ENVIRONMENTAL IMPACT EVALUATION

May 15, 2007

A. Project Identification

Long Term Combined Sewer Overflow Control Plan
The Metropolitan District
Hartford County, Connecticut
Project Number: CWF-360 et al.

Note to Reviewer: This Environmental Impact Evaluation is specific to the Combined Sewer Overflow Control Program within the Metropolitan District. The recommended improvements include Infiltration/Inflow removal in the separate sewer systems in the District member towns that are tributary to the Hartford Water Pollution Control Facility that have an impact on downstream CSO locations. This review is not meant to cover the Infiltration/Inflow removal project related to the Sanitary Sewer Overflows that exist in Newington, Rocky Hill, West Hartford, Wethersfield, and Windsor that are the subject of a separate enforcement action. Categorical Exclusion was public noticed for that project on July 12, 2006.

B. Summary of Environmental Review

The engineering reports entitled Long Term Combined Sewer Overflow (CSO) Control Plan, the CSO Control Planning Baseline Conditions Report, and the Wethersfield Cove CSO Alternatives Evaluation were prepared to evaluate the severity, extent and impact of combined sewer overflows on receiving waters in and around the Hartford area. These engineering reports, which developed recommendations for addressing the environmental issues caused by combined sewer overflows, were submitted to and reviewed by the Department of Environmental Protection (DEP). Subsequent to the submission of these reports, a Value Planning Review process was undertaken in May 2006 to further screen and evaluate the various alternatives in the recommended plan for viability and cost benefit and to provide more detailed construction cost estimates of the recommended plan in preparation for the proposed referendum in the fall of 2006. The Department also reviewed the Long-Term CSO Control Plan Value Planning Study Preliminary Report during the preparation of this document.

As a result of these investigations, CSO system improvements are being proposed within the City of Hartford and surrounding municipalities within the Metropolitan District (District) that are tributary to the combined sewer system. These improvements when fully implemented will prevent CSOs from occurring for storms up to and including the typical one (1) year frequency event, with the exception of the Franklin Avenue drainage basin in which implementation of full sewer separation or other sewer system modifications will eliminate all CSO to Folly Brook and Wethersfield Cove regardless of rainfall event frequency. This aspect of the plan affords these sensitive waters additional environmental protections. The recommended plan employs a mix of CSO abatement technologies and techniques. Due to the magnitude of the program, the project will be implemented in stages. It is expected that the program will be re-evaluated periodically and that the plan recommendations will change in order to take incorporate advances in CSO control technology or methodology and to assess effectiveness of previously implemented recommendations in achieving water quality standards. It is not expected that any such mid-course modifications or adjustments will necessitate the drafting of a new environmental impact evaluation. In terms of prioritization, it is recommended that projects that address public health issues associated with basement backups and discharges to sensitive receiving waters be initiated in the earlier phases of the project. In accordance with the regulations of the Connecticut Environmental Policy Act sections 22a-1a-1 to 22a-1a-12, the findings of the environmental review are summarized below.

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1. Project Description

The proposed project consists of:

- 25% reduction of Infiltration/Inflow (I/I) in the separated District communities that are tributary to the Hartford combined sewer system
- Hartford Water Pollution Control Facility (HWPCF) improvements including a new influent pump station, new screenings and grit removal facilities, and new wet weather treatment processes
- Full separation of the Franklin Avenue drainage area which will eliminate CSO discharges to Folly Brook and Wethersfield Cove for all storm frequencies
- Local separation in areas of Hartford prone to sewer surcharging to alleviate basement backups and street flooding
- Disconnection of Gully Brook from the combined sewer system (CSS)
- Extension of the Connecticut River Relief Interceptor (CRRI)
- New off-line storage in a deep rock tunnel
- Additional storage by use of the existing Park River Auxiliary Conduit (PRAC)*
- New dewatering pump station to drain the deep rock tunnel
- New consolidation pipelines to convey CSO to tunnel storage for eventual treatment at the HWPCF

  * As a result of the Value Planning Review, this alternative was eliminated from further consideration due to the significant up-front costs involved in draining, cleaning and evaluating structural stability of the PRAC with no guarantee of long-term viability for storage. This resulted in a corresponding increase in number and cost of new off-line storage tunnels.

This balance of a variety of technologies and projects provides a favorable measure of flexibility that allows the plan to adjust to other objectives that may arise as the plan is being implemented to provide the best value moving forward. As these changes may occur over time, it is not intended to require the issuance of additional Environmental Impact Evaluations to address them.

2. Existing Conditions

The District, chartered by the Connecticut General Assembly in 1929, provides potable water supply and sewerage services on a regional basis. As shown in Figure 1.1 from the facilities plan, there are eight member communities in the District: Bloomfield, East Hartford, Hartford, Newington, Rocky Hill, West Hartford, Wethersfield, and Windsor.

The District owns and operates a combined sewer system within Hartford and a small portion of West Hartford known as the East Ridge system. These sewers date back to the 19th century, when it was believed that dual-purpose pipes for sewage and storm water conveyance would result in more manageable and cost-effective collection systems. While the pipes were originally sized to carry both sewage and storm water, intense storm events and expansion of the collection system due to development have historically taxed the capacity of the District’s interceptor sewers and the wastewater treatment facility, which cannot handle the large wet weather flows from the combined sewer system.

Six of the eight member communities contribute flow to the Hartford collection system for conveyance to the Hartford Water Pollution Control Facility. These six communities include all of Hartford, all of West Hartford, and portions of Bloomfield, Newington, Wethersfield and Windsor. Hartford and West Hartford are the only member communities with any combined sewers. However, wet weather flow responses from these other member communities do have an effect on CSOs located in Hartford. Also, the District’s CSOs are ultimately discharged to the Connecticut River having a direct effect on multiple downstream communities.

A complex system of diversion structures, control gates, overflow weirs, and pump stations is required to keep sewage flows routed to the HWPCF without surcharge into basements and onto city streets. Surcharging and flooding would be more common during rainstorms without pressure relief (CSOs) at key points in the collection system. The District’s CSOs are necessary to relieve this pressure and prevent direct human exposure to sewage.

In the 1970’s, there were 154 CSO regulators that were tributary to 43 end-of-pipe discharge points, which later became permitted outfalls under the NPDES system. There were also 30 intra-system regulators that allowed flow to cross between different pipes within the combined sewer system. Since the 1970’s, the District has been working to reduce CSO impacts to local receiving waters. Sewer separation projects, relief sewer construction, wet weather treatment improvements and implementation of various best management practices (BMPs) have resulted in the elimination of numerous CSO regulators and intra-system regulators. As a result, in 2006 there are 83 CSO regulators and 14 intra-system regulators remaining in the CSS. These regulators are tributary to 38 end-of-pipe NPDES discharge outfall points as shown in Figure 2-1 from the Facilities Plan.

Table 1shows the expected population changes in each of the District member towns as well as the expected population changes in each of the communities served by the HWPCF. Dry weather flow rates to the HWPCF are predicted to increase due to increases in sanitary flow by about 3% over the planning period for this project.

Table 1: Population Projections

Member Town (Fig 1-1)	**Population**		**Population Served by HWPCF**		
	2000	2020	2000	2020	Median Household Income 2000
Bloomfield	19,587	20,590	17,628	18,531	$53,512
East Hartford	49,575	50,580	0	0	$41,424
Hartford	124,121	145,580	124,121	145,580	$24,820
Newington	29,306	28,000	23,445	22,400	$57,118
Rocky Hill	17,966	18,410	0	0	$60,427
West Hartford	61,046	54,060	61,046	54,060	$61,665
Wethersfield	26,271	24,270	8,669	8,009	$53,289
Windsor	28,237	29,750	7,059	7,438	$64,137
Totals	356,109	371,240	241,968	256,018	

A single system-wide computer model was developed for assessing baseline CSO conditions and evaluating proposed system improvements. The model was calibrated using data including depth and velocity at 17 interceptor locations metered in the spring of 2003, overflow frequency and depth data at 90 locations monitored by the District's overflow alarm system, hourly data at the HWPCF, and flow metering data collected in 1996 to 1997 at 11 community inflow points.

The calibrated model is capable of simulating all flows to the HWPCF and the District's combined sewer outfalls and was adapted to simulate four baseline condition scenarios representing the 1990, 2003, 2005, and 2020 year configurations as explained below.

The 1990 scenario was simulated to reasonably correspond to the CSS configuration that existed prior to the many improvements implemented since the last referendum in 1990. The 2003 scenario is the calibrated model for existing conditions with no additional changes. The 2005 scenario accounts for significant system improvements implemented after the spring 2003 calibration period or planned for the near future.

The 2020 baseline scenario is the condition that was used for the long-term CSO control planning, so that solutions will be effective under future conditions. This simulation takes into account the projected increase in sanitary flows to the HWPCF during the planning period.

3. Purpose and Need

The District's CSS is over 100 years old. It is located primarily in Hartford with a small portion in West Hartford. The system-wide sewer model that was developed for assessing baseline CSO conditions and evaluating proposed CSS improvements has simulated the following baseline conditions that will exist for the design year 2020 if no further CSS improvements are implemented:

- 50 rainfall events result in overflows in an average year.
- 6.55 billion gallons of wet weather combined sewage enter the system annually.
- 5.51 billion gallons of this volume are captured and treated at the HWPCF.
- 1.04 billion gallons overflow untreated to local rivers, streams and public and private facilities.
- The 3-month storm produces 63 million gallons of CSO system-wide.
- The 1-year storm produces 93 million gallons of CSO system-wide.

The purpose of this project is to eliminate basement back-ups and to eliminate pollution from CSOs for all rainfall events up to a 1- year return period storm during an average year.

