

# WWTP Capacity vs. Future Growth

## ► Purpose:

- To provide an annual update to Council on available capacity at the WWTP
- Ensure that planning is ongoing to allow continued growth
- Stay up to date with ever changing regulations



# Components of Treatment Capacity

## ▶ Hydraulic Loading:

- Amount of water that enters the treatment plant or individual process.

## ▶ Organic Loadings:

- Pollutants that originate from an organic source and exert a dissolved oxygen demand. This type of pollutant is measured with CBOD analysis.

## ▶ Organic/Inorganic Loadings:

- Pollutants that originate from organic and inorganic sources that exert a dissolved oxygen demand. This type of pollutant is measured with COD analysis.

## ▶ Solids Loadings:

- Pollutants that are not dissolved in water. They can be organic or inorganic and are removed through sedimentation, filtration, or biologic treatment.

## ▶ Operational Condition of Plant Processes and Equipment

# Interesting Facts

- ▶ Sidney's WWTP receives 45% of flow and 65% of loading from Industrial customers
  - Based on 2008 YTD flow, Sidney has a population equivalent of a City with nearly 70,000 people. (58,800 PE 2007 Data)
  - Based on Loading, Sidney has a population equivalent of a city with nearly 49,294 people. (60,200 PE 2007 Data)
- ▶ Sidney's WWTP operates with a staffing level of about 55-65% of other similar sized treatment plants.
- ▶ The Sidney WWTP's Automation System (SCADA), equipment automation and continuous monitoring is one of the most extensive and complete systems in Ohio.
- ▶ Sidney's Industrial Pretreatment Program continues to be a benchmark program.
- ▶ Sidney's excellent compliance record has resulted in biannual OEPA inspections rather than annual inspections.

# Capacity Trends

► Hydraulic Loading (Flow = MGD Million Gallons per Day)

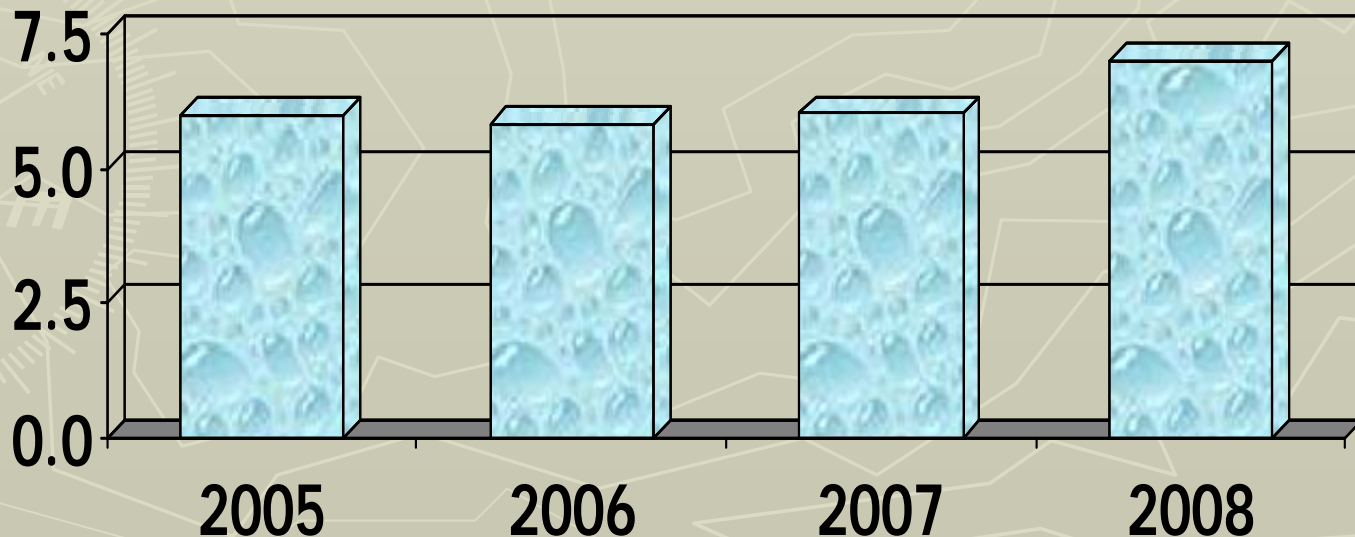
Operating Data

- 2005 **5.99** MGD
- 2006 **5.83** MGD
- 2007 **6.03** MGD
- 2008 **7.00** MGD YTD

Maximum Designed Capacity

5.0 MGD (pre-2002 Upgrade)

7.0 MGD (post-2002 Upgrade)



# Capacity Trends

- ▶ Organic/Inorganic Loading (COD – Chemical Oxygen Demand = INORGANIC & ORGANICS)

