

Stormwater Pollutant Assessment at the City of Kissimmee

9th Biennial Conference on Stormwater Research & Watershed Management

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PROJECT OVERVIEW



- 1988 City of Kissimmee Stormwater Drainage Plan
- 1988 – 2004 Drainage Program
- 2003 – National Pollutant Discharge Elimination System (NPDES) Permit Issued
- 2004 - Total Maximum Daily Load (TMDL) – Group 4
 - Lake Toho North (Ammonia, Nutrients, Mercury)
 - Shingle Creek (DO, Coliforms, Nutrients, Turbidity, BOD)
- 2004 City Funds Stormwater Utility
- 2005 City Initiates Stormwater Monitoring & Modeling Project

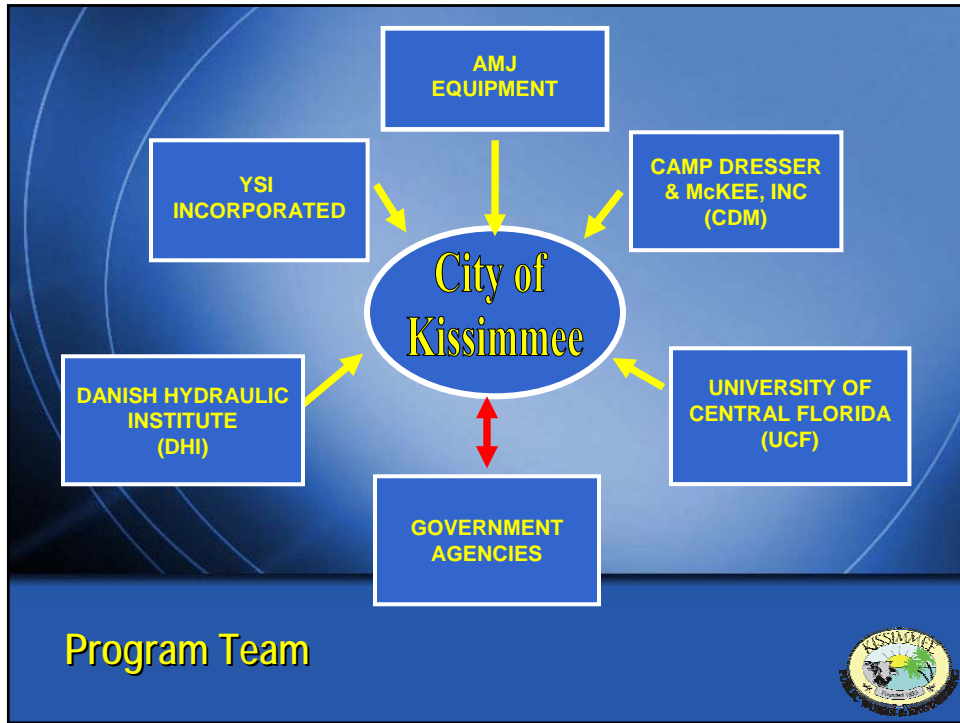
Program History



- Stormwater System Monitoring
- Flood Control for New Development
- Water Quality Management (TMDL & NPDES)
- Stormwater Retrofit Prioritization
- Continuing Operation & Maintenance Program
- Stormwater Reuse Opportunities (TWA)
- Grant Funding Opportunities (SFWMD & FDEP)

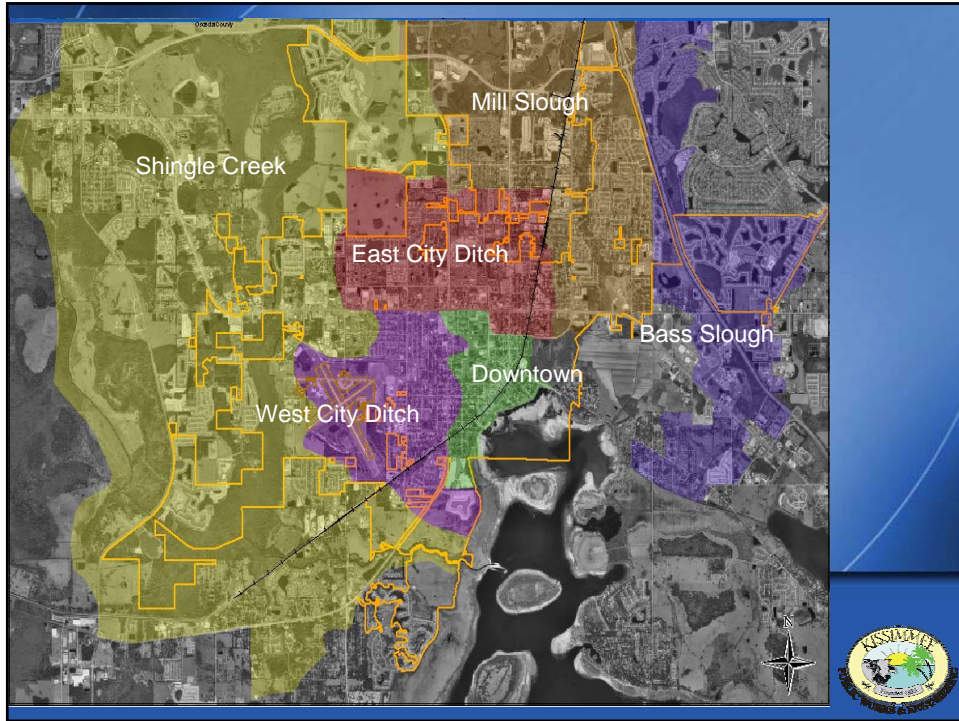
Stormwater Monitoring & Modeling Objectives





