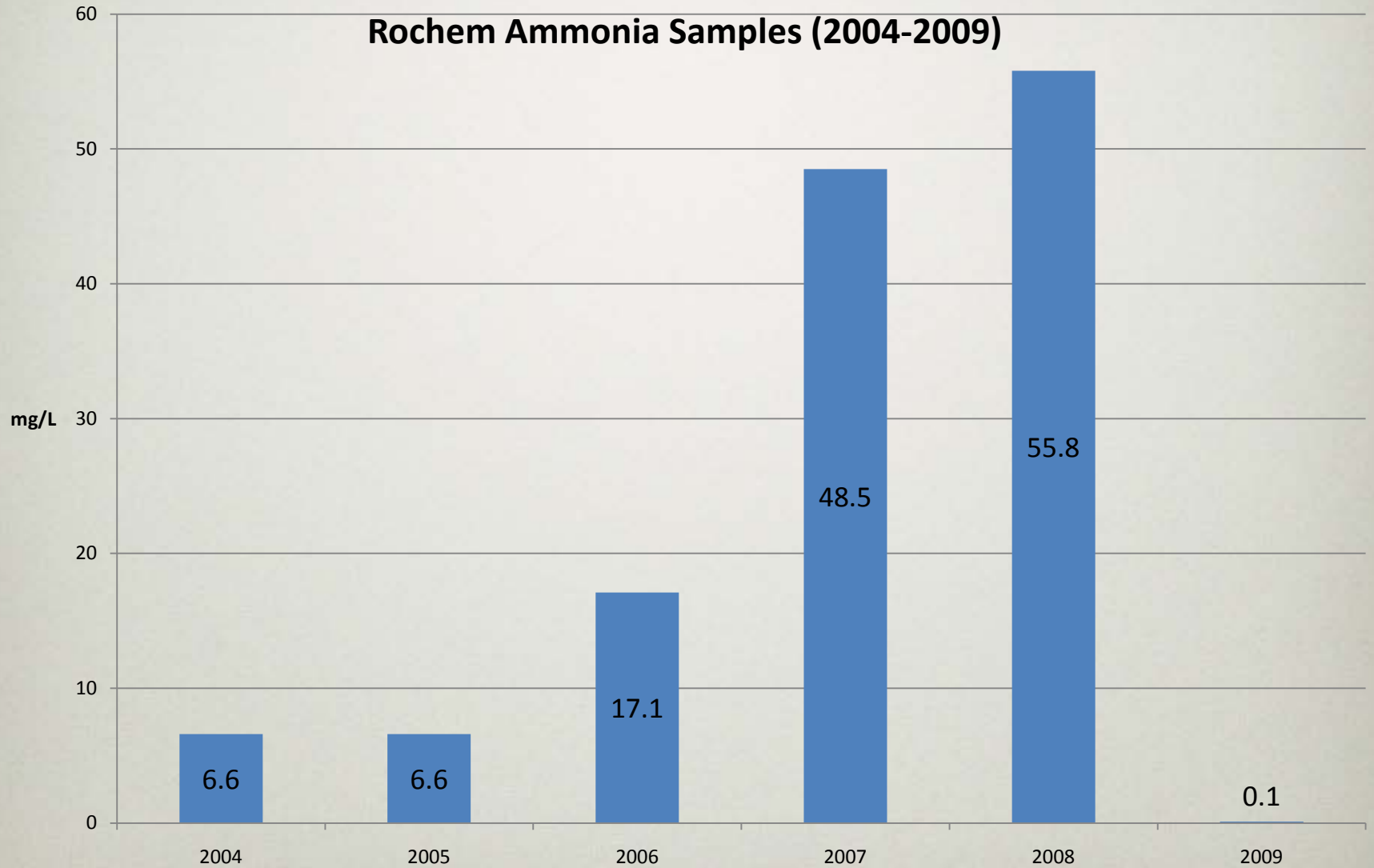
0.0075 mg/L

# Ammonia Averages 2000-2009



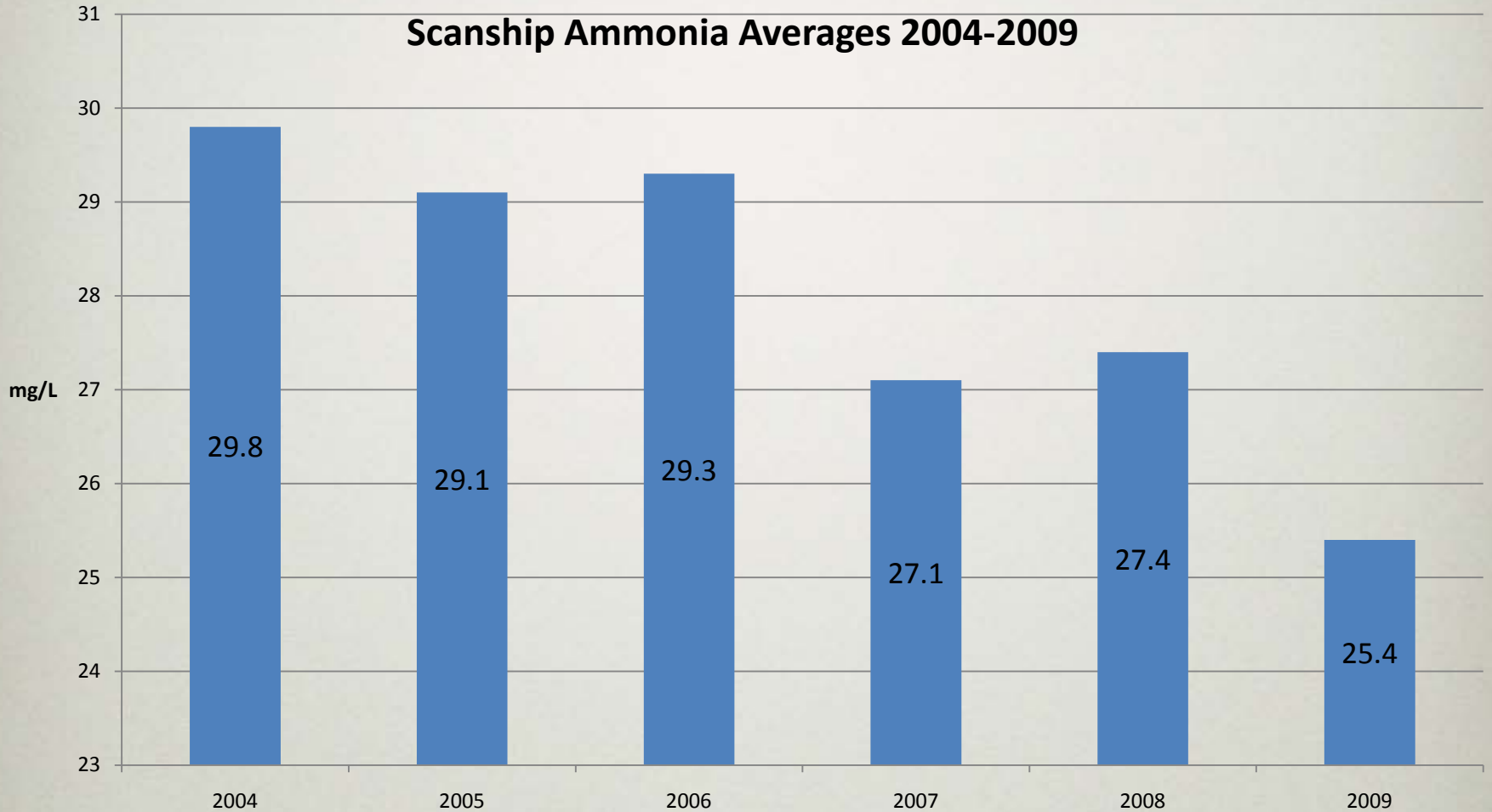


