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ATMOSPHERIC DYNAMICS, INC
Meteorological & Air Quality Modeling

February 20, 2018

California Energy Commission
1516 Ninth Street
Sacramento, Ca 95814

Subject: Record of Conversation on SERC (16-AFC-01) Cumulative Modeling Assessment

Wenjun Qian, California Energy Commission (CEC), called on February 20th, 2018 to ask Gregory Darwin, of Atmospheric Dynamics, Inc. about the use of the Fullerton California meteorological data set that was used on the SERC cumulative analysis. She also asked Atmospheric Dynamics, Inc. to prepare a record of conversation on this matter. The following response is based on her request for justification on the use of Fullerton meteorological data.

Discussion

In the modeling analyses used to support the Application for Certification (AFC) that was submitted to the CEC in 2017, the Anaheim meteorological data set was selected for use. Because of the lack of significant terrain in the area around the project site and the urban characteristics of the land use in the project area, the Anaheim meteorological station was chosen as the nearest and most representative meteorological data set. The Anaheim site is located 5.0 kilometers (km) east-northeast from the project site. At the time of the application submittal, the next two nearest SCAQMD meteorological data sets were La Habra (13.3 km to the north-northeast) and Costa Mesa (15.9 km to the south-southeast), both of which were located either closer to complex terrain or closer to the Pacific Ocean and thus, were not considered any further. See Table 1 for the listing of the previously available SCAQMD meteorological data sets and the distances to the project site.

Since the AFC was submitted to the CEC, the SCAQMD has revised the list of available data sets for use in permitting projects. The revised list is summarized in Table 2. If you note, some of the meteorological data sets listed in Table 1 have been replaced with new site locations. This includes the Anaheim, La Habra and Costa Mesa data sets which are no longer available as discussed below.

The primary reason for the updated meteorological data sets has to do with the SCAQMD incorporation of the new EPA regulatory default use of U* during the processing of the data with AERMET, version 16216. U* is now a regulatory option in the AERMOD modeling system that adjusts the surface friction velocity parameter in the surface file (*.sfc) to improve model performance for sources that have peak concentrations under low wind, stable atmospheric conditions. The U* option is only applied to ASOS data or site-specific meteorological stations that do not include turbulence data. All of the stations that SCAQMD has processed meet these requirements, as turbulence data is not collected at SCAQMD monitoring stations.



Table 1 2016 SCAQMD AERMOD METEOROLOGICAL DATASETS w/ NEW 2017 SCAQMD FULLERTON DATASET SHOWN

Station	Latitude/Longitude		UTM Coordinates		Elevation (m)	Dist. From Project (km)	Direction From Project (deg)	
	Latitude	Longitude	Easting (km)	Northing (km)				
Anaheim	33:49:50	117:56:19	413.14	3743.57	41	5.001	61.6	ENE
La Habra	33:55:31	117:57:08	411.98	3754.08	82	13.291	14.1	NNE
Costa Mesa	33:40:26	117:55:33	414.16	3726.19	20	15.948	160.1	SSE
Long Beach	33:49:25	118:11:19	389.99	3743.04	30	18.843	275.6	W
Compton	33:54:05	118:12:18	388.59	3751.88	22	22.812	297.9	WNW
Pico Rivera	34:00:37	118:04:07	401.31	3763.61	58	23.621	341.7	NNW
Lynnwood	33:55:44	118:12:39	388.07	3754.73	29	24.712	303.2	WNW
Mission Viejo	33:37:49	117:40:30	437.39	3721.17	170	34.950	124.9	SE
Pomona	34:04:00	117:45:00	430.78	3769.61	270	35.964	37.8	NE
Central LA	34:03:59	118:13:36	386.79	3770.00	87	36.221	322.7	NW
Azusa	34:08:11	117:55:26	414.81	3777.47	182	36.785	9.5	N
LAX	33:57:15	118:25:49	367.83	3757.80	42	44.156	292.1	WNW
Upland	34:06:14	117:37:45	441.96	3773.66	379	46.452	45.7	NE
Burbank	34:10:33	118:19:01	378.62	3782.24	175	50.917	323.7	NW
West LA	34:03:02	118:27:24	365.54	3768.52	97	51.121	302.3	WNW
Fontana	34:06:01	117:29:31	454.62	3773.19	367	55.936	55.1	NE
Riverside	34:00:02	117:24:55	461.64	3762.10	250	56.881	68.4	ENE
Lake Elsinore	33:40:35	117:19:51	469.33	3726.13	406	62.431	104.0	ESE
Reseda	34:11:57	118:31:58	358.76	3785.11	228	66.538	311.3	NW
Perris	33:47:20	117:13:40	478.91	3738.58	442	70.216	92.1	E
San Bernardino	34:06:24	117:16:25	474.76	3773.82	305	73.642	63.7	ENE
Santa Clarita	34:23:00	118:31:42	359.48	3805.52	375	81.026	322.6	NW
Crestline	34:14:29	117:16:32	474.62	3788.76	1387	81.258	54.2	NE
Redlands	34:03:32	117:08:52	486.36	3768.50	481	82.283	70.6	ENE
Banning Airport	33:55:15	116:51:30	513.10	3753.19	660	105.046	83.4	E
Palm Springs	33:51:10	116:32:28	542.46	3745.73	171	133.795	88.1	E
Indio	33:42:30	116:12:57	572.67	3729.90	-4	164.316	93.9	E
Stanton Project Site	33:48:25	117:59:10	408.742	3741.189	21			



