

Long Term Control Plan Public Hearing

August 28, 2019

Recommended CSO Control Alternative



SANITARY DISTRICT OF HAMMOND

Introduction / Background Summary of Public Hearings / Meetings

Date	Meeting
October 27, 2011	Introduction to the Planning Process
July 10, 2012	LTCP Alternatives
May 8, 2015	Preliminary Recommendations
February 20, 2018	Recommended CSO Control Alternative
August 28, 2019	Revised Recommended CSO Control Alternative



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Presentation Outline

- What is a Long Term Control Plan?
- History of the LTCP for HSD
- Improvements to date
- Current status of the LTCP
- What's next?



What is a Long Term Control Plan?

First, what is a Combined Sewer Overflow (CSO)?



Sewer systems contain three types of sewers

Sanitary Sewers

- Sewage Only

Storm Sewers

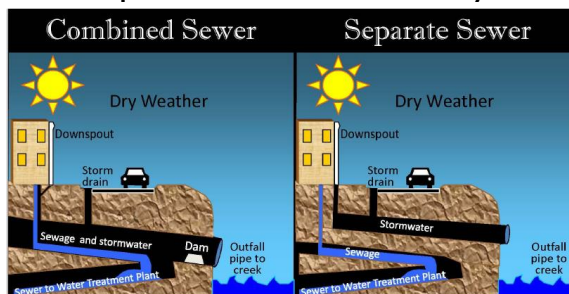
- Storm runoff only

Combined Sewers

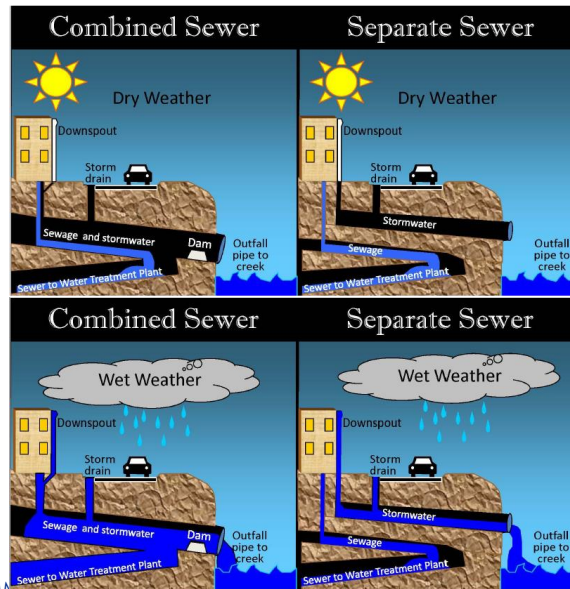
- Mixture of sewage and storm runoff



Combined vs. Separate Sewer Systems



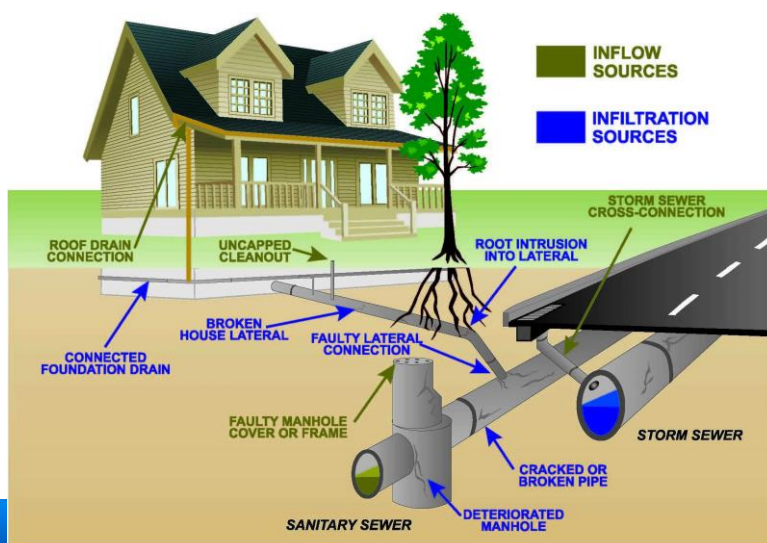
Combined vs. Separate Sewer Systems



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Sewer Separation

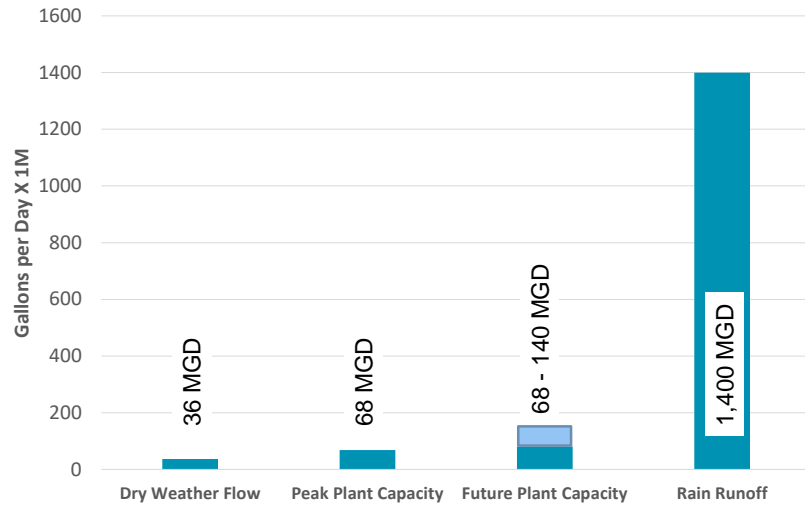


- Disruptive
- Expensive
- Inflow & Infiltration

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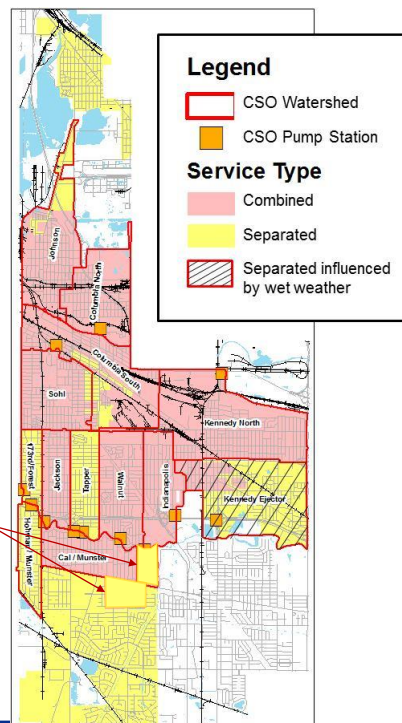
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Stats and facts about HSD's WWTP

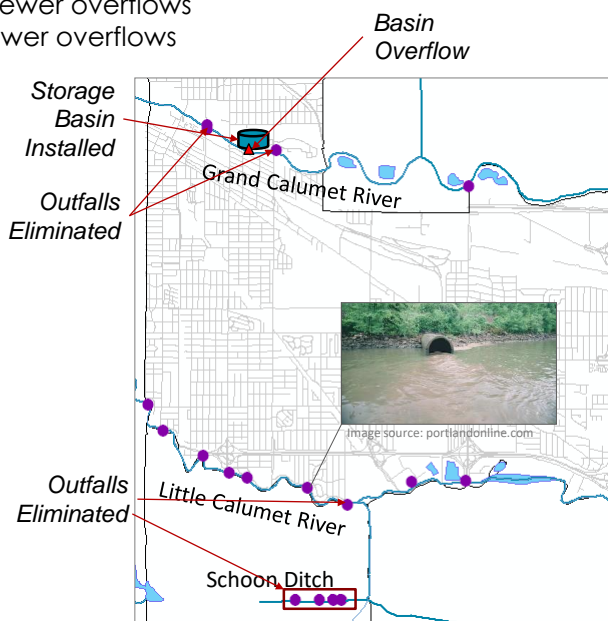


55% of HSD's service area is served by combined sewers (by area)

Separated since start of LTCP Process



2011: 17 combined sewer overflows
 2015: 9 combined sewer overflows



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What is a Long Term Control Plan?

- 772 cities in the US have combined sewer systems and are facing the same challenges as HSD
- To reduce pollution, EPA issued the Combined Sewer Overflow Control Policy, which mandates Cities to develop a Long Term Control Plan...

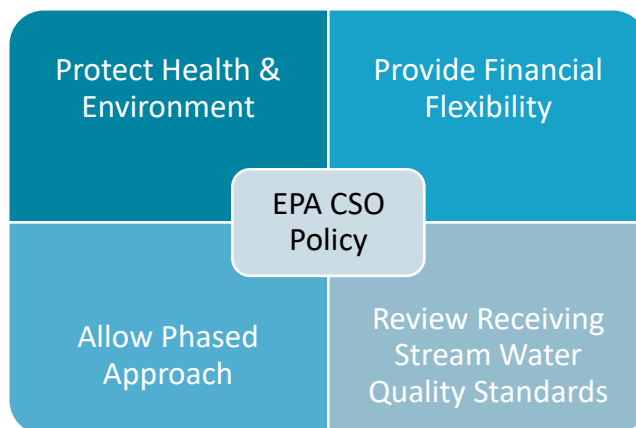


Image source: <http://cfpub.epa.gov/npdes/cso/demo.cfm>

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Key elements of EPAs CSO Control Policy



Goals and objectives of the LTCP

“Ensure all CSO discharges comply with the *technology-based and water quality-based* requirements of the Clean Water Act”

- EPA: *financial approach* – do what you can pay for
- IDEM: *technical approach* – do what will meet design storm criteria
- Everyone: Clean water & better health



IDEM's Ultimate Goal...



