# 7. Long Term Control Plan

In keeping with the City's past activities to reduce CSOs, the LTCP will incorporate continued separation of all combined sewer areas as described in Scenario 1 of Section 6. Based on model projections, should 90% removal be achieved, the resulting reduction of CSO volume will total 165 MG with no overflows per year.

As discussed in earlier sections, recent flow monitoring of areas where sewer separations have been performed to date revealed removal percentages less than the 90% level. System evaluation activities are currently underway to attempt to identify sources of inflow and infiltration. These efforts will continue into the spring of 2004. Therefore, the LTCP will also include an evaluation phase in order to determine the level of success of the City's sewer separation efforts and allow for improvements upon them or plan revisions as necessary.

## 7.1 Sewer Separation Program

The City's sewer separation program will be performed in three phases. Phase I is the work already completed by the City. Phase II includes planned improvements as described in Section 6 and will cost an estimated $4.1 million with a projected reduction in CSO volume of 55.6 MG. These improvements are scheduled to be completed by 2005.

After Phase II is complete, an effectiveness evaluation will determine the success of the sewer separations already implemented. If deficiencies are found, subsequent sewer separation projects can be adjusted and improved upon in order to meet a satisfactory rate of wet-weather capture. Or, if it is determined that adequate removals of wet-weather flow cannot be achieved, then the LTCP will be revisited to determine if other abatement alternatives are necessary to achieve compliance.

Phase III of the sewer separation program will be constructed from 2005 to 2018 and will include the construction of new sanitary sewers totaling nearly 57,000 feet in length at an estimated cost of approximately $10.8M. The work includes the construction of a new sanitary sewer alongside the existing combined sewer; the lengths were approximated using the existing City sewer mapping. Costs for the sewer separation projects are described in Appendix B. The City will abandon existing regulator structures only after confirming that overflows are no longer occurring. Further, the City will continue its effectiveness evaluation as it continues with Phase III. Flow monitoring will be conducted to verify the success of the sewer separation program. If it is determined that adequate removals of wet-weather flow cannot be achieved during this phase, then the LTCP will be revisited.

Table 7.1 below lists the new sanitary sewers to be installed along with a sequence for their construction. The costs for the individual sewer separation projects are shown in Table 7.2. The projects were arranged in blocks of streets within a regulator area in order to allow for simultaneous design and construction of multiple projects. The sequence of the projects is such that the combined sewer outfalls near sensitive areas, as described in Section 1.2, are given higher priority.

Models Based on 90% Reduction

*Table 7.1 - Sewer Separation Projects*

| Timeline | Phase | Sequence | Regulator Area | Street | Action | Approx. Length (l.f.) | Cost Estimate (w/o laterals) | Cost Estimate (w/ laterals) |
|---|---|---|---|---|---|---|---|---|
| <2003 | I | N/A | D-9 | Lear Road | Tributary area separated | | | |
| <2003 | I | N/A | D-7 | Sunset Rd. | Sewer Separation | | | |
| <2003 | I | N/A | D-4 | Beachdale | Sewer Separation | | | |
| <2003 | I | N/A | D-3 | Redwood, | Sewer Separation | | | |
| <2003 | I | N/A | D-1 | Moorewood Ave. | Removal of storm ditch (266 tributary acres) | | | |
| <2003 | I | N/A | C-3 | Duff Dr. | Sewer Separation | | | |
| <2003 | I | N/A | C-2 | Avondale Ave. | Reconfiguration of regulator to prevent overflow | | | |
| <2003 | I | N/A | Curtis Dr. | Curtis Drive | Sewer Separation | | | |
| <2003 | I | N/A | North Point | North Point Drive | Sewer Separation | | | |
| | | | | | | | | |
| 2004 | II | N/A | C-3 | Moore Road | Sewer Separation | N/A | $1,100,000 | $1,100,000[1] |
| 2005 | II | N/A | D-3 | Center Road | Sewer Separation | N/A | $2,300,000 | $2,300,000[1] |
| 2005 | II | N/A | D-3 | Center Road PS | D-3 Separation will reduce OF | N/A | -- | -- |
| 2006 | II | N/A | D-5, 6, 7 | Lake Rd / Vineyard | Sewer Separation | N/A | $1,000,000 | $1,000,000[1] |
| 2006 | II | N/A | C-1 | Miller Road | Reconfigure existing two CSO pipes into separate sewers | N/A | $200,000 | $200,000[1] |
| | | | | | **Phase II total** | **N/A** | **$4,600,000** | **$4,600,000** |
| 2006-2008 | III | A | D-2, Brookfield | Inwood | Construct New Sanitary | 2,470 | $469,300 | $881,790 |
| 2006-2008 | III | A | D-2, Brookfield | Brookfield | Construct New Sanitary | 2,550 | $484,500 | $910,350 |
| 2006-2008 | III | A | D-2, Brookfield | Electric | Construct New Sanitary | 1,120 | $212,800 | $399,840 |
| | | | | | **Project III-A total** | **6,140** | **$1,166,600** | **$2,191,980** |
| 2006-2008 | III | B | D-2, Brookfield | Fairfield | Construct New Sanitary | 2,440 | $463,600 | $871,080 |
| 2006-2008 | III | B | D-2, Brookfield | Berkshire | Construct New Sanitary | 2,480 | $471,200 | $885,360 |
| | | | | | **Project III-B total** | **4,920** | **$934,800** | **$1,756,440** |
| 2008-2013 | III | C | D-1 | Moorewood | Construct New Sanitary | 3,750 | $712,500 | $1,338,750 |
| | | | | | **Project III-C total** | **3,750** | **$712,500** | **$1,338,750** |
| 2008-2013 | III | D | D-1 | Crestwood | Construct New Sanitary | 1,700 | $323,000 | $606,900 |
| 2008-2013 | III | D | D-1 | Vinewood | Construct New Sanitary | 1,550 | $294,500 | $553,350 |

