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CHAPTER 3 PREVIOUS CSO ABATEMENT EFFORTS / PROJECTS

A. Sewer Separation Projects

The following sewer separation projects in **Table 3-1** have recently been completed and have affected several different CSOs.

Table 3-1
Previous CSO Abatement Projects

Project	Completion Date	CSO Impacted	Project Cost
Rabbit Run Sewer Project	1981	004	$5,500,000
Condit Street Sewer Separation	1989	015	$1,755,000
Northwest Sewer Separation Project	1990	009	$1,550,000
Hier's Park Storm Drainage	1991	007	$322,000
Joe Street Phase I and II	1999	004	$10,000,000
Montgomery Street Phase I	2000	018	$385,000
Area 1 Sewer Separation Project	2009	009	$2,800,000
Area 2 Sewer Separation Project	2009	012, 013	
Area 3 Sewer Separation Project	2009	016	
Salamonie Avenue Sewer Separation	2011	004	$750,000

~~The City is also anticipating a sewer separation project along Salamonie Avenue between Jefferson Street and Columbia Street in the next few years. This project would tie into the previously completed Joe Street Project.~~ Additionally, a road project is currently being designed along Etna Avenue. As part of this project new storm sewers will be installed, which will allow the existing combined sewers to become sanitary sewers.

The City's proactive efforts have helped to reduce the number and volume of CSO events.

CHAPTER 4 SEWER SYSTEM MODELING AND CALIBRATION

A. Installation of Rain Gauges and Flow Monitors

To accurately create a model of the sewer system, it is necessary to have accurate rainfall and flow monitoring information. In July, 2008, the City installed four rain gauges at the WWTP, Broadway Lift Station, Carlisle Lift Station, and the River Fork Lift Station. Flow monitors were also installed at that time, but there were complications with the monitoring company. Due to this, flow monitors were not installed and properly calibrated until July 2009. Flow monitors were installed at CSOs 003, 004, 005, 008, 013, 014, 015, and 016. There was already an existing flow meter at CSO 002, which is located at the WWTP. A new flow monitor was recently added in April of 2012 at CSO 007. The City has flow monitors installed on ~~9~~ 10 of 15 CSOs.

B. Model Development – Presumptive / Design Storm Approach

A model of the combined sewer system was completed using the U.S. Environmental Protection Agency's (EPA) SWMM software version 5.0. This program was obtained from the EPA website.

Watershed areas were delineated based on City sewer maps. The NRCS Soil Survey for Huntington County was used to estimate the predominant soil type for each watershed. In areas where there was a significant portion of the watershed with difference characteristics, the Green and Ampt infiltration coefficients were calculated using a weighted average of the soil types.

The dynamic wave routing method was used because this method allows for the greatest amount of complexity and, therefore, produces the most theoretically accurate results. The equations solved using this method account for channel storage, backwater, entrance/exit losses, flow reversal, and pressurized flow.

The model that was developed was of the existing condition as of August 2009. This is the model that was used for calibration. **Figure 4-1** shows the pipes that were modeled in the SWMM model. Subsequent layouts were created based upon modifications to this existing conditions model.

Calibration of the existing condition model was completed using flow monitoring data acquired by Huntington during August 17/18, 2009. This rain event was selected to calibrate the model because it resulted in total volumes and rainfall intensities that closely matched the 10-year, 1-hour storm.

Rain for the August storm occurred in two parts. A small amount fell in the morning of August 17, 2009. The majority of rain fell late on August 17, 2009 and early on the August 18. During the evening, 1.36 inches fell during a span of 3.5 hours leading to an average intensity of 0.39 inches per hour. Peak intensity during this storm was 1.12 inches per hour. The total rainfall for the event was 1.6 inches.

CHAPTER 5 CSO CONTROL ALTERNATIVES

In accordance with IDEM, the City of Huntington must produce a plan aimed at eliminating untreated CSOs. This chapter introduces CSO control alternatives ranging from no action to partial elimination of CSOs as measured by percent reduction of yearly CSO volume to virtually complete elimination of CSOs based upon the design storm approach. Included for each alternative is a cost estimate and a figure that shows the location of each alternative.