Table 2 Updated SCAQMD Meteorological Data Sets											
No.	Lat	Long	Abbrev.	Station Name	Type	UTM-E	UTM-N	Elev(m)	Dist(km)	Direction	
4	33.8715	-117.9856	KFUL	Fullerton Arpt.	ASOS	408843	3748345	29	7.16	0.81	N
7	33.8118	-118.1472	KLGB	Long Beach Arpt.	ASOS	393823	3741881	10	14.94	272.65	W
12	33.6798	-117.8675	KSNA	John Wayne Int'l Arpt.	ASOS	419588	3726991	17	17.87	142.62	SE
22	34.0103	-118.0686	PICO	Pico Rivera	SCAQMD	401327	3763813	58	23.81	341.85	NNW
5	33.9235	-118.3329	KHHR	Hawthorne Arpt.	ASOS	376795	3754474	19	34.60	292.58	WNW
20	33.6300	-117.6756	MSVJ	Mission Viejo	SCAQMD	437340	3721337	170	34.81	124.77	SE
17	34.0664	-118.2267	CELA	Central L.A.	SCAQMD	386802	3770197	87	36.37	322.90	NW
15	34.1365	-117.9239	AZUS	Azusa	SCAQMD	414815	3777676	182	36.99	9.45	N
3	34.0236	-118.2912	KCQT	USC/Downtown L.A.	ASOS	380790	3765524	55	37.06	311.04	NW
2	33.9756	-117.6249	KCNO	Chino Arpt.	ASOS	442275	3759626	198	38.27	61.20	ENE
6	33.9382	-118.3866	KLAX	Los Angeles Int'l Arpt.	ASOS	371853	3756170	30	39.81	292.10	WNW
24	34.1036	-117.6292	UPLA	Upland	SCAQMD	441965	3773822	379	46.57	45.51	NE
8	34.0531	-117.5769	KONT	Ontario Arpt.	ASOS	446757	3768194	289	46.63	54.61	NE
11	34.0210	-118.4471	KSMO	Santa Monica Arpt.	ASOS	366391	3765429	53	48.80	299.78	WNW
10	33.9528	-117.4352	KRAL	Riverside Arpt.	ASOS	459788	3757008	245	53.44	72.78	ENE
1	34.1997	-118.3654	KBUR	Burbank Arpt.	ASOS	374200	3785141	236	55.90	321.84	NW
19	34.1001	-117.4920	FONT	Fontana	SCAQMD	454618	3773364	367	56.03	54.96	NE
18	33.6765	-117.3310	ELSI	Lake Elsinore	SCAQMD	469317	3726337	406	62.37	103.78	ESE
14	34.2123	-118.4915	KVNY	Van Nuys Arpt.	ASOS	362601	3786701	235	64.81	314.61	NW
21	33.7889	-117.2278	PERI	Perris	SCAQMD	478911	3738773	442	70.21	91.97	E
23	34.0597	-117.1472	RDLD	Redlands	SCAQMD	486416	3768785	481	82.43	70.44	ENE
16	33.9208	-116.8584	BNAP	Banning	SCAQMD	513089	3753384	660	105.06	83.33	E
9	33.8222	-116.5043	KPSP	Palm Springs Arpt.	ASOS	545872	3742553	125	137.14	89.43	E
13	33.6317	-116.1641	KTRM	Desert Hot Springs Arpt.	ASOS	577526	3721634	-36	169.91	96.61	E
SERC						408742	3741189	21.95			