## Rochem Ammonia Samples (2004-2009)



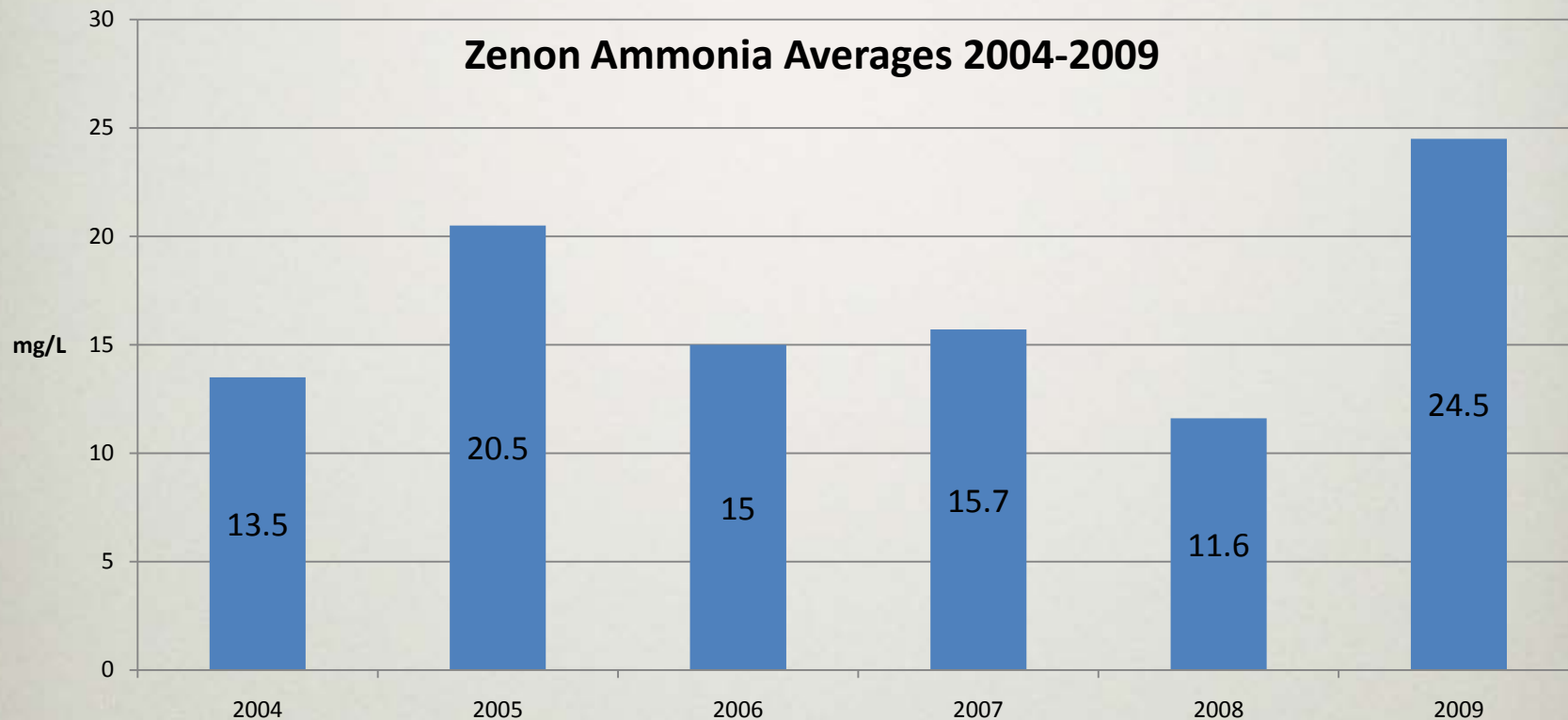
Rochem AWTS samples taken in Alaska. Includes some vessels that only discharged Graywater.

