SUMMARY AND CONCLUSIONS

Summary

- The City sewers, interceptors, pump stations, and wastewater treatment plant can effectively convey and treat dry weather flow and limited quantities of storm runoff.
- The City has undertaken major upgrades to the collection system in order to reduce CSOs.
- Computer model runs using 15 historical rain events which had widely varying durations, depths, and intensities were in general agreement with the overflow volume to rainfall depth relationship developed from the overflow monitoring.
- The estimated total annual overflow volume is 195 million gallons. In 1994, the estimate was 267 million gallons. The estimated total number of overflow occurrences for a year with average rainfall (35 inches) is 700.
- The pollutant concentrations of the overflow were found to be as seen in past sampling and similar to that as seen in other cities.
- Eight of the 30 CSO areas contribute two-thirds of the total annual overflow volume.
- The Main Interceptor from the WWTP to the upstream point of CSO 9 on Frost Parkway west of Washington Street has capacity to receive peak sanitary flows.
- The Rock Creek interceptor has capacity to receive all the peak sanitary flows after separation.

Conclusions

- Sewer separation is the most cost effective method that provides the highest bacteria removal level.
- The sequence of the Long-Term Plan will attempt to achieve the greatest amount of CSO removal as early as practical. Thus, separating the larger combined sewer areas will be considered ahead of the smaller combined sewer areas in the sequence of the Plan.
- The project cost for the individual separation projects will affect the sequence. It may be necessary to split some of the larger phases into several sub-phases to meet budget constraints. This aspect of the sequencing is not addressed specifically in the Long-Term Plan.
- The sequence of separation should also attempt to minimize extended or repeated disruptions of neighborhoods. The smaller CSO areas can be grouped in common areas.

Scheduling of Projects

Table 8 summarizes many of the issues used to develop a project construction sequence.

1. The regulator areas have been ranked based on the size of the combined sewer area within each CSO area.

2. The separate sewer area tributary to the combined sewer area is listed for each CSO.

3. The CSO areas that discharge to the main interceptor sewer with capacity to carry the estimated peak sanitary flow after the areas are separated are noted.

4. The CSO areas that discharge to the Rock Creek Interceptor, which discharges to the main Interceptor at the River crossing near Liberty Street, are noted.

5. The CSO areas that discharge to the Main Interceptor in sections that do not have capacity to carry the peak sanitary flow after the areas are separated, are noted.

The sequence of the Long-Term Plan will attempt to achieve the greatest amount of CSO removal as early as practical. Thus, separating the larger combined sewer areas will be considered ahead of the smaller combined sewer areas in the sequence of the Plan.

There are fifteen combined sewer areas that convey flows from separate sanitary sewers through the combined sewer areas to discharge to the interceptor sewer. This arrangement can result in higher strength waste being discharged to the area streams through the CSOs. Therefore, these areas are given a higher priority in the schedule of separation when possible.

The project cost for the individual separation projects will affect the sequence. It may be necessary to split some of the larger phases into several sub-phases to meet budget constraints. This aspect of the sequencing is not addressed specifically in the Long-Term Plan.

The sequence of separation will also attempt to minimize extended or repeated disruptions of neighborhoods. The smaller CSO areas can be grouped in common areas.

Schedule

1. CSO Areas 5 & 7 — Completed 2005

   The North Sandusky Street Area, west of the River between Thomas Street and Webster. This area has had numerous reports of basement flooding during heavy rainfalls. They represent some of the larger combined sewer areas, and they have a large amount of sanitary flow tributary to the combined sewer area.

2. CSO Areas 8 & 34 — $5,870,240

   The North Sandusky Street Area, west of the River. CSO 34 is north of CSO area 5, and CSO 8 is south of CSO area 7. These two CSO areas have large combined sewer areas along with a significant amount of separate sanitary sewers tributary to them. Preliminary design commenced on this project in April 2006.

3. Item A & CSO 17 — $4,479,920

The Rock Creek interceptor has capacity to receive peak sanitary flows from the separated areas that discharge to it. However, the lower section of the interceptor has a large amount of debris collected that must be removed to provide the needed capacity. This work must be done prior to any combined sewer separation of the areas tributary to it. As a minimum, the interceptor should be cleaned from Perry Street through the River crossing to the Main interceptor. This work is noted as Item A.

CSO 17 is one of the larger combined sewer areas with a significant amount of tributary sanitary sewers.

4. CSO 23 — $4,788,880

This area includes a large section of the neighborhoods immediately south of the downtown area along Washington Street, Melmore Street, Sycamore Street, and north of the Gibson Run Area.

This area is the largest combined sewer area, and it has sanitary flow tributary to the combined sewer area. There is also a need for storm drainage improvements in this area that will be partially corrected by the combined sewer separation.

5. CSO Areas 33 & 28 — $4,371,784

This combined sewer area is on the northeast side of the City on the east side of the River with Industrial Avenue on the north side and Hunter Street on the south with East Market Street on the east side. Both CSO areas are relatively large. In addition, CSO 33 has the largest sanitary sewer area tributary to it.

