Appendix G
Hydrology

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Technical Memorandum

Date:	27 June 2013
To:	Jonathan Riker, ICFI
From:	Rebecca Batchelder, Geosyntec Consultants
Subject:	Hydrology and Water Quality Section for EIR Water Wheel Project

1. INTRODUCTION

The Water Wheel Project (the "Project") will divert water from the Los Angeles River, lifting the water through the use of an approximately 70-foot water wheel, and distributing the water for beneficial reuse. The Project Site ("Site") has two general work areas - the wheel itself will be installed at 1796 N. Baker Street ("Water Wheel Site"), and the side channel will be located within the channel of the Los Angeles River ("LA River") between the Broadway Street and Springs Street bridges ("Diversion Site").

The diversion will be enabled through the use of an approximately 6-foot high inflatable dam in the LA River channel, which has the ability to rise and fall through a computerized control system. When the dam is in the inflated position, the pooled water will be diverted through side channel that will be bored into the west bank of the river, immediately upstream of the dam. The side channel will direct LA River water to power the water wheel. After hitting the blades, over 99% of the flow will be directed into a continuation of the side channel pipe and flow back into the main channel of the LA River. The pipe will re-enter the channel less than 100 feet downstream from the diversion point.

Installation of project components will take place on currently impervious surfaces, so no additional impervious cover will be added as a result of the Project. Some impervious cover may be replaced with pervious landscaped surfaces.

This Report describes the environmental and regulatory setting of the Project as they pertain to water resources as well as the potential adverse impacts of the proposed Project on existing hydrological and water quality characteristics of the Site and its vicinity. Hydrology and water

quality mitigation measures intended to reduce potential impacts to a less than significant level are provided where appropriate.

Data used to prepare this section came from various sources, including the Los Angeles River Basin Plan, the City of Los Angeles General Plan, and Los Angeles Municipal Code.

2. ENVIRONMENTAL SETTING

The Project Site ("Site") is located within the Los Angeles River Watershed, on and adjacent to the LA River in the heart of Downtown Los Angeles (see Figure 1). Land use immediately surrounding the Site is primarily industrial and transportation (see Figure 2). The terrain of the Water Wheel Site is relatively flat.

This section describes existing hydrology and water quality conditions of the Site and vicinity.