The cost estimates were developed using procedures outlined in U.S. EPA's document titled *Costs for Select CSO Control Technologies*, October 1992. These costs were verified utilizing sources that include price quotes from equipment manufacturers, recently bid projects, and Means Construction Cost Estimating Guide. The contingency of 15% is based on actual bid projects to cover unforeseen construction changes after the bid. The non-construction costs include land acquisition, engineering design, grant administration, easement acquisition, and construction administration and inspection.

Yearly operation and maintenance costs were calculated by using equipment runtimes, power requirements, and life spans. Daily labor was also estimated. Detailed estimated of project capital cost and operation and maintenance can be found in Appendix 5.

A. Design Storm Approach Alternatives

The following alternatives were designed to provide full treatment for the 1-yr, 1-hr storm and partial treatment for the 10-yr, 1-hr storm.

1. Alternative 1A – North and South Side Interceptors

This alternative involves the installation of the following ~~five~~ ***six*** interceptors:

Segment #1 runs from the CSO 008 to CSO 003 along the south side of the railroad tracks.

Segment #2 runs from CSO 007 along Herman Street and Frederick Street to Lafontaine Street.

Segment #3 runs from ~~CSO 005 along Fredrick Street to Lafontaine Street, then north on Lafontaine Street to the Lafontaine Street lift station.~~ CSO 006 to the intersection of Frederick Street and Lafontaine Street, then west along Frederick Street to CSO 005.

Segment #4 runs from the CSO 003 to the WWTP along the south side of the railroad tracks.

Segment #5 runs along Market Street from CSO 015 to Water Street, south on Water Street CSO 003.

Segment #6 runs from CSO 005 along Clark Street to William Street, then southwest along William Street to an existing diversion structure on William Street.

Since this alternative would not retain any of the captured volume in the system, all overflows would need to be transported to the WWTP. This would require upgrades to ~~the pumping capacities of the Lafontaine Street lift station. It would also require upgrades to~~ the Rabbit Run lift station at the WWTP to transport the flow to the proposed two (2) 5 ~~10~~ MG equalization basins and wet weather treatment process. Both of the equalization basins and the wet weather treatment process would be located on the south side of the Little River directly across from the WWTP. The required capacity of the ~~Lafontaine Street lift station would be 23 MGD and the required capacity of the~~ Rabbit Run Lift Station lift station would be 90 MGD.

The current capacity of the WWTP is not sufficient to treat the 1-yr, 1-hr flow. The additional treatment capacity of the WWTP would be achieved by storing the excess flow in an equalization basin. The proposed equalization basin is ~~10~~ 5 MG and would be located on the south side of the Little River across from the WWTP. All flow generated by a 1-yr, 1-hr storm must receive full treatment, so once the WWTP reaches capacity flow would be routed to the equalization basin. The Rabbit Run lift station would then send excess flow to the equalization basin. The volume up to the 1-yr, 1-hr storm would be stored in ~~a separate~~ this EQ basin so that it can be taken offline and sent back to the WWTP for full treatment as capacity becomes available.

The volume between the 1-yr, 1-hr storm and the 10-yr, 1-hr storm would be stored in an additional, separate 5 MG EQ basin. Each basin would be fed independently. The splitting of flow between these two EQ basins would be accomplished by a series of valves at the influent structures. Treatment of this volume would be accomplished by a wet weather treatment process, but it would also be able to send flow back to the WWTP if capacity is available. This wet weather treatment process would consist of a 10 MGD high rate clarification system for primary treatment and a subsurface flow constructed wetland for secondary treatment. Prior to discharge the flow would be disinfected with a 10 MGD UV disinfection system. This flow would then be discharged through a second outfall to the Little River. The wet weather treatment process proposed would have the capability of providing full treatment by utilizing the constructed wetland. The wetland would be designed to meet the final effluent limits of the WWTP. This is proposed in the event the WWTP is not able to treat the volume generated by the 1-yr, 1-hr storm within 48 hours. It may be possible to eliminate the constructed wetland if the WWTP is able to treat the 1-yr, 1-hr volume within 48 hours. For all flows above the 10-yr, 1-hr storm, the WWTP and wet weather treatment process would treat as much volume as possible, but any volume above the 10-yr, 1-hr storm would overflow to the Wabash River.

