City of Grand Island

Tuesday, August 29, 2006
Study Session

Item -1

Waste Water Treatment Plant Update Regarding Aerated Static Pile Composting and Anaerobic Digestion

Staff Contact: Steven P. Riehle, Public Works Director

Council Agenda Memo

From: Steven P. Riehle, Public Works Director

Meeting: August 29, 2006

Subject: Waste Water Treatment Plant Update Regarding Aerated Static Pile Composting and Anaerobic Digestion

Item #'s: 1

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

Background

On June 6, 2006, CH2MHill updated the city council on the facility plan for the Grand Island Waste Water Treatment Plant. The consultant recommended the following:

- Implement anaerobic digestion at the appropriate time
- Pursue financing with revenue bonds to speed implementation
- Continue with aerated static pile composting by improving existing compost area
- Continue landfilling remainder of sludge until digesters are constructed

Administration was directed to review financing options for the recommended improvements.

Discussion

CH2MHILL economists and engineers in coordination with city staff reviewed the financial records for the division and will present the following:

Financial Analysis
    Background - City's Current Budget
    Goals & Objectives
Financial Rate Analysis
Financial Model Outputs
City's Top Waste Water Customers
Loading Scenarios
Rate Increase Assumptions
    Scenario No. 1 – (Present situation)

Scenario No. 2 (Expected Situation)
Scenarios Remaining
Packing Plant – Solids Loading
Wastewater Treatment Plant Loading Variability
Approach to Implementation
Take – Or – Pay Evaluation
Recommendations

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. Direction concerning the short term and long term recommendations will be determined at a future city council meeting.

Grand Island's Wastewater Treatment Plant

Facility Plan Update

Solids Handling Improvements

August 29, 2006

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Presentation Overview

- Review of previous presentations
- Financial analysis & WW rates
- Evaluation of solids loading variability
- Recommendations
- Questions

Previous Presentations to City Council (January 2006 and June 2006)

- **WWTP's Challenges and Response**
  - UV Facility Design and Construction
  - Facility Plan Update
  - Short-Term Sludge Handling Changes
    - *Landfilling*
    - *Pilot Composting Unit: Aerated Static Pile*
  - WWTP in compliance with permit limits

Previous Presentation to City Council Status of Solids Handling Options

- **Three previously short-listed processes:**
  - Anaerobic Digestion
    - *Conventional Anaerobic Digestion*
    - *Acid-Gas (Two-Phase) Anaerobic Digestion*
  - Aerated Static Pile
    - *On-site, at the WWTP*
  - Landfill Disposal

Previous Presentation Recommendation Anaerobic Digestion (plus…)

- **Implement anaerobic digesters as a long term solution, use 10 year implementation**
- **Implement short term improvements**
  - Aerated static pile composting (~25% of solids)
  - Continue landfilling of remainder of solids
- **Reasoning for short-term improvements**
  - Reduces landfill fees and trucking costs (short-term)
  - Operational Flexibility: Use as storage during inclement weather
  - May delay need for digestion project expansion
  - Gives a head-start to class A sludge (potential future requirement)
- **Finance with revenue bonds to allow fast implementation**

