Newtown Creek Superfund Site

New York City, New York

November 2019

EPA ANNOUNCES PROPOSED PLAN

This Proposed Plan identifies the preferred alternative for addressing a discrete aspect of the Newtown Creek Superfund site, referred to as Operable Unit 2 (OU2), and provides the rationale for the preference. OU2 relates to current and reasonably anticipated future discharges of the Operable Unit 1 (OU1) chemicals of potential concern (COPCs) from combined sewer overflows (CSOs) to the Newtown Creek Study Area, as the term Study Area is as described later in this plan.

The overall site is being addressed under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, also known as the Superfund Law). In addition, as per the requirements of the Clean Water Act (CWA), the New York City Department of Environmental Protection (NYCDEP) is under order of the New York State Department of Environmental Conservation (NYSDEC) to implement the CSO Long Term Control Plan for Newtown Creek, approved by NYSDEC in 2018 (LTCP). The LTCP includes a number of components to reduce CSO discharges to Newtown Creek, including construction of a storage tunnel, that will reduce the volume of CSO discharges to Newtown Creek to achieve waterbody-specific water quality standards consistent with the Federal CSO Control Policy and related guidance by approximately 61% from current baseline conditions.

The U.S. Environmental Protection Agency (EPA) evaluated the LTCP in the context of the site to determine if the volume controls prescribed by the LTCP are sufficient to meet the needs of an eventual CERCLA remedy for the Study Area. The evaluation of this discrete aspect of the site is referred to as OU2. EPA's preferred alternative to address the volume of current and reasonably anticipated future discharges of COPCs from CSOs to the Study Area is Alternative 2, No Further Action, that is, no action beyond the anticipated implementation of the LTCP, pursuant to the above-referenced CWA order.

EPA, the lead agency, in consultation with the New York State Department of Environmental Conservation (NYSDEC), the support agency, is issuing this Proposed Plan as part of its public participation responsibilities under CERCLA Section 117(a) of CERCLA and the regulations set forth in Section 300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This proposed plan summarizes information that can be found in greater detail in the focused feasibility study

MARK YOUR CALENDAR

PUBLIC COMMENT PERIOD:
November 21, 2019 – December 23, 2019
EPA will accept written comments on the Proposed Plan during the public comment period. Written comments should be addressed to:

Mark Schmidt
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U.S. Environmental Protection Agency
290 Broadway, 18th Floor
New York, NY 10007
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PUBLIC MEETINGS:
EPA will hold two public meetings to explain the Proposed Plan and all of the alternatives presented in the Focused Feasibility Study. Oral and written comments will also be accepted at the meetings. The meetings will be held at:

December 9, 2019	**December 11, 2019**
6:30 to 8:30 P.M. Sunnyside Community Services 43-31 39th Street Queens, New York 11104	6:30 P.M. to 8:30 P.M. P.S. 110 124 Monitor Street Brooklyn, New York 11222

In addition, documents from the administrative record are available on-line at:
https://www.epa.gov/superfund/newtown-creek

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report (FFS) prepared for OU2. This and other documents are part of the publicly available administrative record file and are located in the information repository for the site. EPA encourages the public to review these documents to gain a more comprehensive understanding of the site and the Superfund activities that have been conducted.

EPA, in consultation with NYSDEC, will select the remedy for OU2 after reviewing and considering all information submitted during a public comment period, which will last for at least 30 days. EPA, in consultation with NYSDEC, may modify the preferred alternative or select another response action presented in this Proposed Plan based on new information or public comments. Therefore, the public is encouraged to review and comment on all the information and alternatives presented in this Proposed Plan.

SCOPE AND ROLE OF ACTION

As with many Superfund sites, the contamination at this site is complex, and the cleanup is being managed through several operable units, or OUs. Additional information regarding OU1 and OU3 is provided in the Site History section, below. This Proposed Plan addresses OU2.

The alternatives evaluated in this Proposed Plan apply only to the current and reasonably anticipated future volume of discharge from CSOs. EPA will determine in future decision documents whether additional control actions, either in-creek or at CSO points-of-discharge, are required to meet the remedial action objectives of the overall site, which are yet to be determined. Such additional control actions, if necessary, would be implemented by a future decision document.

In addition, in addressing OU2, EPA makes no determinations or findings regarding past discharges of COPCs from CSOs. Past releases and their impact on the Study Area are being evaluated as part of the OU1 remedial investigation/feasibility study (RI/FS), which is currently being conducted.

OVERALL SITE DESCRIPTION

The site is located in Kings County and Queens County, New York City, New York (Figure 1). The site includes Newtown Creek and its five tributaries, including Whale Creek, Dutch Kills, East Branch, English Kills and Maspeth Creek.

The site is located within the Newtown Creek Significant Maritime and Industrial Area (SMIA), one of six designated SMIAs in New York City. The Newtown Creek SMIA, at over 780 acres, is the largest SMIA in New York City, and includes portions of the Greenpoint, Williamsburg, Long Island City, and Maspeth industrial areas.

Newtown Creek and its tributaries comprise an estuarine water body that is generally oriented in an east-west direction, although the easternmost section of Newtown Creek and several of the tributaries are oriented north-south.

The water in Newtown Creek is currently classified by the NYSDEC as Class SD, saline surface water with a protected use of fish survival only. The Creek does not presently meet parameters for that protected use (e.g., because of low dissolved oxygen). The Creek is used for recreational uses, including kayaking and canoeing and there are existing and planned waterfront access points. Despite a New York State Department of Health fish advisory to limit fishing in Newtown Creek, posted warnings and public outreach efforts, fishing and crabbing have been observed on the Creek.

OVERALL SITE HISTORY

Historically, Newtown Creek drained the uplands of western Long Island and flowed through wetlands and marshes. However, because of heavy industrial development and governmental activities dating from the 1800s, the wetlands and marshes have been filled, Newtown Creek has been channelized, and its banks have been stabilized with bulkheads and rip rap. The historic development has resulted in changes in the nature of Newtown Creek from a natural drainage condition to one that is governed largely by engineered and institutional systems.

In the mid-1800s, the area next to the 3.8-mile-long Creek was one of the busiest industrial areas in New York City. Industrial facilities were located along its banks, including more than 50 oil refineries, petrochemical plants, fertilizer and glue factories, sawmills, and lumber and coal yards. Newtown Creek was crowded with commercial vessels, including large ships bringing in raw materials and fuel and taking out finished products including petroleum products, chemicals and metals. In addition to the industrial pollution that resulted from all of this activity, the City began dumping raw sewage directly into the water in 1856. During World War II, the Creek was one of the busiest ports in the nation. Currently, factories, warehouses, public utilities and municipal facilities operate along the Creek. Various contaminated facilities upland of the Creek have been sources of the contamination at Newtown Creek.

This industrial development resulted in a major reworking of the Creek banks and channel for drainage and navigation purposes. The channelizing and deepening of Newtown Creek and its tributaries were largely completed by the 1930s, defining its current configuration. This historical development has resulted in changes in the nature of Newtown Creek and its tributaries' natural drainage condition from one with tributary flow, to one that is governed largely by engineered and institutional systems.

In the early 1990s, New York State declared that Newtown Creek was not meeting water quality standards under the Clean Water Act. Since then, a number of state- and city-sponsored cleanups of properties in the Newtown Creek area have taken place, and a major upgrade of the Newtown Creek Wastewater Treatment Plant completed in 2012.

The site was added in 2010 to the EPA National Priorities List pursuant to CERCLA. The site was being addressed as one operable unit (OU) until recently, when two additional OUs were identified. The current OU structure is as follows:

OU1

OU1 includes the entire Study Area, as defined in an administrative order on consent (AOC) from 2011 between EPA, the New York City Department of Environmental Protection (NYCDEP), and Phelps Dodge Refining Corporation, Texaco, Inc., BP Products North America Inc., the Brooklyn Union Gas Company D/B/A National Grid NY and ExxonMobil Oil Corporation. These five private parties (excluding New York City) have organized as the Newtown Creek Group (NCG). The 2011 AOC defines the Study Area, generally, as the water body and sediments of Newtown Creek and its tributaries, up to and including the landward edge of the shoreline.

A full RI/FS for OU1 is ongoing under EPA oversight.

OU2

The OU2 FFS was conducted by NYCDEP, with EPA oversight, pursuant to a 2018 AOC between EPA and NYCDEP.

OU3

OU3 refers to the evaluation of a potential interim, early action for the lower two miles of the Creek in the Study Area, as described in a 2019 AOC between EPA and the NCG. An FFS for OU3 is currently being performed by the NCG, with EPA oversight.

ENFORCEMENT HISTORY

As noted previously, six responsible parties have entered into the 2011 AOC to conduct the OU1 RI/FS. OU2 is being conducted per the terms of a 2018 AOC with NYCDEP only, and OU3 is being conducted per the terms of a 2019 AOC with the NCG only.

Additional potentially responsible parties have recently been notified of their potential liability. The role and contribution of these additional parties to each OU at the site is yet to be determined. The search for additional potentially responsible parties continues.

OVERALL SITE CHARACTERISTICS

The site has been extensively studied through the OU1 RI/FS process. The results of these studies will be detailed in the OU1 RI and FS reports. No new physical investigations of the site were conducted as part of OU2. Rather, the evaluations conducted to support the OU2 FFS relied upon data collected as part of the OU1 RI/FS.

OU1 Study Area Investigation

OU1 RI field work began in February 2012 and was substantially completed by May 2014. It was determined that additional data were needed, and these were obtained as part of the OU1 FS so that preparation of the draft OU1 RI report could proceed. OU1 FS Field work began in Spring of 2017 and was substantially completed in 2019.

A draft OU1 RI report was initially submitted in November 2016 and a revised version was submitted in April 2019. EPA sent comments on the revised RI report to the NCG in September 2019 and a revised document is currently due in early 2020.

The OU1 RI/FS field work included the collection of a robust set of data that are being used to determine the nature and extent of contamination at the Study Area, develop the overall conceptual site model, and ultimately support the selection of an appropriate remedial alternative for OU1. These data include the following: sampling of sediment, surface water, porewater, groundwater, seepage, air, shoreline sediment/soil, biota tissue, point source discharges, non-point source discharges, non-aqueous phase liquid (NAPL), and ebullition; surveys of ecological communities and bathymetry; and testing of sediment toxicity, NAPL mobility and geotechnical properties.

