



The Beverly Hills City Council Liaison / Public Works Commission Committee will conduct a Special Meeting, at the following time and place, and will address the agenda listed below:

Teleconference/Video Conference Meeting

<https://www.gotomeet.me/BHLiaison>

You can also dial in by phone:

United States (Toll Free): 1-866-899-4679 or United States: 1-646-749-3117

Access Code: 660-810-077

Beverly Hills, CA 90210

Tuesday, September 8, 2020

3:00pm

Pursuant to Executive Order N-25-20 members of the Beverly Hills City Council and staff may participate in this meeting via a teleconference. In the interest of maintaining appropriate social distancing, members of the public can participate in the teleconference/video conference by using this link:

<https://www.gotomeet.me/BHLiaison> or by phone at 1-866-899-4679 or 1-646-749-3117, Access Code: 660-810-077. Written comments may be emailed to mayorandcitycouncil@beverlyhills.org and will be read at the meeting.

AGENDA

- 1) Public Comment
 - a. Members of the public will be given the opportunity to directly address the Committee on any item listed on the agenda.
- 2) Integrated Water Resources Master Plan 2020 (IWRMP)
- 3) Adjournment

George Chavez
City Manager

Posted: September 4, 2020

A DETAILED LIAISON AGENDA PACKET IS AVAILABLE FOR REVIEW AT
WWW.BEVERLYHILLS.ORG



Pursuant to the Americans with Disabilities Act, the City of Beverly Hills will make reasonable efforts to accommodate persons with disabilities. If you require special assistance, please call (310) 285-1014 (voice) or (310) 285-6881 (TTY). Providing at least forty-eight (48) hours advance notice will help to ensure availability of services.



CITY OF BEVERLY HILLS
PUBLIC WORKS DEPARTMENT
MEMORANDUM

TO: Vice Mayor Robert Wunderlich, Ph.D. and
Councilmember Julian A. Gold, M.D.

FROM: Shana Epstein, Director of Public Works
Gil Borboa, P.E., Assistant Director of Public Works/Utilities

DATE: September 8, 2020

SUBJECT: Integrated Water Resources Master Plan 2020 (IWRMP)

ATTACHMENTS:

1. Agenda report, August 11, 2020 Liaison Meeting
2. Hazen & Sawyer Technical Memorandum

RECOMMENDATION

Staff recommends that the City Council Public Works Liaison Committee receive and recommend to take to the full City Council for review and approval the June 2020 Integrated Water Resources Master Plan.

BACKGROUND

The Integrated Water Resources Master Plan (IWRMP) is a comprehensive planning document that analyzes the water, sewer, and storm drain systems owned, operated, and maintained by the City of Beverly Hills (City). The full IWRMP Part 1 and Part 2, is available at the following link: <http://www.beverlyhills.org/IWRMP>.

The IWRMP was initially presented to the City Council Public Works Liaison Committee on August 11, 2020. The agenda report from the August 11 meeting is included for reference herewith as Attachment 1. Three issues were carried forward for further discussion with the City Council Liaison Committee scheduled for September 8, 2020: an analysis of the largest reservoir possible at the Cabrillo site, system/reservoir operational considerations, and CIP funding for projects identified in the IWRMP and the Public Works Commission's priorities.

DISCUSSION

Cabrillo Reservoir

A Technical Memo prepared by Hazen and Sawyer (Hazen), the City's IWRMP consultant, is included as Attachment 2. Given the site conditions and demands in the pressure zone served by Cabrillo, a maximum reservoir capacity of 4.3 million gallons, comprising two cells of 2.15 million gallons each, is feasible at the site. Due to the construction requirements (partially buried), shallow groundwater in the area, water demands in the zone, pumping considerations, and water quality considerations (a

Reservoir Management System as described further below), the estimated cost for this reservoir is \$14 Million.

System/Reservoir Operations

As presented in Section 5.1.3.4 of the IWRMP report, current practice is to fill all tanks to their high level, and then allow them to supply system demands until the tanks drop to approximately 25% of the maximum water level. During periods of elevated temperatures and/or elevated fire wildfire risk, the tanks are filled and maintained at their highest levels as much as possible.

The operation of the City's reservoir system on a fill/drain cycle which allows levels to drop to approximately 25% of their maximum levels conforms with industry best management practices to maintain appropriate water quality conditions in the reservoirs and the distribution system which serves the community.

When water in tanks and reservoirs stays too long without "turning over", water age becomes a factor in water quality degradation resulting from loss of disinfectant. Possible water quality problems include disinfection by-products (DBPs) formation, disinfectant decay, nitrification, biological growth/regrowth, and taste and odor problems.

A Reservoir Management System (RMS) is proposed to be used to maintain a consistent disinfection residual and provide adequate mixing in the reservoirs. An RMS becomes necessary due to the added volume at Cabrillo. More water will exist in storage in this zone than the demand calls for, resulting in slow turnover and potential water quality degradation. The major components of an RMS consist of mixer(s), chemical storage and feed systems for boosting the disinfectant residual, an on-line analyzer to monitor the concentration of the disinfectant, a control system, and appurtenant piping and valves for a complete operational system. RMS technologies are relatively new systems typically utilized at remote reservoir locations not readily accessed by water agency staff, and is an expensive addition. Presently, city reservoirs are equipped with internal electric or solar-powered mixers with the ability to dose disinfectant chemicals manually, on a daily basis. The proposed RMS has greater automation capabilities.

CIP Funding

The report prepared for the August 11, 2020 Council Liaison meeting included the following Public Works Commission priorities:

- Potable Water Cabrillo Reservoir (estimated cost: \$6,352,000)
- Reservoir 4C (estimated cost: \$4,915,000)
- LADWP Interconnection Upgrade at Coldwater Reservoir (estimated cost: \$433,000)
- Coldwater Pump Station (PS-2) Improvements (estimated cost: \$3,538,000)

From the IWRMP, Table 1 below provided the ranked listing of all projects over the 5 year planning horizon.

Table 1 - Summary of Capital Improvement Projects

Project #	Project Type	Name	Capital Cost	Score
ER-1	Emergency Resiliency	Reservoir 4C	\$4,915,000	87
G-6	Groundwater	Foothill WTP Expansion to 4.7 MGD	\$6,493,000	80
WS-2	Water System	LADWP Interconnection Upgrade at Coldwater Reservoir	\$433,000	80
WS-3	Water System	Pipeline Project No. 1	\$15,561,000	80
WS-4	Water System	Pipeline Project No. 2	\$8,195,000	80
WS-5	Water System	Pipeline Project No. 3	\$6,899,000	80
SS-5	Sewer System	Oakhurst Drive Capacity Improvement Project	\$3,519,000	80
SS-4	Sewer System	Small Diameter Capacity Relief Project	\$836,000	80
SS-11	Sewer System	N. Sierra Drive "Bottleneck" Capacity Relief Project	\$213,000	80
AS-4	Alternative Sources	La Cienega Park Irrigation Supply	\$1,392,000	77
SS-12	Sewer System	La Cienega Boulevard Capacity Improvement Project	\$1,031,000	77
G-3	Groundwater	La Brea Well #2 (La Cienega Park)	\$4,324,000	73
G-4	Groundwater	La Brea Well #3 (La Cienega Park)	\$4,324,000	73
G-7	Groundwater	Hollywood GWB Deep Well	\$5,447,000	73
G-8	Groundwater	Hollywood GWB Shallow Well	\$5,187,000	73
SS-10	Sewer System	Annual Rehabilitation Project	\$271,000	73
WS-1	Water System	Coldwater Pump Station (PS 2) Improvements	\$3,538,000	70
SS-1	Sewer System	Sewer System Pipeline and Manhole Rehabilitation Project - Year 1 (North)	\$5,448,000	70
SS-2	Sewer System	Sewer System Pipeline and Manhole Rehabilitation Project - Year 2 (Central)	\$4,106,000	70
SS-3	Sewer System	Sewer System Pipeline and Manhole Rehabilitation Project - Year 3 (South)	\$4,749,000	70
SS-14	Sewer System	Inflow & Infiltration Study	\$433,000	70
ER-2	Emergency Resiliency	Potable Water Cabrillo Reservoir	\$6,352,000	67
SS-6	Sewer System	Additional Permanent Flow Monitoring Sites	\$240,000	67
G-5	Groundwater	La Brea Well #4 (Location TBD)	\$7,947,000	63
SS-13	Sewer System	Dry-Weather TMDL to Sewer Diversion Project	\$313,000	57
G-9	Groundwater	Santa Monica GWB Irrigation Supply Well (Roxbury Park)	\$2,825,000	50
AS-2	Alternative Sources	Roxbury Park Stormwater Diversion	\$3,688,000	33
AS-3	Alternative Sources	Subterranean Parking Groundwater Diversion	\$6,398,000	33
SD-6	Storm Drain	Storm Water System Pipeline Upgrade Project and Optional Flood Barrier Protection Project	\$24,294,000	30

As noted during the August 11, 2020 Liaison meeting, the Commission's priorities differed only slightly from the top four projects in the IWRMP. As requested at the previous Liaison meeting, foregoing reservoir 4C in favor of a larger reservoir at Cabrillo may provide additional funding utilizing what had previously been budgeted in the CIP for 4C.

For further discussion and consideration, the top ten projects identified in the IWRMP, plus the Cabrillo Reservoir project (#22) are included in Table 2.

Table 2 – CIP Funding Status for IWRMP Top Ten projects plus Cabrillo

Integrated Resources Water Master Plan-Funding Availability for Top Ten Projects and Cabrillo Reservoir

Project Title	Rank	Fund	Projected Cost	Current Available Funding	Remaining Funding Required	Potential Funding Source(s)	Comments
1. Reservoir 4C	87	Water	\$4,915,000	\$4,547,131	\$367,869	CIP 00796 Reservoir Replacement and Pump Station Rehab: \$2,313,984 currently available CIP 00972 Cabrillo Reservoir and Non-Potable Water: \$2,233,147 Currently available Balance can be appropriated from Water Fund Reserves	Available funding can be used for environmental CEQA planning and design efforts. If Reservoir 4C, is not selected, funding can be used for the Cabrillo Reservoir.
2. Foothill WTP Expansion	80	Water	\$6,493,000	\$0	\$6,493,000	CIP 00795 Water Treatment Plant Replacement and Repair: \$750,000 available from FY2021/22-FY2023/24 Balance of \$5,743,000 in rates in FY2023/24	This project is for expanding the WTP to its buildout capacity of 4.5 MGD after the construction of the pre-treatment system in progress.
3. LADWP Connection upgrade at Coldwater Reservoir	80	Water	\$433,000	\$104,857	\$328,143	CIP 00576 Coldwater Canyon Reservoir: \$104,847 currently available CIP 00681 System-Wide Water Capacity Upgrades: remaining balance available in FY2021/22 or appropriate from reserves	The initial funding can be used to complete planning & design effort
4. Pipeline Project No. 1	80	Water	\$15,561,000	\$1,184,015	\$14,376,985	CIP 00387 Water Main and Hydrant Replacement: \$1.2 million currently available after Loma Vista/San Ysidro Dr. pipeline project; Available amount of \$1.2 million does not include the Coldwater Canyon pipeline replacement project costs or ongoing hydrant replacement projects; FY2021/22-FY2023-24: \$9 million Balance Needed: \$4,498,974 Remaining balance: Rates in FY2023/24	
5. Pipeline Project No. 2	80	Water	\$8,195,000	\$0	\$8,195,000	CIP 00387 Water Main and Hydrant Replacement: Rates in FY2023/24	
6. Pipeline Project No. 3	80	Water	\$6,899,000	\$0	\$6,899,000	CIP 00387 Water Main and Hydrant Replacement: Rates in FY2023/24	
Total for Water Projects			\$42,496,000	\$5,836,003	\$36,659,997		
7. Oakhurst Drive Capacity Improvement	80	Sewer	\$3,519,000	\$3,519,000	\$0	CIP 00066 Sewer System Repairs	
8. Small Diameter Capacity Relief Project	80	Sewer	\$836,000	\$836,000	\$0	CIP 00066 Sewer System Repairs	
9. N. Sierra Drive "Bottleneck" Capacity Relief Project	77	Sewer	\$213,000	\$213,000	\$0	CIP 00066 Sewer System Repairs	
Total for Sewer projects			\$4,568,000	\$4,568,000	\$0		
10. La Cienega Park Irrigation Supply	77	Infrastructure	\$1,392,000	\$0	\$1,392,000	TBD	Grants or potentially regional funding contribution
22. Cabrillo Reservoir (Original 3MG project)	67	Water	\$6,352,000	\$2,274,319	\$4,077,881	00972 Cabrillo Reservoir and Non-Potable Water: FY2020/21: \$2,274,319	Original IWRMP Cabrillo Reservoir improvements includes an approx. 3.0 MG of storage
22. Cabrillo Reservoir (new 4.3 MG proposed)	67	Water	\$13,920,000	\$1,657,131	\$12,262,869	00972 Cabrillo Reservoir and Non-Potable Water: FY2021/22: \$307,131 From 4C \$4,547,131 FY2022/23: \$675,000 FY2023/24: \$675,000 Total: \$6,204,262	new proposed Cabrillo Reservoir improvements includes an approx. 4.3 MG of storage with multiple tanks/compartments, new pump station, and provisions for backup power