History of the LTCP in Hammond

- Originally submitted LTCP to IDEM in 1997...
 - IDEM performed a completeness review in 2003
 - Negotiation of terms of plan update began in 2004
- HSD continued to use this document as a roadmap for CSO reduction...
 - Revised plan submitted in June 2015
 - Received comments from IDEM & EPA
 - Requested that HSD evaluate further improvements
- HSD submitted updated LTCP on March 1, 2018
 - Received comments from IDEM & EPA
 - Revised selected alternative

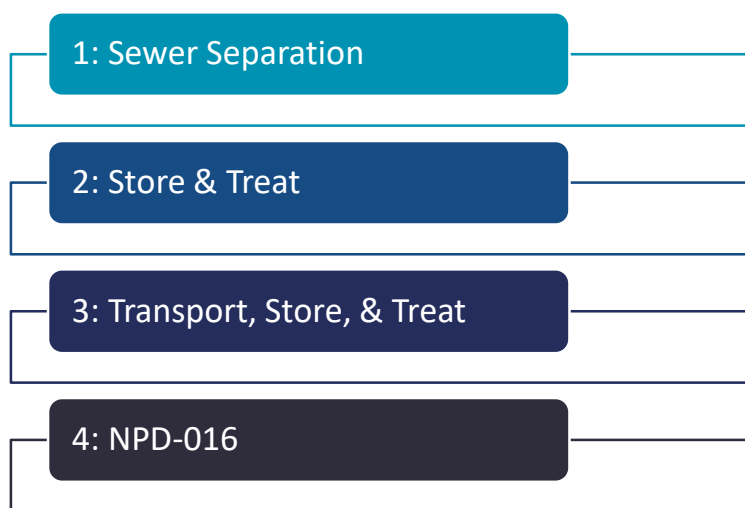
- HSD to submit updated LTCP on September 30, 2019

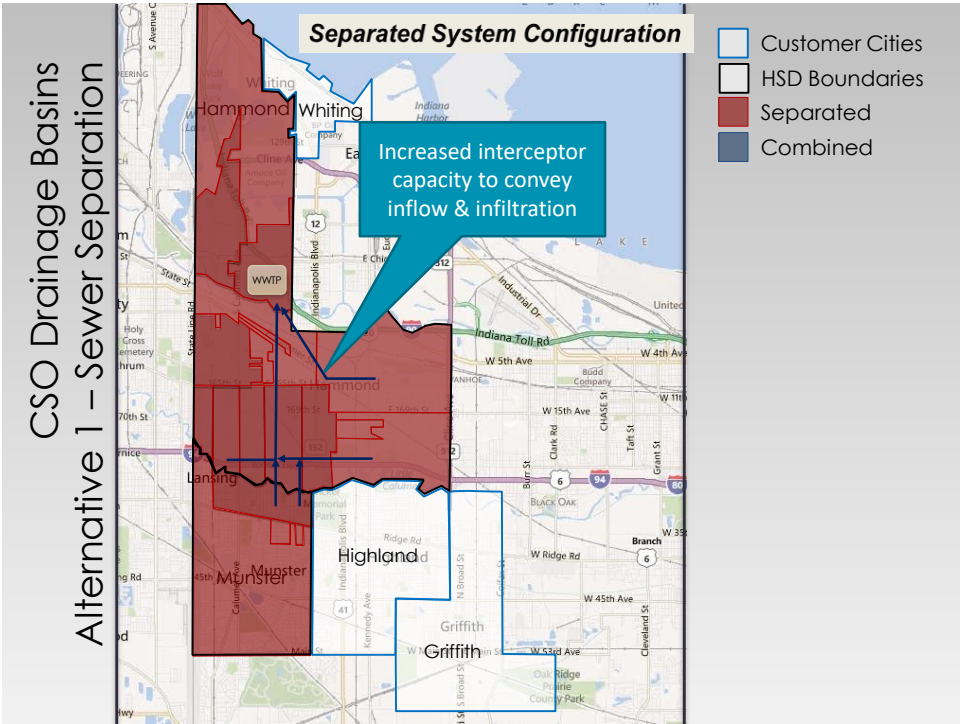
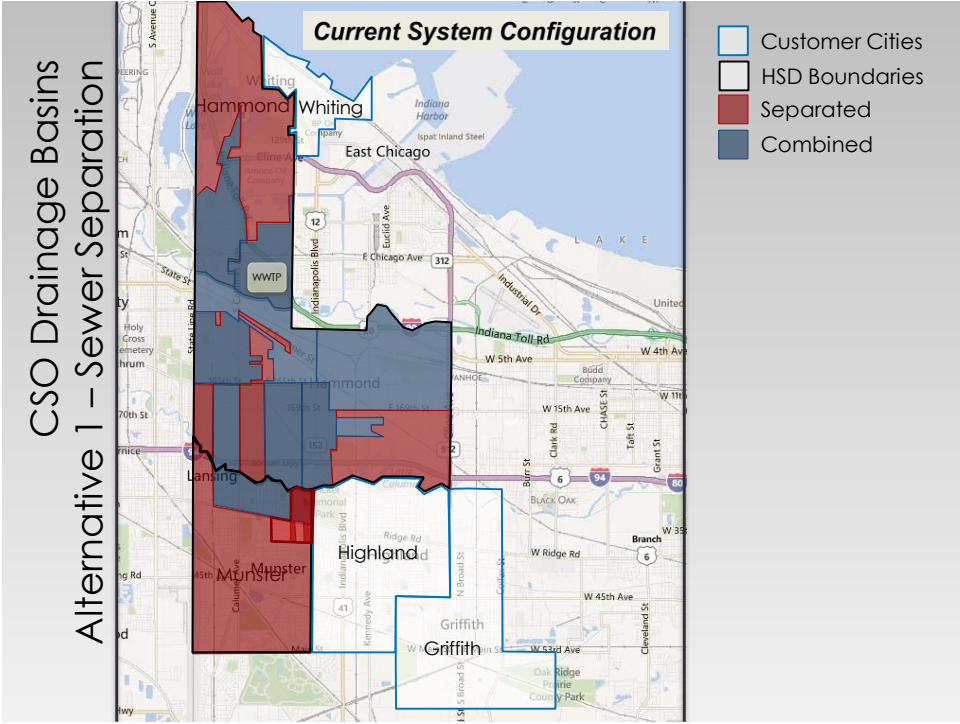
The LTCP lays out a strategy to reduce, treat, and/or eliminate CSOs

- The LTCP consists of 3 main engineering phases:

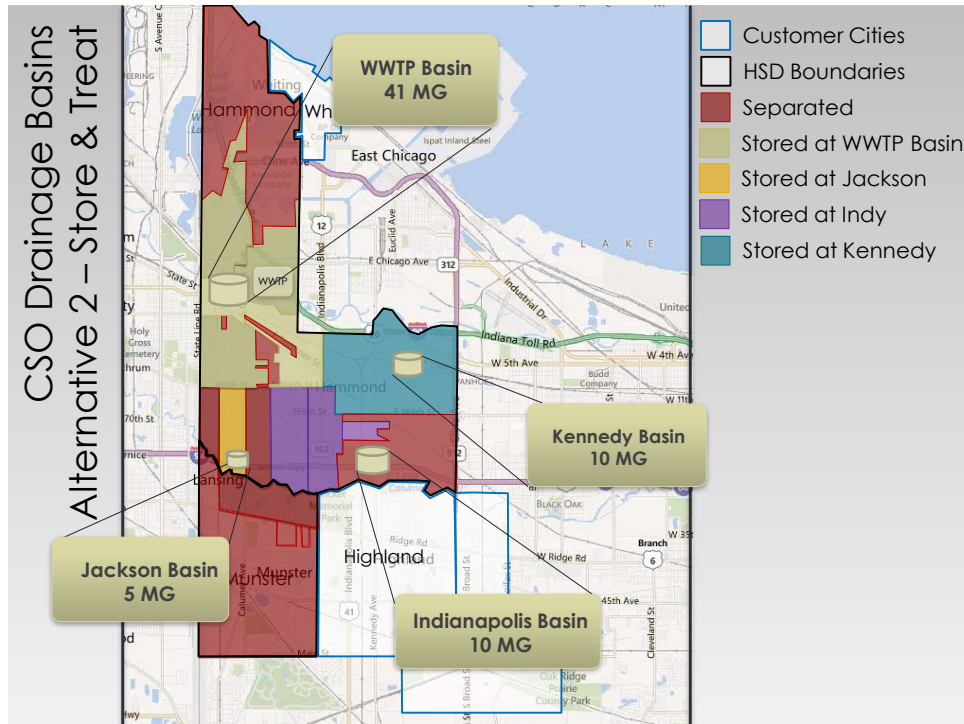


Alternatives Evaluated In June 2015 LTCP



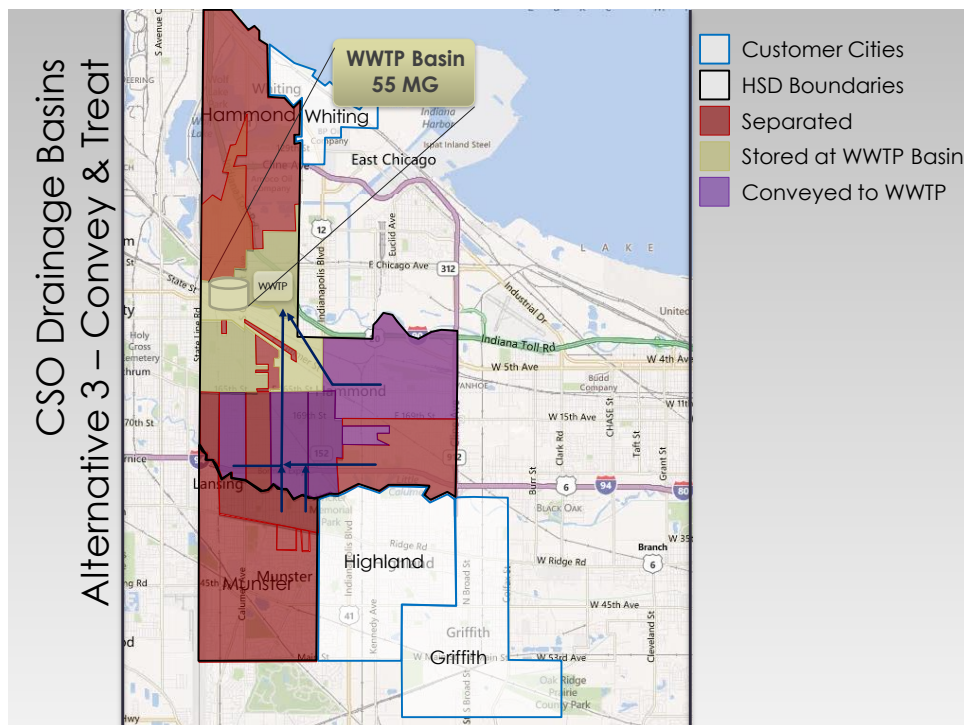


Alternative	Capital Cost
1	\$482M



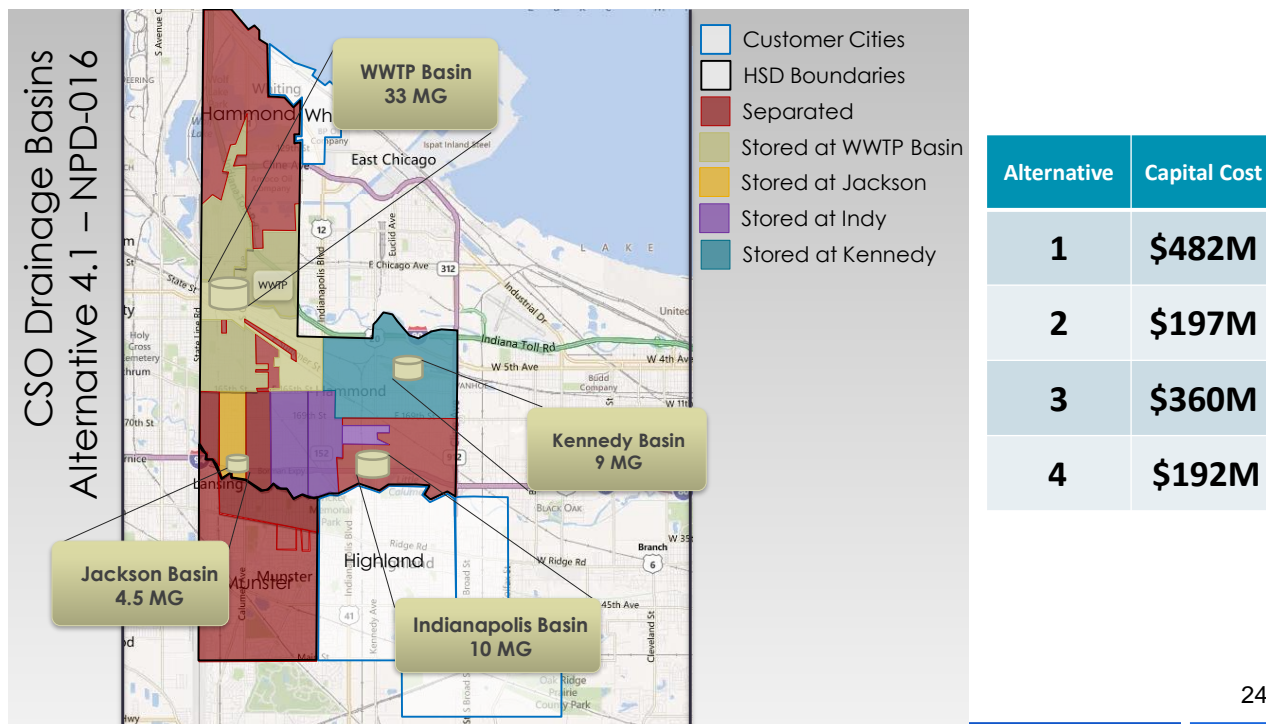
Alternative	Capital Cost
1	\$482M
2	\$197M

