



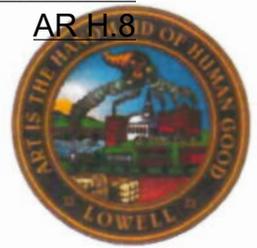
MARK A. YOUNG
EXECUTIVE DIRECTOR

LOWELL REGIONAL WASTEWATER UTILITY

WASTEWATER COLLECTION AND TREATMENT

Exhibit 11

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SUBJECT: CSO Phase 2 Long Term Control Plan (LTCP) for Lowell Massachusetts

DATE: August 15, 2014

Gentlemen:

In conformance with Administrative Order Docket No. 010-026, dated September 30, 2010, and subsequent communication with the Environmental Protection Agency (EPA), the City of Lowell is submitting a Combined Sewer Overflow (CSO) Phase 2 Long Term Control Plan (LTCP) for review and comment.

Before describing Lowell's LTCP, I would like to express my appreciation for the flexibility that your office has afforded the City of Lowell regarding the submittal of this plan. Although the LTCP submission has been delayed, I assure you that the City of Lowell remains dedicated to reducing its CSOs.

To underscore this commitment, the attached submittal describes a program to spend \$123M over the next decade, including the immediate investment of \$52M in capital improvements that will reduce CSOs, eliminate sewer surcharging, upgrade the combined sewer system, and improve wet-weather treatment capacity at the Duck Island Wastewater Treatment Facility (WWTF). The scope of the CSO Phase 2 LTCP also includes ongoing programs for sewer system monitoring, stormwater management, and sewer rehabilitation. For details of the Phase 2 plan, refer to the attached summary of project scope, schedule, benefits, and budget.

The ongoing programs for sewer rehabilitation and stormwater management are intended to comply with Capacity, Management, Operations, and Maintenance (CMOM) and Municipal Separate Stormwater Sewer System (MS4) requirements. The sewer monitoring program will improve LRWWU's understanding of the Lowell sewer system and refine the existing sewer system model (further discussion below). A Duck Island WWTF peak flow treatment capacity analysis will also be conducted.

The Phase 2 LTCP-CIP program is supported by a \$44M capital fund that was authorized by Lowell's City Council on October 13, 2013. In addition, another \$9M in funding for sewer rehabilitation and stormwater management programs is secured in the operating budget of the Lowell Regional Wastewater Utility (LRWWU). In addition to a five-year \$52M Phase 2 program, LRWWU is proposing a second five-year phase of improvements (CSO Phase 3 LTCP), valued at \$71M.

Altogether, Lowell is committed to investing \$123M in improvements over the next eleven years, of which approximately \$103M is targeted for CMOM and CSO projects. This program is an integrated plan that includes CSO, CMOM, CIP, and MS4 projects. In addition to the benefits listed above, the plan also ensures that important sewage transport and treatment systems continue to function properly. Without reliable routine operations, high flow management is not possible.

A review of the Phase 2 program reveals many of the same projects that were previously proposed as part of a "LTCP 1A" plan. Unfortunately, a delay in funding caused the deferral of those projects to this newly-proposed Phase 2 program, which is now fully funded. The new program includes several well-defined projects, with one caveat: the Pevey Street wet-weather storage project, whose funding is dependent upon the cost to implement the remainder of the Phase 2 program. If necessary, this project will be deferred to the Phase 3 program.

The proposed Phase 3 projects need further refinement. In order to better define these projects, LRWWU must first address the following deficiencies: 1) gain a better understanding of the Lowell sewer collection system in key locations; 2) consistently achieve peak flow treatment capacity at the Duck Island WWTF; and 3) realize the benefits of a one-million gallon interceptor storage project at Read Station.

In order to improve its understanding of transport and treatment capacities, LRWWU is ready to embark on a sewer system monitoring program and a capacity analysis of the Duck Island WWTF. These assessments will occur concurrently, along with peak flow improvements at Duck Island and the installation of flow control gates at Read Station. The importance of achieving consistent peak flow treatment at Duck Island and enabling interceptor storage at Read Station cannot be over-stated.

