

APPENDIX 10

Description of Studies and Projects to Reduce Infiltration and Inflow, Sewer Surcharging and Water-In-Basement Complaints from Sanitary Sewers Located in the Alum Creek Tributary Area

1. CIP 405.1, Driving Park Area Infiltration and Inflow Study:

This study was completed in 1999. The following ten projects were identified to mitigate street, yard and water-in-basement flooding including separate sewer overflows due to inadequate Stormwater systems, inflow and infiltration and inadequate hydraulic capacity of the sanitary sewers:

A. CIP 626, Rhoads Avenue Sanitary Sewer Replacement:

This project included the replacement of existing dual sanitary sewers under Rhodes Avenue from the Deshler Tunnel to Sycamore Street with approximately 2,000 feet of 36-inch diameter pipe. The work also included the replacement of existing 8-inch and 10-inch sanitary sewers in Rhoads Avenue from Sycamore Street to Rainbow Park with about 360 feet of 12-inch diameter pipe. Approximately 50 manholes were rehabilitated during construction, in addition to several improvements to the storm water sewer system.

The I&I study completed under CIP 405.1 demonstrated that replacement of smaller sanitary sewer pipes with larger pipes and rehabilitation of manholes will reduce I&I, water-in-basement complaints and surcharging. Water-in-basement reductions will occur upstream of this project.

No designed SSOs were located within the project limits. This project was completed in 2003 at a cost of \$ 989,000.

B. CIP 627, Deshler Avenue Sanitary Sewer Replacement:

This project included the replacement of the existing 8-inch sanitary sewer in Deshler Avenue with approximately 2,600 feet of various diameter pipe (8-inch to 30-inch). The work also included installation of approximately 1,900 feet of various diameter (12-inch to 24-inch) storm sewer, 26 manholes and 8 catch basins.

The I&I study completed under CIP 405.1 demonstrated that replacement of the existing 8-inch diameter sanitary sewer in Deshler Avenue with larger pipes will reduce I&I, surcharging, replace badly damaged service lateral connections, and provide additional capacity for future sewer extensions that will allow eventual separation of combined sewers for a portion of the area west of the project.

No designed SSOs were located within the project limits. This project was completed in 2002 at a cost of \$ 1,201,000.

C. CIP 628, Driving Park Sanitary Sewer Improvements:

This project included the rehabilitation and repair of approximately 130 feet of 8-inch diameter, and approximately 450 feet of 190-inch diameter sanitary sewer pipes by the cured-in place pipe method (CIPP). The work also included rehabilitation and repair of manholes and reinstatement of service laterals after the CIPP work is completed.

The I&I study completed under CIP 405.1 discovered deteriorated manholes and pipes, misaligned, broken and cracked pipe sections. The rehabilitated sanitary sewers were located at Ellsworth Avenue north of Kossuth Street, the alley east of Struder Avenue and west of Lockbourne Avenue, the sewer east of the intersection of Seymour and Geers Avenues, and Frebis Avenue near Frebis Lane.

No designed SSOs were located within the project limits. This project was completed in 2002 at a cost of \$ 400,000.

D. CIP 629, Miller Avenue Sanitary Sewer Replacement:

This project included the replacement of the existing 8-inch sanitary sewer in Miller Avenue from Columbus Street to south of Whittier Street with approximately 1,600 feet of 10-inch diameter pipe. The work also included installation of 7 new manholes.

The I&I study completed under CIP 405.1 discovered deteriorated pipes, misaligned, broken and cracked pipe sections, debris deposits, partial blockages, root intrusion and sags in the pipe. Replacement of the existing 8-inch diameter sanitary sewer in Miller Avenue with a larger pipe will reduce I&I, surcharging, and eliminate the above defects.

No designed SSOs were located within the project limits. This project was completed in 2000 at a cost of \$ 413,000.

E. CIP 631, Columbus/Kossuth Sanitary Sewer Replacement:

A design contract in the amount of \$ 411,000 was awarded to R.D. Zande & Associates in August 2001 for preparation of plans and specifications. The project will include replacement of existing sanitary sewers with approximately 4,200 feet of 24-inch diameter pipe in Columbus Street, the alley west of Lilley, the alley north of Whittier Street, and the alley west of Seymour. The work includes the replacement of an existing sanitary sewer in Kossuth Avenue with 850 feet of 27-inch diameter pipe. Four SSOs will be eliminated. Approximately 60 Americans With Disabilities Act (ADA) wheelchair ramps will be installed under this project.

