



# **City of Grand Island**

**Tuesday, February 21, 2012**

**Study Session**

## **Item -4**

**Update Concerning the Wastewater Treatment Plant and  
Collection System Rehabilitation Project (Engineering Phase)**

**Staff Contact: John Collins, Public Works Director**

# **Council Agenda Memo**

**From:** Terry Brown, Manager of Engineering Services

**Meeting:** February 21, 2012

**Subject:** Update Concerning the Wastewater Treatment Plant and Collection System Rehabilitation Project (Engineering Phase)

**Item #'s:** 4

**Presenter(s):** John Collins, Public Works Director

## **Background**

At the October 11, 2011 meeting City Council approved hiring Black & Veatch of Kansas City, Missouri to provide engineering services for the Wastewater Treatment Plant and Collection System Rehabilitation.

## **Discussion**

After an in-depth review of the project it has been decided that the most cost effective way to address the headworks for the Plant is through a complete rebuild. In an effort to keep the public and City Council informed on the status of this project Black & Veatch will give a presentation explaining this piece of the project.

## **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.

It is the intent of City Administration to bring this issue to a future council meeting for the approval of a bid award for the headworks rebuild portion of this project.

# BUILDING A WORLD OF DIFFERENCE

## UPDATE ON WASTEWATER TREATMENT PLANT AND COLLECTION SYSTEM REHABILITATION PROJECT



CITY OF  
**GRAND**

**ISLAND**

CITY COUNCIL  
STUDY SESSION

JANUARY 31, 2012

**OLSSON**  
ASSOCIATES



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# AGENDA

PURPOSE OF STUDY SESSION  
WWTP CONCEPTUAL DESIGN  
RESULTS  
QUESTIONS

# PURPOSE OF STUDY SESSION

**TERRY BROWN**

MANAGER OF ENGINEERING SERVICES



## PURPOSE OF STUDY SESSION

- Provide the City Council with the results of the conceptual design work associated with the WWTP portion of the project.
- Respond to questions.
- Gain the City Council's understanding of the recommended alternative and proceed to preliminary design phase.

# CONCEPTUAL DESIGN RESULTS

**DEREK CAMBRIDGE**

PROJECT DIRECTOR



## WWTP IMPROVEMENTS EVALUATED

- Influent screening
- Influent pumping – capacity to meet future flows
- Influent flow measurement – replace parshall flume
- Replace grit removal facilities
- Provide flow distribution to downstream treatment



