

Appendix A
Evaluation of In-System Storage Location
Alternatives for the San Mateo Clean Water
Program

Evaluation of In-System Storage Location Alternatives for the San Mateo Clean Water Program

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This memorandum describes the process for selecting, evaluating, and screening a list of potential feasible locations in the City of San Mateo's collection system for an in-system storage basin for the San Mateo Clean Water Program. The potentially feasible locations will be included in the Clean Water Program Draft Programmatic Environmental Impact Report.

Background

The City of San Mateo (City) is currently under a Regional Water Quality Control Board (RWQCB) Cease and Desist Order (CDO) requiring improvements to its collection system to eliminate sanitary sewer overflows (SSOs) that occur during peak wet weather flows. The City is considering two Clean Water Program alternatives to address peak wet weather flows:

- The Full Conveyance Program, which includes conveyance of peak wet weather flows to the WWTP. As a result, the WWTP would be sized to handle larger anticipated influent flows. This alternative would require a new Dale Avenue Pump Station as well as larger-capacity pipeline and pump station upgrades.
- The In-System Storage Program, which includes construction of one or more underground storage basins upstream of the Dale Avenue Pump Station. Detention of influent flows in the in-system storage basins would reduce the needed capacity and size of downstream pipeline and pump station improvements. To avoid the need for a new Dale Avenue Pump Station, a storage volume of approximately 4.2 million gallons (MG) is required. One or more feasible locations for the in-system storage basin would need to be identified.

Process to Identify Potential Storage Sites for Evaluation

Potential sites for an in-system storage basin for the In-System Storage Program were initially evaluated in the *City of San Mateo Integrated Wastewater Master Plan*, prepared by Carollo Engineers, Inc. in 2014 for the City of San Mateo.

The CH2M team started with the list of sites from the *Integrated Wastewater Master Plan*, which was based on several siting criteria. The team added potential sites for an in-system storage facility throughout the City of San Mateo that met any of the following criteria:

- City-owned properties, including parks and corporation yard
- County-owned properties
- School district-owned properties
- Private school properties with large playing fields
- Undeveloped properties

- Larger parking lots on private properties with existing commercial, industrial, or institutional uses (e.g. shopping centers, hospitals)
- Industrial or commercial properties currently proposed for redevelopment (as defined by an application for development submitted to the City of San Mateo)
- Properties with existing residential uses were not included.
- Properties owned by state or federal government were not included.

The resulting comprehensive list of potential sites is included in Attachment A1.

Evaluation Process

The sites were evaluated using the following criteria.

1. Potential storage capacity. Assuming an 8-ft depth and using the size available for storage, volumes were estimated for each site. Sites accommodating less than approximately 200,000 gallons were removed from selection.
2. Presence of bottlenecks or recent (2012 to 2014) historical wet-weather SSO data (see Figure 1) as well as SSOs predicted by the hydraulic model (see Figure 2), located downstream of the site that could be eliminated with the storage.
3. Site constraints and constructability issues, including:
 - a. Highway and/or railroad crossings
 - b. Presence of utilities
 - c. Limited site access/accessibility issues (construction or operation)
 - d. Traffic concerns (construction or operation)
 - e. Known soils issues
4. Ownership, including easement, permits, or acquisition required.
5. Consistency with existing land use plans and with adjacent land uses, including land use conflicts during construction.
6. Proximity to existing conveyance facilities that would foster diversion of peak flows from the collection system. For example, the NSSC Pump Station improvement project included a new force main diverting flow off the South Delaware pipes and Dale Avenue Pump Station. This new force main is near the Fiesta Meadows site, a location under consideration for storage (see Figure 3), and could potentially be used to convey overflows to the storage.
7. Potential reduction of SSOs that could occur as a result of other proposed Clean Water Program pipeline and pump station projects. These are projects that will be designed to increase the conveyance capacity of the system and include the construction of new pipes, enlarging existing pipes, and increasing the pumping capacity of lift stations. These types of projects tend to require extensive design, cost, and construction impact to the public. As a result, placing a storage facility just upstream or near these types of areas may reduce the needed improvement project. Conversely, in-system storage near one of these projects could be redundant.

After applying these criteria, a shorter list of potential sites was further evaluated using hydraulic modeling, as described in the next section.