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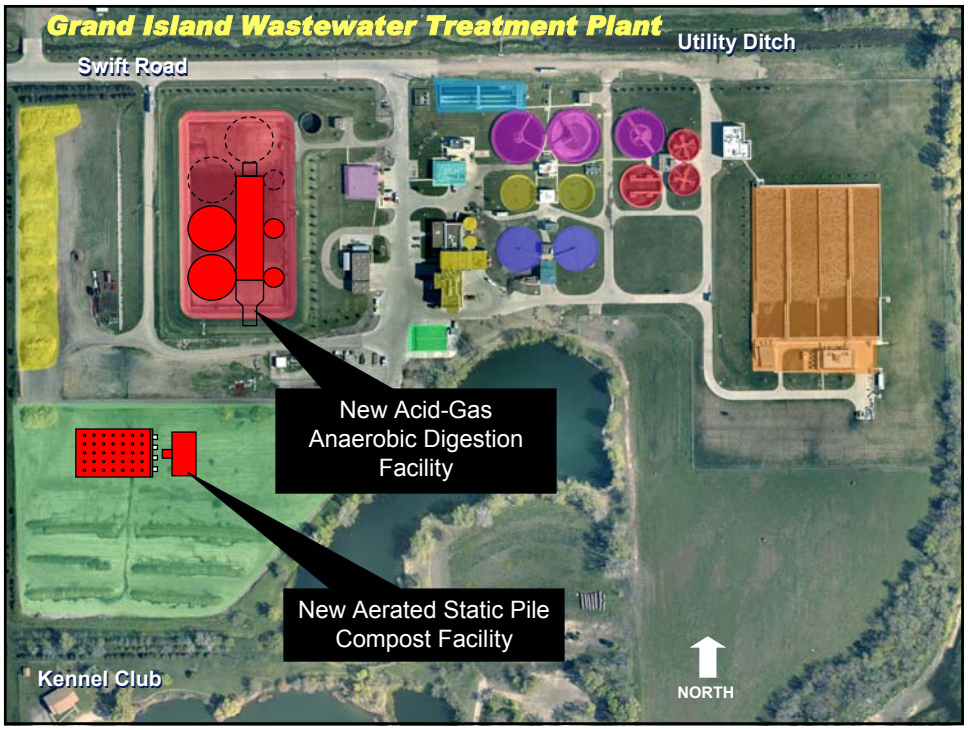


Financial Analysis

Background – City's Current Budget

- Conservatively managed budget
- Low debt ratio at 35% (Normal 50-60%)
- Pay-as-you-go projects have been implemented since 1995 without major rate increases
- Wastewater rates are mid-level compared to other cities

Analysis Goals & Objectives

- Evaluate funding for proposed Capital Improvement Projects (CIP) (Digesters and Composting)
- Review adequacy of existing rates to generate sufficient revenues
- Determine level and timing of debt financing
- Propose rate increases
- Develop Financial Model to aid in the analysis

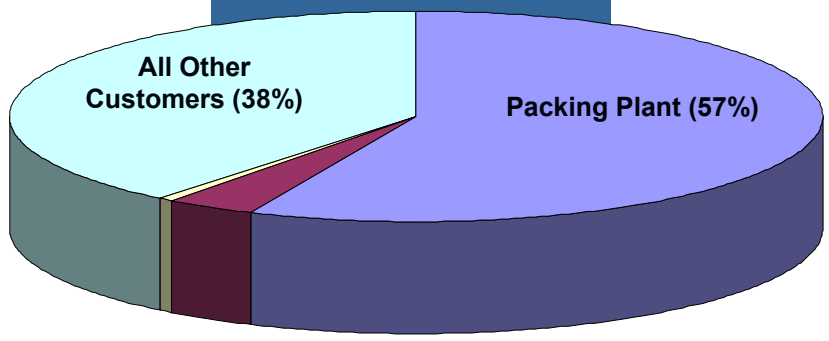
Financial Rate Analysis

Key Parameters:

- Maintain cash balance of 120 days of operating reserves
- Level and timing of debt funding – limit debt funding to cost of Digesters and Composting
- Available revenue must be 1.25 times the debt service (bond covenant)
- Maintain $1.2M for Capital Improvement Program (CIP) for other projects

City's Top Wastewater Customers

- Sewer Service Fee Customers by Percentage of Contributing Revenue



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Loading Scenarios

- Plant loading makes a significant impact in the analysis.
- 3 variables evaluated
  - Packing plant continues as-is
  - Packing plant reduces loading (lagoon)
  - Packing plant no longer a customer

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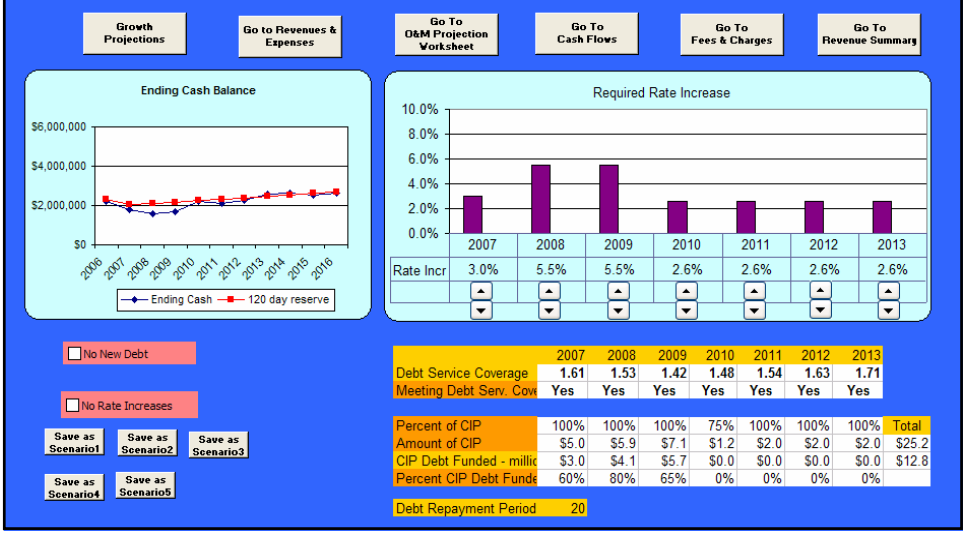
Rate Increase Assumptions