# COMP PLAN BUDGET USED IN CIP AND RATE STUDY

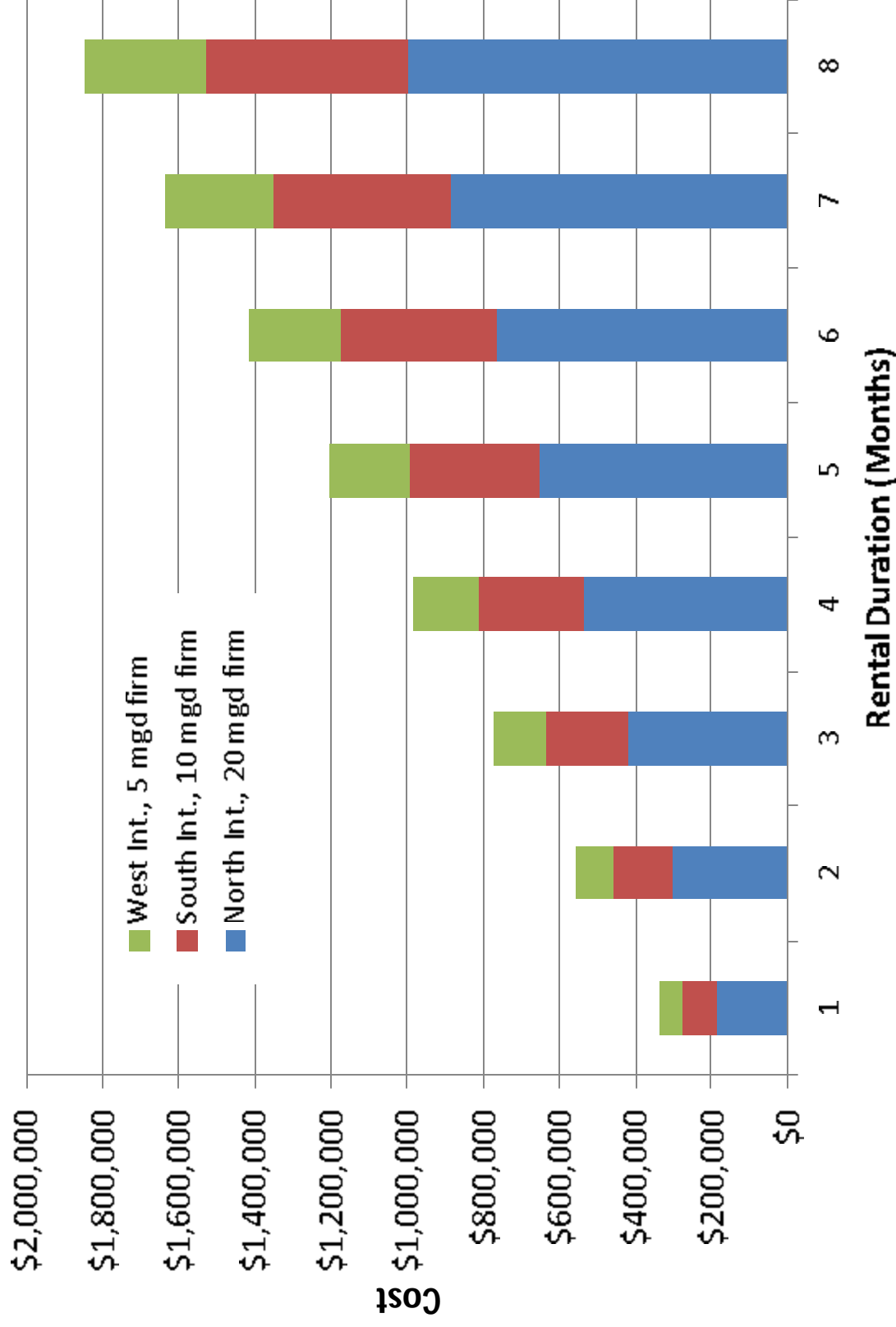
- CIP Budget

CIP Description	CIP Cost
Replace Bar Screens/Concrete Vault	\$3.00M
Replace Influent Pumps	\$0.45M
Replace Parshall Flume	\$1.65M
Replace Grit Basins	\$4.12M
Total	\$9.22M

