APPENDIX D
Revised Air Quality Calculations

Revised Project Air Emissions

PM10 EMISSIONS FROM 500 MILK COW DAIRY FACILITY (CATTLE CORRAL DUST)

	Head Capacity					Scenario 1 (AP-42 Emission Factor; include rain effects; ignore calves)								
Source	1997 USDA Census	Support stock to milk cow ratio	Existing Head	Total Head Capacity	**500 milk cow dairy**	PM10 EF (tons/head-yr)	PM10 Emissions (tons/yr)	PM10 Emissions (tons/month)	PM10 redn in Jan and Feb	PM10 Emissions Jan and Feb	PM10 redn in Dec & Mar	PM10 Emissions Dec & Mar	PM10 Emissions other months	Total PM10 Emissions (tons/yr)
	a	b	c=a x b	d	e=500xb	f	g=fxe	h=g/12	I	j=2xixh	k	l=2xkxh	m=hx8	n=m+l +j
Milk Cow	124,660													
Dry Cows & bred heifers	--	0.150	na	na	75	0.02453	2	0	0.5	0	0.75	0	1	2
Heifers (1 yr to breeding)	--	0.480	na	na	240	0.02453	6	0	0.5	0	0.75	1	4	5
Calves (3 mos. To 1 year)	--	0.400	na	na	200	0.00000	0	0	0.5	0	0.75	0	0	0
Baby Calves (<3 months)	--	0.080	na	na	40	0.00000	0	0	0.5	0	0.75	0	0	0
Total														**7**

	Scenario 2 (AP-42 Emission Factor; ignore rain effects; include calves)		Scenario 3 (USDA AAQTF Emission Factor; include rainfall effects, exclude calves)										Scenario 4 (USDA AAQTF Emission Factor; exclude rainfall effects, include calves)		
Source	PM10 EF (tons/head-yr)	PM10 Emissions (tons/yr)	PM10 EF (lb/1000hd-day)	PM10 EF (tons/head-yr)	PM10 Emissions (tons/yr)	PM10 Emissions (tons/month)	PM10 redn in Jan and Feb	PM10 Emissions Jan and Feb	PM10 redn in Dec & Mar	PM10 Emissions Dec & Mar	PM10 Emissions other months	Total PM10 Emissions (tons/yr)	PM10 EF (lb/1000hd-day)	PM10 EF (tons/head-yr)	PM10 Emissions (tons/yr)
	o	p=oxe	q	r=qx365/(2000x1000)	s=rxe	t=s/12	u	v=2xtxu	w	x=2xwxt	y=tx8	z=y+x+v	aa	b=aax365/(2000x100	ac=exab
Milke cows															
Dry Cows & bred heifers	0.02453	2	20	0.00365	0.27	0.02	0.5	0	0.75	0	0	0	20	0.00365	0
Heifers (1 yr to breeding)	0.02453	6	20	0.00365	0.88	0.07	0.5	0	0.75	0	1	1	20	0.00365	1
Calves (3 mos. To 1 year)	0.02453	5	0	0.00000	0.00	0.00	0.5	0	0.75	0	0	0	20	0.00365	1
Baby Calves (<3 months)	0.02453	1	0	0.00000	0.00	0.00	0.5	0	0.75	0	0	0	20	0.00365	0
Total		**14**										**1**			**2**

PM10 EMISSIONS FROM 705 MILK COW DAIRY FACILITY (CATTLE CORRAL DUST)

	Head Capacity					Scenario 1 (AP-42 Emission Factor; include rain effects; ignore calves)								
Source	1997 USDA Census	Support stock to milk cow ratio	Existing Head	Total Head Capacity	**705 milk cow dairy**	PM10 EF (tons/head-yr)	PM10 Emissions (tons/yr)	PM10 Emissions (tons/month)	PM10 redn in Jan and Feb	PM10 Emissions Jan and Feb	PM10 redn in Dec & Mar	PM10 Emissions Dec & Mar	PM10 Emissions other months	Total PM10 Emissions (tons/yr)
	a	b	c=a x b	d	e=500xb	f	g=fxe	h=g/12	I	j=2xixh	k	l=2xkxh	m=hx8	n=m+l +j
Milk Cow	124,660													
Dry Cows & bred heifers	--	0.150	na	na	106	0.02453	3	0	0.5	0	0.75	0	2	2
Heifers (1 yr to breeding)	--	0.480	na	na	338	0.02453	8	1	0.5	1	0.75	1	6	7
Calves (3 mos. To 1 year)	--	0.400	na	na	282	0.00000	0	0	0.5	0	0.75	0	0	0
Baby Calves (<3 months)	--	0.080	na	na	56	0.00000	0	0	0.5	0	0.75	0	0	0
Total														**10**

	Scenario 2 (AP-42 Emission Factor; ignore rain effects; include calves)		Scenario 3 (USDA AAQTF Emission Factor; include rainfall effects, exclude calves)										Scenario 4 (USDA AAQTF Emission Factor; exclude rainfall effects, include calves)		
Source	PM10 EF (tons/head-yr)	PM10 Emissions (tons/yr)	PM10 EF (lb/1000hd-day)	PM10 EF (tons/head-yr)	PM10 Emissions (tons/yr)	PM10 Emissions (tons/month)	PM10 redn in Jan and Feb	PM10 Emissions Jan and Feb	PM10 redn in Dec & Mar	PM10 Emissions Dec & Mar	PM10 Emissions other months	Total PM10 Emissions (tons/yr)	PM10 EF (lb/1000hd-day)	PM10 EF (tons/head-yr)	PM10 Emissions (tons/yr)
	o	p=oxe	q	r=qx365/(2000x1000)	s=rxe	t=s/12	u	v=2xtxu	w	x=2xwxt	y=tx8	z=y+x+v	aa	b=aax365/(2000x100	ac=exab
Milke cows															
Dry Cows & bred heifers	0.02453	3	20	0.00365	0.39	0.03	0.5	0	0.75	0	0	0	20	0.00365	0
Heifers (1 yr to breeding)	0.02453	8	20	0.00365	1.24	0.10	0.5	0	0.75	0	1	1	20	0.00365	1
Calves (3 mos. To 1 year)	0.02453	7	0	0.00000	0.00	0.00	0.5	0	0.75	0	0	0	20	0.00365	1
Baby Calves (<3 months)	0.02453	1	0	0.00000	0.00	0.00	0.5	0	0.75	0	0	0	20	0.00365	0
Total		**19**										**1**			**3**

PM10 EMISSIONS FROM 2,000 MILK COW DAIRY FACILITY (CATTLE CORRAL DUST)

	Head Capacity					Scenario 1 (AP-42 Emission Factor; include rain effects; ignore calves)								
Source	1997 USDA Census	Support stock to milk cow ratio	Existing Head	Total Head Capacity	**2,000 milk cow dairy**	PM10 EF (tons/head-yr)	PM10 Emissions (tons/yr)	PM10 Emissions (tons/month)	PM10 redn in Jan and Feb	PM10 Emissions Jan and Feb	PM10 redn in Dec & Mar	PM10 Emissions Dec & Mar	PM10 Emissions other months	Total PM10 Emissions (tons/yr)
	a	b	c=a x b	d	e=2,000xb	f	g=fxe	h=g/12	I	j=2xixh	k	l=2xkxh	m=hx8	n=m+l +j
Milk Cow	124,660													
Dry Cows & bred heifers	--	0.150	na	na	300	0.02453	7	1	0.5	1	0.75	1	5	6
Heifers (1 yr to breeding)	--	0.480	na	na	960	0.02453	24	2	0.5	2	0.75	3	16	21
Calves (3 mos. To 1 year)	--	0.400	na	na	800	0.00000	0	0	0.5	0	0.75	0	0	0
Baby Calves (<3 months)	--	0.080	na	na	160	0.00000	0	0	0.5	0	0.75	0	0	0
Total														**27**

	Scenario 2 (AP-42 Emission Factor; ignore rain effects; include calves)		Scenario 3 (USDA AAQTF Emission Factor; include rainfall effects, exclude calves)										Scenario 4 (USDA AAQTF Emission Factor; exclude rainfall effects, include calves)		
Source	PM10 EF (tons/head-yr)	PM10 Emissions (tons/yr)	PM10 EF (lb/1000hd-day)	PM10 EF (tons/head-yr)	PM10 Emissions (tons/yr)	PM10 Emissions (tons/month)	PM10 redn in Jan and Feb	PM10 Emissions Jan and Feb	PM10 redn in Dec & Mar	PM10 Emissions Dec & Mar	PM10 Emissions other months	Total PM10 Emissions (tons/yr)	PM10 EF (lb/1000hd-day)	PM10 EF (tons/head-yr)	PM10 Emissions (tons/yr)
	o	p=oxe	q	r=qx365/(2000x1000)	s=rxe	t=s/12	u	v=2xtxu	w	x=2xwxt	y=tx8	z=y+x+v	aa	b=aax365/(2000x1000	ac=exab
Milke cows															
Dry Cows & bred heifers	0.02453	7	20	0.00365	1.10	0.09	0.5	0	0.75	0	1	1	20	0.00365	1
Heifers (1 yr to breeding)	0.02453	24	20	0.00365	3.50	0.29	0.5	0	0.75	0	2	3	20	0.00365	4
Calves (3 mos. To 1 year)	0.02453	20	0	0.00000	0.00	0.00	0.5	0	0.75	0	0	0	20	0.00365	3
Baby Calves (<3 months)	0.02453	4	0	0.00000	0.00	0.00	0.5	0	0.75	0	0	0	20	0.00365	1
Total		**54**										**4**			**8**

PM10 EMISSIONS FROM 5,000 MILK COW DAIRY FACILITY (CATTLE CORRAL DUST)

	Head Capacity					Scenario 1 (AP-42 Emission Factor; include rain effects; ignore calves)								
Source	1997 USDA Census	Support stock to milk cow ratio	Existing Head	Total Head Capacity	**5,000 milk cow dairy**	PM10 EF (tons/head-yr)	PM10 Emissions (tons/yr)	PM10 Emissions (tons/month)	PM10 redn in Jan and Feb	PM10 Emissions Jan and Feb	PM10 redn in Dec & Mar	PM10 Emissions Dec & Mar	PM10 Emissions other months	Total PM10 Emissions (tons/yr)
	a	b	c=a x b	d	e=5,000xb	f	g=fxe	h=g/12	I	j=2xixh	k	l=2xkxh	m=hx8	n=m+l +j
Milk Cow	124,660													
Dry Cows & bred heifers	--	0.150	na	na	750	0.02453	18	2	0.5	2	0.75	2	12	16
Heifers (1 yr to breeding)	--	0.480	na	na	2,400	0.02453	59	5	0.5	5	0.75	7	39	52
Calves (3 mos. To 1 year)	--	0.400	na	na	2,000	0.00000	0	0	0.5	0	0.75	0	0	0
Baby Calves (<3 months)	--	0.080	na	na	400	0.00000	0	0	0.5	0	0.75	0	0	0
Total														**68**

	Scenario 2 (AP-42 Emission Factor; ignore rain effects; include calves)		Scenario 3 (USDA AAQTF Emission Factor; include rainfall effects, exclude calves)										Scenario 4 (USDA AAQTF Emission Factor; exclude rainfall effects, include calves)		
Source	PM10 EF (tons/head-yr)	PM10 Emissions (tons/yr)	PM10 EF (lb/1000hd-day)	PM10 EF (tons/head-yr)	PM10 Emissions (tons/yr)	PM10 Emissions (tons/month)	PM10 redn in Jan and Feb	PM10 Emissions Jan and Feb	PM10 redn in Dec & Mar	PM10 Emissions Dec & Mar	PM10 Emissions other months	Total PM10 Emissions (tons/yr)	PM10 EF (lb/1000hd-day)	PM10 EF (tons/head-yr)	PM10 Emissions (tons/yr)
	o	p=oxe	q	r=qx365/(2000x1000)	s=rxe	t=s/12	u	v=2xtxu	w	x=2xwxt	y=tx8	z=y+x+v	aa	b=aax365/(2000x1000	ac=exab
Milke cows															
Dry Cows & bred heifers	0.02453	18	20	0.00365	2.74	0.23	0.5	0	0.75	0	2	2	20	0.00365	3
Heifers (1 yr to breeding)	0.02453	59	20	0.00365	8.76	0.73	0.5	1	0.75	1	6	8	20	0.00365	9
Calves (3 mos. To 1 year)	0.02453	49	0	0.00000	0.00	0.00	0.5	0	0.75	0	0	0	20	0.00365	7
Baby Calves (<3 months)	0.02453	10	0	0.00000	0.00	0.00	0.5	0	0.75	0	0	0	20	0.00365	1
Total		**136**										**10**			**20**

SUMMARY

	Scenario (tons/year)			
milk cow dairy capacity	**1**	**2**	**3**	**4**
500	7	14	1	2
705	10	19	1	3
2,000	27	54	4	8
5,000	68	136	10	20

Notes:

a Total milk cows in Kings County in 1997 from 1997 USDA Census of Agriculture for Kings County, CA.

b Ratio of milk cow to support stock for total cattle capacity in Kings County, as provided in Table No. 5, Nitrogen & Salt Generation Calculation Table.

c The USDA 1997 Census of Agriculture for Kings County, CA did not provide a breakdown for the number of dry cows, heifers, and calves. Therefore, the number of dry cows, heifers, and calves was determined using the support stock to milk cow ratio.

d Determined from Table No. 5, Nitrogen & Salt Generation Calculation Table.

f PM10 Emission factor obtained from CARB's Section 7.6 (Cattle Feedlot Dust), March 1989, Emission Inventory Procedural Manual and from USEPA AP42 4th edition; Emission factor assumes a PM10 percent of 48%, based on CARB's Section 7.6. PM10EF = (280lb/1000head-day) x (0.48 PM10) x (365 day/yr) / (2000 lb/ton) = 0.024528 tons/head-year. The emission factor used is for beef cattle in cattle feedlots since PM10 emission factors for support stock at dairy facilities are not available.

i, j According to CARB (personal communication between Mr. Patrick Gaffney, CARB and Ms. Rhodora Del Rosario, BASELINE, on 8/30/99, CARB has not published data that identifies the rainfall volume that would reduce reduce PM10 emissions from feedlot corrals. Based on the lack of data, CARB suggested that published PM10 reductions applied for land preparation be used for feedlot calculations.

q PM10 Emission factor obtained from Confined Livestock Air Quality Committee of the USDA Agricultural Air Quality Committee of the USDA Agricultural Air Quality Task Force, Air Quality Research & Technology Transfer Programs for Concentrated Animal Feeding Operations Air Quality Research and Technoloy Transfer White Paper and Recommendations for Concentrated Animal Feeding Operations, Adopted by USDA Agricultural Air Quality Task Force, Washington D.C., July 19, 2000; emission factor reflects non-annualized value since rainfall effects in Texas would different compared to California.