## Scanship Ammonia Averages 2004-2009



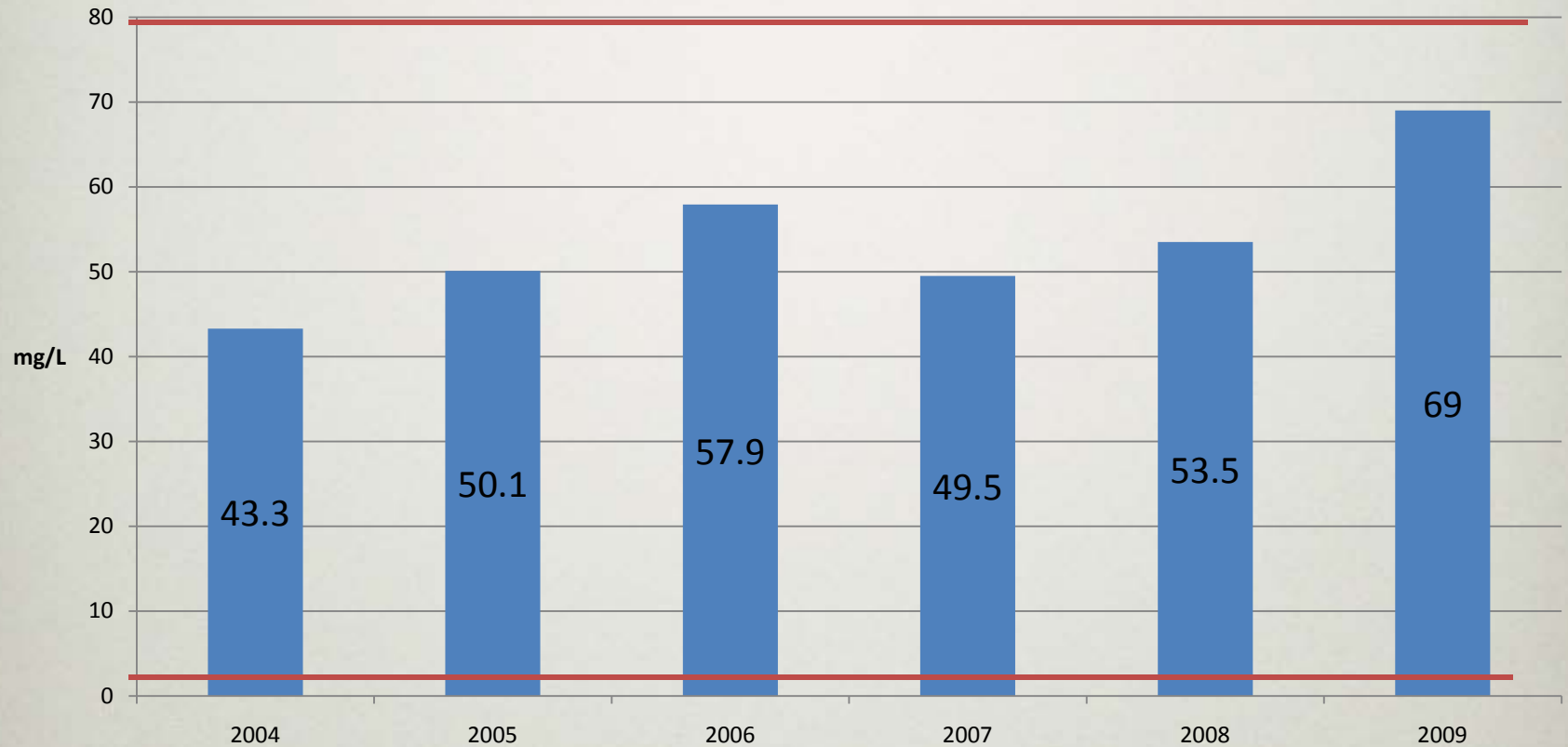
Norwegian CL and Serenade of the Seas. Based on ADEC reviewed sample results taken in Alaska.