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Alternative	Capital Cost
1	\$482M
2	\$197M
3	\$360M

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Total Present Worth of LTCP Alternatives

- Alternative 1: Complete Sewer Separation
- Alternative 2: Store & Treat
- Alternative 3: Convey & Treat
- Alternative 4.1: NPD-016 (4 overflows per year)

	Alt. 1	Alt. 2	Alt. 3	Alt. 4.1
WWTP	\$44	\$44	\$44	\$44
GCR Total	\$224	\$71	\$128	\$63
LCR Total	\$214	\$71	\$176	\$70
Fine Screens		\$12	\$12	\$12
Grand Total	\$482	\$197	\$360	\$192



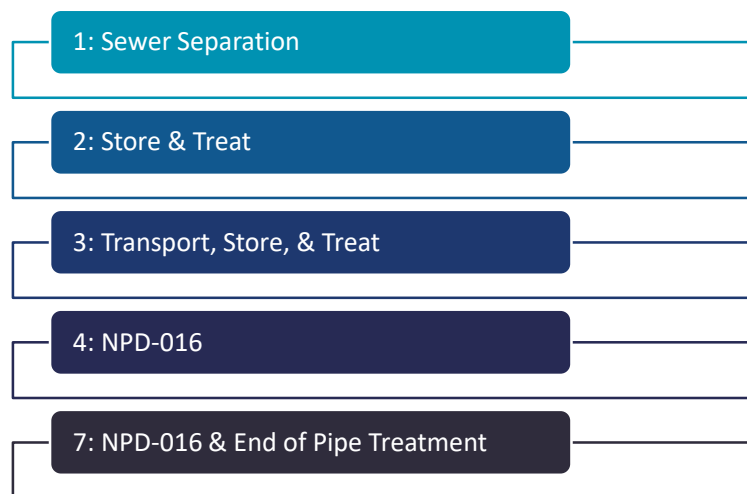
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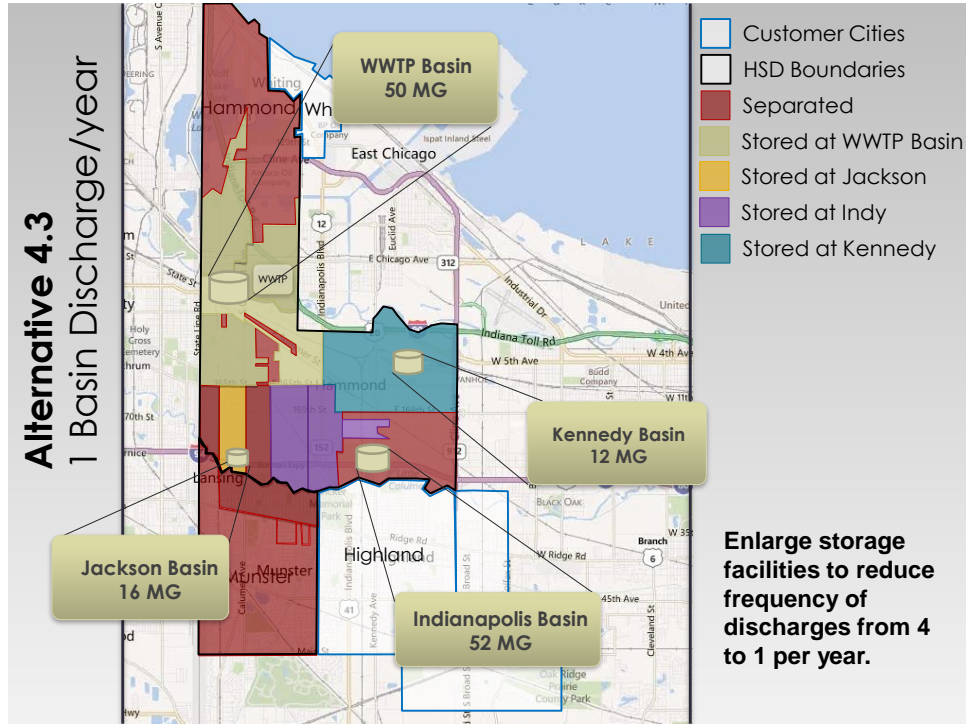
Outcome of EPA Meetings

**Evaluate reducing the
frequency of discharges from
4 to 1-2 per year.**

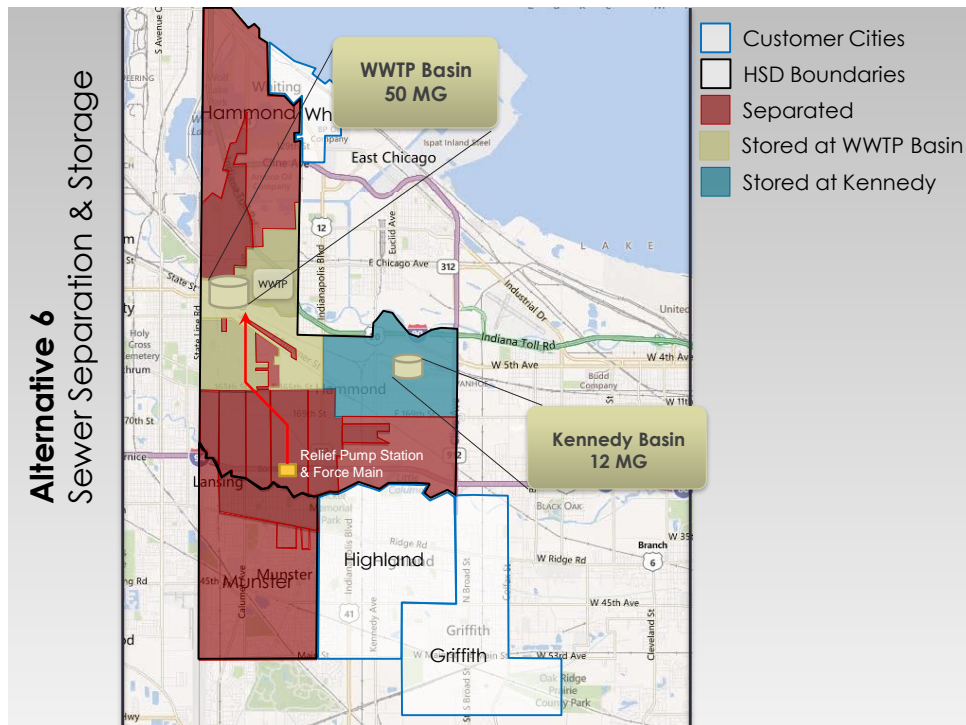


Alternatives Evaluated In March 2018 LTCP

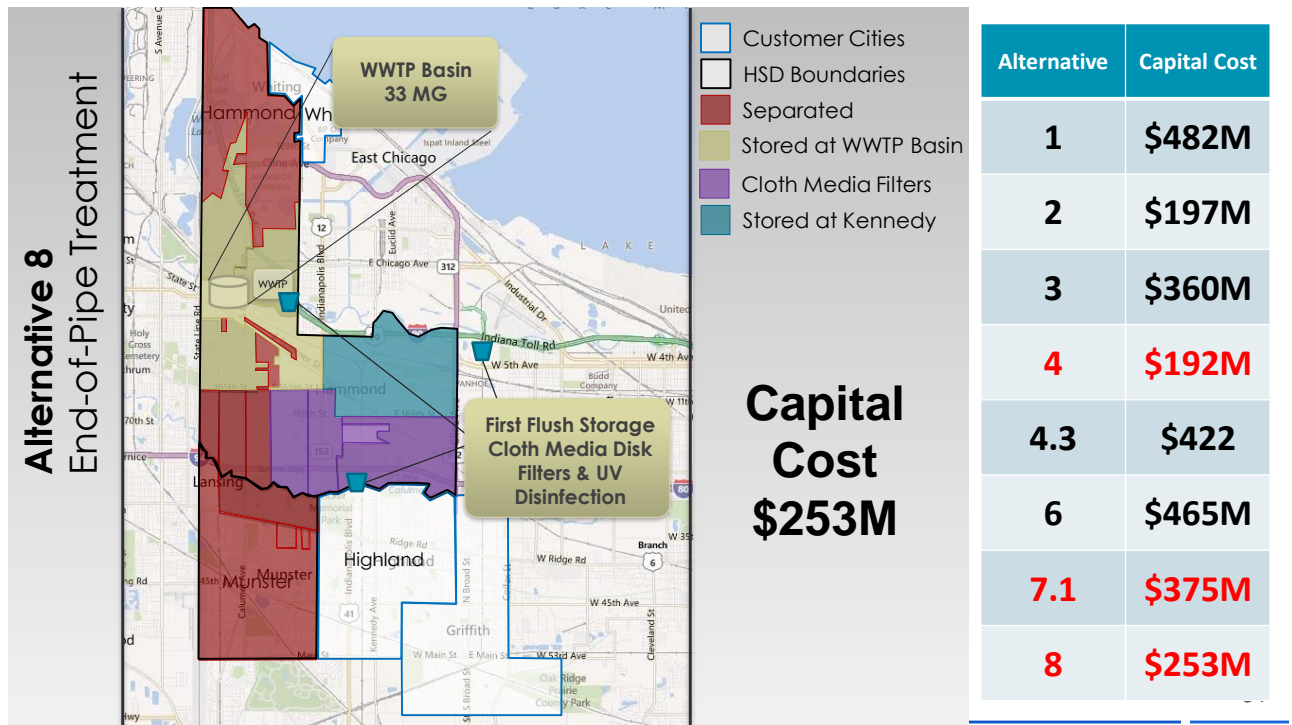
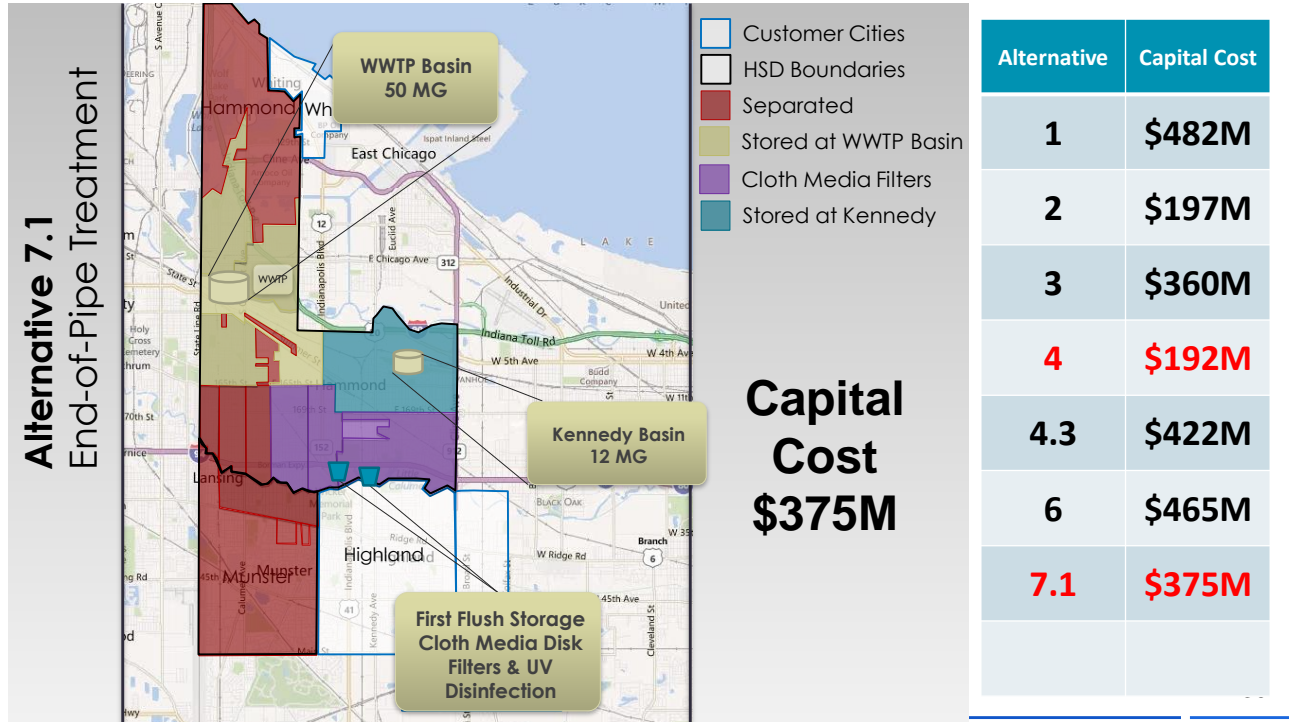