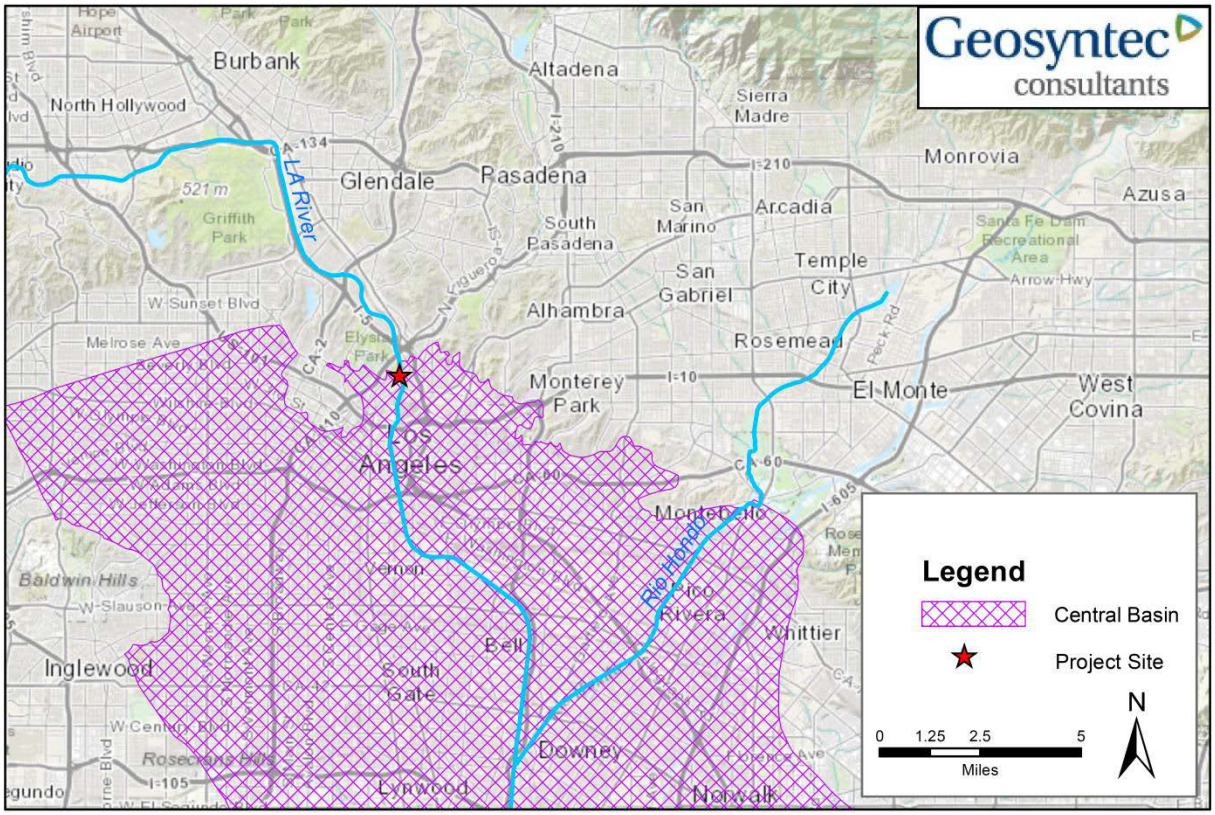


Figure 1. Project Site and Surrounding Area

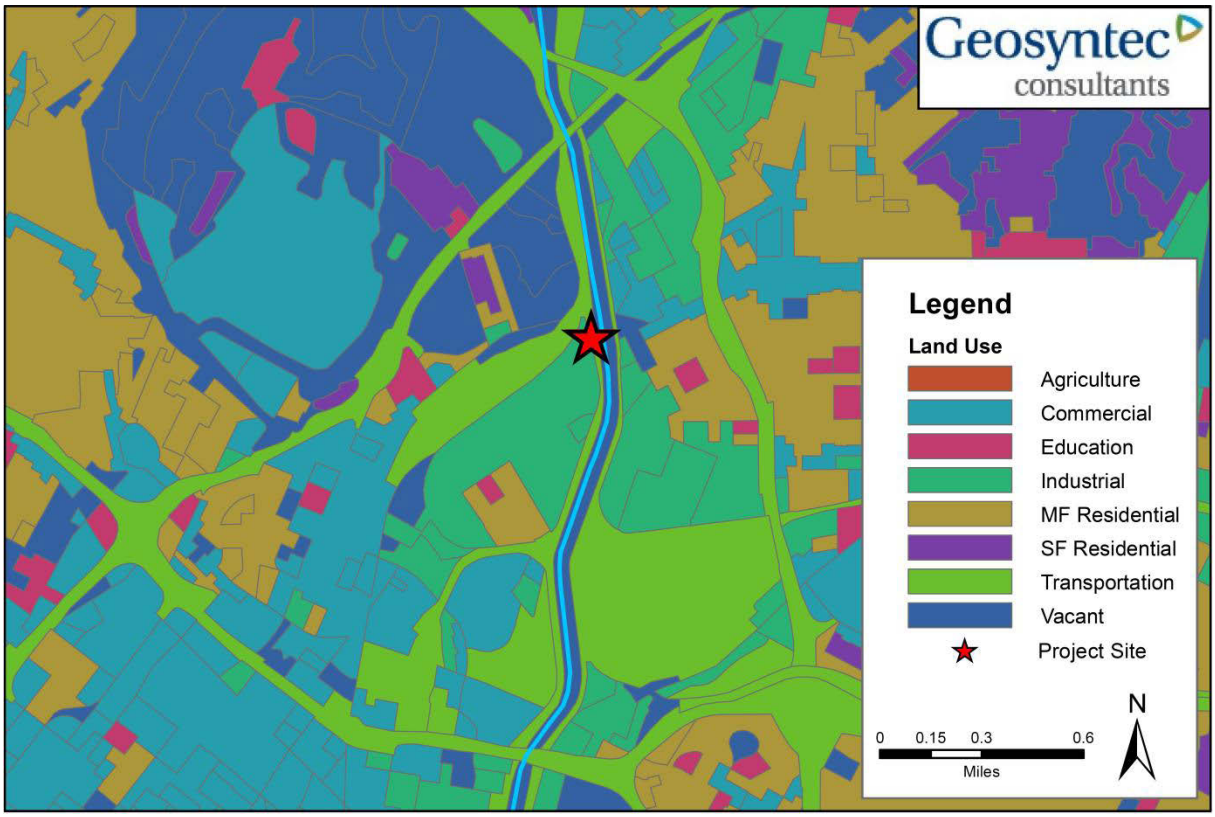


Figure 2. Land Use Surrounding Project Site

2.1 Existing Drainage Patterns

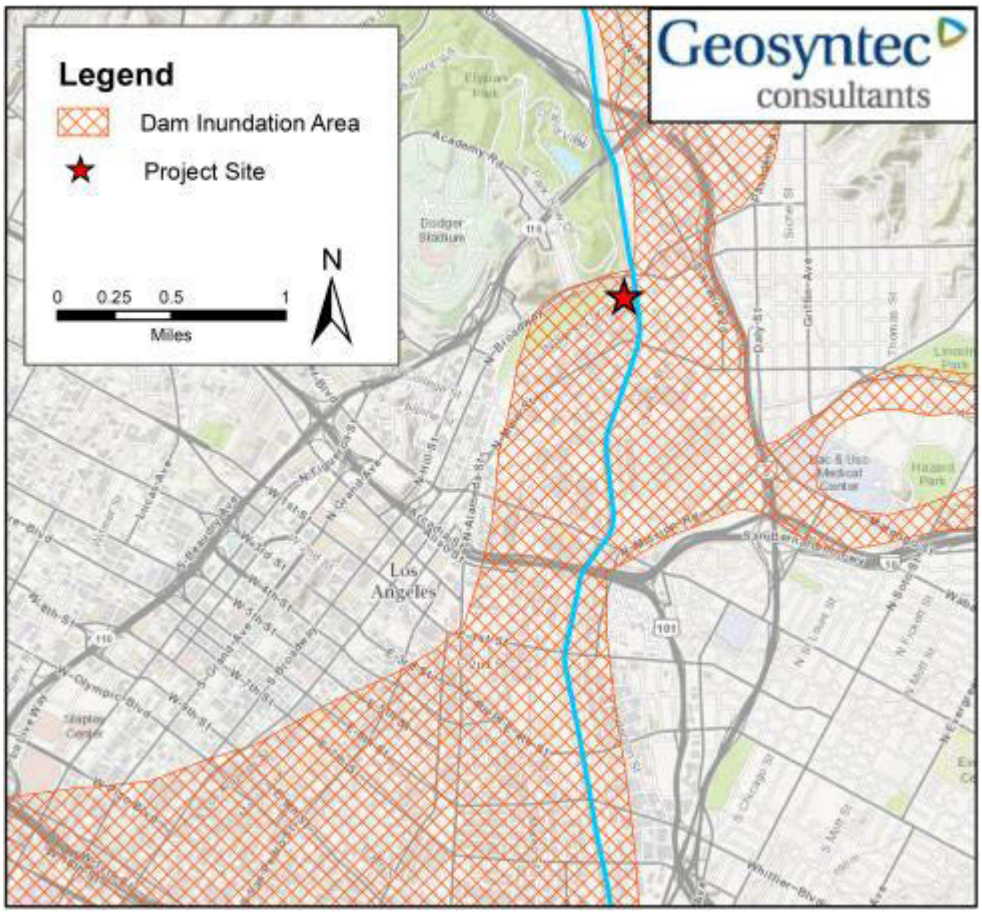
The existing Site slopes from north to south, with a total elevation drop of approximately five feet across the length of the property. The Site has no drain inlets or underground stormwater drainage system; therefore, runoff sheet flows overland to the LA River.

