Barlow Replacement Hospital & Master Plan

Wastewater

January 13, 2011
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I. **INTRODUCTION**

The purpose of this analysis is to summarize the existing wastewater collection and conveyance system on the Barlow Respiratory Hospital Replacement and Master Plan Project site ("project site") and in the surrounding area, and to summarize potential impacts of the proposed project on that system.

Information on existing sewer pipeline location and capacity was obtained from or provided by the City of Los Angeles Department of Public Works sewer WYE reports, City of Los Angeles Central Sanitation District existing as-built records and information from Barlow Respiratory Hospital representatives.

This analysis compares existing wastewater generation on the project site to estimated wastewater flows of the build out for the proposed Project.

II. **REGULATORY SETTING & METHODOLOGY**

Construction and operation of the Barlow Respiratory Hospital Replacement and Master Plan Project Site will be conducted in accordance with applicable laws, ordinances, regulations and standards pertinent to sewage disposal.

The Bureau of Engineering Manual Part F: Sewer Design was used to determine minimum design rules and regulations and to determine onsite existing flows. All new developments in the city are required to obtain a sewer capacity availability report (SCAR) from the Engineering District office at the time the sewer connection permit application is submitted. Further information on sewer threshold capacity has been determined from resources provided by the City of Los Angeles Bureau of Engineering and Bureau of Sanitation.

The project site consists of approximately 24.8 acres and is traversed by Stadium Way and as a result creates two lots within the Barlow Sanatorium Tract. Lot A consists of approximately 10.6 acres and is located just east of Stadium Way. Lot B consists of approximately 14.2 acres and is located just west of Stadium Way. For the remainder of the discussion and for the purposes of clarity, lots A and B of the Barlow Sanatorium Tract shall be referred to as the eastern and western portions, respectively.

III. **PROJECT DESCRIPTION**

The project site consists of approximately 24.8 acres and is traversed by Stadium Way, creating eastern and western parcels. The eastern parcel consists of approximately 10.6 acres and is located just east of Stadium Way. The western parcel consists of approximately 14.2 acres and is located just west of Stadium Way.

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1 The Bureau of Sanitation utilizes a sewer gauging database obtained from permanent monitoring stations. This allows the Engineering District office the ability to determine conditions and capacity of existing sewers.
The proposed project consists of the demolition of 29 buildings and the redevelopment of the project site. The project site is expected to include the development and construction of 888 multi-family residential units, 15,000 square feet of neighborhood-serving commercial uses and the construction of a replacement hospital and associated support buildings.

A. Existing Conditions

The existing wastewater collection system on the project site consists of a network of vitrified clay pipes of different sizes, lengths, and slopes, which serve the eastern and western portions of the project site.

Wastewater sewer lines, including those on the project site, typically operate via “gravity loading”, where upstream (upslope) system lines convey wastewater flows through sloped pipes to a point of discharge at the downstream (downslope) end of the pipe, relying only on gravity for conveyance. Gravity systems do not require any active energy forces to move flow, and there are no pumps or other mechanical devices used in the exterior site wastewater system to assist with movement of wastewater flow. The use of gravity systems, however, impose some constraints on wastewater system design, since pipelines must have enough relative difference in height to provide adequate slope, flow, and capacity between points of connections at buildings or wastewater sources and points of discharge.

The existing hospital and most of the buildings currently in active use are located on the eastern portion of the Project site. On the western portion of the project site all but three buildings are not currently in use and do not generate sewage. A patient cottage (building 36) and two single-family residences (buildings 37,38) on the western portion of the Project site, at the top of the slope on Elysian Park Drive. Refer to Table 1 - Existing Barlow Master Plan Sewer Load Summary for a complete list of existing buildings and associated wastewater generation.

B. Local Infrastructure

The City of Los Angeles Department of Public Works, Bureau of Sanitation provides sewer conveyance infrastructure and wastewater treatment services to Barlow Sanatorium Tract. The Hyperion Treatment plant, located directly west of the Los Angeles International Airport in Playa Del Rey, treats wastewater generated at and surrounding areas of Barlow Hospital.

The public sewer line located within Stadium Way, just south of Scott Avenue is the most upstream sewer segment serving the project area and the project site is therefore the first point of connection to contribute sewage to the municipal system. The public sewer in the immediate Project area has undergone significant improvements over the last 50 years, with sections of the original 100 year-old, eight-inch sewer upgraded to 10, 12, and 15-inch lines. All points of connection from

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the project site to the existing municipal system within Stadium Way consists of either an 8-inch or 15-inch connection.

