

6.0 EXISTING FACILITIES

Currently, the City operates and maintains an extensive water conveyance system, including approximately 140 miles of water pipelines with the largest pipe diameter of 45 inches. Approximately 56 percent of the water pipelines in the system are 6 to 8 inches in diameter. The majority of system pipe material is cast iron pipe, totaling 67 percent of all pipelines. The second most common material is ductile iron pipe, making up 25 percent of the system.

A summary of the City’s water system is shown in Table 6-1 and details of each facility are discussed in this Chapter.

Table 6-1 – City’s Existing Facilities

Facilities (Capacity)	
Water Supply Facilities	<ul style="list-style-type: none"> • One imported water turnout connection to 45-inch diameter MWD West Basin Feeder (15 cfs) • Well 11A (1,800 gpm) • Well 15 (1,500 gpm)
Water Distribution System	<ul style="list-style-type: none"> • Two pressure zones • Approximately 140 miles of pipelines • One pressure monitoring station
Pump Stations	<ul style="list-style-type: none"> • Block 35 Booster Pump Station (four pumps, 1,715 gpm each) • Peck Booster Pump Station (four pumps, 2,200 gpm each) – upgraded, not online during this Master Plan update • Larsson Booster Pump Station (three pumps, 580 gpm each) • 2nd Street Booster Pump Station which serves as a backup for Larsson Pump Station (one pump, 2,302 gpm)
Storage Reservoirs	<ul style="list-style-type: none"> • One ground level reservoir at Block 35 Facility (2 MG) • One elevated tank at Block 35 Facility (0.3 MG) • One partially buried forebay reservoir at the Peck Facility (8 MG) – upgraded, not online during this Master Plan update
Interagency Connection	<ul style="list-style-type: none"> • Two emergency connections with City of El Segundo • One emergency connection with California Water Service transmission main • Total capacity for all three connections is approximately 23 cfs

6.1 WATER SUPPLY FACILITIES

6.1.1 Imported Water Turnouts

The City has one turnout connection (WB-04) importing water from MWD, operated by WBMWD. The ground elevation is approximately 80 feet above mean sea level (amsl) at this location. The City has an existing 18-inch pipeline connected to the MWD’s 45-inch West Basin Feeder, which enters the City from the east in Manhattan Beach Boulevard. MWD imported water capacity is 15 cubic feet per second (cfs) at a minimum pressure of 83.5 pounds per square inch (psi) at the outlet of its meter. When the City’s system is directly supplied from the MWD connection, the minimum discharge hydraulic grade line is at 272 feet (Figure 6-1) with 15 cfs flow. Table 6-2 provides details of the City’s imported water turnout.

Table 6-2 – Imported Water Turnouts

Turnout	Ground Elevation (feet)	Allocated Capacity (cfs)	2013-2020 Average Annual Production (AF)
WB-04	80	15	4,034

6.1.2 Groundwater Wells

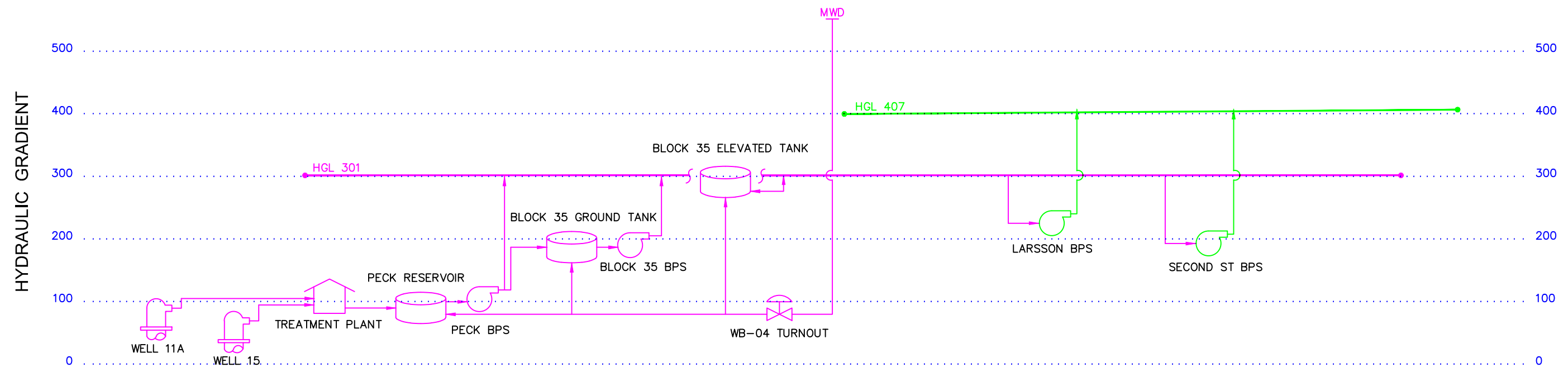
The City owns three wells, two active wells (Well 11A and 15) and one inactive well (Well 13). Well 13 has been abandoned since 1982. Well 11A and Well 15 have a production capacity of approximately 1,800 and 1,500 gpm, respectively, which equates to 3,300 gpm total maximum capacity. The City typically uses the wells during higher demand conditions only, pumping for a certain period of time, and primarily relies on imported water supply. The City’s total annual groundwater entitlement is up to 1,357 afy (840 gpm). Table 6-3 provides detailed information of the City’s wells and Figure 6-1 shows the well locations owned by the City based on the information provided.