NEXT STEPS

Pending support to proceed from City Council Liaison committee members Vice Mayor Wunderlich and Councilmember Gold, staff will prepare to bring the Integrated Water Resources Master Plan before the full Council for direction on preferred priorities, and approve and receive.

Staff and Hazen & Sawyer, the City's consultant, will be available at the Liaison meeting to discuss the assumptions, methodologies, results, and findings prepared in the draft IRWMP report.

ATTACHMENT 1

Agenda Report, August 11, 2020 Liaison Meeting



CITY OF BEVERLY HILLS
PUBLIC WORKS DEPARTMENT
MEMORANDUM

TO: Vice Mayor Robert Wunderlich, Ph.D. and
Councilmember Julian A. Gold, M.D.

FROM: Shana Epstein, Director of Public Works
Gil Borboa, P.E., Assistant Director of Public Works/Utilities

DATE: August 11, 2020

SUBJECT: Integrated Water Resources Master Plan 2020 (IWRMP)

ATTACHMENTS: 1. Executive Summary, 2020 IWRMP

RECOMMENDATION

Staff recommends that the City Council Public Works Liaison Committee receive and recommend to take to the full City Council for review and approval the June 2020 Integrated Water Resources Master Plan.

BACKGROUND

The Integrated Water Resources Master Plan (IWRMP) is a comprehensive planning document that analyzes the water, sewer, and storm drain systems owned, operated, and maintained by the City of Beverly Hills (City). The Executive Summary of the report is attached herewith as Attachment 1. The full IWRMP Part 1 and Part 2, is available at the following link: <http://www.beverlyhills.org/IWRMP>

The IWRMP – Part 1 addresses the City’s major water resources strategy, which includes imported water, groundwater, and other potential supply sources. Part 1 also addresses other topics including emergency storage for the water system, and stormwater compliance. The IWRMP – Part 2 is a master plan of the water, sewer, and storm drain systems. For each system, the document addresses the existing system and service area, evaluation and design criteria, system analysis, and capital improvements. Particular attention should be given to the selection criteria and recommended ranked Capital Improvement Project list for each utility system.

The theme of the IWRMP is to focus on near-term practical solutions with an eye towards what could be done in the future. The near-term represents a focus on projects that may be implemented within the next five years – 2021 through 2025. Proposed future actions include taking the necessary steps now to position for long-term resiliency and reliability of the City’s water, sewer, and storm drain systems.

DISCUSSION

IWRMP priorities and criteria were developed in collaborative workshops with the consultant team, City staff, and the Public Works Commission. The following workshops and meetings have been conducted to date to prepare the draft IRWMP report:

- 1/31/19 – Water System Workshop
- 2/13/19 – Sewer and Storm Drain Systems Workshop
- 3/13/19 – Groundwater Workshop
- 3/20/19 – Meeting with Commissioners Greer and Aronberg (planning for upcoming June 27, 2019 PWC workshop)
- 6/27/19 – All PWC Workshop
- 6/11/20 – PWC Workshop to present draft IWRMP
- 6/19/20 – Ad Hoc PWC meeting to further discuss IWRMP questions, project selection criteria and rankings
- 6/24/20 – Ad Hoc PWC meeting to discuss IWRMP project selection criteria and rankings
- 7/9/20 – PWC Workshop; Commission priorities developed

Priorities and criteria developed and discussed during the first PWC workshop, June 27, 2019, were used to guide the analysis, develop projects, and set prioritization for implementation. A brief description of the IWRMP priorities is provided below:

- Water Supply Reliability – Increasing flexibility of the City’s water supply by increasing local water supply, which includes alternative water resources, and reducing imported water reliance on Metropolitan Water District.
- Emergency Resiliency – Implementing projects that make systems more resilient to emergencies.
- Addressing Aging Infrastructure – Taking a proactive approach to replacing aging infrastructure for the water, sewer, and storm drain systems.
- Accounting for Growth Needs – Ensuring the City’s systems are adequately addressing growth within the service area.

Project Rankings and Priorities

While the Public Works Commission acknowledged that although the City has multiple water supply sources, certain emergency scenarios, in the opinion of the PWC, existed where those sources may not be available or sufficient. Among the concerns, the PWC felt a higher priority was fire protection and earthquakes.

The PWC noted the example of a catastrophic earthquake that severs or significantly impairs both supply points from Metropolitan Water District and all three interconnections with LADWP. In those times, the City must rely solely on the storage in its reservoirs. As Section 5 of this document reports, in a low capacity mode for the City water reservoir system, the City may only have 0.4 days of emergency water storage. Given the history of wildfires in the LA Basin and the fast spreading and devastating nature of those fires, the PWC felt that the level of emergency storage currently existent, particularly at low

capacity, merited a priority consideration. Therefore, the PWC offered recommendations, which prioritized emergency storage projects, and which differed from the ranking of projects developed for the IWRMP, as follows:

The Public Works Commission, upon reviewing the IWRMP analysis, recommends to the City Council that the following four (4) projects merit priority consideration for CIP funding:

- Potable Water Cabrillo Reservoir (estimated cost: \$6,352,000)
- Reservoir 4C (estimated cost: \$4,915,000)
- LADWP Interconnection Upgrade at Coldwater Reservoir (estimated cost: \$433,000)
- Coldwater Pump Station (PS-2) Improvements (estimated cost: \$3,538,000)

This priority list differs from the rankings provided in the IWRMP, for which the top twenty projects are summarized in the table below (from IWRMP table 7-2).

Summary of Capital Improvement Projects

Project #	Project Type	Name	Capital Cost	Score
ER-1	Emergency Resiliency	Reservoir 4C	\$4,915,000	87
G-6	Groundwater	Foothill WTP Expansion to 4.7 MGD	\$6,493,000	80
WS-2	Water System	LADWP Interconnection Upgrade at Coldwater Reservoir	\$433,000	80
WS-3	Water System	Pipeline Project No. 1	\$15,561,000	80
WS-4	Water System	Pipeline Project No. 2	\$8,195,000	80
WS-5	Water System	Pipeline Project No. 3	\$6,899,000	80
SS-5	Sewer System	Oakhurst Drive Capacity Improvement Project	\$3,519,000	80
SS-4	Sewer System	Small Diameter Capacity Relief Project	\$836,000	80
SS-11	Sewer System	N. Sierra Drive "Bottleneck" Capacity Relief Project	\$213,000	80
AS-4	Alternative Sources	La Cienega Park Irrigation Supply	\$1,392,000	77
SS-12	Sewer System	La Cienega Boulevard Capacity Improvement Project	\$1,031,000	77
G-3	Groundwater	La Brea Well #2 (La Cienega Park)	\$4,324,000	73
G-4	Groundwater	La Brea Well #3 (La Cienega Park)	\$4,324,000	73
G-7	Groundwater	Hollywood GWB Deep Well	\$5,447,000	73
G-8	Groundwater	Hollywood GWB Shallow Well	\$5,187,000	73
SS-10	Sewer System	Annual Rehabilitation Project	\$271,000	73
WS-1	Water System	Coldwater Pump Station (PS 2) Improvements	\$3,538,000	70
SS-1	Sewer System	Sewer System Pipeline and Manhole Rehabilitation Project - Year 1 (North)	\$5,448,000	70
SS-2	Sewer System	Sewer System Pipeline and Manhole Rehabilitation Project - Year 2 (Central)	\$4,106,000	70
SS-3	Sewer System	Sewer System Pipeline and Manhole Rehabilitation Project - Year 3 (South)	\$4,749,000	70
SS-14	Sewer System	Inflow & Infiltration Study	\$433,000	70
ER-2	Emergency Resiliency	Potable Water Cabrillo Reservoir	\$6,352,000	67
SS-6	Sewer System	Additional Permanent Flow Monitoring Sites	\$240,000	67
G-5	Groundwater	La Brea Well #4 (Location TBD)	\$7,947,000	63
SS-13	Sewer System	Dry-Weather TMDL to Sewer Diversion Project	\$313,000	57
G-9	Groundwater	Santa Monica GWB Irrigation Supply Well (Roxbury Park)	\$2,825,000	50
AS-2	Alternative Sources	Roxbury Park Stormwater Diversion	\$3,688,000	33
AS-3	Alternative Sources	Subterranean Parking Groundwater Diversion	\$6,398,000	33
SD-6	Storm Drain	Storm Water System Pipeline Upgrade Project and Optional Flood Barrier Protection Project	\$24,294,000	30

Fiscal Impact

A stated in the report, a near term focus of the study looked at projects and programs which could be implemented within the next five years. In each, maintaining flexibility is required in recognition of uncertainties inherent in the current pandemic response circumstances. In response to the Ad Hoc subcommittee's suggestion for a more immediate outlook – two years – the following table presents three projects which staff believes can be addressed by the end of FY 2021-2022

	Projected Cost	Current Funding Available	Comments
Reservoir 4C	\$4,915, 000	\$4,915, 000	Funding currently available
WTP Pretreatment	\$9,919,000	\$11,406,850	Project awarded 6/16/20
Cabrillo Reservoir	\$6,352,000	\$2,233,146.75	Current funding can be used to start environmental review and preliminary design; balance deferred to next rate case

NEXT STEPS

Pending support to proceed from City Council Liaison committee members Vice Mayor Wunderlich and Councilmember Gold, staff will prepare to bring the Integrated Water Resources Master Plan before the full Council for direction on preferred priorities, and approve and receive.

Staff and Hazen & Sawyer, the City's consultant, will be available at the Liaison meeting to discuss the assumptions, methodologies, results, and findings prepared in the draft IRWMP report.

ATTACHMENT 1

Executive Summary, 2020 IWRMP

Executive Summary

The Integrated Water Resources Master Plan (IWRMP) is a comprehensive planning document that analyzes the water, sewer, and storm drain systems owned, operated, and maintained by the City of Beverly Hills (City). The IWRMP is comprised of Part 1 and Part 2.

