Combined Sewer Overflow Long-Term Control Plan

for the

City of Terre Haute

Vigo, Indiana

Prepared by:

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Terre Haute CSO LTCP – Implementation Plan
Breakdown of Phases and Estimated Project Costs

Phase Description	Estimated Project Costs
Phase I (Design start 4/2012, Construction Start by 8/2013)	
• ~~New 009/010 connection sewer on 1st Street~~ – United Consulting – Atlas	$ 5.4M
• In-line storage/floatable controls @ 004/011 – Malcolm Pirnie/Arcadis – Thienemen	$ 3.7M
• Walnut Street weir & large diameter pipe rehab – Greeley + Hansen – Proshut Concrete	$ 4.8M
• ~~New 009/010 floatable controls~~ – RW Armstrong – Wilhelm	$ 3.5M
• IP ponds (liner, inlet & outlet structures) – Commonwealth & Thienemen	$ 6.3M
• 2nd Forcemain to IP, real time control planning	$ 0.5M
Subtotal Phase I Construction Costs	$24.2 M
• Construction contingency (15%)	$ 3.6M
• Project related non-construction costs (Design, Inspection , Testing)	$ 3.6M
• Project Mgt costs (SRF PER, UAA, Monitoring Plan, Regulatory Coord)	$ 0.5M
Total Phase I Project Costs	$ 31.9 M
Phase II (Design start by 8/2015, Construction start by 02/2017)	
• Construct new main lift station	$21.1M
• Reconnect CSO 003 to new main lift station & sitework	$ 5.1M
• Start green infrastructure planning & pilots	$ 2.0M
Subtotal Phase II Construction Costs	$28.2 M
• Construction contingency (15%)	$ 4.2M
• Project related non-construction costs (15%)	$ 4.2M
• Project Mgt costs (SRF PER, CSO & Green Monitoring, Misc.)	$ 0.5M
Total Phase II Project Costs	$ 37.1 M
Phase III (Design start 2/2019, Construction start by 07/2020)	
• Construction interceptor along River from 004/011 to new main lift station	$ 8.5M
• Plan, design & implement 2nd phase of green infrastructure	$ 5.0M
Subtotal Phase III Construction Costs	$13.5 M
• Construction contingency (15%)	$ 2.0M
• Project related non-construction costs (15%)	$ 2.0M
• Project Management costs (SRF PER, Green Monitoring, Easement & ROW)	$ 0.6M
Total Phase III Project Costs	$ 18.1 M
Phase IV (Design start 7/2022, Construction Start by 2/2025)	
• Construct interceptor along River from 008 to 004/011	$17.0M
• Real time control facilities	$ 0.6M
Subtotal Phase IV Construction Costs	$17.6 M
• Construction contingency (15%)	$ 2.6M
• Project related non-construction costs (15%)	$ 2.6M
• Project Management costs (Monitoring/Modeling, 009/010 Basins)	$ 0.4M
Total Phase IV Project Costs	$ 23.2 M
Phase V (Design start 2/2027, Construction Start by 6/2028)	
• Construct storage facility @ 009/010	$ 7.4M
• Construction contingency (15%)	$ 1.1M
• Project related non-construction costs (15%)	$ 1.1M
• Project Management costs (Update CSO LTCP, Implement UAA)	$ 0.3M
Total Phase V Project Costs	$ 9.9 M
Total CSOLTCP Project Costs	**$120.2 M**

Notes

[1]Assumes 50% of remaining basin 009/010 storage is green and 50% tank @ River (Phase V).

[2]Added one year between design and construction on Phase IV to acquire easements and right-of-way for green infrastructure in basins 009/010.

Table 10.3-2
Implementation Schedule
(20 Years)