Since the WWTP is not able to operate at its design capacity, several upgrades are proposed to restore it to its original design capacity. These upgrades include:

- ~~modifying the existing aeration basins to a fixed film bioreactor~~ secondary treatment improvements, or pretreatment to address industrial discharges,
- ~~installation of a septage receiving facility,~~
- replacement of both anaerobic digester covers,
- construction of a biosolids storage building, and
- installation of effluent pumps for discharging during flood conditions.

~~The fixed film bioreactor is intended to help treat the WWTP high concentration of soluble BOD.~~ The WWTP currently receives high concentrations of soluble BOD due to the presence of industrial discharges. Multiple alternatives will be evaluated to address this issue, including (1) the installation of a new type of secondary treatment system at the WWTP, (2) an upgrade of existing treatment systems at the WWTP, or (3) the addition of pretreatment systems at the individual industrial sites.

~~The septage receiving facility will monitor the composition of discharges that septage haulers discharge to the plant. This system would not allow discharge of wastes that could cause an upset to the biological process of the WWTP.~~

The anaerobic digester covers are proposed to be replaced because they are over 50 years old and are becoming inefficient at trapping gases.

A biosolids storage building would greatly benefit the WWTP because it would allow for the storage of solids until it can be hauled away. Currently, the WWTP has to maintain a high amount of solids in the clarifiers when hauling is not possible.

The last upgrade is to install effluent pumps at the WWTP. This is proposed because frequently the outfall of the WWTP becomes submerged as the river level rises. This results in the WWTP not being able to discharge. These upgrades are estimated to cost $13,500,000.

Also proposed with this alternative is the rehabilitation of the existing gravity line between CSO 003 and the WWTP. Due to its proximity to the Little River, it is believed that a significant amount of water infiltrates into this pipe from the river. Rehabilitation of this line would eliminate a significant amount of this infiltration and free up capacity at the WWTP for treatment of wet weather flow.

It is believed that the existing CSO flap gates are no longer water tight. This would allow water to flow into the sewer system from the river and reduce the wet weather capacity of the WWTP. Replacement of all seven flap gates located on the Little River is proposed. This is estimated to cost $500,000.

Additional monitoring and modeling would be necessary once each phase of the project is completed. This would be used to document the level of control achieved by the project and aid in the design of subsequent projects. Monitoring and modeling is estimated to cost $500,000 for all projects.

