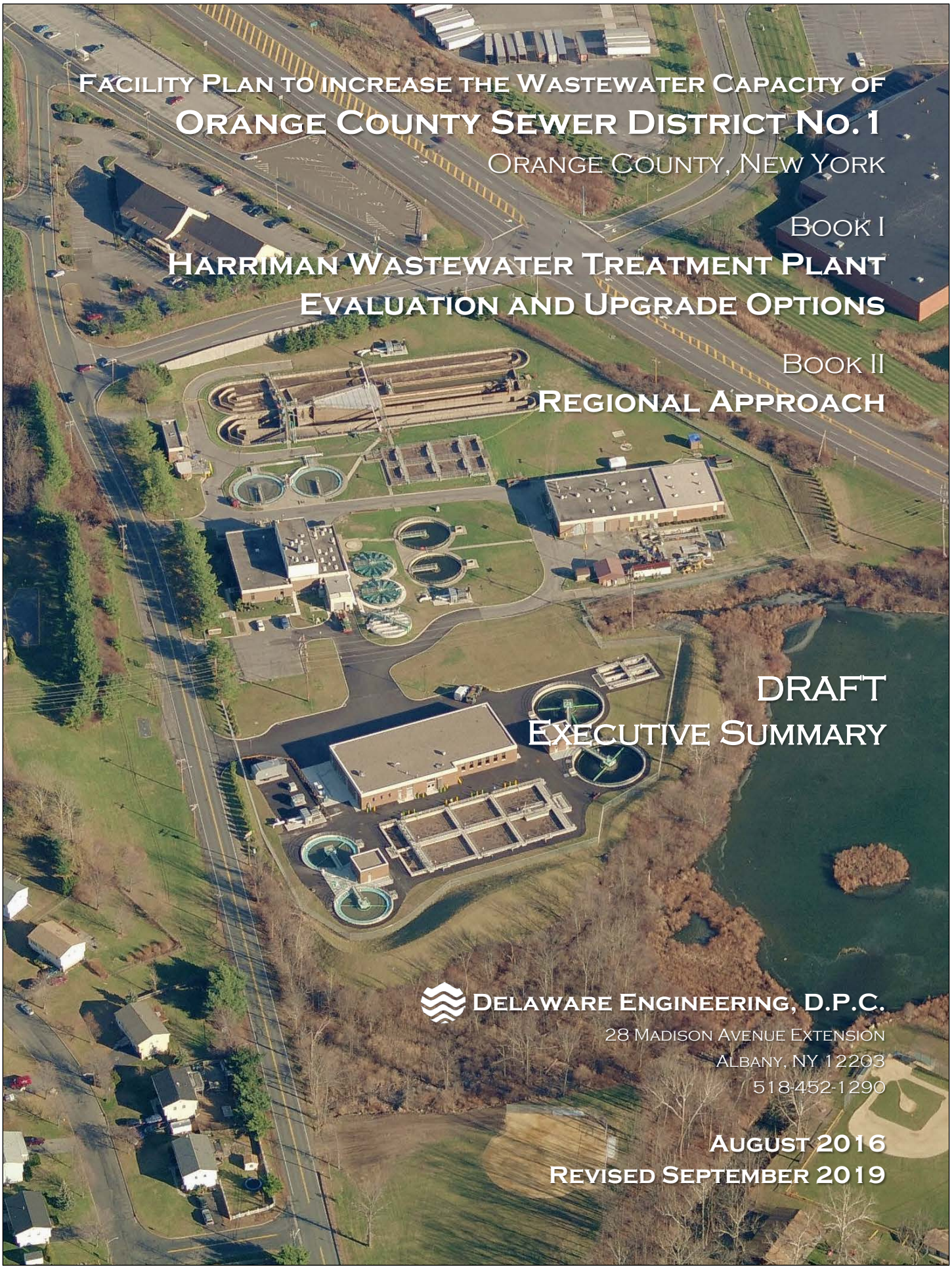

Facility Plan to increase the Wastewater Capacity of
Orange County Sewer District No. 1
Orange County, New York

Book I
Harriman Wastewater Treatment Plant Evaluation and Upgrade Options

Book II
Regional Approach

DRAFT
Executive Summary

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EXECUTIVE SUMMARY

Considerations:

The 2019 updates to the 2016 Draft Facility Plan to Increase Capacity of OCSD No. 1 are driven by two major factors regarding the accommodation of wastewater treatment in Orange County:

1. The potential imposition of a Total Dissolved Solids (TDS) limit (of which Chloride is a component so the reference herein is to TDS) in the Draft SPDES Permit for the existing 6.0 MGD Harriman WWTP are estimated to cost a staggering $40 million in capital which equates to $2.3 million in annual debt (at 4% interest for 30 years with two payments each year) plus $16 million in annual O&M costs for a total burden of $18.3 million a year in additional costs to the users to maintain 6.0 MGD in capacity.

