City of Grand Island

Tuesday, April 08, 2008
Council Session/Study Session

Item X1

Waste Water Treatment Plant Update

This item will be discussed at the Study Session immediately following the City Council regular meeting.

Staff Contact: Steve Riehle

Council Agenda Memo

From: Steven P. Riehle, Public Works Director

Meeting: April 8, 2008

Subject: Waste Water Treatment Plant Update

Item #'s: 1

Presenter(s): Steven P. Riehle, Public Works Director

Background

Mayor Hornady, Jeff Pederson and Steve Riehle will update the city council on activities at the Grand Island Waste Water Treatment Plant.

Waste Water Update
Council will be updated on Solids Handling at the WWTP, customer breakdown, Swift loading and Swift's pre-treatment improvements. The update will include a review of past presentations on costs and the 2008 budget.

A presentation was made at the August 14th city council meeting recommending changes to the 2008 Waste Water budget before approval. On October 16, a presentation on the issue was made to Jeff Pederson, with a focus on the prospect of additions by Swift to their pre-treatment capabilities. Due to uncertainty with Swift intentions that existed at that time, further consideration of the plant improvement options contained in the August 14th presentation to the council was put on hold.

Discussion

Construction work on the expansion to Swift's anaerobic pre-treatment lagoon started on March 10th with an anticipated completion date of August 2008. Clearing and grubbing work began on the Swift/Microgy anaerobic digester complex with completion also scheduled for August 2008. City Administration is confident that Swift's pre-treatment improvements are moving along, so an update to the council is appropriate.

The August 14th council memo stated that "An acid gas digestion system can be sized to meet the current loading (without Swift) plus growth for 20 years at an estimated

construction cost of $7.5 million." The memo further stated that "Building an acid gas digestion facility while using the landfill to shave Swift's loading peaks keeps initial capital costs down, minimizes future operational costs and reduces the risk to the city." With Swift's pre-treatment improvements now underway, City administration recommends moving forward with the Request for Proposals (RFP) for the design work the $7.5 million acid gas digestion system.

It is important to note that construction of digesters at the City's WWTP will take a minimum of 18 to 24 months from design to completion, while Swift's pre-treatments improvements will come on-line in August 2008. The costs the city is incurring to operate the WWTP and dispose of sewage sludge will decline significantly once Swift's pre-treatment improvements are on-line.

Discharge Permit and Swift Update

The council will be updated on the most current information regarding the WWTP exceeding the discharge permit and discussions with Swift on measures being undertaken to reduce Swift's loading on the Grand Island WWTP.

Future Waste Water Operations

The history of the solids projects and the recent overloading of the City's WWTP warrant a discussion of how to proceed with the many projects needed to successfully operate and maintain a collection system of over 215 miles of sanitary sewer mains, 15 lift stations, and a WWTP with many structures and components dating back to the original plant construction in 1964.

Conclusion

This item is presented to the City Council in a Study Session to allow for any questions to be answered and to create a greater understanding of the issue at hand.

City Administration recommends issuance of an RFP for engineering design services related to an acid gas anaerobic digestion system with an agreement to follow for council approval.

