San Gabriel Valley Regional Confirmation of Infiltration Rates

Scientific Studies Program

Fiscal Year 2023-2024

Upper San Gabriel River Watershed

East San Gabriel Valley Watershed Management Group

Gurjot Kohli and Jonathan Abelson

Study Overview

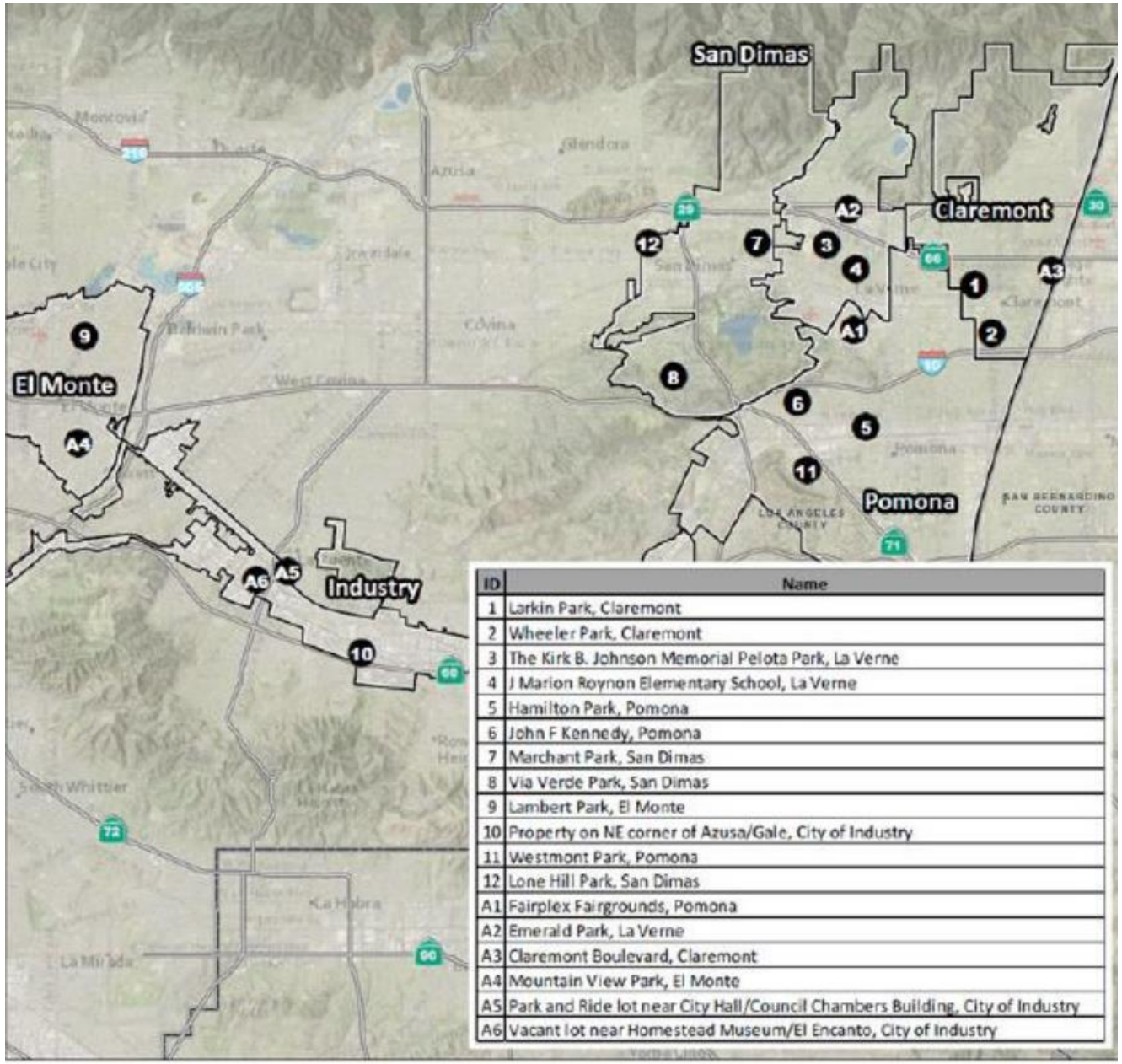
This study conducted 18 borings with infiltration tests across the cities of El Monte, City of Industry, Claremont, Pomona, San Dimas and La Verne for future infiltration project feasibility.

- Based on the results, the cities were able to understand which stormwater capture projects in their Watershed Management Plans should proceed to planning and pre-design phases.