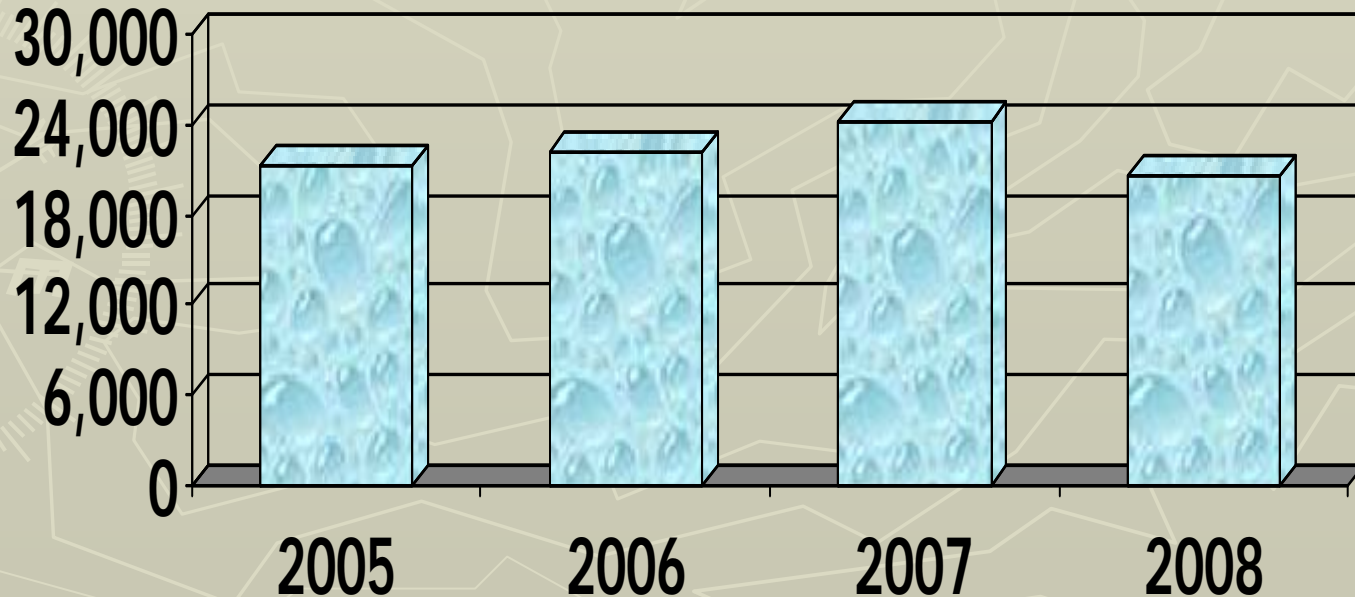
## Operating Data

- 2005 **21,306** lbs/day
- 2006 **22,249** lbs/day
- 2007 **24,154** lbs/day
- 2008 **20,686** lbs/day YTD

## Maximum Designed Capacity

22,000 lbs/day (pre-2002 Upgrade)

30,300 lbs/day (post-2002 Upgrade)