The municipal system within Stadium Way and serving the project site begins as a 8-inch Vitrified Clay Pipe and continues along or within; Stadium Way, Lilac Terrace, Bernard Street and back to Stadium Way, increasing and decreasing in pipe size from 8-inches and up to 15-inches. As diagramed in figure 1 and exhibit 2, the sewer main continues through approximately 21 miles of underground pipe across the County of Los Angeles and ultimately discharges to the Hyperion Wastewater Treatment Plant.

The maximum allowable design capacity of the 15-inch line located within Stadium Way, adjacent to the project site is approximately 3.8 million gallons per day (mgd). However, the system is constrained downstream by a smaller pipe size, an 8-inch VCP within Bernard's street, shown in figure 1. The maximum allowable design capacity of the 8-inch pipe located within Stadium Way is 0.74 MGD. Due to the lack of recorded information, it cannot be readily determined why the project site is served with smaller pipe sizes downstream. Designs typically avoid sizing downstream pipes smaller than upstream pipes, regardless of differing slope and velocity requirements. One of the primary reasons for this is debris that passes through the upstream pipe can get caught in the connecting structure, clogging the sewer.

C. Wastewater Treatment

The Hyperion Treatment Plan currently provides wastewater treatment for nearly all of the Cities of Los Angeles, which includes the project site. Originally designed with a treatment capacity of 250 MGD, the plant’s capacity to provide full secondary treatment has been increased to 450 MGD. Currently the treatment plant averages an average dry weather flow of 340 MGD. Even peak flows of up to 1,000 MGD can be handled for short periods, per the Bureau of Sanitation's 2007-2008 strategic plan. A vicinity Map of the City of Los Angeles and surrounding areas wastewater treatment system can be found in appendix B.

IV. APPROXIMATE EXISTING WASTEWATER LOADS

Approximate existing wastewater generation volumes and wastewater demand for the existing development were generated by M-E Engineers and were used in this technical study to analyze available capacities.

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2 Based on the Maximum Design Depth of Flow allowed by the City of Los Angeles, Department of Public Works, Bureau of Engineering Sewer Manual, Part F. Not to Exceed 3/4.


4 Bureau of Sanitation, Department of Public Works, City of Los Angeles, A Five-Year Strategic plan, June 2007.
There are fifteen (15) available points of discharge/connection along Stadium Way provided by the City of Los Angeles. Ten (10) of the points of connection are available to serve the eastern portion and the remaining five (5) are available to serve the western portion.

Within the eastern portion; asbuilts, existing plumbing demand data and recorded utilities surveyed suggest six of the ten points of connection are currently being utilized. On the western portion; asbuilts and conversations with city engineers\(^5\) suggest that at least two points of connection are currently utilized.

All points of connection serving the Project site consist of wye laterals\(^6\) and these connections include 8-inch and 15-inch lines. These laterals connect to a 15-inch City sewer main under Stadium Way. The sewer main decreases in diameter from 12-inch to eight-inch and finally to a 10-inch main under Lilac Terrace. Refer to Figures 1 and 2 for diagrams of the existing sewer system in the Project area and on the Project site.

The total sewage generation for existing uses on project site based on the maximum allowable capacity, defined by the City of Los Angeles, is approximately 16,067 gallons per day (gpd) or 0.02 MGD. Refer to Table-1 for a detailed breakdown of the sewage generation.

For the following discussion please refer to Exhibit 1: Existing Utilities and the Sewer Wye Map 139-5A211 within appendix A.

A. **Project Site: Eastern Portion**

The eastern portion of the Project site is served by a total of 10 laterals that consist of vitrified clay pipe (VCP) and polyester resin concrete (PRC) pipe sewer lines of varying size, length, and slope. The sewer main that serves the majority of the site begins at building 10, flows south east approximately 700 feet, turns due west through the hospital parking lot, and finally terminates at the public sewer under Stadium Way. This is the longest sewer main on-site and ties in smaller networks comprising four-, six- and eight-inch lines that serve the historic core of the Project site and buildings 6, 11, 12, 21 and 25. The current sewer system serving the site was first built in the 1930s during the early construction of the site. The oldest sewer main, still in use, dates back to 1917. Information on sewage disposal before the 1917 main construction cannot be determined and is not readily known.

The remaining five laterals are direct connections from on-site buildings to the municipal system under Stadium Way. All direct connections are short building sewer laterals and consist of 8-inch VCP lines which serve the frontage buildings along Stadium Way. Refer to Figure 1 for a diagram of the existing sewer system on this portion of the project site.

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\(^{5}\) Conversations with Valnetino Pueblos, Civil Engineering Associate II of the Bureau of Engineering, on 12-14-2010; points out that in all likelihood buildings 37 & 38 connect to the main located on Stadium Way.