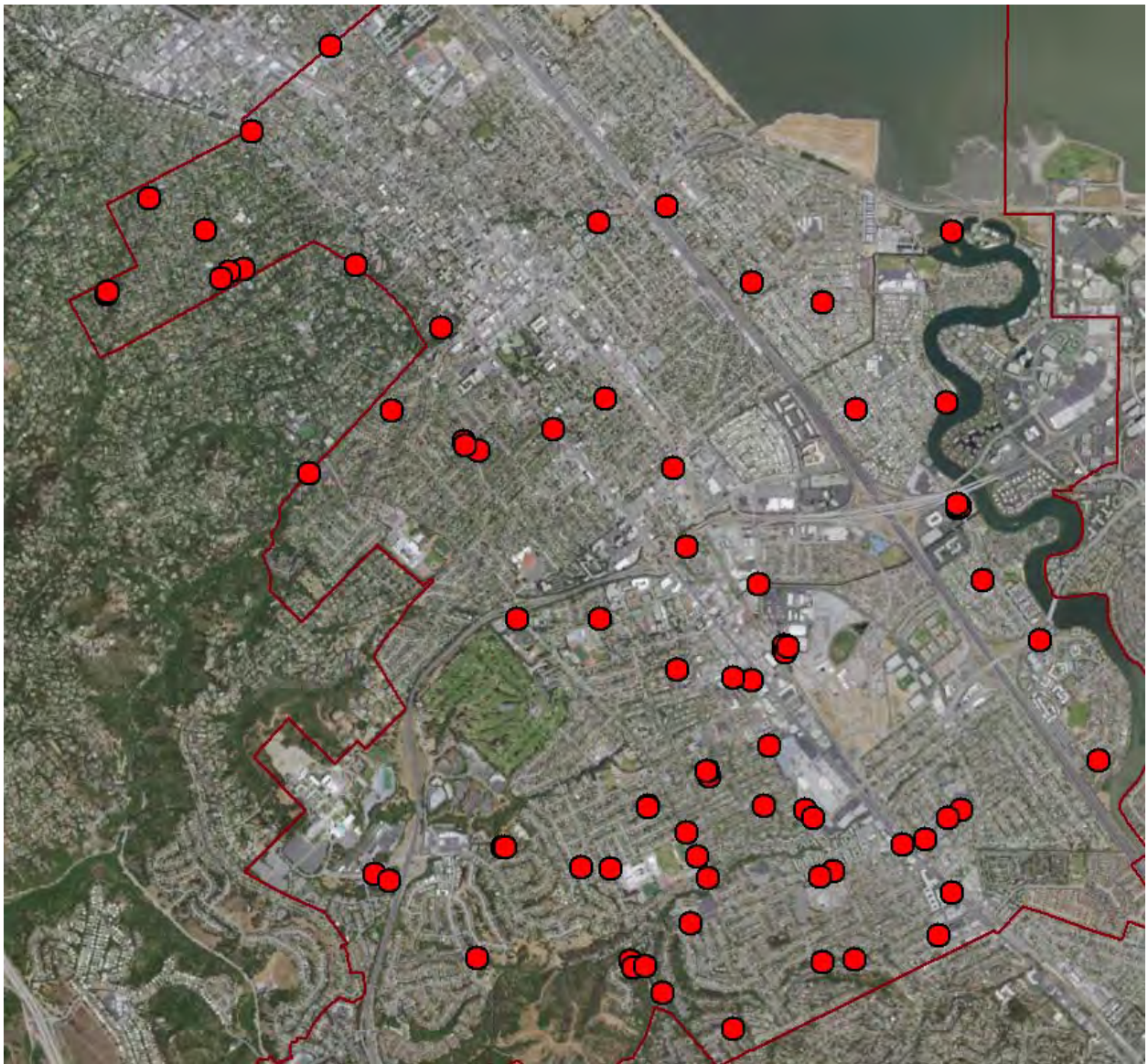


Figure 1. Recent Historical Wet Weather SSOs
Wet Weather SSOs 2012 - 2014

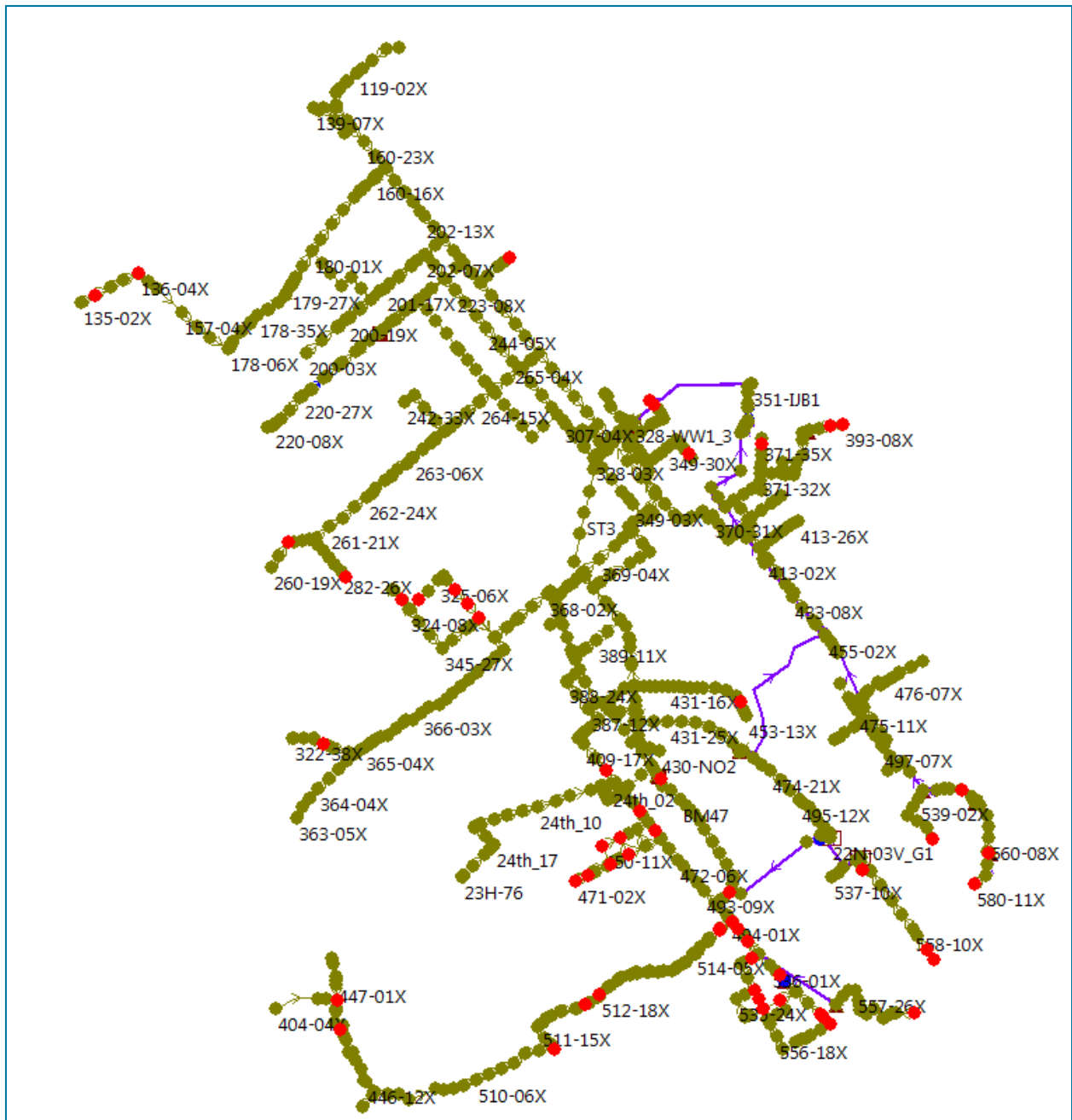


Figure 2. Model Simulated SSOs
 Model predicted SSOs shown in red



Figure 3. Example--System Configurations Where Flow Can Be Diverted or Conveyed
 NSSC Pump Station and Fiesta Meadows Site

Hydraulic Modeling

The San Mateo Clean Water Program included development and calibration a hydraulic model to support analyses of the system. A model is used to assess the hydraulic performance of the system finding areas with limited capacity and developing alternatives to address these areas of restriction. The San Mateo model is an InfoWorks CS v. 14.5.2 model most recently calibrated in 2013 and subsequently used to support planning projects, principally the Master Plan. It is an industry accepted dynamic model ideally suited for the types of flow conditions common to the San Mateo system---flow backups, flow diversions or splits, pressurized flow from lift stations, etc. For all analyses, the same wet weather design storm used in the Master Plan was also used to assess the potential sites, diversion points, and conveyance piping.