The I&I study completed under CIP 405.1 discovered numerous damaged pipe sections and manholes which allow I&I to enter the sanitary system thus exceeding the existing sewer hydraulic capacity. Four designed SSOs currently provide relief. Replacement of smaller diameter pipe with larger ones will increase the capacity, reduce I&I and surcharging and allow for the elimination of four SSOs along Columbus Street. These include SSOs Columbus Reference Nos. 132, Columbus & Studer; 133, Columbus & Linwood; 192, Columbus & alley west of Kelton; and 194, Columbus & Miller.

The project is currently (summer 2003) under design. Plans are under review for approval by various City Departments. Construction bids are scheduled to be received in January 2004, and construction is scheduled to begin in May 2004. Construction costs are estimated to be \$ 3,850,000. The SSO Consent Order requires construction to start by December 2005 and be completed by December 2007.

F. CIP 632, Bulen Avenue/Sycamore Street Sanitary Sewer Replacement:

A design contract in the amount of \$ 206,000 was awarded to R.D. Zande & Associates in August 2001 for preparation of plans and specifications. The project will include replacement of existing sanitary sewers with approximately 1,200 feet of various diameter (15-inch 30-inch) pipe in Sycamore Street from Rhodes Avenue and down Bulen Avenue to Gault Street. Work also includes rerouting a section of sanitary sewer that currently runs through a storm sewer manhole and installation of 4 catchbasins. One SSO will be eliminated. Approximately 48 Americans With Disabilities Act (ADA) wheelchair ramps will be installed under this project.

The I&I study completed under CIP 405.1 discovered extensive leaks at pipe joints and manholes which allow I&I to enter the sanitary system thus exceeding the existing sewer hydraulic capacity and causing water-in-basement complaints. One designed SSO currently provides relief. Some pipe sections have flat slopes which contribute to grease and debris accumulation in the pipes. Replacement of smaller diameter pipe with larger ones will increase the capacity, reduce I&I and surcharging and allow for the elimination of the SSO at the intersection of Bulen and Gault, SSO Columbus Reference No. 198.

The project is about to go to construction (summer 2003). Two construction bids were received in June 2003. Contract award legislation is scheduled to be on City Council Agenda for approval in September. Construction is scheduled to begin in November 2003. The apparent low bid for construction is \$ 1,189,000. The SSO Consent Order requires construction to start by December 2003 and be completed by December 2005.

G. CIP 633, Fairwood Avenue Replacement Sanitary Sewer:

This project included the replacement of an existing 18-inch diameter sanitary sewer in Fairwood Avenue with approximately 2,900 feet of 30-inch diameter pipe, and rehabilitation of approximately 300 feet of 8-inch diameter sanitary sewer. The work also included the replacement of an existing stormwater catchbasin and rehabilitation of manholes.

The I&I study completed under CIP 405.1 demonstrated that the sewer line had numerous broken service lateral connections that contribute significant amounts of I&I thus exceeding the hydraulic capacity of the pipe. Replacement of smaller sanitary sewer pipes with larger ones and rehabilitation of other pipes will reduce I&I, water-in-basement complaints and surcharging.

No designed SSOs were located within the project limits. Complete General Construction Company was awarded a construction contract in March 2003 for \$ 1,192,000. This project is scheduled to be complete in September 2003. The SSO

Consent Order requires construction to start by December 2003 and be completed by December 2005.

H. CIP 634, Frebis/Ellsworth Sanitary Sewer Replacement:

A design contract in the amount of \$ 87,000 was awarded to Pomeroy & Associates in February 2003 for preparation of plans and specifications. The project will include rerouting of an existing 8-inch sanitary sewer in the intersection of Frebis and Ellsworth Avenues. Several defective portions of an 8-inch sanitary sewer and 36-inch storm sewer will be replaced near the intersection of Moler and Berkeley Roads. Work also includes installation of approximately 1500 feet of 15-inch storm sewer and eleven catch basins along Moler Road. A catch basin will also be removed from the sanitary sewer in Alum Creek Drive in the vicinity of the 1-70 exit ramp.

The I&I study completed under CIP 405.1 revealed excessive I&I entering manholes, pipe segments, and numerous structural pipe damage throughout the study area. Rerouting and replacing the sanitary sewers and installation of the storm sewer will reduce I&I, surcharging and water-in-basement complaints.

No designed SSOs are located within the project limits. The design report is under review by the Division. Field work including surveying and sewer cleaning and televising has been completed. Final plans and specifications are due in November 2003. Construction is scheduled to begin in July 2004. Construction costs are estimated to be \$ 381,000. The SSO Consent Order requires construction to start by December 2006 and be completed by December 2008.