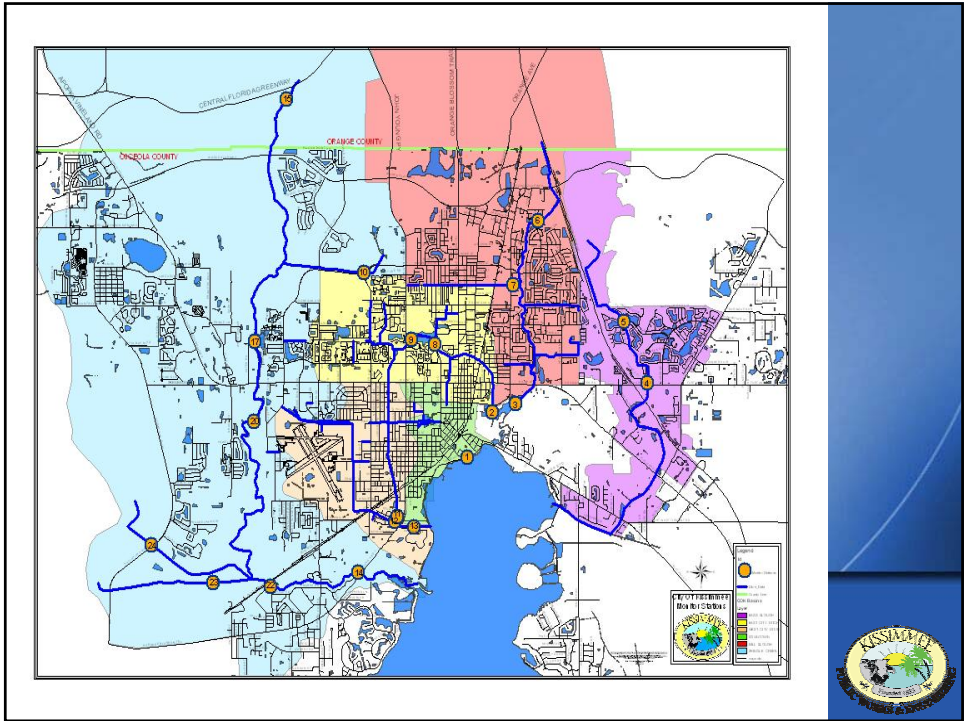
DRAINAGE BASINS

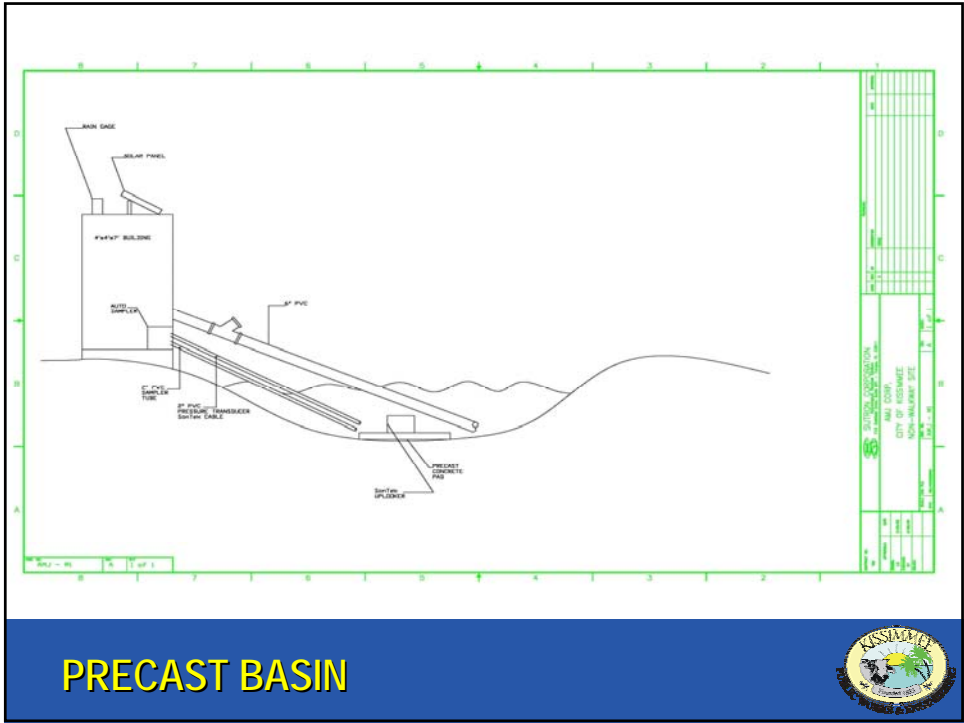




WATER QUALITY MONITORING STATIONS







U-CHANNEL INSTALLATION



U-CHANNEL INSTALLATION





U-CHANNEL INSTALLATION



U-CHANNEL INSTALLATION





U-CHANNEL INSTALLATION



U-CHANNEL INSTALLATION





U-CHANNEL INSTALLATION



U-CHANNEL INSTALLATION





U-CHANNEL INSTALLATION



ISCO Automatic Water Sampler

In-situ NOx, Relative Fluor., and Water Level JD 117-118

JD	NOx surface (µM)	NOx bottom	Water Level (ft)	surface fluorescence
100	12.0	10.0	8.0	10.0
400	10.0	8.0	7.0	8.0
700	12.0	10.0	8.0	10.0
1000	10.0	8.0	7.0	8.0
1300	12.0	10.0	8.0	10.0
1600	10.0	8.0	7.0	8.0
1900	18.0	16.0	10.0	16.0
2200	10.0	8.0	8.0	10.0
2500	12.0	10.0	8.0	10.0
2800	10.0	8.0	7.0	8.0
3100	12.0	10.0	8.0	10.0
3400	10.0	8.0	7.0	8.0
3700	12.0	10.0	8.0	10.0
4000	10.0	8.0	7.0	8.0
4300	12.0	10.0	8.0	10.0
4600	10.0	8.0	7.0	8.0
4900	12.0	10.0	8.0	10.0
5200	10.0	8.0	7.0	8.0
5500	12.0	10.0	8.0	10.0
5800	10.0	8.0	7.0	8.0
6100	12.0	10.0	8.0	10.0
6400	10.0	8.0	7.0	8.0
6700	12.0	10.0	8.0	10.0
7000	10.0	8.0	7.0	8.0
7300	12.0	10.0	8.0	10.0
7600	10.0	8.0	7.0	8.0
7900	12.0	10.0	8.0	10.0
8200	10.0	8.0	7.0	8.0
8500	12.0	10.0	8.0	10.0
8800	10.0	8.0	7.0	8.0
9100	12.0	10.0	8.0	10.0
9400	10.0	8.0	7.0	8.0
9700	12.0	10.0	8.0	10.0
10000	10.0	8.0	7.0	8.0

- Depth
- pH
- Rapid-Pulse DO
- Turbidity
- Temperature
- Chlorophyll
- Conductivity
- Salinity

- Water level
- Water Velocity
- Flow
- Discharge

Monitoring for Both Quantity and Quality

- Coliform (Fecal and Total)
- Nutrients (Nitrogen, Phosphorus)
- Metals (Arsenic, Barium, Cadmium, Chromium, Copper, Iron, Lead, Mercury, Nickel, Selenium, Silver, Zinc)
- Total Petroleum Hydrocarbons
- Solids (TSS and TDS)
- DO, BOD, COD
- pH, Hardness, Turbidity