4. Discussion of Alternatives

a. No Action

This is not an acceptable option because it would result in the continued degradation of the environment. Without any actions taken to mitigate or eliminate the pollution sources, threats to public health and safety and to the environment will increase with time.

b. Quantity Source Control Measures

Quantity control measures are intended to reduce and/or eliminate portions of the wet weather flow generated in the basin tributary to a CSO regulator. Quantity control measures include the use of porous pavements, flow detention ponds, area drain and roof leader disconnection programs, the use of pervious area for infiltration, catch basin modifications using flow retardation devices, green roof and other low impact development techniques. Many of these alternatives are best implemented during new building construction and may not actually be practical for Hartford due to the challenges of implementation in an old urban environment. Aside from the impediment of age of the structures in Hartford, the majority of these strategies rely upon work on private property that presents significant jurisdictional issues for implementation by the District. Land use, zoning and building code changes for new development may be a more appropriate mechanism for incorporating these strategies in the future.

c. Sewer Separation

Sewer separation is defined as the reconstruction of an existing combined sewer system into non-interconnected sanitary and storm sewer systems. The sanitary sewer system is tributary to the wastewater treatment facility, and the storm sewer system discharges directly to local receiving waters. Typically, to separate an existing combined sewer area, either a new storm drainage system is constructed or new sanitary sewer pipelines are installed and the existing combined sewer is used as the sanitary or the separate storm drain pipe, respectively.

In places like Hartford, where numerous roof leaders and sump pumps discharge directly to the combined sewer, there is a significant reduction in the amount of inflow when new sanitary sewers are constructed. This is because the inflow connections will then discharge to the storm drain and will no longer be mixed with sanitary flow. In addition, new sanitary sewers reduce the amount of infiltration entering the system since old pipes can be cracked, have root intrusion, loose or offset joints that allow groundwater to enter the sewer system. The result of separation is that CSOs will be reduced or eliminated, except in extreme events, since storm water inflow will no longer utilize pipeline and treatment capacity.

i. City-wide separation

Historically, citywide sewer separation has been used by many smaller communities to eliminate CSOs altogether. Separation was viewed as a positive way to prevent untreated CSO discharges from entering local water bodies. Separation may remove the sanitary component from the overflow, but still allows untreated storm water runoff, containing sediment, petroleum products, litter and other items, to be discharged to local receiving waters. Citywide separation can also be very expensive and disruptive over large areas during construction. It is estimated that citywide separation will cost approximately $1.089 billion in 2005 dollars.

ii. Local separation

Local separation is a beneficial measure for CSO abatement that can be targeted to address local system problems, as opposed to separating the entire city. Local sewer separation typically targets specific ‘problem’ areas, such as locations that are subject to basement backup problems or areas that discharge to high priority water bodies. During the Citizens Advisory Committee (CAC) meetings, which were held to include the public in the long-term CSO control planning effort, Hartford residents and business owners expressed their desire for basement backup issues to be addressed. The District has identified several areas in Hartford that are prone to basement flooding based on complaints received and frequency of service calls made by the District. These areas are shown shaded on Figure 13-1 from the facilities plan.

The goal of the Wethersfield Cove Alternatives Evaluation was to identify feasible projects that would eliminate discharges to the Cove in a full range of storm events. Wethersfield Cove is viewed as a sensitive and unique water body that has many recreational uses and limited natural flushing capabilities. This means that the impact of the CSOs on the uses of the Cove is sustained over a longer period of time than uses along the Connecticut River or other flowing water bodies that have higher flushing capabilities. Alternatives targeting elimination of CSO discharges to the Cove were developed as part of the study. Full separation in the Wethersfield Cove drainage area would completely eliminate CSO discharge for any size storm event but would result in a higher level of control than methodologies applied elsewhere in the project area. The CAC has also endorsed this concept.

d. CSO Treatment

Treatment technologies target reduction of pollutant loads in combined sewer overflows to receiving waters. Specific technologies address specific pollutants, such as suspended solids, floatables, or bacteria. Treatment residuals must be addressed as part of the implementation plan. Solids removal and disinfection are typically required for reliable and effective CSO pollutant reduction. This usually equates with physical-chemical treatment, which is most suitable for highly variable, intermittent influent flows and pollutant concentrations.

Treatment technologies including dissolved air flotation, chemical flocculation, swirl concentrators and biological treatment were evaluated for possible use at the HWPCF but were discounted due to capital cost considerations, high O&M requirements or inability to handle highly variable flow rates. Other technologies or unit processes that were evaluated and will be considered as potential treatment alternatives either at the HWPCF or at satellite CSO treatment facilities include: screening, sedimentation, enhanced high rate clarification and disinfection.

<u>Screening</u>: Screens for wastewater treatment are available in various types and sizes, ranging from coarse bar racks to fine screens or microstrainers. Screens are effective in removing large solids and floatables – the effectiveness being dependent on the clear opening of the screen. Microstrainers can achieve primary treatment levels by removing 60% of the suspended solids. However, high head losses, O&M requirements related to clogging, and reportedly reduced disinfection effectiveness detract from the attractiveness of microstrainers in some applications.

Bar screens are almost always installed at the entrance to storage and treatment facilities to remove large objects, trash, and debris, and to protect treatment and pumping equipment. Often, two sets of screen in series are used. The first set usually consists of coarse screens with 1 ½ inch bar spacing. Finer screens with ¼ inch to 1 inch spacing are located just downstream. A double screen set-up also has less of a tendency to become blocked than the use of one fine screen does.

Screening is a viable treatment alternative to meet CSO control strategies. However, screening alone will remove only floatables and large solids and does not address coliform violations in receiving waters.

<u>Sedimentation:</u> Gravity sedimentation using high surface overflow rates can achieve 20 to 40% Biochemical Oxygen Demand (BOD) removal and 50 to 70% Total Suspended Solids (TSS) removal in CSOs. Land requirements that are relatively high and residual solids handling are important considerations in determining the feasibility of sedimentation. Since land availability is usually limited in urban areas, citing of CSO abatement facilities with sedimentation basins can be an important issue.

Experience has shown sedimentation to be a reliable cost-effective CSO abatement technology. To meet all water quality objectives, disinfection following sedimentation will be included as part of the treatment process.

<u>Enhanced High-rate Clarification:</u> A relatively new process for treating wet weather flows is enhanced high-rate clarification. This technology, which can be operated intermittently during storm events, is a physical-chemical process in which coagulant and polymer are added to wastewater. The coagulant aggregates the suspended solids in the flow into a floc. The resulting floc particles adsorb onto either very fine sand added to the wastewater, or recirculated solids with the aid of a polymer. The fine sand (or recirculated solids) act as ballast and increases the settling rate of the adsorbed floc.

At least three equipment suppliers can provide enhanced high-rate clarification systems. Whichever process is selected, BOD and TSS removal rates associated with high-rate clarification have been shown to be roughly double those of traditional sedimentation. Land area requirements are only 1/10th of traditional sedimentation requirements. The storage of chemicals may be of concern if this technology is implemented at a satellite location away from the HWPCF.

Screening is required prior to the enhanced high-rate clarification treatment and disinfection is required after. It has been reported that ultraviolet disinfection can be utilized successfully with this process because of the high level of suspended solids removal.

Disinfection: This process is used to destroy pathogenic microorganisms. Many disinfection technologies are available including chlorination, ozonation, and ultraviolet radiation (UV). The most common method is chlorine addition, although its toxicity to aquatic life is a concern that may result in the requirement for dechlorination. There has been limited success in using UV disinfection after screening or primary sedimentation. However, new UV technologies are becoming available and may prove to be effective for CSO disinfection after processes such as enhanced high-rate clarification due to that process being capable of better removal of BOD and TSS.

No treatment technology alone is adequate to meet all water quality objectives. These treatment technologies must be combined, in treatment trains with one another or with other technologies. The selected treatment train should provide floatables removal and disinfection at a minimum.

The CSO treatment trains proposed for further evaluation include:

- Pretreatment (screening and grit removal) and disinfection;
- Pretreatment, primary treatment (sedimentation) and disinfection;
- Pretreatment, high rate clarification and disinfection.

The CSO treatment technologies or combinations thereof are similar regardless of whether the facilities are expanded at the HWPCF or at remote satellite treatment facilities as discussed below. The location of the treatment facilities is also a concern as it relates to the implementation of the LTCP.

i. Hartford Water Pollution Control Facility Improvements

Maximization of flow to treatment facilities is often one of the first considerations in CSO control. The HWPCF presents opportunities for both CSO volume reductions, as well as operational benefits for the collection system. The HWPCF is an existing facility and retains several advantages over constructing new remote or satellite treatment facilities. The District already owns the land, retains staff, and maintains the infrastructure and equipment to run the water pollution control facility 24 hours per day, 365 days per year. Increasing the capacity of the HWPCF to handle higher peak wet weather flows is one way to reduce the frequency and volume of untreated CSO discharges. This alternative will likely require improvements to the existing pretreatment facilities, as well as the wet weather treatment system, and installation of a new pump station on the influent side of the HWPCF. The new pump station would lower the hydraulic grade line at the HWPCF and reduce upstream overflows by pushing more flow through the HWPCF during wet weather events. Another option that will allow more flow to pass through the HWPCF during wet weather events is to increase primary treatment and disinfection capabilities and bypass secondary treatment with a portion of the flow.

ii. Satellite wastewater treatment facility

Satellite treatment facilities are designed to remove or reduce pollutants from CSO discharges to levels consistent with water quality goals. In some cases, overflow volumes may be reduced as well, due to the increased storage capacity associated with some treatment technologies. In all cases, satellite treatment facilities must be designed for reliable and effective treatment of intermittent and highly variable influent flows and pollutant concentrations characteristic of CSOs.

Hartford currently has over 80 CSO regulators, which makes implementing satellite treatment at each regulator impractical. An important consideration in implementing satellite facilities is identifying viable sites near CSO regulators suitable for construction of these facilities in light of their size requirements, operation and maintenance requirements, constructability issues, as well as environmental and community impacts. The general public has been strongly opposed to satellite treatment facilities in the CSS resulting in the Citizens

Advisory Committee strongly advocating alternatives that addressed basement backup problems and kept CSO satellite treatment facilities out of residential neighborhoods.