### Zenon Ammonia Averages 2004-2009



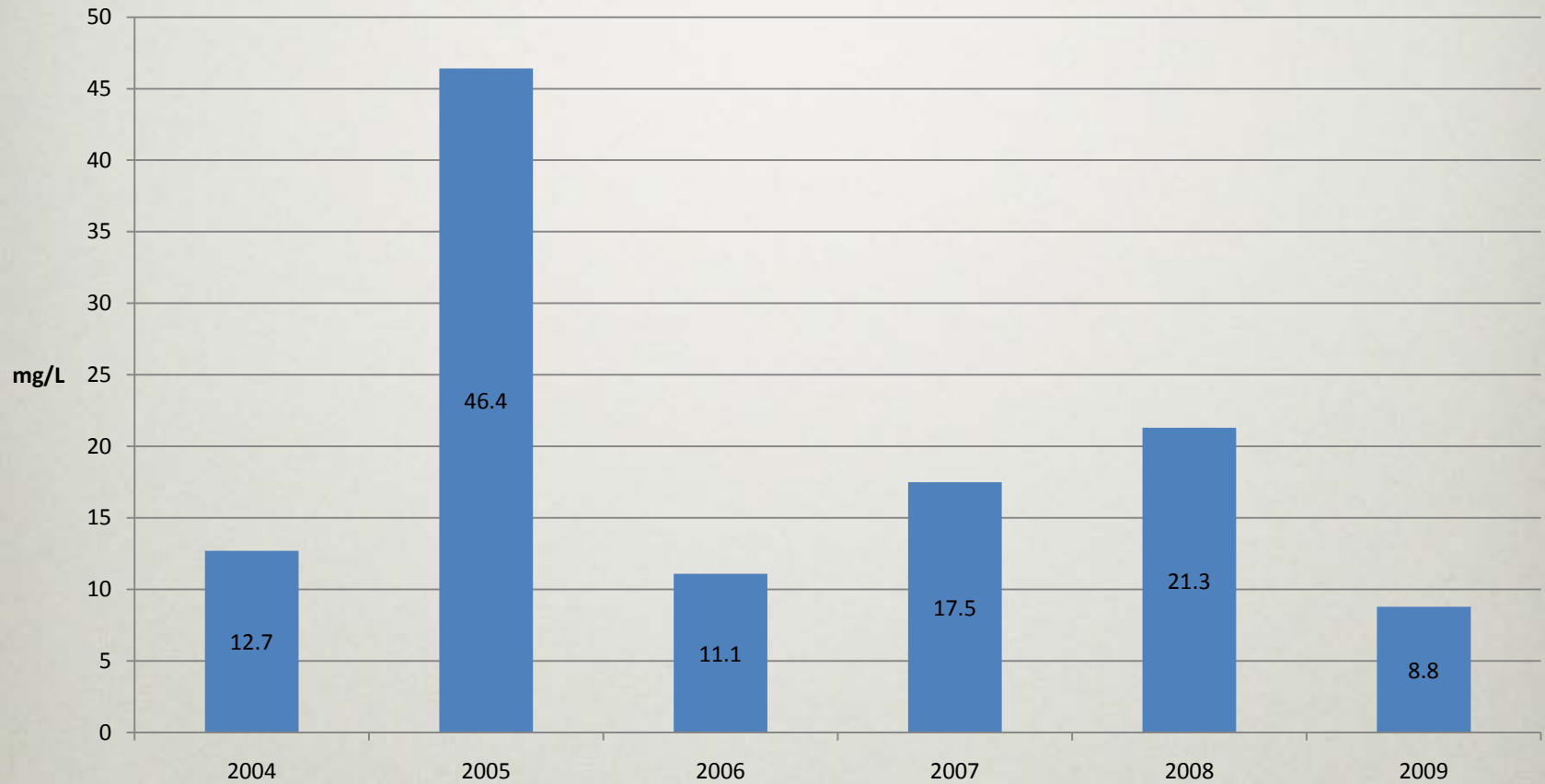
Zenon AWTS. Results based on ADEC reviewed sample data.