I. CIP 635, Livingston Avenue Sanitary Sewer Improvements:

A design contract in the amount of \$ 165,000 was awarded to Pomeroy & Associates in February 2003 for preparation of plans and specifications. The project will include rerouting of an existing 8-inch sanitary sewer in the intersection of Frebis and Ellsworth Avenues. Several damaged portions of an 8-inch sanitary sewer and 36-inch storm sewer will be replaced near the intersection of Moler and Berkeley Roads. Work also includes installation of approximately 1500 feet of 15-inch storm sewer and eleven catch basins along Moler Road. A catch basin will also be removed from the sanitary sewer in Alum Creek Drive in the vicinity of the 1-70 exit ramp. One SSO will be eliminated.

The I&I study completed under CIP 405.1 revealed excessive I&I entering manholes, pipe segments, and numerous structural pipe damage throughout the study area. One designed SSO currently provides relief. Rerouting and replacing the sanitary sewers and installation of the storm sewer will reduce I&I, surcharging, water-in-basement complaints and allow for the elimination of the SSO at the intersection of Seymour and Livingston, SSO Columbus Reference No. 655.

No designed SSOs are located within the project limits. The design report is under review by the Division. Field work including surveying and sewer cleaning and televising has been completed. Final plans and specifications are due in November 2003. Construction is schedule to begin in July 2004. Construction costs are estimated to be \$

381,000. The SSO Consent Order requires construction to start by December 2006 and be completed by December 2008.

J. CIP 636, Forest Street Sanitary Sewer Replacement:

A design contract in the amount of \$ 63,000 was awarded to Pomeroy & Associates in February 2003 for preparation of plans and specifications. The project will replace an existing 8-inch diameter sanitary sewer in Forest Street from the alley west of Seymour to the alley east of Fairwood with a 15-inch diameter pipe, and continue north in the alley east of Fairwood and increase to an 18-inch diameter pipe up to Rainbow Park. The sanitary sewers will be separated in the intersection Forest and Seymour.

The I&I study completed under CIP 405.1 revealed excessive I&I entering manholes, pipe segments, and numerous structural pipe damage throughout the study area. Replacing the sanitary sewers with larger pipes and rerouting the sanitary sewer in the intersection of Forest and Seymour will reduce I&I, surcharging and water-in-basement complaints.

No designed SSOs are located within the project limits. The design report is under review by the Division. Field work including surveying and sewer cleaning and televising has been completed. Final plans and specifications are due in November 2003. Construction is schedule to begin in July 2004. Construction costs are estimated to be \$ 330,000. The SSO Consent Order requires construction to start by December 2006 and be completed by December 2008.

2. CIP 405.7, Northwest Alum Creek Area Infiltration and Inflow Study:

This project is generally bounded by Ferris Road, Alum Creek, Fifth Avenue, Karl Road and Joyce Avenue. The goal of this project is to mitigate street, yard, and water-in-basement flooding including separate sewer overflows due to inadequate stormwater systems, inflow and infiltration and inadequate hydraulic design of the sanitary sewer systems.

This is a multi-staged project that will begin with a comprehensive inventory and study of the sanitary, storm and combined infrastructure. It includes extensive flow monitoring, field investigations and input from area residents. The first stage concludes with the development of a prioritized and sequenced listing of capital improvement projects that are required to enhance the overall performance of service within the Northwest Alum Creek Area.

The second stage involves the procurement of design services contracts for design and preparation of plans and specifications for each of the projects identified from the I&I study. The third stage concludes with the procurement of construction services contracts for the construction of each project.

The SSO Consent Order requires the City to continue with the study of this area as appropriate pursuant to the System Evaluation and Capacity Assurance Plan (SECAP) which is part of this order.

3. CIP 405.11, Livingston/James Area Infiltration and Inflow Study:

This project is generally bounded by the eastern Bexley corporation limits and the western and southern corporate limits of Whitehall. The goal of this project is to mitigate street, yard, and water-in-basement flooding including separate sewer overflows due to inadequate stormwater systems, inflow and infiltration and inadequate hydraulic design of the sanitary sewer systems.

This is a multi-staged project that will begin with a comprehensive inventory and study of the sanitary, storm and combined infrastructure. It includes extensive flow monitoring, field investigations and input from area residents. The first stage concludes with the development of a prioritized and sequenced listing of capital improvement projects that are required to enhance the overall performance of service within the Livingston/James Area.

The second stage involves the procurement of design services contracts for design and preparation of plans and specifications for each of the projects identified from the I&I study. The third stage concludes with the procurement of construction services contracts for the construction of each project.

The SSO Consent Order requires the City to continue with the study of this area as appropriate pursuant to the System Evaluation and Capacity Assurance Plan (SECAP) which is part of this order.