

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 **is** 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. **Revisions to the plan based on the results of “basis of design” studies for Phase I projects were completed and submitted to IDEM in December 2013. These revisions are incorporated within this document.**



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. Improvements to the plant to increase capacities are discussed in Section 6 and are scheduled for completion in early 2015.

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 (2011)

A variety of CSO capture alternatives were considered in the LTCP submitted to IDEM in 2011, including:

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

One additional 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 for parts of the system 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 comprehensive 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.

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.

The alternatives were evaluated independently and combined in various manners to develop three comprehensive alternative plans for the system as described in detail in Sections 6 and 7.

Re-Evaluation of Alternatives (2014)

The City began implementation of its Phase I projects recommended in the approved LTCP in August 2012. The three major projects included in the Phase I recommended plan (excluding smaller common alternative projects) included:

Project 1-1: Floatable Control and In-Line Storage Structure at CSO 004/011 (Hulman/Idaho Street Combined Sewers)

Project 1-2: Floatable Control Structure at CSO 009/010 (Chestnut/Spruce Street Combined Sewers)

Project 1-3: Rehabilitation of Lagoons at Former IP Site for CSO Storage and Additional Main Lift Station Force Main

Prior to design, the City contracted with consultants to develop a basis of design (BOD) report for each project. Each BOD report evaluated the suitability of different technologies through preliminary engineering design and offered more specific design recommendations for each project.

In the BOD report for Project 1-3, the consultant identified three major issues with the recommended alternative of using the former IP site for CSO storage, all of which increased costs from estimates included in the previously approved plan. The three major issues, among others, are described as follows:

- 1) The existing soil conditions were discovered to be worse than originally thought after the removal of all sludge;
- 2) The hydrostatic pressure from the Wabash River during a 100-year flood event coupled with soil conditions dictates a far more robust (e.g. concrete) liner system; and



- 3) The existing lagoon berm elevations were discovered to be approximately 2-feet lower than the established 100-year Flood Elevations. (The previous Agreed Order compliance by the former owner indicated the berms were elevated to the 100-year flood level.)

For these reasons, it was recommended a concrete lined basin be considered in lieu of the previously approved HDPE-lined alternative. It was further recommended that supplemental mixing/aeration be provided as well as a means to clean the basin following draining. These additional requirements increased the cost of the originally recommended storage alternative by approximately \$10.9 million.

The consultant then developed additional high rate treatment alternatives to be used either in lieu of the storage option at the former IP site, or in conjunction with storage at the former IP site. In the Project 1-3 BOD, construction costs of the new high rate treatment alternative were compared to the revised construction costs of the IP lagoon storage alternative, resulting in a 40% construction cost savings. However, when the construction costs for the new high rate treatment facility were incorporated into the new recommended plan, it resulted in a 3% overall increase in the total project cost over the initial estimate.

Section 10, including the final LTCP recommended plan, are revised to reflect the alternative re-evaluation and adjustments to the scope cost and schedule of the recommended plan.

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. The 2014 revisions to the LTCP were presented to the public at a Terre Haute Sanitary District board meeting. Meeting minutes issued by the Sanitary District Board are included in Appendix 6-6.

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 (2011)

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.

Revised Recommended Plan (2014)