Table 6-3 – Groundwater Wells

Well Number	Ground Surface Elevation (feet)	Capacity (gpm)	Motor (hp)	Status	Year Installed	2013-2020 Average Annual Production (AF)
13	119	585	-	Abandoned	1949	-
11A	90	1,800	300	Active	1998 ^a	62
15	69	1,500	300	Active	1979	765

a) Well 11A equipped in 2000

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| RESERVOIR | | PRESSURE ZONE | |
| PUMP STATION | | MAIN (LOW) ZONE | |
| GROUND WATER WELL AND PUMP | | HILL (HIGH) ZONE | |
| TREATMENT PLANT | | | |
| MWD CONNECTION TREATED WATER | | | |

TITLE: **Figure 6-1 -- Water Distribution System Hydraulic Schematic**
 PROJECT: City of Manhattan Beach Water Master Plan
 COORDINATE SYSTEM: NAD 1983 StatePlane California V FIPS 0405 Feet



6.2 WATER DISTRIBUTION SYSTEM

The City’s water distribution system is connected to the MWD turn out at WB-04, located at the intersection of Manhattan Beach Boulevard and Redondo Avenue. From the 45-inch MWD connection, imported water can be directly delivered to the City’s Peck Facility and Block 35 Facility via 14-inch and 18-inch pipelines, respectively. Groundwater from the City’s two active wells can be routed to the Peck Facility via a 16-inch transmission main and to the Block 35 Facility via 12-inch and 10-inch pipelines. The City’s existing water distribution system is shown in Figure 6-2.

