City of Grand Island

Tuesday, January 06, 2009

Study Session Packet

City Council:

Larry Carney
Scott Dugan
John Gericke
Peg Gilbert
Chuck Haase
Robert Meyer
Mitchell Nickerson
Bob Niemann
Kirk Ramsey
Jose Zapata

Mayor:

Margaret Hornady

City Administrator:

Jeff Pederson

City Clerk:

RaNae Edwards

7:00:00 PM
Council Chambers - City Hall
100 East First Street

Call to Order

This is an open meeting of the Grand Island City Council. The City of Grand Island abides by the Open Meetings Act in conducting business. A copy of the Open Meetings Act is displayed in the back of this room as required by state law.

The City Council may vote to go into Closed Session on any agenda item as allowed by state law.

Pledge of Allegiance

Roll Call

A - SUBMITTAL OF REQUESTS FOR FUTURE ITEMS

Individuals who have appropriate items for City Council consideration should complete the Request for Future Agenda Items form located at the Information Booth. If the issue can be handled administratively without Council action, notification will be provided. If the item is scheduled for a meeting or study session, notification of the date will be given.

B - RESERVE TIME TO SPEAK ON AGENDA ITEMS

This is an opportunity for individuals wishing to provide input on any of tonight's agenda items to reserve time to speak. Please come forward, state your name and address, and the Agenda topic on which you will be speaking.

MAYOR COMMUNICATION

This is an opportunity for the Mayor to comment on current events, activities, and issues of interest to the community.

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Item -1

Review of Industrial Waste Water Permitting

Staff Contact: Steve Riehle

Council Agenda Memo

From: Steven P. Riehle, Public Works Directore

Meeting: January 6, 2009

Subject: Review of Industrial Waste Water Permitting

Item #'s: 1

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

Background

Sanitary Sewer Collection System and Waste Water Treatment Plant

The city has been in the sanitary sewer business since the early 1900's. The waste water division maintains a collection system with approximately 220 miles of sanitary sewer mains, over 4,000 manholes, and 16 sanitary sewer lift stations. The Waste Water Treatment Plant (WWTP) operates 24/7/365 in treating an average of 12 Million Gallons per Day (MGD) of waste water. The plant receives waste water loading equivalent to a city with a population of over 140,000. The division is an enterprise fund with all revenues coming from users. There are no property or sales tax dollars used to fund the division.

History of Grand Island's Waste Water Treatment Plant

The WWTP in it's current location was built at 3013 Swift Road in 1964. The primary treatment system uses 2 aerated grit basins and 2 primary clarifiers. The secondary treatment system uses 4 aeration basins and 3 secondary (final) clarifiers. The solids (sludge) removed from the processes are de-watered with a Gravity Belt Thickener (GBT) and 4 large Belt Filter Presses (BFP) before being disposed of in area landfills. From May through September the plant discharge flows through an ultraviolet light disinfection system to remove bacteria.

Discharge Permit for Grand Island Waste Water Treatment Plant

The plant operates under a National Pollutant Discharge Elimination System (NPDES) permit issued by the Nebraska Department of Environmental Quality (NDEQ). The permit contains discharge limits for pH, Carbonaceous Biochemical Oxygen Demand (CBOD), Total Suspended Solids (TSS), Ammonia as Nitrogen (NH_3), Acute Toxicity, and Fecal Coliform. The treated effluent from the plant discharges into the Utility Outfall Ditch along the north side of Swift Road which flows east to the Wood River and eventually to the Platte River.

Past Upgrades to the Grand Island Waste Water Treatment Plant

There were major upgrades to the WWTP in 1980 and 1994 with a solids handling project in 2004 and UV disinfection project in 2006. Design plans are being prepared for an anaerobic digester complex for solids volume reduction. The digester project will leave us with a sludge that has a beneficial use as a soil amendment and eliminates unnecessary landfill expenses.