The IWRMP – Part 1 addresses the City’s major water resources strategy which includes imported water, groundwater, and other potential supply sources. Part 1 also addresses other topics including emergency storage for the water system, and stormwater compliance. The IWRMP – Part 2 is a master plan of the water, sewer, and storm drain systems. For each system, the document addresses the existing system and service area, evaluation and design criteria, system analysis, and capital improvements.

The theme of the IWRMP is to focus on near-term practical solutions with an eye towards what could be done in the future. The near-term represents a focus on projects that should be implemented within the next five years – 2021 through 2025. An eye towards the future includes taking the necessary steps now to position for long-term resiliency and reliability of the City’s water, sewer, and storm drain systems.

IWRMP Priorities

IWRMP priorities and criteria were developed in collaborative workshops with the consultant team, City staff, and the Public Works Commission. Priorities and criteria were used to guide the analysis, develop projects, and set prioritization for implementation. A description of the IWRMP priorities is provided below:

- **Water Supply Reliability** – Increasing flexibility of the City’s water supply by increasing local water supply, which includes alternative water resources, and reducing imported water from Metropolitan Water District.
- **Emergency Resiliency** – Implementing projects that make systems more resilient to emergencies.
- **Addressing Aging Infrastructure** – Taking a proactive approach to replacing aging infrastructure for the water, sewer, and storm drain systems.
- **Accounting for Growth Needs** – Ensuring the City’s systems are adequately addressing growth within the service area.

Water Supply Portfolio

The current, near-term, and future water supply portfolio will include conservation, imported water from Metropolitan Water District (MWD), local groundwater, and may also include alternative sources. With the completion of the La Brea Subarea water supply projects, which includes new groundwater wells and a transmission main, the water supply portfolio from current conditions to year 2025 is illustrated in Figure ES-1. Future year conditions also account for projected water demand using the most conservative

methodology (discussed further in Section 2). As shown, over 20% reduction in imported water is anticipated.



Figure ES-1: Water Supply Portfolio Summary

Groundwater

The City’s water supply includes groundwater wells in the Hollywood Groundwater Basin and the La Brea Subarea of the Central Groundwater Basin. Implementation steps have been identified to maintain the existing groundwater supplies, develop new groundwater supplies, and expand the Foothill Water Treatment Plant to increase water supply reliability.

Maintaining the existing groundwater supplies will require regular monitoring of well operational data, well testing and rehabilitation, and operations best practices.

To develop new groundwater supplies, in addition to the first La Brea Subarea Well at the former Coffee Bean site, the following projects have been identified:

- Two (2) La Brea Subarea Wells to be located at La Cienega Park
- One (1) La Brea Subarea Well to be located at a location to be determined
- One (1) Hollywood Groundwater Basin Well located at Santa Monica Boulevard and Foothill Road
- One (1) Hollywood Groundwater Basin Well located at 3rd Street and Foothill Road
- One (1) Santa Monica Groundwater Basin Well located at Roxbury Park to supply the local irrigation demand

To accommodate the additional groundwater supplies, improvements have been identified at Foothill Water Treatment Plant to increase plant capacity from 2.3 to 4.7 million gallons per day (MGD).

Alternative Sources

A priority for the City is to take immediate steps now to position for long-term water supply options. It is recognized that all potential water supply sources should be identified and evaluated. One potential alternative source of water is shallow groundwater to be used to meet irrigation demand for non-residential uses such as parks, schools, and median landscaping.

Potential alternative source projects and multi-benefit projects have been identified. The projects include:

- Roxbury Park – stormwater diversion, treatment, and distribution for irrigation supply
- Subterranean Parking Structures – shallow groundwater diversion, treatment, and distribution for irrigation supply
- La Cienega Park – raw water distribution from La Brea Well(s) for irrigation supply
- Desalination – buying into a desalination plant and delivery through MWD

Emergency Resiliency

One of the priorities of the IWRMP is Emergency Resiliency – ensuring the City is implementing projects that make systems more resilient to emergencies, such as emergency storage for the water system. The recommended near-term emergency storage projects are:

- Reservoir 4C – 1-million-gallon tank to be constructed adjacent to existing Reservoir 4B
- Cabrillo Reservoir – up to 3-million-gallon tank to be constructed at the inactive Cabrillo Reservoir site

Stormwater Compliance

The City is located entirely within the watershed of Ballona Creek. Stormwater Compliance refers to efforts to maintain the Ballona Creek watershed through compliance with the 2016 Ballona Creek Enhanced Watershed Management Program (BCEWMP).

The “Stormwater Compliance Capital Improvement Program Master Plan – Project Concepts for Stormwater Compliance” was completed in August 2019 that included a multitude of stormwater compliance recommendations such as Burton Way Green Streets and other multi-benefit projects. In addition, this report identified a potential project to utilize sewer system capacity to help the City comply with the MS4 stormwater discharge permit compliance. Three (3) locations were identified in the City’s business and restaurant district to divert dry-weather flow to the sewer system.

The City’s current implementation approach to stormwater compliance projects is to combine them with other City improvement projects when feasible.

Capital Improvement Projects, Annual Programs, and Stakeholder Involvement

A summary of the capital improvement projects, annual programs, and stakeholder involvement identified in this report are shown in Table ES-1 and Table ES-2. Total capital costs for projects were estimated including construction costs, engineering and administrative costs, and land acquisition where applicable. Scoring for each project was based on the following criteria (all equally weighted): cost, reliability, timeframe, feasibility, emergency resiliency, and risk factors. Project descriptions, cost information, and scoring criteria are included in Section 7.

Table ES-1: Summary of Capital Improvement Projects

Project #	Project Type	Name	Capital Cost	Score
ER-1	Emergency Resiliency	Reservoir 4C	\$4,915,000	87
G-6	Groundwater	Foothill WTP Expansion to 4.7 MGD	\$6,493,000	80
WS-2	Water System	LADWP Interconnection Upgrade at Coldwater Reservoir	\$433,000	80
WS-3	Water System	Pipeline Project No. 1	\$15,561,000	80
WS-4	Water System	Pipeline Project No. 2	\$8,195,000	80
WS-5	Water System	Pipeline Project No. 3	\$6,899,000	80
SS-5	Sewer System	Oakhurst Drive Capacity Improvement Project	\$3,519,000	80
SS-4	Sewer System	Small Diameter Capacity Relief Project	\$836,000	80
SS-11	Sewer System	N. Sierra Drive "Bottleneck" Capacity Relief Project	\$213,000	80
AS-4	Alternative Sources	La Cienega Park Irrigation Supply	\$1,392,000	77
SS-12	Sewer System	La Cienega Boulevard Capacity Improvement Project	\$1,031,000	77
G-3	Groundwater	La Brea Well #2 (La Cienega Park)	\$4,324,000	73
G-4	Groundwater	La Brea Well #3 (La Cienega Park)	\$4,324,000	73
G-7	Groundwater	Hollywood GWB Deep Well	\$5,447,000	73
G-8	Groundwater	Hollywood GWB Shallow Well	\$5,187,000	73
SS-10	Sewer System	Annual Rehabilitation Project	\$271,000	73
WS-1	Water System	Coldwater Pump Station (PS 2) Improvements	\$3,538,000	70
SS-1	Sewer System	Sewer System Pipeline and Manhole Rehabilitation Project - Year 1 (North)	\$5,448,000	70
SS-2	Sewer System	Sewer System Pipeline and Manhole Rehabilitation Project - Year 2 (Central)	\$4,106,000	70
SS-3	Sewer System	Sewer System Pipeline and Manhole Rehabilitation Project - Year 3 (South)	\$4,749,000	70
SS-14	Sewer System	Inflow & Infiltration Study	\$433,000	70
ER-2	Emergency Resiliency	Potable Water Cabrillo Reservoir	\$6,352,000	67
SS-6	Sewer System	Additional Permanent Flow Monitoring Sites	\$240,000	67
G-5	Groundwater	La Brea Well #4 (Location TBD)	\$7,947,000	63
SS-13	Sewer System	Dry-Weather TMDL to Sewer Diversion Project	\$313,000	57
G-9	Groundwater	Santa Monica GWB Irrigation Supply Well (Roxbury Park)	\$2,825,000	50
AS-2	Alternative Sources	Roxbury Park Stormwater Diversion	\$3,688,000	33
AS-3	Alternative Sources	Subterranean Parking Groundwater Diversion	\$6,398,000	33
SD-6	Storm Drain	Storm Water System Pipeline Upgrade Project and Optional Flood Barrier Protection Project	\$24,294,000	30

Table ES-2: Summary of Annual and Stakeholder Involvement Programs

Project #	Project Type	Name	Annual Cost
G-1	Groundwater	Production Well Maintenance Program	\$300,000
G-2	Groundwater	GWB Monitoring Program	\$100,000
WE-1	Water Efficiency	Conservation Program	\$600,000
WE-2	Water Efficiency	Leak Detection Program	\$200,000
WS-6	Water System	PRV Asset Management Program	\$500,000
SS-7	Sewer System	CCTV Remainder of System - Year 1 (North)	\$1,421,634
SS-8	Sewer System	CCTV Remainder of System - Year 2 (Central)	\$1,421,634
SS-9	Sewer System	CCTV Remainder of System - Year 3 (South)	\$1,421,634
SD-1	Storm Drain	Storm Drain CCTV Inspection - Year 1	\$1,013,135
SD-2	Storm Drain	Storm Drain CCTV Inspection - Year 2	\$1,068,120
SD-3	Storm Drain	Storm Drain CCTV Inspection - Year 3	\$643,965
SD-4	Storm Drain	Storm Drain CCTV Inspection - Year 4	\$473,005
SD-5	Storm Drain	Storm Drain CCTV Inspection - Year 5	\$387,090
SC-1	Stormwater Compliance	Misc. BMPs from Stormwater Compliance Master Plan	Varies
AS-1	Alternative Sources	Recycled Water Stakeholder Involvement	\$0
AS-5	Alternative Sources	Desalination Stakeholder Involvement	\$0

Public Works Commission Recommendations

Throughout the multiple PWC workshops and meetings, the input provided from various members of the PWC was that the highest priority should be given to emergency water storage projects. Emergency water storage projects include new reservoirs and tanks for the City's water system.

At the July 9, 2020 PWC Regular Meeting, the following three (3) motions passed 5-0:

- The Public Works Commission, upon reviewing the IWRMP analysis, recommends to City Council the following four (4) projects merit priority consideration for CIP funding:
 - Potable Water Cabrillo Reservoir (estimated cost: \$6,352,000)
 - Reservoir 4C (estimated cost: \$4,915,000)
 - LADWP Interconnection Upgrade at Coldwater Reservoir (estimated cost: \$433,000)
 - Coldwater Pump Station (PS 2) Improvements (estimated cost: \$3,538,000)
- The Public Works Commission requested City Staff to add the topic of "Emergency Storage" to future PWC meeting agendas.
- The Public Works Commission recommends that City Staff reconstitute the IWRMP report to take into consideration that the PWC recommends a priority of emergency storage and presents the report with that priority indicated.

ATTACHMENT 2

Hazen & Sawyer Technical Memorandum



August 31, 2020

To: Vince Damasse, P.E., Water Resources Manager
From: Tori Yokoyama, P.E.
Steve Conner, P.E.
cc: Gil Borboa, P.E., Assistant Director of Public Works

Cabrillo Reservoir Technical Memorandum

Introduction

The purpose of this technical memorandum is to identify the project components and costs for a new potable water reservoir to be constructed at the City's existing Cabrillo Reservoir site.