2. The rapid population growth in the County and in particular in the sewer service area, that demands greater wastewater treatment capacity, in the range of 3.0 MGD to 5.0 MGD.

With respect to the Draft SPDES permit, the August 2019 Revision to Book 1 of the Draft Facility Plan incorporates a memo prepared by Barton & Loguidice (B&L) entitled "Harriman Sewage Treatment Plant – TDS and Chloride Treatability Evaluation" which discusses the implications of the addition of TDS discharge parameters at the limits established in the Draft SPDES permit. B&L estimated the capital costs of additional treatment for the existing 6.0 MGD Harriman WWTP at approximately $40 million with annual operating costs $16 million to deal with added residuals from the treatment process. The B&L study points out that an end-of-pipe solution to TDS is the least effective means of achieving water quality improvement in the Ramapo River and that a watershed-based approach is appropriate. Moreover, B&L states that reduction in TDS and Chloride at the source (in drinking water) is more cost effective and provides a substantial benefit to public health.

Costs to Treat TDS at 6.0 MGD Harriman WWTP

MGD	Capital Cost	Annual Debt*	New Annual O&M	2020 Annual OCSD No.1 Budget	Total Annual Cost Est.
6.0	$40.0 M	$2.3 M	$16.0 M	$9.97 M	$28.27 M

* Assumes 30 Year Bonding at 4% Interest Net Level Debt

Regarding demands for sewer capacity, discussions with Harriman WWTP operations staff points towards an approximately 80,000 gallon per year increase in flows over the past several decades which equates to the equivalent of 200 new housing units each year at the Orange County Sewer District No. 1 (OCSD) metric of 400 gpd per single family home.

However, recent trends indicate a trend toward substantially greater demand for sewer services in the Harriman WWTP service area due to new home construction, expansion of retail, new hotels, future gaming and possible transportation hub as well as anecdotal evidence of demographic shifts in existing housing stock towards larger families. Indications are that growth and thus demand for wastewater treatment will continue.

Assuming the Harriman Wastewater Treatment remains in service, Longevity Improvements are needed to extend the useful life of the facility. Estimated to cost approximately $25 million as a stand-alone project without any change to operating and maintenance costs, the Longevity Improvements are designed to extend the useful life of the Harriman WWTP while not precluding a future facility expansion.

Elements of the Longevity Improvements are new mechanical screening, grit removal and flow splitter with odor control housed in a new building constructed adjacent to the existing headworks building. Train 2 would be upgraded to increase treatment efficiency using SBR technology and meet regulatory requirements. The Train 1&2 sand filtration, disinfection and post-aeration system would be upgraded to increase the peak hydraulic flow and two new chlorine contact tanks would be constructed adjacent to the existing UV structure which would be converted to a post-aeration basin. Train 3 upgrades include redirecting the filter backwash to the head of the WWTP and adjustments to the sand filter hydraulics. SCADA upgrades to accommodate the new unit processes would be conducted with other upgrades to appurtenances as dictated by the Capital Plan.

The rate payer impact for the Longevity Improvements is estimated to cost between $25 - $90 a year to the typical household depending on sewer rates as established by the various municipalities in the Harriman WWTP service area. This is an affordable $2 - $7.50 a month to the average household to accomplish $25 million in capital improvements to extend the life the Harriman WWTP.

Costs to Conduct Longevity Improvements at 6.0 MGD Harriman WWTP

MGD	Capital Cost	Annual Debt*	New Annual O&M	2020 Annual OCSD No.1 Budget	Total Annual Cost Est.
6.0	$25.0 M	$1.13 M	$0.0 M	$9.97 M	$ 11.1 M

* Assumes 30 Year Bonding at 4% Interest Net Level Debt

Discussion:

The Harriman WWTP represents a substantial asset to the sewer users of the system; ideally, a regulatory solution can be achieved that does not require treatment of TDS and Chloride at the Harriman WWTP, which would at a minimum, preserve the value of this important asset.