# Capacity Trends

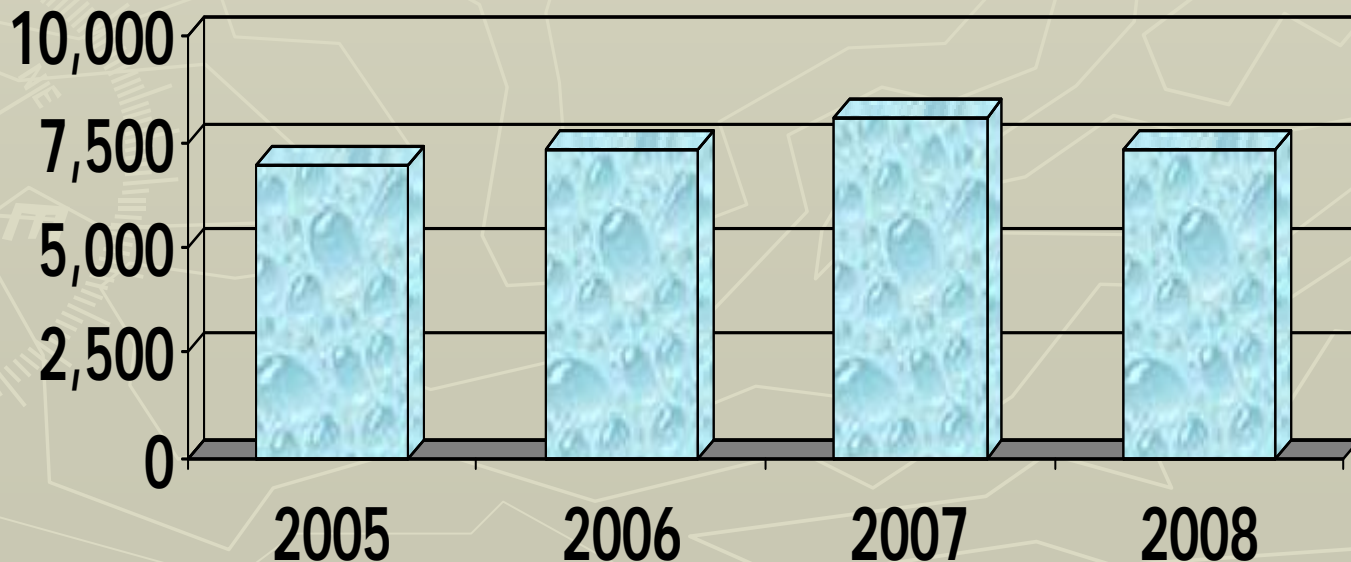
## ► Solids Loading

### Operating Data

- 2005 **6,976** lbs/day
- 2006 **7,328** lbs/day
- 2007 **8,061** lbs/day
- 2008 **7,349** lbs/day

### Maximum Designed Capacity

- 10,700 lbs/day (pre-2002 Upgrade)
- 10,700 lbs/day (post-2002 Upgrade)



# Challenges

- ▶ **Discharges that exceed the permitted limit of Industrial Users**
  - **Industrial Discharges that are non-compliant contain pollutants that can cause operational problems, NPDES Permit violations, odors/corrosion in the collection system and/or can be toxic to the WWTP microorganisms.**
    - ▶ We work closely with the IUs in question to return to compliance.
    - ▶ No NPDES Permit violations or significant operational problems attributed to IU discharges.
  
- ▶ **Hydraulic capacity of Solids Treatment Process**
  - **Average solids hydraulic loading is at 86% of capacity**
  - **Solids Treatment was not part of 2002 upgrade**
    - ▶ Solids Treatment process overall operates well.
    - ▶ This treatment process will be looked at in the planning study.
  
- ▶ **Minimal Staffing:**
  - **Most WWTPs sized 5.0-7.0 MGD have 11-13 FTE staff members.**
  - **Sidney's WWTP has 8 FTE staff members.**
  - **The Sidney WWTP relies heavily on automation, continuous monitoring, and a well trained and dedicated staff for efficient operation.**

# Challenges Cont'd

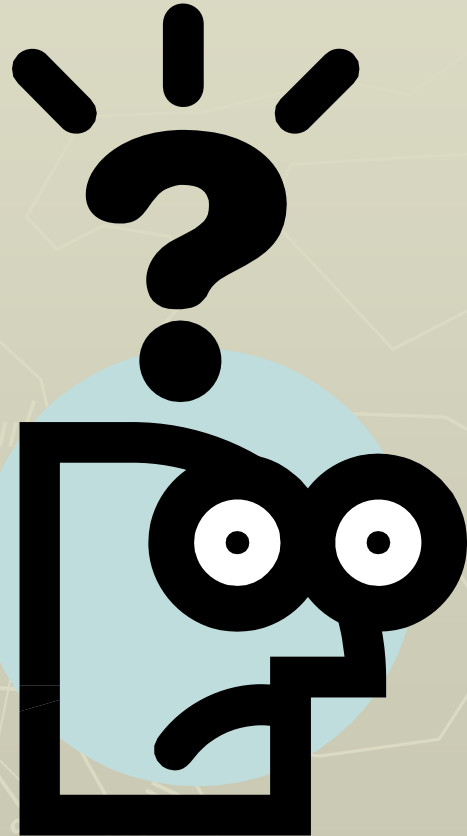
## ▶ **Process Control Equipment**

- Process control equipment that was not replaced during the 2002 expansion is nearing the end of its serviceable life
  - ▶ Many of these items are identified in the capital improvement plan and others are addressed with funding available in the operating budget.
  - ▶ Larger equipment/process replacement items will not be included in either the Five Year Plan or the Operating Budget until after the planning study has been completed.