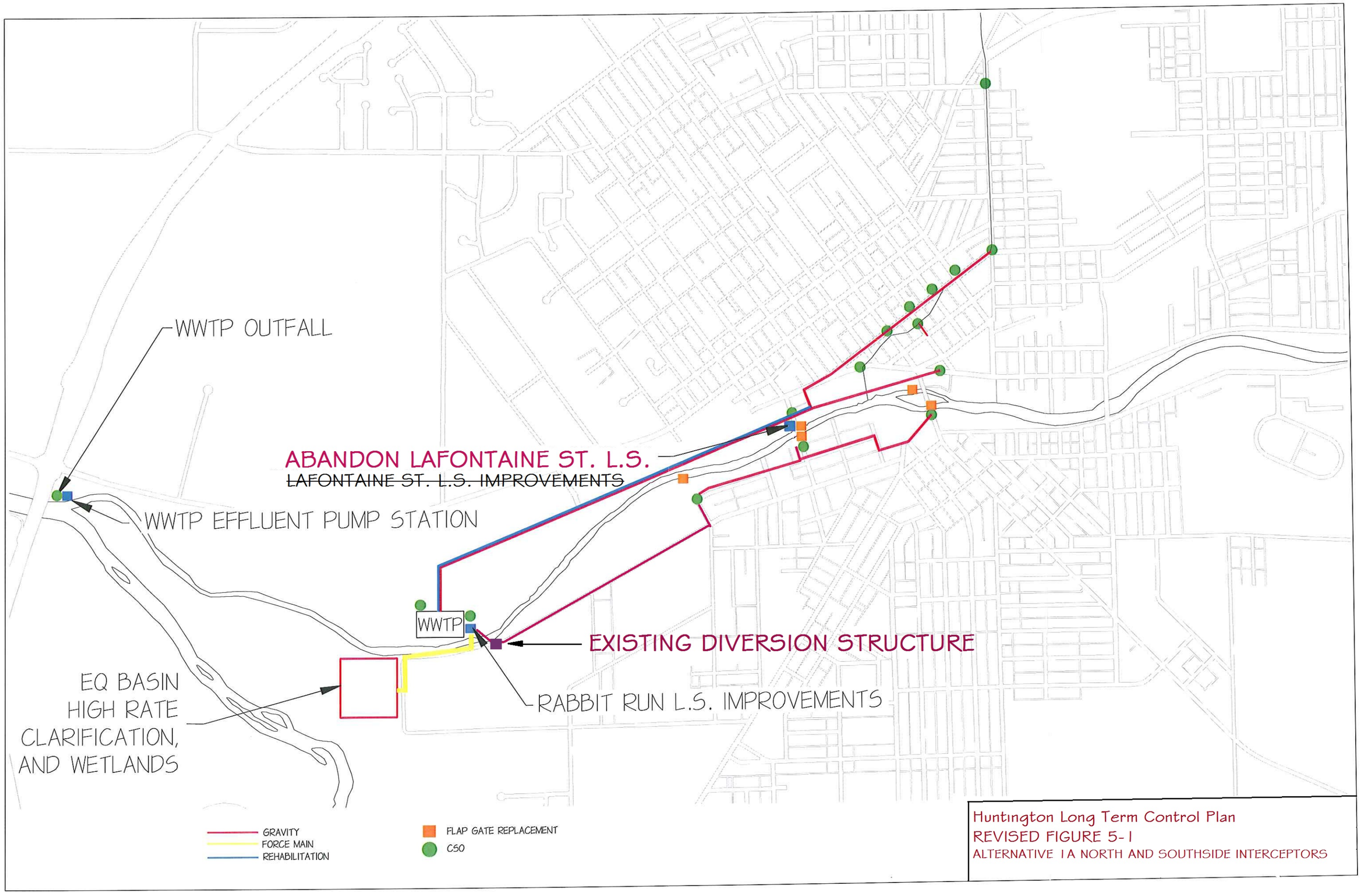
This alternative also budgets $2,000,000 for green infrastructure projects over the next twenty years. Specific projects have not been identified because these projects require a site specific approach. The types of projects that may be implemented include pervious pavement, rain gardens, and residential runoff prevention programs.

The total capital cost for this alternative is estimated to be ~~$64,000,000~~ $67,000,000. The total annual operation and maintenance cost for this alternative is estimated to be ~~$510,000~~ $496,000. The costs are summarized in **Table 5-1**. **Figure 5-1** shows the location of the proposed projects for Alternative 1A. **Figure 5-2** shows how influent flow at the WWTP would be routed during wet weather.

Table 5-1
Cost Estimate for Alternative 1A: North and Southside Interceptors

Project Description	2009 Capital Cost of Each Project
Segment #1 – CSO 008 to CSO 003	$900,000
Segment #2 – CSO 007 to Lafontaine St./Frederick St.	$2,100,000 ~~$1,100,000~~
Segment #3 – Lafontaine St./Frederick St. to CSO 005 ~~Segment #3 – CSO 005 to Lafontaine St. Lift Station~~	$1,800,000 ~~$5,900,000~~
Segment #4 – CSO 003 to WWTP	$10,400,000 ~~$11,200,000~~
Segment #5 – CSO 015 to CSO 003	$4,200,000
Segment #6 – CSO 005 to William Street Diversion Structure	$4,052,000
Rabbit Run LS Improvements~~, and~~ EQ Basins and Wet Weather Treatment	$24,200,000
Green Infrastructure	$2,000,000
WWTP Improvements	$16,030,000 ~~$13,500,000~~
Replacement of CSO Flap Gates	$500,000
Post Construction Monitoring	$500,000
Total Construction Cost* (rounded to nearest $1,000,000)	**$67,000,000** **~~$64,000,000~~**

*Included estimates for contingency (15%) and non-construction costs (15%). See **Appendix 5** for individual project costs.