ROG & Methane Emissions from Manure Decomposition

Existing Conditions

Source	Existing	ratio	Head	emission factors (lb/head-year)			emission (lb/year)			emission (ton/year)		
				TOG	Methane	ROG	TOG	Methane	ROG	TOG	Methane	ROG
	a	b	c=axb	d	e	f	g=cxd	h=cxe	I=cxf	j=g/2000	k=h/2000	L=I/2000
Milk cows	124,668	1	124,668	160.8	112.56	12.88	20,046,614	14,032,630	1,605,734	10,023	7,016	803
Dry Cows & bred heifers		0.150	18,700	160.8	112.56	12.88	3,006,992	2,104,895	240,860	1,503	1,052	120
Heifers (1 yr to breeding)		0.480	59,841	160.8	112.56	12.88	9,622,406	6,735,684	770,755	4,811	3,368	385
Calves (3 mos. To 1 year)		0.400	49,867	160.8	112.56	12.88	8,018,646	5,613,052	642,294	4,009	2,807	321
Baby Calves (<3 months)		0.080	9,973	160.8	112.56	12.88	1,603,708	1,122,596	128,457	802	561	64
Total			**263,050**				42,298,367	29,608,857	3,388,099	**21,149**	**14,804**	**1,694**

Future Conditions

Source	Future Total Head Capacity	emission factors (lb/head-year)			emission (lb/year)			emission (ton/year)		
		TOG	Methane	ROG	TOG	Methane	ROG	TOG	Methane	ROG
	m	n	o	p	q=mxn	r=mxo	s=mxp	t=q/2000	u=r/2000	v=s/2000
Milk cows	381,980	160.8	112.56	12.88	61,422,384	42,995,669	4,919,933	30,711	21,498	2,460
Dry Cows & bred heifers	57,297	160.8	112.56	12.88	9,213,358	6,449,350	737,990	4,607	3,225	369
Heifers (1 yr to breeding)	183,351	160.8	112.56	12.88	29,482,841	20,637,989	2,361,576	14,741	10,319	1,181
Calves (3 mos. To 1 year)	152,792	160.8	112.56	12.88	24,568,954	17,198,268	1,967,973	12,284	8,599	984
Baby Calves (<3 months)	30,558	160.8	112.56	12.88	4,913,726	3,439,608	393,589	2,457	1,720	197
Total	**805,978**				129,601,262	90,720,884	10,381,061	**64,801**	**45,360**	**5,191**

500 Milk Cow Dairy

Source	500 milk cow dairy	ratio	Head	emission factors (lb/head-year)			emission (lb/year)			emission (ton/year)		
				TOG	Methane	ROG	TOG	Methane	ROG	TOG	Methane	ROG
	a	b	c=axb	d	e	f	g=cxd	h=cxe	I=cxf	j=g/2000	k=h/2000	L=I/2000
Milk cows	500	1	500	160.8	112.56	12.88	80,400	56,280	6,440	40	28	3
Dry Cows & bred heifers		0.150	75	160.8	112.56	12.88	12,060	8,442	966	6	4	0
Heifers (1 yr to breeding)		0.480	240	160.8	112.56	12.88	38,592	27,014	3,091	19	14	2
Calves (3 mos. To 1 year)		0.400	200	160.8	112.56	12.88	32,160	22,512	2,576	16	11	1
Baby Calves (<3 months)		0.080	40	160.8	112.56	12.88	6,432	4,502	515	3	2	0
Total			**1,055**				169,644	118,751	13,588	85	59	7

705 Milk Cow Dairy

Source	705 milk cow dairy	ratio	Head	emission factors (lb/head-year)			emission (lb/year)			emission (ton/year)		
				TOG	Methane	ROG	TOG	Methane	ROG	TOG	Methane	ROG
	a	b	c=axb	d	e	f	g=cxd	h=cxe	I=cxf	j=g/2000	k=h/2000	L=I/2000
Milk cows	705	1	705	160.8	112.56	12.88	113,364	79,355	9,080	57	40	5
Dry Cows & bred heifers		0.150	106	160.8	112.56	12.88	17,005	11,903	1,362	9	6	1
Heifers (1 yr to breeding)		0.480	338	160.8	112.56	12.88	54,415	38,090	4,359	27	19	2
Calves (3 mos. To 1 year)		0.400	282	160.8	112.56	12.88	45,346	31,742	3,632	23	16	2
Baby Calves (<3 months)		0.080	56	160.8	112.56	12.88	9,069	6,348	726	5	3	0
Total			**1,488**				239,198	167,439	19,160	120	84	10

2,000 Milk Cow Dairy

Source	2,000 milk cow dairy	ratio	Head	emission factors (lb/head-year)			emission (lb/year)			emission (ton/year)		
				TOG	Methane	ROG	TOG	Methane	ROG	TOG	Methane	ROG
	a	b	c=axb	d	e	f	g=cxd	h=cxe	I=cxf	j=g/2000	k=h/2000	L=I/2000
Milk cows	2,000	1	2,000	160.8	112.56	12.88	321,600	225,120	25,760	161	113	13
Dry Cows & bred heifers		0.150	300	160.8	112.56	12.88	48,240	33,768	3,864	24	17	2
Heifers (1 yr to breeding)		0.480	960	160.8	112.56	12.88	154,369	108,058	12,365	77	54	6
Calves (3 mos. To 1 year)		0.400	800	160.8	112.56	12.88	128,640	90,048	10,304	64	45	5
Baby Calves (<3 months)		0.080	160	160.8	112.56	12.88	25,728	18,009	2,061	13	9	1
Total			**4,220**				678,576	475,003	54,354	**339**	**238**	**27**

5,000 Milk Cow Dairy

Source	5,000 milk cow dairy	ratio	Head	emission factors (lb/head-year)			emission (lb/year)			emission (ton/year)		
				TOG	Methane	ROG	TOG	Methane	ROG	TOG	Methane	ROG
	a	b	c=axb	d	e	f	g=cxd	h=cxe	I=cxf	j=g/2000	k=h/2000	L=I/2000
Milk cows	5,000	1	5,000	160.8	112.56	12.88	804,000	562,800	64,400	402	281	32
Dry Cows & bred heifers		0.150	750	160.8	112.56	12.88	120,600	84,420	9,660	60	42	5
Heifers (1 yr to breeding)		0.480	2,400	160.8	112.56	12.88	385,921	270,145	30,912	193	135	15
Calves (3 mos. To 1 year)		0.400	2,000	160.8	112.56	12.88	321,600	225,120	25,760	161	113	13
Baby Calves (<3 months)		0.080	400	160.8	112.56	12.88	64,319	45,023	5,152	32	23	3
Total			**10,550**				1,696,440	1,187,508	135,885	**848**	**594**	**68**

Summary

	emission (lb/year)			**emission (ton/year)**		
Scenario	**TOG**	**Methane**	**ROG**	**TOG**	**Methane**	**ROG**
Existing Conditions	42,298,367	29,608,857	3,388,099	21,149	14,804	1,694
Future Conditions	129,601,262	90,720,884	10,381,061	64,801	45,360	5,191
500 milk cow dairy	169,644	118,751	13,588	85	59	7
705 milk cow dairy	239,198	167,439	19,160	120	84	10
2000 milk cow dairy	678,576	475,003	54,354	339	238	27
5000 milk cow dairy	1,696,440	1,187,508	135,885	848	594	68

Notes:
a (Existing & Future) - From Table No. 5 (Theoretical Dairy Herd Capacity in Kings County)
b (Existing) - Ratio of milk cow to support stock for total cattle capacity in Kings County, as provided in Table No. 5(Theoretical Dairy Capacity of Kings County)
Emission factors are from CARB Livestock Waste Methodology and 1988, Radian; assumed emission factor
published is for milk cows; adjusted head to equivalent head using Animal Unit (AU) conversion factors.

Ammonia Emissions Generated from Manure Decomposition

Cattle	head	emission factor (lb/animal/yr) NH3	emission (lb/year) NH3	emissions (tons/year) NH3
Existing Conditions				
milk cows	124,668	74.00	9,225,432	4,613
dry cows&bred	18,700	74.00	1,383,815	692
heifers (1yr-bred)	59,841	74.00	4,428,222	2,214
3mo-1yr calves	49,867	74.00	3,690,173	1,845
baby calves	9,973	74.00	738,025	369
Total	**263,050**		**19,465,666**	**9,733**
Future Conditions				
milk cows	381,980	74.00	28,266,520	14,133
dry cows&bred	57,297	74.00	4,239,978	2,120
heifers (1yr-bred)	183,351	74.00	13,567,974	6,784
3mo-1yr calves	152,792	74.00	11,306,608	5,653
baby calves	30,558	74.00	2,261,292	1,131
Total	**805,978**		**59,642,372**	**29,821**
500 milk cow dairy				
milk cows	500	74.00	37,000	19
dry cows&bred	75	74.00	5,550	3
heifers (1yr-bred)	240	74.00	17,760	9
3mo-1yr calves	200	74.00	14,800	7
baby calves	40	74.00	2,960	1
Total	**1,055**		**78,070**	**39**
705 milk cow dairy				
milk cows	705	74.00	52,170	26
dry cows&bred	106	74.00	7,826	4
heifers (1yr-bred)	338	74.00	25,042	13
3mo-1yr calves	282	74.00	20,868	10
baby calves	56	74.00	4,174	2
Total	**1,488**		**110,079**	**55**
2,000 milk cow dairy				
milk cows	2,000	74.00	148,000	74
dry cows&bred	300	74.00	22,200	11
heifers (1yr-bred)	960	74.00	71,040	36
3mo-1yr calves	800	74.00	59,200	30
baby calves	160	74.00	11,840	6
Total	**4,220**		**312,280**	**156**
5,000 milk cow dairy				
milk cows	5,000	74.00	370,000	185
dry cows&bred	750	74.00	55,500	28
heifers (1yr-bred)	2,400	74.00	177,601	89
3mo-1yr calves	2,000	74.00	148,000	74
baby calves	400	74.00	29,600	15
Total	**10,550**		**780,700**	**390**

Notes:
Emission factors obtained from James, et al.; emission factor
does not speciate between the different cattle types (e.g., heifers, calves, cows) as it reflects the average emission factor for all cattle types; estimate assumes that ratios of cattle types are similar to the dairy studied by UC Davis in developing the emission factor.
Support stock for existing, 500-, 2,000-, and 5,000-cow dairy conditions were determined using the ratio of milk cow to support stock for total capacity in Kings County, as provided in Table No. 5B (Theoretical Dairy Capacity of Kings County).

Ammonia Emissions Generated from Manure Decomposition

Cattle	head	emission factor (lb/animal/yr) NH3	emission (lb/year) NH3	emissions (tons/year) NH3
Existing Conditions				
milk cows	124,668	28.37	3,537,230	1,769
dry cows&bred	18,700	28.37	530,585	265
heifers (1yr-bred)	59,841	8.54	510,874	255
3mo-1yr calves	49,867	3.53	176,011	88
baby calves	9,973	3.53	35,202	18
Total	263,050		4,789,902	2,395
Future Conditions				
milk cows	381,980	28.37	10,837,996	5,419
dry cows&bred	57,297	28.37	1,625,699	813
heifers (1yr-bred)	183,351	8.54	1,565,308	783
3mo-1yr calves	152,792	3.53	539,295	270
baby calves	30,558	3.53	107,858	54
Total	805,978		14,676,155	7,338
500 milk cow dairy				
milk cows	500	28.37	14,187	7
dry cows&bred	75	28.37	2,128	1
heifers (1yr-bred)	240	8.54	2,049	1
3mo-1yr calves	200	3.53	706	0
baby calves	40	3.53	141	0
Total	1,055		19,211	10
705 milk cow dairy				
milk cows	705	28.37	20,003	10
dry cows&bred	106	28.37	3,000	2
heifers (1yr-bred)	338	8.54	2,889	1
3mo-1yr calves	282	3.53	995	0
baby calves	56	3.53	199	0
Total	1,488		27,087	14
2,000 milk cow dairy				
milk cows	2,000	28.37	56,746	28
dry cows&bred	300	28.37	8,512	4
heifers (1yr-bred)	960	8.54	8,196	4
3mo-1yr calves	800	3.53	2,824	1
baby calves	160	3.53	565	0
Total	4,220		76,843	38
5,000 milk cow dairy				
milk cows	5,000	28.37	141,866	71
dry cows&bred	750	28.37	21,280	11
heifers (1yr-bred)	2,400	8.54	20,489	10
3mo-1yr calves	2,000	3.53	7,059	4
baby calves	400	3.53	1,412	1
Total	**10,550**		**192,106**	**96**

Notes:
Emission factors obtained from 1994 Battye Report; emission factors reflect stable & storage emission factor components only.
Support stock for existing, 500-, 2,000-, and 5,000-cow dairy conditions were determined using the ratio of milk cow to support stock for total capacity in Kings County, as provided in Table No. 5B (Theoretical Dairy Capacity of Kings County).

Methane Generation from Dairy Cattle

Animal type	#cows	Emission Factor (lb CH4/head/year)	Emissions (tons CH4/year)	Notes
Existing Conditions				
milk cows	124,668	262.5	16,363	considered mature cows
dry cows&bred	18,700	152	1,421	used beef cattle mature cows since these cows are not milk cows
heifers (1yr-bred)	59,841	134.6	4,027	considered replacement cows from 12 -24 months
3mo-1yr calves	49,867	45.5	1,134	considered replacement cows from 0-12 months
baby calves	9,973	45.5	227	considered replacement cows from 0-12 months
Total	263,050		**23,173**	
Future Conditions				
milk cows	381,980	262.5	50,135	considered mature cows
dry cows&bred	57,297	152	4,355	used beef cattle mature cows since these cows are not milk cows
heifers (1yr-bred)	183,351	134.6	12,340	considered replacement cows from 12 -24 months
3mo-1yr calves	152,792	45.5	3,476	considered replacement cows from 0-12 months
baby calves	30,558	45.5	695	considered replacement cows from 0-12 months
Total	805,978		**71,000**	
500 milk cow dairy				
milk cows	500	262.5	66	considered mature cows
dry cows&bred	75	152	6	used beef cattle mature cows since these cows are not milk cows
heifers (1yr-bred)	240	134.6	16	considered replacement cows from 12 -24 months
3mo-1yr calves	200	45.5	5	considered replacement cows from 0-12 months
baby calves	40	45.5	1	considered replacement cows from 0-12 months
Total	1,055		**93**	
705 milk cow dairy				
milk cows	705	262.5	93	considered mature cows
dry cows&bred	106	152	8	used beef cattle mature cows since these cows are not milk cows
heifers (1yr-bred)	338	134.6	23	considered replacement cows from 12 -24 months
3mo-1yr calves	282	45.5	6	considered replacement cows from 0-12 months
baby calves	56	45.5	1	considered replacement cows from 0-12 months
Total	1,488		**131**	
2,000 milk cow dairy				
milk cows	2,000	262.5	263	considered mature cows
dry cows&bred	300	152	23	used beef cattle mature cows since these cows are not milk cows
heifers (1yr-bred)	960	134.6	65	considered replacement cows from 12 -24 months
3mo-1yr calves	800	45.5	18	considered replacement cows from 0-12 months
baby calves	160	45.5	4	considered replacement cows from 0-12 months
Total	4,220		**372**	
5,000 milk cow dairy				
milk cows	5,000	262.5	656	considered mature cows
dry cows&bred	750	152	57	used beef cattle mature cows since these cows are not milk cows
heifers (1yr-bred)	2,400	134.6	162	considered replacement cows from 12 -24 months
3mo-1yr calves	2,000	45.5	46	considered replacement cows from 0-12 months
baby calves	400	45.5	9	considered replacement cows from 0-12 months
Total	10,550		**929**	

Notes:
Emission factors obtained from CARB and Radian Report
Support stock for existing, 500-, 2,000-, and 5,000-cow dairy conditions were determined using the ratio of milk cow to support stock for total capacity in Kings County, as provided in Table No. 5B (Theoretical Dairy Capacity of Kings County).