After screening potential sites and compiling the information listed above, the model was used to analyze the impact of the potential sites. General priority was placed on the following:

1. Sites where there would likely be a regional impact (not just a localized benefit).
2. Sites that could lessen the size, scope, or cost of multiple projects, particularly if the projects are located in close proximity.
3. Storage locations that would be replacing long, contiguous pipe improvement projects as opposed to shorter less cost effective ones.
4. Proximity to prescreened, large sites that could potentially store large volumes (greater than 1 million gallons).
5. Sites where historical and simulated SSOs would be relieved.

At locations that met the general criteria, diversion points and conveyance pipes were added in the model to route flow away from the system during wet weather. A typical configuration in the model was inserting a weir at the crown (top) of the pipe directing excess flow into new conveyance piping that would be directed to the potential site. Total volume diverted and benefit to the system were determined using the model. Figure 4 shows a typical model configuration.

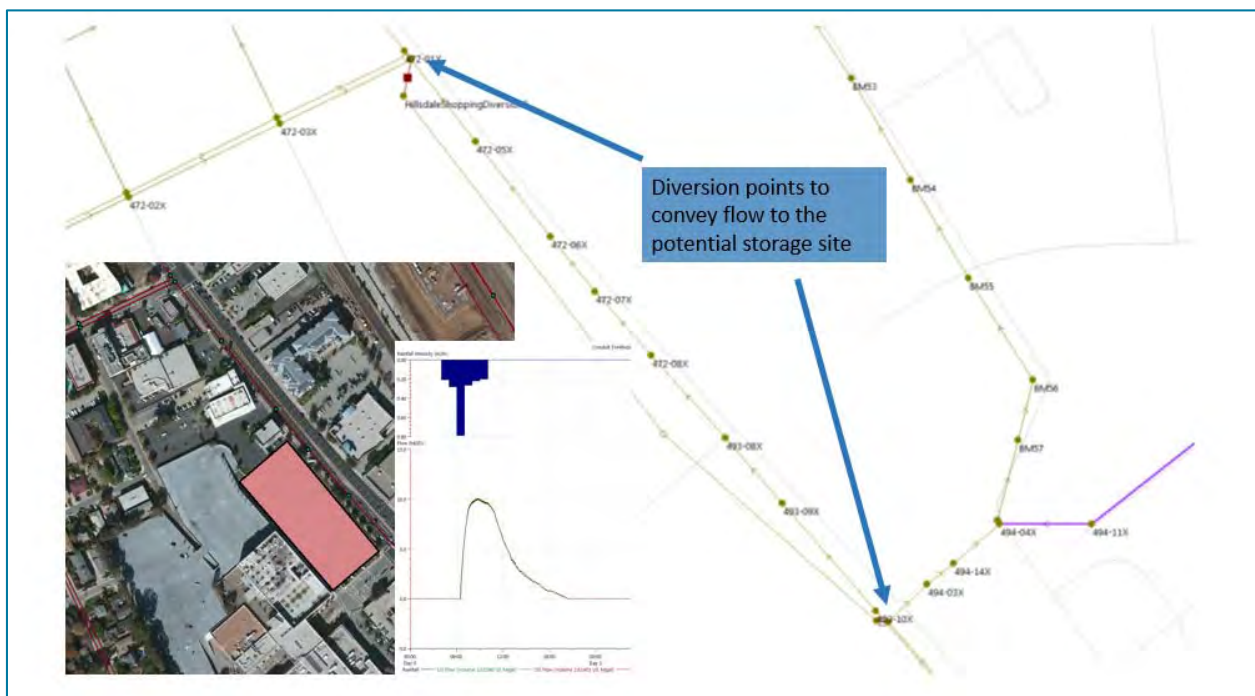


Figure 4. Model Configuration to Potential Storage Location
Diversion points from 15-inch pipe under S. El Camino Real to Hillsdale Site

It is expected final hydraulic solutions will be further evaluated with greater detail. For this phase, diversion points, predicted volumes, and impacts to the system were the primary focus of the analyses.