Background

The abandoned Cabrillo Reservoir is located on City-owned property at Coldwater Canyon Drive and Cabrillo Drive (see Figure 1). Cabrillo Reservoir was a water system reservoir originally constructed in 1918 and retrofitted in 1927 but abandoned in the 1980s. Abandonment was necessary because shallow groundwater was infiltrating the reservoir walls and contaminating the potable water with raw groundwater. The reservoir previously served Zone 6, which also includes Reservoir 3A and Greystone Reservoir.

To supplement the City's emergency storage, a new reservoir facility is proposed to be constructed at the Cabrillo Reservoir site. A primary goal of the project is to maximize additional emergency storage at the Cabrillo Reservoir site, while taking into account system operation considerations such as water quality and water distribution.

The purpose of this technical memorandum is to identify the project components and costs for a new potable water reservoir to be constructed at the City's Cabrillo Reservoir site.

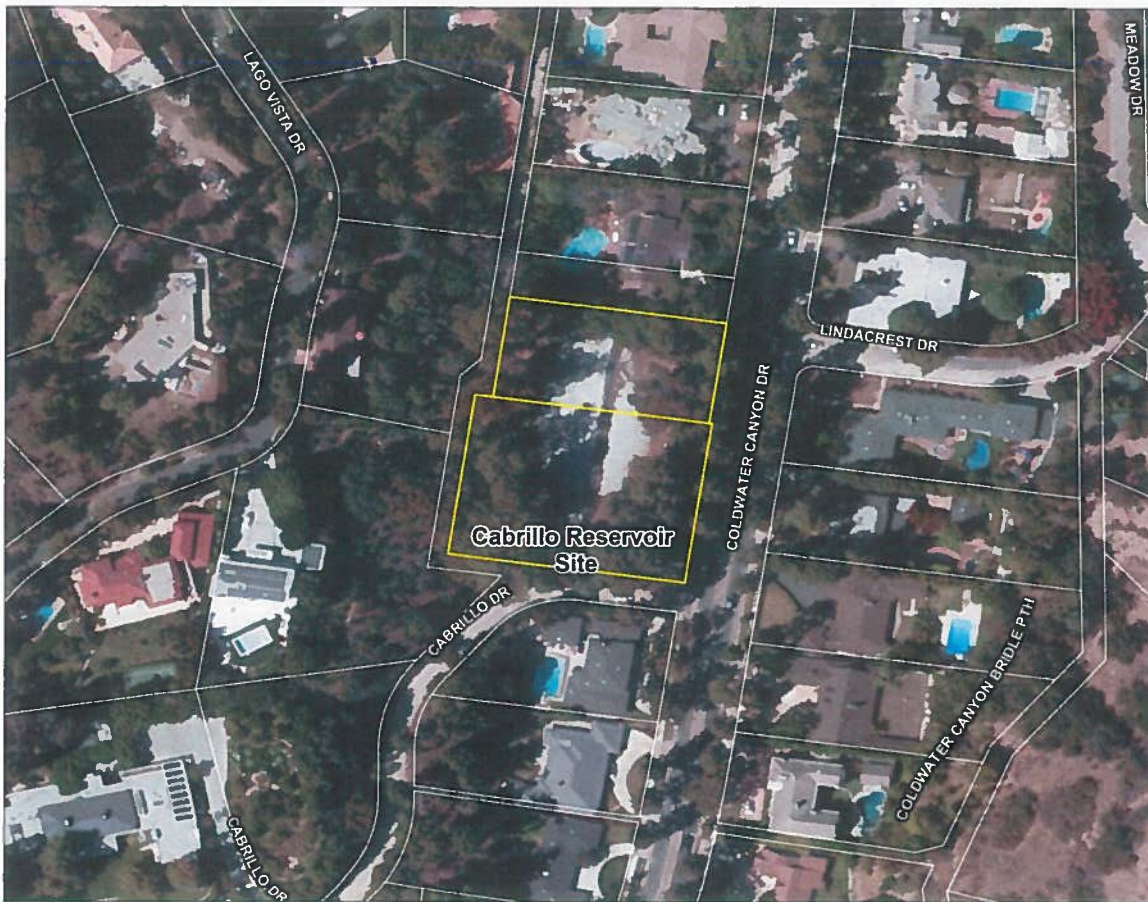


Figure 1: Cabrillo Reservoir Site

Hydraulics and System Operations

Operations and Water Levels: The proposed reservoir would operate “in parallel” with the City’s existing Reservoir 3A, which is located just south of the Cabrillo Reservoir site. The Cabrillo Reservoir would have the same high-water level and base elevation as Reservoir 3A, and could supply Zone 6 by gravity, or supply Reservoirs 4A and 4B through pumping. A summary of the hydraulic parameters for the reservoir are included in Table 1.

Current practice is to fill all tanks to their high water level, and then allow them to supply system demands until the tanks drop to approximately 25% of the full volume, and then the tanks are filled to high water levels and the process starts over again. The duration from high water level to low water level is 2 to 3 days for average demand conditions. This process is adjusted during peak summer and fall months when there is high fire risk, or whenever the City deems it necessary for potential emergency conditions; at those times the tanks are kept at their high water levels as much as possible. It is recommended to continue this operational practice with the proposed Cabrillo Reservoir.

Reservoir Size: Based on discussions with City staff, it was agreed that additional storage could be added to Zone 6 with the provision that the new reservoir was divided into two cells for operational flexibility. Based on the available space at the site, the proposed reservoir size is a total 4.3 MG (two cells at 2.15 MG each). With two-cells, the City can operate both cells in parallel, or one at a time. This allows one cell to be taken out of service when demands are low, such as the rainy season in the winter. This also provides the benefit of being able to take a cell offline for maintenance and still keep the other cell operational.

The operational demands of adding this volume of water to Zone 6 presents a challenge to maintaining the water quality in the storage system for Zone 6. Providing additional storage volume while the demands in the zone remain the same means the water will not move through the storage system as quickly as would be necessary to maintain adequate water quality. This can be addressed, however, with the utilization of a Reservoir Management System as described below.

Pumping Considerations: Based on discussions with City staff, it was agreed that with the addition of the new Cabrillo Reservoir that would operate in parallel with Reservoir 3A, it is appropriate to also construct an additional pump station to pump the Cabrillo Reservoir water to Reservoirs 4A and 4B. The new pump station would provide operational flexibility to the City, and also provide greater distribution capacity in the ability to move water from lower zones to upper zones. The new pump station would supplement the existing Pump Station 3A and Greystone Pump Station by providing additional pumping capacity to the upper pressure zones (pressure zone 8, 11, 13, 15, and 16) and the reservoirs that serve those respective pressure zones.

The pump station would be sized to supply maximum day demand in a 16-hour period for the following upper zones: 8, 11, 13, 15, and 16. This equates to approximately 1,650 gpm.

Table 1: Cabrillo Reservoir Hydraulic Parameters

Hydraulic Parameter	Value
Reservoir Size	4.3 MG
No. of Cells/Size	2 cells at 2.15 MG Each
Base Elevation	594 FT
Overflow Elevation	626 FT
Filled (Supplied) By	BH-1/BH-2 and Coldwater PS
Gravity Supply To	Zone 6, New Cabrillo Pump Station
Pumped Supply To	Zone 8 (Reservoirs 4A and 4B)
Minimum Pump Station Capacity	1650 gpm
Recommended Pump Configuration	4 pumps at 825 gpm each

Site Layout

The proposed site layout is shown on Exhibit 1. A description of the primary site layout components is discussed below.

Hazen

Reservoir Type and Configuration: To maximize the storage volume at the site, the reservoir type recommended would be partially buried cast-in-place concrete construction (as opposed to circular, partially buried prestressed concrete reservoirs). The proposed structure would be approximately 12-feet above existing grade and 30-feet below existing grade (including concrete roof and floor thickness). The reservoir would be situated on the northerly portion of the property and be rectangular in shape, with an internal dividing wall creating the two rectangular cells.

In order to manage the water quality in the reservoirs, a reservoir management system (RMS) is recommended to maintain a consistent disinfectant residual and provide adequate mixing in the reservoirs. The major components of an RMS consist of mixers, chemicals storage and feed systems for boosting the disinfectant residual, an on-line analyzer to monitor concentration of the disinfectant, a control system, and all other piping and valves for a complete operational system.

Pump Station: The new pump station would be located immediately south of the reservoir, with vertical turbine pumps extending approximately 30-feet below grade. The pump cans would be supplied by gravity from Cabrillo Reservoir, and pump into the Zone 8 system (Reservoirs 4A and 4B). The pump configuration is two pumps for each reservoir cell. The pump station can operate in parallel (pumping water from each cell concurrently), or one at a time.

The pumps, piping and valving, and electrical equipment would be housed in a new building adjacent to the reservoir. The new building would be approximately the same height as the reservoir structure and include separate rooms for the mechanical equipment and electrical equipment. Appropriate sound proofing will be included to minimize disturbance to the nearby residential properties. Additional electrical facilities onsite include a backup generator (to power the pumps in the event of a power loss), transformer, service entrance and transfer switch.

Dewatering System: A dewatering system is required to expel shallow groundwater from the site. Dewatering wells could be located either on the northerly end of the property or to the east of the reservoir along Coldwater Canyon Drive. Dewatering is required to avoid damage to the buried structure's walls and bottom which may result from hydrostatic pressure. Water from the dewatering wells would be disposed into the local stormwater system.

Piping and Valving: Piping and valving at the site would include a new inlet/outlet pipe connecting to the existing Zone 6 piping in Cabrillo Drive. New Zone 8 discharge piping from the pump station would connect to the existing Zone 8 piping in Coldwater Canyon Drive.

Access: Primary access to the site would be off of Cabrillo Drive onto the existing access road to the west of the site. A new access gate would be provided for truck access. Sufficient space has been allowed for truck access and parking onto the site adjacent to the pump station building for operations and maintenance access.

Cost Estimate

A project conceptual cost estimate was developed for construction, and final design and environmental (CEQA) documentation. The total estimated cost for the project is \$14 M. A detailed breakdown of the cost estimate is attached.

The estimate is considered to be an AACE Class 4 level. Class 4 has a typical accuracy range of -30% on the low side and +50% on the high side. A 20% design contingency has been added to the estimate based on current status of the design documents, the nature of the project and the estimate classification.

The basis of the cost estimate includes the following:

1. Costs were not escalated and are presented in 2020 dollars.
2. Construction duration is assumed to be 12-months.
3. The project is assumed to be procured as a single prime contract through a traditional design/bid/build process.
4. Wage rates utilized are based on prevailing wages published for Los Angeles County current to June 30, 2021.
5. A 40-hour work week is assumed, no shift, weekend or other premium time is provided.
6. Wherever possible, equipment rates are based on current published rental rates as listed in the AED Blue Book, supplemented by RS Mean's data, the AED Green Book and local rental suppliers.
7. Crews, equipment and productivity used for work items are based mostly on standards specific to each trade. Some information was supplemented by RS Mean's data modified where necessary by estimator judgment.