## Hamworthy (Princess) Ammonia Averages 2004-2009



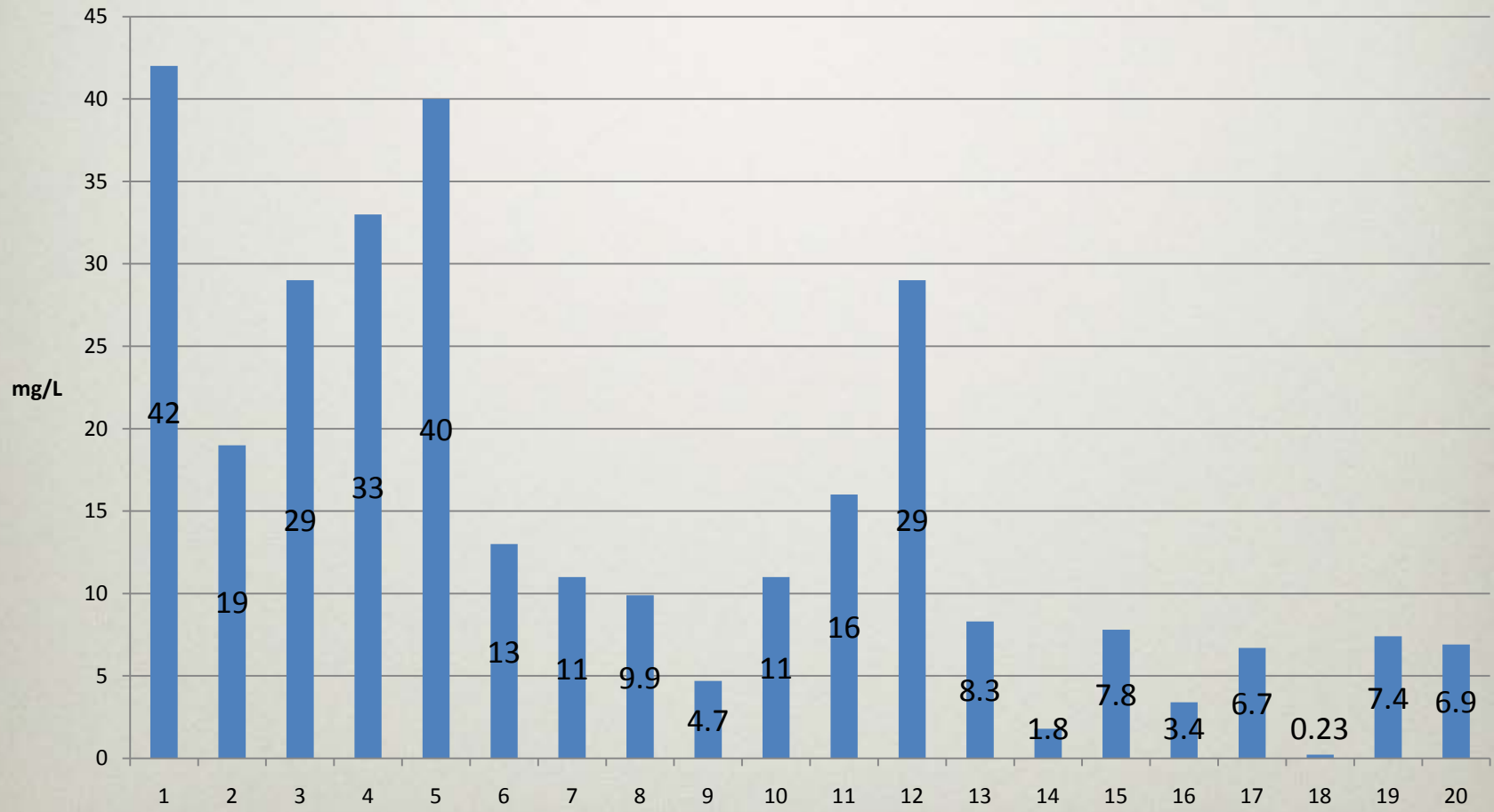
Hamworthy AWTS. Based on ADEC reviewed sample results taken in Alaska.