Alternative	Capital Cost
1	\$482M
2	\$197M
3	\$360M
4	\$192M
4.3	\$422M



Alternative	Capital Cost
1	\$482M
2	\$197M
3	\$360M
4	\$192M
4.3	\$422M
6	\$465M



Capital Costs of LTCP Alternatives

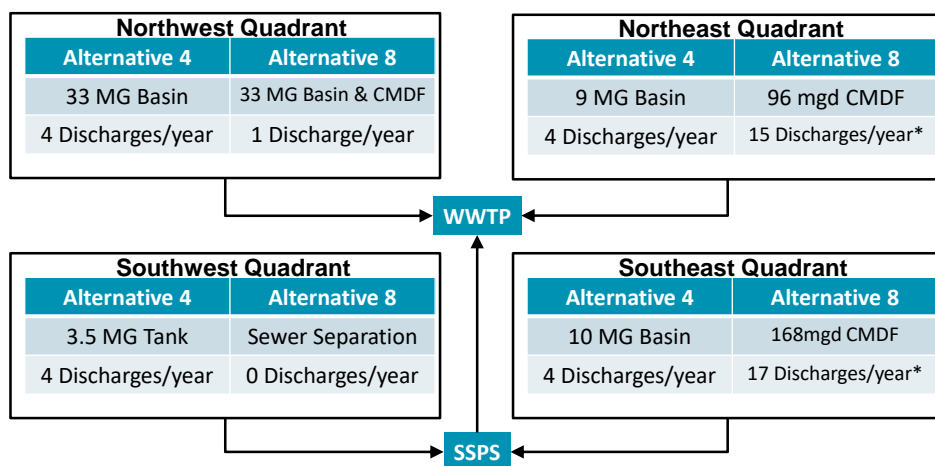
- Alternative 1: Complete Sewer Separation
- Alternative 2: Store & Treat
- Alternative 3: Convey & Treat
- Alternative 4.1: NPD-016 (4 discharges/year)
- Alternative 4.3: NPD-016 (1 discharge/year)
- Alternative 7.1: Store & Treat (1 discharge/year) + CMDf
- Alternative 8: CMDf

	Alt. 1	Alt. 2	Alt. 3	Alt. 4.1	Alt. 4.3	Alt. 7.1	Alt 8
WWTP	\$44	\$44	\$44	\$44	\$192	\$192	\$34
GCR Total	\$223	\$71	\$128	\$66	\$85	\$82	\$124
LCR Total	\$214	\$71	\$176	\$70	\$133	\$90	\$90
Fine Screens		\$12	\$12	\$12	\$12	\$10	\$4
Grand Total	\$482	\$197	\$360	\$192	\$422	\$375	\$253

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Comparison of Alternatives 4 & 8

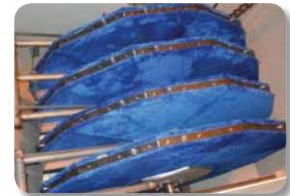
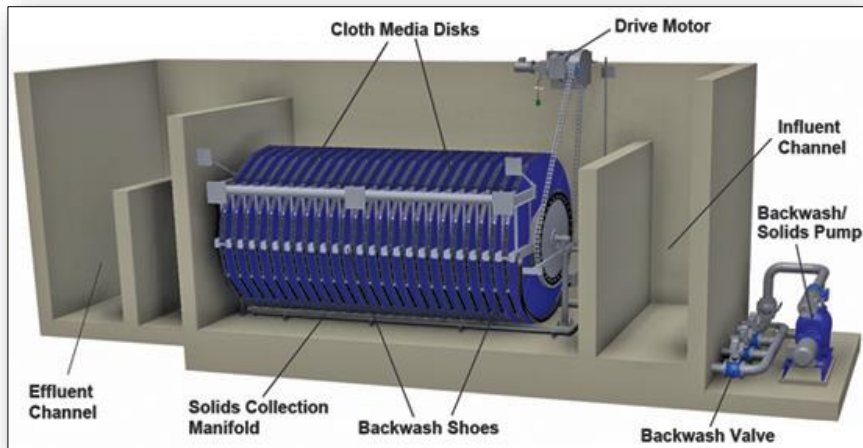


*Treated to a quality approaching secondary effluent + disinfection

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Cloth Media Disk Filters



OptiFiber PES-14®



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Cloth Media Disk Filters



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Benefits of CMDF vs. Storage

- Smaller footprint
- Simple operation & maintenance
- Less odor
- More consistent capture & treatment



CMDF Pilot Testing



CMDF Pilot Testing TSS Removal

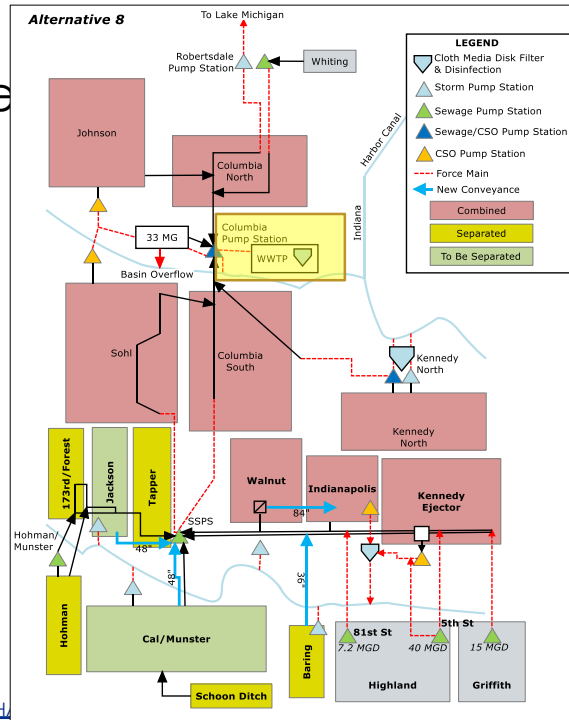
Goal: 30 mg/L

Event	Weighted Avg. Inf.	Weighted Avg. Eff.	Weighted Avg. % Removal	Running Weighted Average
Event 1	203.4	37.0	81.4	
Event 2	187.2	14.1	92.4	
Event 3	133.9	8.6	93.6	
Event 4	171.4	17.8	89.6	
Event 5	94.2	7.1	92.5	16.9
Event 6	220.8	14.6	93.4	12.4
Event 7	77.8	13.4	82.7	12.3
Event 8	193.6	11.7	94.0	12.9
Event 9	89.3	7.6	91.5	10.9
Event 10	116.6	24.9	78.7	14.4
Event 11	135.2	11.2	91.7	13.8
Event 12	96.3	16.2	83.2	14.3
Average	143.3	15.4	88.7	

Selected Plan:

Alternative 8 Store/Treat & CMDF

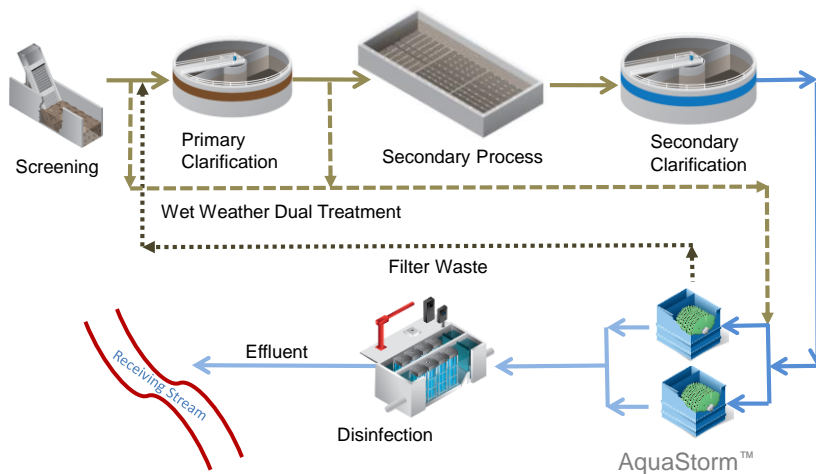
Alternative



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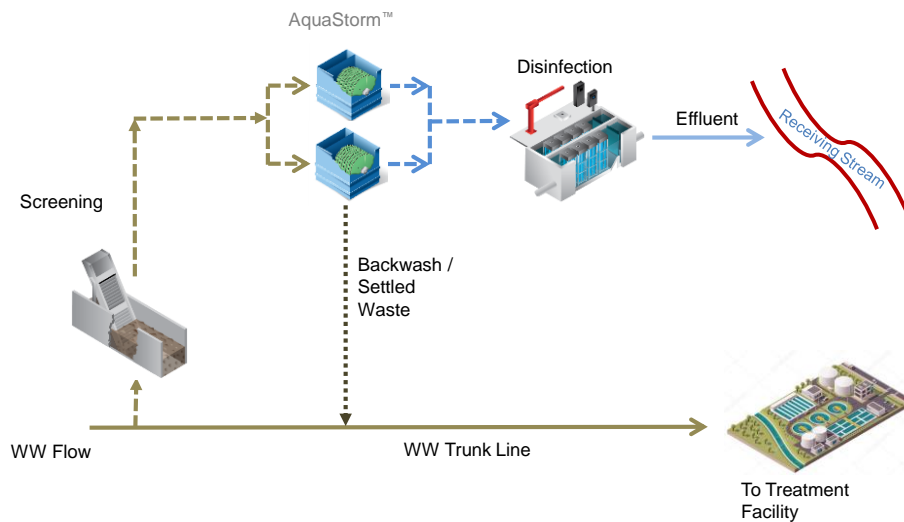
Dual Wet Weather Treatment



