

## CHAPTER 6 - WASTEWATER SERVICE

Wastewater service for Indianola is provided by gravity sanitary sewers, four pump stations, and a wastewater treatment plant. The plant is located at the northwest corner of the City, on the south side of Hoover Street and west of Country Club Road. According to the Comprehensive Plan Update 1996, the plant has a maximum capacity of 4.32 million gallons per day (mgd). The Wastewater Treatment Facilities Long Range Planning Study, prepared in 2001, stated that the facility was designed to treat 4.32 mgd, with the hydraulic capacity to handle 8.35 mgd. For the year 2000, the average dry weather flows were estimated at 1.11 mgd and the average wet weather flows were estimated at 3.93 mgd. During the March 14, 2002 inspection by the IDNR, the plant was treating a flow of 1.44 mgd. The estimated population served is 11,340. However, in terms of organic loading, the plant is only seeing a population equivalent of 5,766. The plant does have substantial additional capacity.

This report will not present or discuss individual components of the plant's treatment process. However, the aforementioned Long Range Planning Study noted specific needs at the plant including additional aeration equipment and air piping replacement.

Two maps of the sewer system accompany this report. The base maps were obtained from Indianola Municipal Utilities (IMU), courtesy of Mr. Mark Ramthun and Mr. Emil Segebart. Newer subdivision plats provided by Mr. Charles Burgin were plotted on the maps. Mr. Larry Kubli and staff then checked these maps for accuracy, noting revisions to the manhole numbers and verifying sewer locations.

The sanitary sewer service areas are shown on one of the maps. The southwest area of the City gravity drains to the McCord pump station, located on the north side of West 17<sup>th</sup> Avenue. Submersible pumps transfer the wastewater easterly into gravity sewers, which then drain into the South Pump Station. There are four 20-horsepower pumps in the McCord Station. Each pump is a Flygt Model CP-3152 pumps, rated at 305 gallons per minute (gpm) against a total discharge head (TDH) of 91 feet. Pump time running meter records, taken by Mr. Larry Kubli from June 24 through July 16, 2002, indicate that each pump operates between 0.63 and 0.74 hours per day. When pumping a flow averaging 86,500 gallons per day, each pump is operating at 526 gpm, against a TDH of 80 feet. This station can handle a large amount of

additional flows. Development in the southwest area of the City is not limited by the capacity of this pump station.

The South Plant pump station serves the south central area of the City, and the discharge from the McCord pump station. It is located on the west side of US Highway 65/69 on the southern edge of the City. There are two 25-horsepower pumps in the South Plant station. Each pump is rated at 250 gallons per minute (gpm) against a total discharge head (TDH) of 160 feet, and 375 gpm against a TDH of 150 feet. Pump time running meter records, taken by Mr. Larry Kubli from June 24 through July 16, 2002, indicate that Pump 1 operated an average of 14.0 hours per day and Pump 2 operated an average of 8.3 hours per day. When pumping a flow averaging 378,000 gallons per day, each pump is operating at 293 gpm. The pumps discharge the wastewater into a forcemain that runs northerly to a manhole at the intersection of South 15<sup>th</sup> Street and Plainview Avenue, where it discharges into a gravity sewer. The average operation time of the two pumps combined was 11.1 hours. Normal design is 12 hours of operation so only 8% growth can occur before larger pumps need to be looked at.

The Plainview pump station serves the southwestern area of the City. It is located on the south side of Plainview Avenue. The forcemain from the station discharges into a gravity sewer that flows north at the intersection of South 15<sup>th</sup> Street and Plainview Avenue. This station utilizes two submersible pumps, each with the rated capacity of 255 gpm at 95 feet of TDH. Pump time running meter records, taken by Mr. Larry Kubli from June 24 through July 16, 2002, indicate that Pump 1 operates between 4.1 hours per day and Pump 2 was not used. When pumping a flow averaging 62,000 gallons per day, Pump 1 is operating at 254 gpm. This station can handle additional wastewater flows. Development in the southeast area of the City, north of Plainview Avenue, is not limited by the capacity of this pump station.

The Morlock pump station serves the east side of the City, as well as the discharges from the other three stations. According to shop drawing data, the station utilizes four 60-horsepower pumps. The pumps are manufactured by Crane-Deming Co. and are vertical dry-pit pumps. Each pump, when operating at 1750 rpm, has the capacity of 1,400 gpm at 110 feet of TDH. With all four (4) pumps in operation, the station capacity is 2,640 gpm (each pump providing 660 gpm at 152 feet of TDH). These pumps have a secondary duty point and can be operated at 900 rpm. At this lower speed, each pump has the rated capacity of 700 gpm at 100 feet of head. Pump time running meter records, taken by Mr. Larry Kubli from June 24 through July 16, 2002, indicate

that Pumps 1, 2, and 4 operate at total of 24.7 hours per day. Pump 3 was not placed in operation. These pumps are set up such that one pump generally operates 24 hours per day, with the remaining pumps operating when higher flows enter the station. The lead on pump is alternated each day. Based upon the influent flows of 617,000 gallons per day, the pumps handle an average flow of 428 gpm. The pumps must be seeing a higher head requirement, approximately 110 feet, which accounts for the decrease in pumping rates from 700 gpm. This station discharges into a forcemain which runs westerly to 15<sup>th</sup> Street, then northerly to Iowa Avenue, where it discharges into a gravity sewer. The capacity of this station is six times greater than the current flows. Development of the east side of the City is not limited by the capacity of this pump station.

Gravity sewers serve the central and northern areas of the City. One interceptor sewer runs northerly along the west side of the City to the treatment plant. The other main interceptor sewer is along the north side of the City, and takes the discharge from the Morlock pump station. This interceptor runs from 15<sup>th</sup> Street westerly to US Highway 65/69, thence northwesterly to the treatment plant. These sewers range in size from twelve (12) to thirty-six (36) inches in diameter.

There was a very significant storm event on July 10 and 11. According to the National Weather Service in Des Moines, the official precipitation totaled 3.29 inches. There was a substantial increase in flows into each pump station on July 11 and 12, as a direct result of inflows into the system. A direct relationship between rainfall and wastewater flows is evident. The flow data is presented in the following table:

<b>Pump Station</b>	<b>Average Daily Flows during the 21 days surrounding July 11 and 12, gallons</b>	<b>Average Daily Flows during July 11 and 12, gallons</b>
McCord	81,610	135,550
South Plant	362,490	532,700
Plainview	56,420	117,650
Morlock	569,715	1,087,350

When planning for future sewers, information in the following table could be used for estimating wastewater flows. This data is based upon the City of Indianola average flow of 85 gallons per day per capita.

<b>Type of Development</b>	<b>Density PE per acre</b>	<b>Flow Range GPD per acre</b>	<b>Use for Planning GPD per acre</b>
Single-family Residential	9 to 15	765 to 1,275	1,000
Duplex Residential	20 to 24	1,700 to 2,040	1,800
Apartment Residential	30 to 50	2,550 to 4,250	3,000
Commercial		800 to 1500	
Interceptor Sewers			4,000
PE: Population Equivalents GPD: Gallons per Day			

End of Chapter 6.