

## TECHNICAL MEMORANDUM

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**Date:** November 14, 2014      **BKF No.:** 20136004-20

**To:** Clarke Miller  
Strada Investment Group

**From:** Sravan Paladugu, P.E.  
Jacob Nguyen, P.E.

**Subject:** Mission Bay Blocks 29-32 – Water Demand Memorandum

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### A. BACKGROUND

The Golden State Warriors organization (GSW) proposes to construct a multi-purpose event center and buildings for other uses on approximately 12-acres located in San Francisco, California (Project). The 12-acre Project site is made up of land referred to as Blocks 29, 30, 31, and 32 (Blocks 29-32) in the Mission Bay South Project Area, a redevelopment area located east of Highway-280 in San Francisco. The site is bounded by Terry A Francois Boulevard to the east, 3<sup>rd</sup> Street to the west, 16<sup>th</sup> Street to the south and South Street to the north and is currently vacant except for surface parking.

Prior to GSW acquisition of the Project site, Blocks 29-32 were planned to be developed as an office space. The office space was studied in the Mission Bay Environmental Impact Report prepared and approved in 1998 and would have included an adjusted square footage of one (1) million. The water usage from the entitled office space was also studied as part of the 98 EIR was estimated to be approximately 0.15 Million Gallons per Day (MGD).

The purpose of this memorandum is to determining future water demand for the proposed Project and the approach used in estimating the demand. This technical memorandum will assist San Francisco Public Utilities Commission (SFPUC) in preparing the Water Supply Assessment (WSA) for the Project per California Water Code Sections 10910 et seq.

The memorandum dated March 13, 2013, from SFPUC requires Project proponents to provide, a) a description of the Project, and b) proposed indoor and outdoor water uses, as part of the Project Demand Memo. The following sections discuss the required items in detail.

### B. Project Description

GSW proposes to construct a multi-purpose event center and ancillary structures including multiple office buildings, retail, restaurants, structure parking, plaza areas, and other amenities on Blocks 29-32. A summary of the various components of proposed Project are included in Table 1 and are discussed below.

#### Event Center

The proposed Event Center would have a seating capacity of 18,064 seats, encompass approximately 775,000 gross square feet in area. The Event Center would serve as the new home of the Golden State

Warriors. The Event Center would host all the home games for the Golden State Warriors, as well as provide a year-round venue for a variety of other uses including concerts, family shows, conferences, conventions, cultural events and other sporting events.

The Event Center main floor would include a full length NBA basketball court for Warriors basketball games, which can also accommodate a stage for performances. Other supporting Event Center facilities would include player/performer locker rooms, club and press areas, concessions, restrooms, a commissary, and a large marshalling area. The Warriors practice facility and support offices would also be integrated within the Event Center.

The practice facility would include two full-length NBA basketball courts with approximately 21,000 square feet of playing surface, a weight room and medical treatment facilities, locker rooms, and a players' lounge. The support offices would accommodate Warriors management, coaching and operations staff, administration, finance, marketing, broadcasting, merchandising, public relations, and ticket operations. The Event Center would be surrounded by large open plaza areas connected by ramps.

#### Office, Retail and Restaurant Uses

The Project would include two office buildings, each eleven (11) stories high, on the northwest and southwest corners of the site. The office buildings would encompass approximately 580,000 gross square foot in area. The Project would also include retail space occupying multiple areas of the site, including the lower floors of the office buildings, within or adjacent to certain plaza-facing areas of the Event Center.

The retail space would be approximately 125,000 square feet of which 62,500 square feet would be used for soft goods retail and the remaining for restaurants. Approximately 51,500 square feet of the restaurant space would be used for sit-down type restaurant and the other 11,000 square feet would be used for quick-serve type facilities.

#### Parking and Open Space

The Project would include 950 parking stalls in a parking structure with below-grade parking and at-grade/below-podium levels, all concealed from the public's view. The total parking and loading area is approximately 475,000 square feet.

The Project open space area would be approximately 180,000 square feet and would constitute of large plaza areas, terrace areas at various levels, landscaped areas and green roof areas. The open space at plaza level is approximately 140,000 square feet. The total landscape area is conservatively estimated to be approximately 30,000 square feet (i.e., 6% of the Project area required for storm water management). Green roof areas are proposed over the two office podiums that are approximately 40,000 square feet in area. The podiums would be at 90-feet above the street level.