Figure 5 shows storage locations and the volumes determined in the model for some sites. Results are preliminary and additional analysis is needed to refine the appropriate balance of system upgrades. From the analysis, system storage should remain a key element to the overall strategy in addressing SSOs and increasing system conveyance. In subsequent design phases, more detailed analyses will refine the final solutions including storage size, control schemes, diversion points, conveyance piping, etc.

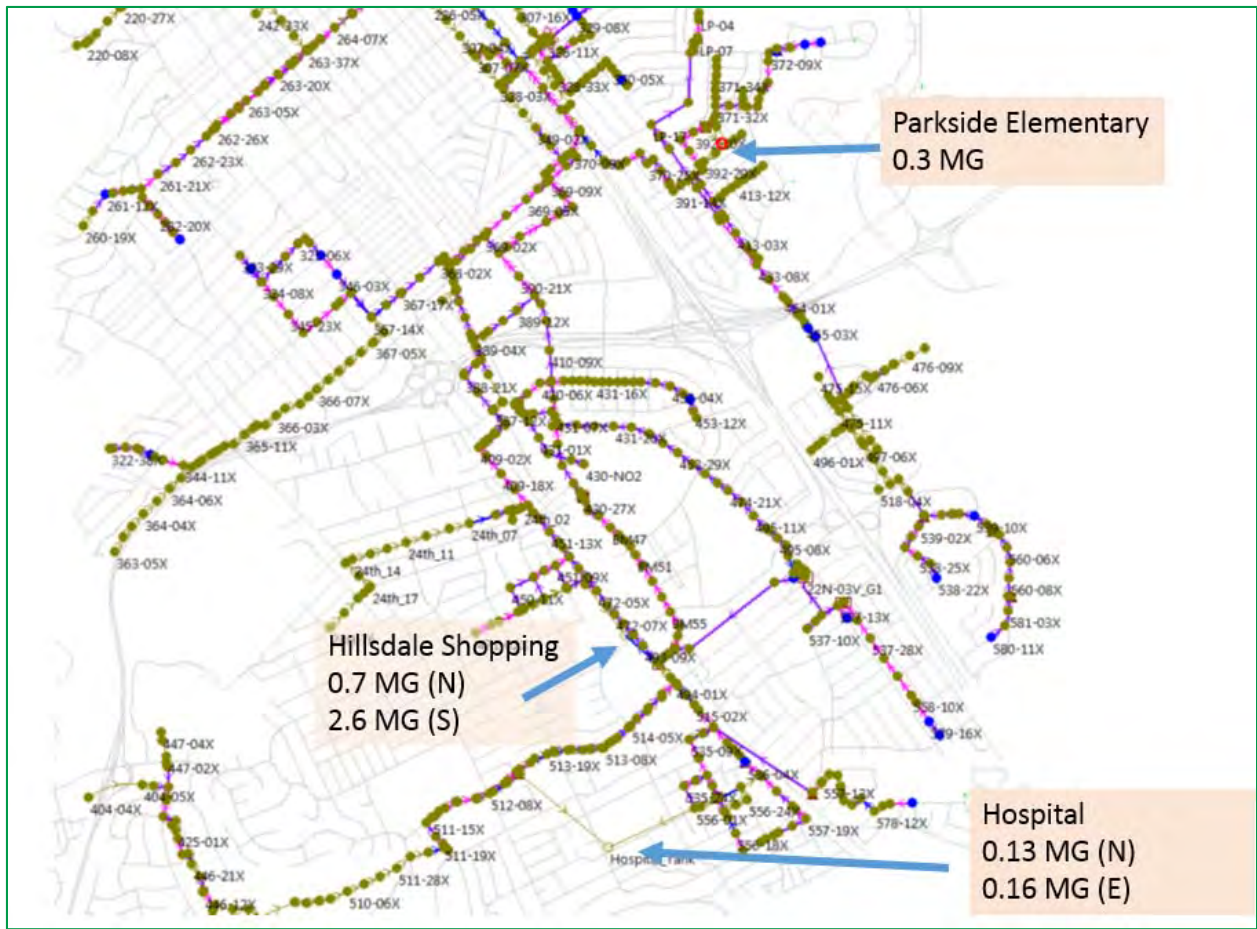


Figure 5. Storage Locations and Volumes
Storage volumes and locations predicted by the model

Bay Meadows site was modeled as part of the *Integrated Wastewater Master Plan*. No additional modeling was done to refine this site or configuration. Fiesta Meadows, although not modeled, remains a potential site for further review due to the new NSSC Pump Station force main that is near the site. This force main could be used to divert flow to and out of the storage basin.