\(^{6}\) Wye is any pipe line or portion thereof, constructed in street, alley or other public place with which the private sewers pipes are joined.
B. Project Site: Western Portion

The existing flows generated on the western portion of the Project site are conveyed through separate wye laterals to the 15" vitrified clay main in Stadium Way. Along the west side of Stadium Way, there are five (5) active sewer laterals which consist of eight-inch and 15-inch vitrified clay pipes. These laterals serve the buildings along and adjacent to the west Stadium Way. Refer to Table 1 - Existing Barlow Master Plan Sewer load Summary, below.
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<thead>
<tr>
<th>Buildings</th>
<th>Type Description</th>
<th>Use</th>
<th>Units</th>
<th>Generation Factor (^7) (gal/day/per unit)</th>
<th>Daily Generation (gal/day)</th>
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<td></td>
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</table>

\(^7\) Source: City of Los Angeles City of Los Angeles L.A. CEQA Thresholds Guide, 2006 Wastewater Generation Factors
Figure 1 - Existing Municipal Vicinity Sewer System.
V. RECENT AND PLANNED IMPROVEMENTS

The following section lists recent and potential future improvements to both project site and municipal wastewater collection systems. Information regarding municipal improvements was determined from available reports and documentation by the City of Los Angeles Department of Public Works (LADPW) and Hyperion Wastewater Treatment Plant.

A. Municipal Improvements

SSRP N13\(^8\) is a secondary sewer plan report conducted by the Bureau of Sanitation in 2006 that identifies aging sewer systems that will need rehabilitation or replacement. The report concludes that parts of the sewer reaches are over 70 years old and have reached their estimated useful life. The sewer shed improvements will consist of approximately 2.46 miles of sewer pipes and is bounded by Academy Road to the north, Temple St. to the south, the Los Angeles River to the east and Glendale Blvd to the West.

Currently, the design process is 90% complete and the final project specifications are in the process of being written and finalized. Construction is expected to begin on 10/12/2010 and to be completed by 10/11/2011.

B. Hyperion Wastewater Treatment Plant

Currently, improvements and expansions for the Hyperion Treatment Plant are being proposed, but quantifiable increases in future capacity cannot be accurately determined at this time. However, with the approval of the 2006 Integrated Resource Plan by the Bureau of Sanitation, capacity at 450 million gallons per day (gpd) by Hyperion in conjunction with other relief wastewater treatment facilities will provide sufficient wastewater treatment capacity until the year 2020.\(^9\)

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\(^8\) Bureau of Engineering, Department of Public Works, Project Information Report.
\(^9\) City of Los Angeles Planning Department, Playa Vista Draft EIR, Public Utilities: Wastewater 2009.
VI. ENVIRONMENTAL IMPACTS ANALYSIS

Presented below are brief discussions of the thresholds of significance used to analyze each alternative.

A. Thresholds of Significance

Based on Appendix G to the CEQA Guidelines and the L.A. CEQA Thresholds Guide, the proposed project would have a significant environmental impact in regards to sewer services if it would:

(a) Exceed wastewater treatment requirements of applicable Regional Water Quality Control Board (RWQCB).

(b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental impact.

(c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the providers existing commitments.

B. Project Impacts

The proposed project would involve the demolition of the existing hospital and 39 existing buildings on the Project site. Additionally, the construction of up to 1,111,000 square feet of new development, including the proposed 56-bed replacement hospital, an associated administration and support facility, skilled nursing facility, residential housing, and 15,000 square feet of commercial uses.

Construction

During project construction, contractors for the project would provide portable, on-site sanitation facilities that would be serviced by approved disposal facilities and/or treatment plants. The amount of construction-related wastewater that would be generated would not have a significant impact on wastewater disposal and treatment facilities due to the temporary nature of construction and expected low volumes of wastes. As a result, construction impacts to wastewater services would be less than significant.

Operation

Wastewater generation associated with the proposed project was calculated using generation factors based on land use, as provided by the City of Los Angeles.\(^{10}\) The estimated net increase was analyzed relative to infrastructure and treatment plant capacity. The proposed project would increase the total number of sewage generation on the site by the addition of restrooms,

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\(^{10}\) City of Los Angeles, Department of Public Works, Bureau of Engineering, Sewer Availability Request (SCAR) 21-1369-0510 date May 5, 2010.
kitchen and laundry facilities. As a result, a net increase in the number of such sewage generating facilities would produce an increase in on-site sewage generation.