Study Team

- **Lead entity:** East San Gabriel Valley Watershed Management Group (ESGVWMG) represented by City of Pomona
- **Prime Consultant:** Stantec Consulting Services
- **Geotechnical Subconsultant**: GeoAdvantec Inc. (GAI)

Study Location



ID	Name
1	Larkin Park, Claremont
2	Wheeler Park, Claremont
3	The Kirk B. Johnson Memorial Pelota Park, La Verne
4	J Marion Roynon Elementary School, La Verne
5	Hamilton Park, Pomona
6	John F Kennedy, Pomona
7	Marchant Park, San Dimas
8	Via Verde Park, San Dimas
9	Lambert Park, El Monte
10	Property on NE corner of Azusa/Gale, City of Industry
11	Westmont Park, Pomona
12	Lone Hill Park, San Dimas
A1	Fairplex Fairgrounds, Pomona
A2	Emerald Park, La Verne
A3	Claremont Boulevard, Claremont
A4	Mountain View Park, El Monte
A5	Park and Ride lot near City Hall/Council Chambers Building, City of Industry
A6	Vacant lot near Homestead Museum/El Encanto, City of Industry

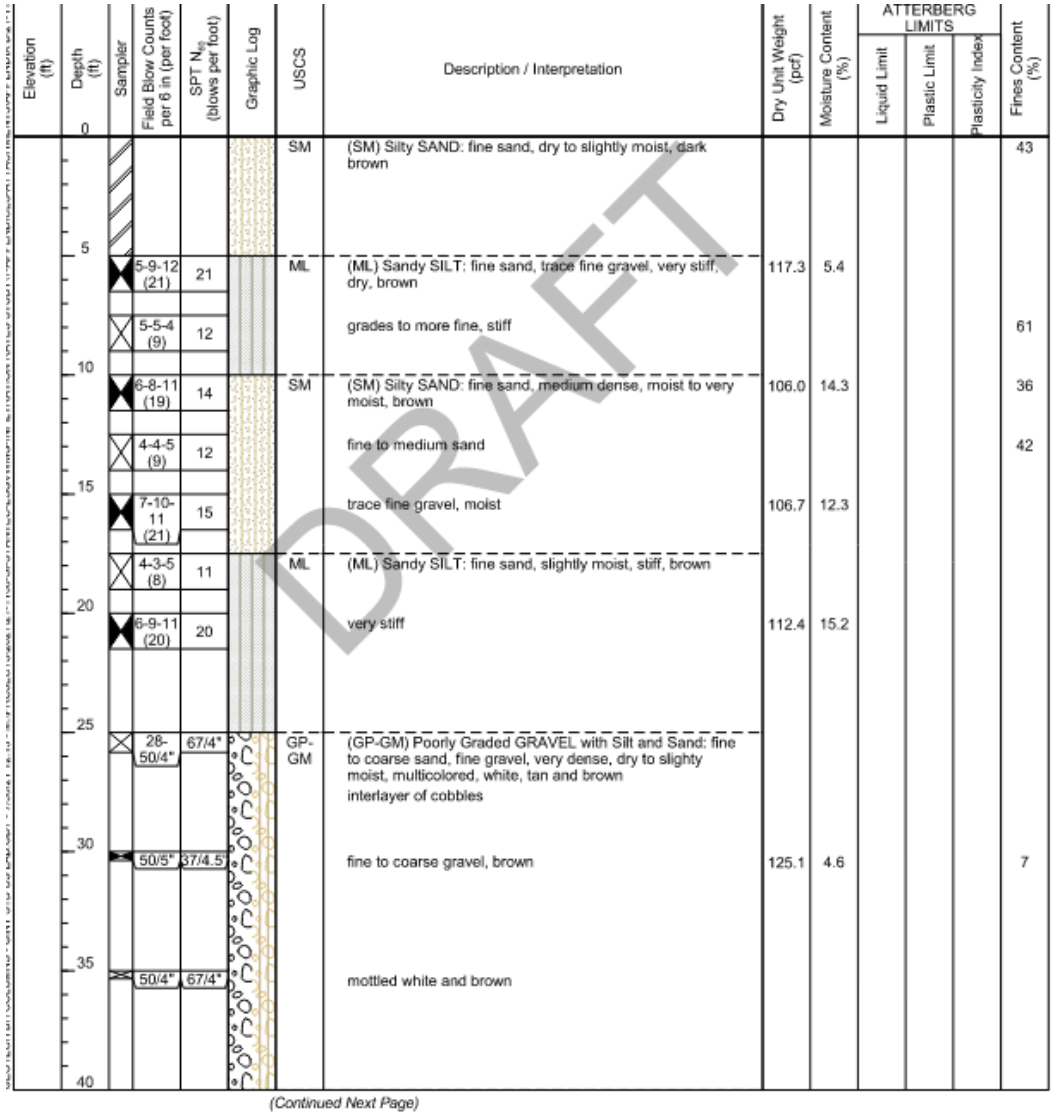
- 18 selected sites for this study based on topography, land uses upstream of the site, jurisdictional boundaries, slope and hydrologic soil group (HSG) classifications
- Team solicited input from WASC and received locations as responses

Problem Statement and Methodology

- Problem Statement
  - Infiltration projects are proposed in locations that have seemingly favorable soils but upon geotechnical investigation are deemed infeasible for infiltration.
  - Performing a geotechnical investigation prior to the conceptual design can reduce time, cost and resources spent for a potential project.
- Methodology
  1. Two geotechnical borings at each of the 18 sites to depths of 50 feet or drilling refusal
  2. Performing infiltration tests
  3. Subsequent lab analysis of samples (e.g. soil density, water content, particle size analysis, etc.)