If TDS and Chloride treatment are not imposed on the discharge of the Harriman WWTP to the Ramapo, it is vital to understand if the flow to the Ramapo can be increased to at least 9.0 MGD if not in the range of 10.0 – 11.0 MGD.

If a regulatory solution is available where the Harriman WWTP is not required to treat TDS and Chloride and the treatment plant can be expanded with continued discharge to the Ramapo River (9.0 MGD is estimated to cost $52 million for the expansion using SBR technology which includes the Longevity Improvements with a reasonable annual operations increased cost of approximately $340,000), this is the most cost-effective option for the County to maintain and provide expanded capacity to meet the needs of the growing community.

Costs to Add 3.0 MGD at Harriman WWTP Without TDS Treatment

MGD	Capital Cost	Annual Debt*	New Annual O&M	2020 Annual OCSD No.1 Budget	Total Annual Cost Est.
9.0	$52.0 M	$3.0 M	$0.34 M	$9.97 M	$13.31 M

* Assumes 30 Year Bonding at 4% Interest Net Level Debt

However, if the Harriman WWTP is mandated to treat Chloride and TDS, then alternate locations for treatment and discharge must be explored for the existing 6.0 MGD flow, but also for the increased treatment capacity.

Alternatively, if the Harriman WWTP is not required to treat TDS and Chloride but the flow to the Ramapo is limited to the existing 6.0 MGD, then an alternate location for treatment and discharge must be explored to accommodate increased treatment capacity demands. This is not without substantial cost; the preliminary estimate is a total of $145.9 million with roughly one-half the cost dedicated to treatment and the other to conveyance of the wastewater from the service area to the Hudson River.

Costs to Convey and Treat 5.0 MGD at a New Hudson River WWTP

MGD	Capital Cost	Annual Debt*	New Annual O&M	Exist. Annual Budget	Total Annual Cost Est.
5.0	$145.9 M	$8.4 M	$2.0 M	$0.0 M	$10.4 M

* Assumes 30 Year Bonding at 4% Interest Net Level Debt

Development of a facility on the Hudson River to treat the existing 6.0 MGD as well as the projected 3.0 to 5.0 MGD of capacity to accommodate growth would increase costs; however, the costs are not linear. It is reasonable to expect that costs to convey and treat 11.0 MGD at a new treatment plant on the Hudson River may be on the order of a fifty percent increase over the costs to convey and treat 5.0 MGD.

The preliminary analysis conducted to date indicates that if TDS treatment is required at the Harriman WWTP, due to the likely cost of operation and maintenance of TDS treatment equipment, investment in alternate treatment at a new Hudson River WWTP even with conveyance is far less costly.

While it may seem compelling to consider the option of terminating the discharge of the Harriman WWTP and directing the treated effluent to the Hudson River for discharge, Section 402(o) and 303(d)(4) of the federal Clean Water Act (CWA), ECL 17-0809 and regulations at 40 CFR 122.44(l) and 6 NYCRR Part 750-1.10 incorporate anti-backsliding regulations with respect to discharge permit standards. In part, this section of the CWA states "…a permit may not be renewed, reissued, or modified on the basis of effluent guidelines promulgated under section 1314(b) of this title subsequent to the original issuance of such permit, to contain effluent limitations which are less stringent than the comparable effluent limitations in the previous permit." Nevertheless, there are exceptions and limitations to 'anti-backsliding' regulations. The situation with the Harriman WWTP is complex; therefore, as evaluations of options for wastewater treatment are explored, the applicability of the exceptions to anti-backsliding regulations will be reviewed.

The Draft Facility Plan identified an option to achieve just under 1.0 MGD of treatment capacity through a Regional Approach (convey wastewater to the Village of Goshen WWTP), which would then create just under 1.0 MGD of capacity at the Harriman WWTP. The costs for this approach are in the neighborhood of $20 million. This approach could be a portion of a long-term solution to wastewater treatment; however, it fails to provide the minimum 3.0 MGD to upwards of 5.0 MGD of expansion capacity that is required to meet projected demands.