- Rate increases above the consumer price index (CPI) were spread over the 2 year project implementation period
- Thereafter rates stay close to the CPI
  - Previous rate increases average 2.9%
  - Consumer Price Index average 2.6%
  - For the years 1997 through 2006

Model Outputs



Scenario 1 (present situation)

- Loading remains at present levels
- Projects: Digesters & Compost
- Highest available capital ($37.3m, for 10 year period)
- Savings ~$1m per year (compared to landfilling)
- Largest debt ($12.8m)
- 20 year debt repayment

Rate Increases:
5.5% in 2008 and 2009

Scenario 2 (Reduced Loading)

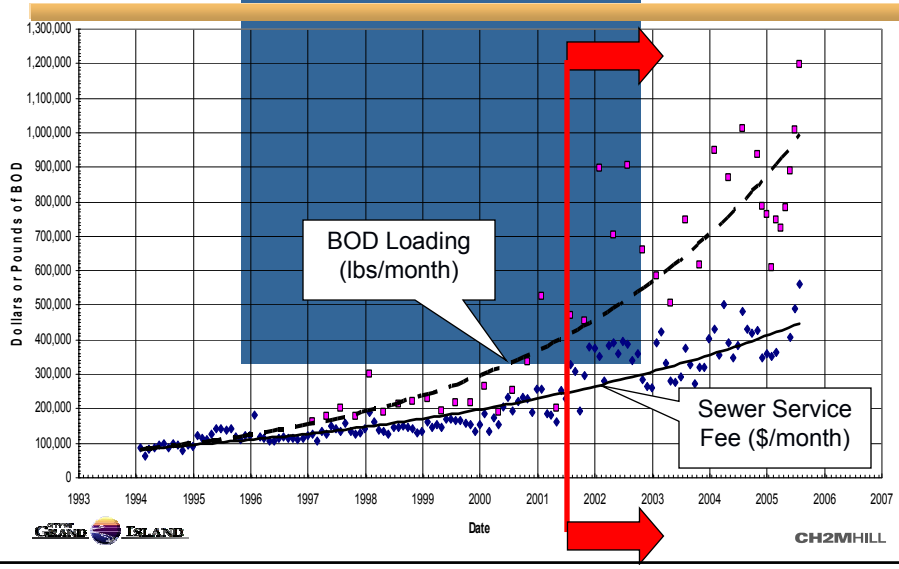
- Loading and revenue reduced
- Projects: Digesters & Compost
- CIP available ($28.4m, for 10 year period)
- Savings ~$0.5m per year compared to landfilling
- Large debt ($9.6m)
- 20 year debt repayment