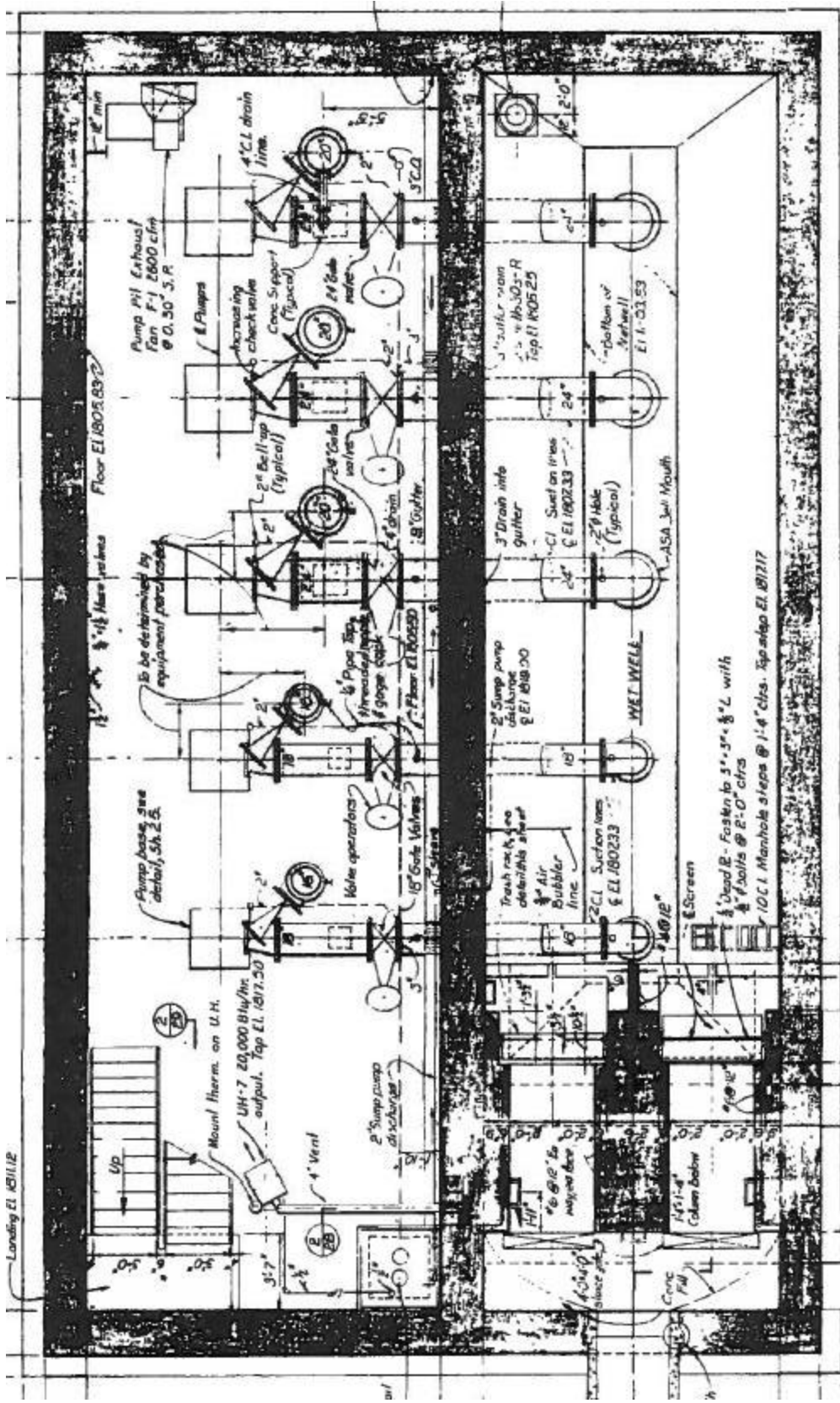
## CONSTRUCTABILITY ISSUES/LIMITATIONS W/ COMP PLAN CONCEPT

- Requires extended period of temporary pumping to complete work = \$\$\$
- Limited to vertical screens
- Building expansion for screening washing/compaction
- No ability to isolate equipment for maintenance
- Maximum of five 8 mgd pumps, installed capacity of 40 mgd. 32 mgd firm capacity (one unit out of service)
- Potential for change orders
  - Unknown condition of existing concrete and gates
- Reusing a 45 year old structure

## Temporary Pumping Costs



# EXISTING PUMPING STATION



# UPDATED PROBABLE PROJECT COSTS FOR COMP PLAN APPROACH

CIP Description	Cost
Replace Bar Screens/Concrete Vault	\$4.05M
Replace Influent Pumps	\$2.28M
Replace Parshall Flume	\$0.43M
Replace Grit Basins	\$6.20M
Total Probable Project Cost	\$12.96M

## ADDITIONAL ALTERNATIVES EVALUATED

- No. 1 – Build new 25 mgd dry pit pump station, rehab existing pump station for 25 mgd.
- No. 2 – Build new 25 mgd submersible pump station, rehab existing pump station for 25 mgd.
- No. 3 – New combined 25 mgd pump station and grit removal facility, rehab existing pump station for 25 mgd.
- No. 4 – New 50 mgd dry pit pump station, reuse existing pump station for plant drain system.
- No. 5 – New 50 mgd submersible pump station, reuse existing pump station for plant drain system.

# MINIMUM CAPACITY REQUIREMENTS

- Design Basis

- Proposed Flows (Year 2029)

Design Wastewater Flow Rates	
Flow Condition	Flow Rate, mgd
Minimum (Diurnal Low)	4.5
Average Daily Flow (Dry Weather)	13.0
Peak Day (Wet Weather)	25.0
Peak Hour	40.0

- Historical Peak Hour Flow = 35 mgd
  - Current Pump Station: Firm Capacity = 26.6 mgd;  
Total Capacity = 34.7 mgd



# ALTERNATIVE PROBABLE PROJECT COSTS

	Comp Plan	Alt No. 1	Alt. No. 2	Alt. No. 3	Alt. No. 4	Alt. No. 5
Rehab PS Capacity, mgd	32	25	25	25	-	-
New PS Capacity, mgd	-	25	25	25	50	50
Total Capacity, mgd	32/40	50/60	50/60	50/60	50/60	50/60
No. of Pumps	5	10	10	10	6	6
No. of Screens	2	4	4	4	2	2
Total Probable Project Cost	\$13.0M	\$18.9	\$17.6M	\$18.6M	\$18.8M	\$16.9M