Table 1 below provides a summary of the proposed land-uses, gross square footage, types of events, and number of days that the events are anticipated to occur. The employment and average event attendance figures are provided by GSW for the purpose of calculating water demand.

Table 1: Blocks 29-32 Summary of Proposed Land Uses

Project Component	Floor Area (GSF)	Capacity /No. of Seats	Event Type	No. of Events Per Year	Full-time Employees	Event Employees	Average Attendance
Event Center	775,000	18,064	Pre-season games	3	n/a	1000	11,000
			Regular season games	41	n/a	1000	17,000
			Playoffs (Maximum possible)	16	n/a	1000	18,000
			Total non-Warriors games	<u>161</u>			
			- Concerts	30	n/a	775	12,500
				15	n/a	675	3,000
			- Family Shows	55	n/a	675	5,000
			- Other Sporting Events	30	n/a	675	7,000
			- Conventions/ Corporate Events	31	n/a	675	9,000
Practice Facility & Training Areas <sup>(1)</sup>	21,000		Practice/training	50	Part of management staff below	30	n/a
Event Management & Team Operations <sup>(1)</sup>	40,000		Ongoing team/arena operations (Mon-Fri)	240	255	n/a	n/a
Kitchen <sup>(1)</sup>	32,260			221	n/a	Part of event staff above	n/a
GSW Office Space <sup>(1)</sup>	25,000			240	Part of management staff above	n/a	n/a
Office Buildings	580,000			260	2,101	n/a	n/a
Retail	62,500			n/a	372	n/a	
Restaurants	62,500			n/a		n/a	
Parking	475,000	950					
Landscape Area <sup>(2)</sup>	70,000						
Open Space <sup>(3)</sup>	110,000						

Notes:

(1) The 775,000 GSF noted for the Event Center includes the square footage identified for these uses.

(2) Includes landscape area at all levels (i.e., approximately 30,000 Sq.Ft. of landscape at plaza level and 40,000 Sq.Ft. at all other levels for storm water management.

(3) Open Space excludes 30,000 Sq.Ft. of landscaped area from roughly 140,000 Sq.Ft. (i.e., 3.2 acres) of open space at plaza level.

## C. Water Demand

### I. Current (Vested) Project Water Demand

Blocks 29-32 were originally planned to be developed as an office space with an adjusted square footage of approximately one (1) million. Water demand from the office space was studied in the Mission Bay Environmental Impact Report prepared and approved in 1998 (98 EIR). The water usage from the entitled office space was estimated to be approximately 0.15 Million Gallons per Day (MGD).

### II. Proposed Project Water Demand

The water demand for the proposed Project was calculated using the gross square footage of different land-uses and forecasted employment and visitor attendance data provided by GSW. The Project water consumption occurs indoor and outdoor. Indoor water consumption primarily includes water used in restrooms, bathrooms, kitchen, laundry, cleaning and by cooling appliances. Outdoor uses include water used for irrigating landscaped areas and for cleaning/washing-down hardscape areas.

#### 1. Methodology

Water consumption for the proposed land uses was estimated based on: a) end-use (i.e, fixture and/or appliance) where there is adequate Project data to reasonably predict uses, and, b) using standard consumption factors developed for similar land-uses as part of research studies and other projects water demand assessments. The following paragraphs discuss in detail the approach used in estimating demand from each individual land use.

##### Event Center

Water consumption during events was estimated using end-use approach. The events hosted at the Event Center are expected to attract a significant crowd of spectators whose primary water usage will be in restrooms. Therefore, restroom water usage is anticipated to account for approximately half of the Event Center's water consumption. Visitor restroom usages include lavatory faucets, urinals and water closets. The restroom end-use fixture baseline flow rates, duration and average daily use were taken from the 2009 LEED Reference Guide for Green Building Design and Construction (LEED). The LEED recommended average daily use of fixtures was increased where deemed necessary to reflect Project specific use. For example, LEED recommends that only 50% of visitors will use restroom. But for this estimate, it was assumed that 100% of the visitors will use restroom at least once during the event to be conservative.