6. CSO Areas 25, 26, & 27 — $4,572,608

These areas are on the upstream section of the Rock Creek interceptor, south of Rock Creek bounded by Schonhardt Street and Coe Street. There are significant sanitary sewer areas tributary to CSOs 27 and 26. There are no sanitary sewers tributary to the other CSO areas that connect to the Rock Creek interceptor.

7. CSO Areas 19, 18, 24, 21, 20, 22, & 31 — $2,780,640

These are the remaining combined sewer areas tributary to the Rock Creek Interceptor, in the downtown area.

This is presented as one phase. The work may be implemented as smaller projects if additional improvements such as streetscapes or paving projects are planned.

8. Item B — $2,780,640

This project provides the needed hydraulic capacity to convey separate sanitary flows from the areas on the south side of Tiffin, including flows from the combined sewer areas to be separated, to the wastewater treatment plant.

A relief interceptor will be constructed in Front Street from the south end of Third Street at CSO 30 to a new river crossing near Pump Station 1 at the end of St. Clair Street.

Pump Station 1 will be increased in size or replaced with a larger capacity pump station. Increase from a 3.0 mgd capacity to approximately 6.0 mgd capacity.

A new force main, paralleling the interceptor, will be constructed from Pump Station 1 to the WWTP. It will be a 24 inch force main approximately 11,000 feet in length.

The existing upstream section of the Main interceptor, upstream of CSO 9, will be capable of relieving surcharge flows to Pump Station 1. This relief will provide the needed capacity in the upper sections of the Main interceptor.

9. CSO Area 16 — $4,788,880

This is the largest combined sewer area that can be connected after Pump Station 1 enlargement and the relief force main are constructed. It includes the east end of Miami Street between Adams Street and Wentz Street. There is also a large section of sanitary flow that passes through the combined sewer area. The West Market Street sanitary sewer connects to this combined sewer area at Market Street and Elmer Street upstream of CSO 16.

10. CSO Areas 37 & 15 — $5,113,288

CSO Area 37 is the area that includes the combined sewers in the area of Hillcrest, Cottage, Seneca, and Central Avenue. It also has a large sanitary sewer area tributary to it. CSO Area 15 is the area between West Perry Street, North Sandusky Street, Market Street, and Melissa Street. It is served by combined sewers only.

11. CSO Areas 12, 13, & 14 — $3,414,008

This CSO area is immediately west of the downtown area and bounded by the River, Clay Street, and Wall Street/North Sandusky Street. It is served by combined sewers only. This is a contiguous project area to minimize repeated disruption by construction.

12. CSO Areas 9, 10, & 11 — $1,652,936

This CSO area is immediately north of the downtown area on the west side of the River between Hudson Street and Miami Street. It is served by combined sewers only.

13. CSO Areas 4, 30, 32 — $695,160

These are the last areas to be separated. CSO 4 serves the Town & Country development on the far north side of town and encompasses 7.3 acres. CSO 30 serves the area around Gibson Court, Hampden Park, and Gibson Street. CSO 32 serves the area of the State Hospital.

14. Items C & D - $5,200,000

Replace two pump stations in collection system. Construct a clarifier and/or CSO overflow tank, as needed, after separation is complete. Replace equipment at the W.P.C.C. as needed.

Table 8
Recommended Sequence of Construction

Ranking Based on Size of Combined Area	Regulator Number	Recommended Sequence of Construction	Combined Sewer Area (Acres)	Separate Sewer Area Tributary to Combined Sewer Area (Acres)	CSO Areas Connected to Interceptor with Capacity	Connected to Rock Creek Interceptor	Connected to Interceptor with Increased Capacity Required
1	16	17	156.1	266.7			●
2	17	3	155.0	137.2	●	●	
3	23	4	140.0	10.1	●	●	
4	8	2	95.5	77.7	●		
5	37	18	95.5	229.1			●
6	34	1	95.5	19.4	●		
7	25	7	91.7	0.0	●	●	
8	33	5	89.7	232.0	●		
9	15	19	70.7	0.0			●
10	12	20	54.5	0.0			●
11	27	8	54.0	66.0	●	●	
12	28	6	51.6	2.6	●	●	
13	9	23	38.7	0.0			●
14	19	10	36.3	0.0	●	●	
15	14	22	34.0	0.0			●
16	13	21	21.9	0.0	●		
17	18	11	16.8	0.0	●	●	
18	24	12	16.0	0.0	●	●	
19	10	24	9.7	0.0			●
20	21	13	7.6	0.0	●	●	
21	4	26	7.3	0.0	●		
22	20	14	5.3	0.0	●	●	
23	11	25	5.3	0.0			●
24	22	15	4.0	0.0	●	●	
25	31	16	4.0	0.0	●	●	
26	26	9	2.5	11.7	●	●	
27	30	27	0.0	185.7			●
28	32	28	0.0	56.3	●		

Note: Regulator Area's 5 and 7 were separated in 2003-2004

CITY OF TIFFIN, OHIO
LONG TERM CONTROL PLAN

COMBINED SEWER SYSTEM

Jones & Henry Engineers, Ltd.

FIGURE 1

QL-4829001MAP1
03/03/06 10-W06