Grand Island's Wastewater Treatment Plant

Update

April 8, 2008

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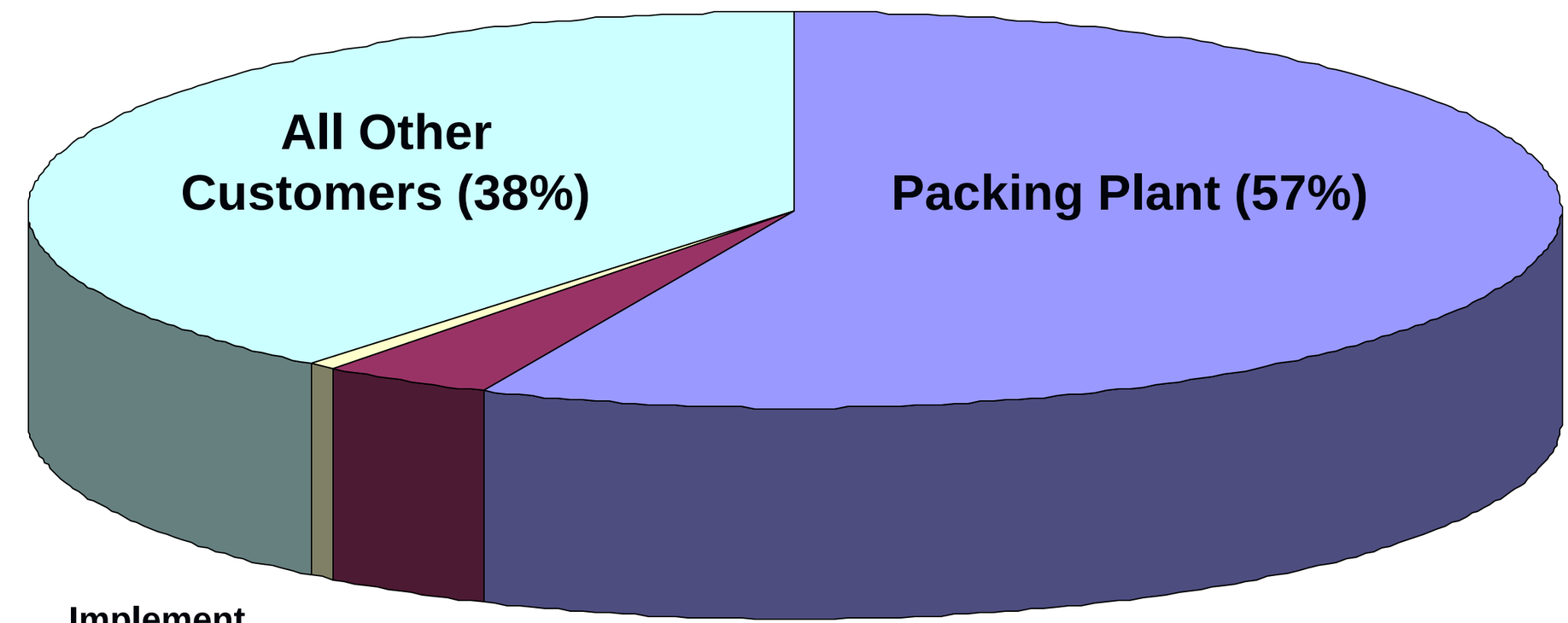
Waste Water Update

- **Solids Handling**
  - Customer Breakdown
  - Swift Loading
  - Swift's Pre-treatment Improvements
  - Review of Past Council Presentations
  - Costs for Solids Handling Alternatives
  - 2008 Budget Discussions
  - Solids Handling Recommendation
- **Discharge Permit and Swift Update**
- **Future Waste Water Operations**

City's Top Wastewater Customers



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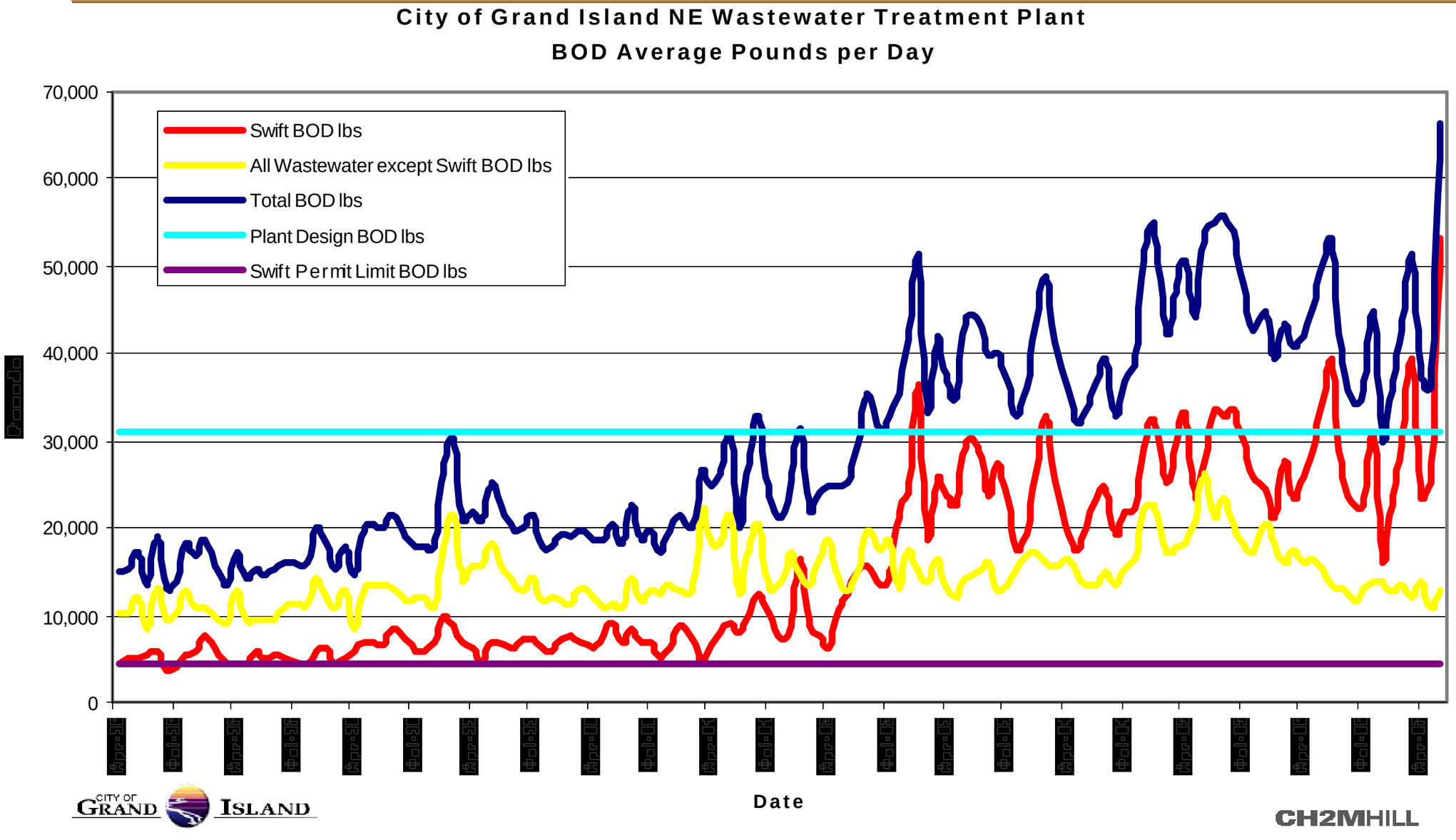
Packing Plant
BOD Loading: Last 10 years