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Remote Wet Weather Treatment

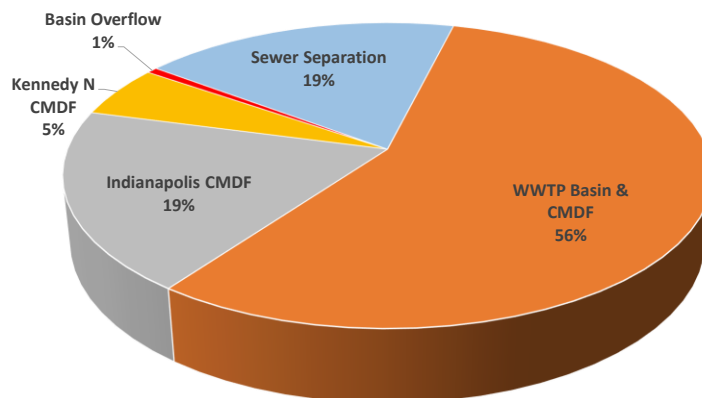


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Reduction In Annual Average CSO Volume

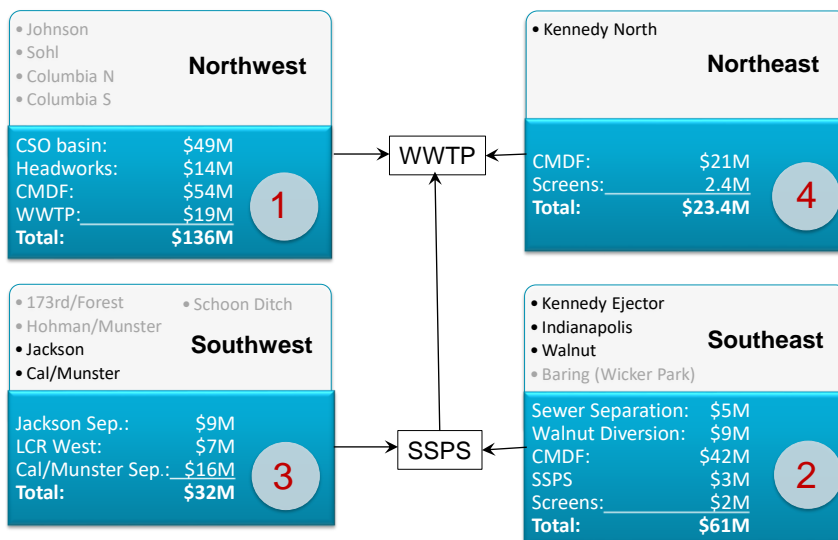
**Annual Average CSO
Discharge Volume:
2.5 BG**



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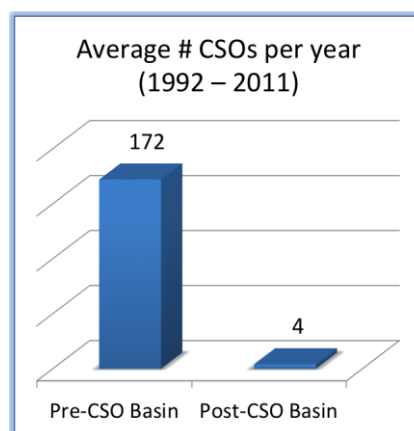
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Selected Plan Elements / Status

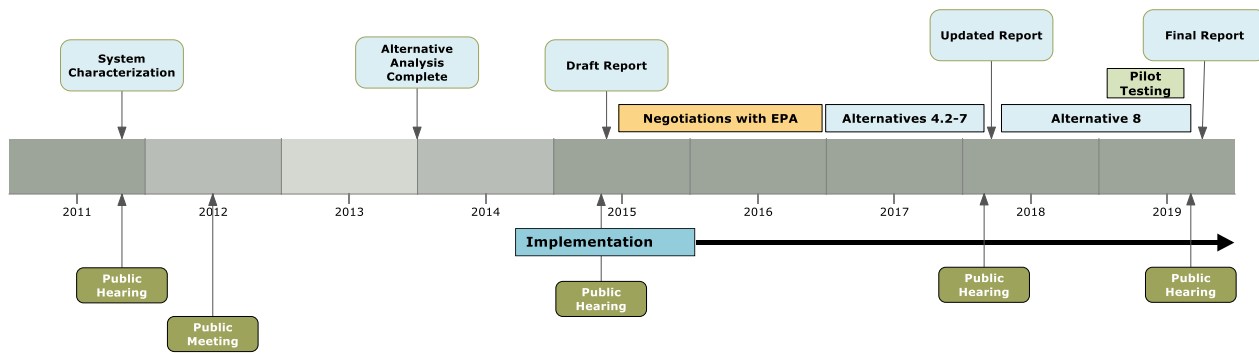


The CSO basin has dramatically reduced CSOs to the Grand Calumet River

- Pre-CSO Basin
 - CSO Outfalls would discharge 172 times per year, on average
- Post-CSO Basin
 - Discharges from existing outfalls *eliminated*
 - The CSO basin overflows 4 times per year, on average
 - Discharges are settled to remove solids and disinfected



Current Status of LTCP



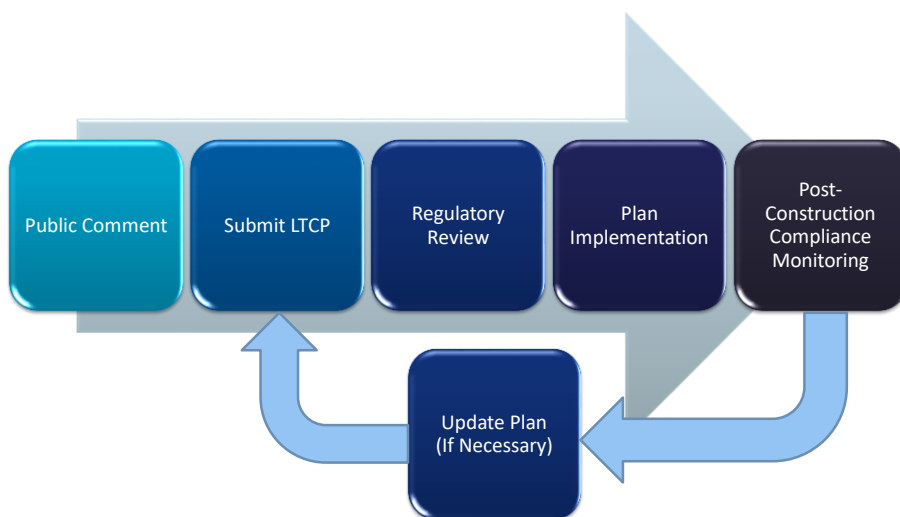
Construction Complete in 2035



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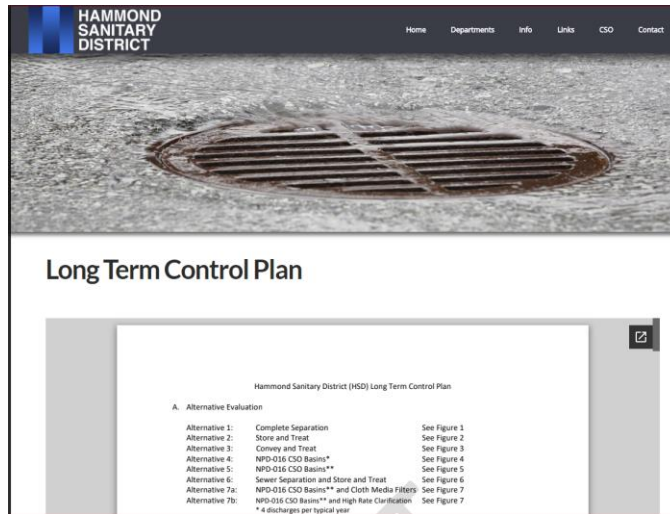
What's next?



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More info on City's Web page...



<http://www.hammondsd.com/long-term-control-plan/>

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Questions or comments?

Long Term Control Plan Public Hearing
Recommended CSO Control Alternative

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Hammond Sanitary District (HSD) Long Term Control Plan

A. Alternative Evaluation

Alternative 1:	Complete Separation	See Figure 1
Alternative 2:	Store and Treat	See Figure 2
Alternative 3:	Convey and Treat	See Figure 3
Alternative 4.1:	NPD-016 CSO Basins (4 overflows/year)	See Figure 4
Alternative 4.3:	NPD-016 CSO Basins (1 overflows/year)	See Figure 5
Alternative 6:	Sewer Separation and Store & Treat	See Figure 6
Alternative 7.1:	NPD-016 CSO Basins and Cloth Media Filters	See Figure 7
Alternative 7.2:	NPD-016 CSO Basins and High Rate Clarification	See Figure 7
Alternative 8:	CMDF & 33MG Columbia CSO Basin	See Figure 8

B. Introduction and Background

This Long Term Control Plan (LTCP) to reduce or eliminate combined sewer overflows (CSOs) is a revision to HSD's original plan submitted to IDEM in 1997, updated in June 2015, and further revised in March 2018. Communities with CSOs must develop and implement an LTCP pursuant to requirements under the federal Clean Water Act. The revised plan includes capital upgrades to accommodate increased flow from HSD's customer communities of the Town of Griffith and the Town of Highland, which is subject to continued negotiation and approval from state and federal agencies, and continued service to the City of Whiting. As described in greater detail below, the recommended alternative also incorporates a 33 MG storage basin completed by September 2014, which HSD constructed pursuant to a 1999 agreement with EPA and IDEM. This basin has eliminated 97% of CSOs near a previously located outfall on the Grand Calumet River.

C. Previously Selected Plan #1 (June 5, 2015)

Of the four alternatives considered, Alternative 4 (NPD-016 CSO Basins) had been previously selected as the recommended alternative to reduce CSOs based on numerous factors, including cost-effectiveness and overall environmental benefit. Alternative 4 was expected to reduce CSOs 91% in fifteen years and – unlike complete separation – would ensure that all incoming wastewater would receive some treatment prior to discharge. A description of the previously selected plan is as follows:

West Branch Grand Calumet River - HSD has already constructed a 33 MG CSO storage basin and force mains which transport CSOs from the Columbia, Johnson and Sohl pump stations to the basin. Improvements to the WWTP have already been constructed such that the CSO basin is expected to discharge partially treated flow four times or less during a typical year.