The second largest water consumption comes from full-time and part-time employees. The end-use water demand from full-time employees is calculated separately from visitors as the frequency of usage is different and there are additional end-uses such as shower, kitchen faucet, and laundry that are not used by visitors. The end-use water demand for part-time employees is calculated by reducing full-time employee demand by 25% since part-time employees are anticipated to work 6-hours during event days. Conservative assumptions were made to estimate onsite laundry water demand. Laundry items such as bath towels and sports towels are assumed to be generated from 30% of the employees. The factors used in calculating water consumption by the end-use approach are presented in Table 8.

Standard water consumption factors are used for other Event Center uses such as food services and HVAC/cooling, for which end-use details are not available. A standard factor for fast food restaurants was used to estimate the Event Center food service water demand. This approach is conservative in that fast food restaurants typically operate during longer hours than the food service areas at the Event Center, which are limited to event hours.

#### Office and Retail Components

The primary water consumption in an office space is from full-time employees using restrooms and kitchen/break rooms. The total number of full-time employees was calculated using a standard rate of 200 square foot per employee and applying that to the total gross square footage. Restroom usages include shower, lavatory faucets, urinals and toilets (water closets). Kitchen/break room usages include faucets and dishwasher. Other end-uses include water used for HVAC/Cooling equipment and indoor cleaning.

The primary water consumption within the retail uses is water used by employees and customers in restrooms. The factors used in calculating water consumption by end-use and references are presented in Table 8.

#### Restaurant Component

The proposed restaurant uses will include quick serve food areas and sit-down restaurants. Standard water consumption factors were used to estimate demand for both types of restaurant uses. A standard consumption factor developed by American Water Works Association (AWWA) was used to predict restaurant water use. The factors and total demand calculations from these uses are presented in Table 6 and 7.

#### Outdoor Water Use

Outdoor water uses at the site will include water used for cleaning hardscape areas and irrigating landscaped areas. The irrigation water demand is estimated using San Francisco's average monthly rainfall, evapotranspiration and plant species factors provided in the outdoor water demand calculators developed by the California State Water Resources Control Board and SFPUC. A plant species factor of 0.5 was used for all landscape areas. The water used for cleaning outdoor hardscape areas and indoor facilities (i.e., Event Center floor areas, walkways, windows, restrooms, etc) was based on information gathered from local vendors.

## 2. Baseline Water Demand

The baseline demand is calculated by applying the baseline fixture flow rates provided in the 2009 LEED Reference Guide to end-uses. Table 2 below summarizes the baseline water demand for the various components of the Project.

**Table 2: Summary of Baseline Water Demand**

Project	Project Component	Floor Area (GSF)	Water Use (MGD)
Blocks 29-32	Event Center	775,000	0.032
	Office Buildings	580,000	0.042
	Retail	62,500	0.011
	Restaurants	62,500	0.028
	Landscape	70,000	0.001
	Washdown & Facility Cleaning		0.002
	<b>Total</b>		<b>0.117</b>

Note: See Table 6 and Table 8 (attached) for detailed calculations used in determining the baseline water demand.

### 3. Adjusted Water Demand for Code

Water conservation measures required as part of the 2011 San Francisco Green Building (SFGB) requirements of Chapter 13C of the San Francisco Building Code will be implemented by the Project. The conservation measures include reducing water consumption using fixtures with low flow rates prescribed by the SFGB requirements for prescriptive approach (Table 13C.5.303.2.3). As such, the baseline demand in the section above was adjusted to new fixture flow rates to calculate the actual anticipated demand.

Other water conservation techniques such as use of water efficient pre-rinse spray valves for food preparation, energy efficient clothes washers and dish washers, and cooling appliances may be used throughout the Project but are not included in calculating water demand. The total water demand after application of conservation measures is shown in the Table 3 below.

**Table 3: Summary of Adjusted Water Demand for Code**

Project	Project Component	Floor Area (GSF)	Water Use (MGD)
Blocks 29-32	Event Center	775,000	0.025
	Office Buildings	580,000	0.036
	Retail	62,500	0.008
	Restaurants	62,500	0.028
	Landscape	70,000	0.001
	Washdown & Facility Cleaning		0.002
	<b>Total</b>		<b>0.100</b>

Note: See Table 7 and Table 8 for detailed calculations used in determining water demand with conservation measures.

