

GREATER NEW HAVEN WATER POLLUTION CONTROL AUTHORITY

Agreement for Professional Engineering Services *Regarding On-Call Services*

DRAFT TASK ORDER CH2M Long Term Control Plan Update

Purpose

The following is a Task Order to the AGREEMENT between the Greater New Haven Water Pollution Control Authority (GNHWPCA, or Authority) and CH2M HILL, Inc. (CH2M HILL) for professional engineering services regarding on-call engineering services for wastewater treatment and major pump stations, energy, value engineering, green technology, and GIS dated April 26, 2010 and Amendment No. 1 dated October 21, 2013.

The purpose of this Task Order is to provide engineering services associated with the preparation of the Long Term Combined Sewer Overflow Control Plan (LTCP) Update as prescribed in Consent Order WC 5509 between the State of Connecticut Department of Energy and Environmental Protection (DEEP) and the Greater New Haven Water Pollution Control Authority. The LTCP Update is required under the terms of the Consent Order at a maximum of 5 year intervals until the conditions prescribed under the Consent Order are fulfilled. A Hydraulic Model Update completed in January 2015 provides a basis for understanding the Authority's collection system. It also includes system optimization as well as analysis of potential short-term, intermediate and long term improvement scenarios based on current system understanding. The Updated Hydraulic Model and analysis of revised abatement scenarios developed key planning parameters for system facilities including the collection system, East Shore WPAF, Union Pump Station, Boulevard Pump Station and East Street Pump Station and will be the basis for updating the LTCP.

The LTCP update will incorporate the findings concluded in the 2015 Hydraulic Model Update Report and investigate the potential alternatives to meet the 2 year 6 hour level of service. CH2MHill will utilize similar optimization processes demonstrated in this Report. The Updated Hydraulic Model will also allow additional analysis of LTCP scenarios by optimizing the collection structure setups for maximizing system performances.

The scope of services described herein will deliver a Long Term Control Plan Update and provide design criteria of key facilities for future upgrades.

Scope

The scope of this Task Order consists of the following tasks:

- Task 1 – Project Management
- Task 2 – Long Term Control Planning
- Task 3 – Screening Level Analysis of Long Term CSO Elimination
- Task 4 – Public Participation and Meetings
- Task 5 – Long Term Control Plan Update Report

Task 1—Project Management

Task 1.1 Project Management

The purpose of this task is to conduct the project management activities required to manage all technical, financial, and schedule aspects of this task order necessary to complete work on time, within budget, and of suitable quality. Activities include coordinating and facilitating team and client meetings, coordinating quality assurance, coordinating subcontractors, monitoring the progress of the work, and assembling all documents.

Task 2—Long Term Control Planning

The Authority recently completed a Hydraulic Modeling Update Project to provide better representation of current system conditions as well as improved predictability. The LTCP Update will refine the findings concluded in the Hydraulic Model Update Report and investigate the potential alternatives to achieve the goal of zero overflows during a 2 year 6 hour design storm. CH2M HILL will prepare a LTCP Update consistent with these requirements.

Task 2.1 Kickoff Meeting and Project Workshop

After the Notice to Proceed, CH2M HILL will develop a project execution plan and conduct a kickoff meeting to focus the team, including both CH2M HILL engineers and Authority staff, on project objectives and main deliverable milestones for the project.

Task 2.2 Data Review and Field Inspection

CH2M HILL will obtain and review record information pertinent to LTCP updates:

- Record data for main pump stations including Boulevard Pump Station, East Street Pump Station and Union Pump Station
- Record data for East Shore WPAF
- Utility and geotechnical data for potential Union Pump Station force main route
- Datasets for green infrastructure suitability assessments:

1. GNHWPCA's pavement surface datasets
2. Surficial geology
3. USDA's SSRGO soil and groundwater dataset
4. Property parcel dataset
5. CTDEEP open space dataset

CH2M HILL will walk through the identified candidate sites of LTCP projects and provide a preliminary assessment of the site conditions for screening of the potential project sites. CH2M HILL will also inspect the Union Pump Station, Boulevard Pump Station, East Street Pump Station and East Shore WPAF to obtain information for design assessments of the pump stations and East Shore WPAF.

Task 2.3 Typical Year and Design Storm Simulations

CH2M HILL will optimize the LTCP scenario setups based on the CSO reduction efficiency of the proposed abatement measures. The optimization will use the 2 year 6 hour design storm.

CH2M HILL will prepare up to ten (10) model scenarios for simulations of different alternatives with the 2 year 6 hour design storm. CH2M Hill will also perform up to ten (10) Long-term hydraulic simulations with the average year rainfall. CH2M Hill will perform analysis to examine the previously selected average year of rainfall (precipitation conditions in 1967) by incorporating more recent rainfall data that has been gathered since the approved LTCP and determine if the current typical year remains appropriate. The simulations will define how the proposed LTCP improvements affect maximized conveyance, and overflow frequency and volume on a "typical year" basis, as defined in the U.S. Environmental Protection Agency's CSO Control Policy. CH2M Hill will use rainfall data from Tweed Airport and the Northeast Regional Climate Center databases. We will analyze the model simulation results and summarize CSO discharge conditions as well as impacts of the proposed abatement projects.