Monitored Constituents and Parameters

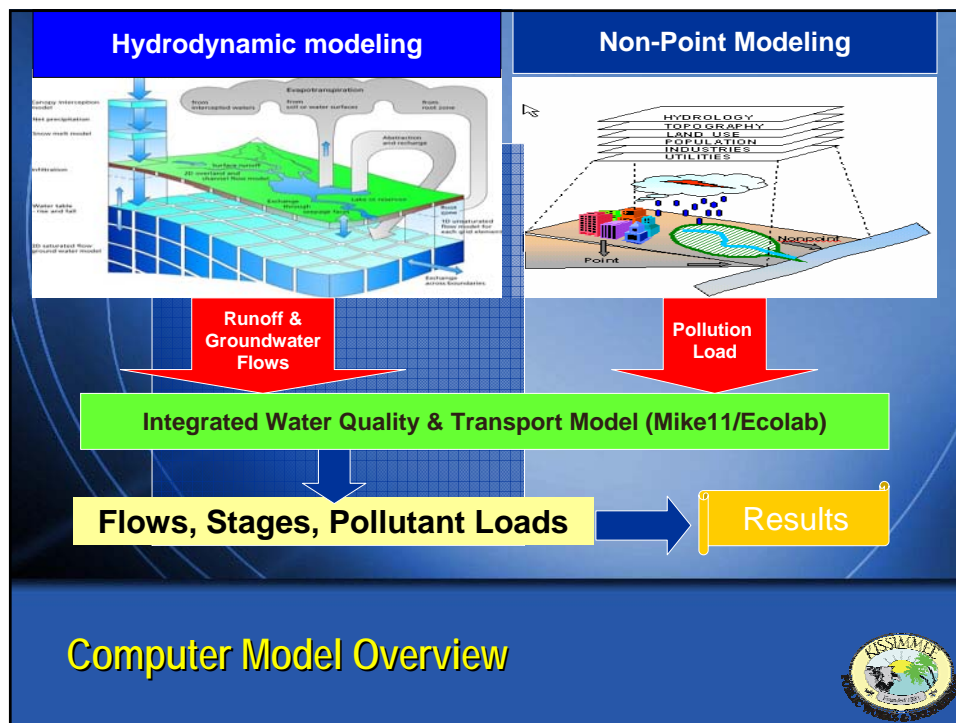


COMPUTER MODEL



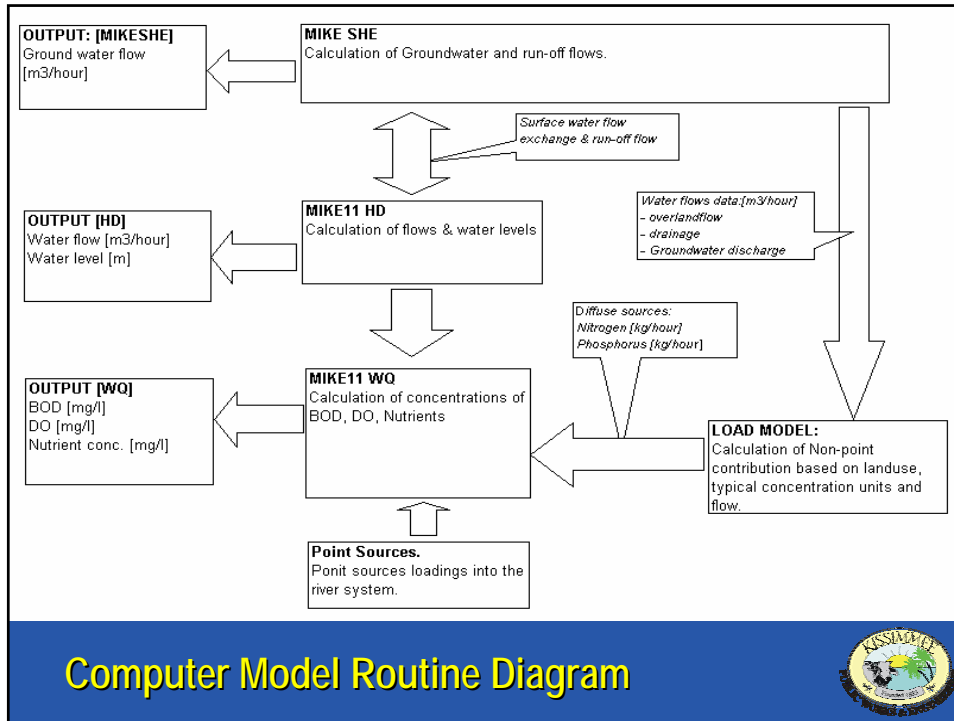
- Historical Modeling
 - ICPR and HEC-2
- State-of-the-Art Integrated Modeling
 - MIKE 11 (Surface Water Model)