Approx 12 M Gal reduction

Further 55 M Gal reduction

Re-evaluate at this point before continuing

| Timeline | Phase | Sequence | Regulator Area | Street | Action | Approx. Length (l.f.) | Cost Estimate (w/o laterals) | Cost Estimate (w/ laterals) |
|---|---|---|---|---|---|---|---|---|
| 2008-2013 | III | D | D-1 | Electric (W of Moorewood) | Construct New Sanitary | 650 | $123,500 | $232,050 |
| | | | | | **Project III-D total** | **3,900** | **$741,000** | **$1,392,300** |
| 2008-2013 | III | E | D-1 | Crestwood (S of Redwood) | Construct New Sanitary | 850 | $161,500 | $303,450 |
| 2008-2013 | III | E | D-1 | Vinewood (S of Redwood) | Construct New Sanitary | 850 | $161,500 | $303,450 |
| 2008-2013 | III | E | D-1 | Redwood | Construct New Sanitary | 900 | $171,000 | $321,300 |
| | | | | | **Project III-E total** | **2,600** | **$494,000** | **$928,200** |
| 2008-2013 | III | F | D-1 | Rosewood (Crestwood to Moorewood) | Construct New Sanitary | 600 | $114,000 | $214,200 |
| 2008-2013 | III | F | D-1 | Electric (E of Moorewood) | Construct New Sanitary | 300 | $57,000 | $107,100 |
| 2008-2013 | III | F | D-1 | Electric (E of Parkwood) | Construct New Sanitary | 300 | $57,000 | $107,100 |
| 2008-2013 | III | F | D-1 | Parkwood | Construct New Sanitary | 1,150 | $218,500 | $410,550 |
| 2008-2013 | III | F | D-1 | Beachwood | Construct New Sanitary | 1,150 | $218,500 | $410,550 |
| 2008-2013 | III | F | D-1 | Parkwood (N of Rosewood) | Construct New Sanitary | 1,100 | $209,000 | $392,700 |
| 2008-2013 | III | F | D-1 | Beachwood (N of Rosewood) | Construct New Sanitary | 1,050 | $199,500 | $374,850 |
| 2008-2013 | III | F | D-1 | Parkwood (N of Electric) | Construct New Sanitary | 500 | $95,000 | $178,500 |
| | | | | | **Project III-F total** | **6,150** | **$1,168,500** | **$2,195,550** |
| 2008-2013 | III | G | C-4 | Ashwood | Construct New Sanitary | 2,900 | $551,000 | $1,035,300 |
| 2008-2013 | III | G | C-4 | Redwood (E of Belmar) | Construct New Sanitary | 1,310 | $248,900 | $467,670 |
| 2008-2013 | III | G | C-4 | Redwood (W of Belmar) | Construct New Sanitary | 340 | $64,600 | $121,380 |
| 2008-2013 | III | G | C-4 | Electric | Construct New Sanitary | 750 | $142,500 | $267,750 |
| 2008-2013 | III | G | C-4 | Belmar | Construct New Sanitary | 400 | $76,000 | $142,800 |
| | | | | | **Project III-G total** | **5,700** | **$1,083,000** | **$2,034,900** |
| 2014-2019 | III | H | D-8 | Jaycox Road | Construct New Sanitary | 5,300 | $1,007,000 | $1,892,100 |
| | | | | | **Project III-H total** | **5,300** | **$1,007,000** | **$1,892,100** |
| 2014-2019 | III | I | D-8 | Yoder Blvd | Construct New Sanitary | 1,500 | $285,000 | $535,500 |
| 2014-2019 | III | I | D-8 | Cherry Ln | Construct New Sanitary | 1,650 | $313,500 | $589,050 |
| 2014-2019 | III | I | D-8 | Harvey Pkwy | Construct New Sanitary | 1,170 | $222,300 | $417,690 |
| 2014-2019 | III | I | D-8 | Electric Blvd | Construct New Sanitary | 700 | $133,000 | $249,900 |
| | | | | | **Project III-I total** | **5,020** | **$953,800** | **$1,792,140** |
| 2014-2019 | III | J | D-10 | Tomahawk | Construct New Sanitary | 2,510 | $476,900 | $896,070 |
| 2014-2019 | III | J | D-10 | South Point | Construct New Sanitary | 3,000 | $570,000 | $1,071,000 |