## D. Summary

Blocks 29-32 water demand for the originally planned one (1) million square foot office space was estimated in the Mission Bay EIR prepared in 1998 to be approximately 0.15 MGD.

The new water demand for the proposed Project at Blocks 29-32 is estimated to be 0.100 MGD. Construction of the Project is anticipated to begin in late 2015 with completion in late fall 2017. A summary of the anticipated water demand for Project phasing is shown below in Table 4.

**Table 4: Water Demand based on Project Phasing**

	2017	2018	2020
Total Demand of proposed Project (MGD)	0	0.100	0.100

The anticipated total water demand for the proposed Project during normal years and single or multiple dry years is shown below in Table 5.

**Table 5: Water Demand based on Water Year Type**

	Normal	Single dry	Multiple 2	Multiple 3
Total Demand of proposed Project (MGD)	0.100	0.100	0.100	0.100

## E. Attachments

Table 6: Blocks 29-32 Water Demand by Project Component – Baseline

Table 7: Blocks 29-32 Water Demand by Project Component – Adjusted for Code (with Water Conservation)

Table 8: Blocks 29-32 Water Consumption by End-Use (Baseline and Adjusted)



## F. References

American Water Works Association. Commercial and Institutional End Uses of Water, 2000

California Building Standards Commission. 2009. 2008 California Green Building Standard Code. California Code of regulations, Title 24, Part II.

California Department of Water Resources, 2008. Modified text of proposed regulation. California Water Efficient Landscape Ordinance. California Code of Regulations, Title 23, Section 490 – 495. November 2008.

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Economic and Planning Systems, 2009. Working Draft Report, Fiscal Analysis of the Candlestick Point – Hunters Point Shipyard Redevelopment Project, updated May 13, 2009.

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EPA Water Sense, 2009. Water Efficiency in the Commercial and Institutional Sector: Considerations for a Watersense Program.

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Pacific Institute, 2003. Waste Not, Want Not: The Potential for Urban Water Conservation in California, November 2003.

US Green Building Council, 2009. 2009 LEED Reference Guide For Green Building Design and Construction.

San Francisco Green Building Requirements, 2011. Administrative Bulletin Title: Implementation of Green Building Regulations, dated January 1, 2011

San Francisco Public Utilities Commission, 2011. 2010 Urban Water Management Plan for the City and County of San Francisco.

# TABLES

Table 6 - Blocks 29-32 Water Demand by Project Component - Baseline

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Table 7 - Blocks 29-32 Water Demand by Project Component - Adjusted

Event Center	Employees		Visitors/ Spectators <sup>(a)</sup>	Water Use (gal/day/capita)		No. of Days <sup>(a)</sup>	Annual Water Use (gal)	MGD
	Full-time <sup>(a)</sup>	Event/Part-time <sup>(a)</sup>		Employee <sup>(h)</sup>	Visitor <sup>(h)</sup>			
Events								
Pre-season Games		1,000	11,000	10	2	3	85,598	0.000
Regular Season Games		1,000	17,000	10	2	41	1,632,313	0.004
Playoffs (Maximum Possible)		1,000	18,000	10	2	16	667,080	0.002
Concerts		775	12,500	10	2	30	887,571	0.002
		675	3,000	10	2	15	164,107	0.000
Family Shows		675	5,000	10	2	55	808,524	0.002
Other Sporting Events		675	7,000	10	2	30	553,813	0.002
Conventions/Corporate Events		675	9,000	10	2	31	688,834	0.002
Management & Operations	255			10	2	240	640,764	0.002
	GSF <sup>(a)</sup>	Unit Rate (gal/day/unit)		Unit	No. of Units	No. of Days <sup>(a)</sup>	Annual Water Use (gal)	MGD
Kitchen <sup>(b)</sup>	32,260	300		1,000 Sq. Ft.	32	221	2,138,838	0.006
Cooling <sup>(c)</sup>	775,000	3		1,000 Sq. Ft.	775	365	866,368	0.002
Event Center Total =							9,133,808	0.025
Other Components	GSF <sup>(a)</sup>	Unit Rate (gal/day/unit)		Unit	No. of Units	No. of Days <sup>(a)</sup>	Annual Water Use (gal)	MGD
Office Buildings <sup>(d)</sup>	580,000	87		1,000 Sq. Ft.	580	260	13,052,306	0.036
Retail <sup>(d)</sup>	62,500	123		1,000 Sq. Ft.	63	365	2,810,500	0.008
Restaurant								
Quick Serve <sup>(b)</sup>	11,000	300		1,000 Sq. Ft.	11	365	1,204,500	0.003
Sit Down <sup>(f)</sup>	51,500	24		Seat	1,030	365	9,097,990	0.025
Landscape <sup>(g)</sup>	70,000						540,670	0.001
Washdown & Facility Cleaning <sup>(i)</sup>							758,441	0.002
Project Total =							36,598,215	0.100