Other factors affecting the viability of localized or satellite facilities for CSO treatment are the inability to handle and effectively treat intermittent and highly variable flows. This is of particular significance in the disinfection process that is necessary to achieve water quality standards. On-site storage of chlorine or other disinfecting chemical agent poses a significant safety concern as well as the issue of viability and stability of the disinfecting agent after long-term storage.

e. Storage (Deep tunnel, and/or satellite near surface storage)

Storage of wet weather overflows in tunnels below ground has become one of the standard methods of dealing with CSOs in recent years. Some communities take advantage of existing conduits, and many are constructing new storage tunnels for the sole purpose of reducing CSO discharges.

i. Deep Tunnel

Tunnels vary in depth and diameter, but most used for CSO storage tend to be very deep rock tunnels 100 to 200 feet below ground with fairly large diameters of 12 to 28 feet or more. The construction of a new deep rock tunnel would involve excavation of large diameter vertical access shafts below grade for lowering or raising construction equipment, and then using a large diameter tunnel boring machine to bore horizontally through solid bedrock. The tunnel would be lined with concrete to prevent groundwater infiltration. Consolidation drop shafts would also be constructed as portals for consolidated CSO to enter into the tunnel for storage. A dewatering pump station would be required to keep the tunnel dry between storm events so that the storage volume is available when needed. Odor control and periodic flushing of sediments that may accumulate in the tunnel should also be planned for. The main advantages of a deep rock storage tunnel include the following:

- Minimal above-ground construction impacts
- A deep tunnel (PRAC) has already been built in Hartford, so suitable conditions are likely
- Tunnels are relatively common and cost-effective solutions for storage of large CSO volume
- Relatively short implementation period

Some disadvantages include:

- Tunnels generally require a large capital investment in a short time period
- Potential for residents to feel vibration during construction
- Expensive and higher risk construction methods for workers

Several sizes were considered in developing solutions that would involve a tunnel. These sizes are based on the total volume of CSO that would need to be stored in the tunnel and the limitations in tunnel diameter given available technology. It is generally preferred from a technology standpoint to operate in the 15 to 25 foot diameter range for tunneling. Larger diameter tunnels have been built but they can be very expensive and pose several construction challenges. It is often more technologically feasible to construct a longer tunnel with a diameter in the preferred range than a shorter tunnel that exceeds the preferred maximum tunnel diameter. This is because there are more tunnel boring machines available in the preferred diameter range, so special boring machines don’t need to be built and there are more contractors that can bid on the project and reduce the cost through competition.

For the purposes of this study, it was assumed that the tunnel would be limited to a bored diameter of 24 feet and a lined diameter of 22 feet. At this size, the length of tunnel required is approximately 350 feet per million gallons stored. Therefore, in order to store system-wide overflow volume of 93MG generated in a 1-year storm, the length of tunnel would be about 33,000 feet or over 6 miles. The length can be reduced if the tunnel is not sized to store the system-wide volume, but only CSOs from selected regulators. For example, considering the distribution of CSOs throughout the city, it may be more cost-effective to limit the CSO inputs to those along the expected route of the tunnel rather than extending consolidation piping to more remote areas. Several routes were considered in developing solutions that would involve a tunnel. In general, it is preferred to locate the tunnel along a route where the largest CSOs are located to minimize the consolidation piping requirements and to maintain an alignment beneath public rights-of-way, including roads and watercourses, to minimize surface and subsurface easements requirements. Other considerations include following a relatively straight path without sharp bends and maintaining a slope of less than 3%. Drop shafts for consolidated CSOs to discharge into the tunnel will be located along the length of the tunnel. Two larger diameter shafts will have to be located at the upstream and downstream ends of the tunnel in order to facilitate insertion and subsequent retrieval of the tunnel-boring machine. A dewatering pump station will need to be constructed to keep the tunnel dry between uses. Odor control will be needed at the pump station and the access drop shafts in order to treat the volume of air in the tunnel as it is displaced by the inflow of CSO to be stored.

The exact route and size of a deep tunnel will be determined during the preliminary design stage. Tunnel construction is likely to occur later in the implementation of the project after other control methodologies have been implemented in order to more accurately determine the size and route of the tunnel.

ii. Satellite near surface storage

Satellite storage facilities are designed to capture and hold overflow volumes until capacity is again available in the interceptor system, at which time the tanks are dewatered back into the collection system for subsequent treatment at the HWPCF. Storage facilities are often considered more advantageous than satellite treatment facilities, since the captured volume is eventually conveyed to the HWPCF for higher-level treatment, rather than discharged through CSO outfalls following localized solids removal and disinfection. Tank size and area requirements were derived by dividing local overflow volume by an assumed 10-foot depth tank. Storage tanks will be installed below ground. Facility footprints assume additional area for disinfection and pump back equipment requirements.

Several options were considered for satellite CSO storage facilities in Hartford, including constructing several smaller facilities throughout the city, or constructing fewer, larger facilities in centralized locations. There are benefits and disadvantages to both options. Smaller facilities will be less difficult to site from a pure size perspective. However, building several smaller storage facilities will require more staffing and have high operations and maintenance costs. Land acquisition may be a costly and difficult process. It will also be a challenge to site facilities in residential neighborhoods because many citizens oppose construction of facilities that are perceived to be detrimental to the community’s appearance or quality of life.

Building fewer, larger storage facilities will be more difficult to site because of large size requirements, and will also require installation of consolidation piping to collect CSO flow and deliver it to the storage facility, but it will cause fewer permanent disturbances to neighborhoods across the city and will be less costly to operate and maintain. Siting of satellite storage facilities is a critical factor. Space requirements and environmental and community impacts are important considerations, as well as operations and maintenance requirements for these type of stand-alone facilities.

f. Infiltration/Inflow Removal

i. Disconnection of Gully Brook from the CSS

One principal source of clean water inflow within Hartford is from brooks that are piped into the CSS, namely Gully Brook and Tower Brook. The separation of Tower Brook was begun in 2006 as a stand alone project distinct from the implementation of the LTCP and will remove significant volumes of brook flow and storm water from the CSS.

In dry weather Gully Brook contributes approximately 1. 9 mgd of undesirable base flow to the Hartford WPCF. However, the flow increases significantly in wet weather. The peak flow at the downstream end of the

Gully Brook Conduit is approximately 100 mgd in the 1-year storm. Of this amount, 10 mgd is discharged as CSO at the G-20 regulator and 90 mgd is conveyed to the HWPCF for treatment. Of this amount, only 40 mgd is actually sanitary or combined sewage that requires treatment. Therefore, the remaining 50 mgd is brook inflow that uses capacity needed in downstream interceptors and at the HWPCF. Removal of Gully Brook from the CSS will lower the base flow and wet weather flows that consume the capacity of the CSS and the HWPCF and thereby reduce the volume, frequency and duration of downstream CSOs.

ii. Infiltration/Inflow Removal in separated tributary communities

To maximize the collection system's capacity, it is necessary to remove extraneous flows caused by infiltration and inflow (I/I). Removal of I/I sources from any sewer collection and treatment system is desirable to maximize hydraulic capacity and minimize the expense of treating 'clean' water.

Infiltration is groundwater that enters the system through broken or cracked pipes, defective joints, root intrusion, and manhole walls. Infiltration can add a considerable amount of flow to a collection system, especially in areas with high groundwater tables. Based on influent metering data from the HWPCF, it is estimated that infiltration contributes approximately 24 mgd on an average annual basis with a peak seasonal rate of 30 mgd. This is a significant portion of the average daily flow of 53 mgd delivered to the HWPCF. Replacing or lining defective pipes, pipe joints and manholes can reduce infiltration. Infiltration problem areas are often difficult to isolate, which can impact the cost-effectiveness of this measure.

By design, surface runoff is the primary source of inflow into a combined sewer system. In a separate system, however, inflow results from direct connections to the system from illegally connected catch basins, roof leaders, cellar and yard drains, sump pumps, and malfunctioning tide gates.

In order to maximize the downstream capacity of the combined sewer system in Hartford, the District will have to work in and with the surrounding member communities to reduce I/I sources in their separate sanitary sewer systems. CSO volume and frequency in Hartford will be reduced if the wet weather flows from the neighboring member communities can be reduced. The District has performed I/I investigations in most member communities in the recent past. A goal of 25% removal of wet weather inflow is a reasonable goal for CSO planning purposes. Higher inflow removal is desirable, but 25% removal is deemed an achievable goal for CSO reduction purposes.

g. Consolidation/Relief Piping for CSOs

Due to the large number of CSO regulators and lack of open space available in Hartford, a plan to consolidate overflows was developed to reduce the number of proposed satellite treatment or storage facilities.

To alleviate CSO occurrences, consolidation pipes can be constructed to collect CSO flow at each active regulator. The pipes can be sized to provide in-line storage, or for delivery to a centralized location, such as a storage tunnel or treatment facility. A network of pipes will have to be constructed throughout the city, in each drainage district to consolidate multiple overflow points to more centralized solutions. The consolidation required to limit the number of satellite facilities would likely require pumping into or out of the facility.

Consolidation piping will provide water quality benefits by removing CSO discharge from local receiving waters for rain events up to and including the 1-year design storm event. Construction will however cause disturbances along pipeline routes. Consolidation and relief piping will be a required component of any long-term control plan. It will not solve the problem in and of itself, but it will capture and convey overflows to a control point. As such, the cost-benefit associated with this component cannot be quantified independently.

5. Impact of Proposed Project on the Environment

a. Direct Impacts

i. Air Quality

Direct adverse impacts of the recommended plan are those associated with construction in the urban environment. Short-term adverse air-quality impacts may occur due to noise and exhaust emissions caused by construction activity. Any noise pollution can be minimized by including terms in the construction contract limiting activities to normal working hours and compliance with local regulations. Exhaust emissions should be negligible compared to normal traffic emissions. Blasting is not anticipated but may be necessary in certain areas during sewer separation or consolidation contracts depending on topography and sewer installation depth. Proper blasting permits will be required contractually and compliance with permit requirements will be enforced. It is not expected that blasting will be necessary during tunnel construction due to the advanced technology of tunnel boring machines that are likely to be employed.

Location and quantity of odors will be reduced by proper operation of the system such as periodic flushing of the sediments that may accumulate in the tunnel, and by the installation of odor control facilities. With decreased overflow volumes and frequency, odors at the point of discharge will be reduced during and following rain events. Temporary odor problems are a possibility with sewer related construction. Vehicular and pedestrian traffic disruption will likely result in some areas during sewer separation and consolidation piping construction activity. Adequate traffic control and traffic police will be required for the protection of the traveling public. Also, dust particles in excess of normal may also result due to construction. Dust particles should be noticeable only in the immediate construction area and dust pollution in surrounding areas will be minimized by including dust control requirements such as wet-down and clean-up in construction contracts. These factors are short-term and will not conflict with Connecticut's State Air Quality Management Plan.

ii. Water Quality

The proposed project will have no negative long-term impacts on the region's water quality. The project has the beneficial impact of improving water quality by the removal of overflows to the Connecticut River and its tributaries. Improvements in water quality will be both aesthetic (elimination of solids, floatables and odors) and physical (increased dissolved oxygen level and improved wildlife habitat). All receiving waters will have the benefit of reduced levels of turbidity, harmful bacteria and viruses thereby enhancing the recreational opportunities now available.