East Branch Grand Calumet River - HSD would construct a 9 MG CSO storage basin near the Kennedy North pump station along with pump station modifications and force mains. The CSO storage basin would store flows from the Kennedy North drainage area. The CSO basin was sized to provide 100% capture of the 1 year- 1-hour storm and settling and disinfection of all discharges. Improvements to the WWTP would be constructed such that the CSO basin could be drained within

48 hours, avoiding potential odor problems.

West Branch Little Calumet River - HSD planned to construct a 3.5 MG CSO storage basin sized to capture flows from the 173rd and Forest, Hohman-Munster and Jackson CSO pump stations. The CSO basin was sized to provide 100% capture of the 1-year 1-hour storm and settling and disinfection of all discharges. Improvements to the WWTP would be constructed such that the CSO basin could be drained within 48 hours. HSD also planned to completely separate the sewers in the Calumet- Munster drainage area and construct an interceptor to transport all sanitary flow to the WWTP.

East Branch Little Calumet River - HSD had planned to construct a 12 MG CSO storage basin along with pump station modifications and force mains. The CSO basin would store CSOs from the Walnut, Indianapolis Boulevard and Kennedy Ejector CSO pump stations. The basin was sized to provide 100% capture of the 1-year 1-hour storm and settling and disinfection of all discharges. Improvements to the WWTP would be constructed such that the CSO basin could be drained within 48 hours.

The projects identified in Alternative 4 were projected to be completed by 2030, subject first to the revised LTCP's overall approval by IDEM and EPA.

D. Previously Selected Plan #2 (March 1, 2018)

HSD responded to two sets of questions raised by U.S. EPA and IDEM in 2015 and 2016 and met with U.S. EPA and IDEM in July 2016. U.S. EPA requested that HSD investigate alternatives that provided a greater level of CSO treatment than provided in HSD's recommended plan in 2015 (4 overflows per year). U.S.EPA also requested that HSD to investigate costs to provide for a level of control to one or two overflows per year. As result, HSD submitted its revised LTCP in March 2018 to meet EPA's suggested one overflow per year criteria. The level of control required by HSD is still subject to approval by EPA and IDEM.

Of the seven alternatives considered, Alternative 7.1 (NPD-016 CSO Basins and Cloth Media Disk & Filters) was selected as the recommended alternative to reduce CSOs based on numerous factors, including cost-effectiveness and overall environmental benefit. HSD also considered options for end-of-pipe treatment in light of comments from the customer communities of Highland and Griffith. Alternative 7.1 would be expected to virtually eliminate untreated CSO discharges. A description of the selected plan is as follows:

West Branch Grand Calumet River - HSD has already constructed a 33 MG CSO storage basin and force mains which transport CSOs from the Columbia, Johnson and Sohl pump stations to the basin. HSD would have expanded the CSO basin by 25 MG to a total capacity of 58 MG. Improvements to the WWTP have already been constructed such that the CSO basin is expected to overflow one time or less during a typical year.

East Branch Grand Calumet River - HSD had planned to construct a 14 MG CSO storage basin along with pump station modifications and force mains. The CSO storage basin would have stored flows from the Kennedy North drainage area. The CSO basin was sized to discharge only once per typical year, with settling and disinfection of all discharges. The CSO basin would have drained within 48 hours.

West Branch Little Calumet River - HSD plans to separate the Jackson CSO drainage basin and construct a relief interceptor to transport all sanitary flow to the WWTP. HSD also plans to completely separate the sewers in the Calumet-Munster drainage area and construct an interceptor to transport all sanitary flow to the WWTP.

East Branch Little Calumet River - HSD had planned to construct two Cloth Media Disk Filter (CMDf) facilities, one near the Indianapolis Boulevard CSO outfall and one near the Kennedy Ejector CSO Pump Station. These facilities would have consisted of first flush storage tanks (1.0 and 0.5 MG for Indy Boulevard and Kennedy Ejector respectively), chemical storage, CMDf facilities with UV disinfection. All discharges would have been treated to meet NPDES permit limits. No more than once per typical year, there may have been small discharges of dilute untreated combined sewage consistent with HSD meeting NPDES permit limits and achieving water quality standards under the Clean Water Act. HSD proposed first demonstrating the effectiveness of the CMDf through a pilot study.

The projects identified in Alternative 7.1 were projected to be completed by 2033, subject first to the revised LTCP's overall approval by IDEM and EPA.

E. Revised Plan Under Consideration (September 2019)

HSD successfully completed a pilot study for the CMDf in July 2019. In light of the environmental benefits and cost savings offered by the CMDfs, HSD has recently been considering modifying Alternative 7.1 by expanding the use of CMDf treatment to additional locations as Alternative 8. A description of the selected plan is as follows:

West Branch Grand Calumet River - HSD has already constructed a 33 MG CSO storage basin and force mains which transport CSOs from the Columbia, Johnson and Sohl pump stations to the basin. HSD can increase WWTP wet weather capacity by constructing a CMDf facility and expanding disinfection, precluding the need to expand the existing basin. The CSO basin is expected to overflow one time or less during a typical year. Under its contract, the customer community of the City of Whiting is required to pay its share of this project.

East Branch Grand Calumet River - HSD is considering CMDfs in lieu of a 14 MG CSO storage basin and pump station and force main modifications. The CMDfs will provide treatment of all virtually CSOs. No more than once per typical year, a small dilute portion of the CSO flow may bypass treatment and blend with treated effluent while continuing to meet NPDES permit requirements and consistent with HSD achieving water quality standards under the Clean Water Act.

West Branch Little Calumet River - HSD plans to separate the Jackson CSO drainage basin and construct a relief interceptor to transport all sanitary flow to the WWTP. HSD also plans to completely separate the sewers in the Calumet-Munster drainage area and construct an interceptor to transport all sanitary flow to the WWTP.

East Branch Little Calumet River – HSD plans to construct a consolidated CMDf facility to treat virtually all CSOs from the Kennedy Ejector, Indianapolis, and Walnut CSO pump stations. This facility will consist of a 1.5 MG first flush storage tank, cloth media disk filter facility, and UV disinfection. No more than once per typical year, a small dilute portion of the CSO flow may

bypass treatment and blend with treated effluent while continuing to meet NPDES permit requirements and consistent with HSD achieving water quality standards under the Clean Water Act. Under their contracts, the customer communities of Griffith and Whiting are required to pay their share of this CMDf project.

The projects identified in Alternative 8 are projected to be completed by 2033, subject first to the revised LTCP's overall approval by IDEM and EPA.