Notes:

GSF - Gross Square Footage

MGD - Million Gallons Per Day (MGD = Annual Water Use (gal)/365x10<sup>6</sup>)

(a) Floor area, type of events, number of events and anticipated number of employees and visitors are provided by GSW Arena LLC.

(b) Water demand for kitchen is assumed to be similar to fast food restaurants. The demand factor is taken from LADWP Water Supply Assessment for the Convention and Event Center Project date January 2012.

(c) Cooling demand is derived from the existing central plant water demand for Staples Center. The annual cooling water demand (1,062,000 gal/yr) for Staples center is divided by GSF (950,000 sq.ft.).

(d) Refer to Table 8 for Unit Rate generation calculations.

(e) Anticipated retail and cinema employees and customer data is provided by GSW Arena LLC.

(f) Flow rate taken from Commercial and Institutional End Uses of Water report by American Water Works Association (Table 2.14). Assumed four seats in a 10-ft X 10-ft dining area covering 50% of GSF.

(g) Annual landscape demand is estimated using SFPUC Non-Potable Water Demand Calculator using a species factor of 0.5.

(h) Employee and Visitor demand is calculated in Table 8.

(i) Includes washdown of outdoor hardscape areas and other miscellaneous cleaning activities such as event center indoor cleaning (floor/walkway, glass, restrooms, etc). Refer to Table 8 for breakdown. The standard demand factor used for restaurant includes cleaning and sanitization.

**Table 8 - Blocks 29-32 Water Consumption By End-Use (Baseline and Adjusted)**

Event Center End Uses									
1. Visitors		Baseline					Adjusted for Code		
Type	Baseline Rate <sup>(a)</sup>	Unit	No. of Units <sup>(c)</sup>	Unit	Ave Daily Use <sup>(c)</sup>	GPD per Visitor	Rate (w/ Code) <sup>(e)</sup>	Unit	GPD per Visitor
Lavatory Faucet	0.5	gal/min	0.25	min	1	0	0.4	gal/min	0
Urinals	1	gal/flush	1	flush	1	1	0.5	gal/flush	1
Toilet (Water Closet)	1.6	gal/flush	1	flush	1	2	1.28	gal/flush	1
Misc						0			0
Sub-Total =						3	Sub-Total = 2		
2. Full-Time Employees		Baseline					Adjusted for Code		
Type	Baseline Rate <sup>(a)(b)</sup>	Unit	No. of Units <sup>(b)(d)</sup>	Unit	Ave Daily Use <sup>(b)(d)</sup>	GPD per Employee	Rate (w/ Code) <sup>(e)</sup>	Unit	GPD per Employee
Showerhead	2.5	gal/min	5	min	0.3	4	2	gal/min	3
Lavatory Faucet	0.5	gal/min	0.25	min	3	0	0.4	gal/min	0
Urinals	1	gal/flush	1	flush	2	2	0.5	gal/flush	1
Toilet (Water Closet)	1.6	gal/flush	1	flush	4	6	1.28	gal/flush	5
Kitchen Faucet	2.2	gal/min	0.25	min	1	1	1.8	gal/min	0
Laundry	4	gal/pound	0.5	pound	0.3	1	4	gal/pound	1
Sub-Total =						14	Sub-Total = 10		