Construction activities will generally be within existing road rights-of-way and no stream crossings nor work in open waterways is planned other than the construction of new storm drain outfalls where necessary to replace the CSOs in areas where separation is planned. Some short-term adverse impacts upon the water quality may result from construction activity. The effects of erosion and siltation will be mitigated by measures to be incorporated into final plans and specifications.

iii.a. Environmentally Sensitive Areas: Wetlands

The project area contains a number of areas designated as wetlands. These areas are predominantly along the stream corridors. There are no designated wetlands within the project area that will be negatively impacted by this project. Potential short-term impacts during construction will be minimal while the long-term beneficial impacts of reduced CSO locations and volume and frequency will serve to enhance the wetland areas.

Proper mitigative measures, including all necessary erosion and sedimentation controls, and surface restoration as soon as possible after construction, will be required. Erosion and sedimentation controls will be required in the construction contract to minimize any impacts to the adjoining wetlands.

iii.b. Environmentally Sensitive Areas: Floodplains

This project consists mainly of sewer and sewer related underground structures such as consolidation conduits and underground tunnel storage facilities. No impacts to flood elevation or storage capacity are anticipated because the construction of these facilities will be below ground.

iii.c. Environmentally Sensitive Areas: Aquifers and Water Supply

There are no aquifer protection areas within the proposed project area. In view of the fact that no new areas will be served by sanitary sewers installed under this project, no new demands on the existing water supply will be exerted.

iv. Socio-Economic Impacts

The recommended plan captures or eliminates the CSO volume from a one-year storm at a total capital cost of $867 Million. This cost estimate includes construction contingency, contractor's overhead and profit, and an allowance for engineering and implementation. The projects are proposed to be funded through the State Clean Water Fund grant and low interest loan program. The original cost from the October 2005 CSO Long Term Control Plan was estimated to be $671Million. This amount was increased to the current estimate as a result of conceptual design efforts and value planning exercises. Significant changes include, but are not limited to the following:

- Limits of sewer separation have changed.
- Sewer separation approach has shifted to new sanitary sewers vs. new storm drains in most areas.
- South tunnel has been added to convey wet weather flows directly to the HWPCF.
- Change in configuration and proposed dimensions of Northern CSO Storage Tunnel.
- Proposed wet weather improvements to HWPCF have been revised.
- Use of the Park River Auxiliary Conduit (PRAC) for CSO storage is no longer being considered.

The project is considered eligible for funding under the Clean Water Fund as a CSO improvement project. This category of funding provides a grant of 50% of eligible project costs, and a loan for the balance at a 2% interest rate with a loan term of 20 years. The I/I removal portion of the project ($40Million) in the upstream tributary areas with separate sewer systems is currently eligible for low interest loan only funding under the Collection System Improvement Program portion of the Clean Water Fund.

Funding Source	**Estimated Contribution**
CT DEP CWF Grant *	$413,500,000
CT DEP CWF Loan *	$453,500,000
Total	$867,000,000

* Note: This level of funding assistance is the best-case scenario for the District but it will stress Clean Water Fund capabilities during the life of the project. This will require a substantial long-term commitment to the fund by the state of which there is no guarantee.

The facilities plan currently estimates that the project will serve approximately 139,032 households. Projected household sewer costs are based on average cost allocated equally to each household in the District's service area as well as the average percentage of flow caused by residential customers. In FY2004, this percentage was 63.4%.

The following tables indicate the impact of the implementation of the CSO improvement program on the estimated household sewer cost. The Revenue Requirement includes cost for Operations and Maintenance, and new and existing debt service less miscellaneous revenue income.

Table 2 - District Average Household Sewer Cost
Baseline District Needs Without CSO Program Implementation

Average Household Sewer Cost	**FY2005**	**FY2010**	**FY2015**	**FY2020**	**FY2025**
Revenue Requirement-Base Case (Annual expense)	$16,488,133	$22,129,040	$29,928,279	$36,741,183	$44,973,856

Number of Households	139,032	139,032	139,032	139,032	139,032
Estimated Household Sewer Cost	$119	$159	$215	$264	$323

Table 3 - District Average Household Sewer Cost
Baseline District Needs With CSO Program Implementation
(50 percent Grant, 50 percent Loan)

Average Household Sewer Cost Impact	**FY2005**	**FY2010**	**FY2015**	**FY2020**	**FY2025**
Revenue Requirement – CSO Impact	$16,488,133	$27,848,436	$49,584,982	$55,553,559	$63,642,157
Number of Households	139,032	139,032	139,032	139,032	139,032
Estimated Household Sewer Cost	$119	$200	$357	$400	$458

Table 4 - District Affordability Ratios
(50 percent Grant, 50 percent Loan)

Affordability	**FY2005**	**FY2010**	**FY2015**	**FY2020**	**FY2025**
Estimated Household Sewer Cost	$119	$200	$357	$400	$458
% of Median Household Income (District Average)	0.25%	0.40%	0.68%	0.73%	0.78%
% of Median Household Income (Hartford)	0.45%	0.72%	1.23%	1.31%	1.40%

Table 5 – District Affordability Ratios
(100 percent District General Obligation Bond financing)

Affordability	**FY2005**	**FY2010**	**FY2015**	**FY2020**	**FY2025**
Estimated Household Sewer Cost	$119	$273	$673	$915	$1,086
% of Median Household Income (District Average)	0.25%	0.55%	1.29%	1.67%	1.93%
% of Median Household Income (Hartford)	0.45%	0.99%	2.31%	2.99%	3.45%

The recommended CSO and plant improvement program proposed by the District represent a major financial and economic challenge. The District faces significant sewer cost increases over the next 20 years as it strives to maintain the integrity of its existing infrastructure regardless of additional CSO and plant improvement expenditures beyond 2005. However, based on the above, it appears that the program is within the affordability criteria as defined by EPA at least as long as partial grant and loan financing is assumed. The impact of the increased revenue requirements will be felt differently among the communities in the service area with Hartford being affected most strongly over the timeline of the projections.

In case of no grant and loan financing, the affordability ratio in Hartford exceeds 2 percent of median household income. The overall financial affordability of the program therefore depends on the District successfully obtaining some of these subsidized finance options or the schedule will need to be extended.

v. Historical / Archaeological Sites and National Landmarks

The majority of construction activities for the project will be within the limits of the public streets or on grounds previously excavated for the installation of other utilities or process equipment and therefore, this project will have no impact upon historic or archaeological sites. In the event that a previously undisturbed area is slated for construction activity, the appropriate archaeological review will take place during design.

vi. Endangered Species

The project construction will not affect any known endangered species.

vii. Coastal Zone Management

This project is not within the coastal zone.

viii. Wild and Scenic Rivers

This project area contains no wild or scenic rivers.

ix. Prime Farmlands

There are no known areas within the proposed project area that are defined as prime farmland soils.

b. Indirect Impacts

There will be no long-term adverse environmental impacts on air or water quality due to this project. There will be no change in flood elevations or long-term erosion patterns. The proposed project will not result in any changes in the rate, density or type of development. This project should not result in any displacement of homes or businesses.

c. Irreversible and Irretrievable Commitment of Resources

Resources being committed to the implementation of the project include all fuel, labor and materials necessary to construct the sanitary collection and consolidation sewers, storage tunnel(s) and pumping station, and treatment plant hydraulic improvements. This project also requires a long-term commitment on the part of the district to provide labor and management resources to properly operate and maintain the wastewater collection, conveyance and wet weather treatment system.

d. Unavoidable Adverse Impacts

Unavoidable adverse impacts are limited to short-term impacts directly related to construction operations. Dust and noise will be present during construction operations. Temporary traffic restrictions or detours may be necessary to accommodate construction in local streets. Erosion of sedimentation may occur in or adjacent to areas where the sewer lines or pumping stations are adjacent to wetlands or surface waters. All these adverse impacts can be minimized, as shown below.

e. Mitigation of Adverse Environmental Impacts

Most of the construction related impacts of the proposed project can be mitigated to a significant degree by the use of proper construction techniques and control measures.

In terms of air quality, dust pollution resulting from construction activities can be controlled by dust control measures such as calcium chloride or sprinkler trucks that minimize dust dispersion. Traffic disruption can be minimized by well-planned vehicle rerouting that is publicized in advance and should only result in a temporary inconvenience. Disruption due to noise can be minimized by restraining construction to normal working hours only and by using properly muffled equipment.

Where appropriate, sediment and erosion control measures such as hay- bale barriers and silt fences, covered excavation stockpiles etc. will be undertaken to protect against siltation from exposed construction areas. Construction easements through wetlands should be minimized as much as possible while still maintaining sufficient width for safe and efficient operations. No equipment or material storage will be allowed in the wetlands area. If any vegetative clearing is necessary, it should be minimized and should be immediately replaced after the end of construction. All streams crossings should be made perpendicular to the stream and within the existing rights-of-ways to avoid disturbing pristine areas. These crossings should be made at low flow conditions and the streambed should be returned to its normal grade. Last, to prevent disturbance of existing wetlands, no fill should be placed above existing contours in these areas.

The control measures outlined above will be incorporated into contract plans and specifications subject to regulatory review and approval. Contractors will be required to convey all dry weather flow and maintain the function of the existing sewer system during construction.

f. Energy Considerations

Energy expenditure for this project falls into two categories: construction and operation. In terms of construction, energy consumption will be primarily that needed to power construction vehicles and produce construction materials. These expenditures are considered relatively minor. In terms of operation, the energy expenditures will be those needed to power the pumps on the tunnel storage system, as well as the influent pumps and other wet weather operations at the HWPCF. A slight increase in energy expenditure will be experienced at the Hartford WPCF in handling and processing the waste stream. The annual estimated expenditure for operations and maintenance is expected to increase by 2.6% by year 2020 as a result of the implementation of the CSO improvement program.