## Hamworthy (Seven Seas Mariner) Ammonia Averages 2004-2009



Hamworthy AWTS. Based on ADEC reviewed sample results taken in Alaska.

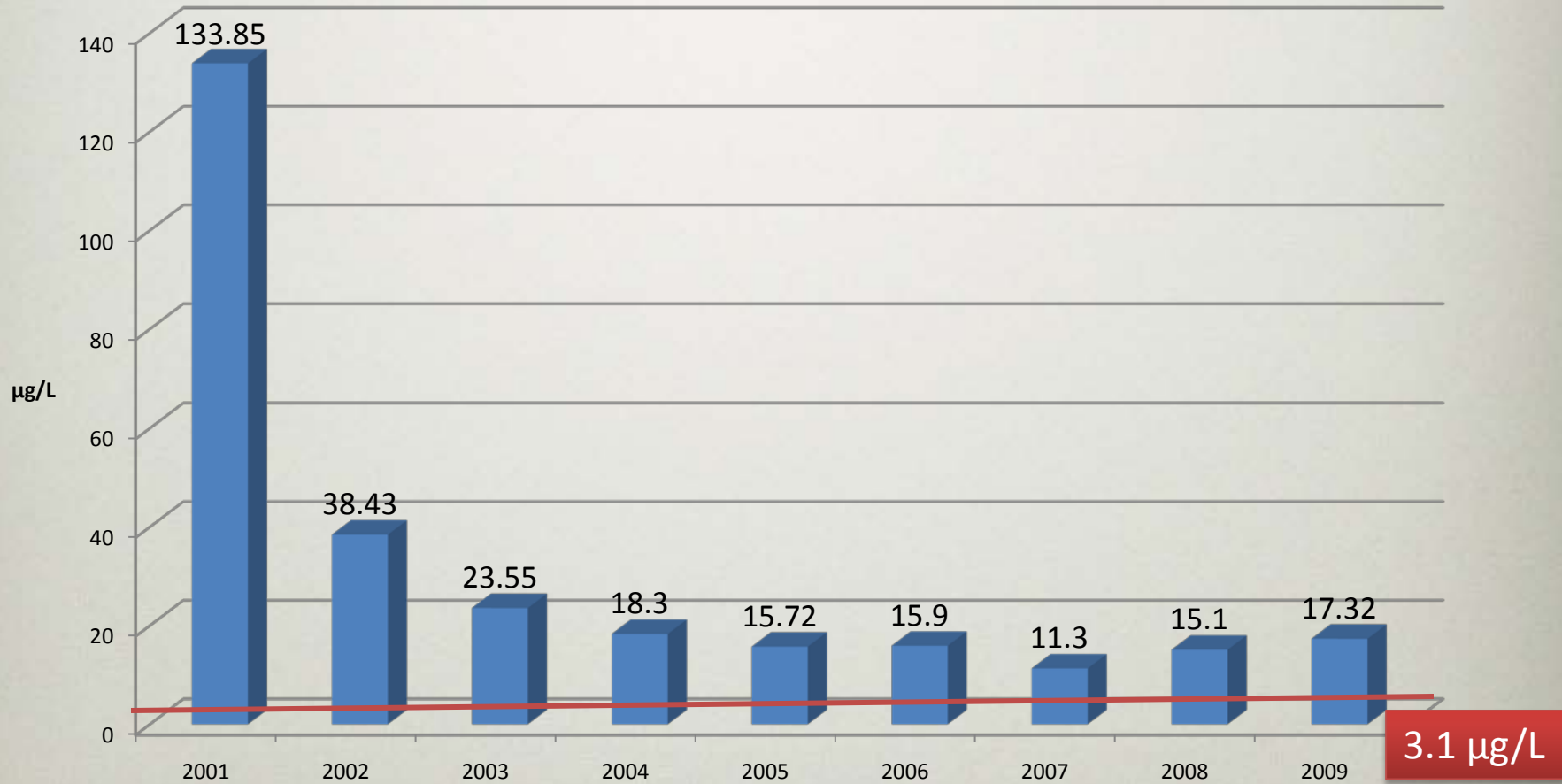