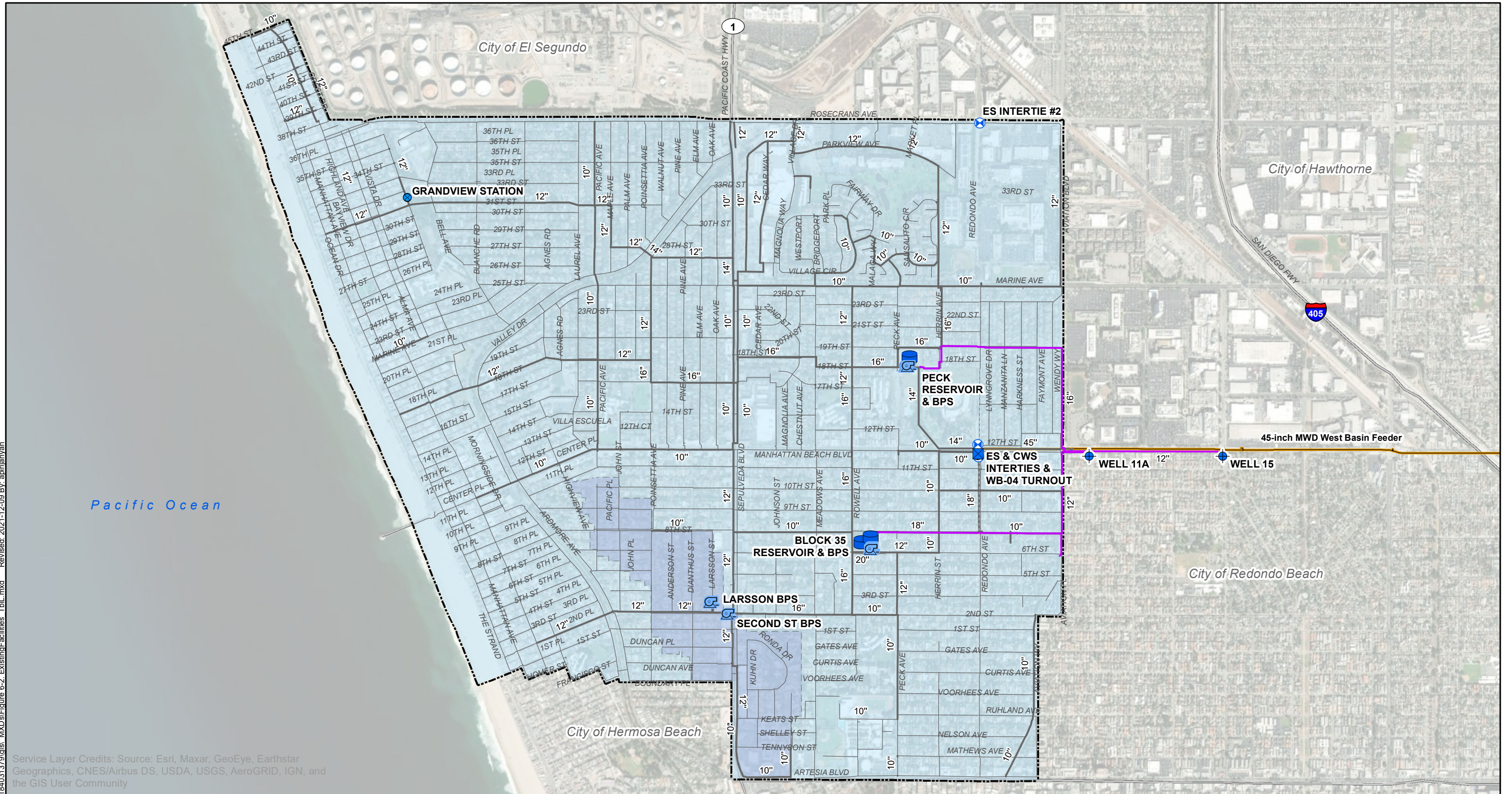
6.2.1 Pressure Zones

The City’s water distribution system consists of two pressure zones which accommodate the elevation variation in the service area. The lower pressure zone, which is the Main Pressure Zone (Main Zone), serves the majority of the City. Pressures in this zone are controlled by the water level in the Block 35 Elevated Tank. The higher-pressure zone, known as the Hill Area Pressure Zone (Hill Zone), serves the City’s service area with elevations as high as 240 feet amsl. The Main Zone includes a pressure monitoring station (Grandview) near the intersection of 31st Street and Vista Drive. An average pressure of 55 psi is observed at this station. The Hill Zone is a closed loop system. The pressures in this system are primarily maintained by the Larsson Booster Pump Station and supplemented by the Second Street Pump Station when needed. Details of the two zones are captured in Table 6-4.

Table 6-4 – Pressure Zones

Zone	Supply Facilities					
	Wells	Import Water Turnouts	Flow Control Valves	Pump Stations	Reservoirs	Interagency Connections
Main	11A 15	MWD	Block 35 Peck	Block 35	Block 35 Ground Tank Block 35 Elevated Tank	ES CWS
Hill	-	-	-	Larsson Second Street	-	-

\\us0300-pj\ss01\workgroup\1840\active\184031379\gis\ MXDs\Figure 6-2_ExistingFacilities_Tbl.mxd Revised: 2021-12-09 By: apirjanvan