2.2 Regional Flooding

The Diversion Site, being within the LA River, which was designed as a flood control channel, is by necessity within the within a Special Flood Hazard Area subject to a 1 percent annual chance of flooding. However, the Water Wheel Site is located within FEMA unshaded Zone X (FEMA, 2008), which is defined as an area outside the 0.2% annual chance floodplain (i.e., 500-year floodplain).

The Site is not located within a Landslide Hazard Zone as mapped by the City of Los Angeles in their California Emergency Management Agency-approved Local Hazard Mitigation Plan.

Due to the large number of dams (22 in total) that were constructed in the Los Angeles area over the years to control flooding, over one third of the City of Los Angeles is subject to potential dam failure hazards. The Project Site is located on the northernmost edge of a dam failure hazard area as shown in Figure 3.



2.3 Surface Water Quality

Typical Surface Water Pollutants from Industrial Sites

Due to the urban setting, stormwater running off from the Site would be expected to contain pollutants commonly found on runoff from industrial sites including:

- Sediments (TSS and Turbidity): Excessive erosion, transport, and deposition of sediment in surface waters are a significant form of pollution resulting in major water quality problems. Sediment imbalances impair waters' designated uses. Excessive sediment can impair aquatic life by filling interstitial spaces of spawning gravels,

impairing fish food sources, filling rearing pools, and reducing beneficial habitat structure in stream channels. In addition, excessive sediment can cause taste and odor problems in drinking water supplies and block water intake structures. Sources of sediment from industrial properties include wind-blown dust and particles, and sediment tracked on site from vehicles.

- Nutrients (Phosphorus and Nitrogen (Nitrate+Nitrite-N, Ammonia-N, and Total Nitrogen): Nutrients of concern include the inorganic forms of nitrogen (nitrate, nitrite and ammonia) and phosphorus. Organic forms of nitrogen are associated with vegetative matter such as particulates from sticks and leaves. Inorganic forms of nitrogen include nitrate, nitrite and ammonia. Total Nitrogen (TN) is a measure of all nitrogen present, including inorganic and particulate forms. Phosphorus can be measured as total phosphorus (TP) or as dissolved phosphorus. Dissolved phosphorus is the more bioavailable form of phosphorus. TP is often composed mostly of soil-related particulate phosphorus. Eutrophication due to excessive nutrient input can lead to changes in algae, benthic, and fish communities; extreme eutrophication can cause hypoxia or anoxia, resulting in fish death. Surface algal scum, water discoloration, and the release of toxins from sediment can also occur. The likely sources of nutrients associated with industrial properties are: fertilizers in runoff from landscaped areas, pet wastes, atmospheric deposition from industry and automobile emissions, and soil erosion.
- Trace Metals (Aluminum, Copper, Lead, and Zinc): The primary sources of trace metals in stormwater are typically commercially available metals used in transportation (e.g. automobiles), buildings, and infrastructure. Metals are also found in fuels, adhesives, paints, and other coatings. Metals are a source of concern because of the potential for toxic effects on aquatic life and the potential for groundwater contamination. High metal concentrations can lead to bioaccumulation in fish and shellfish and affect the beneficial uses of receiving waters.
- Pathogens (Bacteria, Viruses, and Protozoa): Runoff that flows over land, such as urban runoff, can mobilize pathogens, including bacteria and viruses. The presence of pathogens in runoff can impair receiving waters and contaminate drinking water sources. Sources of pathogens in urban areas include pets and other wildlife, leaky sanitary sewer pipes, or human fecal wastes.
- Petroleum Hydrocarbons (Oil and Grease and PAHs): The sources of oil, grease, and other petroleum hydrocarbons include spillage fuels and lubricants, discharge of domestic and industrial wastes, atmospheric deposition, and runoff. Runoff can be contaminated by leachate from asphalt roads, wearing of tires, and deposition from automobile exhaust. Petroleum hydrocarbons, such as polycyclic aromatic hydrocarbons (PAHs), can bioaccumulate in aquatic organisms from contaminated water, sediments, and food; they are toxic to aquatic life at low concentrations.

Hydrocarbons can persist in sediments for long periods of time and result in adverse impacts on the diversity and abundance of benthic communities. Hydrocarbons can be measured as total petroleum hydrocarbons (TPH), oil and grease, or as individual groups of hydrocarbons, such as PAHs.