# Seven Seas Mariner 2008-2009 Results



# Priority Parameters

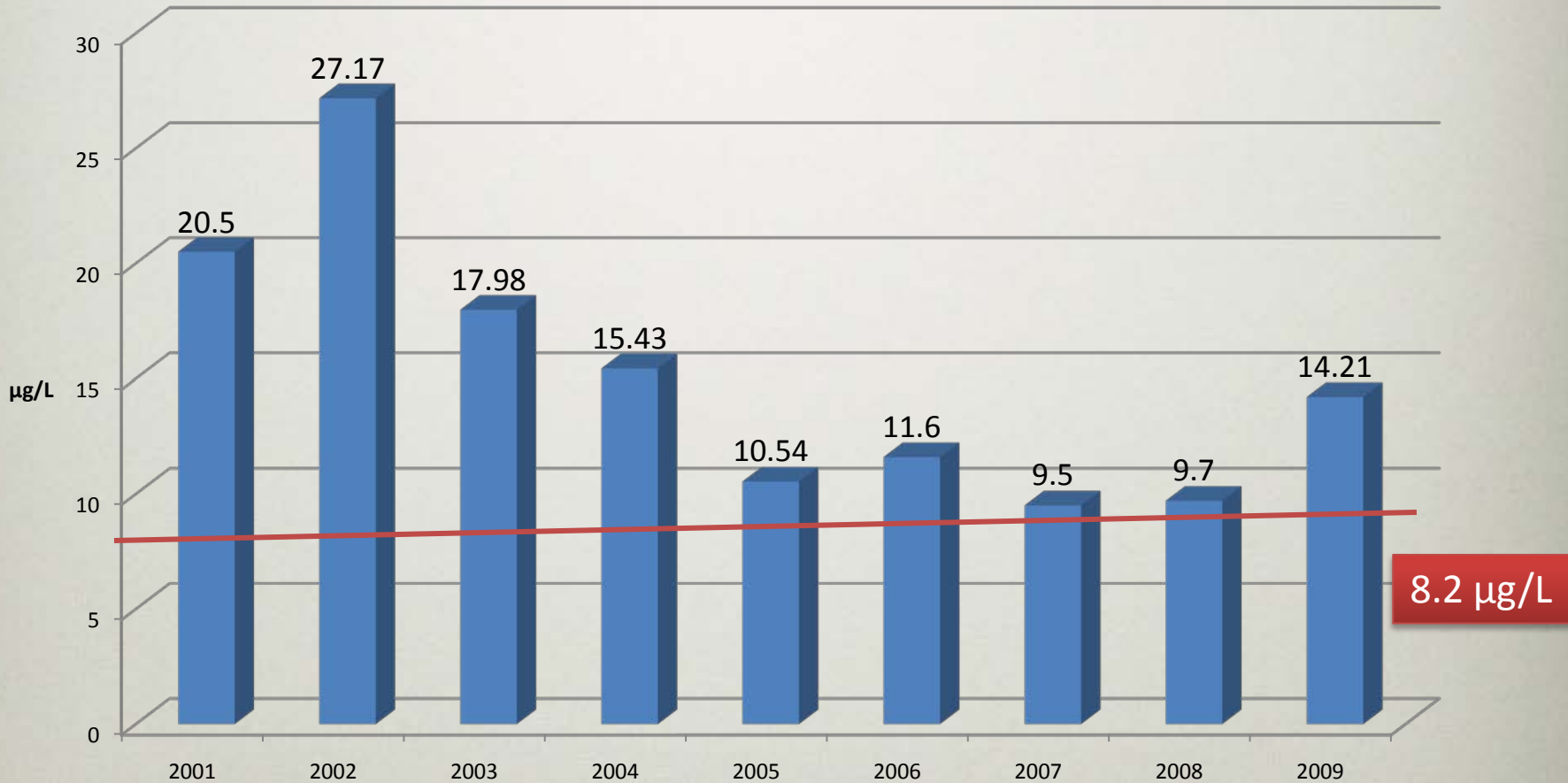
- Metals
- Volatile Organic Compounds (VOCs)
- Base/Neutral Acids (BNAs)