Item	Approved Milestone Date (As of 12/30/2015)	Revised Milestone Date (Requested)
• Complete & Submit CSOLTCP	04/2011	
• WWTF Improvements – Complete Phase I Construction	04/2012	
• WWTF Improvements – Complete Phase II Design Finalize Financing, Procure Bids	09/2012	
• ~~CSOLTCP – Complete Phase I P.E.R. Initiate Design of Phase I~~	~~10/2012~~	
• ~~CSOLTCP – Complete Phase I Design Finalize Financing, Procure Bids~~	~~06/2013~~	
• CSOLTCP – Initiate Basis of Design Reports Projects 1-1, 1-2 and 1-3	10/2012	
• CSOLTCP – Complete Phase I Design – Project 1-1 (Spruce/Chestnut Floatables Control Structure	06/2013	
• CSOLTCP Receive Bids for Project 1-1	07/2013	
• CSOLTCP Begin Design Phase I Common Elements (Project 1-4 and 1-5)	08/2013	
• CSOLTCP Begin Construction Project 1-	08/2013	
• CSOLTCP Permit Application Submission Projects 1-2 and 1-3	12/2013	
• CSOLTCP Complete Design Phase I (Project 1-4)	03/2014	
• CSOLTCP Complete Design Phase I (Project 1-5)	08/2014	
• CSOLTCP Complete Design Project 1-3 (Main Lift Station Site High Rate Treatment)	03/2014	
• CSOLTCP Receive Bids Phase I Common Elements Projects (Project 1-4)	05/2014	
• CSOLTCP Receive Bids Project 1-3 and Phase I Common Element Project (1-5)	10/2014	
• CSOLTCP Receive Bids Project 1-2	04/2015	
• CSOLTCP Begin Construction Phase I Common Elements (Project 1-4)	05/2014	
• CSOLTCP Begin Construction Project 1-3, and Phase I Common Elements (Project 1-5)	11/2014	
• CSOLTCP Begin Construction Project 1-2	05/2015	
• WWTF Improvements – Complete Construction of Phase II	10/2015	
• CSOLTCP Complete Construction Project 1-2	07/2016	08/2016
• ~~CSOLTCP – Complete Construction of Phase I~~	~~03/2015~~	
• CSOLTCP – Complete Construction of Phase I – Project 1-1, and Phase I Common Elements Projects (Project 1-4 and 1-5)	09/2014	
• CSOLTCP – Complete Construction of Phase I – Project 1-5	07/2015	
• CSOLTCP – Complete Construction of Phase I – Project 1-3	03/2016	08/2016
• CSOLTCP – Initiate Monitoring of Phase I and P.E.R. of Phase II	11/2015	08/2016
• Review and Re-evaluate CSOLTCP	09/2016	03/2017

Item	Approved Milestone Date (As of 12/30/2015)	Revised Milestone Date (Requested)
• CSOLTCP – Complete Phase I Monitoring	09/2016	03/2017
• CSOLTCP-Complete Phase II PER Initiate Design (IF PER is needed)	09/2016	04/2017
• CSOLTCP – Complete Phase II Design Finalize Financing, Procure Bids	12/2016	09/2017
• CSOLTCP – Complete Construction of Phase II	08/2018	12/2018
• CSOLTCP – Initiate Monitoring of Phase II and P.E.R. of Phase III	09/2018	01/2019
• CSOLTCP – Complete Phase II Monitoring and Phase III P.E.R. Initiate Phase III Design	06/2019	
• Review and Re-evaluate CSOLTCP	06/2019	
• CSOLTCP – Complete Phase III Design Finalize Financing, Procure Bids	06/2020	
• CSOLTCP – Compete Phase III Construction	06/2022	
• CSOLTCP – Initiate Monitoring of Phase III and P.E.R. of Phase IV	07/2022	
• CSOLTCP – Complete Phase III Monitoring and Phase IV P.E.R. Initiate Design of Phase IV	06/2023	
• Review and Re-evaluate CSOLTCP	12/2023	
• CSOLTCP – Complete Phase IV Design Finalize Financing, Procure Bids	12/2024	
• CSOLTCP – Complete Phase IV Construction	12/2026	
• CSOLTCP – Initiate Monitoring of Phase IV and Phase V P.E.R.	01/2026	
• CSOLTCP – Complete Phase IV Monitoring and Phase V P.E.R Initiate Design of Phase V	01/2027	
• Review and Re-evaluate CSOLTCP	06/2027	
• CSOLTCP – Complete Phase V Design Finalize Financing, Procure Bids	04/2028	
• CSOLTCP – Complete Phase V Construction	04/2030	
• CSOLTCP – Initiate Monitoring of Phase V	05/2030	
• CSOLTCP – Complete Monitoring of Phase V	05/2031	
• Review and Re-evaluate CSOLTCP	12/2031	

Executive Summary

Introduction

The City of Terre Haute has developed a Combined Sewer Overflow Long-Term Control Plan (CSO LTCP), which describes the measures they will take to reduce the combined sewer overflows and improve water quality in the Wabash River in the City of Terre Haute. The LTCP will be reviewed by the Indiana Department of Environmental Management (IDEM) and once approved will be incorporated into a new National Pollution Discharge Elimination System (NPDES) permit.