| Timeline | Phase | Sequence | Regulator Area | Street | Action | Approx. Length (l.f.) | Cost Estimate (w/o laterals) | Cost Estimate (w/ laterals) |
|---|---|---|---|---|---|---|---|---|
| | | | | | **Project III-J total** | **5,510** | **$1,046,900** | **$1,967,070** |
| 2014-2019 | III | K | D-10 | Lakewood | Construct New Sanitary | 2,340 | $444,600 | $835,380 |
| 2014-2019 | III | K | D-10 | Oakwood | Construct New Sanitary | 2,250 | $427,500 | $803,250 |
| 2014-2019 | III | K | D-10 | Forest | Construct New Sanitary | 2,210 | $419,900 | $788,970 |
| 2014-2019 | III | K | D-10 | Grove | Construct New Sanitary | 1,070 | $203,300 | $381,990 |
| | | | | | **Project III-K total** | **7,870** | **$1,495,300** | **$2,809,590** |
| | | | | | **Phase III total** | **56,860** | **$10,803,400** | **$20,299,020** |
| | | | | | **Sewer Separation Program total** | | **$15,403,400** | **$24,899,020** |

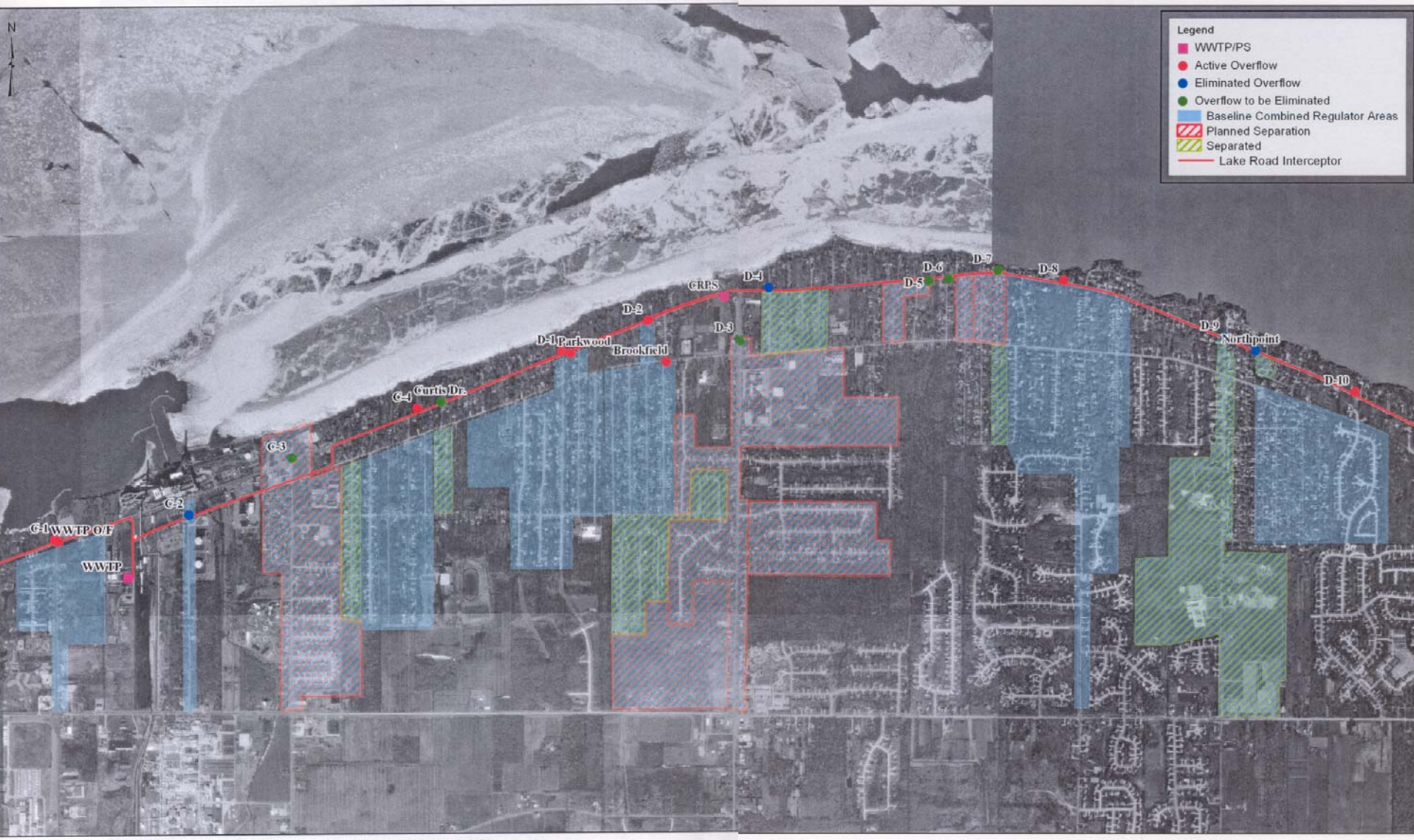
*1 Costs for Phase II projects are City estimates and do not include work to install new sewer laterals*

*Table 7.2 - Sewer Separation Project Costs*

| Project | New Sanitary Sewers (l.f.) | Estimated Cost (w/o laterals) | Estimated Cost w/ laterals)[1] |
|---|---|---|---|