Future Capacity PM10 Emissions from Corrals

Assumes All New Future and Expanded Dairies Subject to Dairy Element 50% Reduction Control Measure

	Uncontrolled Emissions					50% Controlled Emission Reduction from Future New and Expanded Dairies							Controlled Future Conditions	
Animal Type	Existing Head	Future Total Head Capacity	Emissons from Existing Head (tons/year)	Emissons from Future Total Head Capacity (tons/year)	Net Increase in Emissons under Future Conditions (tons per year)	Emissions from Future Expanded and New Dairies (tons/year)	Emissions from Future Expanded and New Dairies (tons/month)	Zero % reduction in Jan and Feb (tons/2months)	25% further reduction in Dec. & Mar. (tons/2 months)	50% reduction from Apr through Nov (tons/8 months)	50% reduction year round (tons/year)	Total Controlled Emission Reduction (tons/year)	Total Future Conditions (tons/year)	Total Net Emission Increase under Future Conditions (tons/year)
Scenario 1														
Milk cows	124,668	381,980	-	-	-	-	-	-	-	-	NA	-	-	-
Dry Cows & bred heifers	18,700	57,297	401	1,230	828	828	69	138	91	276	NA	505	907	505
Heifers (1 yr to breeding)	59,841	183,351	1,284	3,935	2,651	2,651	221	442	292	884	NA	1,617	2,901	1,617
Calves (3 mos. To 1 year)	49,867	152,792	-	-	-	-	-	-	-	-	NA	-	-	-
Baby Calves (<3 months)	9,973	30,558	-	-	-	-	-	-	-	-	NA	-	-	-
Total	263,049	**805,978**	1,686	5,165	3,479	3,479	290	580	383	1,160	NA	2,122	3,808	2,122
Scenario 2														
Milk cows	124,668	381,980	-	-	-	-	-	NA	NA	NA	-	-	-	-
Dry Cows & bred heifers	18,700	57,297	459	1,405	947	947	79	NA	NA	NA	473	473	932	473
Heifers (1 yr to breeding)	59,841	183,351	1,468	4,497	3,029	3,029	252	NA	NA	NA	1,515	1,515	2,983	1,515
Calves (3 mos. To 1 year)	49,867	152,792	1,223	3,748	2,525	2,525	210.38	NA	NA	NA	1,262	1,262	2,485	1,262
Baby Calves (<3 months)	9,973	30,558	245	750	505	505	42.08	NA	NA	NA	252	252	497	252
Total	263,049	**805,978**	3,394	10,400	7,006	7,006	584	NA	NA	NA	3,503	3,503	6,897	3,503
Scenario 3														
Milk cows	124,668	381,980	-	-	-	-	-	-	-	-	NA	-	-	-
Dry Cows & bred heifers	18,700	57,297	60	183	123	123	10	21	14	41	NA	75	135	75
Heifers (1 yr to breeding)	59,841	183,351	191	586	394	394	33	66	43	131	NA	241	432	241
Calves (3 mos. To 1 year)	49,867	152,792	-	-	-	-	-	-	-	-	NA	-	-	-
Baby Calves (<3 months)	9,973	30,558	-	-	-	-	-	-	-	-	NA	-	-	-
Total	263,049	**805,978**	251	769	518	518	43	86	57	173	NA	316	567	316
Scenario 4														
Milk cows	124,668	381,980	-	-	-	-	-	NA	NA	NA	-	-	-	-
Dry Cows & bred heifers	18,700	57,297	68	209	141	141	12	NA	NA	NA	70	70	139	70
Heifers (1 yr to breeding)	59,841	183,351	218	669	451	451	38	NA	NA	NA	225	225	444	225
Calves (3 mos. To 1 year)	49,867	152,792	182	558	376	376	31.31	NA	NA	NA	188	188	370	188
Baby Calves (<3 months)	9,973	30,558	36	112	75	75	6.26	NA	NA	NA	38	38	74	38
Total	263,049	**805,978**	505	1,548	1,043	1,043	87	NA	NA	NA	521	521	1,026	521

Future Capacity Methane Emissions from Manure Decomposition

Assumes Only New Future Dairies Subject to Dairy Element 50% Methane Reduction Control Measure;
Existing Dairies and Expansion Limits are Exempt from Dairy Element Methane Control Measures

Animal Type	Emission Factor (lb/head-yr)	Existing Dairies					
		Existing Head	Future Expansion Head Limit[1]	Total Dairy Head (Expansion and Existing)	Emissons from Existing Head (tons/year)	Emissons from Expanded Head (tons/year)	Total Uncontrolled Emissions[2] (tons/yr)
Milk cows	112.56	124,668	24,559	149,227	7,016	1,382	8,398
Dry Cows & bred heifers	112.56	18,700	3,684	22,384	1,052	207	1,260
Heifers (1 yr to breeding)	112.56	59,841	11,788	71,629	3,368	663	4,031
Calves (3 mos. To 1 year)	112.56	49,867	9,824	59,691	2,807	553	3,359
Baby Calves (<3 months)	112.56	9,973	1,965	11,938	561	111	672
Total		263,049	51,820	314,868	14,804	2,916	17,721

Animal Type	Emission Factor (lb/head-yr)	New Dairies/Dairy Expansion[3]				
		Total Head[4]	Uncontrolled Total Emission (lb/yr)	Uncontrolled Total Emission (ton/yr)	50% Emission Control (ton/yr)	Total Controlled Emissions (ton/yr)
Milk cows	112.56	232,753	26,198,711	13,099	6,550	6,550
Dry Cows & bred heifers	112.56	34,913	3,929,807	1,965	982	982
Heifers (1 yr to breeding)	112.56	111,722	12,575,422	6,288	3,144	3,144
Calves (3 mos. To 1 year)	112.56	93,101	10,479,484	5,240	2,620	2,620
Baby Calves (<3 months)	112.56	18,620	2,095,869	1,048	524	524
Total		491,110	55,279,293	27,640	13,820	13,820

	Future Conditions	
Animal Type	Total Emissions w/Implementation of Control Measure[5]	Total Net Increase in Emissions
Milk cows	**14,948**	**7,932**
Dry Cows & bred heifers	**2,242**	**1,190**
Heifers (1 yr to breeding)	**7,175**	**3,807**
Calves (3 mos. To 1 year)	**5,979**	**3,173**
Baby Calves (<3 months)	**1,196**	**635**
Total	**31,541**	**16,736**

Notes:

[1] Future expansion head limit reflects the cumulative maximum number of head that existing individual dairies can expand to, without exceeding the ROG threshold limit of 10 tons/year. Expansion of existing dairies which currently exceed the ROG threshold limit would be subject to the 50% Reduction Control Measure.

[2] Existing dairies which currently exceed the ROG threshold limit would not be subject to the 50% Reduction Control Measure.

[3] New dairies also include the expansion of existing dairies which currently exceed the ROG threshold limit.

[4] Total head reflects total future capacity minus head from existing dairies and head from expansion of existing dairies that are not required to implement the 50% Methane Control Measure.

[5] The 50% Control Measure would be required for all new dairies and expansion of existing dairies which currently exceed the ROG threshold limit.

Future Capacity ROG Emissions from Manure Decomposition

Assumes Only New Future Dairies Subject to Dairy Element 50% ROG Reduction Control Measure;
Existing Dairies and Expansion Limits are Exempt from Dairy Element ROG Control Measures

Animal Type	Emission Factor (lb/head-yr)	Existing Dairies					
		Existing Head	Future Expansion Head Limit[1]	Total Dairy Head (Expansion and Existing)	Emissons from Existing Head (tons/year)	Emissons from Expanded Head (tons/year)	Total Uncontrolled Emissions[2] (tons/yr)
Milk cows	12.88	124,668	24,559	149,227	803	158	961
Dry Cows & bred heifers	12.88	18,700	3,684	22,384	120	24	144
Heifers (1 yr to breeding)	12.88	59,841	11,788	71,629	385	76	461
Calves (3 mos. To 1 year)	12.88	49,867	9,824	59,691	321	63	384
Baby Calves (<3 months)	12.88	9,973	1,965	11,938	64	13	77
Total		263,049	51,820	314,868	1,694	334	2,028

Animal Type	Emission Factor (lb/head-yr)	New Dairies/Dairy Expansion[3]				
		Total Head[4]	Uncontrolled Total Emission (lb/yr)	Uncontrolled Total Emission (ton/yr)	50% Emission Control (ton/yr)	Total Controlled Emissions (ton/yr)
Milk cows	12.88	232,753	2,997,881	1,499	749	749
Dry Cows & bred heifers	12.88	34,913	449,682	225	112	112
Heifers (1 yr to breeding)	12.88	111,722	1,438,988	719	360	360
Calves (3 mos. To 1 year)	12.88	93,101	1,199,152	600	300	300
Baby Calves (<3 months)	12.88	18,620	239,827	120	60	60
Total		491,110	6,325,531	3,163	1,581	1,581

	Future Conditions	
Animal Type	Total Emissions w/Implementation of Control Measure[5]	Total Net Increase in Emissions
Milk cows	**1,710**	**908**
Dry Cows & bred heifers	**257**	**136**
Heifers (1 yr to breeding)	**821**	**436**
Calves (3 mos. To 1 year)	**684**	**363**
Baby Calves (<3 months)	**137**	**73**
Total	**3,609**	**1,915**

Notes:

[1] Future expansion head limit reflects the cumulative maximum number of head that existing individual dairies can expand to, without exceeding the ROG threshold limit of 10 tons/year. Expansion of existing dairies which currently exceed the ROG threshold limit would be subject to the 50% ROG Reduction Control Measure.

[2] Existing dairies which currently exceed the ROG threshold limit would not be subject to the 50% ROG Reduction Control Measure.

[3] New dairies also include the expansion of existing dairies which currently exceed the ROG threshold limit.

[4] Total head reflects total future capacity minus head from existing dairies and head from expansion of existing dairies that are not required to implement the 50% ROG Control Measure.

[5] The 50% ROG Control Measure would be required for all new dairies and expansion of existing dairies which currently exceed the ROG threshold limit.