Improvements to the plant in the future include replacing the bar screens, a new grit removal system, rebuilding the mechanisms in the 2 existing primary clarifiers, adding a 3rd primary clarifier, performance enhancements to the 4 existing aeration basins, additional aeration basin construction, and an additional final clarifier.

Industrial Waste Water Permitting

The city issues industrial waste water permits to customers such as Case New Holland, Chief Automotive, Chief Industries, CXT, and McCain foods. Industrial permits contain discharge limits for different waste water parameters to keep loading at the city's plant at levels that the city can effectively treat and meet discharge limits. JBS is by far the largest and most significant industrial contributor to the city's WWTP at over 50% of the plant loading.

Existing Sanitary Sewer Rate Structure

The existing sanitary sewer rate structure was established based on a full cost-of-service study that was conducted in 1979. The rate structure is 2 tiered with a flat rate for each customer plus a volume charge per 100 cubic feet of sewage that is discharged. Industrial customers are also charged for sewage strength measured by pounds of Total Suspended Solids, Biochemical Oxygen Demand, Oil & Grease, Hydrogen Sulfide and Ammonia. Both the volume and strength charges are a flat rate that doesn't change with consumption. The sanitary sewer bill for a customer will increase or decrease based on volume discharged or strength, but the price per 100 cubic feet or pound of the different strength parameters does not change with consumption.

Changes to Sanitary Sewer Rates

The sanitary sewer rates since the 1979 cost-of-service study have been adjusted uniformly across the board. The increases in rates have generally been lower then the consumer price index, but have increased in an effort to keep up with the rising costs of owning, maintaining, operating and expanding the sanitary sewer collection system and waste water treatment plant.

Historic Waste Water Flows

Waste water flows and strengths from the JBS pre-treatment system have been increasing since 2004 and irregular because the existing anaerobic lagoon was undersized. An additional 25 million gallon anaerobic pre-treatment lagoon went on-line in July 2008. The existing 9 million gallon anaerobic pre-treatment lagoon was taken off-line for cleaning and is expected to be operational in January 2009. When the old and new lagoon are operational, JBS will have a Hydraulic Retention Time (HRT) of 8 ½ to 10 days. While the increased HRT will improve the efficiency of the pre-treatment system for JBS, the real efficiencies will not be known till the old lagoon is operational and the 2 lagoons stabilize. It is estimated that the 2 anaerobic pre-treatment lagoons could take as long as 12 to 18 months to stabilize.

Waste Water Treatment Plant Overloading

High strength waste water loading from JBS caused the city to exceed discharge permit limits in 2007 and 2008. JBS is currently operating under an emergency order from the NDEQ that sets limits for discharging to the city's WWTP for TSS, BOD and Oil & Grease. The NDEQ will be issuing a new pre-treatment permit to JBS in the next few months. It is anticipated that the permit will start with the emergency order limits and allow a 24 month schedule for compliance with new limits. The city will continue to work with JBS to ensure loading to the city's WWTP from JBS does not exceed levels that can be effectively treated so the city can comply with the discharge permit limits.

Discussion

Updated Cost-of-Service Study

The council approved an amendment to the professional services agreement with Black & Veatch of Kansas City, Missouri at the December 16, 2008 council meeting. The amendment will provide for a complete cost-of-service study that will recommend a rate structure to ensure that the different sanitary sewer customers pay their proportionate share of the city's expenses.

Updated Comprehensive Plan for the Waste Water Collection System and Treatment Plant

The plan is currently being updated by the consulting engineering firm CH2MHill of Omaha, Nebraska to reflect the future needs for both the collection system and the treatment plant. Some portions of the collection system are over 100 years old. Many sanitary sewer interceptor lines are concrete and in need of rehabilitation. Some facilities at the WWTP date back to the original construction in the 1960's. Plant improvements are needed to meet new regulations, continued growth of the community and increasing industrial loadings.