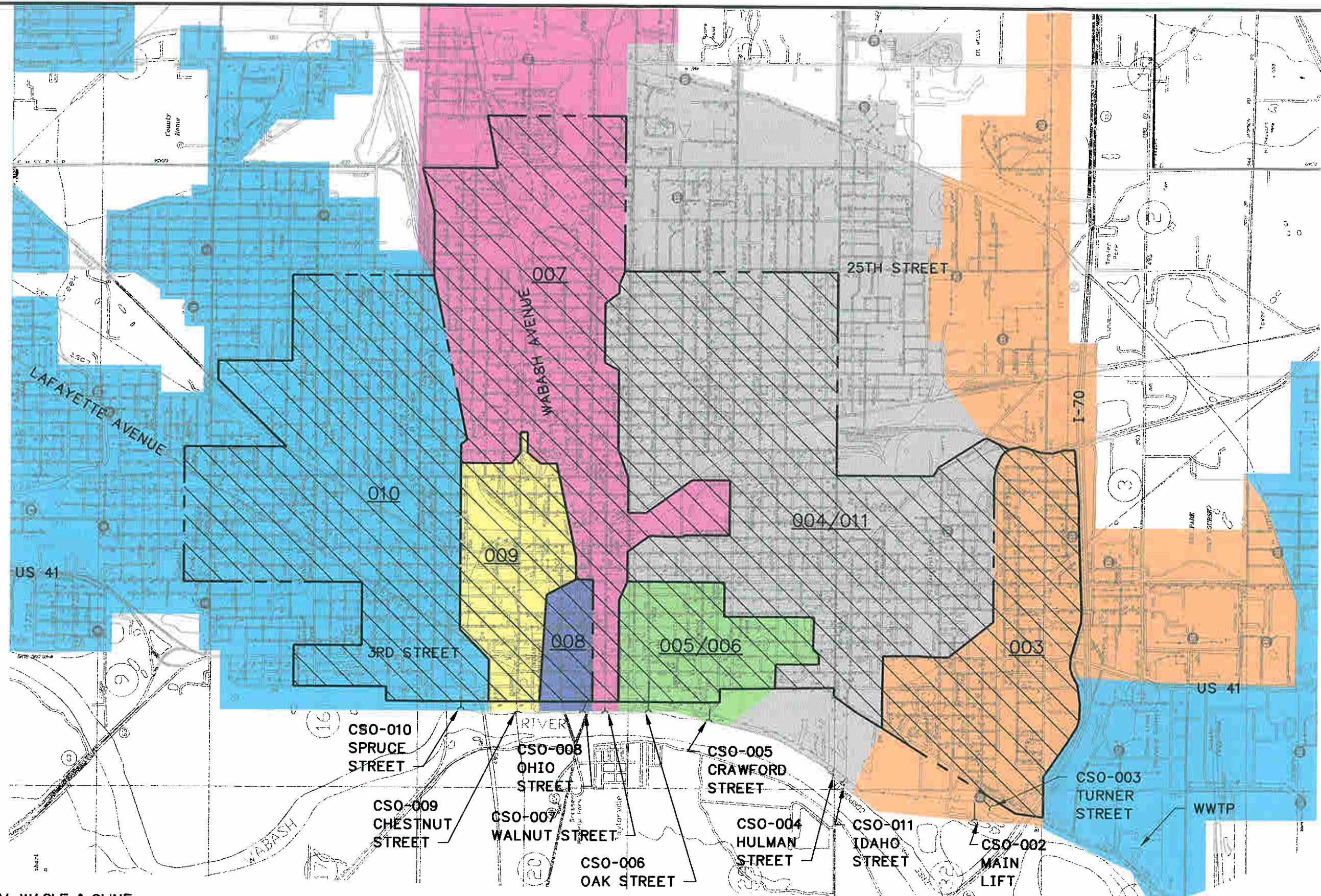
In lieu of the previously recommended plan’s intention to utilize an existing lagoon at the former IP Brownfieldsite for CSO storage, it is now recommended the City construct a high-rate clarification with UV disinfection satellite treatment facility at this site and the lagoons will be used for recreation and stormwater detention only. All other aspects of the previously recommended plan, with the exception of minor revisions to the consolidation of CSO 009 into 010, are to remain the same. The revised estimated cost of the new recommended plan is \$124 million and the recommended implementation schedule remains 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.



FILE: J:\Projects\15800 Terre Haute LTCP\06 Studies\6.8 Report Dwg\TEROG32 1:1 04/18/02 11:35 GH-H