6. Licenses, Permits, & Certifications Needed

DEP’s approval will be needed for the design of the proposed CSO improvements. DOT permits will be needed for construction within a state highway. Local land use agency and the City Flood Commission approvals will be needed for siting of the pump station, new drainage outfalls and access points to the tunnel storage system.

7. Summary of Agency and Public Consultations

A Citizen’s Advisory Committee (CAC) was created for the CSO planning project to help facilitate the public participation process. A public participation firm was hired to assist with development of the CAC, as well as to coordinate regularly scheduled meetings. The CAC and several subcommittees met multiple times throughout the second half of 2004 through 2006 to learn about CSO problems and ways to address them and to develop programs for public outreach and education.

A Community Forum was held in Hartford on October 26, 2004 to present general information to the public. The forum was facilitated by the CAC. A Public Hearing was held on February 25, 2005. It was facilitated by the District and was attended by about 200 people. The LTCP has been modified as the result of applicable comments received from the public, DEP and the District Board.

The Connecticut Department of Environmental Protection is in full support of the proposed project and urges its implementation.

8. Reference Maps

From Long-Term CSO Control Plan October 2005 prepared by Camp Dresser & McKee, Inc.

- Figure 1.1: Greater Hartford MDC Service Area
- Figure 2.1: Combined Sewer Overflow Regulators and Outfall Locations
- Figure 5.4: Proposed CSO Improvements Hartford WPCF
- Current Recommended Plan

Distribution List: Environmental Impact Evaluation:
Long Term Combined Sewer Overflow Control Plan
The Metropolitan District
Hartford County, Connecticut

REVIEW AGENCIES: STATE

Department of Environmental Protection, 79 Elm Street, Hartford, CT
Office of Policy and Management, 450 Capitol Ave, MS #52ASP, Hartford, CT
Council on Environmental Quality, 79 Elm Street, 6th Floor, Hartford, CT
Connecticut Historical Commission, 59 South Prospect Street, Hartford, CT
Department of Public Health, 450 Capitol Ave, Hartford, CT
  Water Supply
  Environmental Health
Department of Transportation, 2800 Berlin Turnpike, Newington, CT

REVIEW AGENCIES: MUNICIPAL

Bloomfield Town Hall, Bloomfield, CT,
East Hartford Town Hall, East Hartford, CT,
Hartford City Hall, Hartford, CT
Newington Town Hall, Newington, CT
Rocky Hill Town Hall, Rocky Hill, CT
West Hartford Town Hall, West Hartford, CT
Wethersfield Town Hall, Wethersfield, CT
Windsor Town Hall, Windsor, CT

  Town or City Clerk
  Mayor
  Inland Wetlands Regulation
  Planning & Zoning
  Public Works/Engineering Department

REGIONAL PLANNING AGENCIES

Capitol Region Council of Governments, 241 Main Street, 4th Floor, Hartford, CT 06106

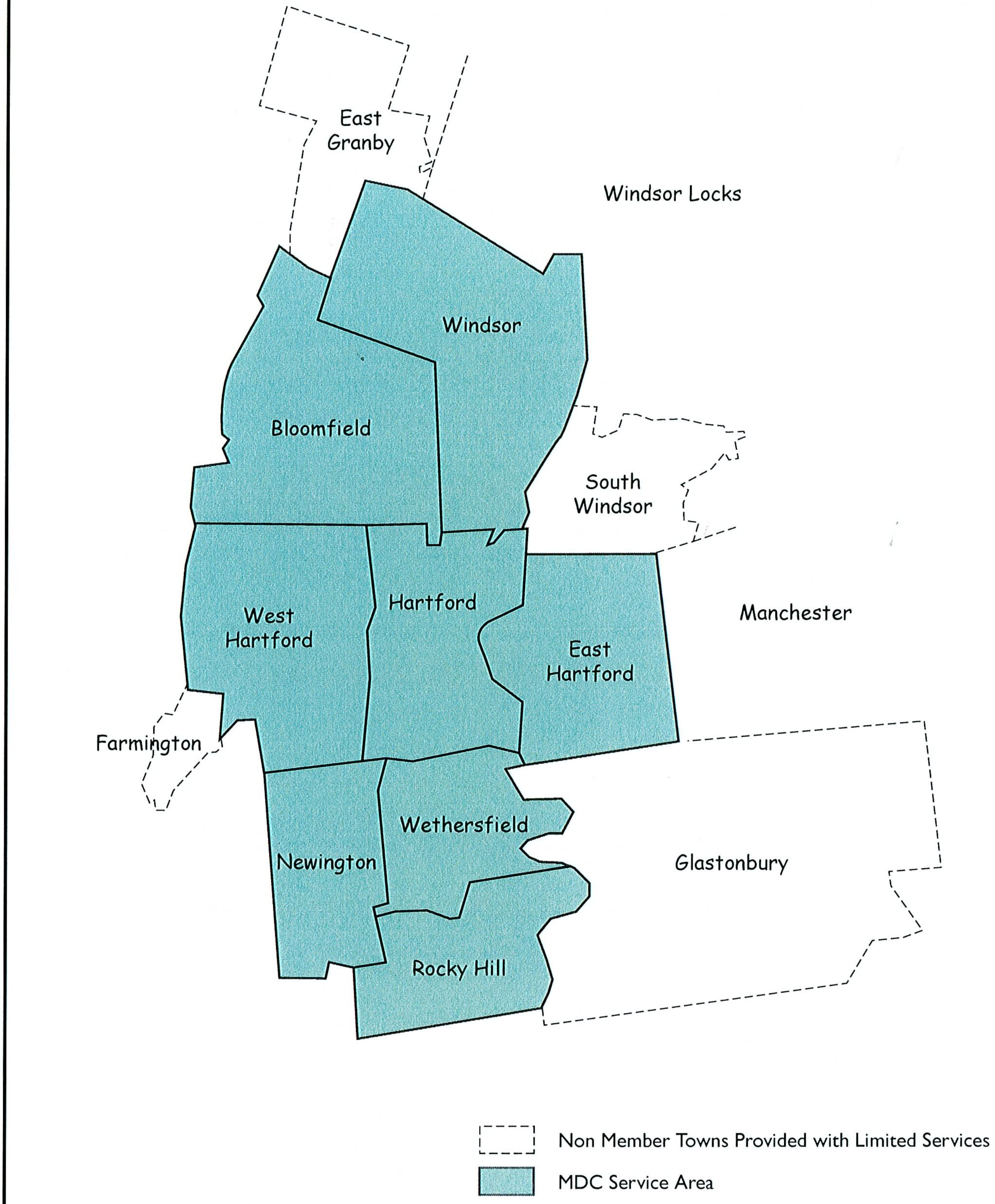


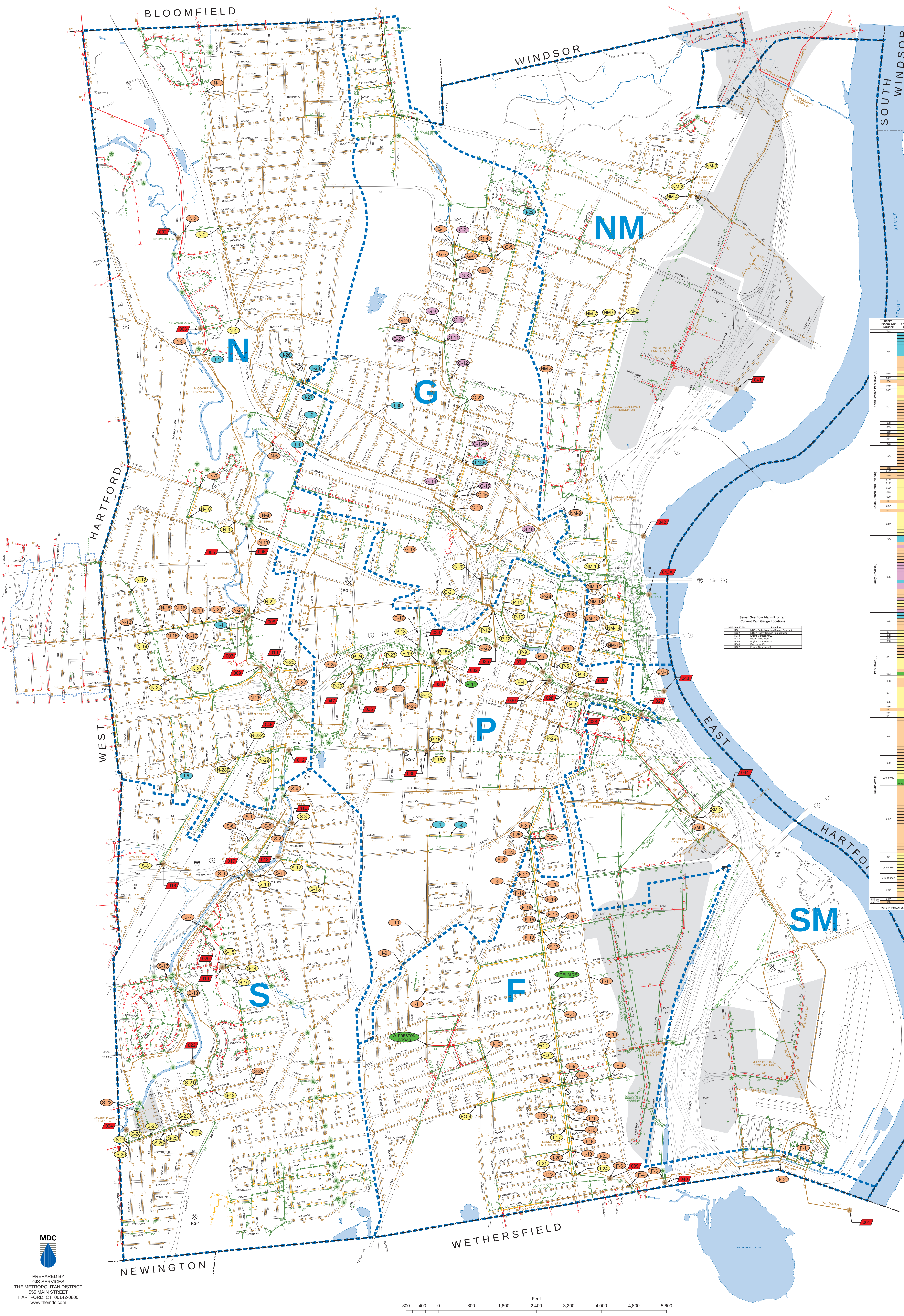
Figure 1-1
Greater Hartford MDC Service Area