ROG EMISSIONS FROM EXISTING DAIIRES AND LIMITED EXPANDED DAIRIES

	Existing Conditions[1]									Total Expansion Limit								
Dairy	Milk cows	Dry Cows & bred heifers	Heifers (1 yr to breeding)	Calves (3 mos. To 1 year)	Baby Calves (<3 months)	Total Head	ROG (lb/year)	ROG (ton/year)	Exceed ROG Threshold (ton/year)	Milk cows	Dry Cows & bred heifers	Heifers (1 yr to breeding)	Calves (3 mos. To 1 year)	Baby Calves (<3 months)	Total Expan-sion Head	ROG (lb/year)	ROG (ton/year)	Exceed ROG Threshold (ton/year)
Maximum Limit	*705*	*106*	*338*	*282*	*56*	*1,488*	*19,160*	*9.58*	*no*	--	--	--	--	--	--	--	--	--
1	81	12	39	*32*	*6*	171	2,201	1	no	624	94	300	250	50	1,317	16,958	8	no
2	98	15	47	*39*	*8*	207	2,663	1	no	607	91	291	243	49	1,281	16,496	8	no
3	110	17	53	*44*	*9*	232	2,989	1	no	595	89	286	238	48	1,255	16,170	8	no
4	118	18	56	*47*	*9*	248	3,197	2	no	587	88	282	235	47	1,239	15,962	8	no
5	118	18	56	*47*	*9*	248	3,197	2	no	587	88	282	235	47	1,239	15,962	8	no
6	133	20	64	*53*	*11*	281	3,615	2	no	572	86	275	229	46	1,207	15,545	8	no
7	164	25	79	*66*	*13*	346	4,457	2	no	541	81	260	216	43	1,142	14,703	7	no
8	166	25	80	*66*	*13*	350	4,511	2	no	539	81	259	216	43	1,137	14,648	7	no
9	176	26	85	*71*	*14*	372	4,796	2	no	529	79	254	211	42	1,115	14,364	7	no
10	176	26	85	*71*	*14*	372	4,796	2	no	529	79	254	211	42	1,115	14,364	7	no
11	176	26	85	*71*	*14*	372	4,796	2	no	529	79	254	211	42	1,115	14,364	7	no
12	176	26	85	*71*	*14*	372	4,796	2	no	529	79	254	211	42	1,115	14,364	7	no
13	183	27	88	*73*	*15*	386	4,973	2	no	522	78	251	209	42	1,101	14,186	7	no
14	200	30	96	*80*	*16*	422	5,435	3	no	505	76	242	202	40	1,066	13,724	7	no
15	235	35	113	*94*	*19*	496	6,395	3	no	470	70	225	188	38	991	12,765	6	no
16	235	35	113	*94*	*19*	496	6,395	3	no	470	70	225	188	38	991	12,765	6	no
17	235	35	113	*94*	*19*	496	6,395	3	no	470	70	225	188	38	991	12,765	6	no
18	235	35	113	*94*	*19*	496	6,395	3	no	470	70	225	188	38	991	12,765	6	no
19	236	35	113	*94*	*19*	498	6,414	3	no	469	70	225	188	38	990	12,746	6	no
20	259	39	124	*104*	*21*	546	7,034	4	no	446	67	214	178	36	941	12,126	6	no
21	294	44	141	*118*	*24*	621	7,993	4	no	411	62	197	164	33	867	11,167	6	no
22	298	45	143	*119*	*24*	629	8,099	4	no	407	61	195	163	33	859	11,061	6	no
23	318	48	153	*127*	*25*	671	8,642	4	no	387	58	186	155	31	817	10,517	5	no
24	324	49	155	*129*	*26*	683	8,793	4	no	381	57	183	153	31	805	10,367	5	no
25	326	49	156	*130*	*26*	688	8,860	4	no	379	57	182	152	30	800	10,300	5	no
26	334	50	160	*134*	*27*	705	9,077	5	no	371	56	178	148	30	783	10,083	5	no
27	340	51	163	*136*	*27*	717	9,240	5	no	365	55	175	146	29	770	9,920	5	no
28	341	51	164	*136*	*27*	720	9,272	5	no	364	55	175	146	29	768	9,888	5	no
29	352	53	169	*141*	*28*	743	9,566	5	no	353	53	169	141	28	745	9,593	5	no
30	353	53	169	*141*	*28*	745	9,592	5	no	352	53	169	141	28	743	9,568	5	no
31	353	53	169	*141*	*28*	745	9,592	5	no	352	53	169	141	28	743	9,568	5	no
32	353	53	169	*141*	*28*	745	9,592	5	no	352	53	169	141	28	743	9,568	5	no
33	363	54	174	*145*	*29*	766	9,865	5	no	342	51	164	137	27	722	9,295	5	no
34	376	56	181	*151*	*30*	794	10,231	5	no	329	49	158	131	26	693	8,928	4	no
35	376	56	181	*151*	*30*	794	10,231	5	no	329	49	158	131	26	693	8,928	4	no
36	388	58	186	*155*	*31*	819	10,545	5	no	317	48	152	127	25	669	8,615	4	no
37	388	58	186	*155*	*31*	819	10,551	5	no	317	48	152	127	25	668	8,609	4	no
38	389	58	187	*156*	*31*	821	10,572	5	no	316	47	152	126	25	667	8,588	4	no
39	400	60	192	*160*	*32*	844	10,871	5	no	305	46	146	122	24	644	8,289	4	no
40	408	61	196	*163*	*33*	861	11,088	6	no	297	45	143	119	24	627	8,072	4	no
41	412	62	198	*165*	*33*	869	11,191	6	no	293	44	141	117	23	619	7,969	4	no
42	412	62	198	*165*	*33*	869	11,191	6	no	293	44	141	117	23	619	7,969	4	no
43	412	62	198	*165*	*33*	869	11,191	6	no	293	44	141	117	23	619	7,969	4	no
44	412	62	198	*165*	*33*	869	11,191	6	no	293	44	141	117	23	619	7,969	4	no
45	427	64	205	*171*	*34*	901	11,605	6	no	278	42	133	111	22	587	7,555	4	no
46	441	66	212	*176*	*35*	931	11,985	6	no	264	40	127	106	21	557	7,175	4	no
47	449	67	216	*180*	*36*	947	12,202	6	no	256	38	123	102	20	540	6,957	3	no
48	457	69	219	*183*	*37*	964	12,420	6	no	248	37	119	99	20	523	6,740	3	no
49	459	69	220	*184*	*37*	968	12,474	6	no	246	37	118	98	20	519	6,686	3	no
50	465	70	223	*186*	*37*	981	12,637	6	no	240	36	115	96	19	506	6,522	3	no
51	471	71	226	*188*	*38*	993	12,789	6	no	234	35	113	94	19	495	6,371	3	no
52	471	71	226	*188*	*38*	993	12,789	6	no	234	35	113	94	19	495	6,371	3	no
53	483	72	232	*193*	*39*	1,019	13,126	7	no	222	33	107	89	18	468	6,033	3	no

ROG EMISSIONS FROM EXISTING DAIIRES AND LIMITED EXPANDED DAIRIES

	Existing Conditions[1]									Total Expansion Limit								
Dairy	Milk cows	Dry Cows & bred heifers	Heifers (1 yr to breeding)	Calves (3 mos. To 1 year)	Baby Calves (<3 months)	Total Head	ROG (lb/year)	ROG (ton/year)	Exceed ROG Threshold (ton/year)	Milk cows	Dry Cows & bred heifers	Heifers (1 yr to breeding)	Calves (3 mos. To 1 year)	Baby Calves (<3 months)	Total Expan-sion Head	ROG (lb/year)	ROG (ton/year)	Exceed ROG Threshold (ton/year)
54	486	73	233	*194*	*39*	1,025	13,208	7	no	219	33	105	88	18	462	5,952	3	no
55	496	74	238	*198*	*40*	1,047	13,480	7	no	209	31	100	84	17	441	5,680	3	no
56	497	75	239	*199*	*40*	1,049	13,507	7	no	208	31	100	83	17	439	5,653	3	no
57	503	75	241	*201*	*40*	1,061	13,670	7	no	202	30	97	81	16	426	5,490	3	no
58	517	78	248	*207*	*41*	1,091	14,050	7	no	188	28	90	75	15	397	5,109	3	no
59	518	78	249	*207*	*41*	1,093	14,078	7	no	187	28	90	75	15	395	5,082	3	no
60	531	80	255	*212*	*42*	1,120	14,431	7	no	174	26	84	70	14	367	4,729	2	no
61	547	82	263	*219*	*44*	1,154	14,866	7	no	158	24	76	63	13	333	4,294	2	no
62	550	83	264	*220*	*44*	1,161	14,947	7	no	155	23	74	62	12	327	4,212	2	no
63	553	83	265	*221*	*44*	1,167	15,029	8	no	152	23	73	61	12	321	4,131	2	no
64	559	84	268	*224*	*45*	1,179	15,187	8	no	146	22	70	58	12	308	3,973	2	no
65	562	84	270	*225*	*45*	1,186	15,273	8	no	143	21	69	57	11	302	3,886	2	no
66	565	85	271	*226*	*45*	1,192	15,355	8	no	140	21	67	56	11	295	3,805	2	no
67	571	86	274	*228*	*46*	1,205	15,518	8	no	134	20	64	54	11	283	3,642	2	no
68	579	87	278	*232*	*46*	1,222	15,735	8	no	126	19	60	50	10	266	3,424	2	no
69	588	88	282	*235*	*47*	1,241	15,986	8	no	117	18	56	47	9	246	3,173	2	no
70	588	88	282	*235*	*47*	1,241	15,986	8	no	117	18	56	47	9	246	3,173	2	no
71	595	89	286	*238*	*48*	1,255	16,170	8	no	110	17	53	44	9	232	2,989	1	no
72	600	90	288	*240*	*48*	1,266	16,306	8	no	105	16	50	42	8	222	2,854	1	no
73	601	90	288	*240*	*48*	1,268	16,333	8	no	104	16	50	42	8	219	2,826	1	no
74	632	95	303	*253*	*51*	1,334	17,176	9	no	73	11	35	29	6	154	1,984	1	no
75	637	96	306	*255*	*51*	1,344	17,312	9	no	68	10	33	27	5	143	1,848	1	no
76	642	96	308	*257*	*51*	1,355	17,448	9	no	63	9	30	25	5	133	1,712	1	no
77	645	97	310	*258*	*52*	1,361	17,529	9	no	60	9	29	24	5	127	1,631	1	no
78	650	98	312	*260*	*52*	1,372	17,665	9	no	55	8	26	22	4	116	1,495	1	no
79	651	98	312	*260*	*52*	1,374	17,692	9	no	54	8	26	22	4	114	1,468	1	no
80	676	101	325	*271*	*54*	1,427	18,384	9	no	29	4	14	11	2	60	775	0	no
81	680	102	326	*272*	*54*	1,435	18,480	9	no	25	4	12	10	2	53	679	0	no
82	689	103	331	*276*	*55*	1,454	18,725	9	no	16	2	8	6	1	34	435	0	no
83	696	104	334	*278*	*56*	1,469	18,915	9	no	9	1	4	4	1	19	245	0	no
84	700	105	336	*280*	*56*	1,477	19,024	10	no	5	1	2	2	0	11	136	0	no
85	706	106	339	*282*	*56*	1,490	19,187	10	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
86	715	107	343	*286*	*57*	1,509	19,432	10	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
87	737	111	354	*295*	*59*	1,555	20,029	10	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
88	749	112	360	*300*	*60*	1,580	20,356	10	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
89	752	113	361	*301*	*60*	1,587	20,437	10	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
90	765	115	367	*306*	*61*	1,614	20,782	10	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
91	800	120	384	*320*	*64*	1,688	21,742	11	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
92	801	120	384	*320*	*64*	1,690	21,769	11	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
93	803	120	385	*321*	*64*	1,694	21,823	11	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
94	811	122	389	*324*	*65*	1,711	22,041	11	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
95	820	123	394	*328*	*66*	1,730	22,285	11	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
96	824	124	395	*329*	*66*	1,738	22,381	11	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
97	824	124	395	*329*	*66*	1,738	22,381	11	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
98	824	124	395	*329*	*66*	1,738	22,381	11	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
99	830	125	398	*332*	*66*	1,751	22,557	11	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
100	833	125	400	*333*	*67*	1,758	22,638	11	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
101	869	130	417	*348*	*70*	1,834	23,617	12	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
102	882	132	424	*353*	*71*	1,862	23,980	12	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
103	882	132	424	*353*	*71*	1,862	23,980	12	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
104	882	132	424	*353*	*71*	1,862	23,980	12	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
105	885	133	425	*354*	*71*	1,867	24,052	12	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
106	931	140	447	*372*	*74*	1,964	25,302	13	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
107	968	145	465	*387*	*77*	2,042	26,307	13	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
108	979	147	470	*392*	*78*	2,066	26,606	13	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes

ROG EMISSIONS FROM EXISTING DAIIRES AND LIMITED EXPANDED DAIRIES

	Existing Conditions[1]									Total Expansion Limit								
Dairy	Milk cows	Dry Cows & bred heifers	Heifers (1 yr to breeding)	Calves (3 mos. To 1 year)	Baby Calves (<3 months)	Total Head	ROG (lb/year)	ROG (ton/year)	Exceed ROG Threshold (ton/year)	Milk cows	Dry Cows & bred heifers	Heifers (1 yr to breeding)	Calves (3 mos. To 1 year)	Baby Calves (<3 months)	Total Expan-sion Head	ROG (lb/year)	ROG (ton/year)	Exceed ROG Threshold (ton/year)
109	985	148	473	*394*	*79*	2,078	26,769	13	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
110	989	148	475	*396*	*79*	2,087	26,878	13	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
111	1,000	150	480	*400*	*80*	2,110	27,177	14	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
112	1,000	150	480	*400*	*80*	2,110	27,177	14	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
113	1,023	153	491	*409*	*82*	2,159	27,802	14	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
114	1,026	154	492	*410*	*82*	2,165	27,884	14	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
115	1,027	154	493	*411*	*82*	2,167	27,911	14	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
116	1,028	154	493	*411*	*82*	2,169	27,938	14	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
117	1,029	154	494	*412*	*82*	2,171	27,965	14	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
118	1,103	165	529	*441*	*88*	2,327	29,976	15	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
119	1,117	168	536	*447*	*89*	2,357	30,357	15	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
120	1,118	168	536	*447*	*89*	2,358	30,374	15	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
121	1,140	171	547	*456*	*91*	2,405	30,982	15	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
122	1,149	172	552	*460*	*92*	2,424	31,226	16	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
123	1,154	173	554	*462*	*92*	2,435	31,362	16	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
124	1,157	174	555	*463*	*93*	2,441	31,444	16	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
125	1,176	176	565	*471*	*94*	2,482	31,973	16	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
126	1,190	179	571	*476*	*95*	2,511	32,341	16	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
127	1,200	180	576	*480*	*96*	2,532	32,612	16	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
128	1,232	185	591	*493*	*99*	2,600	33,482	17	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
129	1,235	185	593	*494*	*99*	2,606	33,572	17	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
130	1,253	188	601	*501*	*100*	2,644	34,053	17	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
131	1,319	198	633	*528*	*106*	2,783	35,846	18	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
132	1,353	203	649	*541*	*108*	2,855	36,769	18	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
133	1,371	206	658	*548*	*110*	2,893	37,260	19	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
134	1,400	210	672	*560*	*112*	2,954	38,048	19	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
135	1,640	246	787	*656*	*131*	3,460	44,570	22	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
136	1,641	246	788	*656*	*131*	3,463	44,597	22	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
137	1,830	275	878	*732*	*146*	3,861	49,734	25	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
138	1,859	279	892	*744*	*149*	3,922	50,522	25	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
139	1,879	282	902	*752*	*150*	3,965	51,066	26	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
140	1,925	289	924	*770*	*154*	4,062	52,316	26	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
141	2,154	323	1,034	*862*	*172*	4,545	58,539	29	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
142	2,463	369	1,182	*985*	*197*	5,197	66,937	33	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
143	2,545	382	1,222	*1,018*	*204*	5,370	69,165	35	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
144	2,594	389	1,245	*1,038*	*208*	5,473	70,497	35	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
145	2,600	390	1,248	*1,040*	*208*	5,486	70,660	35	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
146	2,932	440	1,407	*1,173*	*235*	6,187	79,683	40	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
147	4,430	665	2,126	*1,772*	*354*	9,347	120,394	60	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
148	4,889	733	2,347	*1,956*	*391*	10,316	132,868	66	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
149	4,980	747	2,390	*1,992*	*398*	10,508	135,341	68	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
TOTAL	**124,668**	**18,700**	**59,841**	**49,867**	**9,973**	**263,049**	**3,388,091**	**1,694**		**24,559**	**3,684**	**11,788**	**9,824**	**1,965**	**51,820**		**334**	

[1] Herd size based on year 2000 milk cows in Kings County, obtained from Carol Collar, Farm Advisor U.C, Cooperative

Extension. Support stock based on ratio of milk cows to support stock, as identified in Table 5 of the Dairy Element.