- Trash & Debris: Trash (such as paper, plastic, polystyrene packing foam, and aluminum materials) and biodegradable organic debris (such as leaves, grass cuttings, and food waste) are general waste products on the landscape that can be entrained in urban runoff. The presence of trash and debris may have a significant impact on the recreational value of a water body and aquatic habitat. Excess organic matter can create a high biochemical oxygen demand in a water body and thereby lower its water quality. Also, in areas where stagnant water exists, the presence of excess organic matter can promote septic conditions resulting in the growth of undesirable organisms and the release of odorous and hazardous compounds such as hydrogen sulfide.

Section 303(d) List of Impaired and Threatened Waters

Under Section 303(d) of the 1972 Clean Water Act, states, territories and authorized tribes are required to develop a list of waters where required pollution controls are not sufficient to attain or maintain applicable water quality standards. Reach 2 of the Los Angeles River (Carson Street to N. Figueroa Street) runs through the Diversion Site and is included on California's §303(d) list for ammonia, coliform, copper, lead, nutrients, oil and trash.

Total Maximum Daily Loads are developed for contaminants in 303(d)-listed water bodies. The Regional Board has established a number of TMDLs for the Los Angeles River Watershed, including bacteria, metals, trash and nutrients. Compliance with TMDLs can be achieved through an array of BMPs required by the National Pollutant Discharge Elimination System permit. The TMDL document categorizes the practices as end-of-pipe full capture structural controls, partial capture control systems, and institutional controls.

For a more detailed discussion of the regulatory framework for 303(d) listed waters and TMDLs, refer to section 3.

2.4 Groundwater

The Site is located within the Central Basin. The Central Basin extends approximately 270 square miles over Central and East Los Angeles. The California Department of Water Resources (1961) divided the Central Basin into four sections; the Los Angeles and Montebello Forebays, which occupy the northern portion of the basin, the Whittier Area, a small portion in the eastern segment of the basin, and the Pressure Area, the largest section occupying the southern half of the basin. The Site is located in the Pressure Area.

Recharge to the basin occurs in the two forebays where the aquifer is unconfined, through direct percolation of precipitation, stream flow, and applied water. The Whittier Area and Pressure Area are confined aquifer systems and therefore contribute minimally to aquifer recharge and instead are replenished from the up-gradient forebay areas and adjacent groundwater basins. In the Pressure Area, the aquifers are separated by thick aquitards, which protect groundwater from surface contamination.

The depth of the Central Basin ranges from 1,600 to more than 2,200 feet. Total storage in the Central Basin is estimated to be approximately 13.8 million acre feet. It is an adjudicated basin, with rights set at 267,900 AFY. The amount of the adjudicated water rights that can be pumped each year is limited to approximately 80 percent of the total adjudicated amount (217,367 acre feet per year).

Water quality in the Central Basin aquifer is generally good. Volatile organic compounds (VOCs), primarily tetrachlororoethylene (PCE) and trichloroethylene (TCE), are present in the Central Basin and have impacted many production wells. However, most of the wells that have the VOCs do not exceed drinking water quality standards. Those with higher levels require treatment prior to use as drinking water (MWD, 2007). TDS content in the subbasin ranges from 200 to 2,500 mg/l according to data from 293 public supply wells. The average for these 293 wells is 453 mg/l (CDWR, 2004).

Based on the focused research of historical and regulatory documents and databases, potential shallow groundwater contaminants associated with historic Site use and surrounding properties include the following:

- Petroleum hydrocarbons
- Volatile organic compounds (VOCs)
- Semi volatile organic compounds (SVOCs, including PAHs)
- Metals
- Poly-chlorinated biphenyls (PCBs)
- Pesticides and herbicides
- Methane

The potential presence of petroleum hydrocarbons, VOCs and SVOCs is based upon the historic Site use and the long-term use of the adjoining property used for storage of petroleum products. The potential presence of metals, PCBs, pesticides and herbicides is based upon the long-term use of the Site as a rail line/rail spur facility where these contaminants are often associated with historic operations and detected in shallow or surficial soils. The potential presence of PAHs and methane is based upon data obtained from adjoining properties.

2.5 Beneficial Uses

The phrase "beneficial uses" refers to the various ways water can be used. The Regional Water Quality Control Board (RWQCB) designates beneficial uses for surface and groundwater. Together with water quality objectives for specific beneficial uses, these beneficial uses form the basis of developing water quality standards. Taken directly from the Los Angeles Basin Plan, the beneficial uses (potential, existing, and intermittent) for the Los Angeles River specifically include:

- Ground Water Recharge (GWR): Uses of water for natural or artificial recharge of groundwater for purposes of future extraction, maintenance of water quality, or halting saltwater intrusion into freshwater aquifers.
- Non-Contact Water Recreation (REC2): Uses of water for recreational activities involving proximity to water, but not normally involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.
- Preservation of rare and endangered species (RARE): Uses of waters that support habitats necessary for the survival and successful maintenance of plant or animal species established under state and/or federal law as rare, threatened, or endangered.
- Municipal and Domestic Supply (MUN): Uses of water for community, military, or individual water.
- Water Contact Recreation (REC1): Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water skiing, skin and scuba diving, surfing, white water activities, fishing or use of natural hot springs.
- Warm Freshwater Habitat (WARM): Uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.
- Wetland Habitat (WET): Uses of water that support wetland ecosystems, including, but not limited to, preservation or enhancement of wetland habitats, vegetation, fish, shellfish, or wildlife, and other unique wetland functions which enhance water quality such as providing flood and erosion control.
- Wildlife Habitat (WILD): Uses of water that support terrestrial ecosystems including, but not limited to, preservation or enhancement of terrestrial habitats, vegetation, wildlife (e.g. mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.
- Fish Spawning (SPWN): Uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish.