Recommendation:

In consideration of these factors, the Updated Recommendation of the Draft Facility Plan is a concerted effort to work with the NYSDEC to conduct in-depth exploration of the SPDES permit limitations for the exiting Ramapo River discharge at the Harriman WWTP to understand the implications of the SPDES limits. Understanding the SPDES limits will guide next steps which may include:

1. Exploration of alternate discharge location, such as the Hudson River, including potential partnership with other municipalities
2. Expansion of the Harriman WWTP using SBR technology to accommodate at least 3.0 MGD of additional capacity if it is a viable option to expand the Harriman WWTP.
3. Longevity Improvements including SBR upgrades to improve treatment efficiency at the Harriman WWTP

In considering each of these options, it is important to understand the amount of time involved in bringing each to fruition. To that end, preliminary timelines for expansion and/or Longevity Improvements at the Harriman WWTP as well as the Hudson River option are provided as attachments to this document.

With resolution of the SPDES issues with respect to the Ramapo and direction from the County regarding which alternates should explored in greater detail, efforts can be expended to further refine and scrutinize the best means to add treatment capacity to accommodate demands for additional sewer capacity to support the existing Harriman WWTP service area, including the villages of Harriman, Monroe and Kiryas Joel (OCSD No. 1) as well as portions of the towns of Chester, Monroe and Woodbury and the Village of South Blooming Grove.

Orange County Sewer District #1
Harriman Wastewater Treatment Plant

Capacity Expansion Preliminary Timeline

Hudson River Discharge

Action	Timeframe (In Quarters of the Year)
Initial Engineering and Planning for Trunk Sewer and WWTP including Regulatory Coordination	Q4 2019 – Q2 2020 (9 months)
Engineering Report and Preliminary Plans	Q3 2020 – Q4 2020 (6 months)
State Environmental Quality Review Act	Q1 2021 – Q3 2021 (9 months)
Special District Proceeding (Increase or Improvement; new or expanded district) and Initial Financing	Q3 2021 – Q1 2022 (9 months)
Design and Permitting ROW, Easements & Land Acquisition	Q4 2021 – Q4 2023 (24 months)
Bidding, Award, Contracts and Notice to Proceed	Q1 2024 (3 months)
Simultaneous Construction of Trunk Sewer and Wastewater Treatment Plant	Q2 2024 – Q2 2027 (36 months)
Start-Up	Q3 2027 (3 months)

Assumptions:

1. Hudson River Alternate is pursued and there are no major regulatory obstacles including intervening party lawsuits
2. Substantial eminent domain proceedings are not required for ROW and/or easements for the trunk line and land for the treatment plant
3. Environmental Impact Statement is required
4. Local governmental structures (e.g. county sewer districts) are utilized to implement the plan as opposed to the creation of an authority through the state legislature
5. Traditional Design/Bid/Build under General Municipal Law is pursued as opposed to use of the County's Design/Build legislation

Orange County Sewer District #1
Harriman Wastewater Treatment Plant

Capacity Expansion Preliminary Timeline

Harriman WWTP

Action	Timeframe (In Quarters of the Year)
Regulatory Coordination regarding SPDES	Q4 2019 (3 months)
Engineering Report and Preliminary Plans	Q1 2020 - Q2 2020 (6 months)
State Environmental Quality Review Act	Q3 2020 – Q4 2020 (6 months)
Special District Proceeding (Increase or Improvement; new or expanded district) and Initial Financing	Q4 2020 – Q2 2021 (9 months)
Design and Permitting	Q3 2020 – Q3 2021 (12 months)
Bidding, Award, Contracts and Notice to Proceed	Q4 2021 (3 months)
Construction	Q1 2022 – Q3 2023 (18 months)
Start-Up	Q4 2023 (3 months)

Assumptions:

1. Harriman WWTP can be expanded without treatment for TDS and Chlorides
2. Technology is utilized to allow land area for expansion of 3.0 MGD – 5.0 MGD in addition to the existing 6.0 MGD on site or adjacent land is available for acquisition
3. Expanded Long Environmental Assessment is required
4. Local governmental structures (e.g. county sewer districts) are utilized to implement the plan as opposed to the creation of an authority through the state legislature
5. Traditional Design/Bid/Build under General Municipal Law is pursued as opposed to use of the County's Design/Build legislation