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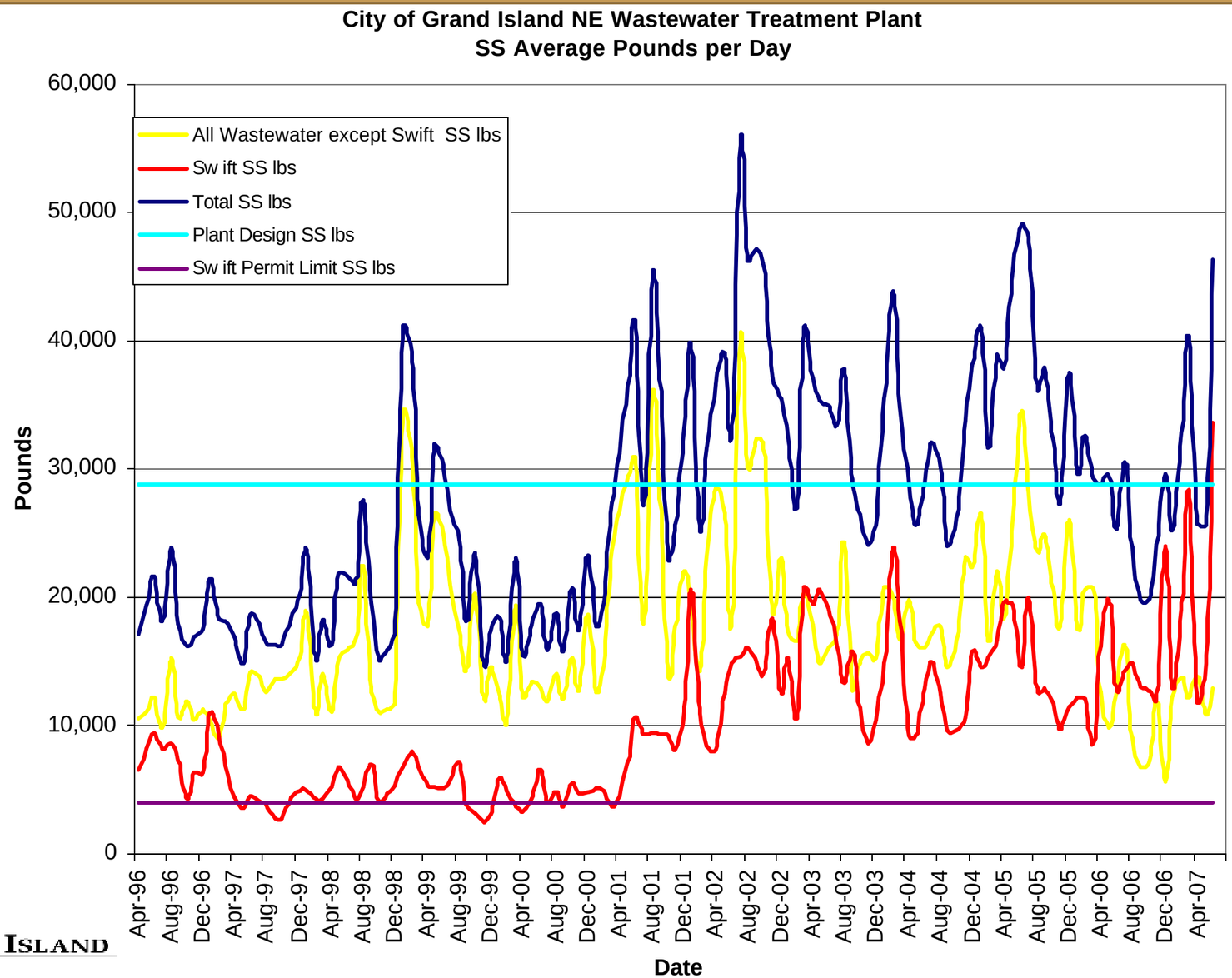
Packing Plant
Suspended Solids Loading: Last 10 years