LRWWU acknowledges that maximizing wet-weather treatment capacity and interceptor storage have been long-standing objectives. Significant improvements have been made to the Duck Island facility, but two crucial upgrades must be completed to support reliable wet-weather treatment. Frequent failure of the plant's original clarifiers (six primary and four secondary) limit LRWWU's ability to treat peak flows. Compounding this limitation is an unreliable sludge de-watering system (twenty-year old belt filter press) that results in high secondary blankets, which further limit peak flow treatment.

Interceptor storage has been optimized in every location except Read Station. This cost-effective approach to wet-weather storage has been utilized with great success at Warren, Merrimack, Tilden, West, Walker, and Beaver Brook stations. Unlike the other stations, Read Station was not originally built with flow control gates. During the Phase 2 LTCP program, LRWWU will install gates and realize the benefit of nearly one million gallons of available wet-weather storage that is currently not utilized.

With the completion of clarifier replacements and the installation of new centrifuges, and the additional storage at Read Station, LRWWU will be capable of achieving consistent peak flow treatment and maximizing interceptor storage. Once the capacity of its existing facilities is fully maximized, LRWWU will be able to finalize its CSO Phase 3 LTCP projects. In order to accommodate a thoughtful assessment of the benefits of Phase 2 improvements, LRWWU is inserting a one-year assessment period between the two LTCP phases. With this framework in mind, we propose the submittal of another five-year plan in December 2019.

The Phase 3 LTCP will feature at least one large-scale wet-weather storage project and the construction of a 60-MGD wet-weather treatment facility at Read Station. The second phase of improvements at Read Station will increase LRWWU's overall wet-weather treatment capacity significantly, by as much as 60%. We expect this increased capacity to drastically reduce CSOs on the North Bank of the Merrimack River, and to determine the scale of work necessary to do the same on the river's South Bank.

The Read Station wet-weather treatment facility will be a "game-changer", which is why LRWWU is proposing a re-evaluation of its long-term control plan in 2024, after this milestone is attained. LRWWU's proposal of two five-year plans with a one-year assessment period demonstrates our belief in an adaptive management approach to CSO reduction. This is the same approach that LRWWU successfully implemented in its Phase 1 program, an approach that afforded us the flexibility to phase projects and adapt their scope as our understanding grew and progress was made. The ability to re-prioritize and revise projects proved to be invaluable; and we expect the same benefits to accrue during the next ten years of Phase 2 and Phase 3 projects.

LRWWU acknowledges that the current plan varies from a typical long-term control plan, in terms of duration and its reluctance to rely on long-term predictive modeling during high-flow conditions. Nevertheless, our dedication to reducing CSOs is evident in our proposed \$123M plan. Given our current level of understanding and the under-utilization of our existing facilities for wet-weather storage and treatment, we believe it would be premature to provide a plan with a longer duration.

Although our current sewer system model could be used to predict sizing and costs of future projects, we believe that developing a long-term capital plan based on this model would be an unsound approach. The reality is that LRWWU does not trust the current model, which is why we are proposing to revise the model with additional monitoring. An important technique that we intend to use is calibration of the existing model by measuring actual levels in key locations during high-flow conditions.

LRWWU has had excellent success characterizing its interceptor system using level monitoring (rather than flow metering). We believe that accurate open-channel flow measurement, particularly in temporary configurations, is very difficult to achieve. Level measurement, on the other hand, is a much more reliable basis for system characterization. With this approach in mind, LRWWU utilized a level monitoring program in 2007-2008 that informed its High Flow Management Program. This program has been a major factor in LRWWU's remarkable success reducing CSOs by 80% in the past decade.