An itemized breakdown of estimate assumptions is included below:

Demolition

- Demolish existing reservoir structure, assume on average 10-ft wall height, approximately 240,282 cubic feet of reservoir volume
 - Assume an average floor and wall thickness of 1-ft

Site Work

- Allow for site finishing.
 - Perimeter fencing, 8-ft high tubular steel fence
 - Sliding access gate, 20-ft wide
 - Site pavement (asphalt-concrete)
 - Landscaping surrounding site

Yard Piping

- Zone 6 inlet and outlet pipe, up to 16-inch diameter DIP, assume 20-ft cover
- Zone 8 discharge pipe, up to 14-inch diameter DIP, assume 3-ft cover
- Assume 3-ft cover

- Allow for street work, including pavement removal and replacement and traffic control

Reservoir

- Cast-in-place concrete structure (inside dimensions: 140-ft x 140-ft x 35-ft). Partially buried, 20-ft below grade
 - Include interior dividing wall, 2-ft thickness
 - Allow for concrete columns supporting an elevated slab, 10-inch thickness
 - Allow for mat foundation for bottom slab with thickened wall footing
 - Allow for interior coating
 - Allow for exterior waterproofing for buried portion
- Include excavation, active shoring and engineered fill (assume 3-ft overexcavation)
 - Assume excavation within first 10-ft is not required due to demolition of existing reservoir
 - Include active shoring around entire perimeter of site and along south wall of new reservoir
- Reservoir overflow and submersible guiderail mounted drain pump for each cell, with new pipe connecting to storm drain
 - Assume 25-hp pumps
 - Assume 8-inch diameter discharge line
- Include access hatch to each cell with SS ladder and intermediate platform

Reservoir Management System

- Reservoir Management System consisting of mixers, chemicals storage and feed systems for boosting the disinfectant residual, an on-line analyzer to monitor concentration of the disinfectant, a control system, and all other piping and valves for a complete operational system

Pump Station

- CMU building at grade with architectural features to match surrounding area (12-ft height, 20-ft x 60-ft). Internal partition walls for electrical room and stairway
- Include excavation, active shoring and engineered fill (assume 3-ft over-excavation)
 - Assume excavation within first 10-ft is not required due to demolition of existing reservoir
- Include (4) pumps, assume 100-hp vertical turbine type, with pump cans approximately 30 feet deep, 18-inch diameter carbon steel
 - Allow for valves and piping within the wet well. 16-inch diameter DIP
 - Allow for common intake from Zones 6 and 8, 24-inch diameter DIP
- Include cast-in-place valve vault (20-ft x 25-ft x 10-ft), buried 20-ft below grade

Electrical and Controls

- Allow electrical and instrumentation as a percentage of project cost.
- Include back-up generator, assume 250-kW
 - Include concrete slab-on-grade

- Include transformer, assume 750-kVA
- Include automatic transfer switch, assume 800-A
- Include service entrance
- Allow for programming/integration

Dewatering

- Allow for permanent dewatering system as part of the finished project which include multiple dewatering wells, piping system, and discharge to a local storm drain

Please note, this latest cost estimate for the Cabrillo Reservoir is increased from the costs originally presented in the Integrated Water Resources Master Plan (IWRMP). The major factors contributing to the cost increases include the larger reservoir structure (4.3 MG vs 3.0 MG), and the addition of a pump station facility.

Next Steps

The next steps to implement the proposed Cabrillo Reservoir project is to initiate the design and CEQA phase of the project, which is estimated to take 12-months. Bid/award, and then construction is estimated at 15-months.

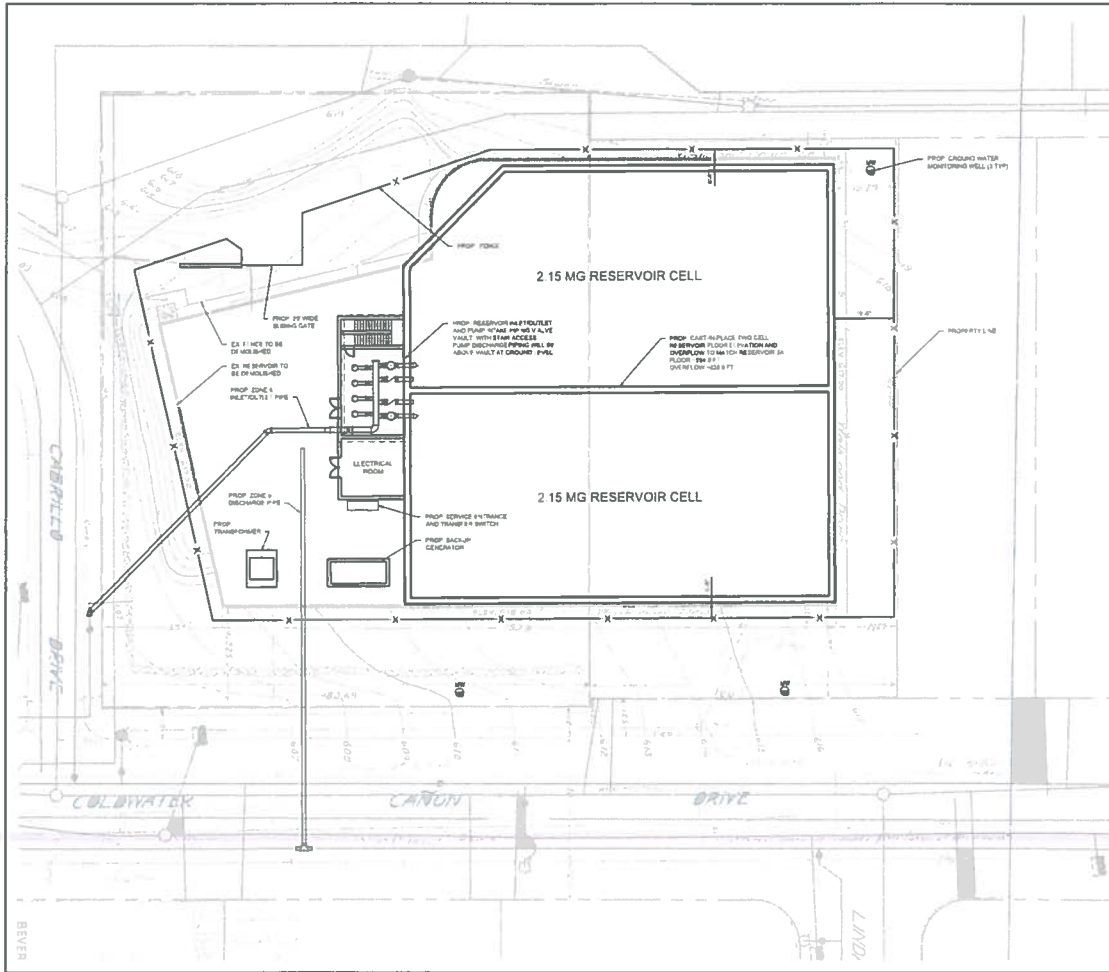
Discussion on Emergency Storage

The following section is an excerpt from the IWRMP report (Part 1 – Section 5 Emergency Resiliency):

A possible conclusion to the desire to increase emergency storage duration is to construct additional storage facilities. However, construction of additional storage facilities in the City presents several challenges, including acquiring available land at the optimal hydraulic elevation for a new reservoir, as well as community impacts from construction (noise, aesthetics, construction traffic).

An alternative to constructing additional storage facilities is to develop alternative sources of supply, such as groundwater. Maximizing the City's supply from groundwater wells provides increased emergency storage duration, while also holding several advantages over constructing additional storage facilities. One advantage is maximizing the City's existing infrastructure, including existing wells, pipelines, and the Foothill Water Treatment Plant which are already in place. Another advantage is the reduced footprint of a well site compared to a storage site. A third advantage is reliability – a groundwater well with backup power capability reduces reliance on the MWD supply and provides a second supply source for the City.

After the initial local water supply projects and new storage projects are completed, it is recommended that the City reevaluate their emergency storage situation and priorities for future years.



Hazen

HAZEN AND SAWYER
7700 IRVINE CENTER DRIVE, SUITE 200
IRVINE, CALIFORNIA 92618

BEVERLY HILLS	EXHIBIT
CABRILLO RESERVOIR PROPOSED SITE PLAN	1



City of Beverly Hills
Cabrillo Reservoir
Improvements
Conceptual Estimate

Date: August 28, 2020

Item	Description		
0	General Conditions	10%	\$ 725,723
1	Demolition		\$ 76,520
2	Site Work		\$ 124,913
3	Yard Piping		\$ 120,653
4	Reservoir		\$ 4,540,371
5	Reservoir Management System		\$ 452,004
6	Pump Station		\$ 1,204,962
7	Electrical and Controls		\$ 593,898
8	Dewatering		\$ 143,905
		Subtotal:	\$ 7,982,948
	Contractor Overhead	10%	\$ 798,295
		Subtotal:	\$ 8,781,243
	Contractor Profit	10%	\$ 878,124
		Subtotal:	\$ 9,659,367
	Escalation to mid-point of construction	0%	\$ -
		Subtotal:	\$ 9,659,367
	Bond and Insurance	3%	\$ 289,781
		Subtotal:	\$ 9,949,148
	Contingency	20%	\$ 1,989,830
		Probable Bid Cost:	\$ 11,900,000
	Engineering Design and Environmental (CEQA) Services	8%	\$ 952,000
	Engineering Services During Construction	3%	\$ 357,000
	Construction Management Services	5%	\$ 595,000
	Admin/Legal	1%	\$ 119,000
		Probable Bid Cost:	\$ 13,920,000

8/28/2020



City of Beverly Hills
Cabrillo Reservoir
Improvements

Item/Div #	Dwg#	Conceptual Estimate	Quantity	Unit	Notes	Labor Unit Cost	Equipment Unit Cost	Material Unit Cost	Total Unit Cost	Total Cost
1 Demolition										
Div 02		Existing Conditions								
		<i>Demolish existing reservoir</i>								
		Remove cover	28,370	sf		\$0.28	\$0.15		\$ 0	\$ 12,141
		Demolish walls	7,100	sf		\$0.92	\$0.56		\$ 1	\$ 10,535
		Demolish foundation	28,370	sf		\$0.72	\$0.44		\$ 1	\$ 32,742
		Disposal	1,401	cy		\$5.29	\$4.77	\$5.00	\$ 15	\$ 21,102
		Div 02 Subtotal								\$ 76,520
		Item No. 1 Subtotal								\$ 76,520
2 Site Work										
Div 32		Exterior Improvements								
		Gravel Bedding	163	cy		\$18.93	\$9.87	\$25.00	\$ 54	\$ 8,766
		Replacement pavement	275	tn		\$11.23	\$4.62	\$80.00	\$ 98	\$ 26,359
		Sliding gate	1	ea	20-ft length	\$1,079.20	\$67.27	\$4,000.00	\$ 5,146	\$ 5,146
		Perimeter fence	770	lf	Tubular steel	\$10.79	\$0.67	\$67.93	\$ 79	\$ 61,134
		Landscaping	1	ls	Allow	\$10,791.97	\$1,923.58	\$10,791.97	\$ 23,508	\$ 23,508
		Div 32 Subtotal								\$ 124,913
		Item No. 2 Subtotal								\$ 124,913
3 Yard Piping										
Div 31		Earthwork								
		<i>Zone 6 (16-inch)</i>			Only for portion outside main excavation					
		Excavation	197	cy		\$12.62	\$6.58		\$ 19	\$ 3,784
		Timber shoring	3,071	sf		\$9.71	\$0.45	\$2.00	\$ 12	\$ 37,365
		Gravel Bedding	9	cy		\$18.93	\$9.87	\$25.00	\$ 54	\$ 475
		Backfill (reuse)	197	cy		\$18.93	\$9.87		\$ 29	\$ 5,676
		Disposal of soil	0	cy		\$5.29	\$4.77	\$5.00	\$ 15	\$ -
		<i>Zone 8 (14-inch)</i>			Only for portion outside main excavation					
		Excavation	64	cy		\$12.62	\$6.58		\$ 19	\$ 1,224
		Trench box	1	wk				\$450.00	\$ 450	\$ 450
		Gravel Bedding	12	cy		\$18.93	\$9.87	\$25.00	\$ 54	\$ 664
		Backfill (reuse)	64	cy		\$18.93	\$9.87		\$ 29	\$ 1,836
		Disposal of soil	0	cy		\$5.29	\$4.77	\$5.00	\$ 15	\$ -
		Div 31 Subtotal								\$ 51,475
Div 32		Exterior Improvements								
		<i>Zone 6 (16-inch)</i>								
		Sawcut	119	lf		\$1.34	\$0.65	\$0.36	\$ 2	\$ 279
		Remove/dispose of pavement	238	sf		\$2.03	\$0.77	\$1.00	\$ 4	\$ 905
		Replacement pavement	7	tn		\$11.23	\$4.62	\$85.00	\$ 101	\$ 751
		<i>Zone 8 (14-inch)</i>								
		Sawcut	168	lf		\$1.34	\$0.65	\$0.36	\$ 2	\$ 396
		Remove/dispose of pavement	333	sf		\$2.03	\$0.77	\$1.00	\$ 4	\$ 1,266
		Replacement pavement	10	tn		\$11.23	\$4.62	\$85.00	\$ 101	\$ 1,051
		Div 32 Subtotal								\$ 4,649
Div 40		Process Connections								
		<i>Zone 6 (16-inch)</i>								
		Furnish/Install 16-inch diameter pipe	110	lf		\$17.99	\$8.79	\$128.83	\$ 156	\$ 17,117
		45-elbow	2	ea		\$269.80	\$131.92	\$658.70	\$ 1,060	\$ 2,121
		<i>Zone 8 (14-inch)</i>								
		Furnish/Install 14-inch diameter pipe	150	lf		\$15.99	\$7.82	\$208.09	\$ 232	\$ 34,784
		45-elbow	2	ea		\$269.80	\$131.92	\$527.80	\$ 930	\$ 1,859
		Tee	1	ea		\$269.80	\$131.92	\$940.80	\$ 1,343	\$ 1,343
		Testing	2	cd		\$1,078.36			\$ 1,078	\$ 2,157
		Traffic control								
		Flagger	8	cd		\$200.00			\$ 200	\$ 1,600
		Barrels	52	ea		\$5.68	\$1.07	\$2.00	\$ 9	\$ 455
		Arrow board	2	wk				\$500.00	\$ 500	\$ 1,000
		Temporary markings/signs	1	ls		\$859.55	\$37.50	\$85.96	\$ 983	\$ 983
		Permanent markings/signs	1	ls		\$859.55	\$37.50	\$214.89	\$ 1,112	\$ 1,112
		Div 40 Subtotal								\$ 64,529
		Item No. 3 Subtotal								\$ 120,653



