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SUBJECT: EDEN MIXED-USE (PL23-0111) ENERGY TABLES

The following Energy Tables were prepared for the proposed Eden Mixed-Use (PL23-0111) development (referred to as "Project") which is located on the northwest corner of Euclid Avenue (SR-83) and Schaefer Avenue in the City of Chino.

CONSTRUCTION EQUIPMENT ELECTRICITY USAGE ESTIMATES

Based on the *2023 National Construction Estimator* (1), the typical power cost per 1,000 square feet of building construction per month is estimated to be $2.50. The Project is to consist of the development of a Four-story residential component with 282 multifamily (mid-rise) residential dwelling units, a Four-story self-storge component with 145,000 square feet of self-storage use, and A retail component that consists of 2 fast-food restaurants with drive-through window pads totaling 7,000 square feet and a 12,500 square foot retail pad (assuming 9,400 square feet of fast-food restaurant without drive-through window use and 3,100 square feet of retail use). Table 1 estimates the total power cost of the on-site electricity usage during the construction of the proposed Project to be approximately $13,086.96.

TABLE 1: PROJECT CONSTRUCTION POWER COST

Land Use	Power Cost (per 1,000 SF)	Size (1,000 SF)	Construction Duration (months)	Project Construction Power Cost
Self-Storage Facility	$2.50	145.000	8	$2,900.00
Multifamily (Mid-Rise) Residential	$2.50	270.720	8	$5,414.40
Retail Shops	$2.50	3.100	8	$62.00
Fast-Food Restaurant without Drive-Thru	$2.50	7.000	8	$140.00
Fast-Food Restaurant with Drive-Thru	$2.50	9.400	8	$188.00
Parking	$2.50	122.778	8	$2,455.56
Other Asphalt Surfaces	$2.50	96.350	8	$1,927.00
			CONSTRUCTION POWER COST	***$13,086.96***

Electricity would be provided to the Project by Southern California Edison (SCE). The SCE general service rate schedule were used to determine the Project's electrical usage. As of October 1, 2023, SCE's general

service rate is $0.13 per kilowatt hours (kWh) of electricity for general services and $0.16 for residential uses (2), the total electricity usage from on-site Project construction related activities is estimated to be approximately 93,115 kWh.

TABLE 2: PROJECT CONSTRUCTION ELECTRICITY USAGE

Land Use	Cost per kWh	Project Construction Electricity Usage (kWh)
Self-Storage Facility	$0.13	22,536
Multifamily (Mid-Rise) Residential	$0.16	33,493
Retail Shops	$0.13	482
Fast-Food Restaurant without Drive-Thru	$0.13	1,088
Fast-Food Restaurant with Drive-Thru	$0.13	1,461
Parking	$0.13	19,082
Other Asphalt Surfaces	$0.13	14,975
CONSTRUCTION ELECTRICITY USAGE		***93,115***

CONSTRUCTION EQUIPMENT FUEL ESTIMATES

Fuel consumption estimates are presented in Table 3. The aggregate fuel consumption rate for all equipment is estimated at 18.5 hp-hr-gal., obtained from California Air Resources Board (CARB) 2018 Emissions Factors Tables and cited fuel consumption rate factors presented in Table D-24 of the Moyer guidelines (3). For the purposes of this analysis, the calculations are based on all construction equipment being diesel-powered which is standard practice consistent with industry standards. Diesel fuel would be supplied by existing commercial fuel providers serving the City and region. As presented in Table 3, Project construction activities would consume an estimated 46,759 gallons of diesel fuel over the course of the Project construction period, approximately 8 months .

TABLE 3: CONSTRUCTION EQUIPMENT FUEL CONSUMPTION ESTIMATES

Construction Activity	Duration (Days)	Equipment	HP Rating	Quantity	Usage Hours	Load Factor	HP-hrs/day	Total Fuel Consumption
Site Preparation	10	Rubber Tired Dozers	367	3	8	0.40	3,523	1,904
		Crawler Tractors	87	4	8	0.43	1,197	647
Grading	30	Excavators	36	2	8	0.38	219	355
		Graders	148	1	8	0.41	485	787
		Rubber Tired Dozers	367	1	8	0.40	1,174	1,904
		Scrapers	423	2	8	0.48	3,249	5,268
		Crawler Tractors	87	2	8	0.43	599	971
Building Construction	150	Cranes	367	2	8	0.29	1,703	13,807
		Forklifts	82	5	8	0.20	656	5,319
		Generator Sets	14	2	8	0.74	166	1,344
		Tractors/Loaders/Backhoes	84	5	8	0.37	1,243	10,080
		Welders	46	2	8	0.45	331	2,685
Paving	20	Pavers	81	2	8	0.42	544	588
		Paving Equipment	89	2	8	0.36	513	554
		Rollers	36	2	8	0.38	219	237
Architectural Coating	40	Air Compressors	37	1	8	0.48	142	307
CONSTRUCTION FUEL DEMAND (GALLONS DIESEL FUEL)								***46,759***

CONSTRUCTION WORKER FUEL ESTIMATES

It is assumed that all construction worker trips are from light duty autos (LDA) along area roadways. Data regarding Project related construction worker trips were based on CalEEMod 2022.1.1.20 defaults utilized within the AQIA. Vehicle fuel efficiencies for LDAs were estimated using information generated within the 2021 version of the EMFAC developed by the CARB.

Table 4 provides an estimated annual fuel consumption resulting from the Project generated by LDAs related to construction worker trips. Based on Table 4, it is estimated that 29,548 gallons of fuel will be consumed related to construction worker trips over the course of the Project construction period, approximately 8 months .