| Phase II Total | N/A | $4,600,000 | $4,600,000 |
| Project III-A | 6,140 | $1,166,600 | $2,191,980 |
| Project III-B | 4,920 | $934,800 | $1,756,440 |
| Project III-C | 3,750 | $712,500 | $1,338,750 |
| Project III-D | 3,900 | $741,000 | $1,392,300 |
| Project III-E | 2,600 | $494,000 | $928,200 |
| Project III-F | 6,150 | $1,168,500 | $2,195,550 |
| Project III-G | 5,700 | $1,083,000 | $2,034,900 |
| Project III-H | 5,300 | $1,007,000 | $1,892,100 |
| Project III-I | 5,020 | $953,800 | $1,792,140 |
| Project IIII-J | 5,510 | $1,046,900 | $1,967,070 |
| Project III-K | 7,870 | $1,495,300 | $2,809,590 |
| Phase III Total | 56,860 | $10,803,400 | $20,299,020 |
| **Program Total** | **56,860** | **$15,403,400** | **$24,899,020** |

*1 Costs for Phase II projects are City estimates and do not include work to install new sewer laterals*

It is recommended that the overflows associated with areas to be separated remain in service until such time that post-separation monitoring is performed and results are input into the system hydraulic model to project system response.




Note: All areas tributary to regulators developed using existing Avon Lake sewer mapping

BROWN AND CALDWELL

Avon Lake
Sewer System Features