Future Upgrades to the Grand Island Waste Water Treatment Plant

Major upgrades to the WWTP are being planned such as a new anaerobic digester complex. The comprehensive waste water plan and JBS loadings indicate a need for performance enhancements to the existing aeration basins at the plant and an accelerated need for a 4th final clarifier. The bar grates at the plant date back to the original construction in 1964 and need upgraded. An additional primary clarifier and grit handing improvements are also needed.

Capacity Analysis of Grand Island's Waste Water Treatment Plant

An updated capacity analysis for the Grand Island WWTP was completed in November 2008. The analysis will be an important tool for the city to use in the comprehensive plan for the sanitary sewer collection system & treatment plant, the updated cost-of-service study, the design for the digester complex, establishing industrial waste water pre-treatment limits for all industrial customers including JBS, and in negotiations for a new pre-treatment agreement between the City and JBS.

History of JBS Packing Plant

The packing plant was built just west of the City's WWTP at 555 South Stuhr Road at the same time as the city's plant. The packing plant has undergone numerous ownership changes from Swift to Monfort, to Con Agra, back to Swift and now to JBS. While the prior ownership of the plant appeared unwilling to spend funds to upgrade their pre-treatment facilities, the new ownership under JBS appears willing to spend the necessary monies on their waste water pre-treatment system as evidenced by the $5 million lagoon expansion.

Pre-treatment System for Industrial Waste Water at JBS

JBS pre-treats waste water and discharges it to Grand Island's WWTP. The pre-treatment system consists of screening equipment, 2 large Dissolved Air Floatation units, a 9 million gallon anaerobic pre-treatment lagoon, an oxygen injection system, and a recently completed 25 million gallon pre-treatment lagoon with an estimated construction cost of $5 million.

Communication and Coordination with JBS

The current arrangement between the city and JBS appears to be effective where JBS reduces the strength of their waste water with their pre-treatment system and the city provides the final treatment. As the largest customer for the Waste Water Division, it is critical that regular and open communication occurs between City and JBS operational staff. Changes at JBS's waste

water pre-treatment system can have a significant impact on the city's WWTP. The city has almost daily contact with the operators of JBS's pre-treatment system. A weekly conference call is conducted with the Waste Water Engineering and Operations Superintendent and JBS's Utility Manager. Public Works and City administration have verbal and written communication with JBS officials on a weekly to monthly basis.

1994 Industrial Waste Water Pre-treatment agreement between the City and JBS

A pre-treatment agreement with Monfort was negotiated in 1994. While the city does issue a pre-treatment permit to JBS with limits for flow and strengths, the previous agreement has lapsed. The agreement was negotiated because major plant improvements were needed and the city needed a commitment from Monfort. The permit was artificially low and should be more realistic of JBS needs as well as the ability of the city's plant to accommodate the loads and still meet the discharge permit limits.

New Industrial Waste Water Pre-treatment Agreement between the City and JBS

A pre-treatment agreement with JBS is critical for successful long-term planning for the city's waste water division. The agreement will provide a written framework for the years to come. Issues such as expansion of the city's waste water treatment plant, rate structure and even contributions to the expansion of the City's plant should be part of the agreement. The negotiations leading up to an industrial pre-treatment agreement that is acceptable to both industry and the city will be complex and involve capacity reviews, collection costs, treatment costs, etc. The pre-treatment agreement needs to be in place in 6 to 8 months so that improvements to the City's WWTP and JBS's pre-treatment system can be designed, scheduled and constructed to keep ahead on community growth and increasing industrial loading.

Conclusion

The Public Works Administration will bring forward an agreement for professional services to hire a consulting engineering firm to assist with preparation of and negotiations for an industrial waste water pre-treatment agreement with JBS at a future council meeting. It's important for public works staff to have the assistance of an engineering firm with expertise in both municipal & industrial waste water treatment, negotiations and permit writing.