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Swift Operations

- **Permit**
  - BOD: 4,250 lbs per day
  - SS: 4,000 lbs per day
- **Current**
  - BOD: 1,800 mg/L
    - *YTD Avg 32,400 lbs per day*
    - *Max Daily – 217,300 lbs per day*
  - SS: 1,100 mg/L
    - *YTD Avg 12,600 lbs per day*
    - *Max Daily – 179,600 lbs per day*
  - Annual Pre-Tax Revenue: $4.2M
- **Proposed pre-treatment improvements**
  - BOD: 10,000-13,400 lbs per day
  - SS: 10,000-13,400 lbs per day
  - Annual Pre-Tax Revenue: $2.8M - $3.3M

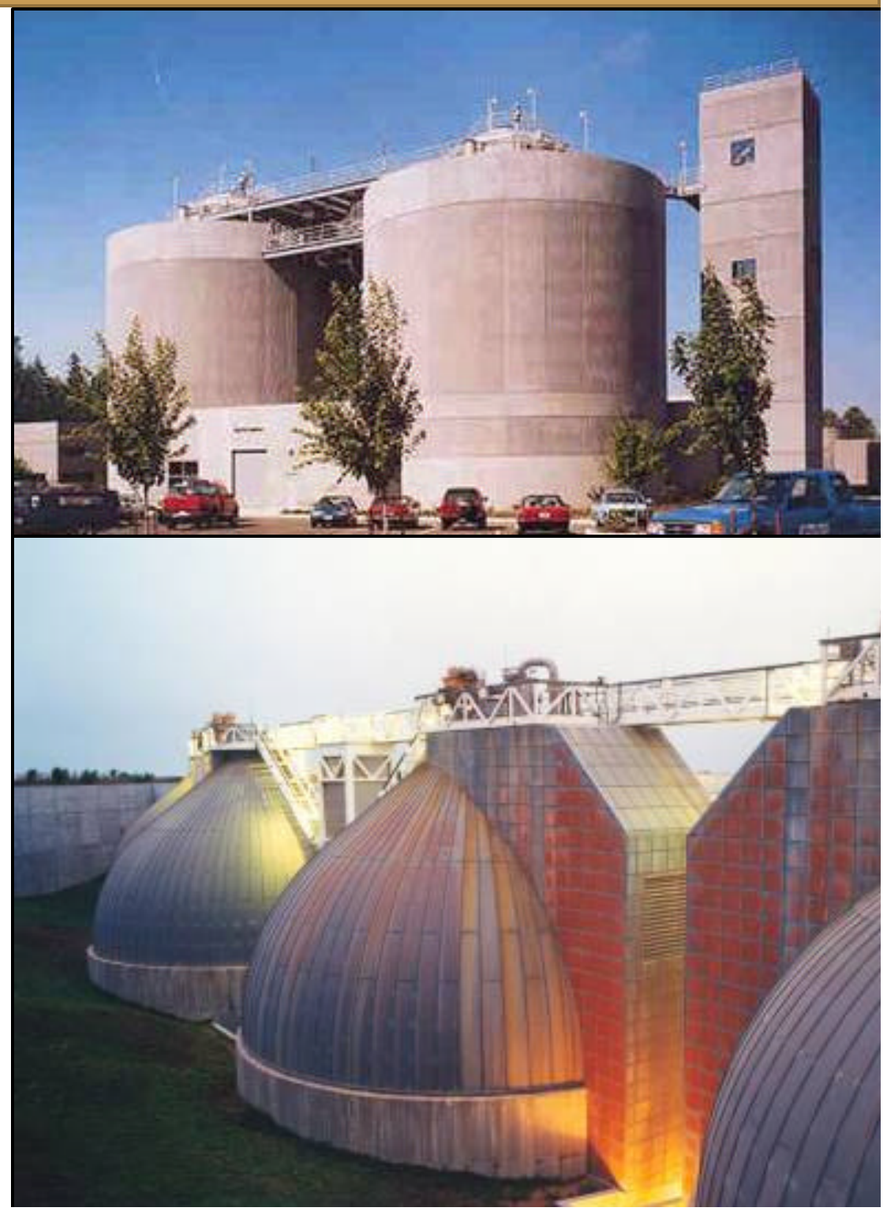
Current WWTP Capacity
BOD: 30,850 lbs per day
SS: 28,825 lbs per day