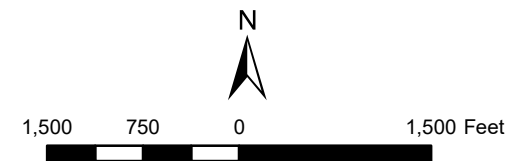


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|--|-----------------------------------|--|----------------------------|
| | Reservoir | | Flow Control Valve |
| | Groundwater Well | | Booster Pump Station (BPS) |
| | Import Water Turnout | | Hill Zone |
| | Interagency Connection (Intertie) | | Main Zone |
| | Pressure Monitoring Station | | City of Manhattan Beach |
| | | | Outside Agency Pipeline |

- Existing Pipelines**
- Less than 10" Diameter
 - 10" Diameter and Greater
 - Well Transmission Main
 - MWD Distribution Main

Note:
 CWS = California Water Service
 ES = City of El Segundo
 MWD = Metropolitan Water District



Date: 12/6/2021

TITLE: Figure 6-2 – Pressure Zones and Existing Facilities

PROJECT: City of Manhattan Beach Water Master Plan

COORDINATE SYSTEM: NAD 1983 StatePlane California V FIPS 0405 Feet



6.2.2 Pipelines

The water distribution system has approximately 140 miles of pipelines, with the largest pipe diameter of 45 inches. Approximately 56 percent of the water pipelines in the system are 6 to 8 inches in diameter, as shown in Table 6-5.