Huntington Long Term Control Plan
REVISED FIGURE 5-1
ALTERNATIVE 1A NORTH AND SOUTHSIDE INTERCEPTORS

Table 5-7
Summary of Alternative Capital Cost

Alternative	Alternative Description	2009 Capital Cost	O&M Cost
Alternative 1A	North and Southside Interceptors	$67,000,000 ~~$64,000,000~~	$496,000 ~~$510,000~~
Alternative 1B	North and Southside Interceptors with a Forcemain	$77,000,000	$610,000
Alternative 2	Northside Interceptors	$57,000,000	$470,000
Alternative 3	Southside Interceptors	$60,000,000	$510,000
Alternative 4	Total Separation	$70,000,000	$100,000
Alternative 5	No Action	$14,000,000	$160,000

To evaluate the most cost effective alternative, Figure 5-7 was generated that shows the anticipated number of CSO events vs. capital cost. In Figure 5-7 Alternative 1A occurs at the knee of the curve. This is the point of diminishing returns and after this point costs begin to increase faster for minor increases in the level of control. Alternative 1A is the most cost effective because it provides a great level of control at a low cost when compared to the other alternatives.

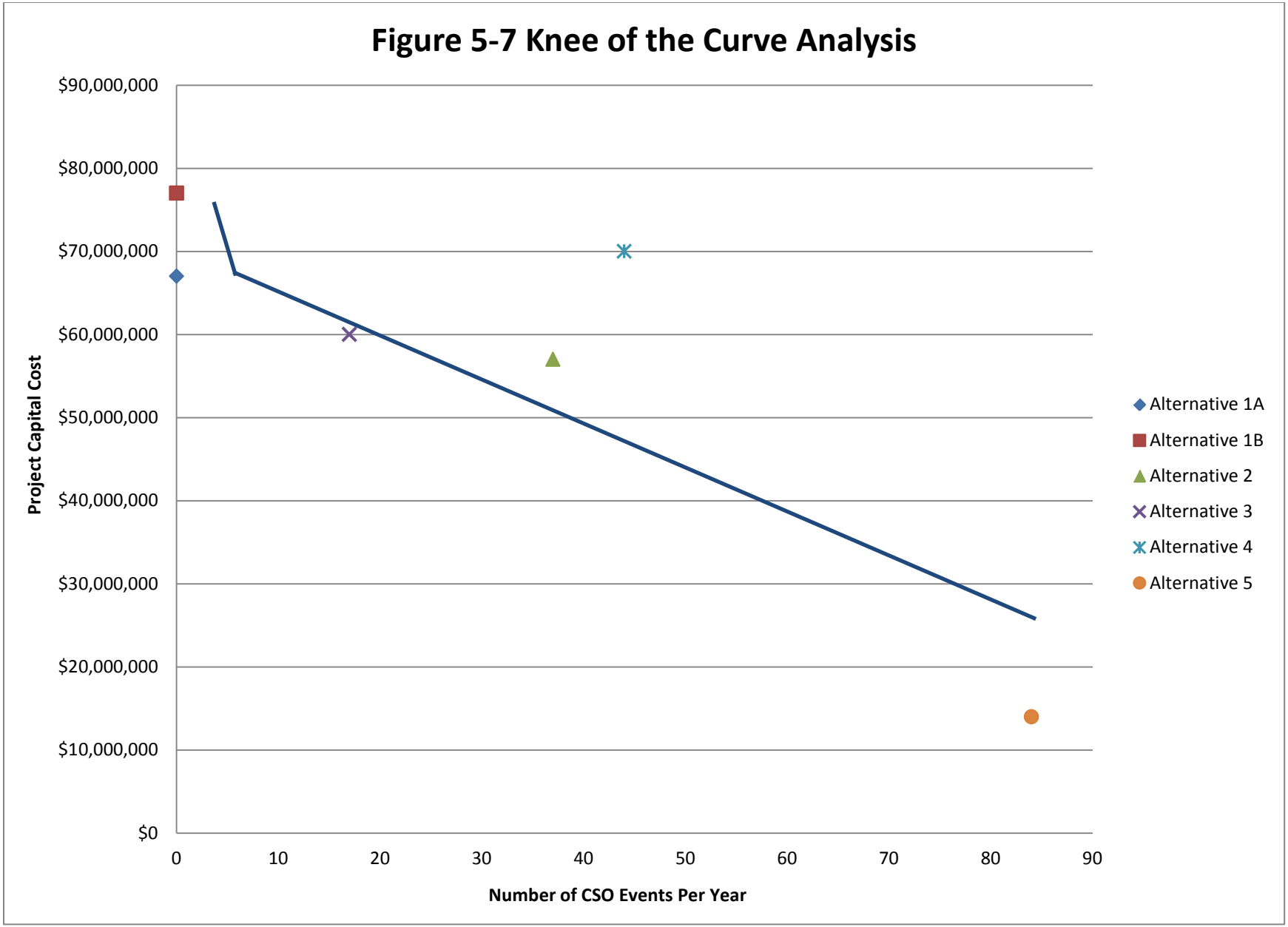


Figure 5-7 Knee of the Curve Analysis
$90,000,000
$80,000,000
$70,000,000
$60,000,000
$50,000,000
$40,000,000
$30,000,000
$20,000,000
$10,000,000
$0
Project Capital Cost
0
10
20
30
40
50
60
70
80
90
Number of CSO Events Per Year
Alternative 1A
Alternative 1B
Alternative 2
Alternative 3
Alternative 4
Alternative 5

11. Board of Works meeting No. 2 – November 16, 2009

At the regularly scheduled Board of Works meeting on November 16, 2009 the recommendation of the CAC was presented and accepted by the Board of Works. The Board gave permission to submit the LTCP. A copy of the meeting minutes from this meeting is included in **Appendix 6**.

12. Public Meeting – June 7, 2012

A public meeting was held to present the Preliminary Engineering Report to the public regarding the proposed, upcoming construction of interceptor sewer Segment 2 and Segment 3, referred to as the Frederick Street CSO Interceptor Project. Also included, was a discussion of the LTCP Alternative 1A revision to add Segment 6 and eliminate the Lafontaine Lift Station upgrade. A copy of the sign in sheet and meeting minutes from this meeting is included in **Appendix 6**.

13. Future meetings