Alternative #1 Complete Separation

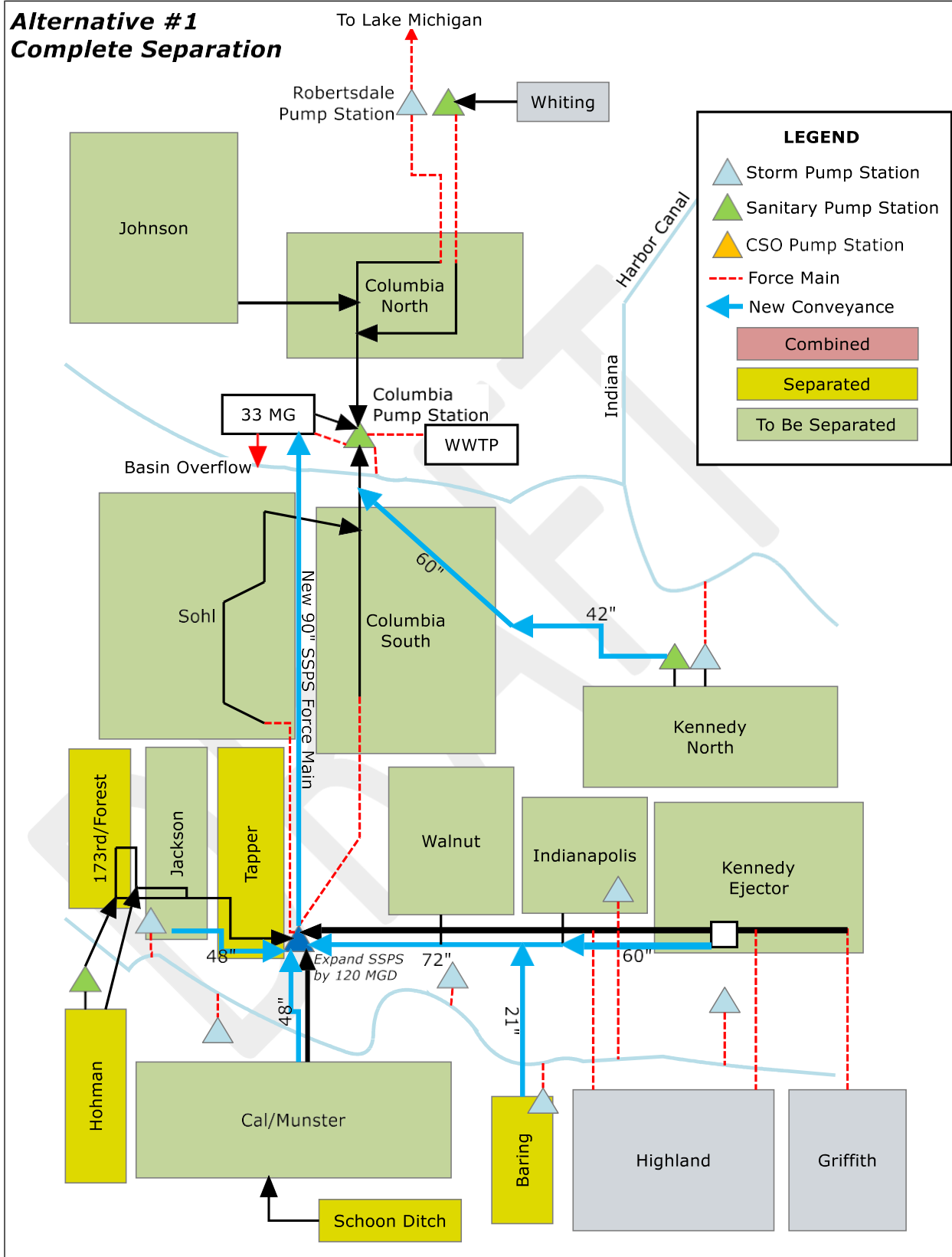


Figure 1 – Schematic of Alternative 1, Complete Separation

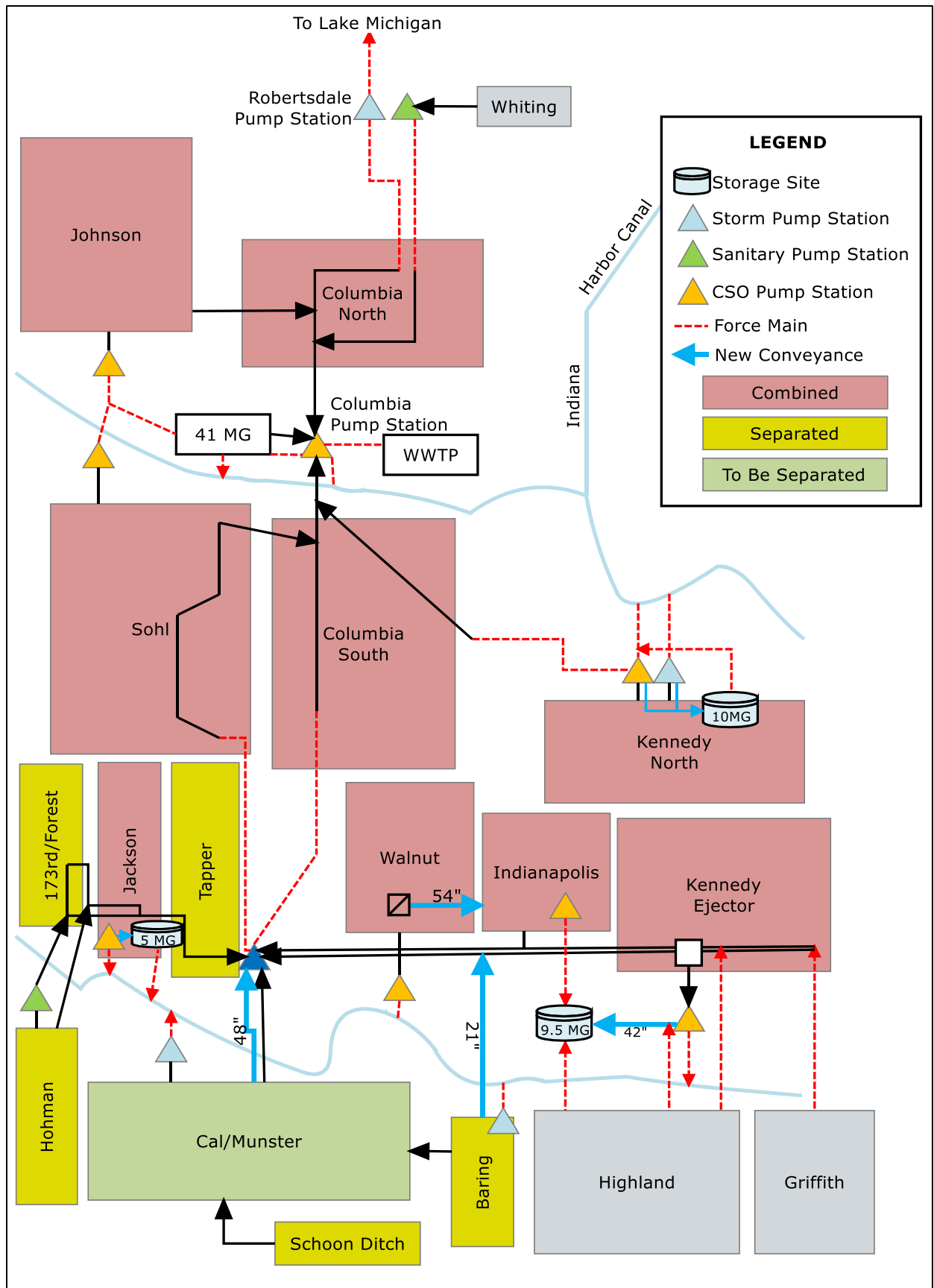


Figure 2 – Schematic of Alternative 2, Store & Treat

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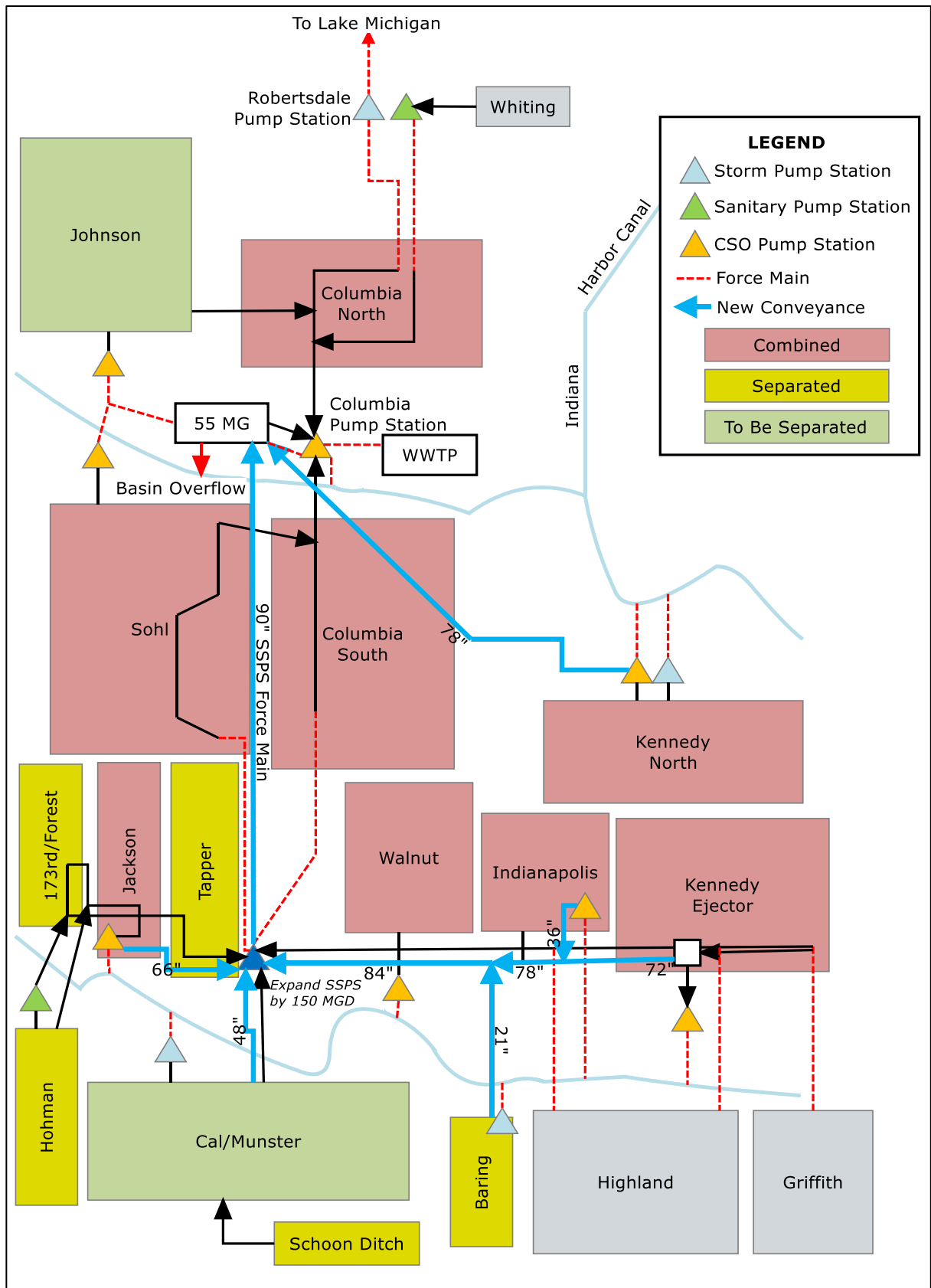