 - MIKE SHE (Ground Water Model)
 - ECO Lab (Water Quality Model)
- Refine Upon City's Comprehensive GIS Data

Computer Modeling Approach




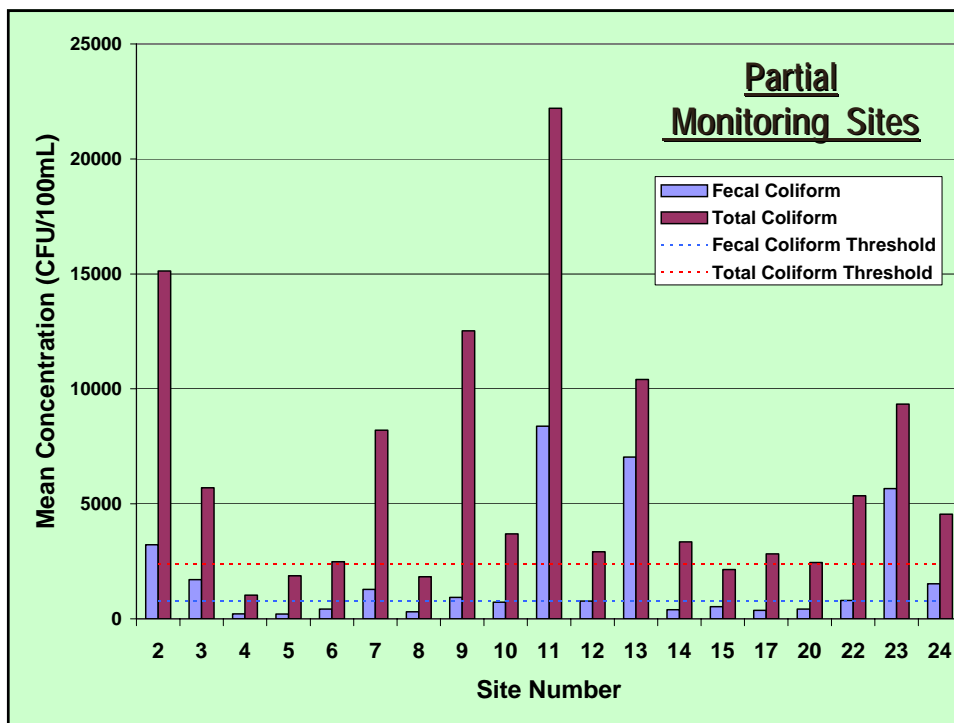
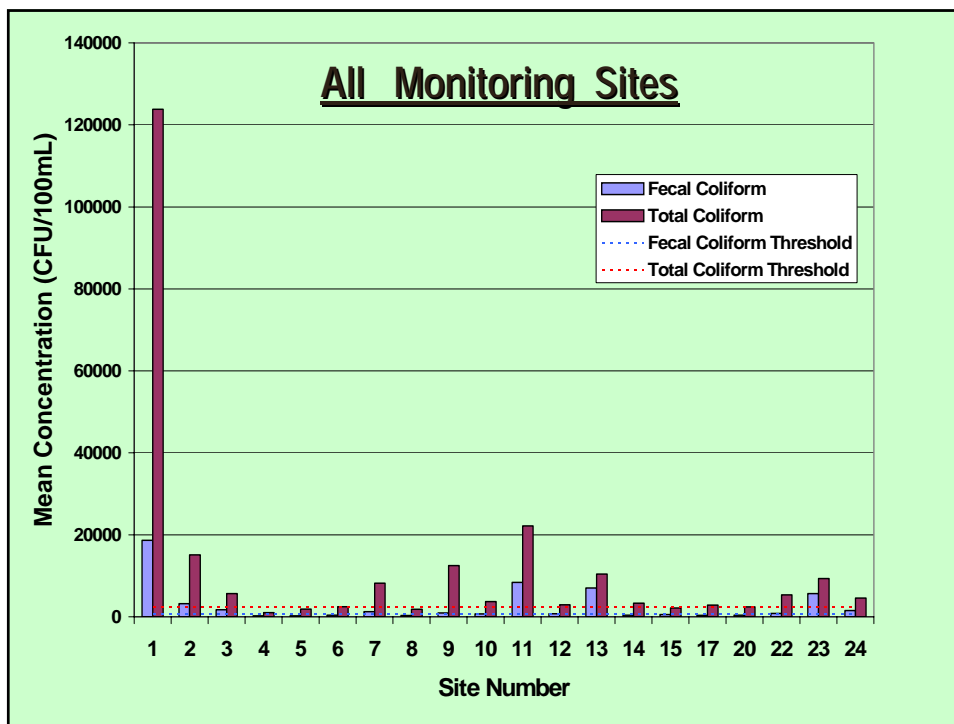
Computer Model Overview