Notes:  
(a) Baseline flow rate for showerhead, bathroom faucet, toilet, urinals and kitchen faucet are taken from 2009 LEED Reference Guide For Green Building Design and Construction(WE Table 1).  
(b) Gallons of water used by laundry per pound of fabric is taken from webpage @ http://www.allianceforwaterefficiency.org/commercial\_laundry.aspx. The equipment type is assumed to be a waher-extractor which is typical fro small to medium size laundries. Laundry is assumed to be generated by players and event performers from showers and other activities. 30% of all the employees are assumed to be players and event performers.  
(c) Duration and Average daily use suggested in the 2009 LEED Reference Guide For Green Building Design and Construction (WE Table 2) were increased to be specific to event uses. All visitors/spectators are assumed to use the restrooms.  
(d) Duration and Average daily use of fixture flow rates are taken from 2009 LEED Reference Guide For Green Building Design and Construction (WE Table 2). Average daily use of showerhead is increased from 0.1 to 0.3.  
(e) Flow rate based on maximum flow rate prescribed by 2011 SF Green Building Requirements (Table 13C.5.303.2.3).

Office End Uses										
1. Full-Time Employees		Baseline					Adjusted for Code			
Type	Baseline Rate <sup>(a)(b)</sup>	Unit	No. of Units <sup>(b)(d)</sup>	Unit	Ave Daily Use <sup>(b)(d)</sup>	GPD per Employee	Rate (w/ Code) <sup>(e)</sup>	Unit	GPD per Employee	
Showerhead	2.5	gal/min	5	min	0.3	4	2	gal/min	3	
Lavatory Faucet	0.5	gal/min	0.25	min	3	0	0.4	gal/min	0	
Urinals	1	gal/flush	1	flush	2	2	0.5	gal/flush	1	
Toilet (Water Closet)	1.6	gal/flush	1	flush	4	6	1.28	gal/flush	5	
Kitchen Faucet	2.2	gal/min	0.25	min	1	1	1.8	gal/min	0	
Sub-Total =						13	Sub-Total = 10			
GSF/Employee =						200	GSF/Employee = 200			
GPD per 1,000 GSF =						65	GPD per 1,000 GSF = 49			
2. Dishwasher		11.15	gal/cycle	1	cycle	1	11	11.15	gal/cycle	11
3. HVAC/Cooling Demand <sup>(f)</sup>		0.0196	gal/sf	1000	sf	1	20	0.0196	gal/sf	20
4. Indoor Floor Cleaning <sup>(g)</sup>		0.75	gal/min	4	min/1,000 sf	0.7	2	0.75	gal/min	2
5. Misc (assumed to be 5%)							4	4		
Total GPD per 1,000 GSF =						103	Total GPD per 1,000 GSF = 87			

Notes:  
(a) Baseline flow rate for showerhead, bathroom faucet, toilet, urinals and kitchen faucet are taken from 2009 LEED Reference Guide For Green Building Design and Construction(WE Table 1).  
(b) Gallons of water used by laundry per pound of fabric is taken from webpage @ http://www.allianceforwaterefficiency.org/commercial\_laundry.aspx. The equipment type is assumed to be a waher-extractor which is typical fro small to medium size laundries. Laundry is assumed to be generated by players and event performers from showers and other activities. 30% of all the employees are assumed to be players and event performers.  
(c) Duration and Average daily use suggested in the 2009 LEED Reference Guide For Green Building Design and Construction (WE Table 2) were increased to be specific to event uses. All visitors/spectators are assumed to use the restrooms.  
(d) Duration and Average daily use of fixture flow rates are taken from 2009 LEED Reference Guide For Green Building Design and Construction (WE Table 2). Average daily use of showerhead is increased from 0.1 to 0.3.  
(e) Flow rate based on maximum flow rate prescribed by 2011 SF Green Building Requirements (Table 13C.5.303.2.3).  
(f) Water demand for cooling is taken from SFPUC Potable Offset Investigation, April 2012. Water required is the average for 12-months.  
(g) Indoor cleaning flow rate and time required are taken from www.tomcatequip.com. The specs for MAGNUM floor scrubber dryer recommended for sports arena are used. The suggested cleaning rate is 26,000 sf/hr but 15,000 sf/hr is used for calculations to be conservative.