Although not specifically modeled to determine storage volumes needed, model results of the existing system and historical SSO information was used to determine other potential sites where storage should be considered for further review. These sites are listed in Table 1 and shown in Figure 6.

TABLE 1
Storage Location Sites Recommended For Further Review

Location ¹	Potential to Mitigate Modeled SSOs in vicinity of MHS	Integrated Wastewater Master Plan Capital Improvement Projects	Additional Comments	Potential Storage Volume (MG)
Hillsdale High School	MHS 512-18X, 425-37X	SST-14	N/A	15.6
Abbott Middle School	MHS 512-18X, 425-37X	SST-14	N/A	7.5
San Mateo County Hospital	MHS 512-18X, 425-37X, 535-29X	SST-X1, SST-14, Pacific Blvd Projects	N/A	9.2

TABLE 1
Storage Location Sites Recommended For Further Review

Location¹	Potential to Mitigate Modeled SSOs in vicinity of MHs	<i>Integrated Wastewater Master Plan Capital Improvement Projects</i>	Additional Comments	Potential Storage Volume (MG)
Hillsdale Shopping Center	MHs 451-17X, 494-04X, 451-14X	SST-5, South Delaware Trunk Projects	Midbasin storage with significant potential to mitigate multiple projects and SSOs	6.9
Bay Meadows Park	MHs 430-30X, 494-04X, 451-14X	South Delaware Trunk Projects	Midbasin storage with significant potential to mitigate multiple projects and SSOs	21.7
Trinta Park - Area 1	MHs 430-02X, 430-30X	SST-6	N/A	2.5
Station Park Green Development	MHs 346-09X, 430-02X, 430-30X	South Delaware Trunk Projects	N/A	9.5
Fiesta Meadows Park	MHs 453-07X	South Delaware Trunk Projects	NSSC Pump Station Upgrade (completed) Force Main is near site.	9.5
Central Park	TBD	TBD	TBD	TBD
Martin Luther King Park	TBD	TBD	TBD	TBD
California Water Company	TBD	TBD	TBD	TBD

¹Basin would be proposed for fields, parks, parking lots, or other undeveloped areas at each location.

TBD: To be determined in future analysis



Figure 6. Sites Recommended For Further Analysis
Potential Storage Sites

Attachment A1. Full List, Potential In-System Storage Sites

	Location	Address	Land Ownership	Parcel Size (acres)	Acres Usable	Potential Storage (MG)
Sites from Integrated Wastewater Master Plan						
1	San Mateo County Expo Center	2495 South Delaware St	San Mateo County	24	3	4
2	San Mateo High School	506 N Delaware St	San Mateo Unified High School District (SMUHSD)	35.4	4.3	11.2
3	North Shoreview Elementary	1301 Cypress St	San Mateo Foster City School District (SMFCSD)	4.5	1.5	4
4	Aragon High School	900 Alameda de las Pulgas	SMUHSD	29.3	4.9 - 3 locations	12.8 total
5	Hillsdale High School	3115 Del Monte St	SMUHSD	33.6	7.3	19
6	Borel Middle School	425 Barneson Ave	SMFCSD	8.5	3.8	9
7	Borel Park	450 Borel Ave	City	1.5	0.6	1.6
8	Abbott Middle School	600 36th Ave	SMFCSD	9.9	2.8	7
9	Martin Luther King Jr Park	725 Monte Diablo Ave	City	6	2	5.2
10	Central Park	50 East 5th Ave	City	11.9	4 in 2 locations	10.5 total
11	Shoreview Park	950 Ocean View Ave	City	3.7	1.2	3.1
12	Fiesta Meadows Park	1141 Bermuda Dr	City	4.9	2.6	6.8
13	Beresford Park	2720 Alameda de las Pulgas	City	15.9	3.4 in 2 locations	8.8 total
14	Laurie Meadows Park	111 Laurie Meadows Dr	City	5.3	1.8	4.7
15	Joinville Park	2111 Kehoe Ave	City	13.7	1.9	5
16	Parkside Aquatic Park	100 Seal St	City	3.4	0.9	2.3
17	Trinta Park	150 19th Ave	City	1.8	0.9 in 2 locations	2.4 total
18	Corps Yard Parking	Pacific Blvd/S. Delaware St	City	7.7	0.4	1
19	Old Police HQ/Corps Yard	2018 S Delaware St	City	2	0.5	1.3
20	Lakeshore Park	1500 Marina Ct	City	4.3	1.3	3.4
21	East Hillsdale Park	123 31st Ave	City	2	0.5	1.3
22	George Hall Elementary School	130 San Miguel Way	SMFCSD	7.6	2	5.2
23	Gateway Park	800 East 3rd Ave	City	1.3	0.2	0.5
24	Saratoga Square Park (Bay Meadows Park West)	Yates Way & David Street	City	5.9	0.9	2
25	Bay Meadows Phase II Park	28th Ave (between Saratoga Ave and S. Delaware St)	City	7	7	18
26	S. Delaware St Empty Lot North	E. 25th Ave & S. Delaware St	Private	0.7	0.7	1.7
27	S. Delaware St Empty Lot South	E. 25th Ave & S. Delaware St	Private	0.5	0.5	1.3
28	San Mateo Commons Shopping Center Parking Lot	Concar Dr & S. Delaware St	Private	8	0.4 to 3.4 usable – 3 locations	1 to 9
29	Poplar Creek Golf Course	1700 Coyote Point Dr	City	105	0.5	1.3
30	PG&E Facility	East Poplar Ave	Pacific Gas & Electric (PG&E)	38	0.5	1.2
31	PG&E Empty Lot	Dore Ave	PG&E	38	2.5	6.5

