

4 Conclusions and Recommendations

4.1 Conclusions

The objectives of this project were:

1. Check for pipe connectivity, structural defects, and potential sources of I&I in existing manholes and sanitary sewer lines within Wildwood South sewer district.
2. Use the data collection to update the City's GIS and ensure accurate routing is documented.

Both objectives were met through the manhole inspections, smoke and dyed water testing, and CCTV completed in this Project Area. GIS update recommendations were discussed in Section 3. Many sources of I&I were discovered throughout the various field inspections and can be addressed with a basin-wide rehabilitation project.

An overall conclusion for this project area is:

- The general condition of the City's sanitary sewer system is **good**. The sanitary sewer lines generally appear to be in good shape but approximately 33% of the 53 lines inspected have significant structural defects or inflow and infiltration that should be fixed. The manhole structures are in the same condition, with approximately 29% needing some level of rehabilitation. There were 29 significant and 18 minor I&I sources identified during CCTV and smoke testing in the sanitary sewer system that could be addressed to reduce rainfall I&I into the system, which, for a 175-acre project area, is a moderate number of sources.

4.2 Recommendations

4.2.1 Maintenance Items

During CCTV inspections there were 14 instances of roots intruding into the sewer lines.

- It is recommended that the City continue with its routine root cutting program to keep the sewer lines clear from blockages caused by roots.

During CCTV and manhole inspections there were minor defects observed in a majority of the structures which were not severe enough for repairs to be cost effective at this time. However, these defects may worsen over time.

- It is recommended that the City implement a routine inspection program in order to ensure that proactive maintenance can be performed as needed in the future.

4.2.2 Construction Items

Based on structural condition assessments of the 50 successfully inspected manholes, it is recommended that the City perform rehabilitation on 18 manholes. The manholes in need of rehabilitation, as well as the type of rehabilitation recommended, are listed in Appendix A, Table A-1.

Inspection attempts were made at all manholes assigned to this project to confirm pipe connectivity. Out of the 54 structures selected for inspections and analysis, four (4) were not able to be inspected.

- It is recommended that the City locate and raise to grade manholes UMH-1 and D-08-125. The presence and location of both manholes were confirmed during CCTV. CCTV discovered a utility cross bore in MH D-08-125, repair of which has been added to the manhole rehab recommendations list. It is recommended that a surface inspection be conducted once manholes are raised in order to confirm there are no other major defects present.
- It is recommended that the City construct a standard manhole at the current location of UMH-2. This will allow proper access to the line connecting UMH-2 to D-07-065 for cleaning and maintenance.
- It is recommended that the City abandon UMH-3 and its associated downstream line.

Smoke testing exposed several areas of rainfall I&I into the sanitary system that should be addressed.

- It is recommended that the City address the following I&I sources:
 - The exposed pipe at 300 Olive Street that was discovered during smoke testing should be disconnected and properly abandoned.
 - Fix broken caps or replace missing caps on 17 cleanouts listed in Table 2-10.
- It is also recommended that the City evaluate the cost-effectiveness of disconnecting the following private sources:
 - Disconnect five (5) foundation drains located at the following addresses:
 - 100 S 3rd St most likely connected to line segment D-07-07-065 – D-07-070
 - 210 S 2nd St most likely connected to line segment D-08-065 – D-08-070
 - 310 E Kansas Ave most likely connected to line segment D-07-075 – D-07-065
 - 307 E Kay St most likely connected to line segment D-08-165 – D-08-060

The repairs in Appendix A, Table A-2 should be completed based on CCTV inspections. Line items highlighted in blue should be priority.

The recommended rehabilitation is shown in Figure 4-1 and listed in Appendix A.

4.2.3 Administrative Items

The CCTV performed showed that the City's GIS network is lacking correct information on the material for several segments.

- It is recommended the City consider performing a system-wide update to incorporate CCTV data and manhole inspection data into their GIS databases. The lines with the necessary changes are listed in Table 3-1.