Samples were analyzed for a comprehensive list of contaminants, including volatile organic compounds, semi-volatile organic compounds, metals (total and dissolved), polychlorinated biphenyl (PCB) aroclors and congeners, dioxins/furans and pesticides.

In addition, as part of the OU1 RI/FS, a complex set of inter-related models is being developed. The first two major pieces (the hydrodynamic and sediment transport models, which include groundwater and point-source sub-models) have been submitted with the draft RI report and are being refined. The remaining portions of the modeling framework (the contaminant fate and transport model and the bioaccumulation model) are still being developed and will be submitted as part of the draft FS report. As such, while development of the Conceptual Site Model for OU1 is well underway, a full system understanding is still being developed. The OU1 FS report is currently scheduled for completion in 2022.

Physical Characteristics of OU1 Study Area

Elevated concentrations of contamination were found throughout the Study Area. Much of this contamination is due to historic inputs of contamination to the Creek, and contaminated sediment, in particular, is found in the surface and subsurface sediment, and the underlying native sediment.

Ongoing, external inputs of contamination to the Study Area include, but are not necessarily limited to, municipal separate storm sewer system outfalls (MS4s), the Newtown Creek waste water treatment plant (WWTP) treated effluent outfall, permitted industrial discharges, other permitted/non-permitted discharges, overland flow/direct drainage, groundwater, other non-point sources, the tidal effects of the East River, atmospheric deposition, shoreline seeps/groundwater discharge from upland properties and shoreline bank erosion, as well as CSO discharges.

Representative samples from these inputs have been collected as part of the OU1 RI/FS process, providing sufficient data to develop quantitative estimates of the concentrations of hazardous substances entering the Creek from these sources and, where appropriate, the mass/volume.

The Creek itself also has elevated concentrations of many contaminants, and there are in-Creek processes that may lead to the spread of this contamination within the Study Area. These processes include ebullition (bubbling), sediment resuspension, and NAPL migration.

Point source discharges to the Study Area include over 300 private and municipal outfalls along the Creek and its tributaries. These point source discharges primarily supply freshwater flows to Newtown Creek during wet weather conditions and include individually permitted stormwater and wastewater discharges, CSO discharges, unpermitted discharges, and treated wastewater discharges from the WWTP. Stormwater runoff from roadways and overland flow are also discharged to the Creek.

OU2 FFS

Background of Operable Unit 2

During wet weather conditions, the Creek receives discharges from point sources, which include CSOs and stormwater (municipal discharges, and permitted and unpermitted private point source discharges), as well as from non-point sources, such as overland flow (see Figure 2 for some of these point source discharge locations). In addition to the discharges during wet weather, the Creek also receives freshwater inputs from groundwater. The groundwater enters the Creek through the sediment and from the upland properties adjacent to the Creek. The East River and point sources are currently considered the primary sources of solids to the Creek.

For several decades, the control of CSOs to affect improvements in bacteria levels and dissolved oxygen concentrations in waterbodies has been driven by CWA regulatory programs, including EPA's CSO Control Policy (Section 402 (q) of the CWA), and the NYSDEC promulgation of numeric water quality standards for bacteria and dissolved oxygen. The control of CSOs has focused on volumetric reductions of CSO discharges to meet these standards.

CSO planning for Newtown Creek was initiated in 1990 via the Newtown Creek Water Quality Facility Planning Project. A Waterbody/Watershed Facility Plan (WWFP) for Newtown Creek was issued by NYCDEP and approved by NYSDEC in 2012. The WWFP included an analysis of operational and structural modifications targeting the reduction of CSOs and improvement of the overall performance of the collection and treatment system within the watershed. In 2017 NYCDEP developed an LTCP to identify, with public input, appropriate CSO controls necessary to achieve waterbody-specific water quality standards consistent with the Federal CSO Control Policy and related guidance. NYSDEC approved the LTCP in 2018.

While efforts to reduce the volume of CSO discharges are focused on the CWA objectives, the volume reduction will also decrease the mass of site-related COPCs discharged to the Creek. The overall goal of the OU2 FFS is to determine if the volume controls prescribed by the LTCP designed to meet the requirements of the CWA program are sufficient to also meet the CERCLA requirements for the site.

As part of the OU1 RI/FS efforts, a robust point source sampling program was completed. Thirty-one point source discharges were sampled during 15 wet weather sampling events between June 2014 and December 2015. Samples were collected from CSOs, MS4s, highway drains, stormwater discharging from private properties and permitted outfalls. These data were used in evaluating the lines of evidence described below. Discharges from the sampled CSOs account for approximately 96 percent of the total CSO discharge to the Creek

Multiple Lines of Evidence Evaluation

As mentioned above, the OU1 RI/FS is ongoing and the preliminary remediation goals for the Study Area have not been developed. Because of this, a multiple lines of evidence approach was used to assess the relative performance of each of the alternatives evaluated in the OU2 FFS.

Three Lines of Evidence (LOEs) were evaluated, as described below.

- LOE 1: comparison of the particulate-phase concentrations of COPCs in CSO discharges to the particulate-phase concentrations in other potential sources of contamination to the Creek;

- LOE2: comparison of the mass loading of COPCs from CSO discharges to the mass loading of COPCs from other potential sources of contamination to the Creek; and

- LOE 3: assessment of the impact of COPCs from CSO discharges on the sediment bed of the Creek assuming that a CERCLA remedy for the entire Study Area has been implemented. A relatively simple series of models was developed to determine the resultant concentration of COPCs in the surface sediment from CSO discharges and from other potential sources of contamination to the Creek.

The COPCs used in these evaluations are consistent with those that have been determined to be contributing the greatest amount of risk to human and ecological receptors for the Study Area as part of the OU1 RI/FS process, as described in the Summary of Site Risks section of this Proposed Plan.

The data used in evaluating the LOEs were all obtained during the OU1 RI/FS process. In particular, data collected from the following categories of potential sources of contamination to the Study Area were used in the LOE evaluations:

- CSO discharges – includes 20 samples collected from seven CSO outfalls representing approximately 96 percent of the total CSO discharges to the Creek;
- Stormwater discharges – includes 47 samples collected from MS4s, private properties, highway drains and other stormwater outlets;
- Treated discharges – includes up to 23 samples collected from wastewater treated effluent, permitted discharges from groundwater treatment systems and treated discharges from industrial facilities;
- East River – includes up to 87 samples collected from the river; and
- Atmospheric deposition – regional data from various publicly available sources was used.

These potential sources are referred to as the CSO discharges and the "other evaluated inputs" in the OU2 FFS. As described in the "Physical Characteristics of the OU1 Study Area" portion of this Proposed Plan, note that these other evaluated inputs do not represent all potential sources of COPCs to the Study Area.

The results of the LOE evaluation are discussed in the Evaluation of Alternatives section of this Proposed Plan.

SUMMARY OF SITE RISKS

OU1 Risk Assessments

As part of the OU1 RI/FS process, baseline human health and ecological risk assessments were conducted and the reports have been approved by EPA. The assessments found unacceptable risk to both human health and the environment. Therefore, there is a basis to take remedial action at the site.

The Baseline Human Health Risk Assessment (BHHRA) was approved in June 2017. It found that unacceptable risks associated with ingestion of fish and crab from the Creek exist. The contaminants of potential concern identified by the BHHRA were total non-dioxin-like PCB congeners, total PCB toxicity equivalences (TEQs), and total dioxin/furan TEQs.

The Baseline Ecological Risk Assessment (BERA) was approved in September 2018. Overall, the results of the BERA indicate that Study Area sediment, particularly in the Turning Basin and most of the tributaries, is toxic to benthic invertebrates and presents exposure risks for bivalves, blue crabs, fish and birds. The primary contaminants leading to unacceptable risk were PAHs, PCBs, and copper, with additional risk from dioxins/furans and lead.

Because unacceptable risk was identified in the OU1 risk assessments, there is a basis to evaluate appropriate remedial actions at the site, including for OU2. The OU1 FS, which is underway, will evaluate alternatives for the remediation of the overall site.

OU2 Risks

Separate risk analyses were not conducted as part of the OU2 FFS process. The COPCs identified in the OU1 BHHRA and BERA are the COPCs evaluated in this OU2 FFS.

Therefore, the full list of contaminants evaluated in detail in the OU2 FFS includes total PAHs (TPAH17, with 17 referring to the number of individual compounds included in the total), total PCBs (TPCBs), copper, dioxin/furans and lead.

REMEDIAL ACTION OBJECTIVES

The remedial action objective (RAO) for OU2 of the site is:

- Minimize, to the extent practicable, inputs of site-identified compounds to Newtown Creek from CSO outfalls that may add contamination to the Study Area.

As described earlier, the COPCs for OU2 are TPAH17, TPCBs, copper, dioxins/furans and lead.

Preliminary remediation goals (PRGs) were not developed for OU2. They are not needed to evaluate the RAO. Instead, the alternatives developed in the OU2 FFS were evaluated relative to each other. PRGs for

WHAT IS A "PRINCIPAL THREAT"?

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes an expectation that EPA will use treatment to address the principal threats posed by a site wherever practicable (NCP Section 300.430(a)(1)(iii)(A)). The "principal threat" concept is applied to the characterization of "source materials" at a Superfund Site. A source material is material that includes or contains hazardous substances, pollutants or contaminants that act as a reservoir for migration of contamination to ground water, surface water or air, or acts as a source for direct exposure. Contaminated ground water generally is not considered to be a source material; however, NAPLs in ground water may be viewed as source material. Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained, or would present a significant risk to human health or the environment should exposure occur. The decision to treat these wastes is made on a site-specific basis through a detailed analysis of the alternatives using the nine remedy selection criteria. This analysis provides a basis for making a statutory finding that the remedy employs treatment as a principal element.

each COPC will be developed as part of the OU1 RI/FS process.

PRINCIPAL THREAT WASTE

Current and reasonably anticipated future discharges of COPCs from CSOs act as a source of contamination to the Study Area. However, this action does not characterize their toxicity and mobility. Therefore, a determination of which sources constitute principal threat waste will be deferred to the OU1 remedy selection process. Please refer to the text box entitled, "What is a Principal Threat" for more information on the principal threat concept, and the Summary of Site Risks Section for more information on the risks posed by the site.