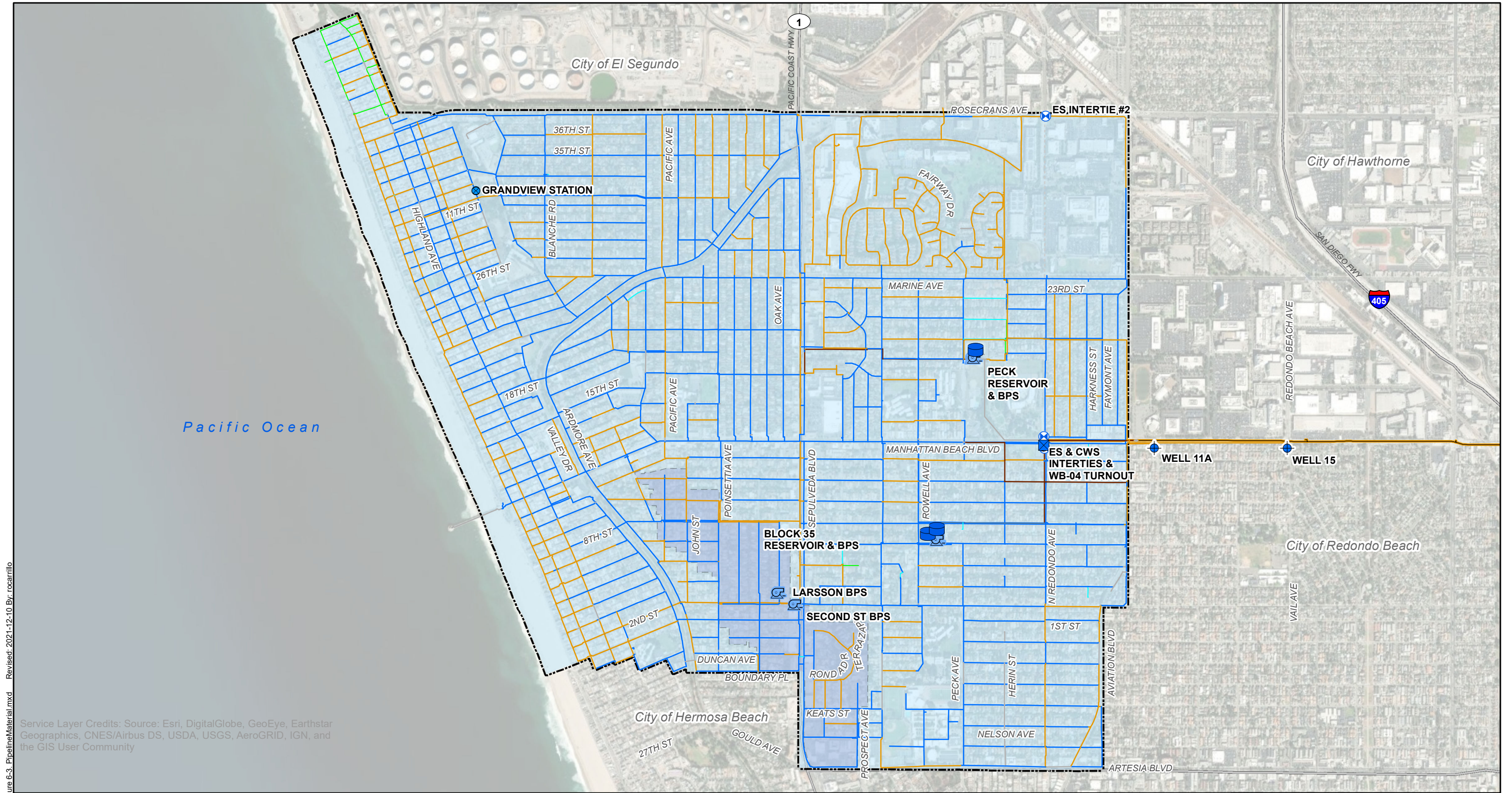
Table 6-5 – Pipe Diameter Inventory

Diameter (inch)	Length (miles)	Percent
Less than or equal to 4	30	21%
6	49	35%
8	30	21%
10	11	8%
12	8	6%
14	1	1%
16	4	3%
18	1	1%
20	2	1%
24	1	1%
27	1	1%
45	2	1%
Total	140	100 %

Table 6-6 provides an inventory of pipe material based on available data and Figure 6-3 shows a map of the system’s pipeline material. The majority of system pipe material is cast iron pipe, totaling 67 percent of all pipelines. The second most common material is ductile iron pipe, making up 25 percent of the system.

Table 6-6 – Pipe Material Inventory

Material	Length (Miles)	Percent
Asbestos Cement Pipe (ACP)	2	1%
Cement	1	<1%
Cast Iron Pipe	91	65%
Copper	1	<1%
Ductile Iron Pipe	35	25%
Galvanized Iron Pipe (GIP)	1	<1%
Steel	4	3%
Steel Concrete	1	<1%
Other	4	3%
Total	140	100%

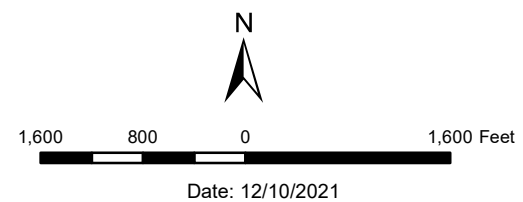


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|-----------------------------------|----------------------------|----------------------------|---------|
| Reservoir | Flow Control Valve | MWD Distribution Main | Steel |
| Groundwater Well | Booster Pump Station (BPS) | Asbestos Cement Pipe (ACP) | Other |
| Import Water Turnout | Main Zone | Cast Iron Pipe (CIP) | Unknown |
| Interagency Connection (Intertie) | Hill Zone | Ductile Iron Pipe (DIP) | |
| Pressure Monitoring Station | City of Manhattan Beach | | |
| | Outside Agency Pipeline | | |

Note:
 CWS = California Water Service
 ES = City of El Segundo
 MWD = Metropolitan Water District



TITLE:	Figure 6-3 – Pipeline Material
PROJECT:	City of Manhattan Beach Water Master Plan
COORDINATE SYSTEM:	NAD 1983 StatePlane California V FIPS 0405 Feet

6.2.3 Pump Stations

The City owns and operates four pump stations: Peck, Block 35, Larsson and 2nd Street booster pump stations. The Block 35 and the Peck Booster pump stations provide water into the Main Zone. The Peck pump station was under construction as of the date of this Master Plan. The Hill Zone is normally served by the Larsson Booster Pump Station and is backed up by the Second Street Booster Pump Station in the case of higher demands. Existing pump station details are provided in Table 6-7 and shown on Figure 6-2

Table 6-7 – Pump Stations

Name	Firm Capacity (gpm)	Pumping Units				Zone	
		Number	Type	Capacity (gpm)	Year Installed ^a	From	To
Block 35	5,145	1	Horiz. Centrifugal	1,715	1998	MWD and Groundwater	Main
		2	Horiz. Centrifugal	1,715	1998		
		3	Horiz. Centrifugal	1,715	1998		
		4	Horiz. Centrifugal	1,715	1998		
Peck ^b	6,600	1	Horiz. Split Case	2,200	2021	MWD and Groundwater	Main
		2	Horiz. Split Case	2,200	2021		
		3	Horiz. Split Case	2,200	2021		
		4	Horiz. Split Case	2,200	2021		
Larsson	1,740	1	Horiz. Centrifugal	580	1998	Main	Hill
		2	Horiz. Centrifugal	580	1998		
		3	Horiz. Centrifugal	580	1998		
Second Street	2,302	1	Horiz. Centrifugal	2,302	1977		

a) Year the pump was installed or replaced

b) Peck pump station under construction as of the date of this report, and not included in model of existing scenarios