City of Beverly Hills
Cabrillo Reservoir
Improvements

Item/Div #	Dwg#	Conceptual Estimate	Quantity	Unit	Notes	Labor Unit Cost	Equipment Unit Cost	Material Unit Cost	Total Unit Cost	Total Cost
4		Reservoir								
Div 03		Concrete								
		Slab								
		Erect/Strip Formwork	840	sf		\$7.38	\$0.25	\$1.50	\$ 9	\$ 7,670
		Place Rebar	194,299	lb		\$0.67	\$0.06	\$1.00	\$ 2	\$ 335,438
		Place Concrete	1,089	cy		\$42.64	\$1.56	\$145.00	\$ 189	\$ 206,021
		Concrete Finishing	20,440	sf		\$1.22	\$0.10		\$ 1	\$ 27,021
		Footing								
		Erect/Strip Formwork	2,240	sf		\$7.38	\$0.25	\$1.50	\$ 9	\$ 20,453
		Place Rebar	6,477	lb		\$0.75	\$0.06	\$1.50	\$ 2	\$ 15,008
		Place Concrete	415	cy		\$42.64	\$1.56	\$135.00	\$ 179	\$ 74,336
		Elevated slab								
		Erect/Strip Formwork	19,600	sf		\$22.81	\$1.21	\$5.50	\$ 30	\$ 578,626
		Place Rebar	89,948	lb		\$0.67	\$0.13	\$1.00	\$ 2	\$ 162,402
		Place Concrete	605	cy		\$42.64	\$1.56	\$135.00	\$ 179	\$ 108,407
		Concrete Finishing	19,600	sf		\$1.22	\$0.24		\$ 1	\$ 28,701
		Concrete column								
		Erect/Strip Formwork	88	ea						
		Erect/Strip Formwork	18,480	sf		\$7.38	\$0.61	\$2.50	\$ 10	\$ 193,797
		Place Rebar	45,938	lb		\$0.67	\$0.13	\$1.00	\$ 2	\$ 82,941
		Place Concrete	257	cy		\$42.64	\$1.56	\$135.00	\$ 179	\$ 45,998
		Concrete Finishing	18,480	sf		\$1.22	\$0.24		\$ 1	\$ 27,061
		Exterior Walls								
		Erect/Strip Formwork	39,200	sf		\$9.97	\$0.81	\$2.50	\$ 13	\$ 520,589
		Place Rebar	194,299	lb		\$0.67	\$0.13	\$1.00	\$ 2	\$ 350,807
		Place Concrete	1,452	cy		\$42.64	\$1.56	\$135.00	\$ 179	\$ 280,177
		Concrete Finishing	39,200	sf		\$1.22	\$0.24		\$ 1	\$ 57,403
		Interior Walls			Length					
		Erect/Strip Formwork	1	ea						
		Erect/Strip Formwork	9,800	sf		\$9.97	\$0.81	\$2.50	\$ 13	\$ 130,147
		Place Rebar	50,741	lb		\$0.67	\$0.13	\$1.00	\$ 2	\$ 91,814
		Place Concrete	363	cy		\$42.64	\$1.56	\$135.00	\$ 179	\$ 65,044
		Concrete Finishing	9,800	sf		\$1.22	\$0.24		\$ 1	\$ 14,351
		Div 03 Subtotal								\$ 3,404,010
Div 05		Miscellaneous Metals								
		Access hatch	2	ea		\$2,208.31	\$962.95	\$4,500.00	\$ 7,671	\$ 15,343
		Ladder	70	lf		\$61.17	\$6.67	\$360.00	\$ 428	\$ 29,949
		Intermediate platform	100	sf	Assume 5-ft x 10-ft	\$39.33	\$3.93	\$90.00	\$ 133	\$ 13,325
		Div 05 Subtotal								\$ 58,617
Div 09		Finishes								
		Interior coating	78,120	sf	Interior faces only.	\$0.38	\$0.04	\$2.00	\$ 2	\$ 189,184
		Exterior waterproofing	13,440	sf	Exterior buried faces only.	\$0.38	\$0.04	\$3.50	\$ 4	\$ 52,708
		Div 09 Subtotal								\$ 241,892
Div 31		Earthwork								
		Excavation	11,278	cy	Not including open excavation from demolition	\$8.41	\$4.38		\$ 13	\$ 144,313
		Timber shoring	16,575	sf	Around existing reservoir	\$9.71	\$0.45	\$2.00	\$ 12	\$ 201,680
		Timber shoring	2,625	sf	Along south wall of new reservoir only	\$9.71	\$0.45	\$2.00	\$ 12	\$ 31,940
		Gravel Bedding	726	cy	Assume 12-inches thick	\$12.62	\$6.58	\$25.00	\$ 44	\$ 32,082
		Backfill (Import)	2,178	cy		\$12.62	\$6.58	\$35.00	\$ 54	\$ 118,023
		Backfill (Reuse)	3,560	cy		\$12.62	\$6.58		\$ 19	\$ 68,332
		Disposal of Soil	7,718	cy		\$5.29	\$4.77	\$5.00	\$ 15	\$ 116,225
		Div 31 Subtotal								\$ 712,596
Div 40		Process Connections								
		West tank								
		Furnish/Install 8-inch diameter pipe	30	lf		\$11.99	\$5.86	\$60.78	\$ 79	\$ 2,359
		Elbow	1	ea		\$215.84	\$105.54	\$149.10	\$ 470	\$ 470
		Butterfly valve	1	ea		\$539.60	\$263.85	\$2,200.00	\$ 3,003	\$ 3,003
		Check valve	1	ea		\$539.60	\$263.85	\$4,780.00	\$ 5,583	\$ 5,583
		Supports	2	ea		\$147.70	\$12.50	\$750.00	\$ 910	\$ 1,820
		East tank								
		Furnish/Install 8-inch diameter pipe	30	lf		\$11.99	\$5.86	\$60.78	\$ 79	\$ 2,359
		Elbow	1	ea		\$215.84	\$105.54	\$149.10	\$ 470	\$ 470
		Butterfly valve	1	ea		\$539.60	\$263.85	\$2,200.00	\$ 3,003	\$ 3,003
		Check valve	1	ea		\$539.60	\$263.85	\$4,780.00	\$ 5,583	\$ 5,583
		Supports	2	ea		\$147.70	\$12.50	\$750.00	\$ 910	\$ 1,820
		Common discharge								
		Furnish/Install 8-inch diameter pipe	100	lf		\$11.99	\$2.55	\$60.78	\$ 75	\$ 7,533