SUMMARY OF REMEDIAL ALTERNATIVES

CERCLA Section 121(b)(1), 42 U.S.C. § 9621(b)(1), mandates that remedial actions must be protective of human health and the environment, be cost-effective, and use permanent solutions and alternative treatment technologies and resource recovery alternatives to the maximum extent practicable. CERCLA Section 121(d), 42 U.S.C. § 9621(d), further specifies that a remedial action must require a level or standard of control of the hazardous substances, pollutants, and contaminants that at least attains applicable or relevant and appropriate requirements (ARARs) under federal and state laws, unless a waiver can be justified pursuant to CERCLA Section 121(d)(4), 42 U.S.C. § 9621(d)(4).

Remedial alternatives for OU2 are summarized below. Capital costs are those expenditures that are required to construct a remedial alternative. Operation and maintenance (O&M) costs are those post-construction costs necessary to ensure or verify the continued effectiveness of a remedial alternative and are estimated on an annual basis. Present worth is the amount of money which, if invested in the current year, would be sufficient to cover all the costs over time associated with a project. Construction time is the time required to construct and implement the alternative and does not include the time required to design the remedy, negotiate performance of a remedy with the responsible parties, or procure contracts for design and construction.

Alternative 1 - No Action

Capital Cost: *$0*
Annual O&M Cost: *$0*
Present Worth Cost: *$0*

Construction Timeframe: *0 years*

The NCP requires that a "No Action" alternative be evaluated to establish a baseline for comparison with other remedial alternatives. This alternative assumes that the CSO discharges to the Creek remain as they currently are, without implementation of the LTCP. Under this scenario, the total CSO discharges to the Creek are estimated to be approximately 1.2 billion gallons per year, using conditions detailed in the NYSDEC-approved LTCP.

Alternative 2 – No Further Action

Capital Cost: *$0*
Annual O&M Cost: *$0*
Present Worth Cost: *$0*
Construction Time Frame: *0 months*

This alternative assumes that NYCDEP will implement the LTCP as ordered pursuant to the CWA CSO orders issued by NYSDEC, the state authority delegated by

EPA to implement the CWA. Milestones for design and construction are contained in the CSO orders, which indicate the LTCP will be implemented as the CERCLA process is conducted. No additional CSO discharge volume control measures beyond those required by the LTCP are included in this alternative.

To support this alternative, in light of the many changes anticipated for Newtown Creek in the coming years, including the selection of future response actions under CERCLA, EPA anticipates requiring the following monitoring activity going forward:

- Sampling of discharge from the four major CSOs to Newtown Creek on a quarterly basis until the LTCP is fully implemented, with regular reporting to EPA.

Furthermore, EPA and NYSDEC will consider a track-back program to address any persistent increases in COPC concentrations from CSO discharges, if any are found. If required, a track-back program would identify sources of elevated contaminant concentrations within the sewershed, so they can be addressed either through tighter permit controls or upland action, as appropriate. The CSO monitoring, and potential track-back program, that would be required under this Alternative would be used to confirm that the assumptions used in developing this alternative, pursuant to CERCLA, remain appropriate until the LTCP is fully implemented.

The costs for conducting this monitoring are estimated to be $5,000,000 for the quarterly sampling of CSO discharges for approximately 22 years (the time until the LTCP is fully implemented) plus an additional $5,000,0000 to track sources of contamination, if necessary. The cost of any monitoring of a "no action" or "no further action" remedy is not considered to constitute a remedy under CERCLA, so the costs associated with this alternative are listed as zero.

No five-year reviews would be associated with Alternative 2. However, there would be regular reporting requirements until the LTCP is implemented, the results of which would be used to inform the effectiveness of this decision. An evaluation of the final duration and frequency of the monitoring and reporting would be conducted in association with the OU1 site-wide remedy selection process.

Alternative 3 – 100% CSO Control

Capital Cost:	-
Annual O&M Cost:	-
Present Worth Cost:	*At least $1.65 billion*
Construction Time Frame:	*At least 22 years*

This alternative assumes that all CSO discharges to the Creek are controlled. As compared to Alternative 2, this alternative would require the construction of a larger diameter tunnel, to be connected to all CSOs discharging to Newtown Creek, and additional wastewater treatment facilities.

In the OU2 FFS, the costs associated with developing this alternative were not fully determined. However, the NYSDEC-approved LTCP does include an evaluation of the cost to control all discharges from the four largest CSOs. This present worth cost was estimated to be $1,650,000,000. Since Alternative 3 goes beyond what was evaluated in the LTCP, it is estimated that it would cost more than $1.6 billion to implement full CSO control and more than the 22 years it is expected to take to implement the approved LTCP.

Similar to Alternative 2, Alternative 3 would also require monitoring, coupled with the implementation of a track-back program for reducing COPC loading from CSOs, until such time as the CSO controls are fully implemented.

No five-year reviews would be associated with this alternative. However, there would be regular reporting requirements until Alternative 3 is implemented, the results of which would be used to inform the effectiveness of this decision. An evaluation of the final duration and frequency of the monitoring and reporting would be conducted in association with the OU1 site-wide remedy selection process.

EVALUATION OF ALTERNATIVES

Multiple Lines of Evidence Evaluation

As described earlier in this plan, three LOEs were used to evaluate each alternative. A summary of the results of this evaluation is described below. More details about the evaluation can be found in the OU2 FFS report.

LOE 1: Comparison of Concentrations

For LOE 1, the particulate-phase COPC concentrations in CSO discharges to the Study Area were compared to the particulate-phase COPC concentrations in the other evaluated inputs to the Study Area. The other evaluated inputs for LOE1 are stormwater, treated discharges and East River surface water. Since the alternatives impact the volume of discharges from the CSOs, but not the concentration of COPCs in the discharges, it was not necessary to evaluate each alternative separately through this LOE. Figures 3a to 3e show the results of the LOE 1 comparisons for each of the OU2 COPCs.

Overall, LOE 1 shows that the measured concentrations of COPCs on solids in the CSO discharges are generally within the range of concentrations measured on solids from the other evaluated inputs. For each COPC, the average concentrations detected in CSO solids was less than the average from stormwater solids and higher than the average from treated discharges and the East River.

LOE 2: Comparison of Loadings

Contaminant loading is defined as a unit of mass over a unit of time (e.g., kg/year). The loading for each COPC was calculated using data on the flow rate of each evaluated input and the associated concentration of COPCs in that input. The COPC loading from CSO discharges was compared to the loading from the other evaluated inputs to the Study Area. For LOE 2, the other evaluated inputs were the East River, atmospheric deposition, MS4s and treated discharges. For this LOE, the loadings under both Alternative 1 and Alternative 2 were compared to the other evaluated inputs. Alternative 3 was not evaluated as part of LOE 2 because the loading under this alternative would be eliminated. Figures 4a to 4e show the results of the LOE 2 comparisons for each of the OU2 COPCs.

Overall, LOE2 shows that the loading from CSOs is generally similar to or less than the loading from the other evaluated inputs. Alternative 2 results in significantly less loading than Alternative 1, which makes sense since the volume of discharges to the Study Area would be reduced by approximately 61 percent through implementation of the LTCP (as per the requirements of the CWA). For TPAH17, the largest loading to the Study Area comes from treated discharges, whereas the East River supplies the largest loading of TPCBs, copper and lead as compared to the other evaluated inputs. The greatest loading of dioxins/furans is estimated to come from atmospheric deposition.

LOE 3: Post-Remediation Assessment of the Impact of CSOs on the Study Area through Modeling

The third LOE involved the application of a suite of numerical models designed to simulate the fate and transport of contaminants in Newtown Creek. The models were applied to all three remedial alternatives evaluated in the OU2 FFS and the predicted COPC concentrations in a remediated sediment bed were compared to provide a relative assessment of the alternatives.

The modeling framework used for the OU2 FFS included a point source model, groundwater seepage estimates, a hydrodynamic model, a combined eutrophication and sediment transport model, and a chemical model. The point source model calculated flows to the Creek from CSO discharges, stormwater runoff, and overland flow from upland properties. Flows calculated by the point source model along with horizontal and vertical groundwater seepage rates were passed to the hydrodynamic model. The hydrodynamic model calculated water column transport and mixing and passed this information to the eutrophication/ sediment transport and chemical models. The eutrophication/sediment transport model used nutrient, organic carbon, and sediment loadings (from point sources and the East River) along with the results of the hydrodynamic model to calculate the fate and transport of algae, organic carbon, and sediments and passed this information to the chemical model. Finally, the chemical model used chemical loadings (from point sources, the East River, and other inputs) along with the results of the hydrodynamic and eutrophication/ sediment transport models to calculate the fate and transport of COPCs. Taken together, and subject to the assumptions and performance of the various models, the modeling framework calculated the transport of

COPCs originating from various sources and the deposition of COPCs to the sediment bed in the Creek.

Figures 5a and 5b show the comparison of the modeled surface weighted average concentration (SWAC) of each of the three primary COPCs (TPAH17, TPCBs and copper) versus the percent reduction of discharge from CSOs. The graphs show that even 100 percent control of CSO discharge has a minimal impact on the resultant concentrations in the sediment of the Study Area. The modeling includes inputs from the East River, other point sources and groundwater, and the results of the modeling indicate that even with 100 percent CSO control, post-remediation sediment bed concentrations do not approach zero. In fact, the modeling shows that 100 percent CSO control actually increases the resultant TPCB concentration in certain portions of the Study Area.

The 2018 AOC with the City governing the OU2 FFS included a statement that at least three alternatives should be evaluated – no action, no further action and 100 percent control. The results of LOE 3 show that evaluation of another alternative, with CSO volume controls between what is prescribed by the LTCP and 100 percent control is not necessary because even 100 percent reduction of CSO discharge volume has little impact on the sediment bed concentrations of the COPCs at the Study Area.

Nine Criteria Evaluation

Nine criteria are used to evaluate the different remediation alternatives individually and against each other in order to select a remedy (see table below, Evaluation Criteria for Superfund Remedial Alternatives). This section of the Proposed Plan describes the relative performance of each alternative against the nine criteria, noting how each compares to the other options under consideration. A detailed analysis of the alternatives can be found in the OU2 FFS Report.