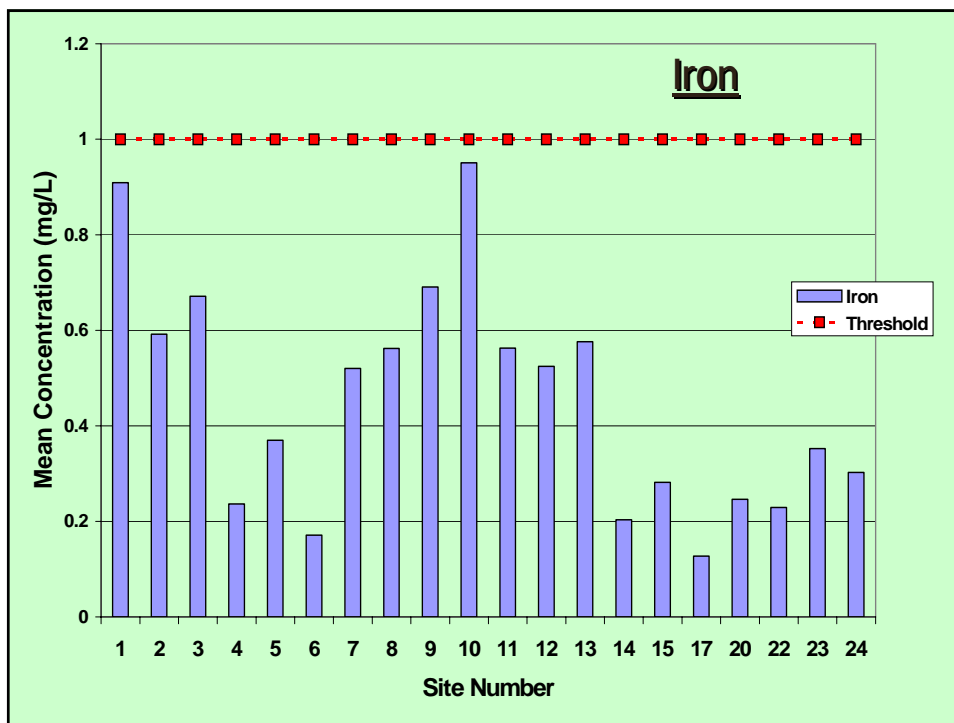
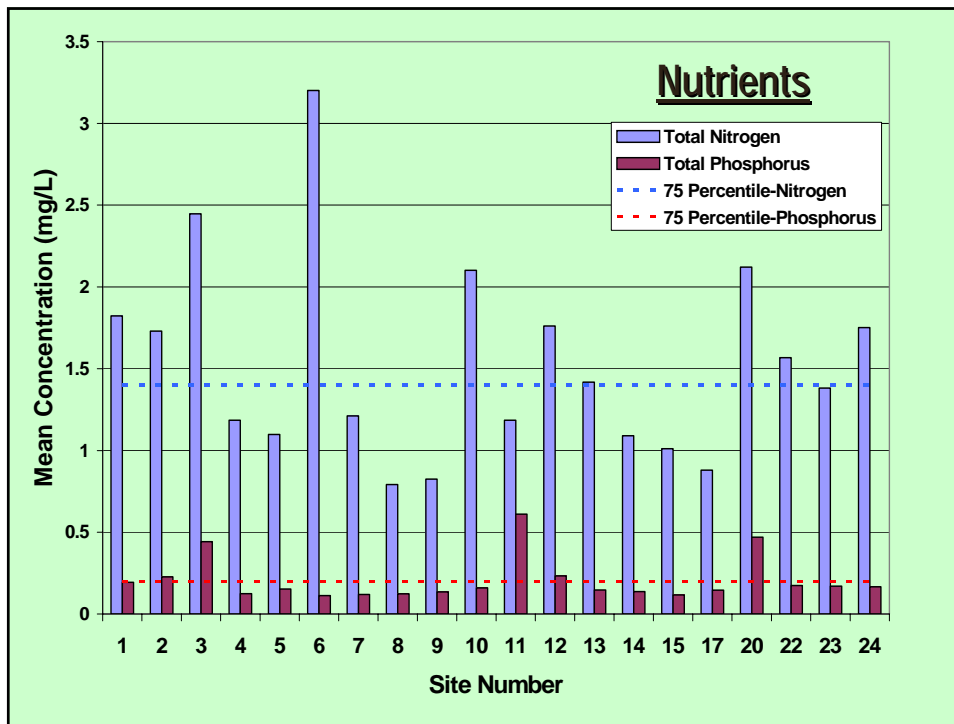