Attachment A1. Full List, Potential In-System Storage Sites

	Location	Address	Land Ownership	Parcel Size (acres)	Acres Usable	Potential Storage (MG)
Additional Potential Sites						
32	College Park Elementary (open lot)	715 Indian Ave		2.5	1.7	4.5
33	California Water Services Co (Parking Lot)	341 N Delaware St		2.3	1.6	4.1
34	St. Timothy School (parking lot)	1515 Dolan Ave		2	0.4 to 0.5 usable - 3 locations	3.7 total
35	Parkside Elementary School (field)	1685 Eisenhower St		3.1	2.2	5.7
36	Shoreview Shopping Center (parking lot)	400 S Norfolk St		2.5	1.8	4.6
37	Sunnybrae Elementary School (blacktop/field)	1031 S Delaware St		2.6	1.9	4.8
38	San Mateo County Hospital (parking lot)	222 W 39th Ave		5	3.5	9.2
39	West Hillsdale Park	345 31st Ave		1.5	1	2.7
40	Hillsdale Shopping Center (north parking lot)	60 31st Ave		3.8	2.7	6.9
41	Los Prados Park	1837 Bahia St		7.8	5.5	14.2
42	Junipero Serra High School (field)	451 West 20th Ave		2.8	1.9	5.1
43	San Mateo Area Chamber of Commerce (Parking Lot)	S El Camino Real & Borel Ave		2.4	1.7	4.4
44	Bridgepointe Shopping Center	Bridgepointe Pkwy		17.2	5.6 to 6.4 usable - 2 locations	31.4 total
45	Future Caltrain Station - Station Park Green Development (replacing existing Hayward Park station)	S Delaware St & Concar Dr (across from Commons)		5.2	3.7	9.5
46	Delaware Street deep tunnel	Delaware Street		3.6	2.5	6.6
47	Parking lot, Caltrain San Mateo station	385 First Avenue		0.8	0.6	1.5
48	Hillsdale Caltrain station	3333 El Camino Real (current station address)		1.6	1.1	2.9
49	YMCA parking lot	1877 S Grant St		3.6	2.5	6.5
50	Salesforce.com/ Crossroads parking lot	900 Concar Dr		3.4	2.4	6.2
51	Marriott parking lot	1770 S Amphlett Blvd		4	2.8	7.3
52	The Bayside STEM Academy	2025 Kehoe Ave		8.5	6	15.5
53	Fish Market Restaurant parking lot	1855 South Norfolk Street		1.3	0.9	2.4
54	Parkside Plaza parking lot	1830-1860 S Norfolk St		2	1.4	3.6
55	Marina Food Market parking lot	2992 S Norfolk St		1.7	1.2	3.0