Revised Cumulative Air Emissions

PM10 EMISSIONS FROM FUTURE DAIRY OPERATIONS (CATTLE CORRAL DUST)

1999 Scenario

		Scenario 1 (CARB Emission Factor; include rain effects; ignore calves)								
Source	Total Head Capacity	PM10 EF (tons/head-yr)	PM10 Emissions (tons/yea	PM10 Emissions (tons/month)	PM10 redn in Jan and Feb	PM10 Emissions Jan and Feb	PM10 redn in Dec & Mar	PM10 Emissions Dec & Mar	PM10 Emissions other months	Total PM10 Emissions (tons/year)
Dry Cows & bred heifers	140,325	0.02453	3,442	287	0.5	287	0.75	430	2,295	3,012
Heifers (1 yr to breeding)	449,040	0.02453	11,014	918	0.5	918	0.75	1,377	7,343	9,637
Calves (3 mos. To 1 year)	374,200	0.00000	0	0	0.5	0	0.75	0	0	0
Baby Calves (<3 months)	74,840	0.00000	0	0	0.5	0	0.75	0	0	0
Total	**1,038,404**									**12,649**

	Scenario 2 (CARB Emission Factor; ignore rain effects; include calves)	Scenario 3 (USDA AAQTF Emission Factor; include rainfall effects, exclude calves)											Scenario 4 (USDA AAQTF Emission Factor; exclude rainfall effects, include calves)		
Source	PM10 EF (tons/head-yr)	PM10 Emissions (tons/year)	PM10 EF (lb/1000hd-day)	PM10 EF (tons/head-yr)	PM10 Emissions (tons/year)	PM10 Emissions (tons/month)	PM10 redn in Jan and Feb	PM10 Emissions Jan and Feb	PM10 redn in Dec & Mar	PM10 Emissions Dec & Mar	PM10 Emissions other months	Total PM10 Emissions (tons/year)	PM10 EF (lb/1000hd-day)	PM10 EF (tons/head-yr)	PM10 Emissions (tons/year)
Dry Cows & bred heifers	0.02453	3,442	20	0.00365	512	43	0.5	43	0.75	64	341	448	20	0.00365	512
Heifers (1 yr to breeding)	0.02453	11,014	20	0.00365	1,639	137	0.5	137	0.75	205	1,093	1,434	20	0.00365	1,639
Calves (3 mos. To 1 year)	0.02453	9,178	0	0.00000	0	0	0.5	0	0.75	0	0	0	20	0.00365	1,366
Baby Calves (<3 months)	0.02453	1,836	0	0.00000	0	0	0.5	0	0.75	0	0	0	20	0.00365	273
Total		**25,470**										**1,882**			**3,790**

2010 Scenario

		Scenario 1 (CARB Emission Factor; include rain effects; ignore calves)								
Source	Total Head Capacity	PM10 EF (tons/head-yr)	PM10 Emissions (tons/yea	PM10 Emissions (tons/month)	PM10 redn in Jan and Feb	PM10 Emissions Jan and Feb	PM10 redn in Dec & Mar	PM10 Emissions Dec & Mar	PM10 Emissions other months	Total PM10 Emissions (tons/year)
Dry Cows & bred heifers	240,003	0.02453	5,887	491	0.5	491	0.75	736	3,925	5,151
Heifers (1 yr to breeding)	768,010	0.02453	18,838	1,570	0.5	1,570	0.75	2,355	12,558	16,483
Calves (3 mos. To 1 year)	640,008	0.00000	0	0	0.5	0	0.75	0	0	0
Baby Calves (<3 months)	128,002	0.00000	0	0	0.5	0	0.75	0	0	0
Total	**1,776,023**									**21,634**

	Scenario 2 (CARB Emission Factor; ignore rain effects; include calves)	Scenario 3 (USDA AAQTF Emission Factor; include rainfall effects, exclude calves)											Scenario 4 (USDA AAQTF Emission Factor; exclude rainfall effects, include calves)		
Source	PM10 EF (tons/head-yr)	PM10 Emissions (tons/year)	PM10 EF (lb/1000hd-day)	PM10 EF (tons/head-yr)	PM10 Emissions (tons/year)	PM10 Emissions (tons/month)	PM10 redn in Jan and Feb	PM10 Emissions Jan and Feb	PM10 redn in Dec & Mar	PM10 Emissions Dec & Mar	PM10 Emissions other months	Total PM10 Emissions (tons/year)	PM10 EF (lb/1000hd-day)	PM10 EF (tons/head-yr)	PM10 Emissions (tons/year)
Dry Cows & bred heifers	0.02453	5,887	20	0.00365	876	73	0.5	73	0.75	110	584	767	20	0.00365	876
Heifers (1 yr to breeding)	0.02453	18,838	20	0.00365	2,803	234	0.5	234	0.75	350	1,869	2,453	20	0.00365	2,803
Calves (3 mos. To 1 year)	0.02453	15,698	0	0.00000	0	0	0.5	0	0.75	0	0	0	20	0.00365	2,336
Baby Calves (<3 months)	0.02453	3,140	0	0.00000	0	0	0.5	0	0.75	0	0	0	20	0.00365	467
Total		**43,562**										**3,219**			**6,482**

2020 Scenario

		Scenario 1 (CARB Emission Factor; include rain effects; ignore calves)								
Source	Total Head Capacity	PM10 EF (tons/head-yr)	PM10 Emissions (tons/yea	PM10 Emissions (tons/month)	PM10 redn in Jan and Feb	PM10 Emissions Jan and Feb	PM10 redn in Dec & Mar	PM10 Emissions Dec & Mar	PM10 Emissions other months	Total PM10 Emissions (tons/year)
Dry Cows & bred heifers	390,940	0.02453	9,589	799	0.5	799	0.75	1,199	6,393	8,390
Heifers (1 yr to breeding)	1,251,007	0.02453	30,685	2,557	0.5	2,557	0.75	3,836	20,456	26,849
Calves (3 mos. To 1 year)	1,042,506	0.00000	0	0	0.5	0	0.75	0	0	0
Baby Calves (<3 months)	208,501	0.00000	0	0	0.5	0	0.75	0	0	0
Total	**2,892,954**									**35,239**

	Scenario 2 (CARB Emission Factor; ignore rain effects; include calves)		Scenario 3 (USDA AAQTF Emission Factor; include rainfall effects, exclude calves)										Scenario 4 (USDA AAQTF Emission Factor; exclude rainfall effects, include calves)		
Source	PM10 EF (tons/head-yr)	PM10 Emissions (tons/year)	PM10 EF (lb/1000hd-day)	PM10 EF (tons/head-yr)	PM10 Emissions (tons/year)	PM10 Emissions (tons/month)	PM10 redn in Jan and Feb	PM10 Emissions Jan and Feb	PM10 redn in Dec & Mar	PM10 Emissions Dec & Mar	PM10 Emissions other months	Total PM10 Emissions (tons/year)	PM10 EF (lb/1000hd-day)	PM10 EF (tons/head-yr)	PM10 Emissions (tons/year)
Dry Cows & bred heifers	0.02453	9,589	20	0.00365	1,427	119	0.5	119	0.75	178	951	1,249	20	0.00365	1,427
Heifers (1 yr to breeding)	0.02453	30,685	20	0.00365	4,566	381	0.5	381	0.75	571	3,044	3,995	20	0.00365	4,566
Calves (3 mos. To 1 year)	0.02453	25,571	0	0.00000	0	0	0.5	0	0.75	0	0	0	20	0.00365	3,805
Baby Calves (<3 months)	0.02453	5,114	0	0.00000	0	0	0.5	0	0.75	0	0	0	20	0.00365	761
Total		**70,958**										**5,244**			**10,559**

Notes:

d Determined from Table No. 5, Nitrogen & Salt Generation Calculation Table.

f PM10 Emission factor obtained from CARB's Section 7.6 (Cattle Feedlot Dust), March 1989, Emission Inventory Procedural Manual and from USEPA AP42 4th edition; Emission factor assumes a PM10 percent of 48%, based on CARB's Section 7.6. PM10EF = (280lb/1000head-day) x (0.48 PM10) x (365 day/yr) / (2000 lb/ton) = 0.024528 tons/head-year. The emission factor used is for beef cattle in cattle feedlots since PM10 emission factors for support stock at dairy facilities are not available.

i, k According to CARB (personal communication between Mr. Patrick Gaffney), CARB and Ms. Rhodora Del Rosario, BASELINE, on 8/30/99, CARB has not published data that identifies the rainfall volume that would reduce reduce PM10 emissions from feedlot corrals. Based on the lack of data, CARB suggested that published PM10 reductions applied for land preparation be used for feedlot calculations.

q PM10 Emission factor obtained from Confined Livestock Air Quality Committee of the USDA Agricultural Air Quality Committee of the USDA Agricultural Air Quality Task Force, Air Quality Research & Technology Transfer Programs for Concentrated Animal Feeding Operations Air Quality Research and Technoloy Transfer White Paper and Recommendations for Concentrated Animal Feeding Operations, Adopted by USDA Agricultural Air Quality Task Force, Washington D.C., July 19, 2000; emission factor reflects non-annualized value since rainfall effects in Texas would different compared to California.

Summary	Scenario (tons per year)			
Year	**1**	**2**	**3**	**4**
1999	12,649	25,470	1,882	3,790
2010	21,634	43,562	3,219	6,482
2020	35,239	70,958	5,244	10,559

ROG & Methane Emissions from Manure Decomposition

1999 Scenario

Source	Head	Head	emission factors (lb/head-year)			emission (lb/year)			emission (ton/year)		
			TOG	Methane	ROG	TOG	Methane	ROG	TOG	Methane	ROG
	c=axb	c	g	h	I	j=gxf	k=hxf	l=Ixf	m=j/2000	n=k/2000	0=l/2000
Milk cows	935,499	935,499	160.8	112.56	12.88	150,428,239	105,299,767	12,049,302	75,214	52,650	6,025
Dry Cows & bred heifers	140,325	140,325	160.8	112.56	12.88	22,564,236	15,794,965	1,807,395	11,282	7,897	904
Heifers (1 yr to breeding)	449,040	449,040	160.8	112.56	12.88	72,205,555	50,543,888	5,783,665	36,103	25,272	2,892
Calves (3 mos. To 1 year)	374,200	374,200	160.8	112.56	12.88	60,171,296	42,119,907	4,819,721	30,086	21,060	2,410
Baby Calves (<3 months)	74,840	74,840	160.8	112.56	12.88	12,034,259	8,423,981	963,944	6,017	4,212	482
Total	**1,973,903**	**1,973,903**				317,403,585	222,182,509	25,424,027	**158,702**	**111,091**	**12,712**

2010 Scenario

Source	Projected Head	AU	emission factors (lb/head-year)			emission (lb/year)			emission (ton/year)		
			TOG	Methane	ROG	TOG	Methane	ROG	TOG	Methane	ROG
	c	f=exc	g	h	I	j=gxf	k=hxf	l=Ixf	m=j/2000	n=k/2000	0=l/2000
Milk cows	1,600,021	1,600,021	160.8	112.56	12.88	257,283,338	180,098,337	20,608,395	128,642	90,049	10,304
Dry Cows & bred heifers	240,003	240,003	160.8	112.56	12.88	38,592,501	27,014,750	3,091,259	19,296	13,507	1,546
Heifers (1 yr to breeding)	768,010	768,010	160.8	112.56	12.88	123,496,002	86,447,202	9,892,030	61,748	43,224	4,946
Calves (3 mos. To 1 year)	640,008	640,008	160.8	112.56	12.88	102,913,335	72,039,335	8,243,358	51,457	36,020	4,122
Baby Calves (<3 months)	128,002	128,002	160.8	112.56	12.88	20,582,667	14,407,867	1,648,672	10,291	7,204	824
Total	**3,376,044**	**3,376,044**				542,867,843	380,007,490	43,483,714	**271,434**	**190,004**	**21,742**

2020 Scenario

Source	Projected Head	equivalent head	emission factors (lb/head-year)			emission (lb/year)			emission (ton/year)		
			TOG	Methane	ROG	TOG	Methane	ROG	TOG	Methane	ROG
	c	f=exc	g	h	I	j=gxf	k=hxf	l=Ixf	m=j/2000	n=k/2000	0=l/2000
Milk cows	2,606,265	2,606,265	160.8	112.56	12.88	419,087,447	293,361,213	33,568,905	209,544	146,681	16,784
Dry Cows & bred heifers	390,940	390,940	160.8	112.56	12.88	62,863,117	44,004,182	5,035,336	31,432	22,002	2,518
Heifers (1 yr to breeding)	1,251,007	1,251,007	160.8	112.56	12.88	201,161,975	140,813,382	16,113,074	100,581	70,407	8,057
Calves (3 mos. To 1 year)	1,042,506	1,042,506	160.8	112.56	12.88	167,634,979	117,344,485	13,427,562	83,817	58,672	6,714
Baby Calves (<3 months)	208,501	208,501	160.8	112.56	12.88	33,526,996	23,468,897	2,685,512	16,763	11,734	1,343
Total	**5,499,220**	**5,499,220**				884,274,513	618,992,159	70,830,388	**442,137**	**309,496**	**35,415**

Summary

	emission (lb/year)			**emission (ton/year)**		
Scenario	**TOG**	**Methane**	**ROG**	**TOG**	**Methane**	**ROG**
1999	317,403,585	222,182,509	25,424,027	158,702	111,091	12,712
2010	542,867,843	380,007,490	43,483,714	271,434	190,004	21,742
2,020	884,274,513	618,992,159	70,830,388	442,137	309,496	35,415

Notes:
d From Table No. 5 (Theoretical Dairy Herd Capacity in Kings County)
e From Table No. 5 (Theoretical Dairy Herd Capacity in Kings County)
g, h, I From CARB Livestock Waste Methodology and 1988, Radian.

Ammonia Emissions Generated from Manure Decomposition

Cattle	head	emission factor (lb/animal/yr) NH3	emission (lb/year) NH3	emissions (tons/year) NH3
1999 Scenario				
milk cows	935,499	28.37	26,543,102	13,272
dry cows&bred	140,325	28.37	3,981,465	1,991
heifers (1yr-bred)	449,040	8.54	3,833,549	1,917
3mo-1yr calves	374,200	3.53	1,320,775	660
baby calves	74,840	3.53	264,155	132
Total	1,973,903		35,943,046	17,972
2010 Scenario				
milk cows	1,600,021	28.37	45,397,712	22,699
dry cows&bred	240,003	28.37	6,809,657	3,405
heifers (1yr-bred)	768,010	8.54	6,556,670	3,278
3mo-1yr calves	640,008	3.53	2,258,973	1,129
baby calves	128,002	3.53	451,795	226
Total	3,376,044		61,474,807	30,737
2020 Scenario				
milk cows	2,606,265	28.37	73,948,089	36,974
dry cows&bred	390,940	28.37	11,092,213	5,546
heifers (1yr-bred)	1,251,007	8.54	10,680,125	5,340
3mo-1yr calves	1,042,506	3.53	3,679,629	1,840
baby calves	208,501	3.53	735,926	368
Total	5,499,220		100,135,983	50,068

Notes:
Emission factors obtained from 1994 Battye Report; emission factors reflect stable & storage emission factor components only.
Table No. 5 (Theoretical Dairy Capacity of Kings County).