# What does it all mean?

- ▶ **How much growth can we handle?**
  - **It depends...**
    - ▶ **What is the expected loadings from the Industrial Customer?**
      - **How much ORGANIC, INORGANIC, & SOLIDS Loading is expected?**
    - ▶ **What is the flow rate from the potential Industrial Customer?**
      - **Additional flow can have a negative impact on overall WWTP performance.**
    - ▶ **What is the make-up of the discharge?**
      - **Some compounds (TKN) are more difficult to break down than others.**
    - ▶ **What will the next NPDES permit contain?**
      - **There is a possibility that nutrient removal could be required.**
        - ▶ **Nutrients = Nitrogen & Phosphorous**
        - ▶ **Sidney's WWTP currently does not have design considerations for these type of treatment processes**



# Realistic Expectations

- ▶ How much growth can we handle?
  - Using existing Industries as a reference and based on LOADINGS:
    - ▶ **6** additional Industries equivalent to
      - Organic/Inorganic Loading

Or

    - ▶ **5** additional Industries equivalent to
      - Local Limits for Metals

Or

    - ▶ **2** additional Industries equivalent to
      - Organic Loading

Or

    - ▶ **10** additional Industries equivalent to
      - Organic Loading

The Cargill logo features the word "Cargill" in a bold, black, sans-serif font. A green leaf-like shape is positioned above the letter 'i'.The Honda logo consists of a red stylized 'H' inside a red rounded square, with the word "HONDA" in red capital letters below it.The Freshway Foods logo features a square frame with a yellow background. Inside the frame is a stylized illustration of a house and trees. Below the frame, the word "FRESHWAY" is written in a small, black, sans-serif font, and "foods" is written in a larger, black, cursive font.The MaMa Rosa's logo features the name "MaMa Rosa's" in a white, cursive font on a red, curved banner. A red rose with green leaves is positioned below the banner.

# Realistic Expectations

- ▶ How much growth can we handle?
  - Using existing Industries as a reference and based on current Design Flow:
    - ▶ 0 additional Industries equivalent to
      - Flow

Or

    - ▶ 0 additional Industries equivalent to
      - Flow

Or

    - ▶ 0 additional Industries equivalent to
      - Flow

Or

    - ▶ 0 additional Industries equivalent to
      - Flow

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# WHAT WILL THE FUTURE BRING?

## ▶ 2009 Upgrades/Projects

- The WWTP Planning Study/Master Plan
  - ▶ Completed late 2009
- OEPA Biosolids rule changes
  - ▶ Draft rules are out for review. Staff has been active in response to the proposed rule changes.
- Continue upgrading plant equipment as funds allow.
  - ▶ Hose pumps, SCADA upgrades, improved safety
- Energy Efficiency Related
  - ▶ Staff is currently reviewing available programs for Demand Response

# WHAT WILL THE FUTURE BRING?

Cont'd

## ▶ Next Upgrade Recommendations:

- Increase Solids Treatment Capacity
    - ▶ **Class A Biosolids?**
    - ▶ **Capitalize on beneficial use of methane (cogeneration)**
  - Increase Hydraulic Capacity
  - Increase Organic/Inorganic Capacity (?)
  - Increase Back-up Generator Capacity
  - Replace Chlorine disinfection with UV technology
  - Planning Study will identify short & long term needs and feasibility of energy recovery projects.
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- ## ▶ OEPA has proposed rules to Land Application of Biosolids.
- These proposed rules should have no affect on the current Biosolids Program.

# ANNUAL PRESENTATION

Staff will be presenting an overview of Capacity vs. Future Growth each September so that Council can be apprised of future needs. This is in conformance with Sidney 2020!

This will also help readily identify our ability to meet the needs of new and existing Industrial Customers.



Questions or Comments?