A good example of LRWWU's mistrust of the existing system model and our insufficient understanding of the sewer system exists in the Marginal-Pevey-Middlesex Sewer corridor. This undersized sewer line is prone to severe surcharging during heavy rainfall, because two CSO outfalls were capped twenty-five years ago with no accommodation made for excess flow. Surcharging in this line has been a serious public health concern since that time, which is why LRWWU has included the following two projects in our Phase 2 program: the Marginal Sewer Relief Pipe and the Middlesex Sewer Relief Pipe.

We know that these projects will alleviate surcharging in the Marginal-Pevey-Middlesex sewer line. What is uncertain is whether these improvements will eliminate the existing surcharge conditions. LRWWU believes that level monitoring in this sewer and an evaluation of the actual (not predicted) benefit of the above two projects will inform our decision regarding the need for subsequent improvements. LRWWU is considering storage and conveyance solutions at 91 Pevey Street that require more information and a better understanding in order to be properly sized and supported with adequate budget.

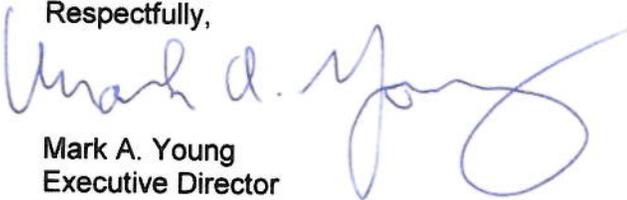
In ten years, when the capacity of the existing facilities is fully utilized and the new wet-weather treatment facility has been completed at Read Station, LRWWU will be in a solid position to determine the next steps in its CSO long-term control plan (CSO Phase 4 LTCP). With two treatment facilities on the Merrimack River's North Bank, it is a certainty that future projects will include increased conveyance to downstream facilities at Read Station and the Duck Island WWTF. The first conveyance project is proposed in Phase 3, with additional siphons at Beaver Brook constructed to alleviate CSOs at this station and fully utilize the treatment capacity of the Read Station wet-weather facility.

In preparation for Phase 4, LRWWU will evaluate the feasibility of adding new siphons across the Merrimack and Concord rivers. These new siphons would alleviate CSOs associated with Warren and Merrimack-Barasford stations. In order to accommodate the increased peak flows from upstream, expansion of the Duck Island facility is also being considered. These projects will be further evaluated after the benefits of the Phase 2 and Phase 3 programs are realized.

In the meantime, I am seeking your support for LRWWU's \$123M plan to reduce CSOs and sewer surcharging in the City of Lowell during the next ten years. I welcome your feedback and ask that we continue our collaborative approach to improving water quality in the Merrimack River watershed.

Should you have any questions, please do not hesitate to call me at 978-674-1601.

Respectfully,



Mark A. Young
Executive Director
Lowell Regional Wastewater Utility

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Mark Young, LRWWU Executive Director
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Jim Drake, CDM Project Manager