THE METROPOLITAN DISTRICT

COMBINED SEWER OVERFLOW REGULATORS AND OUTFALL LOCATIONS

CITY OF HARTFORD

SEPTEMBER 2004



MDC CSO REGULATORS AND NPDES DISCHARGE POINTS

Revised August 19, 2004

	NPDES DISCHARGE NUMBER	MDC REGULATOR NUMBER	REGULATOR LOCATION	RECEIVING WATER
	001			Connecticut River
North Branch Park River (N)	N/A	I-1	Albany Ave. West of Mark Twain Dr.	
		I-2	Homestead Ave. West of Woodland St.	
		I-3	Homestead Ave. West of Woodland St.	
		I-4	Owen St.	
		I-5	Greenwood St. @ Grace St.	
		I-26	Albany Ave. @ Adams St.	
		I-27	Albany Ave. @ Milford St.	
		I-28	Albany Ave. @ Blue Hills Ave.	
		N-1	Granby St. North of Durham St.	
		N-5	Albany Ave. @ Scarborough St.	
		N-8	Old North Branch Interceptor, North of Asylum Ave.	
		N-11	Asylum Ave. West of Woodland St.	
		N-26	Forest St.	
	002*	N-2	Granby St. @ Pembroke St.	North Branch Park River
		N-3	Mark Twain Dr. North of Plainfield St.	
	003*	N-4	Granby St. South of Cornwall St.	North Branch Park River
	004	N-6	Woodland Drive	North Branch Park River
	005*	N-7	Asylum Ave. @ Girard Ave.	North Branch Park River
		N-10	Girard Ave. North of Elizabeth St.	North Branch Park River
	006*	N-9	Asylum Ave. Regulator Chamber	North Branch Park River
	007	N-12	Oxford St. @ Cone St.	No. Br. Park River Conduit via Tremont St. Conduit North Farmington Ave
		N-13	Tremont St. North of Farmington Ave.	No. Br. Park River Conduit via Tremont St. Conduit North Farmington Ave
		N-14	Farmington Ave. @ Tremont St.	No. Br. Park River Conduit via Tremont St. Conduit North Farmington Ave
		N-15	Whitney St. @ Farmington Ave.	No. Br. Park River Conduit via Tremont St. Conduit North Farmington Ave
		N-16	Kenyon St. @ Farmington Ave.	No. Br. Park River Conduit via Tremont St. Conduit North Farmington Ave
		N-17	Evergreen Ave. @ Farmington Ave.	No. Br. Park River Conduit via Tremont St. Conduit North Farmington Ave
		N-18	Girard Ave. @ Farmington Ave.	No. Br. Park River Conduit via Tremont St. Conduit North Farmington Ave
		N-19	Sisson Ave. @ Farmington Ave.	No. Br. Park River Conduit via Tremont St. Conduit North Farmington Ave
		N-20	Sherman St. @ Farmington Ave.	No. Br. Park River Conduit via Tremont St. Conduit North Farmington Ave
		N-21	Lorraine St. @ Farmington Ave.	
	008	N-22	Farmington Ave. West of Woodland St.	No. Br. Park River Conduit
	009	N-23	South Whitney @ Warrenton Ave.	No. Br. Park River Conduit via Tremont St. Conduit South Farmington Ave
		N-24	Warrenton Ave. West of So. Whitney St.	No. Br. Park River Conduit via Tremont St. Conduit South Farmington Ave
	010	N-25	Hawthorne St. @ So. Marshall St.	No. Br. Park River Conduit
	011	N-27	Captiol Ave. East of Forest St.	No. Br. Park River Conduit
	012	N-28A	Park St. @ Orange St.	So. Br. Park River Conduit via 66" High Level Drain
		N-28B	Park Street @ Francis Street	So. Br. Park River Conduit via 66" High Level Drain
	046	N-29	Bartholomew Ave. @ Park St.	No. Br. Park River Conduit via 36" Low Level Drain
South Branch Park River (S)	N/A	S-2	Brookfield St. South of Hamilton St.	
		S-4	Jefferson St. Interceptor @ Pope Park	
		S-7	Private Lands, West of Pulaski Dr.	
		S-9	Brookfield St. @ Saybrooke St.	
		S-11	Brookfield St. West of Wilson St.	
		S-18	Overlook Terrace	
		S-22	Newfield Ave. @ Pump Station	
	013	S-1	Hamilton Street	South Branch Park River
	014*	S-3	Hamilton Street @ Brookfield St.	South Branch Park River
	015	S-5	Belmont Street	South Branch Park River
		S-6	Rose St.	
	016*	S-8	New Park Ave.	Kane Brook
	017*	S-10	Brookfield St. @ Saybrooke St.	South Branch Park River
	018*	S-12	Brookfield St. @ Ward Place Ext.	South Branch Park River
		S-13	Wilson St. between Zion & Hillside	South Branch Park River
	019	S-15	Flatbush Ave. West of Chandler St.	Cemetery Brook Conduit
	020	S-14	Flatbush Ave. East of Chandler St.	Cemetery Brook Conduit
		S-16	Flatbush Ave. West of Chandler St.	Cemetery Brook Conduit
	021	S-17	Flatbush Ave. @ Overlook Ter.	South Branch Park River
	022*	S-19	Arlington St. @ Stone St.	South Branch Park River
		S-21	Natick St. @ Arlington St.	South Branch Park River
	023	S-20	Chandler St @ Arlington St	Cemetery Brook Conduit
	024*	S-23	Giddings St. @ New Britain Ave.	South Branch Park River via 48" Outfall from New Britain Avenue Storm Drain
		S-24	Nepaug St. @ New Britain Ave.	South Branch Park River via 48" Outfall from New Britain Avenue Storm Drain
		S-25	Wilbur St. @ New Britain Ave.	South Branch Park River via 48" Outfall from New Britain Avenue Storm Drain
		S-26	Goshen St. @ New Britain Ave.	South Branch Park River via 48" Outfall from New Britain Avenue Storm Drain
		S-27	Montrose St. @ New Britain Ave.	South Branch Park River via 48" Outfall from New Britain Avenue Storm Drain
		S-28	Grant St. @ New Britain Ave.	South Branch Park River via 48" Outfall from New Britain Avenue Storm Drain
		S-29	Roslyn St. @ New Britain Ave.	South Branch Park River via 48" Outfall from New Britain Avenue Storm Drain
		S-30	New Britain Ave. @ Roslyn St.	South Branch Park River via 48" Outfall from New Britain Avenue Storm Drain
Gully Brook (G)	N/A	I-29	Charlotte St. @ Martin St.	
		I-30	Albany Ave. @ Cabot St.	
	025	G-1	Westland St. West of Gully Brook Conduit	
		G-2	Westland St.	Gully Brook Conduit
		G-3	Westland St. @ Love La.	
		G-4	Love La. North of Westland St.	
		G-5	Garden St. @ Westland St.	
		G-6	Gully Brook Interceptor in private lands	
		G-7	Winchester St. West of Auburn St.	
		G-8	Rockville Street	Gully Brook Conduit
		G-9	Capen St. West of Gully Brook	Gully Brook Conduit
		G-10	Capen St. East of Gully Brook	Gully Brook Conduit
		G-11	Mansfield Street (East)	Gully Brook Conduit
		G-12	Enfield Street	Gully Brook Conduit
		G-13W	Albany Ave. West of Brook St.	Gully Brook Conduit
		G-13E	Albany Ave. West of Brook St.	Gully Brook Conduit
		G-14	Garden St. North of Bedford St.	Gully Brook Conduit
		G-15	Brook St. North of Liberty St.	Gully Brook Conduit
		G-16	Liberty St. @ Brook St.	
		G-17	Walnut St. West of William St.	
		G-18	Collins St. West of Garden St.	
		G-19	High St. @ Walnut St.	Gully Brook Conduit
		G-20	Spruce St. @ Church St.	Gully Brook Conduit
		G-21	Asylum St. Garden St.	Gully Brook Conduit
		G-22	Garden St. @ Pliny St.	
		G-23	Vine St. @ Mansfield St.	Gully Brook Conduit
Park River (P)	N/A	I-6	Allen Place, East of Broad St.	
		I-7	Allen Place, East of Broad St.	
		I-8	Maple Ave. @ Pawtucket St.	
		I-9	New Britain Ave. @ Henry St.	
		I-10	New Britain Ave. @ Broad St.	
		P-17	Flower St. North of RR tracks, under I-84 overpass	
	027	P-1	Commerce St. @ Sheldon St.	Park River Conduit
	028	P-2	Main St. @ Sheldon St.	Park River Conduit
	029	P-3	Main St. @ Arch St.	Park River Conduit
	030	P-4	Pulaski Circle	Park River Conduit
	031	P-5	Wells Street	Park River Conduit via Park River Storm Drain
		P-6	Trumbull St. @ Gold St.	
		P-7	Trumbull St. @ Jewell St.	
		P-8	Asylum St. @ Trumbull St.	
		P-9	Jewell St. @ Ann St.	Park River Conduit via Park River Storm Drain
		P-10	Asylum St. @ High St.	Park River Conduit via Park River Storm Drain
		P-11	High St. North of Asylum St.	Park River Conduit via Park River Storm Drain
		P-12	Asylum St. @ Gully Brook (North)	Park River Conduit via Park River Storm Drain
		P-13	Asylum St. @ Gully Brook (South)	Park River Conduit via Park River Storm Drain
		P-28	Trumbull St. @ Pratt St.	
	032	P-14	Capitol Ave. west of Hungerford St.	Park River Conduit
	033	P-15	Broad St. South of Capitol Ave.	Park River Conduit
		P-20	Lawrence St. North of Russ St.	
		P-21	Babcock St. South of Capitol Ave.	
		P-22	Putnam St. South of Capitol Ave.	
	034	P-15A	Broad St. Capitol Ave.	Park River Conduit
		P-19	Capitol Ave. @ Flower St.	Park River Conduit via Southeast Storm Drain
		P-23	Capitol Ave. East of Columbia St.	Park River Conduit via Southeast Storm Drain
		P-24	Capitol Ave. @ Park Terrace	Park River Conduit via Southeast Storm Drain
	035	P-16	Park St. and Broad St.	Park River Aux. Conduit
		P-16A	Park St. West of Broad St.	Park River Aux. Conduit
	036	P-18	Flower St. North of Capitol Ave.	Park River Conduit via Southeast Storm Drain
	037	P-25	Hawthorne St at Imlay St	Park River Conduit
	038	P-26	Main St. @ Buckingham St.	Park River Conduit
	047	P-29	Capitol Ave. @ Sigourney St.	Park River Conduit
Franklin Ave (F)	N/A	I-11	Broad St. @ Mountford St.	
		I-12	Douglas St. @ Campfield Ave.	
		I-13	Roosevelt St. @ Fenwick St.	
		I-14	Franklin Ave. @ Roosevelt St. (East)	
		I-15	Franklin Ave. @ Plymouth St.	
		I-16	Franklin Ave. @ Hanmer St. (East)	
		I-18	Franklin Ave. @ Goodrich St.	
		I-19	Franklin Ave. @ Eaton St.	
		I-20	Franklin Ave. @ Chester St.	
		I-22	Franklin Ave. @ Tredeau St.	
		I-23	Franklin Ave. @ Bolton St.	
		I-25	Maple Ave. @ Franklin Ave.	
		F-1	Franklin Ave. Interceptor @ H.W.P.C.P.	
	039	F-4	Victoria Rd. West of Wethersfield Ave.	
		F-5	South End Playground	Folly Brook Conduit
		I-17	Franklin Ave. @ Hanmer St. (West)	
		I-21	Franklin Ave. @ Cromwell St.	
		I-24	Private Lands, East of Franklin Ave.	
	039 or 040	EQ-1	Franklin Ave. & Brown St.	
		EQ-2	Franklin Ave. & Bodwell St.	
		EQ-4	South St. & Hubbard Rd.	
		Adelaide	Franklin Ave. @ Adelaide St.	Folly Brook via South Meadows Pressure Conduit
		West Preston/Broad	West Preston St. @ Broad St.	Folly Brook via South Meadows Pressure Conduit
	040*	F-2	Franklin Ave. Interceptor @ Clark Dike	
		F-3	Franklin Ave. Interceptor @ South Meadows P. S.	
		F-6	Wethersfield Ave. @ South St.	
		F-7	South St. East of Franklin Ave.	Folly Brook via South Meadows Pressure Conduit
		F-8	Franklin Ave. @ South St.	Folly Brook via South Meadows Pressure Conduit
		F-9	Franklin Ave. @ South St.	Folly Brook via South Meadows Pressure Conduit
		F-10	Wethersfield Ave. @ Airport Rd.	Folly Brook via South Meadows Pressure Conduit
		F-11	Wethersfield Ave. North of Adelaide St.	Folly Brook via South Meadows Pressure Conduit
		F-12	Franklin Ave. @ Elliott St.	Folly Brook via South Meadows Pressure Conduit
		F-13	Franklin Ave. @ Elliott St.	Folly Brook via South Meadows Pressure Conduit
		F-14	Elliott St. @ Elliott Place	Folly Brook via South Meadows Pressure Conduit
		F-15	Franklin Ave. @ Warner St.	Folly Brook via South Meadows Pressure Conduit
		F-16	Franklin Ave. @ Benton St.	Folly Brook via South Meadows Pressure Conduit
		F-17	Franklin Ave. @ Benton St.	Folly Brook via South Meadows Pressure Conduit
		F-18	Franklin Ave. @ Shultas Place	Folly Brook via South Meadows Pressure Conduit
		F-19	Pawtucket St. @ Franklin Ave.	Folly Brook via South Meadows Pressure Conduit
		F-20	Franklin Ave. @ Pawtucket St.	Folly Brook via South Meadows Pressure Conduit
		F-21	Franklin Ave. @ Annawan St.	Folly Brook via South Meadows Pressure Conduit
		F-22	Franklin Ave. @ North of Annawan St.	Folly Brook via South Meadows Pressure Conduit
		F-23	Franklin Ave. 250' South of Maple Ave.	Folly Brook via South Meadows Pressure Conduit
		F-24	Franklin Ave. @ Maple Ave.	Folly Brook via South Meadows Pressure Conduit
		F-25	Maple Ave. @ Franklin Ave.	Folly Brook via South Meadows Pressure Conduit
		EQ-3	Franklin Ave. & Bliss St.	
	041	NM-2	Tower Ave. @ Main St.	North Meadows Storage via Tower Brook Conduit
		NM-3	Main St. @ Tower Ave.	North Meadows Storage via Tower Brook Conduit
		NM-4	Main St. South of Fishfy St.	North Meadows Storage via Tower Brook Conduit
	042 or 041	NM-5	Windsor St. @ Sanford St.	Connecticut River via Tower Brook Conduit or Northeast Storm Drain
		NM-6	Bellevue St. @ Sanford St.	Connecticut River via Tower Brook Conduit or Northeast Storm Drain
		NM-7	Sanford St. @ Main St.	Connecticut River via Tower Brook Conduit or Northeast Storm Drain
		NM-8	Main Street north of Pavilion St.	Connecticut River via Northeast Storm Drain
	043 or 043A	NM-9	West of Windsor St. @ Market St.	
		NM-10	Market St. @ Trumbull St.	Connecticut River via East Side Storm Drain or East Side Storm Drain So. of Grove St.
		NM-11	Morgan St. @ Market St.	
	043*	NM-12	Talcott St. @ Market St.	
		NM-13	Market St. @ Kinsley St.	
		NM-14	State St. East of Market St.	Connecticut River via East Side Storm Drain South of Grove St.
		NM-15	Grove St. East of Prospect St.	
		SM-1	Commerce St. @ Keeney La.	
South Meadows (SM)	044*	SM-2	Masseek St. @ Van Block Ave.	Connecticut River
	045	SM-3	Masseek St east of Hendricxsen Ave	Folly Brook via Colt District Conduit