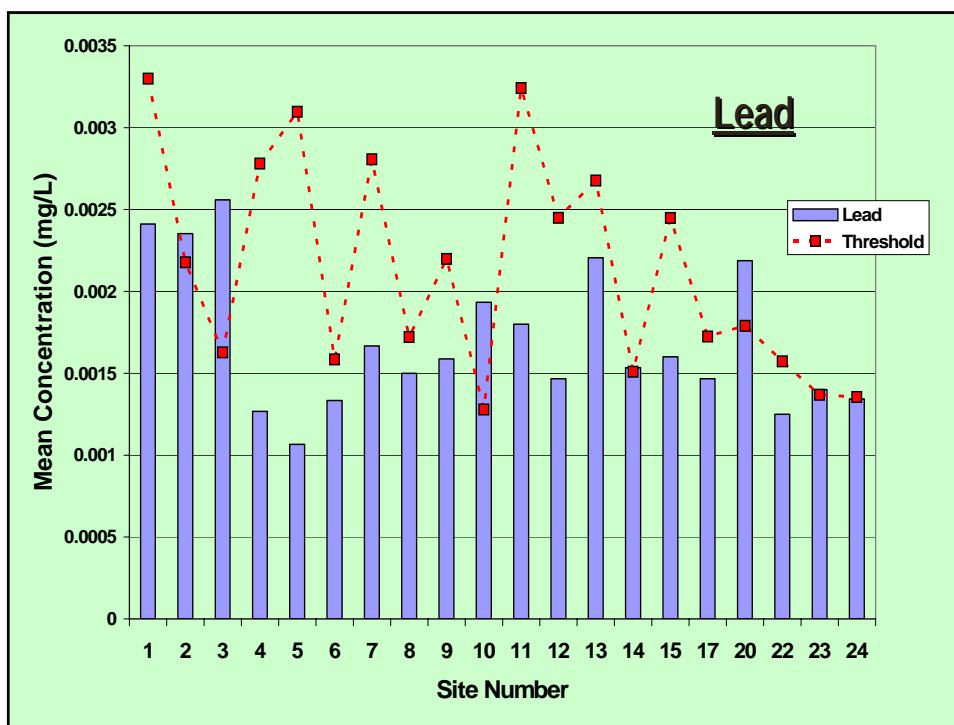
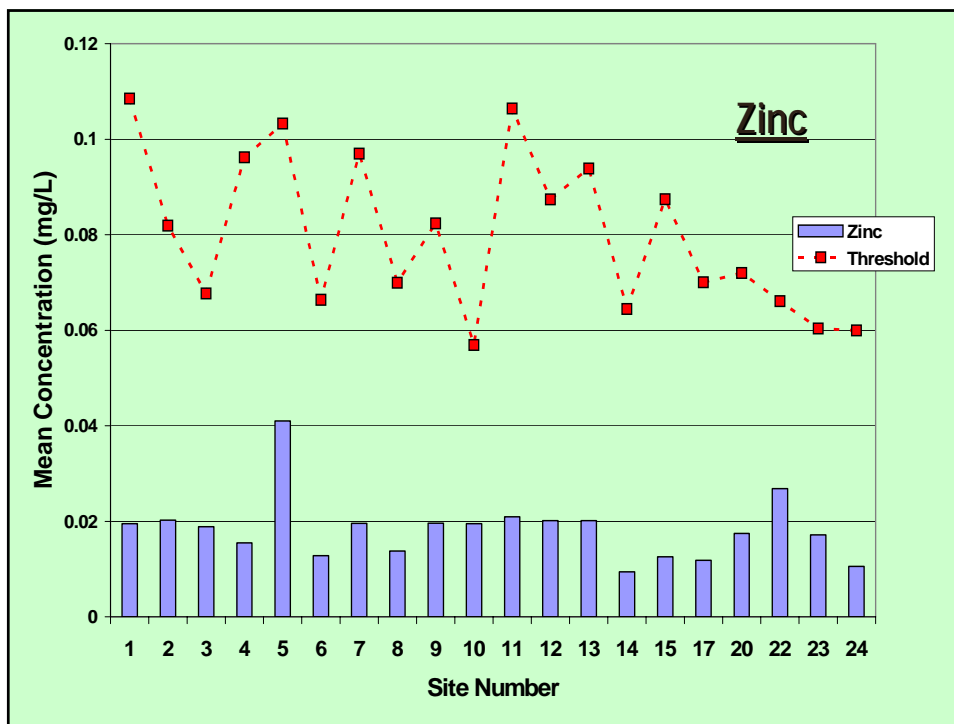