- Industrial Service Supply (IND): Uses of water for industrial activities that do not depend primarily on water quality, including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, and oil well re-pressurization.
- Industrial Process Supply (PROC): Uses of water for industrial activities that depend primarily on water quality.
- Marine Habitat (MAR): Uses of water that support marine ecosystems, including, but not limited to, preservation or enhancement of marine habitats, vegetation such as kelp, fish, shellfish, or wildlife (e.g., marine mammals, shorebirds).
- Fish Migration (MIG): Uses of water that support habitats necessary for migration, acclimatization between fresh water and salt water, and protection of aquatic organisms that are temporary inhabitants of waters within the region.
- Shell Fish Harvesting (SHELL): Uses of water that support habitats suitable for the collection of crustaceans and filter-feeding shellfish (e.g., clams, oysters, and mussels) for human consumption, commercial, or sport purposes.

Beneficial uses for groundwater in the Central Basin include:

- Agricultural Supply (AGR): Uses of water for farming, horticulture, or ranching including, but not limited to, irrigation, stock watering, or support of vegetation for range grazing.
- Municipal and Domestic Supply (MUN): Uses of water for community, military, or individual water.
- Industrial Service Supply (IND): Uses of water for industrial activities that do not depend primarily on water quality, including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, and oil well re-pressurization.
- Industrial Process Supply (PROC): Uses of water for industrial activities that depend primarily on water quality.

3. REGULATORY SETTING

3.1 Clean Water Act

In 1972, the Federal Water Pollution Control Act [later referred to as the Clean Water Act (CWA)] was amended to require National Pollutant Discharge Elimination System (NPDES) permits for the discharge of pollutants to waters of the United States from any point source. In 1987, the CWA was amended to require that the United States Environmental Protection Agency (USEPA) establish regulations for permitting municipal and industrial stormwater

discharges under the NPDES permit program. The USEPA published final regulations regarding stormwater discharges on November 16, 1990. The regulations require that municipal separate storm sewer system (MS4) discharges to surface waters be regulated by a NPDES permit.

In addition, the CWA requires each state to adopt water quality standards approved by the USEPA for receiving water bodies. Water quality standards consist of designated beneficial uses for a particular receiving water body (e.g. wildlife habitat, agricultural supply, fishing etc.) along with water quality criteria necessary to support those uses. Water quality criteria are prescribed concentrations, or levels, of constituents – such as lead, suspended sediment, and fecal coliform bacteria – or narrative statements which represent the quality of water that support a particular use.

CWA Section 303(d) - TMDLs

When designated beneficial uses of a particular receiving water body are being compromised by water quality, Section 303(d) of the CWA requires identifying and listing that water body as "impaired". Once a water body has been deemed impaired, a Total Maximum Daily Load (TMDL) must be developed for the impairing pollutant(s). A TMDL is an estimate of the total load of pollutants from point, non-point, and natural sources that a water body may receive without exceeding applicable water quality standards (with a "factor of safety" included). Once established, the TMDL allocates the loads among current and future pollutant sources to the water body.

The US EPA has delegated implementation and enforcement of the CWA in California to the State of California.

CWA Section 401 and 404 – Dredge and Fill Materials

Section 404 of the Clean Water Act is a program that regulates the discharge of dredged and fill material into waters of the United States, including wetlands. Activities in waters of the United States that are regulated under this program include fill for development (including physical alterations to drainages to accommodate storm drainage, stabilization, and flood control improvements), water resource projects (such as dams and levees), infrastructure development (such as highways and airports), and conversion of wetlands to uplands for farming and forestry.

Any person applying for a federal permit or license that may result in a discharge of pollutants into waters of the United States must obtain a state water quality certification that the activity complies with all applicable water quality standards, limitations, and restrictions. Subject to

certain limitations, no license or permit may be issued by a federal agency until the Section 401 certification has been granted. Further, no license or permit may be issued if certification has been denied. CWA Section 404 permits and authorizations are subject to section 401 certification by the RWQCBs. It is expected that this project will qualify for a Nationwide 43 404 Permit (Stormwater Management Facility) because it involves less than ½ acre of nontidal waters and less than 300 linear feet of stream bed.

CWA Section 408 - Alteration of Corps Project

Any proposed alteration/modification to an existing United States Army Corps of Engineers' (USACE) structure (ie: levee, flood risk reduction project) must obtain a Section 408 Permit to ensure that the project will not compromise the hydraulic capacity of the structure. There are two levels of review under Section 408: Major 408 and Minor 408. Major 408 reviews are for projects that involve a modification of the physical characteristics or the hydraulic capacity of the levee. Minor 408 reviews are for projects that either result in temporary impacts to levees or are within the critical area of the levee, but do not permanently change the physical characteristics or hydraulic conditions of the levee.

3.2 California Porter-Cologne Act

California's primary statute governing water quality and water pollution issues with respect to both surface waters and groundwater is the Porter-Cologne Water Quality Control Act of 1970 (Porter-Cologne Act). The Porter-Cologne Act grants the State Water Resources Control Board (SWRCB) and RWQCBs power to protect water quality; it is the primary vehicle for implementing California's responsibilities under the federal Clean Water Act. The Porter-Cologne Act grants the SWRCB and RWQCBs authority and responsibility to adopt plans and policies to regulate discharges of waste to surface and groundwater, to regulate waste disposal sites, and to require cleanup of discharges of hazardous materials and other pollutants. The Porter-Cologne Act also establishes reporting requirements for unintended discharges of any hazardous substance, sewage, or oil or petroleum product.