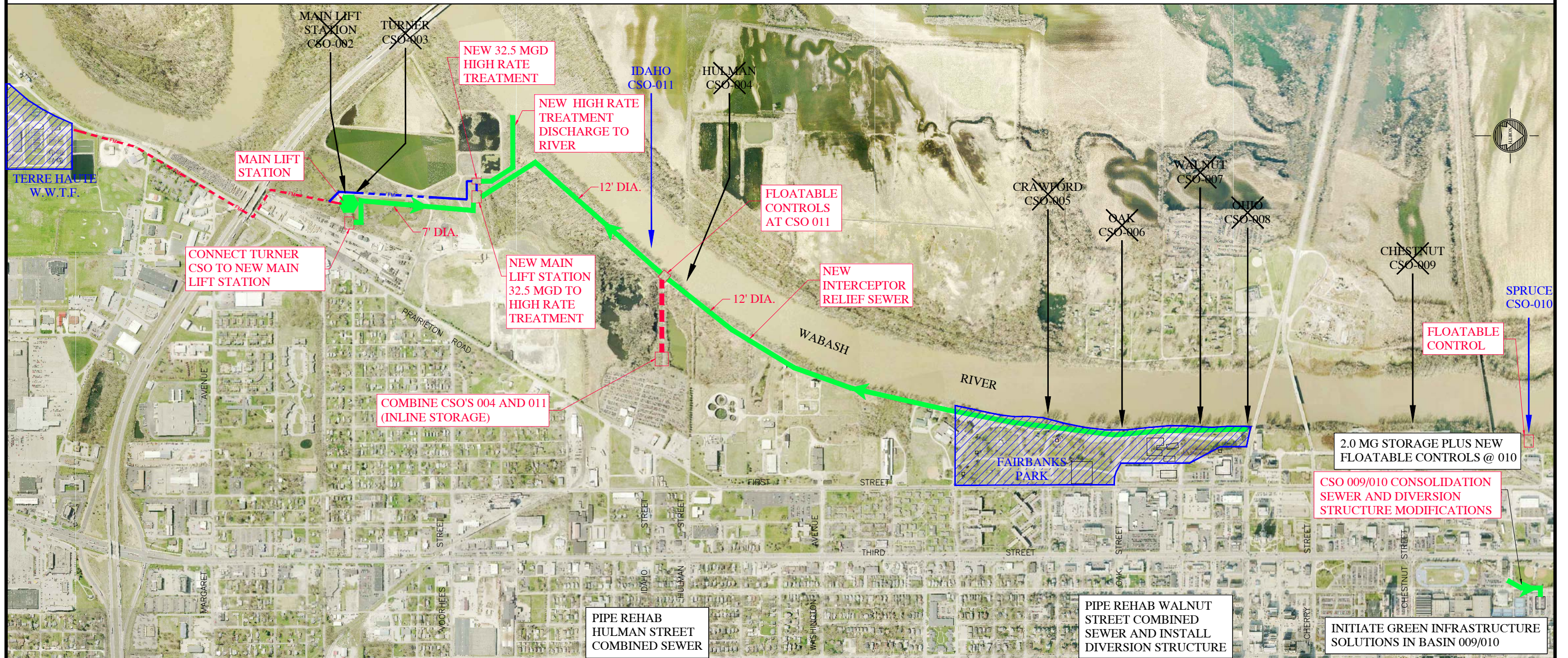
HANNUM, WAGLE & CLINE
 engineering
GREELEY AND HANSEN LLC

CSO SERVICE AREAS
 SCALE: 1"=2500'

CITY OF TERRE HAUTE
 COMBINED SEWER OVERFLOW
 LONG TERM CONTROL PLAN
 FIGURE ES-1

REF: 4X
 REF: 01X
 FEROG03X
 FEROG02X
 KREFS:

Terre Haute CSO LTCP



LEGEND

- | | | | |
|--|---------------------------------|--|---|
| | RELIEF SEWER AND FLOW | | EXISTING CSO TO BE ELIMINATED |
| | EXISTING MAIN LIFT STATION | | EXISTING CSO TO REMAIN (SOME REMAIN OPEN AT LESSER LEVELS OF CONTROL) |
| | RELIEF SEWER SIZE | | |
| | NEW PUMP STATION OR STRUCTURE | | |
| | NEW FORCE MAIN | | |
| | EXISTING COMBINED SEWER OUTFALL | | |

TERRE HAUTE
A LEVEL ABOVE

HWC
ENGINEERING

Figure ES-2
Recommended Plan
REVISED - SEPTEMBER 2014