Ammonia Emissions Generated from Manure Decomposition

Cattle	head	emission factor (lb/animal/yr) NH3	emission (lb/year) NH3	emissions (tons/year) NH3
1999 Scenario				
milk cows	935,499	74.00	69,226,926	34,613
dry cows&bred	140,325	74.00	10,384,039	5,192
heifers (1yr-bred)	449,040	74.00	33,228,924	16,614
3mo-1yr calves	374,200	74.00	27,690,770	13,845
baby calves	74,840	74.00	5,538,154	2,769
Total	1,973,903		146,068,814	**73,034**
2010 Scenario				
milk cows	1,600,021	74.00	118,401,536	59,201
dry cows&bred	240,003	74.00	17,760,230	8,880
heifers (1yr-bred)	768,010	74.00	56,832,737	28,416
3mo-1yr calves	640,008	74.00	47,360,614	23,680
baby calves	128,002	74.00	9,472,123	4,736
Total	3,376,044		249,827,241	124,914
2020 Scenario				
milk cows	2,606,265	74.00	192,863,626	96,432
dry cows&bred	390,940	74.00	28,929,544	14,465
heifers (1yr-bred)	1,251,007	74.00	92,574,541	46,287
3mo-1yr calves	1,042,506	74.00	77,145,450	38,573
baby calves	208,501	74.00	15,429,090	7,715
Total	5,499,220		406,942,251	203,471

Notes:
Emission factors obtained from James, et al.; emission factor does not speciate between the different cattle types (e.g., heifers, calves, cows) as it reflects the average emission factor for all cattle types; estimate assumes that ratios of cattle types are similar to the dairy studied by UC Davis in developing the emission factor.

Methane Generation from Dairy Cattle

Animal type	#cows	Emission Factor (lb CH4/head/year)	Emissions (tons CH4/year)	Notes
1999 Scenario				
milk cows	935,499	262.5	122,784	considered mature cows
dry cows&bred	140,325	152	10,665	used beef cattle mature cows since these cows are not milk cows
heifers (1yr-bred)	449,040	134.6	30,220	considered replacement cows from 12 -24 months
3mo-1yr calves	374,200	45.5	8,513	considered replacement cows from 0-12 months
baby calves	74,840	45.5	1,703	considered replacement cows from 0-12 months
Total	1,973,903		**173,885**	
2010 Scenario				
milk cows	1,600,021	262.5	210,003	considered mature cows
dry cows&bred	240,003	152	18,240	used beef cattle mature cows since these cows are not milk cows
heifers (1yr-bred)	768,010	134.6	51,687	considered replacement cows from 12 -24 months
3mo-1yr calves	640,008	45.5	14,560	considered replacement cows from 0-12 months
baby calves	128,002	45.5	2,912	considered replacement cows from 0-12 months
Total	3,376,044		**297,402**	
2020 Scenario				
milk cows	2,606,265	262.5	342,072	considered mature cows
dry cows&bred	390,940	152	29,711	used beef cattle mature cows since these cows are not milk cows
heifers (1yr-bred)	1,251,007	134.6	84,193	considered replacement cows from 12 -24 months
3mo-1yr calves	1,042,506	45.5	23,717	considered replacement cows from 0-12 months
baby calves	208,501	45.5	4,743	considered replacement cows from 0-12 months
Total	5,499,220		**484,437**	

Notes:
Emission factors obtained from CARB and Radian Report

PM10 EMISSIONS FROM FUTURE DAIRY OPERATIONS (CATTLE CORRAL DUST)

1999 Scenario

		Scenario 1 (CARB Emission Factor; include rain effects; ignore calves)								
Source	Total Head Capacity	PM10 EF (tons/head-yr)	PM10 Emissions (tons/yea	PM10 Emissions (tons/month)	PM10 redn in Jan and Feb	PM10 Emissions Jan and Feb	PM10 redn in Dec & Mar	PM10 Emissions Dec & Mar	PM10 Emissions other months	Total PM10 Emissions (tons/year)
Dry Cows & bred heifers	18,700	0.02453	459	38	0.5	38	0.75	57	306	401
Heifers (1 yr to breeding)	59,841	0.02453	1,468	122	0.5	122	0.75	183	979	1,284
Calves (3 mos. To 1 year)	49,867	0.00000	0	0	0.5	0	0.75	0	0	0
Baby Calves (<3 months)	9,973	0.00000	0	0	0.5	0	0.75	0	0	0
Total	**138,381**									**1,686**

	Scenario 2 (CARB Emission Factor; ignore rain effects; include calves)	Scenario 3 (USDA AAQTF Emission Factor; include rainfall effects, exclude calves)											Scenario 4 (USDA AAQTF Emission Factor; exclude rainfall effects, include calves)		
Source	PM10 EF (tons/head-yr)	PM10 Emissions (tons/year)	PM10 EF (lb/1000hd-day)	PM10 EF (tons/head-yr)	PM10 Emissions (tons/year)	PM10 Emissions (tons/month)	PM10 redn in Jan and Feb	PM10 Emissions Jan and Feb	PM10 redn in Dec & Mar	PM10 Emissions Dec & Mar	PM10 Emissions other months	Total PM10 Emissions (tons/year)	PM10 EF (lb/1000hd-day)	PM10 EF (tons/head-yr)	PM10 Emissions (tons/year)
Dry Cows & bred heifers	0.02453	459	20	0.00365	68	6	0.5	6	0.75	9	46	60	20	0.00365	68
Heifers (1 yr to breeding)	0.02453	1,468	20	0.00365	218	18	0.5	18	0.75	27	146	191	20	0.00365	218
Calves (3 mos. To 1 year)	0.02453	1,223	0	0.00000	0	0	0.5	0	0.75	0	0	0	20	0.00365	182
Baby Calves (<3 months)	0.02453	245	0	0.00000	0	0	0.5	0	0.75	0	0	0	20	0.00365	36
Total		**3,394**										**251**			**505**

2010 Scenario

		Scenario 1 (CARB Emission Factor; include rain effects; ignore calves)								
Source	Total Head Capacity	PM10 EF (tons/head-yr)	PM10 Emissions (tons/yea	PM10 Emissions (tons/month)	PM10 redn in Jan and Feb	PM10 Emissions Jan and Feb	PM10 redn in Dec & Mar	PM10 Emissions Dec & Mar	PM10 Emissions other months	Total PM10 Emissions (tons/year)
Dry Cows & bred heifers	31,984	0.02453	784	65	0.5	65	0.75	98	523	686
Heifers (1 yr to breeding)	102,348	0.02453	2,510	209	0.5	209	0.75	314	1,674	2,197
Calves (3 mos. To 1 year)	85,290	0.00000	0	0	0.5	0	0.75	0	0	0
Baby Calves (<3 months)	17,058	0.00000	0	0	0.5	0	0.75	0	0	0
Total	**236,679**									**2,883**

	Scenario 2 (CARB Emission Factor; ignore rain effects; include calves)	Scenario 3 (USDA AAQTF Emission Factor; include rainfall effects, exclude calves)											Scenario 4 (USDA AAQTF Emission Factor; exclude rainfall effects, include calves)		
Source	PM10 EF (tons/head-yr)	PM10 Emissions (tons/year)	PM10 EF (lb/1000hd-day)	PM10 EF (tons/head-yr)	PM10 Emissions (tons/year)	PM10 Emissions (tons/month)	PM10 redn in Jan and Feb	PM10 Emissions Jan and Feb	PM10 redn in Dec & Mar	PM10 Emissions Dec & Mar	PM10 Emissions other months	Total PM10 Emissions (tons/year)	PM10 EF (lb/1000hd-day)	PM10 EF (tons/head-yr)	PM10 Emissions (tons/year)
Dry Cows & bred heifers	0.02453	784	20	0.00365	117	10	0.5	10	0.75	15	78	102	20	0.00365	117
Heifers (1 yr to breeding)	0.02453	2,510	20	0.00365	374	31	0.5	31	0.75	47	249	327	20	0.00365	374
Calves (3 mos. To 1 year)	0.02453	2,092	0	0.00000	0	0	0.5	0	0.75	0	0	0	20	0.00365	311
Baby Calves (<3 months)	0.02453	418	0	0.00000	0	0	0.5	0	0.75	0	0	0	20	0.00365	62
Total		**5,805**										**429**			**864**

2020 Scenario

		Scenario 1 (CARB Emission Factor; include rain effects; ignore calves)								
Source	Total Head Capacity	PM10 EF (tons/head-yr)	PM10 Emissions (tons/yea	PM10 Emissions (tons/month)	PM10 redn in Jan and Feb	PM10 Emissions Jan and Feb	PM10 redn in Dec & Mar	PM10 Emissions Dec & Mar	PM10 Emissions other months	Total PM10 Emissions (tons/year)
Dry Cows & bred heifers	52,098	0.02453	1,278	106	0.5	106	0.75	160	852	1,118
Heifers (1 yr to breeding)	166,714	0.02453	4,089	341	0.5	341	0.75	511	2,726	3,578
Calves (3 mos. To 1 year)	138,928	0.00000	0	0	0.5	0	0.75	0	0	0
Baby Calves (<3 months)	27,786	0.00000	0	0	0.5	0	0.75	0	0	0
Total	**385,526**									**4,696**

	Scenario 2 (CARB Emission Factor; ignore rain effects; include calves)	Scenario 3 (USDA AAQTF Emission Factor; include rainfall effects, exclude calves)											Scenario 4 (USDA AAQTF Emission Factor; exclude rainfall effects, include calves)		
Source	PM10 EF (tons/head-yr)	PM10 Emissions (tons/year)	PM10 EF (lb/1000hd-day)	PM10 EF (tons/head-yr)	PM10 Emissions (tons/year)	PM10 Emissions (tons/month)	PM10 redn in Jan and Feb	PM10 Emissions Jan and Feb	PM10 redn in Dec & Mar	PM10 Emissions Dec & Mar	PM10 Emissions other months	Total PM10 Emissions (tons/year)	PM10 EF (lb/1000hd-day)	PM10 EF (tons/head-yr)	PM10 Emissions (tons/year)
Dry Cows & bred heifers	0.02453	1,278	20	0.00365	190	16	0.5	16	0.75	24	127	166	20	0.00365	190
Heifers (1 yr to breeding)	0.02453	4,089	20	0.00365	609	51	0.5	51	0.75	76	406	532	20	0.00365	609
Calves (3 mos. To 1 year)	0.02453	3,408	0	0.00000	0	0	0.5	0	0.75	0	0	0	20	0.00365	507
Baby Calves (<3 months)	0.02453	682	0	0.00000	0	0	0.5	0	0.75	0	0	0	20	0.00365	101
Total		**9,456**										**699**			**1,407**

Notes:

d Determined from Table No. 5, Nitrogen & Salt Generation Calculation Table.

f PM10 Emission factor obtained from CARB's Section 7.6 (Cattle Feedlot Dust), March 1989, Emission Inventory Procedural Manual and from USEPA AP42 4th edition; Emission factor assumes a PM10 percent of 48%, based on CARB's Section 7.6. PM10EF = (280lb/1000head-day) x (0.48 PM10) x (365 day/yr) / (2000 lb/ton) = 0.024528 tons/head-year. The emission factor used is for beef cattle in cattle feedlots since PM10 emission factors for support stock at dairy facilities are not available.

i, k According to CARB (personal communication between Mr. Patrick Gaffney), CARB and Ms. Rhodora Del Rosario, BASELINE, on 8/30/99, CARB has not published data that identifies the rainfall volume that would reduce reduce PM10 emissions from feedlot corrals. Based on the lack of data, CARB suggested that published PM10 reductions applied for land preparation be used for feedlot calculations.

q PM10 Emission factor obtained from Confined Livestock Air Quality Committee of the USDA Agricultural Air Quality Committee of the USDA Agricultural Air Quality Task Force, Air Quality Research & Technology Transfer Programs for Concentrated Animal Feeding Operations Air Quality Research and Technoloy Transfer White Paper and Recommendations for Concentrated Animal Feeding Operations, Adopted by USDA Agricultural Air Quality Task Force, Washington D.C., July 19, 2000; emission factor reflects non-annualized value since rainfall effects in Texas would different compared to California.

Summary	Scenario (tons per year)			
Year	**1**	**2**	**3**	**4**
1999	1,686	3,394	251	505
2010	2,883	5,805	429	864
2020	4,696	9,456	699	1,407

ROG & Methane Emissions from Manure Decomposition

1999 Scenario

Source	Head		emission factors (lb/head-year)			emission (lb/year)			emission (ton/year)		
			TOG	Methane	ROG	TOG	Methane	ROG	TOG	Methane	ROG
	c=axb	f=exc	g	h	I	j=gxf	k=hxf	l=lxf	m=j/2000	n=k/2000	0=l/2000
Milk cows	124,668	124,668	160.8	112.56	12.88	20,046,614	14,032,630	1,605,734	10,023	7,016	803
Dry Cows & bred heifers	18,700	18,700	160.8	112.56	12.88	3,006,992	2,104,895	240,860	1,503	1,052	120
Heifers (1 yr to breeding)	59,841	59,841	160.8	112.56	12.88	9,622,375	6,735,662	770,752	4,811	3,368	385
Calves (3 mos. To 1 year)	49,867	49,867	160.8	112.56	12.88	8,018,646	5,613,052	642,294	4,009	2,807	321
Baby Calves (<3 months)	9,973	9,973	160.8	112.56	12.88	1,603,729	1,122,610	128,459	802	561	64
Total	**263,049**	**263,049**				42,298,356	29,608,849	3,388,098	**21,149**	**14,804**	**1,694**

2010 Scenario

Source	Projected Head		emission factors (lb/head-year)			emission (lb/year)			emission (ton/year)		
			TOG	Methane	ROG	TOG	Methane	ROG	TOG	Methane	ROG
	c	f=exc	g	h	I	j=gxf	k=hxf	l=lxf	m=j/2000	n=k/2000	0=l/2000
Milk cows	213,225	213,225	160.8	112.56	12.88	34,286,514	24,000,560	2,746,350	17,143	12,000	1,373
Dry Cows & bred heifers	31,984	31,984	160.8	112.56	12.88	5,142,977	3,600,084	411,952	2,571	1,800	206
Heifers (1 yr to breeding)	102,348	102,348	160.8	112.56	12.88	16,457,527	11,520,269	1,318,248	8,229	5,760	659
Calves (3 mos. To 1 year)	85,290	85,290	160.8	112.56	12.88	13,714,605	9,600,224	1,098,540	6,857	4,800	549
Baby Calves (<3 months)	17,058	17,058	160.8	112.56	12.88	2,742,921	1,920,045	219,708	1,371	960	110
Total	**449,904**	**449,904**				72,344,544	50,641,181	5,794,798	**36,172**	**25,321**	**2,897**

2020 Scenario

Source	Projected Head		emission factors (lb/head-year)			emission (lb/year)			emission (ton/year)		
			TOG	Methane	ROG	TOG	Methane	ROG	TOG	Methane	ROG
	c	f=exc	g	h	I	j=gxf	k=hxf	l=lxf	m=j/2000	n=k/2000	0=l/2000
Milk cows	347,320	347,320	160.8	112.56	12.88	55,849,118	39,094,382	4,473,514	27,925	19,547	2,237
Dry Cows & bred heifers	52,098	52,098	160.8	112.56	12.88	8,377,368	5,864,157	671,027	4,189	2,932	336
Heifers (1 yr to breeding)	166,714	166,714	160.8	112.56	12.88	26,807,577	18,765,304	2,147,287	13,404	9,383	1,074
Calves (3 mos. To 1 year)	138,928	138,928	160.8	112.56	12.88	22,339,647	15,637,753	1,789,406	11,170	7,819	895
Baby Calves (<3 months)	27,786	27,786	160.8	112.56	12.88	4,467,929	3,127,551	357,881	2,234	1,564	179
Total	**732,846**	**732,846**				117,841,639	82,489,147	9,439,115	**58,921**	**41,245**	**4,720**

Summary

	emission (lb/year)			**emission (ton/year)**		
Scenario	**TOG**	**Methane**	**ROG**	**TOG**	**Methane**	**ROG**
1999	42,298,356	29,608,849	3,388,098	21,149	14,804	1,694
2010	72,344,544	50,641,181	5,794,798	36,172	25,321	2,897
2,020	117,841,639	82,489,147	9,439,115	58,921	41,245	4,720

Notes:
d From Table No. 5 (Theoretical Dairy Herd Capacity in Kings County)
e From Table No. 5 (Theoretical Dairy Herd Capacity in Kings County)
g, h, I From CARB Livestock Waste Methodology and 1988, Radian.