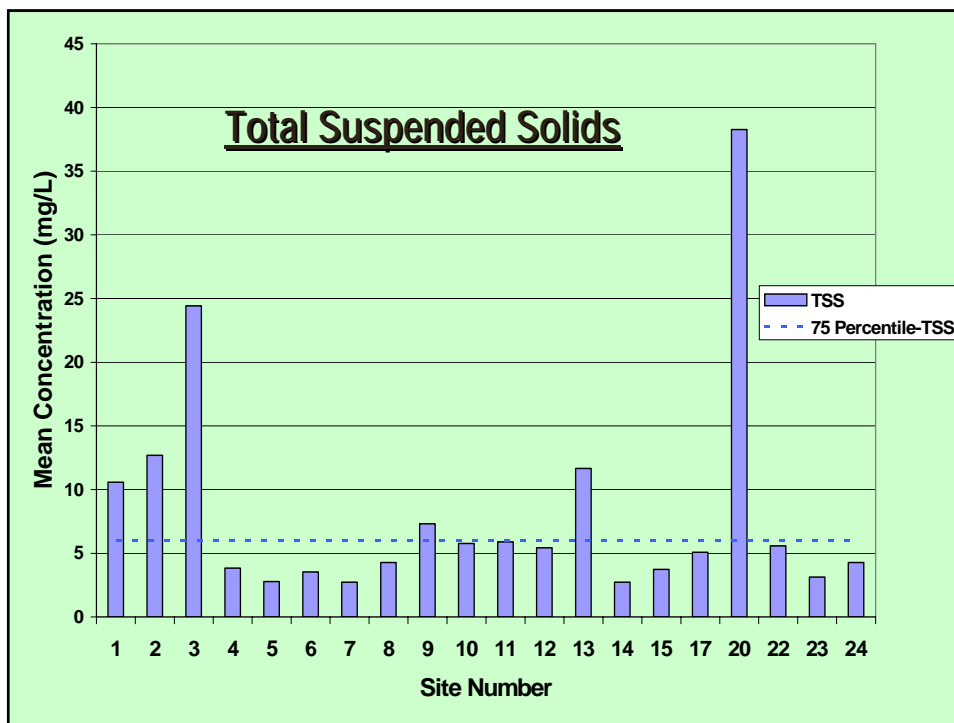
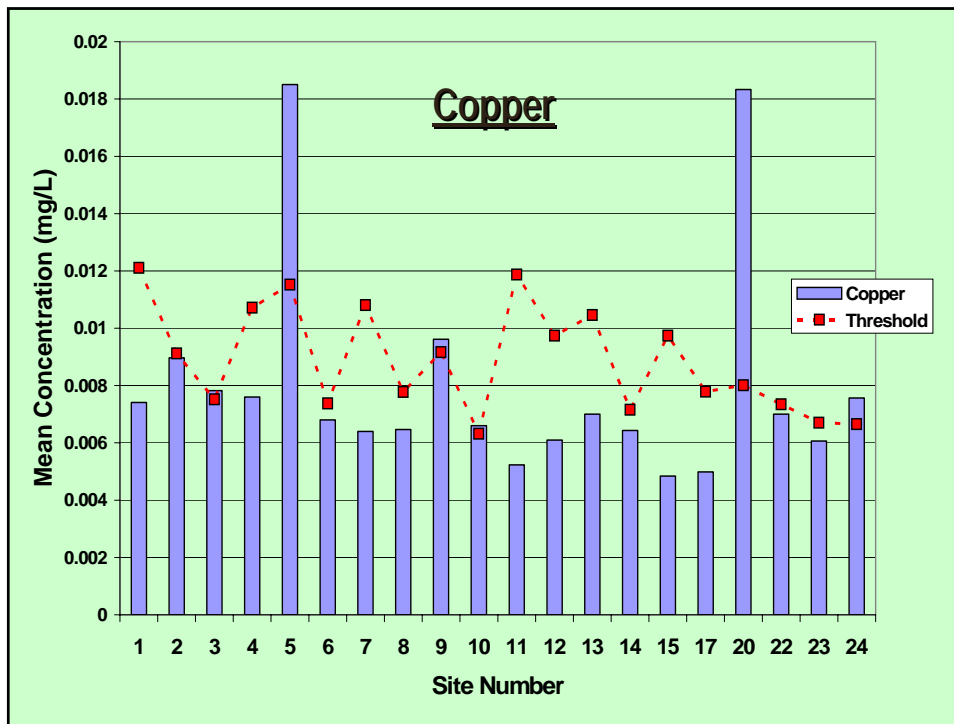
PRELIMINARY RESULTS