TABLE 4: CONSTRUCTION WORKER FUEL CONSUMPTION ESTIMATES

Year	Construction Activity	Duration (Days)	Worker Trips/Day	Trip Length (miles)	VMT	Average Vehicle Fuel Economy (mpg)	Estimated Fuel Consumption (gallons)
2024	LDA						
	Site Preparation	10	9	18.5	1,665	31.57	53
	Grading	30	10	18.5	5,550	31.57	176
	Building Construction	150	136	18.5	377,400	31.57	11,953
	Paving	20	8	18.5	2,960	31.57	94
	Architectural Coating	40	27	18.5	19,980	31.57	633
	LDT1						
	Site Preparation	10	5	18.5	925	24.59	38
	Grading	30	5	18.5	2,775	24.59	113
	Building Construction	150	68	18.5	188,700	24.59	7,673
	Paving	20	4	18.5	1,480	24.59	60
	Architectural Coating	40	14	18.5	10,360	24.59	421
	LDT2						
	Site Preparation	10	5	18.5	925	24.51	38
	Grading	30	5	18.5	2,775	24.51	113
	Building Construction	150	68	18.5	188,700	24.51	7,700
	Paving	20	4	18.5	1,480	24.51	60
	Architectural Coating	40	14	18.5	10,360	24.51	423
TOTAL CONSTRUCTION WORKER FUEL CONSUMPTION							***29,548***

CONSTRUCTION VENDOR FUEL ESTIMATES

It is assumed that 50% of all vendor trips are from Medium-Heavy-Duty-Trucks (MHDT) and 50% are from Heavy-Heavy-Duty Trucks (HHDT). These assumptions are consistent with the CalEEMod 2022.1.1.20 defaults utilized within the within the AQIA. Vehicle fuel efficiencies for MHDTs and HHDTs were estimated using information generated within EMFAC2021.

Table 5 shows the estimated fuel economy of MHDTs and HHDTs accessing the Project site. Based on Table 5, fuel consumption from construction trips will total approximately 10,568 gallons over the course of the Project construction period, approximately 8 months .

TABLE 5: CONSTRUCTION VENDOR FUEL CONSUMPTION ESTIMATES

Year	Construction Activity	Duration (Days)	Vendor Trips/Day	Trip Length (miles)	VMT	Average Vehicle Fuel Economy (mpg)	Estimated Fuel Consumption (gallons)
2024	MHDT						
	Site Preparation	10	2	10.2	204	8.32	25
	Grading	30	5	10.2	1,530	8.32	184
	Building Construction	150	23	10.2	35,190	8.32	4,232
	HHDT (Vendor)						
	Site Preparation	10	2	10.2	204	6.03	34
	Grading	30	5	10.2	1,530	6.03	254
	Building Construction	150	23	10.2	35,190	6.03	5,840
TOTAL CONSTRUCTION VENDOR FUEL CONSUMPTION							***10,568***

TRANSPORTATION ENERGY DEMANDS

Energy that would be consumed by Project-generated traffic is a function of total VMT and estimated vehicle fuel economies of vehicles accessing the Project site. Table 6 presents the estimated annual fuel consumption from project-generated traffic.

FACILITY ENERGY DEMANDS

Project building operations and Project site maintenance activities would result in the consumption of natural gas and electricity. Natural gas would be supplied to the Project by Southern California Gas (SoCalGas) and electricity would be supplied to the Project by SCE. Annual natural gas and electricity demands of the Project are summarized in Table 7.

TABLE 6: PROJECT-GENERATED TRAFFIC ANNUAL FUEL CONSUMPTION

Vehicle Type	Annual VMT	Average Vehicle Fuel Economy (mpg)	Estimated Annual Fuel Consumption (gallons)
LDA	31.57	8,222,473	260,423
LDT1	24.59	682,424	27,750
LDT2	24.51	3,274,095	133,605
MDV	19.97	2,529,602	126,692
LHDT1	15.81	478,064	30,231
LHDT2	14.97	129,028	8,620
MHDT	8.32	278,156	33,448
HHDT	6.03	279,939	46,461
OBUS	6.08	10,261	1,687
UBUS	4.86	5,179	1,067
MCY	41.98	346,706	8,259
SBUS	6.43	17,912	2,786
MH	5.74	79,165	13,788
TOTAL (ALL VEHICLES)	***16,333,002***		***694,816***

TABLE 7: PROJECT ANNUAL OPERATIONAL NATURAL GAS AND ELECTRICITY DEMAND SUMMARY

Land Use	Natural Gas Demand (kBTU/year)	Electricity Demand (kWh/year)
Self-Storage Facility	2,756,548	669,712
Multifamily (Mid-Rise) Residential	3,112,485	1,217,158
Retail Shops	18,276	30,158
Fast-Food Restaurant without Drive-Thru	1,074,146	329,627
Fast-Food Restaurant with Drive-Thru	799,896	245,467
Parking	0	107,607
Other Asphalt Surfaces	0	0
TOTAL PROJECT ENERGY DEMAND	***7,761,351***	***2,599,729***

REFERENCES

1. **Pray, Richard.** *2021 National Construction Estimator.* Carlsbad : Craftsman Book Company, 2021.
2. **Southern California Edison.** Schedule GS-1 General Service. *Regulatory Information - Rates Pricing.* [Online] https://library.sce.com/content/dam/sce-doclib/public/regulatory/tariff/electric/schedules/general-service-&-industrial-rates/ELECTRIC_SCHEDULES_GS-1.pdf.
3. **California Air Resources Board.** *Methods to Find the Cost-Effectiveness of Funding Air Quality Projects For Evaluating Motor Vehicle Registration Fee Projects And Congestion Mitigation and Air Quality Improvement (CMAQ) Projects, Emission Factor Tables.* 2018.