The City intends to maintain a CAC while the LTCP is implemented. This will enable the projects to address the community's concerns. CAC meetings will be held annually to review the current status of projects and upcoming projects. While projects are being designed CAC meetings may be held more frequently.

C. Public Education

In addition to the Citizen's Advisory Committee, the City will be implementing an educational program for the local community. Huntington will invite the public to an annual meeting to discuss the current status of the LTCP and any possible changes to the plan. The meeting locations and dates will be posted in the local newspaper and advertised accordingly. The reasoning behind the LTCP will be discussed and all questions will be addressed. In addition to this annual meeting, the City has a contact number posted at all of the CSO locations that can be used to provide additional information to concerned citizens.

CHAPTER 8 RECOMMENDED ALTERNATIVE AND IMPLEMENTATION SCHEDULE

Each alternative was evaluated to identify which was the most cost effective. **Figure 5-7** was generated and shows the total capital cost for each alternative plotted against the predicted number of CSO events.

Alternative 1A is the recommended alternative because it satisfies the design storm approach and results in a WW_{CHPI} just over 2% (2.41%). It provides a significant level of CSO control, but lessens the economic impact on residents. This alternative will meet the 1-year, 1-hour and the 10-year, 1-hour design storm criteria as outline in IDEM's CSO Treatment Facilities Nonrule Policy Document Water-016. Implementation will result in no overflows from wet weather events below the 1-year, 1-hour storm. Additionally, no overflows will occur between the 1-year, 1-hour storm and the 10-year, 1-hour storm except for flows treated by the wet weather treatment process.

Table 8-1 is the proposed implementation schedule for Alternative 1A based upon an implementation schedule of 16 years. The projects are ordered so that the projects that provide the greatest reduction in CSO volume will occur first. Additionally, by implementing the projects in the order outlined, it will be possible to minimize the cost for subsequent more costly projects by allowing for a period of flow monitoring. Implementation of this alternative will not require a Use Attainability Analysis, since it satisfies the requirements of the design storm approach.