NOTE : * INDICATES NPDES DISCHARGE LOCATIONS WHICH WILL BE REQURED TO HAVE AN IDENTIFICATION SIGN POSTED AT THE OUTFALL LOCATION

Sewer Overflow Alarm Program
Current Rain Gauge Locations

MDC Site ID No.	Location
RG-1	MDC's Cedar Mountain Storage Reservoir
RG-2	MDC's Fishfry Sewage Pump Station
RG-3	Engine Company #10
RG-4	Maxim Road Yard
RG-5	Engine Company #14
RG-6	Fire House #5
RG-7	Engine Company #8

Legend

MDC COMBINED SANITARY SEWERS
- DIAM. 6" TO 22"
- DIAM. 24" AND LARGER

PRIVATE COMBINED SANITARY SEWERS
- DIAM. 6" TO 22"
- DIAM. 24" AND LARGER

CITY OF HARTFORD COMBINED SANITARY SEWERS
- DIAM. 6" TO 22"
- DIAM. 24" AND LARGER

MDC PARTIALLY SEPARATED SANITARY SEWERS
- DIAM. 6" TO 22"
- DIAM. 24" AND LARGER

PRIVATE PARTIALLY SEPARATED SANITARY SEWERS
- DIAM. 6" TO 22"
- DIAM. 24" AND LARGER

CITY OF HARTFORD PARTIALLY SEPARATED SANITARY SEWERS
- DIAM. 6" TO 22"
- DIAM. 24" AND LARGER

MDC SEPARATED SANITARY SEWERS
- DIAM. 6" TO 22"
- DIAM. 24" AND LARGER

PRIVATE SEPARATED SANITARY SEWERS
- DIAM. 6" TO 22"
- DIAM. 24" AND LARGER

MDC STORM SEWERS
- DIAM. 6" TO 21"
- DIAM. 24" AND LARGER

PRIVATE STORM SEWERS
- DIAM. 6" TO 21"
- DIAM. 24" AND LARGER

CITY OF HARTFORD STORM SEWERS
- DIAM. 6" TO 21"
- DIAM. 24" AND LARGER

STATE/ARMY CORP/OTHER STORM SEWERS
- DIAM. 6" TO 21"
- DIAM. 24" AND LARGER

CITY OF WEST HARTFORD STORM SEWERS
- DIAM. 6" TO 21"
- DIAM. 24" AND LARGER

OVERFLOWS
- S-13 ACTIVE, METERED, REPORTED, ALARM
- P-14 ACTIVE, METERED, REPORTED, NO ALARM
- G-2 ACTIVE, METERED, NO REPORTING, ALARM
- I-5 ACTIVE, NO METER, NO REPORTING, NO ALARM
- N-7 CLOSED