Each RWQCB must formulate and adopt a water quality control plan (Basin Plan) for its region. The Basin Plan must conform to the policies set forth in the Porter-Cologne Act and state water policy established by the SWRCB. To implement state and federal law, the Basin Plan establishes beneficial uses for surface and groundwaters in the region and sets forth narrative and numeric water quality objectives to protect those beneficial uses. The Porter-Cologne Act also allows a RWQCB to include water discharge prohibitions within its regional plan applicable to particular conditions, areas, or types of waste.

The Project Site is located within the boundary of the Los Angeles RWQCB (Region 4). The Basin Plan for the Los Angeles Region (LARWQCB, 1994, as amended) designates beneficial uses for receiving waters and provides numeric and narrative criteria for a range of water quality constituents applicable to certain receiving water bodies and groundwater basins within the Los Angeles region. Specific criteria are provided for the larger, designated water bodies within the region as well as general criteria or guidelines for ocean waters, bays and estuaries, inland surface waters, and groundwaters. Waters not specifically listed (generally smaller tributaries) are assumed to have the same beneficial uses as the streams, lakes, or reservoirs to which they are tributary. In general, the narrative criteria require that degradation of water quality does not occur due to increases in pollutant loads that will adversely impact the designated beneficial uses of a water body. For example, the Los Angeles Basin Plan requires that "inland surface waters shall not contain suspended or settleable solids in amounts which cause a nuisance or adversely affect beneficial uses as a result of controllable water quality factors."

The Basin Plan also contains water quality criteria for groundwater basins. For example, the Basin Plan requires that "groundwaters shall not contain taste or odor producing substances in concentrations that cause nuisance or adversely affect beneficial uses."

3.2 MS4 Permit Planning and Land Development Program

In 2012, the Los Angeles RWQCB issued an NPDES Permit and Waste Discharge Requirements (Permit No. CAS004001, Order No. R4-2012-0175) under the CWA and the Porter-Cologne Act for discharges of urban runoff in public storm drains in Los Angeles County. The Permittees are the Los Angeles County cities and the County (collectively "the Co-Permittees").

The 2012 NPDES Permit includes design requirements for new development and significant redevelopment in Part VI.D.7.c (New Development/Redevelopment Project Performance Criteria).

3.4 Construction General Permit

Pursuant to the CWA Section 402(p), requiring regulations for permitting certain stormwater discharges, the SWRCB issued a statewide general NPDES Permit for stormwater discharges from construction sites [(NPDES No. CAR000002) Water Quality Order 2009-0009-DWQ, SWRCB NPDES General Permit for Stormwater Discharges Associated with Construction Activity (adopted by the SWRCB on September 2, 2009)]. Discharges of stormwater from construction sites with a disturbed area of one or more acres are required to either obtain individual NPDES permits for stormwater discharges or to be covered by the Construction

General Permit. Due to the complexity of obtaining an individual permit, virtually all construction projects utilize the Construction General Permit. Coverage under the Construction General Permit is accomplished by completing a construction site risk assessment to determine appropriate coverage level as well as preparing a Stormwater Pollution Prevention Plan (SWPPP), including site maps, a Construction Site Monitoring Program (CSMP), and sediment basin design calculation. All of these documents must be electronically submitted to the SWRCB for General Permit coverage. The primary objective of the SWPPP is to identify and apply proper construction, implementation, and maintenance of BMPs to reduce or eliminate pollutants in stormwater discharges and authorized non-stormwater discharges from the construction site during construction. The SWPPP also outlines the monitoring and sampling program required for the construction site to verify compliance with discharge Numeric Action Levels (NALs) set by the Construction General Permit.

3.5 General Waste Discharge Requirements for Dischargers of Groundwater From Construction and Project Dewatering

The Los Angeles Regional Water Quality Control Board has issued a General NPDES Permit and General Waste Discharge Requirements (WDRs) (Order No. R4-2008-0032, NPDES No. CAG994004) governing construction-related dewatering discharges within the Project development areas (the "General Dewatering Permit.") This permit addresses discharges from temporary dewatering operations associated with construction and permanent dewatering operations associated with development. The discharge requirements include provisions mandating notification, sampling and analysis, and reporting of dewatering and testing-related discharges. The General Dewatering Permit authorizes such construction-related activities so long as all conditions of the permit are fulfilled. Compliance with the requirements of the General Dewatering Permit is used as one method to evaluate Project construction-related impacts on surface water quality.

3.6 Discharge of Fill or Dredge Materials

3.7 Lake or Streambed Alteration Agreement (LSAA)

The California Department of Fish and Wildlife (CDFW) is responsible for conserving, protecting, and managing California's fish, wildlife, and native plant resources. To meet this responsibility, the law requires the proponent of a Project that may impact a river, stream, or lake to notify the CDFW before beginning the Project. This includes rivers or streams that flow at least periodically or permanently through a bed or channel with banks that support fish or other aquatic life and watercourses having a surface or subsurface flow that support or have supported riparian vegetation.

Section 1602 of the Fish and Game Code requires any person who proposes a Project that will substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake or use materials from a streambed to notify the CDFW before beginning the Project. Similarly, under section 1602 of the Fish and Game Code, before any State or local governmental agency or public utility begins a construction Project that will: 1) divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake; 2) use materials from a streambed; or 3) result in the disposal or deposition of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into any river, stream, or lake, it must first notify the CDFW of the proposed Project. If the CDFW determines that the Project may adversely affect existing fish and wildlife resources, a Lake or Streambed Alteration Agreement is required.