Exceed Wastewater Treatment Requirements (a)

**Threshold:** (a) Exceed wastewater treatment requirements of applicable Regional Water Quality Control Board (RWQCB).

The Hyperion Treatment plant are subject to permits issued by the RWQCB. The permits that regulate the treatment plant set limitations on the amount of pollutants that the plant can discharge into receiving waters or the amount of pollutants allowable to remain in reclaimed water. Currently, the Hyperion Treatment Plant is operating at 90 MGD below capacity, additional sewage generated by the project site shall not result in an exceedance of sewage treatment requirements set forth by the RWQCB permit.

**Mitigation:** The potential impacts are less than significant. The wastewater treatment plan will operate within the limitations contained within the RWQCB permit.

Capacity of Wastewater Treatment Provider (b) & (c)

**Threshold:** (b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental impact.

(c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the projects projected demand in addition to the providers existing commitments.

The City of Los Angeles Bureau of Sanitation in conjunction with the City of Los Angeles Bureau of Engineering (BOE) has indicated that the proposed project would result in 156,050 gpd. This represents a net increase of approximately 139,983 gallons per day (gpd) in wastewater use over current conditions. Refer to Table -2 Projected Wastewater Discharges below, for existing and projected wastewater discharges.

The project site is the first and most upstream discharger for the 8-inch and 15-inch sanitary sewer mains located within Stadium Way. Since the sanitary sewer main is the most upstream service for its tributary area and the 8-inch pipe is the constraint for the existing system, the available capacity of the sewer main can be quantified. This amount would represent approximately 19% of the maximum allowable design flow capacity\(^{13}\) of the existing 8-inch sewer line. Additionally, the Los Angeles City Bureau of Sanitation has indicated that should the Project generate 156,050 gpd, there is sufficient capacity in the sewer system to accommodate the project.

\(^{13}\) City of Los Angeles Bureau of Engineering; Part F221.1- Maximum Design Depth of Flow.
### Table 2- Projected Wastewater Discharges

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<thead>
<tr>
<th>Type</th>
<th>Units</th>
<th>Generation Factor (gal/day/per unit)</th>
<th>Daily Generation (gal/day)</th>
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<tbody>
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<td>Existing Bldg's to be Demolished</td>
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<td>-</td>
<td>14,771</td>
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<tr>
<td>Existing Bldg's to Remain (Historic Core) 2A,3,15,16,17,18,20,37,38</td>
<td>-</td>
<td>-</td>
<td>1,296</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>16,067</strong></td>
</tr>
</tbody>
</table>

**Proposed**

<table>
<thead>
<tr>
<th>Type</th>
<th>Units</th>
<th>Generation Factor (gal/day /1000 sq. ft.)</th>
<th>Daily Generation (gal/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital (56 Beds)/Medical Building</td>
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<td>250 gpd</td>
<td>30,000</td>
</tr>
<tr>
<td>Condos (2 Bed)</td>
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<tr>
<td>Condos (1 Bed)</td>
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<td>Townhomes</td>
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<tr>
<td><strong>Total</strong></td>
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<td></td>
<td><strong>156,090</strong></td>
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</table>

**Project Total** (Historic Core + Proposed) 157,386

Additionally, the project site is served by 21 miles of pipe of varying size and material, and as indicated by exhibits provided by the city of Los Angeles, sewage generated from the Project does not flow through "Areas of Constrained Sewer Capacity". Please refer to figures 1 & exhibit 2, within this report for areas of constrained sewer capacity within the vicinity of the Project Site.

**Mitigation:** The Project site would not generate a significant wastewater impact that would affect capacity or that would require upgrade, expansion or new construction of a wastewater treatment plant. Therefore, no mitigation measures are warranted.

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12 The wastewater assessment prepared for The Barlow Replacement Hospital & Master plan project by City of Los Angeles Bureau of Sanitation. du-dwelling unit, sq. ft.- square feet; gpd-gallons per day

13 City of Los Angeles CEQA Thresholds Guidelines: Sewer Capacity threshold study area maps; Dated 2006.
C. Temporary Construction Impacts

i) Onsite
Project construction would involve excavation and grading activities on the Project site's west and east portions. Existing utility infrastructure for buildings to remain on the Project site including existing sewer lines, would be upgraded as necessary for connection to the proposed sewer mains. Proposed building locations would necessitate a realignment, redesign and construction of new sewer mains within the project site.

ii) Offsite
Offsite improvements would be based on the required points of connection and trenching within Stadium Way. The current condition is served by fifteen points of connection, which can be adequately used for the proposed development. The current sizes of the points of connection, 8-inch and 15-inch lateral wyes provide sufficient capacity for the proposed development.

VII. LEVEL OF SIGNIFICANCE AFTER MITIGATION

Some of the identified wastewater related impacts can be mitigated to a level of less than significant through compliance with requirements of permitting agencies. The agencies, through the established permitting process, will ensure compliance to the applicable requirements.