A report with appropriate graphics and tables will be prepared to describe the alternative results. The draft report will be submitted to the Authority for its review and comment. A final report will then be submitted to the Authority and incorporated into the LTCP report.

Task 2.4 Development of LTCP Alternatives

CH2M Hill will analyze potential alternatives including sewer separation, green infrastructure, maximizing in system storage and conveyance, offline storage, and upgrades to the treatment plant required to achieve the goal of zero CSO overflows during a 2 year 6 hour design event.

Task 2.4.1 Development of Short Term Improvements

CH2M Hill will develop planning level design including a sequence of projects and cost estimates for identified Short Term Improvements discussed in the January 2015 Hydraulic Model Update. CH2M Hill has assumed that up to five (5) model runs will be conducted to plan Short Term Improvements. Below is a list of short term improvements that will be developed;

- Documentation of the West River CSO Improvements as conducted under the Hydraulic Modeling Update

- Documentation of the results of the review and update the Preliminary Design Report for Construction of Relief Sewers as conducted under the Hydraulic Modeling Update
- Documentation of regulator improvements/closures at each regulator to optimize in system storage and reduce/eliminate CSOs as conducted under the Hydraulic Modeling Update
 - Sketches of the recommended plan
 - Identify permits list and utility conflicts
- Update the CSO Nine Minimum Controls (“NMCs”) Implementation Assessment documenting the Authority’s implementation of the NMC measures described in EPA’s May 1995 guidance document. For each of the NMCs, summarize the status of control measures implemented and identify planned future actions based on assessment findings. Includes the following items:
 - A description of the specific short and long-term actions that the Authority is taking, or plans to take, to address any of the deficiencies identified during the completion of the NMCs Implementation Assessment.
 - A schedule for implementation of the NMCs Corrective Action Plan.

The identified improvements are at various stages of planning or design. CH2M Hill will work from existing baseline planning material and work to define them all to a planning level of design.

Task 2.4.2 Development of Intermediate Improvements

CH2M Hill will develop planning level design including a sequence of projects and cost estimates for identified Intermediate Improvements discussed in the January 2015 Hydraulic Model Update. CH2M Hill has assumed that up to five (5) model runs will be conducted to plan Intermediate Improvements. Below is a list of intermediate improvements that will be developed;

- Upgrade of Union Pump Station in the existing location for CSO abatement
 - Pumping capacity and configuration
 - Dry weather flows to East Street Pump Station
 - Wet weather or all flows to the Junction Chamber at the Harbor Crossing
 - Screenings and grit improvements
 - SCADA
 - Generator
 - HVAC/odor control
 - Flow metering
 - Equipment access issues
 - Operating strategy/controls until expansion of ESWPAF
 - Plans and sections of the recommended plan
- Union Pump Station Force Main(s)
 - Force main(s) size, materials and route(s)
 - Analyze alternatives for routing dry weather and wet weather flows
 - Analyze alternatives for connection to junction chamber
 - Identify permits list and utility conflicts
 - Analyze railroad crossing alternatives

- Analyze packaging of permitting, design and construction Contracts
- Detailed critical path timeline

CH2M Hill will subcontract with H.W. Lochner to analyze railroad crossing alternatives and required permits and construction timeline.

Task 2.4.3 Development of Long Term Improvements

CH2M Hill will develop concept level design including a sequence of projects and cost estimates for identified Long Term Improvements discussed in the January 2015 Hydraulic Model Update. CH2M Hill has assumed that up to ten (10) model runs will be conducted to plan Long Term Improvements. Below is a list of improvements that will be developed;

- Boulevard and East Street Pump Station Improvements
 - Pumping capacity and configuration
 - Screenings and grit improvements
 - SCADA
 - Generator
 - HVAC/odor control
 - Flow metering
 - Force main capacity analysis
 - Plans and sections of the recommended plan
- East Shore Water Pollution Abatement Facility Improvements
 - Updates to Facilities Plan based on new capacity
 - Improvements to effluent flow metering
 - Plans and sections of the recommended plan
- CSO Storage Tanks
 - Sewer separation and green infrastructure alternatives
 - Tank location and sizing alternatives
 - Land acquisition/easement issues
 - Geotechnical assessment
 - Identify permits list and utility conflicts
 - Plans and sections of the recommended plans
- Sewer separation in other areas identified
 - Sketches of the recommended plan
 - Identify permits list and utility conflicts
- Sewer separation of Fair Haven
 - Green infrastructure alternatives
 - Private inflow removal alternatives
 - Sketches of the recommended plan
 - Identify permits list and utility conflicts

To investigate green infrastructure alternatives for CSO abatement in the combined sewersheds CH2M Hill will use an ArcGIS built-in tool. CH2M HILL will process the datasets to locate the potential GI opportunities to reduce runoff discharging into the combined sewer system. CH2M HILL will also develop a procedure to rank the sites/parcels for potential GI opportunities.