LOWELL REGIONAL WASTEWATER UTILITY PHASE 2 LTCP-CIP PROGRAM SUMMARY

Program	Project (Purpose)	Project Description & Benefits	Project Cost	Design Schedule	Construction Schedule
Sewer Rehab & Stormwater Management	Stormwater Management (MS4)	<ul style="list-style-type: none"> Stormwater Outfall Identification & Monitoring Drainage System Mapping & Public Education Illicit Discharge Detection & Elimination (IDDE) 	\$1 M	Assessment/Administrative Program	January 2014 – December 2019
	Sewer Rehabilitation (CMOM)	<ul style="list-style-type: none"> In-House Video Inspection of Sewer Lines Replace / Rehabilitate Aging Sewer Pipes Reduce Extraneous Flows into Sewer System (I/I) Increase Sewer System Capacity and Reduce Likelihood of Failure 	\$8 M	Assessment/Construction Program	January 2014 – December 2019
LTCP-CIP Planning	LTCP Phase 3 Plan (CSO)	<ul style="list-style-type: none"> Sewer System Level Monitoring, Metering & Modeling Long-Term Control Plan (LTCP) Development/Submittal 	\$1 M	Planning Program	October 2014 – December 2019
	Capital/LTCP Planning (CSO-CIP)	<ul style="list-style-type: none"> Plan Capital Project Prioritization and Sequencing Ongoing Assessment of LTCP Objectives and Strategies Value Engineering for Capital Projects in Design 	\$1 M		
Combined Sewer System Improvements	University Crossing Sewer Separation (CSO)	<ul style="list-style-type: none"> Sewer Separation in Tilden Sewer Basin Will Reduce CSOs Neighborhood Improvements (Water, Gas, Sewer, Drain, Paving) Collaborative Project with UMass-Lowell 	\$2.5 M	October 2014 – March 2015	April 2015 – December 2015
	Marginal Street Sewer Relief Pipe (CMOM)	<ul style="list-style-type: none"> Eliminate Recurring Sewer Surcharging on Marginal Street Re-Direct Flow from Warren Station to Walker Station Monitor Impact on Walker Station (Future Storage Facility) 	\$3 M		
	Middlesex Street Sewer Relief Pipe (CSO-CMOM)	<ul style="list-style-type: none"> Alleviate Severe Sewer Surcharging in Basement and Driveway of the Lowell Boys & Girls Club Address Safety and Public Health Concerns for Residents 	\$3 M		
	Stormwater Infiltration (Green CSO)	<ul style="list-style-type: none"> Neighborhood Demonstration Project in Public Park Public Education Regarding Stormwater Management Promote Stormwater Infiltration Strategies for Private Properties 	\$0.5 M		
WWTF Capacity & Pump Station Improvements	WWTF Peak Flow Treatment (CSO)	<ul style="list-style-type: none"> Peak Flow Capacity Analysis & High Flow Management Install New Centrifuges (Reliable De-Watering System) Replace Failing Clarifiers (Maximize Peak Flow Treatment Capacity) 	\$8 M	October 2014 – June 2015	June 2015 – December 2016
	WWTF Improvements & Remote Station Upgrades (CIP)	<ul style="list-style-type: none"> Hauled Waste and Solids Processing Ventilation and Odor Control Systems Miscellaneous Process Control & Safety Improvements Integrate Remote Stations into SCADA System 	\$3 M		
Flood Pumping & Wet-Weather Storage	Read Pump Station & Interceptor Storage (CSO)	<ul style="list-style-type: none"> Interceptor Storage of Wet-Weather Flows Flood Pumping (60 MGD) at Read Station Integrate Pumping with Future Wet Weather Treatment Facility Crucial Component of LTCP for CSO Control 	\$17 M	January 2016 – December 2016	January 2017 – July 2018
	Pevey Street Wet-Weather Storage (CSO)	<ul style="list-style-type: none"> Install Wet-Weather Storage at 91 Pevey Street Alleviate Recurring Sewer Surcharging on Pevey-Middlesex Street More Storage (if needed) in Subsequent Phase 	\$4 M	July 2017 – December 2017	January 2018 – December 2018
Phase 2 LTCP-CIP	Est. \$47 M in CSO-CMOM	CSO-CMOM-CIP-MS4 Phase 2 Projects	\$52 M	January 2014 – December 2019	January 2014 – December 2019