Ammonia Emissions Generated from Manure Decomposition

Cattle	head	emission factor (lb/animal/yr) NH3	emission (lb/year) NH3	emissions (tons/year) NH3
1999 Scenario				
milk cows	124,668	28.37	3,537,230	1,769
dry cows&bred	18,700	28.37	530,585	265
heifers (1yr-bred)	59,841	8.54	510,873	255
3mo-1yr calves	49,867	3.53	176,011	88
baby calves	9,973	3.53	35,202	18
Total	263,049		4,789,901	2,395
2010 Scenario				
milk cows	213,225	28.37	6,049,864	3,025
dry cows&bred	31,984	28.37	907,480	454
heifers (1yr-bred)	102,348	8.54	873,766	437
3mo-1yr calves	85,290	3.53	301,039	151
baby calves	17,058	3.53	60,208	30
Total	449,904		8,192,356	4,096
2020 Scenario				
milk cows	347,320	28.37	9,854,591	4,927
dry cows&bred	52,098	28.37	1,478,189	739
heifers (1yr-bred)	166,714	8.54	1,423,272	712
3mo-1yr calves	138,928	3.53	490,361	245
baby calves	27,786	3.53	98,072	49
Total	732,846		13,344,485	6,672

Notes:
Emission factors obtained from 1994 Battye Report; emission factors reflect stable & storage emission factor components only.
Table No. 5 (Theoretical Dairy Capacity of Kings County).

Ammonia Emissions Generated from Manure Decomposition

Cattle	head	emission factor (lb/animal/yr) NH3	emission (lb/year) NH3	emissions (tons/year) NH3
1999 Scenario				
milk cows	124,668	74.00	9,225,432	4,613
dry cows&bred	18,700	74.00	1,383,815	692
heifers (1yr-bred)	59,841	74.00	4,428,207	2,214
3mo-1yr calves	49,867	74.00	3,690,173	1,845
baby calves	9,973	74.00	738,035	369
Total	263,049		19,465,662	**9,733**
2010 Scenario				
milk cows	213,225	74.00	15,778,619	7,889
dry cows&bred	31,984	74.00	2,366,793	1,183
heifers (1yr-bred)	102,348	74.00	7,573,737	3,787
3mo-1yr calves	85,290	74.00	6,311,448	3,156
baby calves	17,058	74.00	1,262,290	631
Total	449,904		33,292,887	16,646
2020 Scenario				
milk cows	347,320	74.00	25,701,708	12,851
dry cows&bred	52,098	74.00	3,855,256	1,928
heifers (1yr-bred)	166,714	74.00	12,336,820	6,168
3mo-1yr calves	138,928	74.00	10,280,683	5,140
baby calves	27,786	74.00	2,056,137	1,028
Total	732,846		54,230,605	27,115

Notes:
Emission factors obtained from James, et al.; emission factor does not speciate between the different cattle types (e.g., heifers, calves, cows) as it reflects the average emission factor for all cattle types; estimate assumes that ratios of cattle types are similar to the dairy studied by UC Davis in developing the emission factor.

Methane Generation from Dairy Cattle

Animal type	#cows	Emission Factor (lb CH4/head/year)	Emissions (tons CH4/year)	Notes
1999 Scenario				
milk cows	124,668	262.5	16,363	considered mature cows
dry cows&bred	18,700	152	1,421	used beef cattle mature cows since these cows are not milk cows
heifers (1yr-bred)	59,841	134.6	4,027	considered replacement cows from 12 -24 months
3mo-1yr calves	49,867	45.5	1,134	considered replacement cows from 0-12 months
baby calves	9,973	45.5	227	considered replacement cows from 0-12 months
Total	263,049		**23,173**	
2010 Scenario				
milk cows	213,225	262.5	27,986	considered mature cows
dry cows&bred	31,984	152	2,431	used beef cattle mature cows since these cows are not milk cows
heifers (1yr-bred)	102,348	134.6	6,888	considered replacement cows from 12 -24 months
3mo-1yr calves	85,290	45.5	1,940	considered replacement cows from 0-12 months
baby calves	17,058	45.5	388	considered replacement cows from 0-12 months
Total	449,904		**39,633**	
2020 Scenario				
milk cows	347,320	262.5	45,586	considered mature cows
dry cows&bred	52,098	152	3,959	used beef cattle mature cows since these cows are not milk cows
heifers (1yr-bred)	166,714	134.6	11,220	considered replacement cows from 12 -24 months
3mo-1yr calves	138,928	45.5	3,161	considered replacement cows from 0-12 months
baby calves	27,786	45.5	632	considered replacement cows from 0-12 months
Total	732,846		**64,558**	

Notes:
Emission factors obtained from CARB and Radian Report

PM10 EMISSIONS FROM FUTURE DAIRY OPERATIONS (CATTLE CORRAL DUST)

1999 Scenario

		Scenario 1 (CARB Emission Factor; include rain effects; ignore calves)								
Source	Total Head Capacity	PM10 EF (tons/head-yr)	PM10 Emissions (tons/yea	PM10 Emissions (tons/month)	PM10 redn in Jan and Feb	PM10 Emissions Jan and Feb	PM10 redn in Dec & Mar	PM10 Emissions Dec & Mar	PM10 Emissions other months	Total PM10 Emissions (tons/year)
Dry Cows & bred heifers	18,700	0.02453	459	38	0.5	38	0.75	57	306	401
Heifers (1 yr to breeding)	59,841	0.02453	1,468	122	0.5	122	0.75	183	979	1,284
Calves (3 mos. To 1 year)	49,867	0.00000	0	0	0.5	0	0.75	0	0	0
Baby Calves (<3 months)	9,973	0.00000	0	0	0.5	0	0.75	0	0	0
Total	**138,381**									**1,686**

	Scenario 2 (CARB Emission Factor; ignore rain effects; include calves)	Scenario 3 (USDA AAQTF Emission Factor; include rainfall effects, exclude calves)											Scenario 4 (USDA AAQTF Emission Factor; exclude rainfall effects, include calves)		
Source	PM10 EF (tons/head-yr)	PM10 Emissions (tons/year)	PM10 EF (lb/1000hd-day)	PM10 EF (tons/head-yr)	PM10 Emissions (tons/year)	PM10 Emissions (tons/month)	PM10 redn in Jan and Feb	PM10 Emissions Jan and Feb	PM10 redn in Dec & Mar	PM10 Emissions Dec & Mar	PM10 Emissions other months	Total PM10 Emissions (tons/year)	PM10 EF (lb/1000hd-day)	PM10 EF (tons/head-yr)	PM10 Emissions (tons/year)
Dry Cows & bred heifers	0.02453	459	20	0.00365	68	6	0.5	6	0.75	9	46	60	20	0.00365	68
Heifers (1 yr to breeding)	0.02453	1,468	20	0.00365	218	18	0.5	18	0.75	27	146	191	20	0.00365	218
Calves (3 mos. To 1 year)	0.02453	1,223	0	0.00000	0	0	0.5	0	0.75	0	0	0	20	0.00365	182
Baby Calves (<3 months)	0.02453	245	0	0.00000	0	0	0.5	0	0.75	0	0	0	20	0.00365	36
Total		**3,394**										**251**			**505**

2010 Scenario

		Scenario 1 (CARB Emission Factor; include rain effects; ignore calves)								
Source	Total Head Capacity	PM10 EF (tons/head-yr)	PM10 Emissions (tons/yea	PM10 Emissions (tons/month)	PM10 redn in Jan and Feb	PM10 Emissions Jan and Feb	PM10 redn in Dec & Mar	PM10 Emissions Dec & Mar	PM10 Emissions other months	Total PM10 Emissions (tons/year)
Dry Cows & bred heifers	31,984	0.02453	784	65	0.5	65	0.75	98	523	686
Heifers (1 yr to breeding)	102,348	0.02453	2,510	209	0.5	209	0.75	314	1,674	2,197
Calves (3 mos. To 1 year)	85,290	0.00000	0	0	0.5	0	0.75	0	0	0
Baby Calves (<3 months)	17,058	0.00000	0	0	0.5	0	0.75	0	0	0
Total	**236,679**									**2,883**

	Scenario 2 (CARB Emission Factor; ignore rain effects; include calves)	Scenario 3 (USDA AAQTF Emission Factor; include rainfall effects, exclude calves)											Scenario 4 (USDA AAQTF Emission Factor; exclude rainfall effects, include calves)		
Source	PM10 EF (tons/head-yr)	PM10 Emissions (tons/year)	PM10 EF (lb/1000hd-day)	PM10 EF (tons/head-yr)	PM10 Emissions (tons/year)	PM10 Emissions (tons/month)	PM10 redn in Jan and Feb	PM10 Emissions Jan and Feb	PM10 redn in Dec & Mar	PM10 Emissions Dec & Mar	PM10 Emissions other months	Total PM10 Emissions (tons/year)	PM10 EF (lb/1000hd-day)	PM10 EF (tons/head-yr)	PM10 Emissions (tons/year)
Dry Cows & bred heifers	0.02453	784	20	0.00365	117	10	0.5	10	0.75	15	78	102	20	0.00365	117
Heifers (1 yr to breeding)	0.02453	2,510	20	0.00365	374	31	0.5	31	0.75	47	249	327	20	0.00365	374
Calves (3 mos. To 1 year)	0.02453	2,092	0	0.00000	0	0	0.5	0	0.75	0	0	0	20	0.00365	311
Baby Calves (<3 months)	0.02453	418	0	0.00000	0	0	0.5	0	0.75	0	0	0	20	0.00365	62
Total		**5,805**										**429**			**864**

2020 Scenario

		Scenario 1 (CARB Emission Factor; include rain effects; ignore calves)								
Source	Total Head Capacity	PM10 EF (tons/head-yr)	PM10 Emissions (tons/yea	PM10 Emissions (tons/month)	PM10 redn in Jan and Feb	PM10 Emissions Jan and Feb	PM10 redn in Dec & Mar	PM10 Emissions Dec & Mar	PM10 Emissions other months	Total PM10 Emissions (tons/year)
Dry Cows & bred heifers	52,098	0.02453	1,278	106	0.5	106	0.75	160	852	1,118
Heifers (1 yr to breeding)	166,714	0.02453	4,089	341	0.5	341	0.75	511	2,726	3,578
Calves (3 mos. To 1 year)	138,928	0.00000	0	0	0.5	0	0.75	0	0	0
Baby Calves (<3 months)	27,786	0.00000	0	0	0.5	0	0.75	0	0	0
Total	**385,526**									**4,696**

	Scenario 2 (CARB Emission Factor; ignore rain effects; include calves)		Scenario 3 (USDA AAQTF Emission Factor; include rainfall effects, exclude calves)										Scenario 4 (USDA AAQTF Emission Factor; exclude rainfall effects, include calves)		
Source	PM10 EF (tons/head-yr)	PM10 Emissions (tons/year)	PM10 EF (lb/1000hd-day)	PM10 EF (tons/head-yr)	PM10 Emissions (tons/year)	PM10 Emissions (tons/month)	PM10 redn in Jan and Feb	PM10 Emissions Jan and Feb	PM10 redn in Dec & Mar	PM10 Emissions Dec & Mar	PM10 Emissions other months	Total PM10 Emissions (tons/year)	PM10 EF (lb/1000hd-day)	PM10 EF (tons/head-yr)	PM10 Emissions (tons/year)
Dry Cows & bred heifers	0.02453	1,278	20	0.00365	190	16	0.5	16	0.75	24	127	166	20	0.00365	190
Heifers (1 yr to breeding)	0.02453	4,089	20	0.00365	609	51	0.5	51	0.75	76	406	532	20	0.00365	609
Calves (3 mos. To 1 year)	0.02453	3,408	0	0.00000	0	0	0.5	0	0.75	0	0	0	20	0.00365	507
Baby Calves (<3 months)	0.02453	682	0	0.00000	0	0	0.5	0	0.75	0	0	0	20	0.00365	101
Total		**9,456**										**699**			**1,407**

Notes:

d Determined from Table No. 5, Nitrogen & Salt Generation Calculation Table.

f PM10 Emission factor obtained from CARB's Section 7.6 (Cattle Feedlot Dust), March 1989, Emission Inventory Procedural Manual and from USEPA AP42 4th edition; Emission factor assumes a PM10 percent of 48%, based on CARB's Section 7.6. PM10EF = (280lb/1000head-day) x (0.48 PM10) x (365 day/yr) / (2000 lb/ton) = 0.024528 tons/head-year. The emission factor used is for beef cattle in cattle feedlots since PM10 emission factors for support stock at dairy facilities are not available.

i, k According to CARB (personal communication between Mr. Patrick Gaffney), CARB and Ms. Rhodora Del Rosario, BASELINE, on 8/30/99, CARB has not published data that identifies the rainfall volume that would reduce reduce PM10 emissions from feedlot corrals. Based on the lack of data, CARB suggested that published PM10 reductions applied for land preparation be used for feedlot calculations.

q PM10 Emission factor obtained from Confined Livestock Air Quality Committee of the USDA Agricultural Air Quality Committee of the USDA Agricultural Air Quality Task Force, Air Quality Research & Technology Transfer Programs for Concentrated Animal Feeding Operations Air Quality Research and Technoloy Transfer White Paper and Recommendations for Concentrated Animal Feeding Operations, Adopted by USDA Agricultural Air Quality Task Force, Washington D.C., July 19, 2000; emission factor reflects non-annualized value since rainfall effects in Texas would different compared to California.