1. Overall Protection of Human Health and the Environment

The LOE 1 comparison showed that COPCs being discharged to the Study Area from CSOs are within the range of concentrations from other evaluated inputs to the Study Area. LOE 2 showed that Alternative 2 would decrease loading of COPCs to the Study Area as compared with Alternative 1, and that Alternative 3 would further reduce loading to the Study Area by eliminating CSO discharges. However, LOE 3 shows that there is an insignificant change in the modeled SWACs on an assumed clean post-remediation sediment bed, regardless of whether Alternative 1, 2 or 3 is evaluated.

The LOE evaluation shows that all three alternatives provide roughly the same level of protectiveness.

2. Compliance with Applicable or Relevant and Appropriate Requirements

Actions taken at any Superfund site must meet all applicable or relevant and appropriate requirements under federal and state laws or provide grounds for invoking a waiver of those requirements. For alternatives 1 and 2 there are no ARARs because there is no CERCLA-related action required. Alternative 3 would comply with ARARs.

3. Long-Term Effectiveness and Permanence

Alternative 2, once implemented, would be more effective in the long-term than Alternative 1 since it would reduce the volume of CSO discharges to the Study Area. Alternative 3 would provide the greatest level of effectiveness and permanence by effectively eliminating CSO discharges to the Study Area upon implementation.

4. Reduction of Toxicity, Mobility, or Volume through Treatment

While there is no significant difference in COPC concentrations in the modeled surface sediment concentrations of the Creek under the different alternatives, Alternative 1 would not provide any additional reduction of the CSO discharges so there is no additional reduction in mobility, and volume of contaminants. Both Alternatives 2 and 3 would reduce the mobility, and volume of contaminants through capture and reduce toxicity through treatment/discharge of most or all CSO discharges. However, Alternative 3 would provide a higher degree of reduction in mobility, and volume of contaminants because it provides a higher level of CSO volume capture and treatment as compared to Alternative 2.

5. Short-Term Effectiveness

For Alternatives 1 and 2, there would be no short-term impacts to the community or site workers since no remedial activities would be required under CERCLA.

Alternative 3 would have significant impacts on the community in the short-term. Expanding the size of the LTCP beyond what NYCDEP is already under order to implement would likely results in a longer time-frame for implementation and would require a larger footprint to construct.

6. Implementability

Neither Alternative 1 nor Alternative 2 requires any remedial action, so an evaluation of the implementability criterion under the NCP is not necessary for these two alternatives. It should be noted that while Alternative 2 includes no action, the Alternative presumes that the independent obligation under the City's State CWA Order to implement the LTCP will occur, and that action, although not selected under CERCLA, has been determined to be implementable by NYSDEC.

Alternative 3 would be very difficult to implement, both from an engineering and an administrative perspective.

7. Cost

There is no CERCLA-related cost associated with Alternative 1 or Alternative 2.

The estimated cost of Alternative 3 is greater than $1,650,000,000. This was estimated based on calculations provided in the LTCP.

8. State Acceptance

The State of New York is reviewing EPA's preferred alternative as presented in this Proposed Plan.

9. Community Acceptance

Community acceptance of the preferred alternatives will be evaluated after the public comment period ends and will be addressed in the record of decision (ROD) for OU2. Based on public comment, the preferred alternatives could be modified from the version presented in this proposed plan. The ROD is the document that formalizes the selection of the remedy for a site.

PREFERRED ALTERNATIVE

EPA's preferred alternative for OU2 is Alternative 2, No Further Action, where No Further Action in this case assumes that the LTCP that NYCDEP is under order to implement is, in fact, timely implemented. EPA has concluded that the volume reduction achieved by the LTCP will be sufficient for the purposes of a CERCLA response action.

To support this decision in light of the many changes anticipated for Newtown Creek in the coming years, including the selection of future response actions under CERCLA, EPA anticipates requiring the following monitoring activity going forward:

- Sampling of discharge from the four major CSOs to Newtown Creek quarterly until the LTCP is fully implemented.

Furthermore, EPA and NYSDEC will consider a track-back program to address any persistent increases in COPC concentrations from CSO discharges, if any are found. If required, a track-back program would identify sources of elevated contaminant concentrations within the sewershed, so they can be addressed either through tighter permit controls or upland action, as appropriate. The CSO monitoring, and potential track-back program, would be used to confirm that the assumptions used in developing this alternative, pursuant to CERCLA, remain appropriate until the LTCP is fully in place and functioning, which is expected to be in 2042.

Alternative 2 applies to the volume of discharge from the CSOs only. EPA will determine in future remedy selection decisions for other OUs whether additional control actions, either in-creek or at CSO points-of-discharge, are needed. These additional control actions could include, but are not necessarily limited to, the placement of sediment traps and/or oil sorbent pads at the end of CSO discharge pipes and in-creek maintenance dredging to address potential accumulation of contaminated solids near the CSO discharges.

The multiple LOE evaluation conducted supports the conclusion that no further action is required (beyond the approved LTCP once implemented) for volume reduction of CSO discharges to the Creek. Modeling conducted as part of LOE 3 shows that the incremental reduction in COPC concentrations in the Study Area if a 100 percent control option, or something between the NYSDEC-approved LTCP and the 100 percent control option were to be selected, would not be significant.

Through the LOE analysis, it was determined that each of the alternatives evaluated provides roughly the same level of protectiveness; therefore, the volume control prescribed by the LTCP approved by NYSDEC, to be implemented by NYCDEP, is sufficient for the purposes of a CERCLA action and no further volume-reduction measures are needed. In addition, Alternative 3 would have significantly higher impacts in the short-term, would be very difficult to implement, would cost significantly more than Alternative 2 and would not result in a significant reduction of COPC loading to the Creek.

No five-year reviews would be associated with the preferred alternative. However, there will be regular reporting requirements until the LTCP is implemented, the results of which will be used to inform the effectiveness of this decision. An evaluation of the final duration and frequency of the monitoring and reporting will be conducted in association with the OU1 site-wide remedy selection process.

Based on information currently available, EPA believes the preferred alternative meets the threshold criteria and provides the best balance of tradeoffs among the alternatives with respect to the balancing and modifying criteria. EPA expects the preferred alternative to satisfy the following statutory requirements of CERCLA Section 121(b) because (1) it will be protective of human health and the environment, either through this action or through additional actions to be determined as part of the OU1 ROD; (2) it meets a level or standard of control of the hazardous substances, pollutants, and contaminants that at least attains the legally applicable or relevant and appropriate requirements under federal and state laws because no ARARs are required for no further action remedies; (3) it is cost-effective; and (4) it utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable. In addition, CERCLA Section 121 includes a preference for remedies that permanently and significantly reduce the volume, toxicity or mobility of hazardous substances as a principal element (or requires a justification for not satisfying the preference). While no further action is required under the selected remedy, implementation of the LTCP will substantially reduce the volume of CSO discharges, a source of contaminant loading, to Newtown Creek.

Consistent with EPA Region 2's Clean and Green policy, EPA will evaluate the use of sustainable technologies and practices with respect to implementation of a selected remedy.

COMMUNITY PARTICIPATION

EPA encourages the public to gain a more comprehensive understanding of the site and the Superfund activities that have been conducted there.

The dates for the public comment period, the date, location and time of the public meeting, and the locations of the Administrative Record files, are provided in the text box entitled, "Mark Your Calendar" located on the front page of this Proposed Plan. Instructions for submitting written comments on the Proposed Plan are provided in the highlight box, below.

EPA Region 2 has designated a public liaison as a point-of-contact for the community concerns and questions about the federal Superfund program in New York, New Jersey, Puerto Rico, and the U.S. Virgin Islands. To support this effort, the Agency has established a 24-hour, toll-free number (1-888-283-7626) that the public can call to request information, express their concerns, or register complaints about Superfund.

For further information on the Newtown Creek Superfund Site, please contact:

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schmidt.mark@epa.gov	loney.natalie@epa.gov

Written comments on this Proposed Plan should be mailed to Mr. Schmidt at the address below or sent via email.

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Regional Public Liaison
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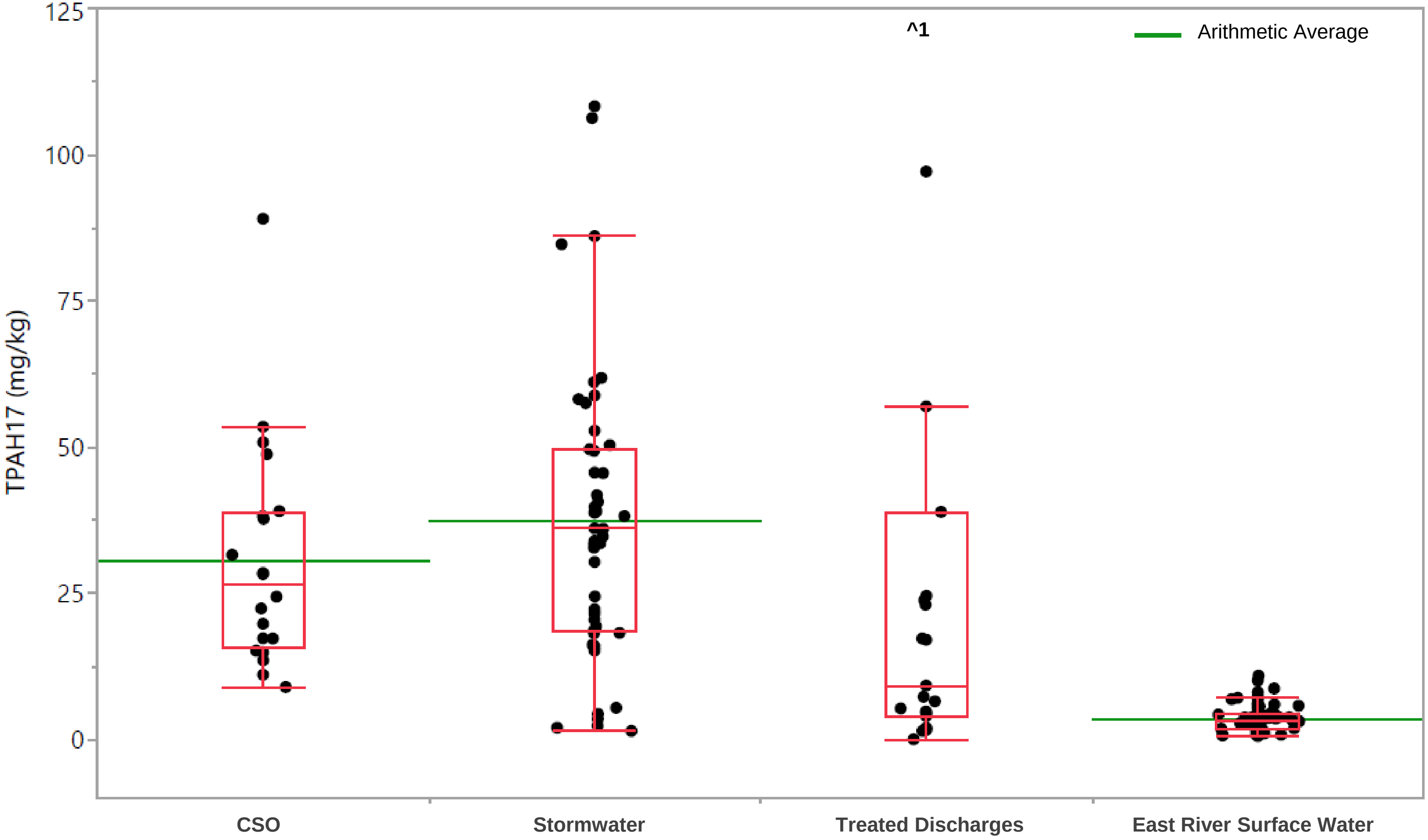
(732) 321-6621