Raw meteorological data from SCAQMD’s monitoring stations and the Automated Surface Observing System (ASOS) stations were collected for the years of 2010 – 2016. Hourly wind and temperature data were collected from both SCAQMD and ASOS stations, while cloud cover and 1-minute wind data were only available from the ASOS stations. The ASOS 1-minute wind data was processed with U.S. EPA’s processor AERMINUTE Version 15272 and included in AERMET for ASOS stations with the use of a wind speed threshold of 0.5 m/s, which is consistent with U.S. EPA’s guidelines.

After the meteorological data was processed with AERMET, the data went through QA/QC to determine if it passed the U.S. EPA’s threshold of less than ten percent missing data by quarter and less than 15 percent calm hours by quarter. The most recent five years of data meeting the QA/QC criteria were then determined for each station, with some stations being eliminated for use in dispersion modeling applications. As mentioned, a number of SCAQMD stations that had been available in the past were determined to no longer be useable for this update, due to not passing the U.S. EPA’s QA/QC criteria, the station being discontinued, or due to having a co-located ASOS station available. Additionally, the ASOS stations within the SCAQMD were included to provide robust coverage for dispersion modeling purposes. The Anaheim data set was not updated to reflect the U* option because of the lack of a co-located ASOS station. Additionally, the La Habra and Costa Mesa data sets were not updated and are no longer available on the SCAQMD web site. The annual wind rose plots for both Anaheim and Fullerton are included as Attachment A to this summary.

Based on the updated SCAQMD data sets and the inclusion of the EPA regulatory default use of U*, the cumulative modeling analyses were performed utilizing the closest and most representative meteorological data set which was the Fullerton site, located approximately 7.2 kilometers northeast of



the SERC project site (see Figure 1). To determine the potential changes in modeled concentrations between the Anaheim and Fullerton meteorological data sets, the SERC sources were modeled with both data sets with the results summarized in Table 3. Based on the results in Table 3, there is very little difference between the two sets of modeled concentrations and the overall pollutant concentration levels with both data sets are below the applicable EPA significant impact levels (SILs).

Regards,
Atmospheric Dynamics, Inc.

A handwritten signature in blue ink that reads "Gregory Darwin". The signature is written in a cursive, flowing style.