If the City must implement the projects in less than 16 years, then the projects will still occur in the same order, but at an accelerated rate. Constructing all projects in such a short time would potentially result in additional expense because treatment and collection systems would potentially be oversized. Oversizing of pipes is more likely to occur when sufficient time is not allowed for flow monitoring. It would be in the City's best interest to have as much time as possible to construct the project to minimize expense and disruption to citizens.

Table 8-1 details the capital cost and operation and maintenance for each alternative. ~~A budget for green infrastructure projects is included with each project. Each project should be evaluated for the possible inclusion of green opportunities. If it is not possible to incorporate green opportunities into each project, then the budgeted funds will be rolled into the subsequent green budget. It's also possible to reallocate budgeted funds from the budget of a future green project if a significant opportunity exists.~~ $2,000,000 has been allocated for green infrastructure in the form of a downtown “Green Street” associated with the construction of Segment #5. However, each project should be evaluated for the possible inclusion of green opportunities.

Table 8-1 Project Implementation Schedule

Year	Projects	Capital Cost	Operation and Maintenance
2009	No Project – Monitoring Only	$30,000	$0
2010	~~WWTP Improvements Phase I (Membrane Bioreactor, Sludge Thickener, Biosolids Storage Building, Septage Receiving Facility, Screens, North Anaerobic Digester Cover)~~	~~$9,000,000~~	$0 ~~$30,000~~
	~~Green Infrastructure ($2,000,000 Total)~~	~~$225,000~~	
	~~Monitoring~~	~~$30,000~~	
	No Project – Monitoring Only	$30,000	
2011	WWTP Improvements (South Anaerobic Digester Cover)	$1,350,000	$0
	Green Infrastructure Study (Analysis of Proposed LTCP Projects to Incorporate Green Infrastructure)	$48,500	
	Monitoring	$30,000	
	~~No Project – Monitoring Only~~	~~$30,000~~	
2012	~~Interceptor – Segment #2 (CSO 007 to Lafontaine St. and Liftstation)~~	~~$1,100,000~~	~~$0~~ ~~$30,000~~
	~~Interceptor – Segment #3 (CSO 005 to Lafontaine St. LS and LS Improvements~~	~~$5,900,000~~	
	~~Green Infrastructure ($2,000,000 Total)~~	~~$225,000~~	
	No Project – Monitoring Only	$30,000	
	~~Monitoring~~	~~$30,000~~	
2013	No Project – Monitoring Only	$30,000	$0
2014	WWTP Improvements Phase I (Influent Screens, Grit Removal, Sludge Thickener, North Anaerobic Digester Cover)	$6,900,000	$85,000 ~~$50,000~~
	Rabbit Run Phase I (Screens, 55 MGD Pumps, 5.0 MG EQ Basin)	$9,800,000 ~~$9,300,000~~	
	WWTP Improvements Phase 1a (Additional Treatment Improvements and/or Pretreatment at Industries)	$5,580,000	
	Interceptors – Segment #2, Segment #3 and Segment #6 (Frederick Street CSOs 005, 006 and 007)	$7,952,000	
	~~Green Infrastructure ($2,000,000 Total)~~	~~$225,000~~	
	Monitoring	$30,000	
2015	No Project – Monitoring Only	$30,000	$0
2016	Replacement of CSO Flap Gates	$500,000	$5,000
	~~Green Infrastructure ($2,000,000 Total)~~	~~$225,000~~	
	Monitoring	$30,000	

(Continues on next page)

Table 8-1 Project Implementation Schedule (continued)