3.8 City of Los Angeles Low Impact Development Ordinance

Los Angeles' LID ordinance became effective in May 2012. The main purpose of this law is to ensure that development and redevelopment projects mitigate runoff in a manner that captures rainwater at its source, while utilizing natural resources. Project applicants are required to prepare and implement a stormwater mitigation plan when their projects fall into any of these categories:

- Single-family hillside residential developments
- Housing developments of 10 or more dwelling units (including single family tract developments)
- Industrial/Commercial developments with one acre or more of impervious surface area
- Automotive service facilities
- Retail gasoline outlets
- Restaurants
- Parking lots of 5,000 square feet or more of surface area or with 25 or more parking spaces
- Projects with 2,500 square feet or more of impervious area that are located in, adjacent to, or draining directly to designated Environmentally Sensitive Areas (ESA)

4. SIGNIFICANCE CRITERIA

Criteria for determining the significance of impacts are based upon criteria contained in Appendix G of the CEQA Guidelines. The Project could have a significant effect upon hydrology and water quality if the Project:

a) Violates any water quality standards or waste discharge requirements.
b) Substantially depletes groundwater supplies or interferes substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).
c) Substantially alters the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site.
d) Substantially alters the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site.
e) Creates or contributes runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.
f) Otherwise substantially degrades water quality.
g) Places housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.
h) Places within a 100-year flood hazard area structures which would impede or redirect flood flows.
i) Exposes people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.
j) Exposes people to inundation by seiche, tsunami, or mudflow?

5. HYDROLOGIC AND WATER QUALITY IMPACTS

The Project will not place housing within the 100-year flood hazard area. Additionally, because the Project is located well away from steeply sloped areas and large water bodies, there is no opportunity for mudflows or seiche in the Project area. Consequently, these effects (Criteria g and j) are found have no impacts and are not evaluated further within this report.

5.1 Violate Water Quality Standards or Waste Discharge Requirements, or Degrade Water Quality (Criteria a and f)

Construction

The greatest potential to violate water quality standards or degrade water quality during construction would result from discharges of soil, spills or other constituents directly into the river, uncontrolled runoff of contaminated storm water into the river and discharges of contaminated water from dewatering into the river.

Project construction will be in and adjacent to the river channel. Consequently, there is a potential for siltation and sedimentation in the river channel from earthwork associated with construction. There is also the potential that fuel leaks and spills from construction equipment could enter the waterway. However, in order to receive authorization for the CWA Section 404 permit, the project applicant will have to demonstrate that it has (1) taken steps to avoid wetland impacts; (2) minimized potential impacts on wetlands; (3) provided compensation for any remaining unavoidable impacts.

In areas of active construction, soil erosion may also result in discharges of sediment-laden stormwater runoff into receiving waters if not properly controlled. Additional sediment input to the downstream surface water bodies from construction of the Project could contribute to degradation of downstream water quality and impairment of beneficial uses. Sediment can also be a carrier for other pollutants, such as heavy metals, nutrients, pathogens, oil and grease, fuels and other petroleum products. In addition to sediment, other pollutants associated with the various phases of construction, such as trash, paint, solvents, sanitary waste from portable restrooms, and concrete curing compounds, can discharge into and impair receiving waters if released during construction.

Therefore, Project construction period activities could generate stormwater runoff that may cause or contribute to a violation of water quality standards or waste discharge requirements, provide substantial additional sources of polluted runoff, or otherwise substantially degrade the receiving water quality.

The General Construction Permit includes conditions and requirements with the specific purpose of minimizing the discharge of contaminants from a construction site into surface and ground water.

Measures will also be implemented to protect receiving waters from dewatering and construction related non-stormwater discharges. Such discharges will be implemented in compliance with the Los Angeles RWQCB's General Waste Discharge Requirements (WDRs) under Order No. R4-2008-0032 (NPDES No. CAG994004) governing construction-related dewatering discharges within the Project development areas. Typical BMPs for construction dewatering include infiltration of clean groundwater; on-site treatment using suitable treatment technologies; on-site or transport offsite for sanitary sewer discharge with local sewer district approval; or use of a sedimentation bag for small volumes of localized dewatering.

Implementing specific measures highlighted in Mitigation Measure Hyd-1 would mitigate impacts that could result in violating water quality standards or waste discharge requirements from Project construction to a less than significant level.

Project Operation

The Project would result in a new side channel carrying river water through the project site. The operation of the proposed Project could change pollutant load through alteration of stormwater chemistry due to a change in land use. The property is currently being used for maintenance of MTA vehicles. While some maintenance will be required during the operation of the wheel and the water treatment system, it expected to be less frequent than current maintenance activities and fewer vehicles entering and exiting the site. This could potentially decrease the load of metals and petroleum hydrocarbons in stormwater runoff.

Additionally, the 80 gallons per minute of water in the Los Angeles River that gets pumped out of the channel by the Water Wheel will undergo filtration and UV treatment to remove particles and pathogens. The water will be treated to level to allow it to be safely used for spray irrigation. As such, conditions resulting in violating water quality standards or waste discharge requirements are not expected as a result of the Project.

5.2 Deplete Groundwater Supplies or Interfere with Recharge (Criteria b)

Dewatering activities may be required during excavation both for the side channel in the LA River and the Water Wheel housing pit. However, this activity will only remove shallow groundwater for a short period of time during construction of the Project and would not impact groundwater supplies which are drawn from deeper segments of the aquifer.

The proposed Site overlays the Central Los Angeles groundwater basin. Redeveloping the mostly paved site will not impact recharge as natural recharge to the basin.