Combining the likelihood of implementation and suitability results, CH2M HILL will develop a prioritized ranking of sites/parcels for potential GI implementation. Various levels of GI implementation scenarios will be developed by translating results into the hydraulic model using its LID module for simulating the hydrologic function of green infrastructure.

In addition to the short, intermediate and long term scenario models required to define the improvements, CH2M HILL will also develop up to three model runs to estimate the potential intermediate CSO reduction benefits at each milestone year of the recommended LTCP. One of the main objectives is to investigate the sequencing of the CSO abatement projects that are contingent upon other considerations (financial, regulatory, social etc.) Based on LTCP scenario results, a recommended plan will be selected to provide basis of design for collection system improvements and upgrades to the main pump stations and the East Shore WPAF.

Task 3 – Screening Level Analysis of Long Term CSO Elimination

CH2M HILL will utilize the CT DOT hyetograph for the 25 year 24 hour design storm to analyze a Long Term CSO Elimination Alternative. This alternative will develop the capital cost of improvements to eliminate CSOs during the 25 year 24 hour design storm. Land constraints and constructability limitations of each component of the alternative will be identified. The following components may be screened in this alternative:

- Sewer separation of all combined sewer areas
 - Green infrastructure alternatives
 - Private inflow removal alternatives
- Complete I/I Reduction Programs in Hamden, East Haven and Woodbridge
 - Private inflow removal alternatives
- Relief sewer construction to increase conveyance to major pump stations and the ESWPAF
- Cleaning and lining of all large diameter sewers
- Major Pump Station Upgrades (Boulevard, East Street and Union) to increase conveyance to the ESWPAF
 - Pumping capacity
- Minor Pump Station Upgrades of up to 27 remaining pump stations to increase conveyance to major pump stations and the ESWPAF
 - Pumping capacity
- ESWPAF Upgrades
 - Updates to Facilities Plan based on new wet weather capacity
- CSO Storage Tanks
 - Regulator and CSO Outfall closures
 - Tank location and sizing
- Consolidation conduits, storage tunnels and dewatering pumping stations

The findings of this Screening Level Analysis of Long Term CSO Elimination will be presented in a separate Technical Memorandum.

Task 4—Public Participation and Meetings

CH2M HILL will prepare public/stakeholders outreach meeting materials including meeting announcement flyers, PowerPoint presentations, meeting handouts and large display maps/plans. This scope includes participation of two (2) public/stakeholders meetings and three (3) meetings with DEEP.

Task 5 – Long Term Control Plan Update Report

CH2M Hill will prepare a LTCP Update report which incorporates the analysis of the tasks described in this Task Order.

CH2M Hill will incorporate all conceptual and planning level design sketches, descriptions, cost estimates, sequencing of projects and cost benefit analysis relative to reducing CSOs.

The predicted costs for the construction of the measures identified in the recommended LTCP to eliminate CSOs from the 2 year 6 hour design storm will be updated based on a class 5 planning level estimates defined as by the Association for the Advancement of Cost Engineering (AACE International). The cost estimates will also be consistent with the approach defined in the 2009 Facilities Plan. A sequence of projects planned under the LTCP will be included.

CH2M HILL will prepare a draft LTCP report summarizing the updates described in previous tasks. The draft report will be submitted to the Authority for its review and comment. CH2M HILL will incorporate comments from the Authority and other stake holders. A final draft report will then be submitted to the Authority and DEEP.

Project Costs and Schedule

Project Cost

The lump sum costs for the Task Order are shown in Table 1, broken down by task. For services provided under this Task Order, costs have been calculated by CH2M HILL direct salaries, plus a percentage of direct salaries (overhead 170%), plus a fee percentage of 10% on labor. Expenses include direct expenses and outside services on a cost basis (no markup). A DEEP 5700 form is attached.

CH2M HILL will meet or exceed the DEEP Clean Water Funding of 3% MBE and 5% WBE participation goals for the project.

TABLE 1 Task Order Project Costs	
Task	Task Total
1 – Project Management	\$50,000
2 – Long Term Control Planning	
Task 2.1 Kickoff Meeting and Project Workshop	\$5,000
Task 2.2 Data Review and Field Inspection	\$30,000
Task 2.3 Typical Year and Design Storm Simulations	\$35,000
Task 2.4 Development of LTCP Alternatives	
2.4.1 STCP Improvements	\$75,000
2.4.2 ITCP Alternatives	\$240,000
2.4.3 LTCP Alternatives	\$110,000
3 – Screening Level Analysis of Long Term CSO Elimination	\$5,000
4 – Public Participation and DEEP Meetings	\$45,000
5 – Long Term Control Plan Update Report	\$105,000
Grand Total	\$700,000

Project Schedule

Upon approval of the task order, CH2M HILL will complete the Long Term Control Plan Update Final Draft Report and submit copies to DEEP for review within 12 months of a Notice to Proceed.