City of Beverly Hills
Cabrillo Reservoir
Improvements

Item/Div #	Dwg#	Conceptual Estimate	Quantity	Unit	Notes	Labor Unit Cost	Equipment Unit Cost	Material Unit Cost	Total Unit Cost	Total Cost
		Item Description								
		90-elbow	2	ea		\$215.84	\$45.97	\$149.10	\$ 411	\$ 822
		Tee	1	ea		\$215.84	\$45.97	\$219.10	\$ 481	\$ 481
		Testing	1	cd		\$1,078.36	\$75.00		\$ 1,153	\$ 1,153
		Div 40 Subtotal								\$ 36,462
Div 43		Process Gas and Liquid Handling, Purifications and Storage Equipment								
		Furnish/Install drain pump	2	ea	Submersible type, 25hp	\$6,075.37	\$991.23	\$35,000.00	\$ 42,067	\$ 84,133
		Equipment Testing	2	cd		\$1,180.36	\$150.00		\$ 1,330	\$ 2,661
		Div 43 Subtotal								\$ 86,794
		Item No. 4 Subtotal								\$ 4,540,371
5		Reservoir Management System								
Div 11		Equipment								
		Reservoir mixing and chemical dosing system	1	ls	Based upon reference cost			\$452,004.06	\$ 452,004	\$ 452,004
		Div 11 Subtotal								\$ 452,004
		Item No. 5 Subtotal								\$ 452,004
6		Pump Station								
Div 03		Concrete								
		<i>Pump station building</i>								
		<i>Slab-on-grade</i>								
		Erect/Strip Formwork	240	sf		\$7.38	\$0.25	\$1.50	\$ 9	\$ 2,191
		Place Rebar	15,861	lb		\$0.67	\$0.06	\$1.00	\$ 2	\$ 27,383
		Place Concrete	67	cy		\$42.64	\$1.56	\$135.00	\$ 179	\$ 11,947
		Concrete Finishing	1,440	sf		\$1.22	\$0.10		\$ 1	\$ 1,904
		<i>Footing</i>	1	ea						
		Erect/Strip Formwork	640	sf		\$7.38	\$0.25	\$1.50	\$ 9	\$ 5,844
		Place Rebar	1,850	lb		\$0.75	\$0.06	\$1.50	\$ 2	\$ 4,288
		Place Concrete	47	cy		\$42.64	\$1.56	\$135.00	\$ 179	\$ 8,496
		<i>Valve vault</i>								
		<i>Bottom slab</i>								
		Erect/Strip Formwork	135	sf		\$7.38	\$0.25	\$1.50	\$ 9	\$ 1,233
		Place Rebar	6,609	lb		\$0.67	\$0.06	\$1.00	\$ 2	\$ 11,409
		Place Concrete	28	cy		\$42.64	\$1.56	\$135.00	\$ 179	\$ 4,978
		Concrete Finishing	635	sf		\$1.22	\$0.10		\$ 1	\$ 839
		<i>Footing</i>	1	ea						
		Erect/Strip Formwork	360	sf		\$7.38	\$0.25	\$1.50	\$ 9	\$ 3,287
		Place Rebar	1,041	lb		\$0.75	\$0.06	\$1.50	\$ 2	\$ 2,412
		Place Concrete	27	cy		\$42.64	\$1.56	\$135.00	\$ 179	\$ 4,779
		<i>Elevated slab</i>								
		Erect/Strip Formwork	500	sf		\$22.81	\$1.21	\$5.50	\$ 30	\$ 14,761
		Place Rebar	6,609	lb		\$0.67	\$0.13	\$1.00	\$ 2	\$ 11,932
		Place Concrete	19	cy		\$42.64	\$1.56	\$135.00	\$ 179	\$ 3,319
		Concrete Finishing	1,000	sf		\$1.22	\$0.24		\$ 1	\$ 1,464
		<i>Walls</i>								
		Erect/Strip Formwork	1,800	sf		\$9.97	\$0.81	\$2.50	\$ 13	\$ 23,905
		Place Rebar	4,461	lb		\$0.67	\$0.13	\$1.00	\$ 2	\$ 8,054
		Place Concrete	67	cy		\$42.64	\$1.56	\$135.00	\$ 179	\$ 11,947
		Concrete Finishing	1,800	sf		\$1.22	\$0.24		\$ 1	\$ 2,636
		Staircase	1	ls		\$11,850.46	\$1,000.00	\$34,951.39	\$ 47,802	\$ 47,802
		<i>Equipment Pads</i>								
		Erect/Strip Formwork	2	ea	West					
		Erect/Strip Formwork	30	sf		\$14.76	\$0.50	\$1.50	\$ 17	\$ 536
		Place Rebar	82	lb		\$1.34	\$0.11	\$0.75	\$ 2	\$ 207
		Dowel into Slab	30	ea		\$44.42	\$8.87	\$0.25	\$ 54	\$ 1,606
		Place Concrete	1	cy		\$85.29	\$3.12	\$135.00	\$ 223	\$ 265
		Concrete Finishing	88	sf		\$2.44	\$0.20		\$ 3	\$ 254
		<i>Equipment Pads</i>								
		Erect/Strip Formwork	2	ea	East					
		Erect/Strip Formwork	32	sf		\$14.76	\$0.50	\$1.50	\$ 17	\$ 536
		Place Rebar	94	lb		\$1.34	\$0.11	\$0.75	\$ 2	\$ 207
		Dowel into Slab	32	ea		\$44.42	\$8.87	\$0.25	\$ 54	\$ 1,713
		Place Concrete	1	cy		\$85.29	\$3.12	\$135.00	\$ 223	\$ 265
		Concrete Finishing	96	sf		\$2.44	\$0.20		\$ 3	\$ 254
		Div 03 Subtotal								\$ 221,836
Div 04		Architecture								
		CMU Building	1,200	sf			\$275.00		\$ 275	\$ 330,000



City of Beverly Hills
Cabrillo Reservoir
Improvements

Item/Div #	Dwg#	Conceptual Estimate	Quantity	Unit	Notes	Labor Unit Cost	Equipment Unit Cost	Material Unit Cost	Total Unit Cost	Total Cost
		Div 04 Subtotal								\$ 330,000
Div 31		Earthwork								
		<i>Pump station</i>								
		Excavation	467	cy		\$8.41	\$4.38		\$ 13	\$ 5,972
		Timber shoring	1,575	sf		\$9.71	\$0.45	\$2.00	\$ 12	\$ 19,164
		Gravel bedding	19	cy	Assume 12-inches thick	\$12.62	\$6.58	\$25.00	\$ 44	\$ 818
		Backfill (import)	56	cy		\$12.62	\$6.58	\$35.00	\$ 54	\$ 3,011
		Backfill (reuse)	249	cy		\$12.62	\$6.58		\$ 19	\$ 4,777
		Disposal of soil	218	cy		\$5.29	\$4.77	\$5.00	\$ 15	\$ 3,280
		Div 31 Subtotal								\$ 37,022
Div 40		Process Connections								
		<i>West discharge</i>								
		Furnish/Install 16-inch diameter pipe	20	lf		\$17.99	\$8.79	\$128.83	\$ 158	\$ 3,112
		Tee	2	ea		\$269.80	\$131.92	\$1,293.60	\$ 1,695	\$ 3,391
		Butterfly valve	4	ea		\$539.60	\$263.85	\$4,656.30	\$ 5,460	\$ 21,839
		Check valve	2	ea		\$539.60	\$263.85	\$9,651.00	\$ 10,454	\$ 20,909
		Supports	4	ea		\$147.70	\$12.50	\$750.00	\$ 910	\$ 3,641
		<i>East discharge</i>								
		Furnish/Install 16-inch diameter pipe	20	lf		\$17.99	\$8.79	\$128.83	\$ 158	\$ 3,112
		Tee	2	ea		\$269.80	\$131.92	\$1,293.60	\$ 1,695	\$ 3,391
		Butterfly valve	4	ea		\$539.60	\$263.85	\$4,656.30	\$ 5,460	\$ 21,839
		Check valve	2	ea		\$539.60	\$263.85	\$9,651.00	\$ 10,454	\$ 20,909
		Supports	4	ea		\$147.70	\$12.50	\$750.00	\$ 910	\$ 3,641
		<i>Common intake from Zone 6 and 8</i>								
		Furnish/Install 24-inch diameter pipe	40	lf		\$35.97	\$7.66	\$190.85	\$ 234	\$ 9,379
		90-elbow	3	ea		\$359.73	\$76.62	\$2,249.10	\$ 2,685	\$ 8,056
		Tee	6	ea		\$359.73	\$76.62	\$2,921.10	\$ 3,357	\$ 20,145
		Butterfly valve	1	ea		\$539.60	\$114.93	\$12,117.00	\$ 12,772	\$ 12,772
		Reducer	2	ea		\$359.73	\$76.62	\$1,206.80	\$ 1,643	\$ 3,288
		Supports	4	ea		\$147.70	\$12.50	\$750.00	\$ 910	\$ 3,641
		Testing	4	cd		\$1,078.36	\$75.00		\$ 1,153	\$ 4,613
		Div 40 Subtotal								\$ 167,675
Div 43		Process Gas and Liquid Handling, Purifications and Storage Equipment								
		Furnish/Install west pump	2	ea	100hp, vertical turbine	\$6,075.37	\$991.23	\$70,000.00	\$ 77,067	\$ 154,133
		Furnish/Install east pump	2	ea	100hp, vertical turbine	\$6,075.37	\$991.23	\$70,000.00	\$ 77,067	\$ 154,133
		Pump can	4	ea	30-ft deep, 18-inch diameter	\$1,596.10	\$750.45	\$31,363.71	\$ 33,710	\$ 134,841
		Equipment Testing	4	cd		\$1,180.36	\$150.00		\$ 1,330	\$ 5,321
		Div 43 Subtotal								\$ 448,429
		Item No. 6 Subtotal								\$ 1,204,962
7		Electrical and Controls								
Div 03		Concrete								
		<i>Generator</i>								
		Erect/Strip Formwork	87	sf		\$7.38	\$0.25	\$1.50	\$ 9	\$ 794
		Place Rebar	2,379	lb		\$0.67	\$0.06	\$1.00	\$ 2	\$ 4,107
		Place Concrete	10	cy		\$42.64	\$1.56	\$135.00	\$ 179	\$ 1,792
		Concrete Finishing	267	sf		\$1.22	\$0.10		\$ 1	\$ 353
		<i>Transformer</i>								
		Erect/Strip Formwork	60	sf		\$7.38	\$0.25	\$1.50	\$ 9	\$ 548
		Place Rebar	1,322	lb		\$0.67	\$0.06	\$1.00	\$ 2	\$ 2,282
		Place Concrete	6	cy		\$42.64	\$1.56	\$135.00	\$ 179	\$ 996
		Concrete Finishing	160	sf		\$1.22	\$0.10		\$ 1	\$ 212
		Div 03 Subtotal								\$ 11,084
Div 31		Earthwork								
		<i>Generator</i>								
		Excavation	53	cy		\$12.62	\$6.58		\$ 19	\$ 1,013
		Gravel bedding	21	cy	Assume 12-inches thick	\$18.93	\$9.87	\$25.00	\$ 54	\$ 1,136
		Backfill (reuse)	26	cy		\$18.93	\$9.87		\$ 29	\$ 749
		Disposal of soil	27	cy		\$5.29	\$4.77	\$5.00	\$ 15	\$ 403
		<i>Transformer</i>								
		Excavation	37	cy		\$12.62	\$6.58		\$ 19	\$ 711
		Gravel bedding	15	cy	Assume 12-inches thick	\$18.93	\$9.87	\$25.00	\$ 54	\$ 797
		Backfill (reuse)	20	cy		\$18.93	\$9.87		\$ 29	\$ 576
		Disposal of soil	17	cy		\$5.29	\$4.77	\$5.00	\$ 15	\$ 257



City of Beverly Hills
Cabrillo Reservoir
Improvements

Item/Div #	Dwg#	Conceptual Estimate	Quantity	Unit	Notes	Labor Unit Cost	Equipment Unit Cost	Material Unit Cost	Total Unit Cost	Total Cost
		Div 31 Subtotal								\$ 5,641
Div 26		Electrical								
		Duct bank	50	ft				\$400.00	\$ 400	\$ 20,000
		Back-up Generator	1	ea	250kW	\$5,961.65	\$3,151.80	\$100,000.00	\$ 109,113	\$ 109,113
		TX	1	ea	750kVA	\$5,961.65	\$3,151.80	\$60,000.00	\$ 69,113	\$ 69,113
		Service entrance	1	ea		\$2,980.82	\$1,575.90	\$50,000.00	\$ 54,557	\$ 54,557
		ATS	1	ea	800A	\$5,961.65	\$3,151.80	\$12,000.00	\$ 21,113	\$ 21,113
		Electrical	1	ls	Assume at 3% of subitem cost			\$195,582.68	\$ 195,583	\$ 195,583
		Div 26 Subtotal								\$ 469,480
Div 40		Process Connections								
		Instrumentation	1	ls	Assume at 1% of subitem cost			\$65,194.23	\$ 65,194	\$ 65,194
		Programming/Integration	25	cd		\$1,650.00	\$50.00		\$ 1,700	\$ 42,500
		Div 40 Subtotal								\$ 107,694
		Item No. 7 Subtotal								\$ 593,898
8		Dewatering								
Div 31		Earthwork								
		Mob/Demob	1	ls		\$11,371.75	\$9,187.36		\$ 20,559	\$ 20,559
		Wellpoint	2	ea	Assume 20-ft depth	\$11,371.75	\$9,187.36	\$900.00	\$ 21,459	\$ 42,918
		Furnish/Install 6-inch diameter pipe	760	ft		\$10.79	\$2.30	\$43.64	\$ 57	\$ 43,113
		6-inch 90-degree elbow	5	ea		\$215.84	\$45.97	\$101.50	\$ 363	\$ 1,817
		6-inch 90-degree tee	2	ea		\$215.84	\$45.97	\$147.00	\$ 409	\$ 818
		Allow for miscellaneous fittings at pumps	1	ls		\$2,158.39	\$459.72	\$2,158.39	\$ 4,777	\$ 4,777
		Div 31 Subtotal								\$ 114,001
Div 40		Process Interconnections								
		Wellpoint pump	2	ea		\$3,915.01	\$1,036.93	\$10,000.00	\$ 14,952	\$ 29,904
		Div 40 Subtotal								\$ 29,904
		Item No. 8 Subtotal								\$ 143,905

Executive Summary

The Integrated Water Resources Master Plan (IWRMP) is a comprehensive planning document that analyzes the water, sewer, and storm drain systems owned, operated, and maintained by the City of Beverly Hills (City). The IWRMP is comprised of Part 1 and Part 2.