Gregory Darwin

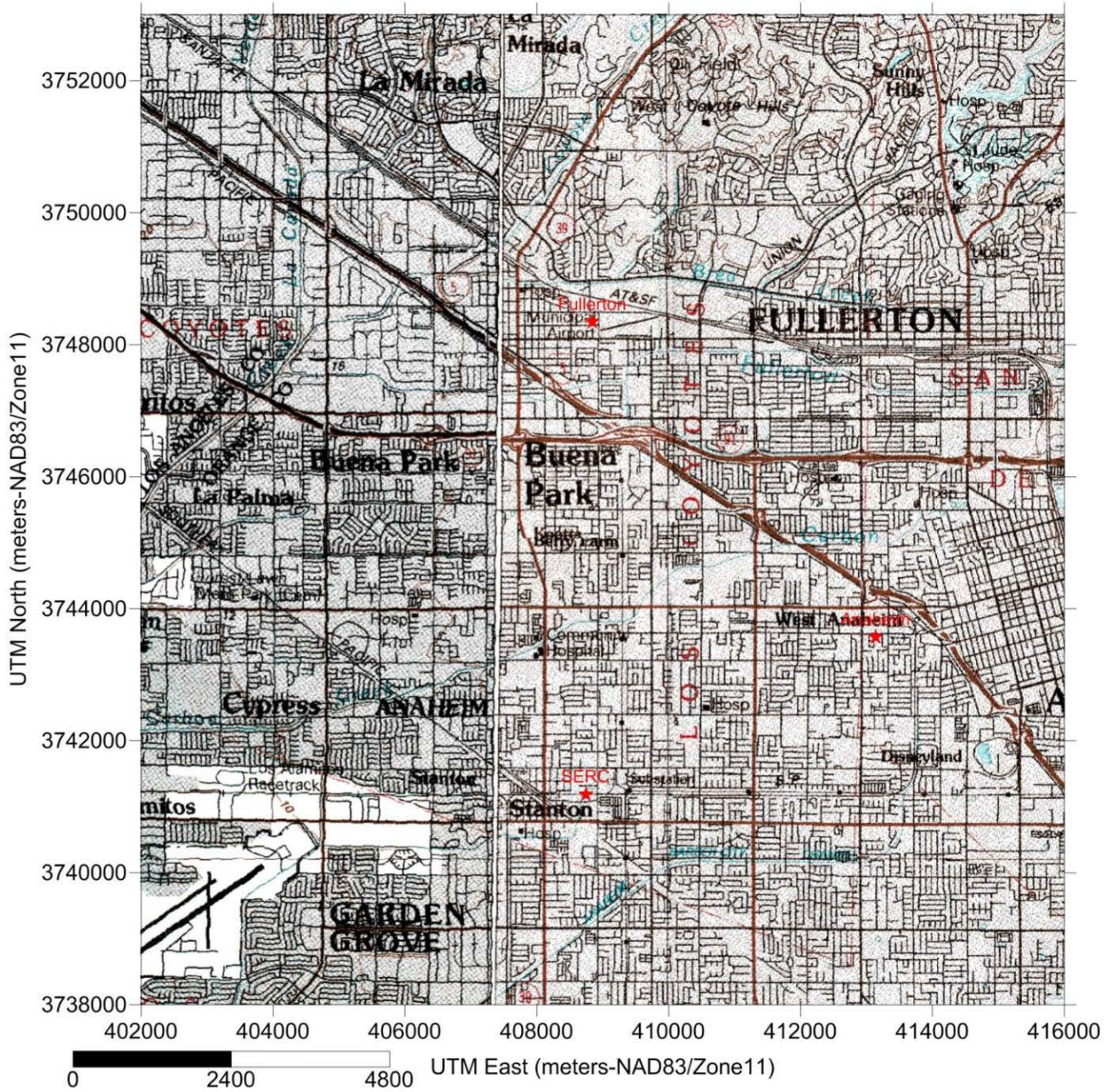


Table 3 – Maximum SERC-Only Concentrations Utilizing the Fullerton and Anaheim Meteorological Data Sets

Pollutant	Averaging Period	Maximum SERC-Only Modeled Concentration ($\mu\text{g}/\text{m}^3$)		USEPA/SCAQMD Sig.Impact Levels ($\mu\text{g}/\text{m}^3$)
		Fullerton Meteorological Data (ASOS) with U*	Anaheim Meteorological Data	
Normal Operating Conditions				
NO ₂ ^a	1-hour Max	1.152	1.51	7.5
	1-hr 5-yr Avg of Max's	1.433	1.09	7.5
	Annual Max	0.024	0.019	1
CO	1-hour Max	1.123	1.84	2000
	8-hour Max	0.897	0.83	500
SO ₂	1-hour Max	0.270	0.44	7.8
	3-hour Max	0.274	0.30	25
	24-hour Max	0.080	0.07	5
	Annual Max	0.005	0.0056	1
PM10	24-hour Max	0.480	0.510	5
	Annual Max	0.016	0.013	1
PM2.5	24-hr 5-yr Avg of Max's	0.429	0.40	1.2
	Annual Max	0.016	0.013	0.3
	5-yr Avg of Annual Conc's	0.016	0.012	0.3
Start-up/Shutdown Periods				
NO ₂ ^a	1-hour Max	4.722	6.17	7.5
	1-hr 5-yr Avg of Max's	4.104	3.32	7.5
CO	1-hour Max	5.678	15.26	2000
	8-hour Max	2.310	2.96	500
N/A – No exceedances of AAQS modeled.				
*Same – Background concentration already exceeds AAQS, so all receptors considered.				
Anaheim: Albedo: 0.17, Surface roughness: 0.453, Bowen Ratio: 1.0				
Fullerton: Albedo: 0.18, Surface roughness: 0.262, Bowen Ratio: 1.18				