Consequently there would be no impact on groundwater supplies.

5.3 Drainage Pattern Alteration Resulting in Erosion or Siltation on or Offsite (Criteria c)

During construction of the Project, construction activities would result in land-disturbing activities such as demolition of existing pavement, excavation, and trenching for utility infrastructure installation. These types of construction activities could result in minor temporary alterations of drainage patterns that expose soil to increased rates of erosion during Project construction periods. These minor alterations to drainage patterns would not result in significant erosion or siltation on or offsite, especially with the implementation of Hyd-1.

Post-construction (e.g., operational), though a new side channel to the river will be present on the project site, the overall drainage patterns will not be greatly altered from their current state. The post-construction flows through the side channel will not substantially increase

rates of erosion or siltation. Additionally erosion from storm water runoff will not increase due to the fact that the impermeable area of the site will remain the same or be reduced. Impacts would be less-than-significant.

5.4 Drainage Pattern Alteration Resulting in Flooding or Exceedance of Existing Stormwater Facility Capacity (Criteria d and e)

As stated above, the proposed Project would not substantially change the current drainage pattern or increase runoff volume. The flows to the existing storm water drainage system will stay the same or slightly decrease so the capacity of the existing system will not be exceeded as a result of the Project. There are no new storm water pollution sources associated with the project so the Project would not result in substantional additional polluted runoff. Therefore, Project impacts associated with storm water quantity and quality would be less than significant.

5.5 Places Structures Within a 100-yr Flood Hazard Area Which Would Impede or Redirect Flows (Criteria h)

No structures associated with the Project will be located in the 100-year flood hazard area other than the inflatable dam and new side channel that will connect to the LA River, The inflatable dam that will be placed in the LA River as part of this project will be designed to pool water during low flow conditions. When storms are predicted to occur in the contributing area to the Project Site, programed controls will automatically lower the dam and release stored water so that flood flows can pass unimpeded with no impact to the pre-project water surface elevations. Controls will be programmed to have redundancy to ensure the dam is in the lowered position when elevated river flows reach the area of the Site.

All proposed designs will be approved by the USACE through the Section 408 permit process. It is anticipated that this project will qualify for a Minor 408 because it is not expected to permanently altar the hydraulic capacity of the river. The USACE's existing HEC-RAS model, which is used by FEMA to determine flood hazard areas, will be used to evaluate all channel alterations to ensure they will not result in changes to the water surface elevation during flood conditions. Potential impacts related to impeding or redirecting flood flows would be less than significant.

5.6 Exposes People or Structures to a Significant Risk of Loss, Injury or Death Involving Flooding, Including Flooding as a Result of the Failure of A Levee or Dam (Criteria i)

As discussed in Section 2.1, the Project Site is located at the edge of a dam failure inundation zone. This is not expected to create a significant risk for visitors to the site, because inundation depths are shallower at the borders of inundation areas, and areas outside of the inundation area are within less than one half mile from the project site in a direction that is easily accessible by foot.

The structures that would be installed within the dam failure inundation area could sustain flood damage in the event of a dam failure. The water wheel structure will be exposed to water during operations and the damage to this structure from being exposed to flood waters would likely be minor. Ancillary buildings and facilities would have water damage that could be costly, especially the electronics associated with the project. These structures would not be considered critical infrastructure and this impact would be considered less than significant.

6. MITIGATION MEASURES

The following mitigation measures will serve to reduce potential hydrology and water quality impacts associated with the Project to a less than significant level:

Hyd-1: Consistent with the requirements of the statewide Construction General Permit, the Project applicant shall prepare and implement a SWPPP designed to reduce potential adverse impacts to surface water quality through the Project construction period. The SWPPP shall be designed based on the assessed Project Risk Level to address the following objectives: (1) all pollutants and their sources, including sources of sediment associated with construction, construction site erosion and all other activities associated with construction activity are controlled; (2) where not otherwise required to be under a RWQCB permit, all non-storm water discharges are identified and either eliminated, controlled, or treated; (3) site BMPs are effective and result in the reduction or elimination of pollutants in stormwater discharges and authorized non-stormwater discharges from construction activity to the BAT/BCT standard; (4) calculations and design details as well as BMP controls for site run-on are complete and correct; and (5) stabilization BMPs installed to reduce or eliminate pollutants after construction are completed.

The SWPPP shall prepared by a Qualified SWPPP Developer. The SWPPP shall include the minimum BMPs required in Attachment D for the assessed Project Risk Level. The Project Risk Level would be determined as part of the Notice of Intent for coverage under the Construction General Permit. These include: BMPs for erosion and sediment control, site

management/housekeeping/waste management, management of non-stormwater discharges, infiltration and runoff controls, and BMP inspection/maintenance/repair activities.

The SWPPP shall include a construction site monitoring program that identifies requirements for dry weather visual observations of pollutants at all discharge locations, and as appropriate (depending on the Risk Level), sampling of the site effluent and receiving waters (receiving water monitoring is only required for some Risk Level 3 dischargers). A Qualified SWPPP Practitioner shall be responsible for implementing the BMPs at the site and performing all required monitoring and inspection/maintenance/repair activities. If the Project is Risk Level 2 or 3, the Project applicant shall also prepare a Rain Event Action Plan as part of the SWPPP.

The following are the types of BMPs that shall be implemented for the Project:

- Erosion Control BMPs
- Sediment Control BMPs
- Wind Erosion Control BMPs
- Tracking Controls
- Non-Stormwater Controls
- Waste Management and Materials Pollution Control BMPs

7. REFERENCES

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