U.S. EPA Region 2
2890 Woodbridge Avenue, MS-211
Edison, New Jersey 08837-3679

Figure 1 – Newtown Creek Site Location

Figure 2 – Newtown Creek CSO and Outfall Locations

Figure 3a - Comparison of Particulate Concentrations in CSOs with Particulate Concentrations from Other Evaluated Inputs TPAH17



Note: Average concentration of TPAH17 in treated discharges is 2,056 mg/kg, which is outside the scale of the figure.

Figure 3b - Comparison of Particulate Concentrations in CSOs with Particulate Concentrations from Other Evaluated Inputs TPCBs

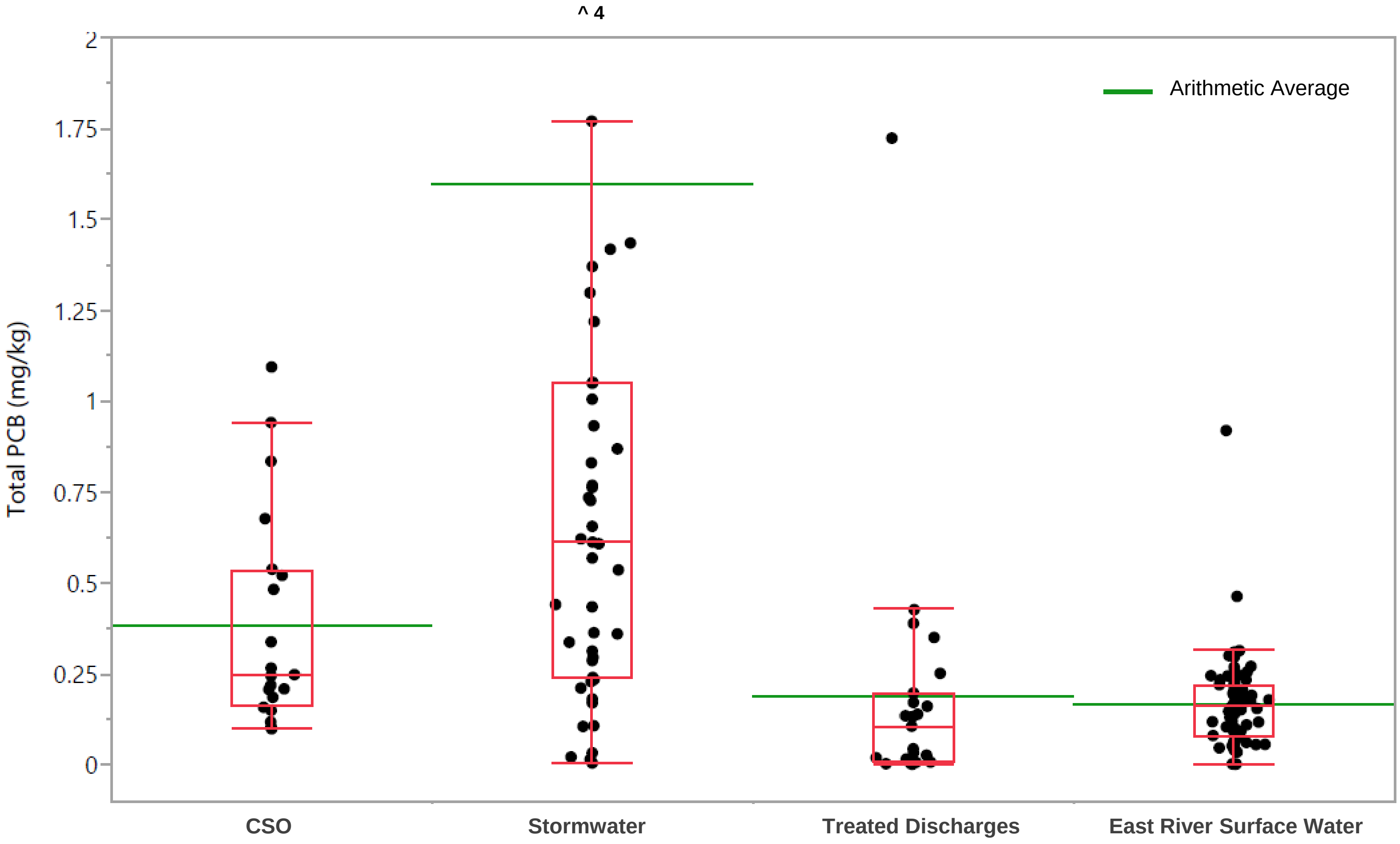


Figure 3c - Comparison of Particulate Concentrations in CSOs with Particulate Concentrations from Other Evaluated Inputs Copper

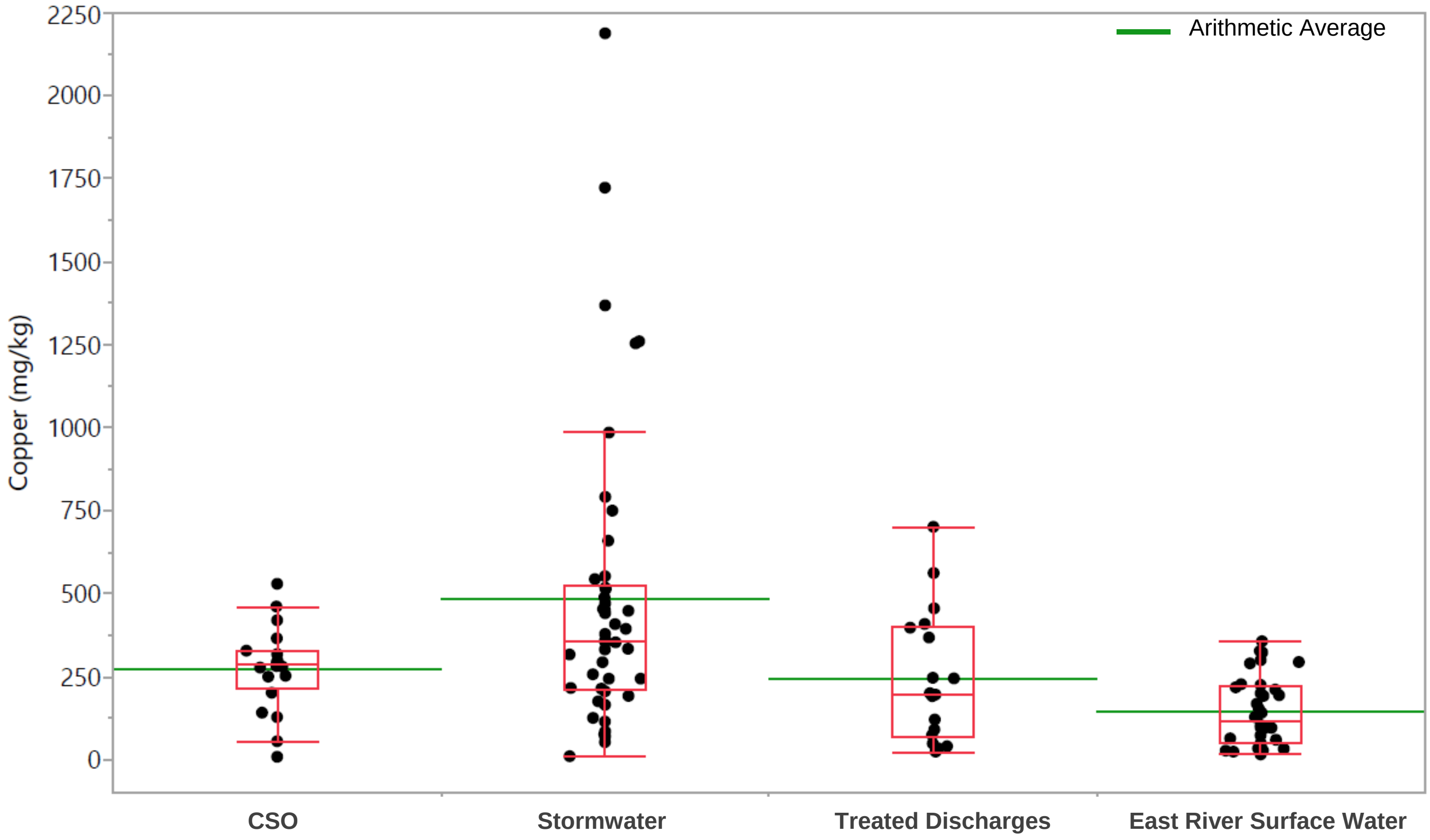


Figure 3d - Comparison of Particulate Concentrations in CSOs with Particulate Concentrations from Other Evaluated Inputs Lead