# Copper(Dissolved)

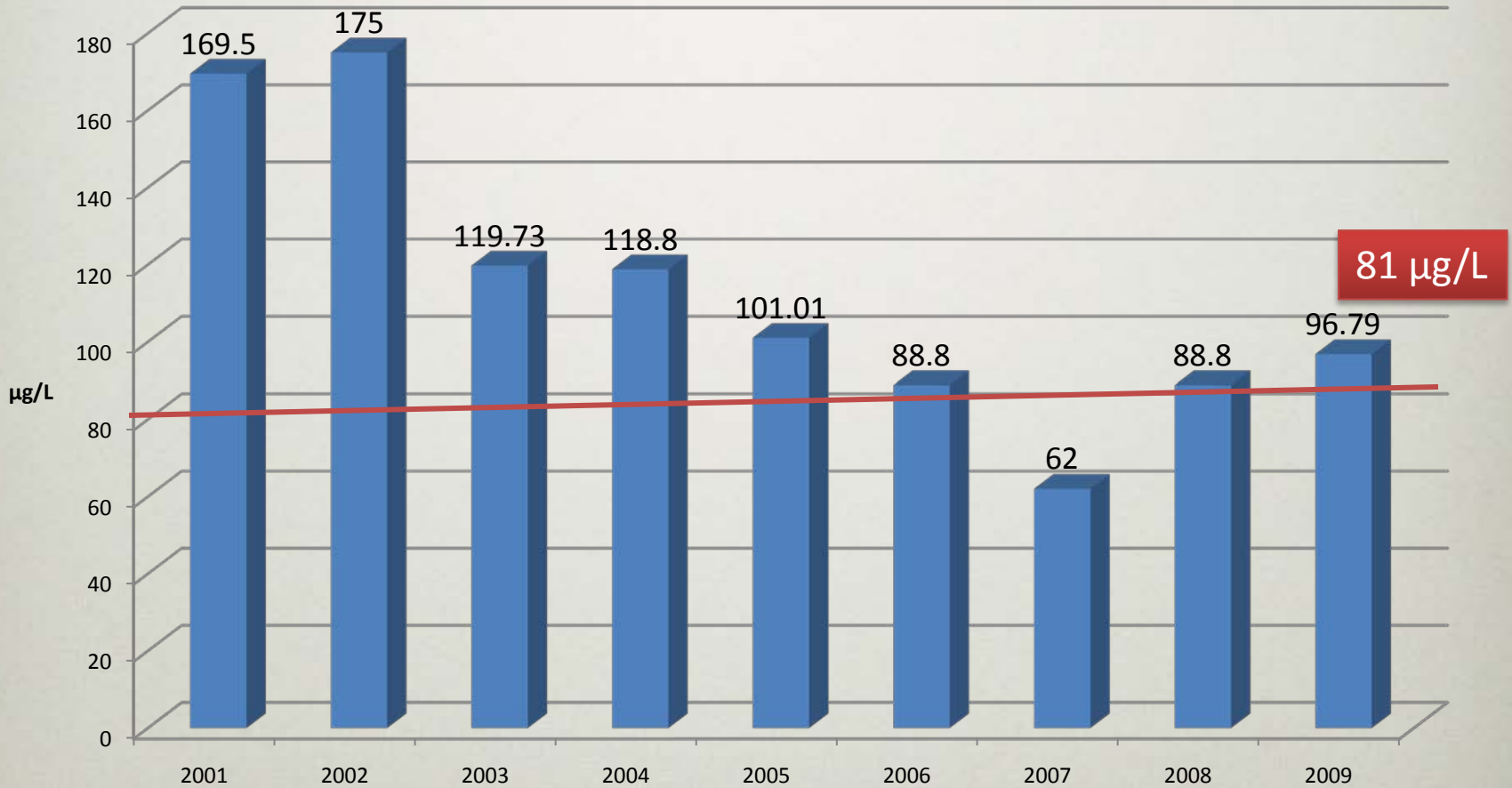




# Nickel (Dissolved)



# Zinc (Dissolved)



# Thank You

Ed White

Alaska Dept of Environmental Conservation  
CPVEC

edward.white@alaska.gov

[http://www.dec.state.ak.us/water/cruise\\_ships/reports.htm](http://www.dec.state.ak.us/water/cruise_ships/reports.htm)