Currently *ten* combined sewer overflows are active in the Terre Haute area and 100% of those outfalls discharge into the Wabash River. Flow, water quality and rainfall data was collected and both the combined sewer system and the Wabash River in the CSO areas was modeled to assist in the planning process. No areas were qualified as "sensitive areas" but the outfalls around Fairbanks Park were to be given priority. A CSO LTCP will be recommended to reduce the number of CSO events per year (average year) from 37 to 7 times per year, which will reduce the number of hours when bacteria loadings from the CSO's exceed recommended levels in the river by 75%, from 174 hours to 45 hours at the wastewater treatment plant.

Many regulatory requirements were considered in the City of Terre Haute's LTCP. Both Federal and State CSO policies are divided into two phases. Phase I (CSO Operational Plan) was submitted to IDEM and approved by IDEM in 2006. Phase II represents the submittal of this document. All of the regulatory requirements are intended to reduce the in-stream impact from CSO discharges during wet conditions and ultimately make the Wabash River more "fishable and swimmable" (CWA, 1972).

The City of Terre Haute's LTCP was developed with IDEM's assistance. Several key issues specific to Terre Haute were evaluated as described in Section 1.3. The project team consisted of two separate groups. The first group included engineering and financial consultants; the second group was a technical review committee which included members of the City Engineering and WWTP Staff.

The groups worked together to establish project goals specific to the City of Terre Haute. The work was carried out over two year period and a plan was completed and submitted to IDEM by the deadline. All of the key decision-making involved input from members of the team.

Existing Conditions

The City of Terre Haute's combined sewer system has approximately 5,100 acres that discharge through *10* combined sewer overflow points along the Wabash River. The most upstream combined sewer overflow (CSO) discharge point is at River Mile 215 and the wastewater treatment plant discharge is at River Mile 210. Figure ES-1 shows the location of the CSOs and the boundary of the combined sewer area.

The interceptor sewer collects the dry weather flow and a portion of the wet weather flows from each CSO and conveys it to the 48 MGD main lift station. The main lift station *(which has an emergency overflow at 002)* pumps the flow to the wastewater treatment plant that has an existing primary treatment and disinfection peak flow capacity of 48 MGD and a secondary treatment peak flow capacity of 36 MGD, although only a flow of 31 MGD can be currently sustained through the plant due to a series of hydraulic bottlenecks that limit the process performance at high flows. These bottlenecks limit the ability to transmit greater flow volumes from the combined sewer area and results in more combined sewer overflows of greater duration and flow volume.

In an average year, a continuous simulation of the collection system model simulates that 284 million gallons of combined sewage is discharged from these CSOs. Terre Haute is fortunate in that the receiving stream has a large average flow rate relative to the volume of CSO overflow, which can provide significant assimilative capacity. Despite this fact, simulations indicate that in an average year, the Wabash River exceeds the water quality standards for *E. coli* approximately 30% of the time during the recreation season (April-October) when bacteria loads from all pollutant sources are considered and less than 5% of the time if non-CSO sources effects are eliminated.

Terre Haute has an important public park, Fairbanks Park, located in the center of the city that has a boat launch. There are 4 CSOs that discharge in the park. Special attention was given to these particular CSOs (005, 006, 007 and 008).

Consideration of Sensitive Areas

Both IDEM and EPA guidelines require determination of any "sensitive areas" within the CSO outfall areas and farther downstream. Any areas deemed sensitive would be given the highest priority for CSO reduction, elimination or control.

The sensitive areas were evaluated based on several criteria including: Habitats for Threatened or Endangered Wildlife, Primary Contact Recreational Areas, Drinking Water Sources and Outstanding State Resource Waters or Outstanding Natural Resource Waters. None of the areas within the CSO outfalls or downstream were found to be "sensitive" areas. The Citizens Action Committee did prioritize the areas around Fairbanks Park for the LTCP.