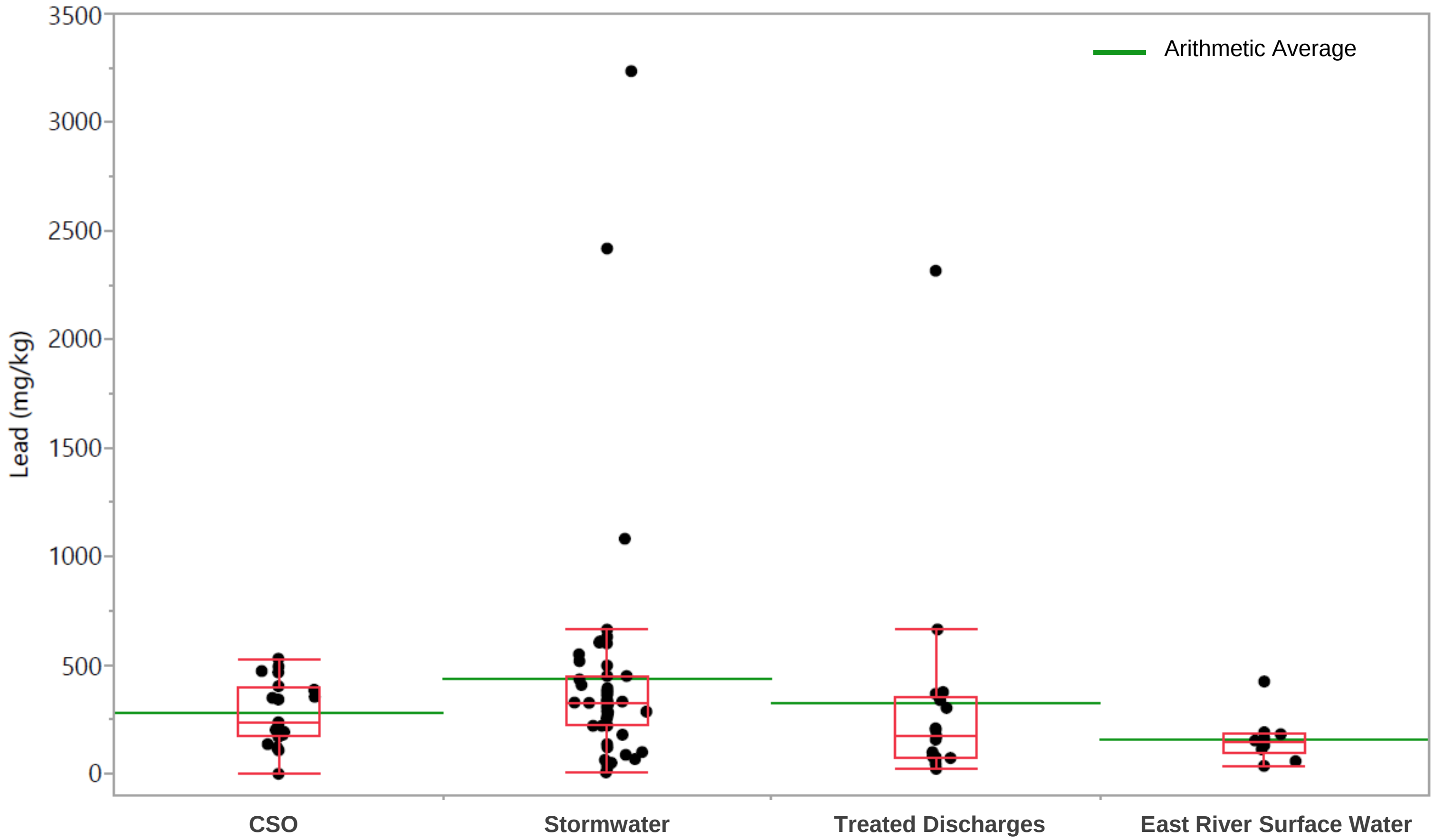
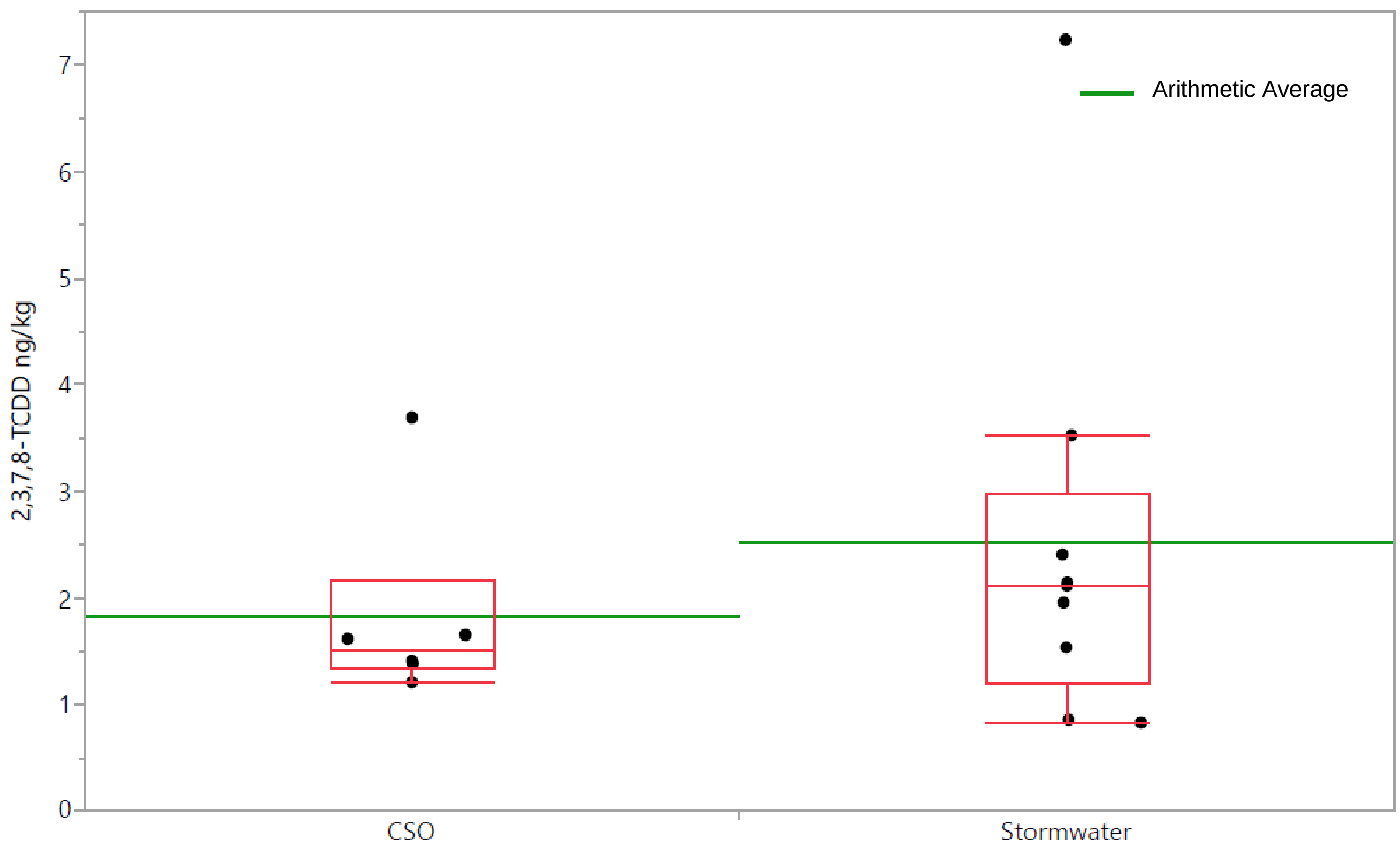


Figure 3e - Comparison of Particulate Concentrations in CSOs with Particulate Concentrations from Other Evaluated Inputs 2,3,7,8-TCDD



Notes:
1) Due to a large number of non-detected samples in CSOs and other elevated inputs, the figure shows the comparison for detected samples only.
2) For East River and treated discharges, only one sample was detected, therefore box plots are not shown for these sources.
3) Statistical comparison is conducted only for detected samples.

Figure 4a - Comparison of TPAH17 Loads from CSOs and Other Evaluated Inputs to the Study Area

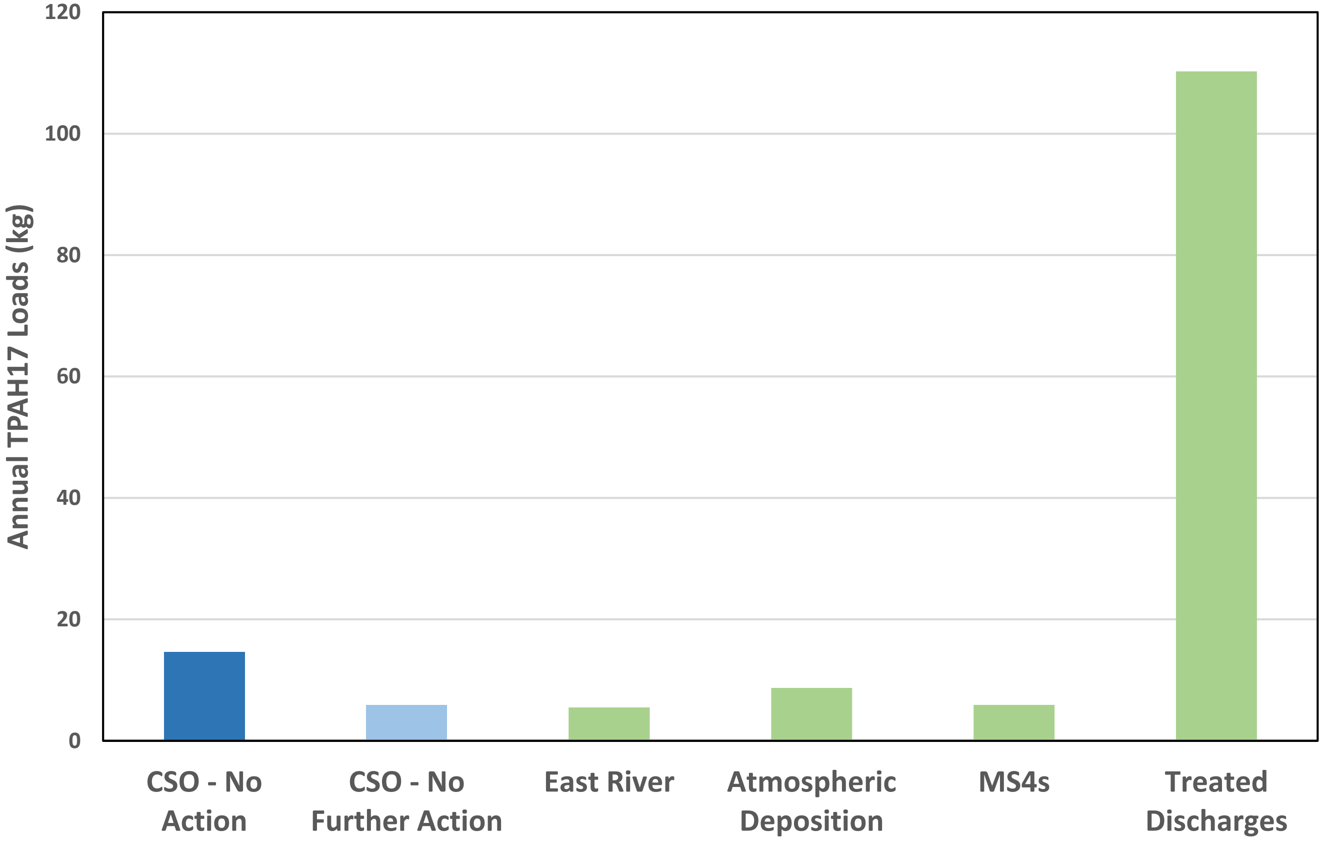


Figure 4b - Comparison of TPCB Loads from CSOs and Other Evaluated Inputs to the Study Area