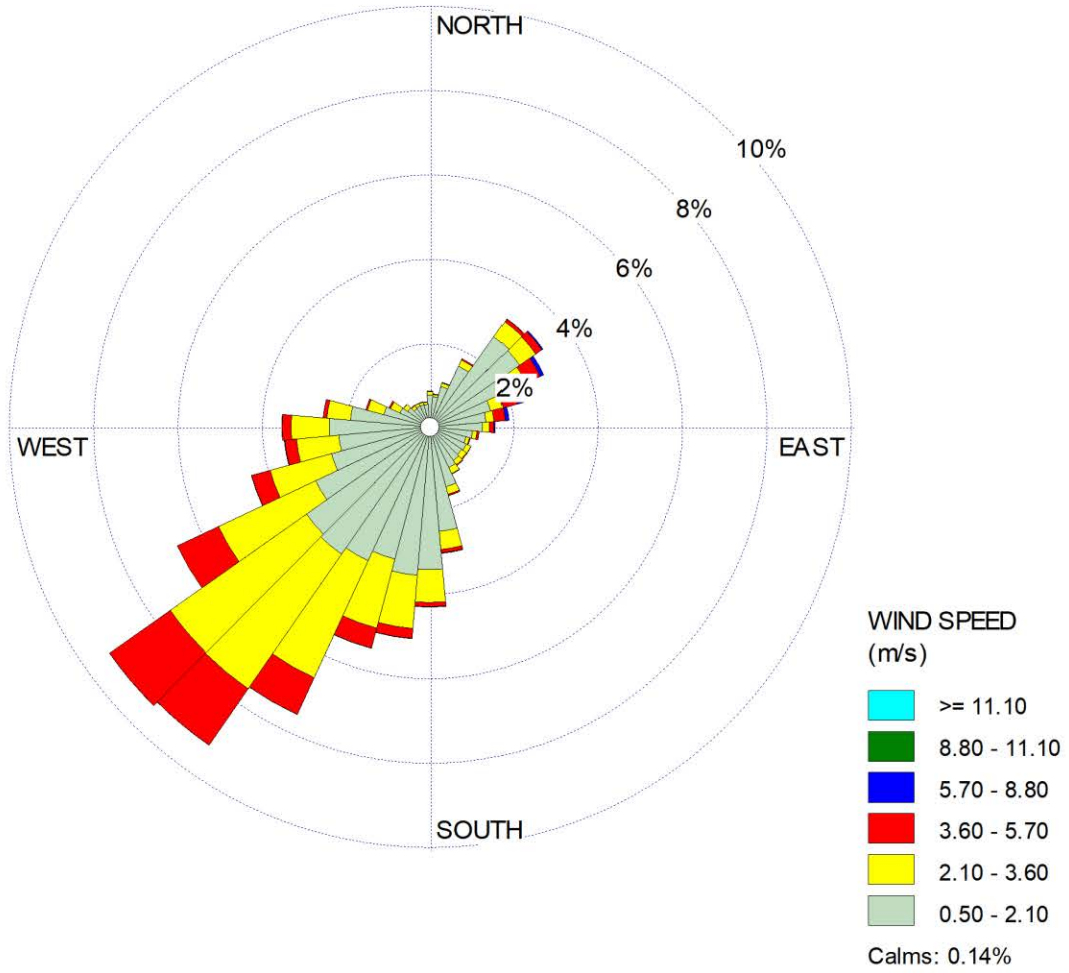
Figure 1
SCAQMD Met Datasets Nearest SERC



Attachment A
Wind Roses



Anaheim Annual Wind Rose



Fullerton Annual Wind Rose