Evaluation of Alternatives

A variety of CSO capture alternatives were considered in the LTCP including:

- No Action
- System-wide Separation
- Storage (inline, tanks, earthen, tunnel)
- Conveyance (open cut gravity sewer, tunnel)
- High Rate Treatment

These technologies were screened and then evaluated with consideration for initial costs, annual operation and maintenance costs, ease of implementation, environmental impacts, primary and secondary impacts and local affordability. Two factors weighed into consideration for three final alternatives that were evaluated in greater detail. The first factor was the purchase of the International Paper site by the City of Terre Haute and which includes several large earthen ponds located adjacent to the City's main combined sewer pumping station in 2010. The second factor was the City's decision to significantly increase the peak, sustained wet weather treatment capacity at the WWTF from 30 to 36 MGD up to 48 MGD. These two developments were used in consideration of the final alternatives set aside for detailed evaluation.

One final alternative evaluated was a CSO tunnel (approximately 40 feet deep) connecting all of the CSO outfalls to a new main lift station and utilization of the IP site (approximately 30 MG) for storage. The other final alternatives included construction of a large diameter open cut gravity interceptor from Fairbanks Park (consolidating and closing all of the outfalls within the park) and using the IP site for storage of CSO flows. One of the alternatives included consolidation of the northern two CSO outfalls and storage and a new main lift station to replace the City's existing aging lift station *(which would eliminate outfall 002).* This alternative also suggested the use of green infrastructure within the basins 009 and 010 to capture flow before entering the combined system.

Public Participation

Public Participation is an IDEM requirement for completing the City of Terre Haute CSO LTCP. The public was involved in many ways including both City government officials and private citizens. Several City government divisions including the City Council, the Board of Public Works and Safety, the Terre Haute Sanitary District Board of Commissioners and the Terre Haute Wastewater Treatment Plant were brought into the LTCP.

Perhaps the most important public participation came from the Citizen's Advisory Committee (CAC). A series of meetings were held with the CAC over a 10 year period to explain the process of determining alternatives for control and to garner input throughout the project.

Public Education was handled through various means. The CAC helped to educate the public at its meetings and through various meetings its members attended. A brochure outlining Terre Haute's plans was distributed and several newspaper articles were published in the local newspaper. Warning signs were installed at all of the outfall structures to provide information about potential health risks associated with structure overflows. A website was created to educate the public on the issues that CSOs cause and what the City is doing to rectify the problems associated with them.

A community notification program will be required by IDEM. This typically involves additional signage in prominent areas of the Wabash River and also notification if an overflow event is occurring or will occur within 24 hours. All notifications would be documented and submitted to IDEM.

The current volume of CSO discharges impairs the water quality in the Wabash River during CSO events and for several days afterwards. The recommended plan for the LTCP can be developed and implemented in phases and each phase will act to reduce the CSO volumes discharged to the Wabash River to some degree. The results of each phase will be monitored and those results will be used in the design and implementation of the future phases.

Financial Capability Assessment and Implementation Schedule

Funding of a LTCP is perhaps the greatest challenge in developing the plan. The goal in funding is to determine the level of control that the community can provide without causing undue hardship on the City or on the individual households within the community. The guidelines consider the ability to contribute financially of both residents, and the City, to help determine the schedule implementation

length for the plan. The recommended plan is not the most or least expensive of the three final alternatives considered for implementation.

Recommended Plan

After reviewing the environmental performance, cost-effectiveness and affordability, operability, reliability, and constructability, a recommended plan was developed that reduces CSO volume discharging to the river by 72%, results in 96% capture of wet weather flow, eliminates the CSOs in Fairbanks Park and results in no more than seven overflows in a typical year at the remaining CSOs. The recommended plan will utilize a combination of greater wet weather treatment capacity at the City's wastewater treatment facility, a large CSO storage facility at the former International Paper (IP) Brownfield site, a new main pump station to replace the existing facility constructed in 1965, a new large diameter CSO gravity sewer interceptor along the Wabash River between Fairbanks Park and the new main lift station and either "gray" or "green" CSO storage facilities at the north end of the CSO system. *Eight* of the *ten* existing CSO outfalls will be closed off completely. The recommended plan is shown in Figure ES-2. The estimated cost of the recommended plan is $120 million and the recommended implementation schedule for the plan is 25 years.