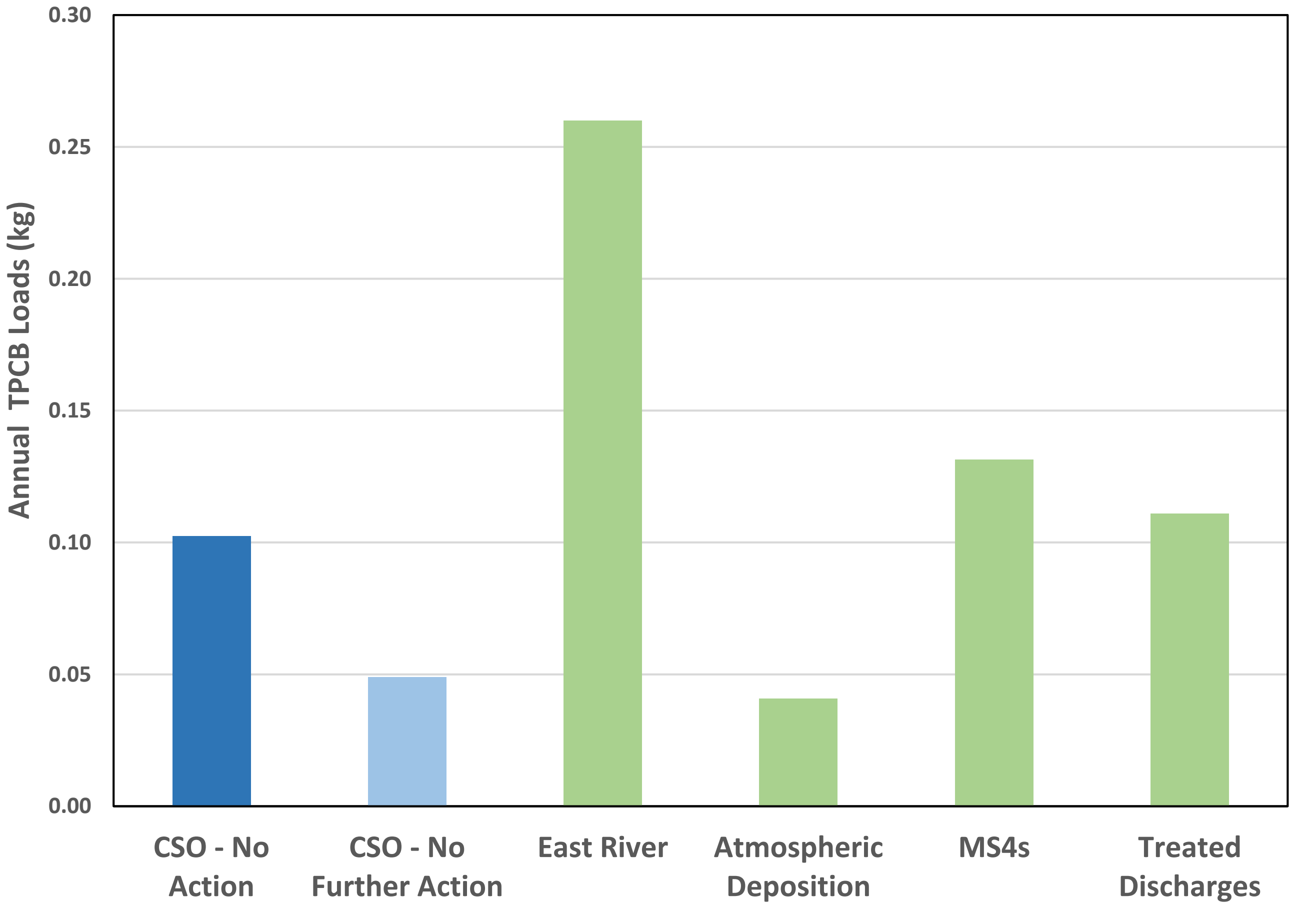


Figure 4c - Comparison of Copper Loads from CSOs and Other Evaluated Inputs to the Study Area

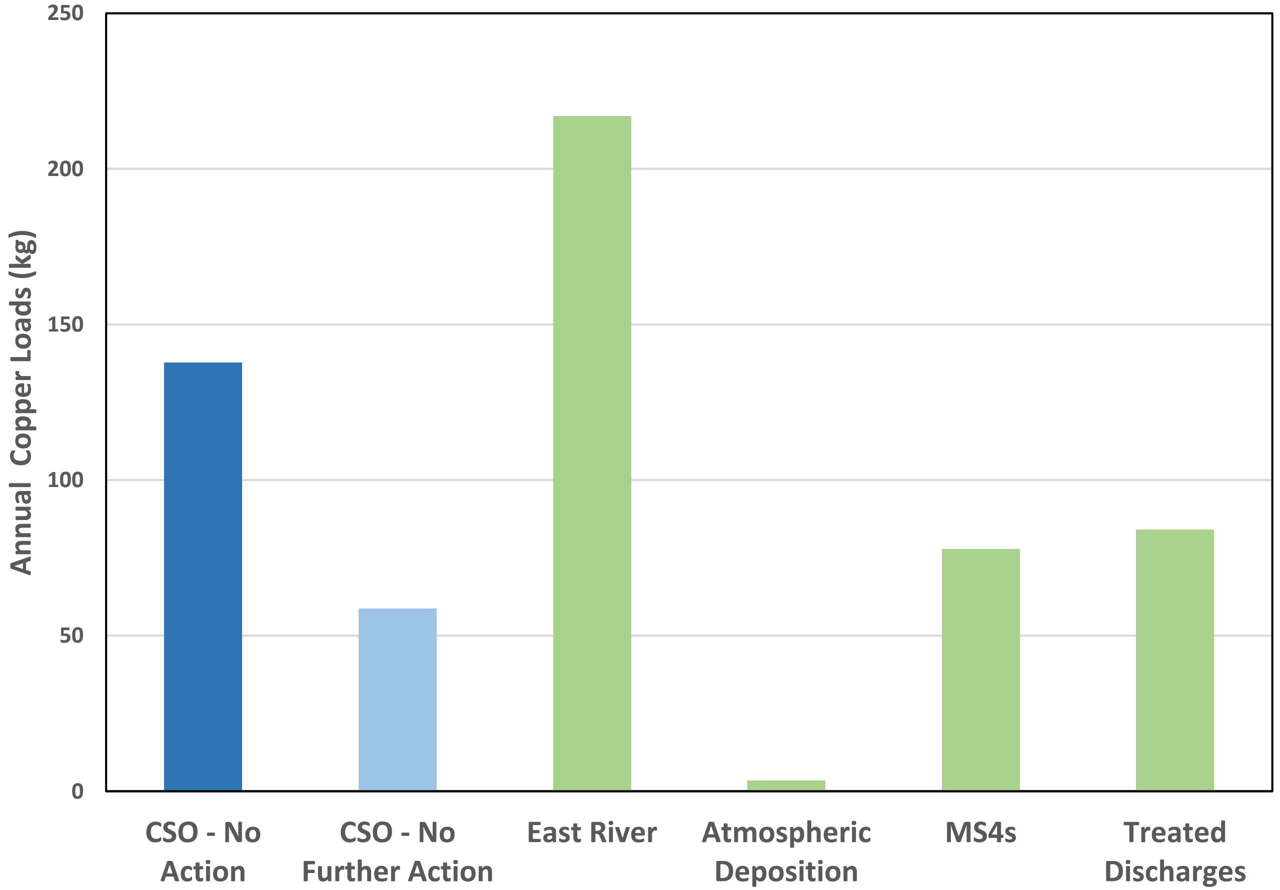


Figure 4d - Comparison of Lead Loads from CSOs and other Evaluated Inputs to the Study Area