Results

- Compliant with the county's 2017 GS200.2 for Phase 1 and 2021 GS200.1 for Phase 2
  - Note a minimum of 0.3 in/hr is considered feasible for infiltration
  - Recommended reductions were applied of 6-7 for average factors and 3-5 for minimum factors
- 13/18 projects were deemed feasible for an infiltration facility
- 8 sites encountered groundwater within the 50-foot borings
- Subsurface soil conditions included alternating layers of loose to very dense sand and gravel and stiff to hard silt and clay



Results (cont.)

City	Location	Test Well	Infiltration Test Type[1]	Test Depth Interval (feet)	Groundwater Depth (feet)	Raw Infiltration Rate (inch/hour)	Average Design Infiltration Rate[2] (RF = 6 to 7) (inch/hour)	Max. Design Infiltration Rate[3] (RF = 3 to 5) (inch/hour)	Infiltration Facility Feasible?
Phase 1									
Claremont	Larkin Park	P-1	HF	13.6 – 15.2	N/A	5.85	0.84	1.17	Yes
Claremont	Wheeler Park[4]	P-2	BP	17.0 – 18.3	N/A	1.04	0.17	0.35	No
La Verne	Pelota Park	P-3	HF	13.0 – 15.5	N/A	29.69	4.24	5.94	Yes
La Verne[4]	J. Marion Roynon El. Sch.[4]	P-4	BP	18.1 – 20.2	N/A	0.44	0.07	0.15	No
San Dimas	Marchant Park	P-5	BP	17.7 – 20.1	N/A	5.87	0.98	1.96	Yes
San Dimas[4]	Via Verde Park[4]	P-6	BP	8.6 – 11.5	21.5	0	0	0	No
San Dimas	Lone Hill Park	P-7	HF	14.5 – 18.3	N/A	30.06	4.29	6.01	Yes
Pomona	Hamilton Park	P-8	BP	12.7 – 15.2	N/A	2.94	0.49	0.98	Yes
Pomona	John F. Kennedy Park	P-9	BP	17.7 – 20.0	N/A	2.83	0.47	0.94	Yes
Pomona[4]	Westmont Park[4]	P-10	BP	15.1 – 17.5	N/A	0.23	0.04	0.08	No
City of Industry	Azusa/Gale Ave	P-11	HF	15.7 – 18.3	39	11.84	1.69	2.37	Yes
El Monte	Lambert Park	P-12	HF	17.5 – 20.0	N/A	31.01	4.43	6.20	Yes
Phase 2									
Pomona	Fairplex Fairgrounds	P-1	CH	17.2 – 20.0	48	9.57	1.37	1.91	Yes
La Verne	Emerald Park[4]	P-2	FH	11.9 – 16.6	N/A	0.60	0.10	0.20	No
Claremont	Claremont Boulevard	P-3	CH	17.6 – 19.8	N/A	8.26	1.18	1.65	Yes
El Monte	Mountain View Park	P-4	CH	18.3 – 20.0	N/A	24.91	3.56	4.98	Yes
City of Industry	Park and Ride Lot	P-5	CH	10.3 – 13.1	40	8.42	1.20	1.68	Yes
San Dimas	Pioneer Park	P-6	CH	17.7 – 20.3	N/A	7.60	1.09	1.52	Yes

1. BP = Standard Boring Percolation Test, HF = High Flow Rate Boring Percolation Test, FH = Falling Head Small Diameter Boring Infiltration Test, CH = Constant Head Small Diameter Boring Infiltration Test
2. Reduction Factor (RF) = 6 for BP/FH Test and 7 for HF/CH Tests
3. Reduction Factor (RF) = 3 for BP/FH Test and 5 for HF/CH Tests
4. Site does not have the required average design infiltration rate of 0.3 inch/hour

Cost & Schedule

Phase	Description	Cost	Completion Date
1	12 initial sites completed borings and infiltration testing	$212,300	8/20/21
2	6 additional sites completed borings and infiltration testing	$82,350	3/18/22
Geotechnical Report Development, Final Report Development, Summary Reports and Project Closeout		$90,350	6/15/22
TOTAL		**$385,000**	

- This project was able to investigate a total of 18 sites for infiltration viability.

Summary of Benefits

- Through determination of the infiltration rates, more precise design concepts can be determined by estimating water capture volumes per storm and annually.
- This in turn will inform how much of the 85th percentile storm can be treated. Based on the favorability of the soil conditions, project cost can be reduced.
- Thus, more community amenities (e.g. sensory playgrounds, sports fields, native plantings etc.) can be invested in.


Questions?
Jon Abelson
Gurjot Kohli