LOWELL REGIONAL WASTEWATER UTILITY PHASE 3 LTCP-CIP PRELIMINARY PROGRAM SUMMARY

Program	Targeted Project (Purpose)	Project Description & Benefits	Project Cost	Project Type / Priority	Schedule / Comment
Sewer Rehab & Stormwater Management	Stormwater Management (MS4)	<ul style="list-style-type: none"> Stormwater Outfall Identification & Monitoring Drainage System Mapping & Public Education Illicit Discharge Detection & Elimination (IDDE) 	\$1 M	Assessment/Administrative Program	January 2020 – December 2024
	Sewer Rehabilitation (CMOM)	<ul style="list-style-type: none"> In-House Video Inspection of Sewer Lines Replace / Rehabilitate Aging Sewer Pipes Reduce Extraneous Flows into Sewer System (I/I) Increase Sewer System Capacity and Reduce Likelihood of Failure 	\$10 M	Assessment/Construction Program	January 2020 – December 2024
LTCP-CIP Planning	LTCP Phase 4 Plan (CSO)	<ul style="list-style-type: none"> Sewer System Level Monitoring, Metering & Modeling Long-Term Control Plan (LTCP) Development/Submittal 	\$1 M	Planning Program	January 2020 – December 2024
	Capital/LTCP Planning (CSO-CIP)	<ul style="list-style-type: none"> Plan Capital Project Prioritization and Sequencing Ongoing Assessment of LTCP Objectives and Strategies Value Engineering for Capital Projects in Design 	\$1 M		
WWTF & Pump Station Improvements	WWTF Improvements & Remote Station Upgrades (CIP)	<ul style="list-style-type: none"> Replace Failing Pump Stations Structural Repairs to Aging Facilities (Tunnels and Tanks) Miscellaneous Process & Safety Improvements Various Electrical and Mechanical System Upgrades 	TBD	Priority Project	Failing Facilities Require Reinvestment
Wet-Weather Treatment	Read Station Wet-Weather Treatment Facility (CSO)	<ul style="list-style-type: none"> Wet Weather Treatment (60 MGD) at Read Station Dramatic Increase in LRWWU's Treatment Capacity Second Phase of Read Station Pump & Treatment Project 	TBD	Priority Project	Crucial Component of CSO Phase 3 LTCP
Combined Sewer System Improvements	Beaver Brook Siphon Expansion (CSO)	<ul style="list-style-type: none"> Convey More Wet-Weather Flow Downstream To Wet-Weather Treatment Facility at Read Station Reduce CSOs at Beaver Brook Station 	TBD	Priority Project	Convey High Flows to New Read Facility
	Tilden Area Sewer Separation (CSO)	<ul style="list-style-type: none"> Sewer Separation in Tilden Sewer Basin Will Reduce CSOs Neighborhood Improvements (Water, Gas, Sewer, Drain, Paving) Collaborative Project with Lowell Housing Authority 	TBD	Alternative Project	Scope TBD
	Stormwater Infiltration (Green CSO)	<ul style="list-style-type: none"> Neighborhood Demonstration Project in Public Park Public Education Regarding Stormwater Management Promote Stormwater Infiltration Strategies for Private Properties 	TBD	Alternative Project	Scope TBD
Wet-Weather Storage	Walker Wet-Weather Storage Facility (CSO)	<ul style="list-style-type: none"> Wet-Weather Storage at Walker Station Handle Peak Flows from Marginal-Pevey Reduce CSOs at Walker Station 	TBD	Priority Project	Reduce CSOs at Walker Station
	Pevey Street Relief Pipe & Wet-Weather Storage (CSO-CMOM)	<ul style="list-style-type: none"> Alleviate Recurring Sewer Surcharging on Pevey-Middlesex Street Re-Direct Flow from Warren Station to Walker Station Wet-Weather Storage at 91 Pevey Street 	TBD	Alternative Project	Scope TBD
	Douglas Road Wet-Weather Storage Facility (CSO-CMOM)	<ul style="list-style-type: none"> Douglas Road Wet-Weather Storage Facility Alleviate Recurring Sewer Surcharging Wentworth-Douglas Area Reduce CSOs at Barasford-Merrimack Station 	TBD	Alternative Project	Scope TBD
Phase 3 LTCP-CIP	Est. \$56 M in CSO-CMOM	CSO-CMOM-CIP-MS4 Phase 3 Targeted Projects	\$71 M	LRWWU Committed to \$71M Program	January 2020 – December 2024