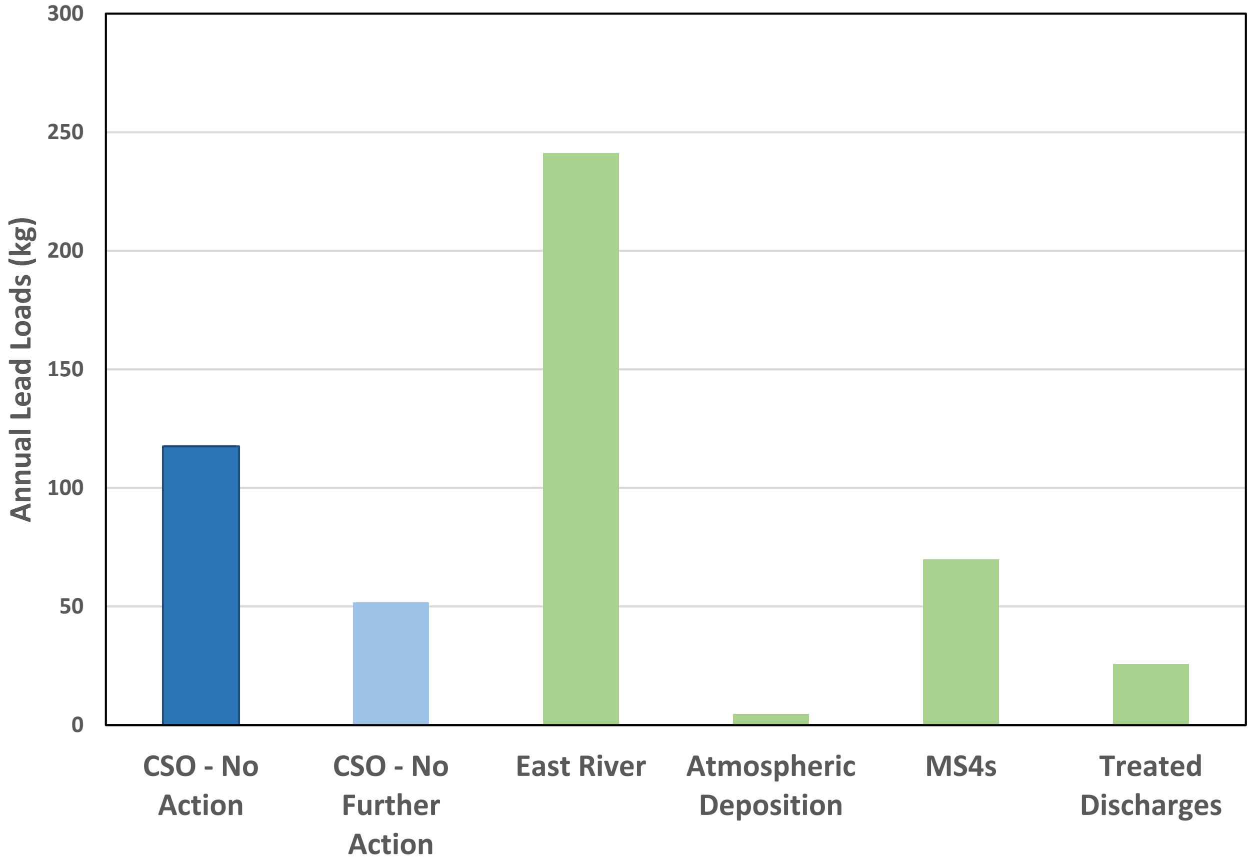


Figure 4e - Comparison of 2,3,7,8-TCDD Loads from CSOs and other Evaluated Inputs to the Study Area

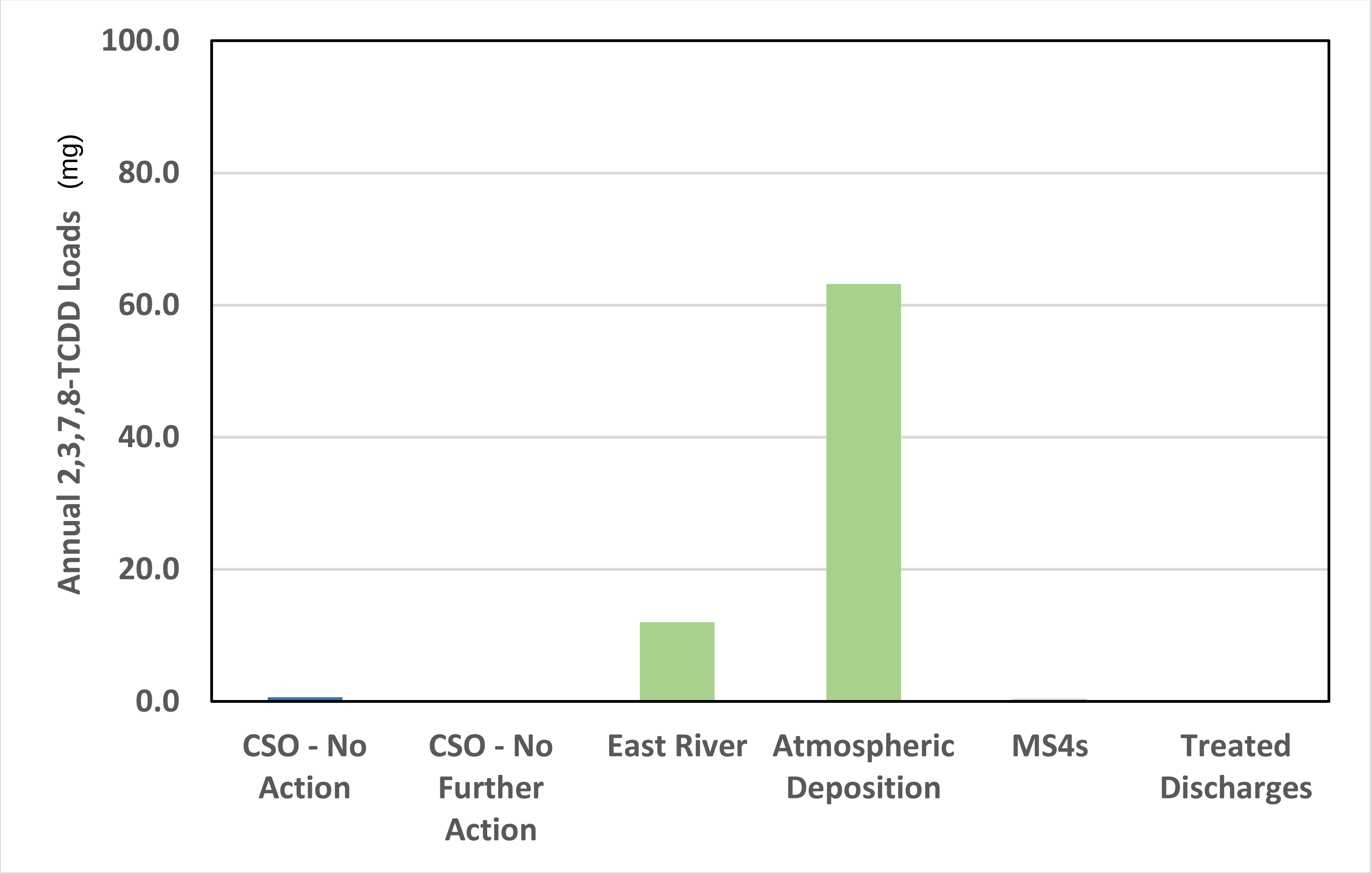


Figure 5a - Comparison of Newtown Creek Modeled SWACs with Percent Reduction in CSO Discharge

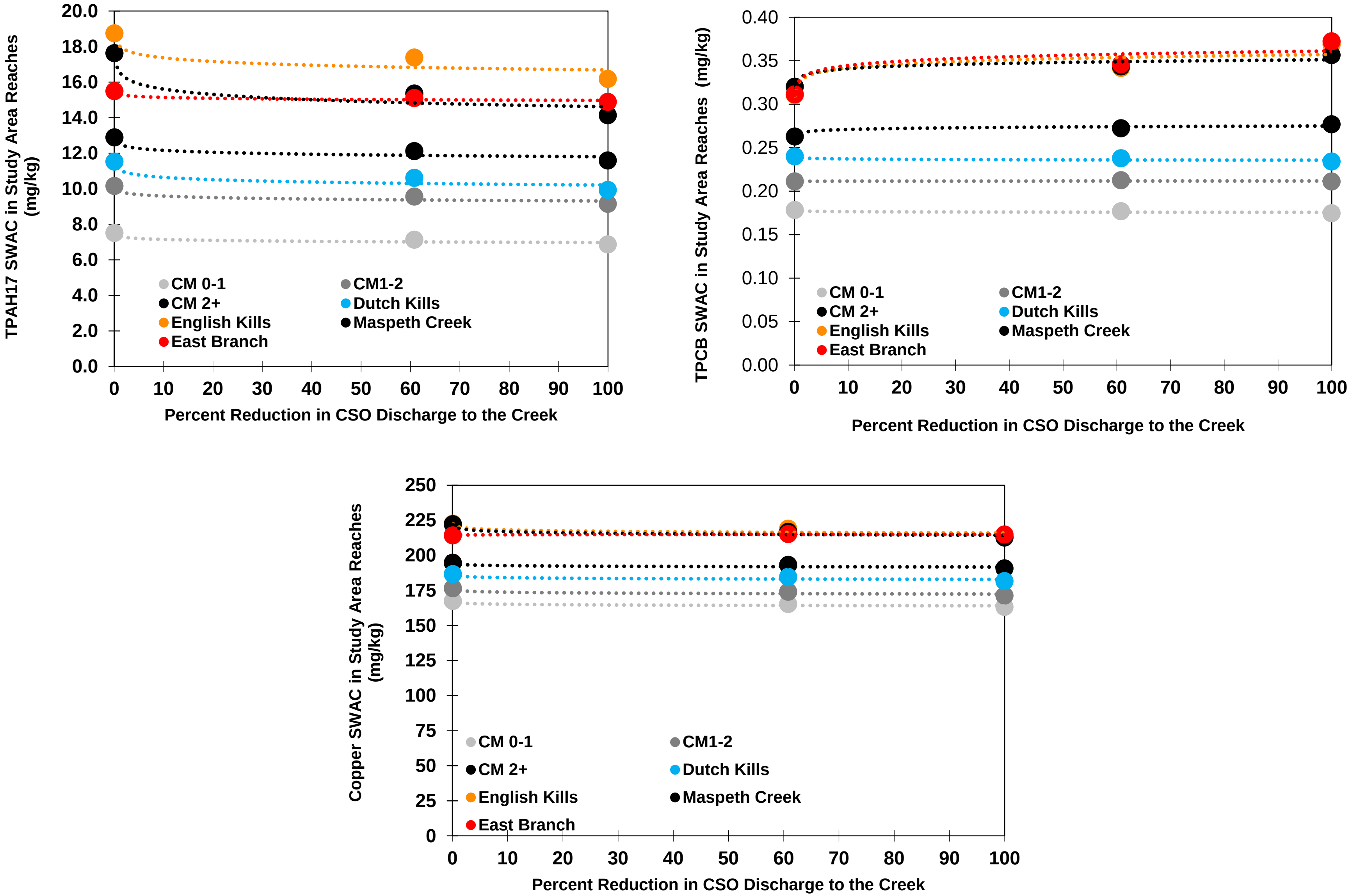


Figure 5b - Comparison of Newtown Creek Modeled SWACs – Study Area Wide with Percent Reduction in CSO Discharge