6.2.4 Storage Reservoirs

All existing storage is located in the Main Zone, at the Peck Facility and the Block 35 Facility. The storage facilities consist of one partially buried reservoir (Peck Reservoir), one ground level reservoir (Block 35 Ground Level Tank), and one elevated tank (Block 35 Elevated Tank), with a combined total storage capacity of 10.3 million gallons (MG). The Peck Reservoir and Block 35 Ground Level Tank provide emergency storage for the system and act as the forebay reservoir for the adjacent booster pump stations. The Block 35 Ground Level Tank currently provides minimal storage due to water losses at higher water levels. The Block 35 Elevated Tank is used to control the pressure within the Main Zone. The Peck Facility was under construction as of the date of this Master Plan. The storage capacity includes the upgraded capacity of the Peck Reservoir. See Table 6-8 and Figure 6-2 for facility details.

Table 6-8 – Storage Reservoirs

Name	Capacity (MG)	Size (Feet)	HWL ^a (feet)	LWL ^b (feet)	Bottom Elevation (feet)	Year Constructed
Block 35 Ground Level Tank	2.0	140 Dia.	190	176	172	1948
Block 35 Elevated Tank	0.3	varies	301	275	275	1948
Peck Reservoir ^c	8	280 L x 200 W	100	80	75	2021
Total	10.3					