Figure 3 – Schematic of Alternative 3, Convey & Treat

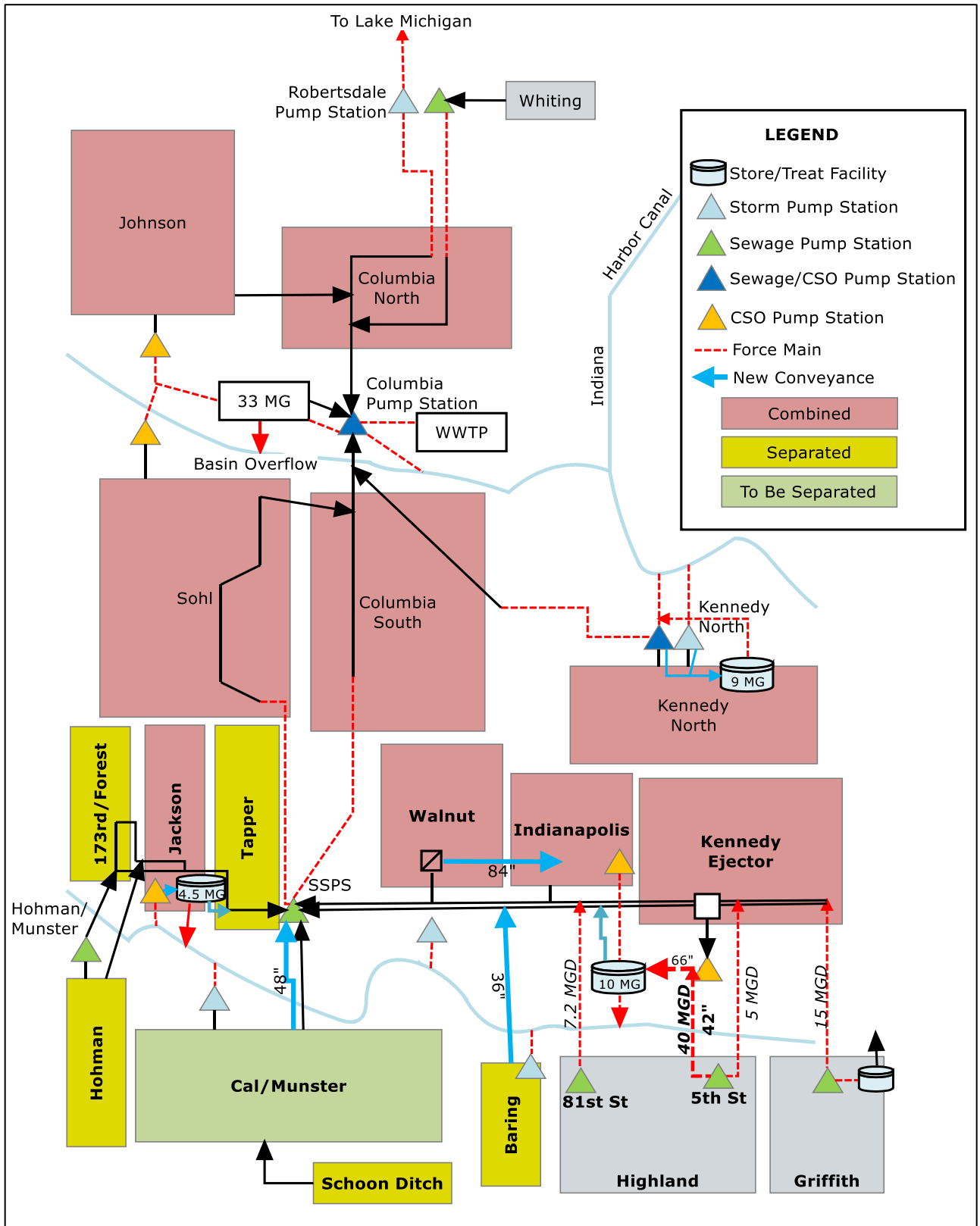


Figure 4 – Schematic of Alternative 4.1, NPD-016 Basins, 4 discharges per year

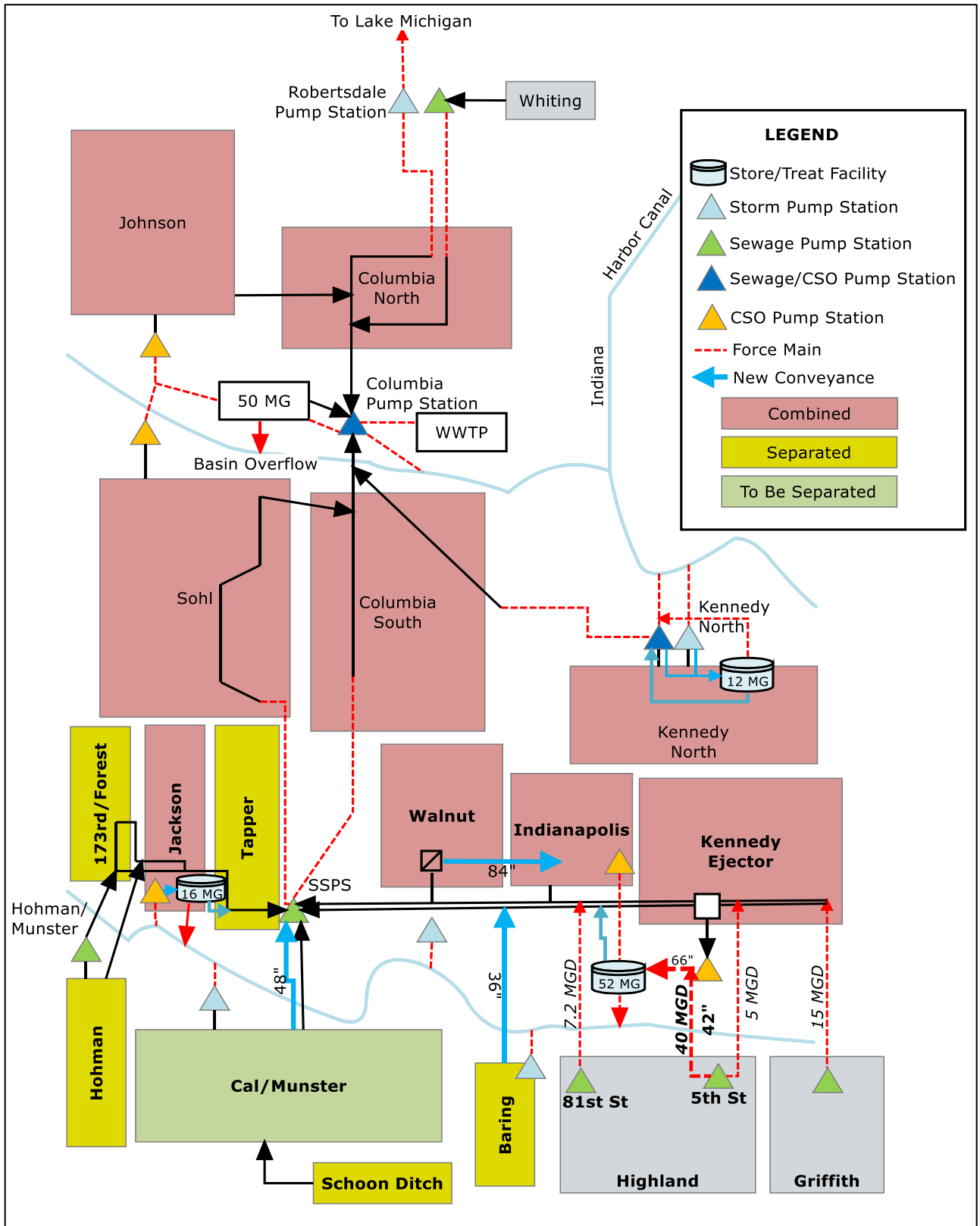


Figure 5 – Schematic of Alternative 4.3, NPD-016 Basins, 1 discharge per year

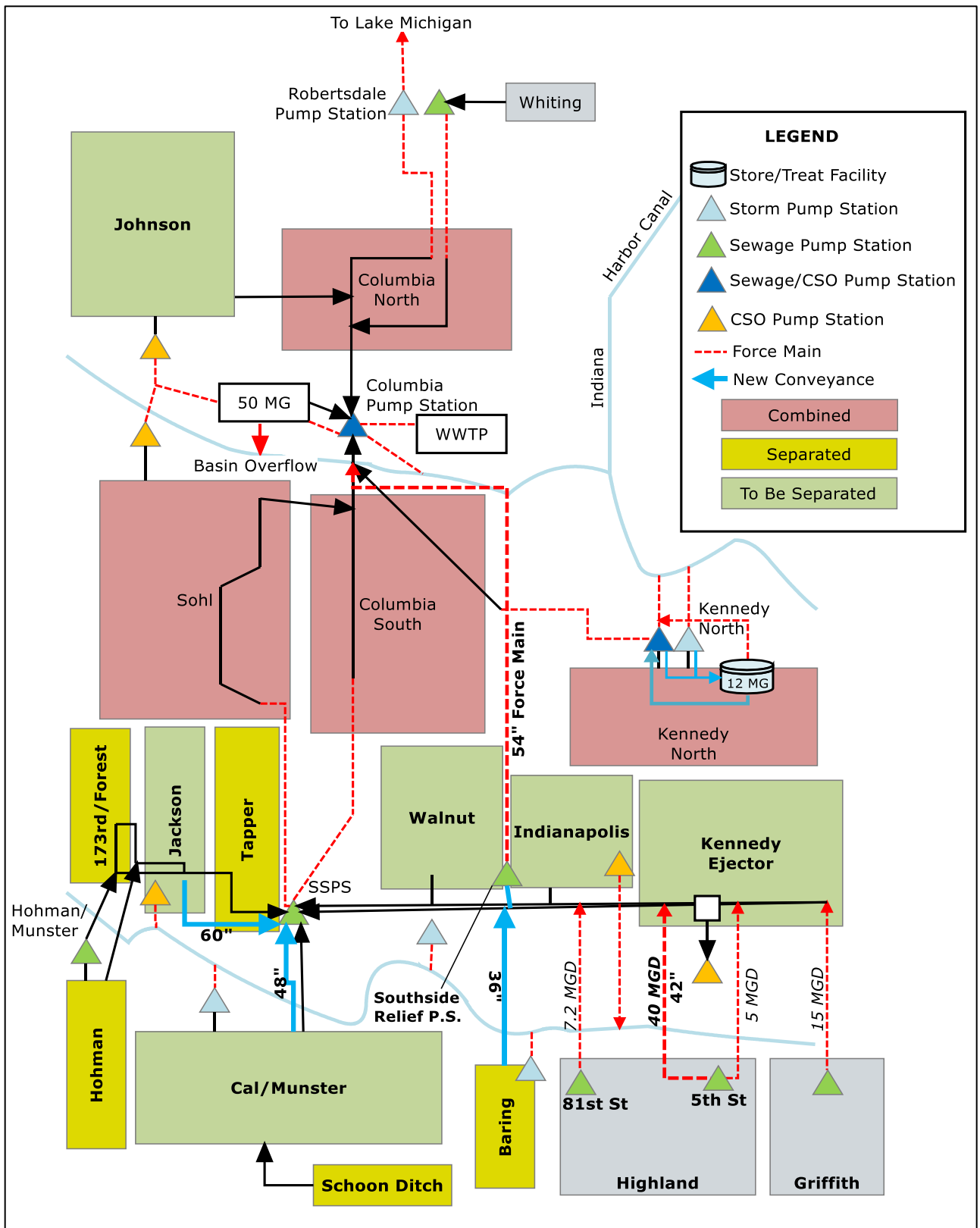


Figure 6 – Schematic of Alternative 6, Sewer Separation with Store & Treat

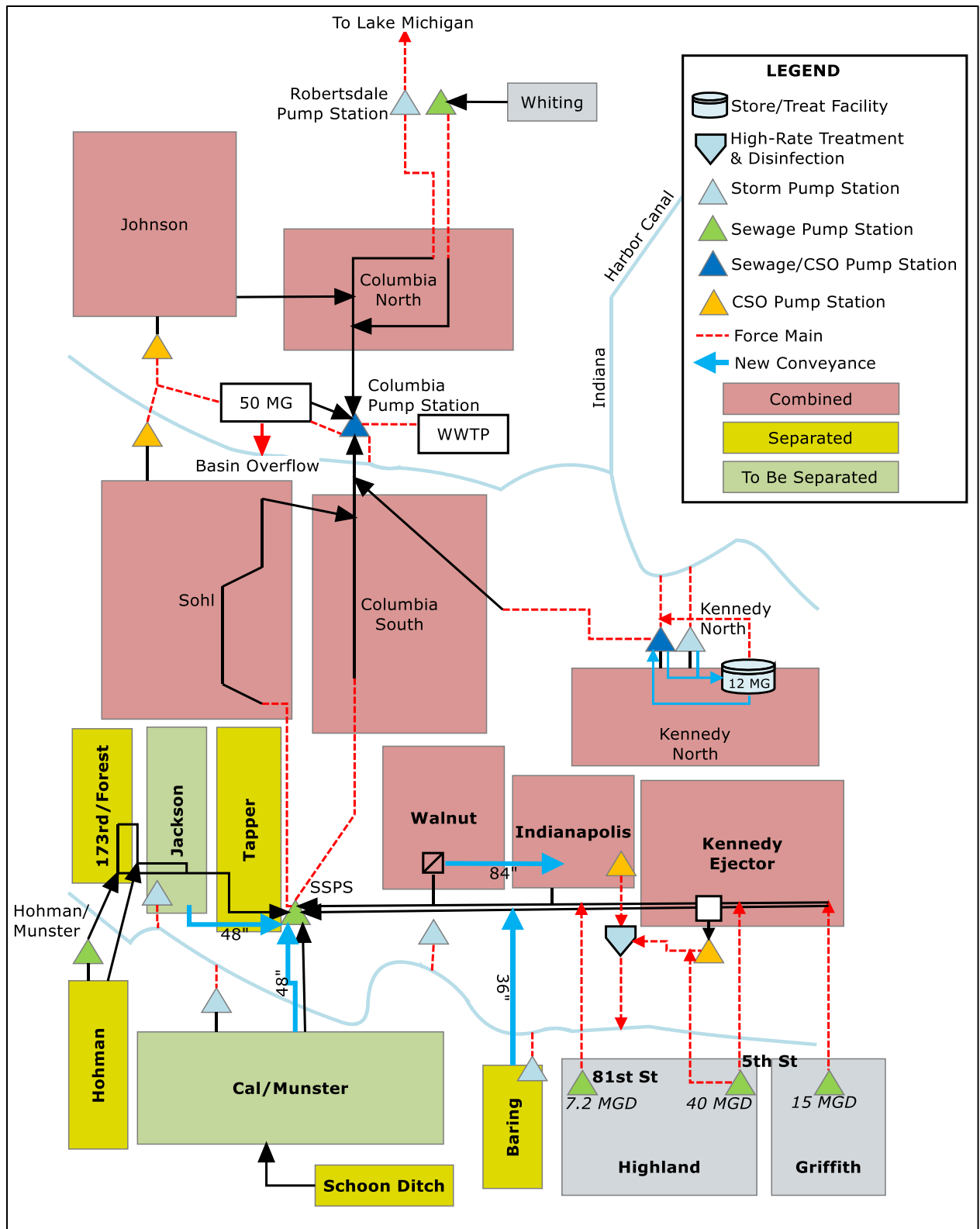


Figure 7 – Alternative 7, NPD-016 Basins and Cloth Media Filter or High Rate Clarification