The IWRMP – Part 1 addresses the City’s major water resources strategy which includes imported water, groundwater, and other potential supply sources. Part 1 also addresses other topics including emergency storage for the water system, and stormwater compliance. The IWRMP – Part 2 is a master plan of the water, sewer, and storm drain systems. For each system, the document addresses the existing system and service area, evaluation and design criteria, system analysis, and capital improvements.

The theme of the IWRMP is to focus on near-term practical solutions with an eye towards what could be done in the future. The near-term represents a focus on projects that should be implemented within the next five years – 2021 through 2025. An eye towards the future includes taking the necessary steps now to position for long-term resiliency and reliability of the City’s water, sewer, and storm drain systems.

IWRMP Priorities

IWRMP priorities and criteria were developed in collaborative workshops with the consultant team, City staff, and the Public Works Commission. Priorities and criteria were used to guide the analysis, develop projects, and set prioritization for implementation. A description of the IWRMP priorities is provided below:

- **Water Supply Reliability** – Increasing flexibility of the City’s water supply by increasing local water supply, which includes alternative water resources, and reducing imported water from Metropolitan Water District.
- **Emergency Resiliency** – Implementing projects that make systems more resilient to emergencies.
- **Addressing Aging Infrastructure** – Taking a proactive approach to replacing aging infrastructure for the water, sewer, and storm drain systems.
- **Accounting for Growth Needs** – Ensuring the City’s systems are adequately addressing growth within the service area.

Water Supply Portfolio

The current, near-term, and future water supply portfolio will include conservation, imported water from Metropolitan Water District (MWD), local groundwater, and may also include alternative sources. With the completion of the La Brea Subarea water supply projects, which includes new groundwater wells and a transmission main, the water supply portfolio from current conditions to year 2025 is illustrated in Figure ES-1. Future year conditions also account for projected water demand using the most conservative

methodology (discussed further in Section 2). As shown, over 20% reduction in imported water is anticipated.



Figure ES-1: Water Supply Portfolio Summary

Groundwater

The City's water supply includes groundwater wells in the Hollywood Groundwater Basin and the La Brea Subarea of the Central Groundwater Basin. Implementation steps have been identified to maintain the existing groundwater supplies, develop new groundwater supplies, and expand the Foothill Water Treatment Plant to increase water supply reliability.

Maintaining the existing groundwater supplies will require regular monitoring of well operational data, well testing and rehabilitation, and operations best practices.

To develop new groundwater supplies, in addition to the first La Brea Subarea Well at the former Coffee Bean site, the following projects have been identified:

- Two (2) La Brea Subarea Wells to be located at La Cienega Park
- One (1) La Brea Subarea Well to be located at a location to be determined
- One (1) Hollywood Groundwater Basin Well located at Santa Monica Boulevard and Foothill Road
- One (1) Hollywood Groundwater Basin Well located at 3rd Street and Foothill Road
- One (1) Santa Monica Groundwater Basin Well located at Roxbury Park to supply the local irrigation demand

To accommodate the additional groundwater supplies, improvements have been identified at Foothill Water Treatment Plant to increase plant capacity from 2.3 to 4.7 million gallons per day (MGD).

Alternative Sources

A priority for the City is to take immediate steps now to position for long-term water supply options. It is recognized that all potential water supply sources should be identified and evaluated. One potential alternative source of water is shallow groundwater to be used to meet irrigation demand for non-residential uses such as parks, schools, and median landscaping.

Potential alternative source projects and multi-benefit projects have been identified. The projects include:

- Roxbury Park – stormwater diversion, treatment, and distribution for irrigation supply
- Subterranean Parking Structures – shallow groundwater diversion, treatment, and distribution for irrigation supply
- La Cienega Park – raw water distribution from La Brea Well(s) for irrigation supply
- Desalination – buying into a desalination plant and delivery through MWD

Emergency Resiliency

One of the priorities of the IWRMP is Emergency Resiliency – ensuring the City is implementing projects that make systems more resilient to emergencies, such as emergency storage for the water system. The recommended near-term emergency storage projects are:

- Reservoir 4C – 1-million-gallon tank to be constructed adjacent to existing Reservoir 4B
- Cabrillo Reservoir – up to 3-million-gallon tank to be constructed at the inactive Cabrillo Reservoir site

Stormwater Compliance

The City is located entirely within the watershed of Ballona Creek. Stormwater Compliance refers to efforts to maintain the Ballona Creek watershed through compliance with the 2016 Ballona Creek Enhanced Watershed Management Program (BCEWMP).

The “Stormwater Compliance Capital Improvement Program Master Plan – Project Concepts for Stormwater Compliance” was completed in August 2019 that included a multitude of stormwater compliance recommendations such as Burton Way Green Streets and other multi-benefit projects. In addition, this report identified a potential project to utilize sewer system capacity to help the City comply with the MS4 stormwater discharge permit compliance. Three (3) locations were identified in the City’s business and restaurant district to divert dry-weather flow to the sewer system.

The City’s current implementation approach to stormwater compliance projects is to combine them with other City improvement projects when feasible.

Capital Improvement Projects, Annual Programs, and Stakeholder Involvement

A summary of the capital improvement projects, annual programs, and stakeholder involvement identified in this report are shown in Table ES-1 and Table ES-2. Total capital costs for projects were estimated including construction costs, engineering and administrative costs, and land acquisition where applicable. Scoring for each project was based on the following criteria (all equally weighted): cost, reliability, timeframe, feasibility, emergency resiliency, and risk factors. Project descriptions, cost information, and scoring criteria are included in Section 7.

Table ES-1: Summary of Capital Improvement Projects

Project #	Project Type	Name	Capital Cost	Score
ER-1	Emergency Resiliency	Reservoir 4C	\$4,915,000	87
G-6	Groundwater	Foothill WTP Expansion to 4.7 MGD	\$6,493,000	80
WS-2	Water System	LADWP Interconnection Upgrade at Coldwater Reservoir	\$433,000	80
WS-3	Water System	Pipeline Project No. 1	\$15,561,000	80
WS-4	Water System	Pipeline Project No. 2	\$8,195,000	80
WS-5	Water System	Pipeline Project No. 3	\$6,899,000	80
SS-5	Sewer System	Oakhurst Drive Capacity Improvement Project	\$3,519,000	80
SS-4	Sewer System	Small Diameter Capacity Relief Project	\$836,000	80
SS-11	Sewer System	N. Sierra Drive "Bottleneck" Capacity Relief Project	\$213,000	80
AS-4	Alternative Sources	La Cienega Park Irrigation Supply	\$1,392,000	77
SS-12	Sewer System	La Cienega Boulevard Capacity Improvement Project	\$1,031,000	77
G-3	Groundwater	La Brea Well #2 (La Cienega Park)	\$4,324,000	73
G-4	Groundwater	La Brea Well #3 (La Cienega Park)	\$4,324,000	73
G-7	Groundwater	Hollywood GWB Deep Well	\$5,447,000	73
G-8	Groundwater	Hollywood GWB Shallow Well	\$5,187,000	73
SS-10	Sewer System	Annual Rehabilitation Project	\$271,000	73
WS-1	Water System	Coldwater Pump Station (PS 2) Improvements	\$3,538,000	70
SS-1	Sewer System	Sewer System Pipeline and Manhole Rehabilitation Project - Year 1 (North)	\$5,448,000	70
SS-2	Sewer System	Sewer System Pipeline and Manhole Rehabilitation Project - Year 2 (Central)	\$4,106,000	70
SS-3	Sewer System	Sewer System Pipeline and Manhole Rehabilitation Project - Year 3 (South)	\$4,749,000	70
SS-14	Sewer System	Inflow & Infiltration Study	\$433,000	70
ER-2	Emergency Resiliency	Potable Water Cabrillo Reservoir	\$6,352,000	67
SS-6	Sewer System	Additional Permanent Flow Monitoring Sites	\$240,000	67
G-5	Groundwater	La Brea Well #4 (Location TBD)	\$7,947,000	63
SS-13	Sewer System	Dry-Weather TMDL to Sewer Diversion Project	\$313,000	57
G-9	Groundwater	Santa Monica GWB Irrigation Supply Well (Roxbury Park)	\$2,825,000	50
AS-2	Alternative Sources	Roxbury Park Stormwater Diversion	\$3,688,000	33
AS-3	Alternative Sources	Subterranean Parking Groundwater Diversion	\$6,398,000	33
SD-6	Storm Drain	Storm Water System Pipeline Upgrade Project and Optional Flood Barrier Protection Project	\$24,294,000	30

Table ES-2: Summary of Annual and Stakeholder Involvement Programs

Project #	Project Type	Name	Annual Cost
G-1	Groundwater	Production Well Maintenance Program	\$300,000
G-2	Groundwater	GWB Monitoring Program	\$100,000
WE-1	Water Efficiency	Conservation Program	\$600,000
WE-2	Water Efficiency	Leak Detection Program	\$200,000
WS-6	Water System	PRV Asset Management Program	\$500,000
SS-7	Sewer System	CCTV Remainder of System - Year 1 (North)	\$1,421,634
SS-8	Sewer System	CCTV Remainder of System - Year 2 (Central)	\$1,421,634
SS-9	Sewer System	CCTV Remainder of System - Year 3 (South)	\$1,421,634
SD-1	Storm Drain	Storm Drain CCTV Inspection - Year 1	\$1,013,135
SD-2	Storm Drain	Storm Drain CCTV Inspection - Year 2	\$1,068,120
SD-3	Storm Drain	Storm Drain CCTV Inspection - Year 3	\$643,965
SD-4	Storm Drain	Storm Drain CCTV Inspection - Year 4	\$473,005
SD-5	Storm Drain	Storm Drain CCTV Inspection - Year 5	\$387,090
SC-1	Stormwater Compliance	Misc. BMPs from Stormwater Compliance Master Plan	Varies
AS-1	Alternative Sources	Recycled Water Stakeholder Involvement	\$0
AS-5	Alternative Sources	Desalination Stakeholder Involvement	\$0

Public Works Commission Recommendations

Throughout the multiple PWC workshops and meetings, the input provided from various members of the PWC was that the highest priority should be given to emergency water storage projects. Emergency water storage projects include new reservoirs and tanks for the City’s water system.

At the July 9, 2020 PWC Regular Meeting, the following three (3) motions passed 5-0:

- The Public Works Commission, upon reviewing the IWRMP analysis, recommends to City Council the following four (4) projects merit priority consideration for CIP funding:
 - Potable Water Cabrillo Reservoir (estimated cost: \$6,352,000)
 - Reservoir 4C (estimated cost: \$4,915,000)
 - LADWP Interconnection Upgrade at Coldwater Reservoir (estimated cost: \$433,000)
 - Coldwater Pump Station (PS 2) Improvements (estimated cost: \$3,538,000)
- The Public Works Commission requested City Staff to add the topic of “Emergency Storage” to future PWC meeting agendas.
- The Public Works Commission recommends that City Staff reconstitute the IWRMP report to take into consideration that the PWC recommends a priority of emergency storage and presents the report with that priority indicated.