OUTFALLS
- 001 NPDES OUTFALL
- ★ CSO OUTFALL
- ★ STORM OUTFALL

▨ PUMP STATION SERVICE AREAS

⊗ RAIN GAUGE LOCATION

▬ ▬ ▬ DRAINAGE DISTRICT

MDC
PREPARED BY
GIS SERVICES
THE METROPOLITAN DISTRICT
555 MAIN STREET
HARTFORD, CT 06142-0800
www.themdc.com

MDC_CSOandOutfallMap091004.mxd

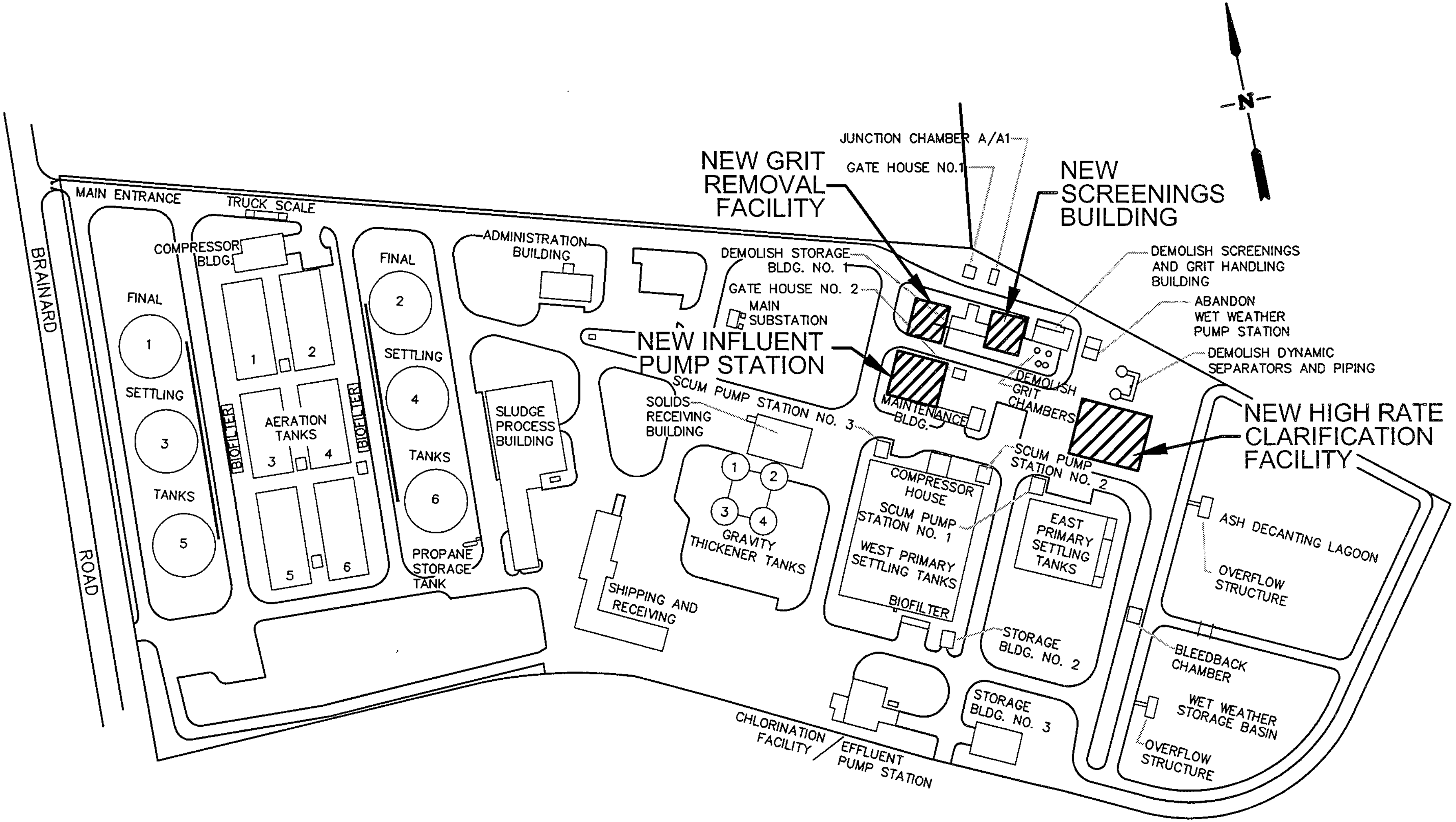
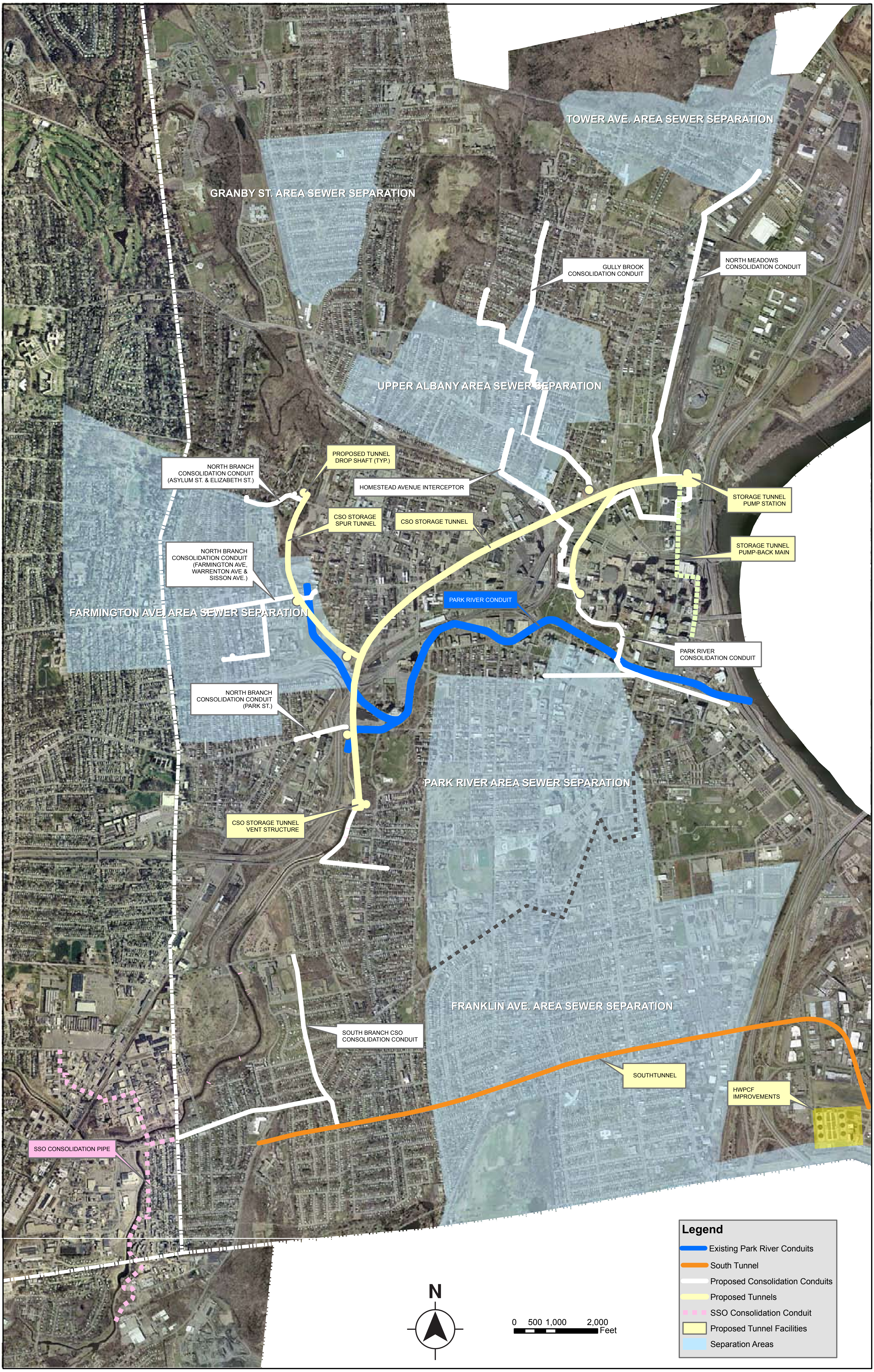


FIGURE 5-4: SITE PLAN - PROPOSED CSO IMPROVEMENTS
HARTFORD WATER POLLUTION CONTROL FACILITY
HARTFORD, CONNECTICUT

CDM


TOWER AVE. AREA SEWER SEPARATION
GRANBY ST. AREA SEWER SEPARATION
GULLY BROOK CONSOLIDATION CONDUIT
NORTH MEADOWS CONSOLIDATION CONDUIT
UPPER ALBANY AREA SEWER SEPARATION
PROPOSED TUNNEL DROP SHAFT (TYP.)
NORTH BRANCH CONSOLIDATION CONDUIT (ASYLUM ST. & ELIZABETH ST.)
HOMESTEAD AVENUE INTERCEPTOR
STORAGE TUNNEL PUMP STATION
CSO STORAGE SPUR TUNNEL
CSO STORAGE TUNNEL
STORAGE TUNNEL PUMP-BACK MAIN
NORTH BRANCH CONSOLIDATION CONDUIT (FARMINGTON AVE, WARRENTON AVE & SISSON AVE.)
PARK RIVER CONDUIT
FARMINGTON AVE. AREA SEWER SEPARATION
PARK RIVER CONSOLIDATION CONDUIT
NORTH BRANCH CONSOLIDATION CONDUIT (PARK ST.)
PARK RIVER AREA SEWER SEPARATION
CSO STORAGE TUNNEL VENT STRUCTURE
FRANKLIN AVE. AREA SEWER SEPARATION
SOUTH BRANCH CSO CONSOLIDATION CONDUIT
SOUTHTUNNEL
HWPCF IMPROVEMENTS
SSO CONSOLIDATION PIPE
Legend
Existing Park River Conduits
South Tunnel
Proposed Consolidation Conduits
Proposed Tunnels
SSO Consolidation Conduit
Proposed Tunnel Facilities
Separation Areas
N
0 500 1,000 2,000
Feet

ENVIRONMENTAL IMPACT EVALUATION

Long Term Combined Sewer Overflow Control Plan
The Metropolitan District
Hartford County, Connecticut

Dear Reviewer:

This Environmental Impact Evaluation has been prepared pursuant to Section 22a-1b of the Connecticut General Statutes and Section 22a-1a-10 of the Regulations of Connecticut State Agencies for the construction of the sewer system improvements recommended in the Long-Term CSO Control Plan. This project will eliminate the overflow of untreated combined sewage to the Connecticut River and its tributaries for all storms up to a one-year return frequency in an average year. The proposed project area includes the combined sewer collection system within the City of Hartford and a small portion of the Town of West Hartford as well as the separate sewer system tributary to the Hartford Water Pollution Control Plant within the District member towns of Bloomfield, Newington, West Hartford, Wethersfield and Windsor.

The Department of Environmental Protection has assessed this project and has determined that it will have no significant adverse impact on the surrounding environment. This document has been prepared and is being circulated in support of that determination.

Your review of this Environmental Impact Evaluation is encouraged. Written comments should be submitted to Michael J. O'Brien, Department of Environmental Protection, Bureau of Water Protection and Land Reuse, 79 Elm Street 2nd Floor, Hartford, CT, 06106-5127. The deadline for this submission is Friday July 20, 2007.

Sincerely,

s/Betsey Wingfield

Betsey Wingfield
Chief
Bureau of Water Protection and Land Reuse