Previous Solids Handling Presentations to City Council

- **January 31, 2006**
  - Identified immediate response measures to curb odors originating from the WWTP
    - *Landfill sludge*
    - *Pilot ASP Composting*
    - *Evaluate long-term sludge handling improvements*
      - Anaerobic digestion and land application of sludge
      - ASP composting and land application of sludge
      - Landfill disposal
- **June 6, 2006**
  - Presented present worth and qualitative evaluation of solids handling alternatives
  - Recommended City implement anaerobic digestion which had lowest present worth and highest benefit cost score.
- **August 29, 2006**
  - Presented financial evaluation and funding alternatives for long-term solids handling improvements
  - Recommendations
    - *Implement short term ASP for reduced O&M and long-term operational flexibility - finance through revenue bonds*
    - *Obtain Take-or-Pay agreement from Swift*
    - *Long-term solution – 2 phase anaerobic digestion: finance through revenue bonds once take-or-pay agreement finalized with Swift*

Anaerobic Digestion Advantages

- Reliable and consistent process – widely used with successful track record
- Lowest O&M costs
- Major reduction in solids
- Pathogen reduction (Class B) allows immediate land application
- Improved de-watering ability of solids
- Enclosed to control odors
- Potential beneficial use of digester gas



Long-Term Solids Handling Options
Present Worth Analysis
(June 6, 2006 City Council Presentation)

Alternative	Capital Cost	O&M Cost	Present Worth Cost
Acid Gas Anaerobic Digestion	$10,673,000	$207,000	$13,486,000
Conventional Anaerobic Digestion	$13,954,000	$212,000	$16,829,000
Onsite Aerated Static Pile	$6,302,000	$792,000	$17,069,000
Landfill	$585,000	$1,665,000	$23,212,000

Council chose Aerated Static Pile Composting over the Consultant's recommended Acid Gas Anaerobic Digestion because of the lower up-front capital cost. It reduced the risk of Swift reducing their load and leaving the city with an expensive anaerobic digestion system.

Conditions in August 2007

- Swift loadings continue at highest levels on record
- Landfill tipping fees 20-35 percent less than anticipated in June, 2006
- Costs for compost amendment increased $20 per ton

Estimated costs in August 2007

Alternative	Capital Cost	O&M Cost
Onsite Aerated Static Pile	$4,240,000	$1,238,500
Landfill	$0	$995,000

- *The cost to landfill is now cheaper then the ASP because of reduced disposal costs.*
- *Swift has projects planned to improve their pre-treatment system and reduce loading, thereby reducing landfill costs.*

August 14, 2007 City Council Meeting

- Pull construction of the ASP compost system out of the 2008 budget
- Shelve the ASP compost design
- Add funds for design of downsized acid gas anaerobic digesters to the 2008 budget
- Wait 6 months to observe direction of Swift regarding pre-treatment improvements
- Update council before proceeding with RFP for design of the digesters

Downsized Digesters

- **Downsized Acid Gas Anaerobic digestion**
  - sized for City loading less Swift
    - *allow for 20-years of City Growth*
      - Capital Cost: $7.5M
      - **Annual O&M: $225k (vs. $995k for landfill)**
      - Reduces volume of solids produced
      - Will accommodate Swift's estimated loadings after the pre-treatement projects are completed
- **Landfill balance of solids – short term**
- **Negotiate agreement with Swift**
- **City Administration recommends moving forward with the RFP for consultant engineering services for the Acid Gas Anaerobic Digestion system**

Discharge Permit and Swift Update

- **Discharge Permit Exceeded March 27th through March 31st**
  - Total Suspended Solids
  - Carbonaceous Biochemical Oxygen Demand (CBOD)
- **Elevated levels of CBOD considered cause of fish kill**
- **Swift Update**

Future Waste Water Operations

- Update on Activities
- Open Discussion