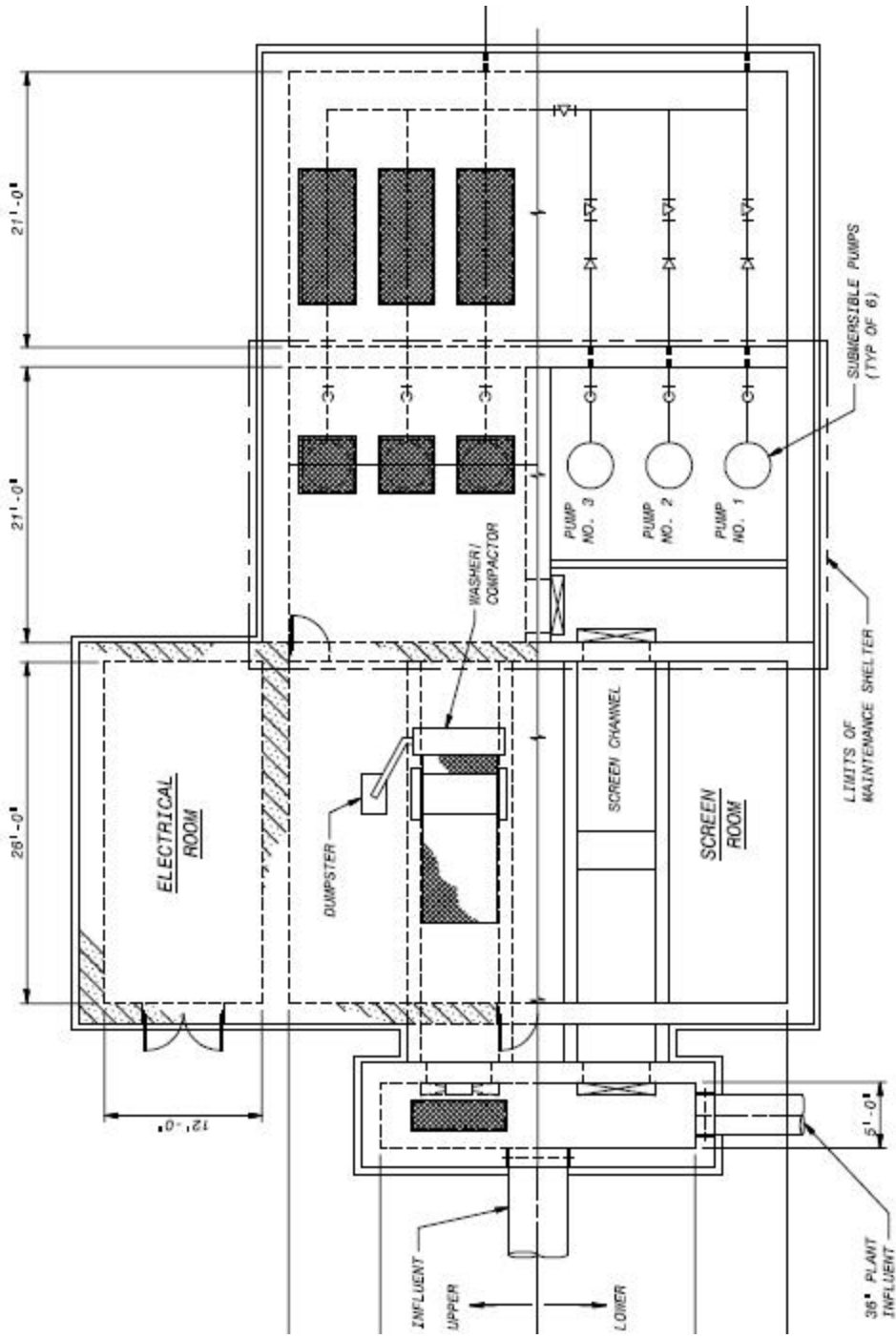


## BENEFITS OF ALTERNATIVE NO. 5

- Provides required pumping capacity for 20 years and beyond. 50 mgd firm capacity
- Simplifies construction
  - Reduces unknowns
  - Ability to coordinate construction with interceptor sewer work
  - No temporary pumping
- **Reduced O&M**
  - 6 versus 10 pumps, 2 versus 4 screens
  - New structure
- Single point for screenings disposal pickup

# NEW 50 MGD WET-PIT PUMPING STATION

January 24-25, 2012



# QUESTIONS



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# Together



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