Compliance Monitoring Plan

A post-construction monitoring program will be implemented upon approval of the LTCP and submitted to IDEM prior to implementation of the LTCP. The program will measure reduction of combined sewer overflows and improvements to river quality. The City will conduct periodic reviews, not less than every five years after approval of the LTCP, to determine if the CSO control goals are being met. CSO control will be modified to meet the goals.

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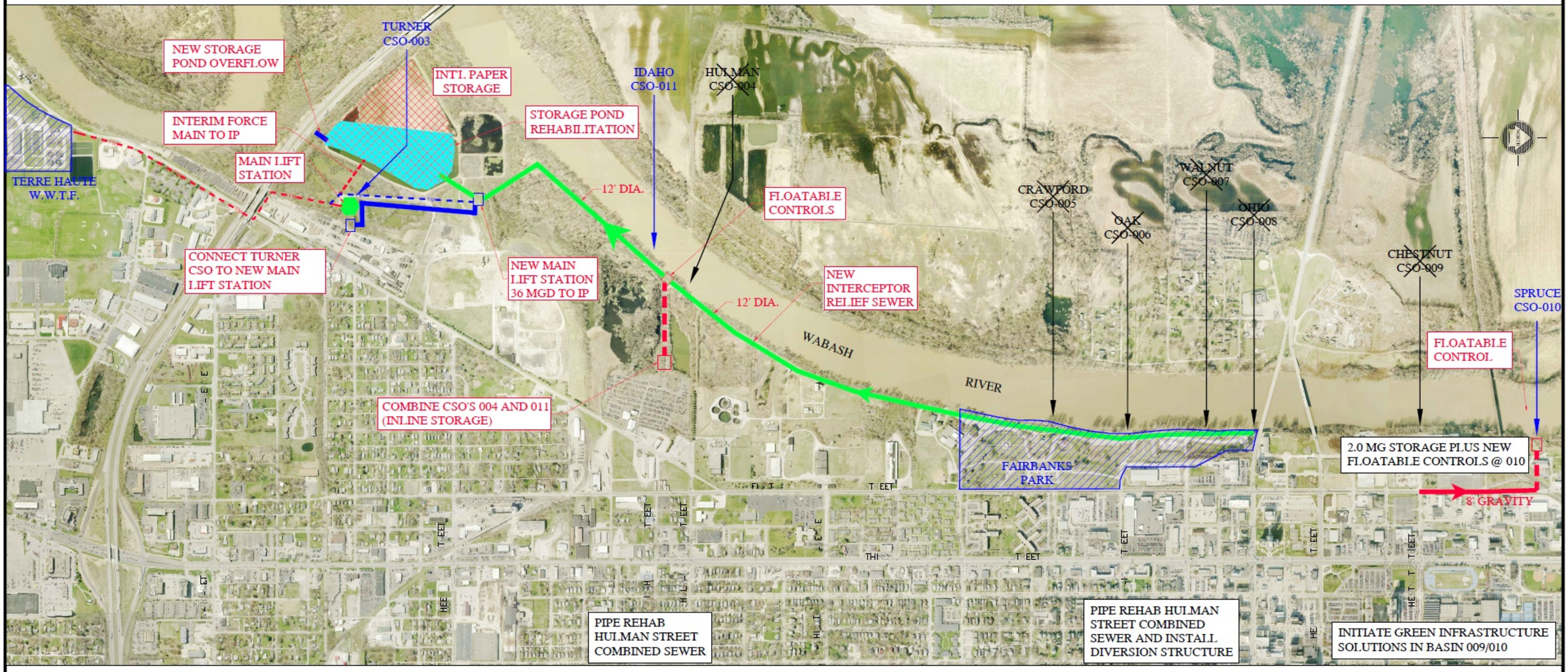
Terre Haute CSO LTCP



LEGEND

- RELIEF SEWER AND FLOW
- EXISTING MAIN LIFT STATION
- 12"Ø — RELIEF SEWER SIZE
- NEW PUMP STATION OR STRUCTURE
- NEW FORCE MAIN
- EXISTING COMBINED SEWER OUTFALL
- ~~OHIO CSO-008~~ — EXISTING CSO TO BE ELIMINATED
- OHIO CSO-008 — EXISTING CSO TO REMAIN (SOME REMAIN OPEN AT LESSER LEVELS OF CONTROL)

TERRE HAUTE
A LEVEL ABOVE

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Figure ES-2
Recommended Plan