**Table 8 - Blocks 29-32 Water Consumption By End-Use (Baseline and Adjusted)**

Retail End Uses										
1. Customer		Baseline					Adjusted for Code			
Type	Baseline Rate <sup>(a)</sup>	Unit	No. of Units <sup>(b)</sup>	Unit	Ave Daily Use <sup>(b)</sup>	GPD per Customer	Rate (w/ Code) <sup>(c)</sup>	Unit	GPD per Customer	
Lavatory Faucet	0.5	gal/min	0.25	min	0.5	0		0.4	gal/min	0
Urinals	1	gal/flush	1	flush	0.4	0		0.5	gal/flush	0
Toilet (Water Closet)	1.6	gal/flush	1	flush	0.6	1		1.28	gal/flush	1
Sub-Total =						1	Sub-Total =		1	
GSF/Customer =						10	GSF/Customer =		10	
GPD per 1,000 GSF =						142	GPD per 1,000 GSF =		102	
2. Employee		Baseline					Adjusted for Code			
Type	Baseline Rate <sup>(a)</sup>	Unit	No. of Units <sup>(b)</sup>	Unit	Ave Daily Use <sup>(b)</sup>	GPD per Employee	Rate (w/ Code) <sup>(c)</sup>	Unit	GPD per Employee	
Lavatory Faucet	0.5	gal/min	0.25	min	3	0		0.4	gal/min	0
Urinals	1	gal/flush	1	flush	2	2		0.5	gal/flush	1
Toilet (Water Closet)	1.6	gal/flush	1	flush	4	6		1.28	gal/flush	5
Sub-Total =						9	Sub-Total =		6	
GSF/Employee =						300	GSF/Employee =		300	
GPD per 1,000 GSF =						29	GPD per 1,000 GSF =		21	
Total GPD per 1,000 GSF =						172	Total GPD per 1,000 GSF =		123	
Notes:										
(a) Baseline flow rate for Lavatory faucet, toilet and urinals are taken from 2009 LEED Reference Guide For Green Building Design and Construction(WE Table 1).										
(b) Duration and Average daily use of fixture flow rates are taken from 2009 LEED Reference Guide For Green Building Design and Construction (WE Table 2). Average daily use of "Visitor" was used for customers instead of "Retail Customer" uses from WE Table 2 as it seemed more reasonable.										
(c) Flow rate based on maximum flow rate prescribed by 2011 SF Green Building Requirements (Table 13C.5.303.2.3).										
Washdown & Facility Cleaning										
Type	Flow Rate <sup>(a)(b)</sup>	Unit	No. of Units <sup>(a)(b)</sup>	Unit	Ave Yearly Use <sup>(c)</sup>	GPY per 1,000 GSF				
Outdoor Hardscape Washdown	5	gal/min	30	min/1,000 sf	4	600				
Project Annual Water Use (gal) =						66,000				
(using harscape area of 110,000 sf)										
Parking Area Washdown	5	gal/min	30	min/1,000 sf	2	300				
Project Annual Water Use (gal) =						142,500				
(using parking GSF of 475,000 sf)										
Indoor Floor Cleaning	0.75	gal/min	4	min/1,000 sf	221	663				
Project Annual Water Use (gal) =						513,825				
(using GSF of 775,000 sf)										
Misc Cleaning (assumed to be 5%)						36,116				
Total GPY =						758,441				
Notes:										
(a) Outdoor power wash flow rate and time required are based on information gathered from local vendors (Puma Power Wash, San Francisco & Clean 'n Seal, Brentwood, CA). A similar flow rate is also provided in the 2008 Watersmart Guidebook prepared by EBMUD.										
(b) Indoor cleaning flow rate and time required are taken from www.tomcatequip.com. The specs for MAGNUM floor scrubber dryer recommended for sports arena are used. The suggested cleaning rate is 26,000 sf/hr but 15,000 sf/hr is used for calculations to be conservative.										
(c) Outdoor hardscape area cleaning is assumed to be occur 4 times/year. General cleaning practice is 2 to 3 times/year based information provided by local vendors. Indoor floor is assumed to be cleaned after every event.										