Year	Projects	Capital Cost	Operation and Maintenance
2017	No Project – Monitoring Only	$30,000	$0
2018	WWTP Improvements Phase II (~~South Anaerobic Digester Cover~~, WWTP Effluent Pumps)	$2,200,000 ~~$4,500,000~~	$30,000
	~~Green Infrastructure ($2,000,000 Total)~~	~~$225,000~~	
	Monitoring	$30,000	
2019	No Project – Monitoring Only	$30,000	$0
2020	Interceptor – Segment #1 (CSO 008 to CSO 003)	$900,000	$1,000
	~~Green Infrastructure ($2,000,000 Total)~~	~~$225,000~~	
	Monitoring	$30,000	
2021	No Project – Monitoring Only	$30,000	$0
2022	Interceptor – Segment #5 (CSO 015 to CSO 003)	$4,200,000	$10,000 ~~$5,000~~
	Green Infrastructure for Segment #5	$2,000,000	
	~~Green Infrastructure ($2,000,000 Total)~~	~~$225,000~~	
	Monitoring	$30,000	
2023	No Project – Monitoring Only	$30,000	$0
2024	Interceptor – Segment #4 (CSO 003 to WWTP)	$10,400,000 ~~$11,200,000~~	$5,000
	~~Green Infrastructure ($2,000,000 Total)~~	~~$225,000~~	
	Monitoring	$30,000	
2025	No Project – Monitoring Only	$30,000	
2026	Rabbit Run Phase II (35 MGD Pump & 5 MG EQ Basin, Wet Weather Treatment [high rate clarification, wetlands treatment, and UV disinfection])	$14,400,000	$360,000
	Green Infrastructure ($2,000,000 Total)	$225,000	
	Monitoring	$30,000	
Total		**$67,000,000** ~~**$64,000,000**~~	**$496,000** ~~**$510,000**~~

**Note: Citizens' Advisory Committee meetings will be held annually to review the current status of the LTCP. More frequent meetings should be held as necessary.*

***Note: The wetlands treatment system may be eliminated in the future depending on the capacity of the WWTP to treat volume of the 1-year, 1-hour storm.*

****Note: The total cost for monitoring is estimated to be $500,000.*

Frederick Street CSO Interceptor Project

BLA Project #: 210-0062

PUBLIC HEARING MEETING MINUTES

Meeting Date: June 7, 2012

Meeting Location: City of Huntington, City Council Chambers

Prepared By: Cherylynn Schilling, BLA

The public hearing included the presentation of two PERs. Attendees included Anthony Goodnight (Assistant City Engineer), Cherylynn Schilling (representing Bernardin, Lochmueller & Associates, Inc.), two engineering consultants connected to the other PER being presented, and one member of the public.

- Cherylynn began the public hearing with a general introduction to the proposed project.
- A PowerPoint presentation was used to provide proposed project details, including:
    - A brief description of CSO Long Term Control Planning and the Clean Water Act.
    - General description of project components.
    - Proposed modifications to the LTCP selected "Alternative 1A", in accordance with the selected PER "Alternative A".
    - General design criteria.
    - Discussion of cost comparison of PER alternatives.
    - Contact information for written questions after the public hearing.
- The attendee from the general public asked whether the land space located on the southeast side of the intersection of Lafontaine Street and the railroad tracks was considered for placement of the lift station upgrade in PER Alternative B, since there was more space available there.
    - Cherylynn noted that it was likely this option would still necessitate lengthy and costly negotiations for placement of a large lift station upgrade within the railroad right-of-way.
- The attendee from the general public asked if Segment #6 would be pressurized or gravity-flow, if it would collect existing sanitary flows from this area, and if the roadway would include storm inlets to this sewer.
    - Cherylynn indicated that for the selected PER Alternative A, all interceptor segments would be gravity-flow. Existing sanitary flows will discharge to this interceptor. New storm inlets to this sewer would not be included.
- The attendee from the general public asked if the road would be repaved and would include new sidewalks and curbs.
    - Cherylynn indicated that the road would be repaved if the interceptor was placed in the roadway, but the design would evaluate the potential to construct outside of the roadway, if possible, to reduce costs. New sidewalk and curbing is not currently proposed, since there is no existing sidewalk and curbing in this area.

PUBLIC HEARING: Frederick Street CSO Interceptor Project
300 Cherry Street, Huntington - Mayor's Conference Room
June 7, 2012

SIGN-IN SHEET

Name	Contact Information (Address, Phone Number, Email)
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B John	A&D 356-1515
Cheryl Lynn Schilling	Bernardin Lochmueller & Associates 3502 Woodview Trace, Suite 150 Indy (317)222-3880 cschilling@blainc.com