a) HWL = high water level

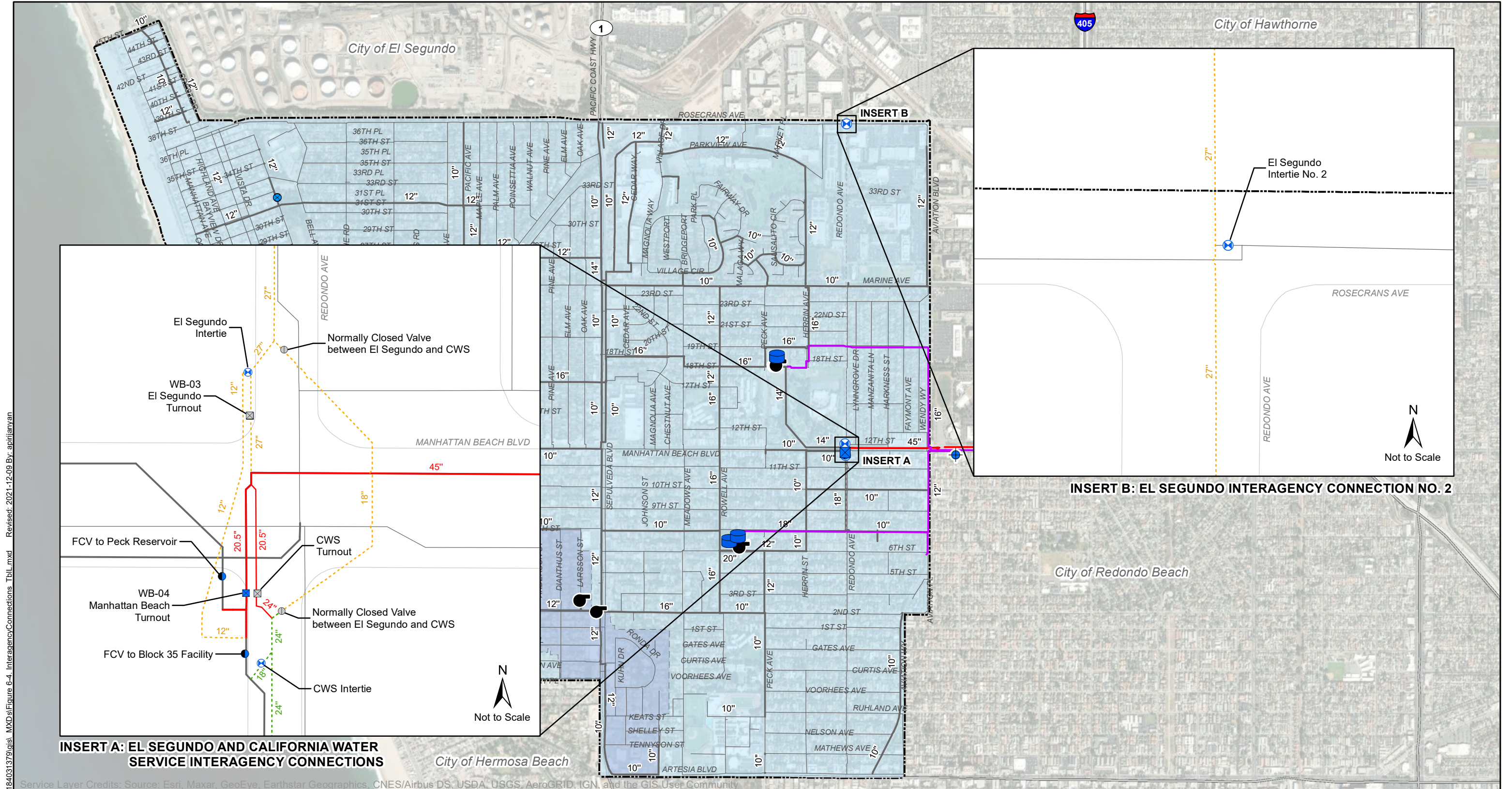
b) LWL = low water level

c) Peck Facility under construction as of the date of this report, not included in model existing scenarios

6.3 INTERAGENCY CONNECTIONS

The City maintains three emergency interties or connections with adjacent agencies with a total capacity of approximately 23 cfs. Two of the interties are with the City of El Segundo and California Water Service and both are equipped with two-way valves which have the ability of providing water both to and from the City. An additional interconnection with City of El Segundo provides the ability for the City to receive water only. The two interties with two-way valves are located at the intersection of Manhattan Beach Boulevard and Redondo Avenue as shown on Figure 6-4. The City has a 12-inch connection with a 27-inch City of El Segundo main and an 18-inch connection with a 24-inch California Water Service main. The third connection is an 8-inch gate valve at Rosecrans Avenue and Redondo Avenue and is the second connection with the City of El Segundo.

The interagency connections are for emergency use only and should not be relied on as a primary supply source.



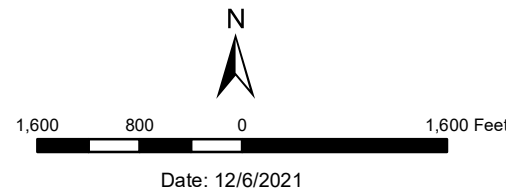
\\us0300-pj\ss01\workgroup\1840\active\184031379\gis\ MXDs\Figure 6-4. InteragencyConnections_Tbl.mxd Revised: 2021-12-09 By: apitilanyan

INSERT A: EL SEGUNDO AND CALIFORNIA WATER SERVICE INTERAGENCY CONNECTIONS

INSERT B: EL SEGUNDO INTERAGENCY CONNECTION NO. 2

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|--|-----------------------------------|--|----------------------------|--|--------------------------|--|--------------------------|
| | Reservoir | | Flow Control Valve | | California Water Service | | Less than 10" Diameter |
| | Groundwater Well | | Booster Pump Station (BPS) | | El Segundo | | 10" Diameter and Greater |
| | Import Water Turnout | | Main Zone | | MWD Transmission Main | | Hill Zone Pipeline |
| | Interagency Connection (Intertie) | | City of Manhattan Beach | | | | |
| | Pressure Monitoring Station | | Well Transmission Main | | | | |

Note:
 CWS = California Water Service
 ES = City of El Segundo
 MWD = Metropolitan Water District



TITLE: Figure 6-4 – El Segundo & California Water Service Interagency Connections

PROJECT: City of Manhattan Beach Water Master Plan

COORDINATE SYSTEM: NAD 1983 StatePlane California V FIPS 0405 Feet

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community