Rate Increases:
5.5% in 2008, 2009, and 2010

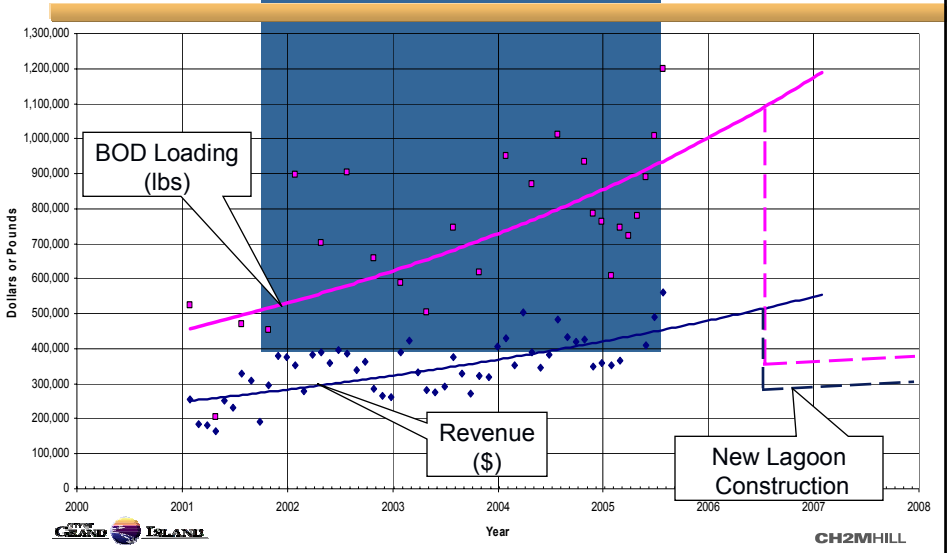
Remaining Scenarios

- Continuing with landfilling reduces available CIP by $0.5m to $1m annually
- Least "financial risk" is to proceed with ASP composting. Selection of Digesters based on quantitative and qualitative analysis. (odors, operation, cost, etc.)
- A "significant" drop in loading would require a significant rate increase to cover operational costs and debt service.

Packing Plant
Solids Loading – Last 10 years



WWTP Loading Variability



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WWTP Loading Variability Approach to Implementation

- All current customers remain
- Construction of packing plant lagoon to be decided within next 3 to 6 months
- Because the packing plant is a significant customer (50% of the loading), the City must protect its investment interests
- Implement a take-or-pay type of agreement similar to the 1994 agreement

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WWTP Loading Variability Take-or-Pay Evaluation

- Agreement protects city's interest when financing improvements
- Customers continue to discharge and pay bills.
- Ensures adequate revenue even with a drop in loading

Recommendations

Solid Handling Recommendations

- **Implement short-term aerated static pile composting improvements immediately.**
  - Allows best savings over landfill alone
  - long-term operational benefits: loading variability and wet weather storage
- **Provide financing of ASP composting with revenue bonds**
- **Debt $2.1 million (Composting only)**

Solid Handling Recommendations

- **Obtain Take-or-Pay agreement from packing plant customer**
  - Use previous agreement as a guide
  - Longer term required to match improvements
  - Consider rate structure changes

Solid Handling Recommendations

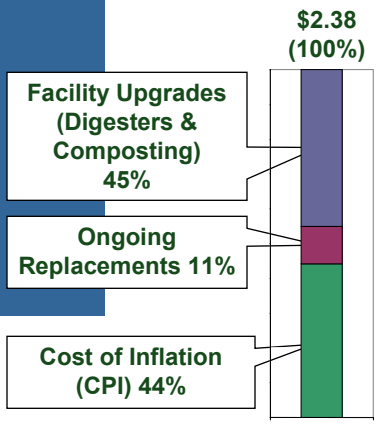
- **Work with packing plant customer to conservatively size digester project for 10 year loading projection**
  - Second digester expansion necessary in 2017
  - Use 2-phase digestion to minimize capital costs and provide other benefits.

Solid Handling Recommendations

- **If loading remains at current levels, implement rate increases of 5.5% in 2008 and 2009**
- **If loading decreases, implement rate increases of 5.5% in 2008, 2009, and 2010.**
  - Thereafter use the higher rate of either the consumer price index (CPI) or 2.6%
  - A rate increase of 3.0% was previously approved for 2007

Residential Customer Rates (Example)

Residential Customer	FY 2006	FY 2009
Monthly Water Usage	5,200 gallons	5,200 gallons
Fixed Fee	$7.55	$8.66
Consumption Fee - $/hcf	$1.25	$1.43
Total Charges	$16.24	$18.62
	Net Increase	$ 2.38



Rate Increases, 3% in 2007, and 5.5% in 2008 & 2009

(1 hcf = 748 gallons) Taxes not included

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Solid Handling Recommendations

- **Provide financing of digesters with revenue bonds**
- **Debt**
  - Current Loading: $10.7 million (Digestion only)
  - Reduced Loading: $8.9 million (Digestion only)
- **Implement anaerobic digestion project, but only if the Take-or-Pay agreement and the loading sizing has been finalized.**

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Questions?