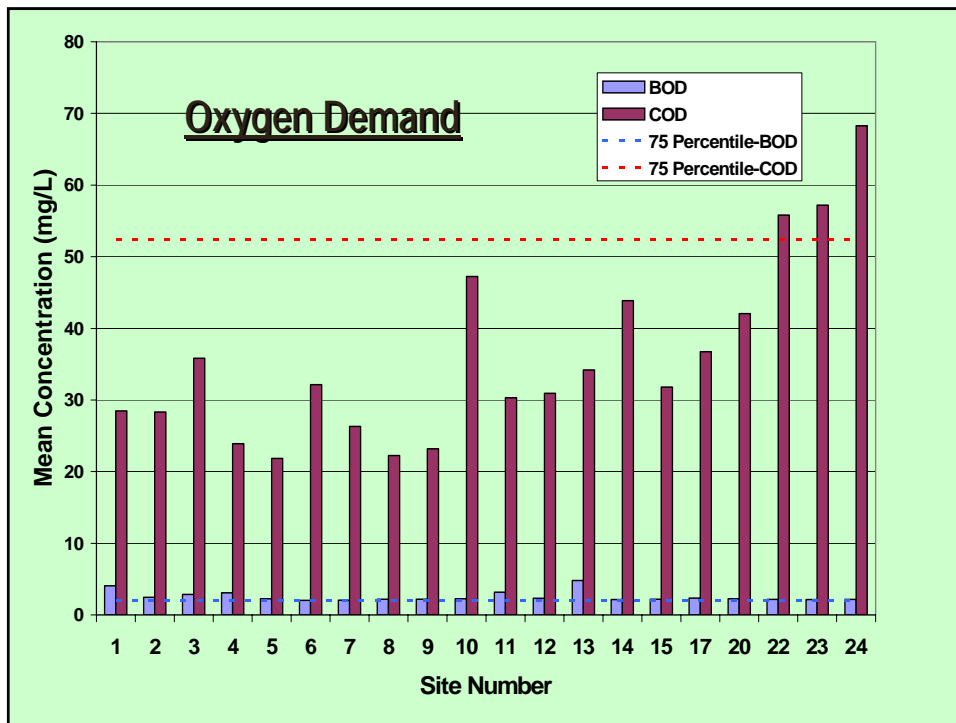
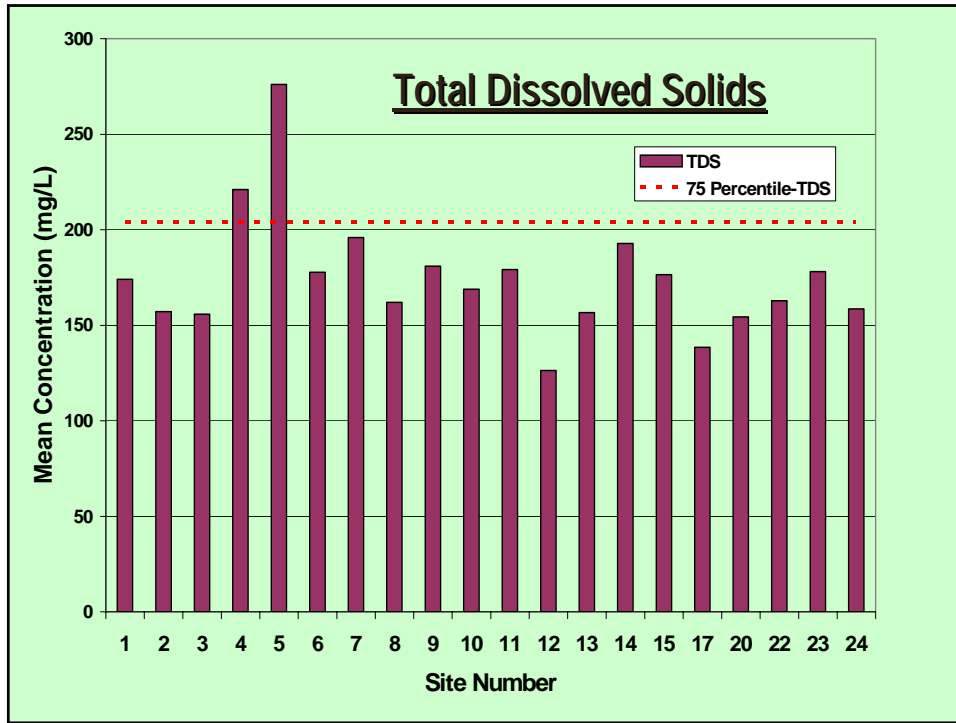












ANY QUESTIONS ?