Summary	Scenario (tons per year)			
Year	1	2	3	4
1999	1,686	3,394	251	505
2010	2,883	5,805	429	864
2020	4,696	9,456	699	1,407

Future Capacity PM10 Emissions from Corrals

Assumes All New Future and Expanded Dairies Subject to Dairy Element 50% Reduction Control Measure
1999 Scenario

	Uncontrolled Emissions					50% Controlled Emission Reduction from Future New and Expanded Dairies						Controlled Future Conditions		
Animal Type	Existing Head	1999 Total Head Capacity	Emissons from Existing Head (tons/year)	1999 Herd Capacity Emissions	Net Increase in Emissons (tons per year)	Emissions from Future Expanded and New Dairies (tons/year)	Emissions from Future Expanded and New Dairies (tons/month)	Zero % reduction in Jan and Feb (tons/2months)	25% further reduction in Dec. & Mar. (tons/2 months)	50% reduction from Apr through Nov (tons/8 months)	50% reduction year round (tons/year)	Total Controlled Emission Reduction (tons/year)	Total Conditions (tons/year)	Total Net Emission Increase (tons/year)
Scenario 1														
Milk cows	124,668	124,668	-	-	-	-	-	-	-	-	NA	-	-	-
Dry Cows & bred heifers	18,700	18,700	401	401	-	-	-	-	-	-	NA	-	401	-
Heifers (1 yr to breeding)	59,841	59,841	1,284	1,284	-	-	-	-	-	-	NA	-	1,284	-
Calves (3 mos. To 1 year)	49,867	49,867	-	-	-	-	-	-	-	-	NA	-	-	-
Baby Calves (<3 months)	9,973	9,973	-	-	-	-	-	-	-	-	NA	-	-	-
Total	263,049	263,049	1,686	1,686	0	0	0	0	0	0	NA	0	1,686	**0**
Scenario 2														
Milk cows	124,668	124,668	-	-	-	-	-	NA	NA	NA	-	-	-	-
Dry Cows & bred heifers	18,700	18,700	459	459	-	-	-	NA	NA	NA	-	-	459	-
Heifers (1 yr to breeding)	59,841	59,841	1,468	1,468	-	-	-	NA	NA	NA	-	-	1,468	-
Calves (3 mos. To 1 year)	49,867	49,867	1,223	1,223	-	-	-	NA	NA	NA	-	-	1,223	-
Baby Calves (<3 months)	9,973	9,973	245	245	-	-	-	NA	NA	NA	-	-	245	-
Total	263,049	263,049	3,394	3,394	0	0	0	NA	NA	NA	0	0	3,394	**0**
Scenario 3														
Milk cows	124,668	124,668	-	-	-	-	-	-	-	-	NA	-	-	-
Dry Cows & bred heifers	18,700	18,700	60	60	-	-	-	-	-	-	NA	-	60	-
Heifers (1 yr to breeding)	59,841	59,841	191	191	-	-	-	-	-	-	NA	-	191	-
Calves (3 mos. To 1 year)	49,867	49,867	-	-	-	-	-	-	-	-	NA	-	-	-
Baby Calves (<3 months)	9,973	9,973	-	-	-	-	-	-	-	-	NA	-	-	-
Total	263,049	263,049	251	251	0	0	0	0	0	0	NA	0	251	**0**
Scenario 4														
Milk cows	124,668	124,668	-	-	-	-	-	NA	NA	NA	-	-	-	-
Dry Cows & bred heifers	18,700	18,700	68	68	-	-	-	NA	NA	NA	-	-	68	-
Heifers (1 yr to breeding)	59,841	59,841	218	218	-	-	-	NA	NA	NA	-	-	218	-
Calves (3 mos. To 1 year)	49,867	49,867	182	182	-	-	-	NA	NA	NA	-	-	182	-
Baby Calves (<3 months)	9,973	9,973	36	36	-	-	-	NA	NA	NA	-	-	36	-
Total	263,049	263,049	505	505	0	0	0	NA	NA	NA	0	0	505	**0**

2010 Scenario

	Uncontrolled Emissions					50% Controlled Emission Reduction from Future New and Expanded Dairies						Controlled Future Conditions		
Animal Type	Existing Head	Future 2010 Total Head Capacity	Emissons from Existing Head (tons/year)	Emissons from 2010 Total Head Capacity (tons/year)	Net Increase in Emissons under 2010 Future Conditions (tons per year)	Emissions from Future Expanded and New Dairies (tons/year)	Emissions from Future Expanded and New Dairies (tons/month)	Zero % reduction in Jan and Feb (tons/2months)	25% further reduction in Dec. & Mar. (tons/2 months)	50% reduction from Apr through Nov (tons/8 months)	50% reduction year round (tons/year)	Total Controlled Emission Reduction (tons/year)	Total Future Conditions (tons/year)	Total Net Emission Increase under Future Conditions (tons/year)
Scenario 1														
Milk cows	124,668	213,225	-	-	-	-	-	-	-	-	NA	-	-	-
Dry Cows & bred heifers	18,700	31,984	401	686	285	285	24	48	31	95	NA	174	575	174
Heifers (1 yr to breeding)	59,841	102,348	1,284	2,197	912	912	76	152	100	304	NA	556	1,841	556
Calves (3 mos. To 1 year)	49,867	85,290	-	-	-	-	-	-	-	-	NA	-	-	-
Baby Calves (<3 months)	9,973	17,058	-	-	-	-	-	-	-	-	NA	-	-	-
Total	263,049	**449,904**	1,686	2,883	1,197	1,197	100	200	132	399	NA	730	2,416	**730**
Scenario 2														
Milk cows	124,668	213,225	-	-	-	-	-	NA	NA	NA	-	-	-	-
Dry Cows & bred heifers	18,700	31,984	459	784	326	326	27	NA	NA	NA	163	163	622	163
Heifers (1 yr to breeding)	59,841	102,348	1,468	2,510	1,043	1,043	87	NA	NA	NA	521	521	1,989	521
Calves (3 mos. To 1 year)	49,867	85,290	1,223	2,092	869	869	72	NA	NA	NA	434	434	1,658	434
Baby Calves (<3 months)	9,973	17,058	245	418	174	174	14	NA	NA	NA	87	87	332	87
Total	263,049	**449,904**	3,394	5,805	2,411	2,411	201	NA	NA	NA	1,206	1,206	4,600	**1,206**
Scenario 3														
Milk cows	124,668	213,225	-	-	-	-	-	-	-	-	NA	-	-	-
Dry Cows & bred heifers	18,700	31,984	60	102	42	42	4	7	5	14	NA	26	86	26
Heifers (1 yr to breeding)	59,841	102,348	191	327	136	136	11	23	15	45	NA	83	274	83
Calves (3 mos. To 1 year)	49,867	85,290	-	-	-	-	-	-	-	-	NA	-	-	-
Baby Calves (<3 months)	9,973	17,058	-	-	-	-	-	-	-	-	NA	-	-	-
Total	263,049	**449,904**	251	429	178	178	15	30	20	59	NA	109	360	**109**
Scenario 4														
Milk cows	124,668	213,225	-	-	-	-	-	NA	NA	NA	-	-	-	-
Dry Cows & bred heifers	18,700	31,984	68	117	48	48	4	NA	NA	NA	24	24	92	24
Heifers (1 yr to breeding)	59,841	102,348	218	374	155	155	13	NA	NA	NA	78	78	296	78
Calves (3 mos. To 1 year)	49,867	85,290	182	311	129	129	11	NA	NA	NA	65	65	247	65
Baby Calves (<3 months)	9,973	17,058	36	62	26	26	2	NA	NA	NA	13	13	49	13
Total	263,049	**449,904**	505	864	359	359	30	NA	NA	NA	179	179	684	**179**

2020 Scenario

	Uncontrolled Emissions					50% Controlled Emission Reduction from Future New and Expanded Dairies						Controlled Future Conditions		
Animal Type	Existing Head	Future 2020 Total Head Capacity	Emissons from Existing Head (tons/year)	Emissons from 2020 Total Head Capacity (tons/year)	Net Increase in Emissons under 2020 Future Conditions (tons per year)	Emissions from Future Expanded and New Dairies (tons/year)	Emissions from Future Expanded and New Dairies (tons/month)	Zero % reduction in Jan and Feb (tons/2months)	25% further reduction in Dec. & Mar. (tons/2 months)	50% reduction from Apr through Nov (tons/8 months)	50% reduction year round (tons/year)	Total Controlled Emission Reduction (tons/year)	Total Future Conditions (tons/year)	Total Net Emission Increase under Future Conditions (tons/year)
Scenario 1														
Milk cows	124,668	347,320	-	-	-	-	-	-	-	-	NA	-	-	-
Dry Cows & bred heifers	18,700	52,098	401	1,118	717	717	60	119	79	209	NA	407	809	407
Heifers (1 yr to breeding)	59,841	166,714	1,284	3,578	2,294	2,294	191	382	252	669	NA	1,304	2,588	1,304
Calves (3 mos. To 1 year)	49,867	138,928	-	-	-	-	-	-	-	-	NA	-	-	-
Baby Calves (<3 months)	9,973	27,786	-	-	-	-	-	-	-	-	NA	-	-	-
Total	263,049	**732,846**	1,686	4,696	3,010	3,010	251	502	331	878	NA	1,711	3,397	**1,711**
Scenario 2														
Milk cows	124,668	347,320	-	-	-	-	-	NA	NA	NA	-	-	-	-
Dry Cows & bred heifers	18,700	52,098	459	1,278	819	819	68	NA	NA	NA	410	410	868	410
Heifers (1 yr to breeding)	59,841	166,714	1,468	4,089	2,621	2,621	218	NA	NA	NA	1,311	1,311	2,778	1,311
Calves (3 mos. To 1 year)	49,867	138,928	1,223	3,408	2,184	2,184	182.04	NA	NA	NA	1,092	1,092	2,315	1,092
Baby Calves (<3 months)	9,973	27,786	245	682	437	437	36.41	NA	NA	NA	218	218	463	218
Total	263,049	**732,846**	3,394	9,456	6,062	6,062	505	NA	NA	NA	3,031	3,031	6,425	**3,031**
Scenario 3														
Milk cows	124,668	347,320	-	-	-	-	-	-	-	-	NA	-	-	-
Dry Cows & bred heifers	18,700	52,098	60	166	107	107	9	18	12	31	NA	61	120	61
Heifers (1 yr to breeding)	59,841	166,714	191	532	341	341	28	57	38	100	NA	194	385	194
Calves (3 mos. To 1 year)	49,867	138,928	-	-	-	-	-	-	-	-	NA	-	-	-
Baby Calves (<3 months)	9,973	27,786	-	-	-	-	-	-	-	-	NA	-	-	-
Total	263,049	**732,846**	251	699	448	448	37	75	49	131	NA	255	505	**255**
Scenario 4														
Milk cows	124,668	347,320	-	-	-	-	-	NA	NA	NA	-	-	-	-
Dry Cows & bred heifers	18,700	52,098	68	190	122	122	10	NA	NA	NA	61	61	129	61
Heifers (1 yr to breeding)	59,841	166,714	218	609	390	390	33	NA	NA	NA	195	195	413	195
Calves (3 mos. To 1 year)	49,867	138,928	182	507	325	325	27.09	NA	NA	NA	163	163	345	163
Baby Calves (<3 months)	9,973	27,786	36	101	65	65	5.42	NA	NA	NA	33	33	69	33
Total	263,049	**732,846**	505	1,407	902	902	75	NA	NA	NA	451	451	956	**451**

2010 Scenario Controlled ROG Emissions from Manure Decomposition

Assumes Only New Future Dairies Subject to Dairy Element 50% ROG Reduction Control Measure; Existing Dairies and Expansion Limits are Exempt from Dairy Element ROG Control Measures

Animal Type	Future Theoretical Total Head Capacity	2010 Herd Capacity
Milk cows	381,980	213,225
Dry Cows & bred heifers	57,297	31,984
Heifers (1 yr to breeding)	183,351	102,348
Calves (3 mos. To 1 year)	152,792	85,290
Baby Calves (<3 months)	30,558	17,058
Total	**805,978**	**449,904**

Animal Type	Emission Factor (lb/head-yr)	Existing Dairies					
		Existing Head	Future Expansion Head Limit[1]	Total Dairy Head (Expansion and Existing)	Emissons from Existing Head (tons/year)	Emissons from Expanded Head (tons/year)	Total Uncontrolled Emissions[2] (tons/yr)
Milk cows	12.88	124,668	24,559	149,227	803	158	961
Dry Cows & bred heifers	12.88	18,700	3,684	22,384	120	24	144
Heifers (1 yr to breeding)	12.88	59,841	11,788	71,629	385	76	461
Calves (3 mos. To 1 year)	12.88	49,867	9,824	59,691	321	63	384
Baby Calves (<3 months)	12.88	9,973	1,965	11,938	64	13	77
Total		263,049	51,820	314,868	1,694	334	2,028

Animal Type	Emission Factor (lb/head-yr)	New Dairies/Dairy Expansion[3]				
		2010 Total Head Capacity[4]	Uncontrolled Total Emission (lb/yr)	Uncontrolled Total Emission (ton/yr)	50% Emission Control (ton/yr)	Total Controlled Emissions (ton/yr)
Milk cows	12.88	63,998	824,298	412	206	206
Dry Cows & bred heifers	12.88	9,600	123,645	62	31	31
Heifers (1 yr to breeding)	12.88	30,719	395,660	198	99	99
Calves (3 mos. To 1 year)	12.88	25,599	329,719	165	82	82
Baby Calves (<3 months)	12.88	5,120	65,946	33	16	16
Total		135,035	1,739,267	870	435	435

	Future Conditions	
Animal Type	Total Emissions w/Implementation of Control Measure[5]	Total Net Increase in Emissions
Milk cows	**1,167**	**364**
Dry Cows & bred heifers	**175**	**55**
Heifers (1 yr to breeding)	**560**	**175**
Calves (3 mos. To 1 year)	**467**	**146**
Baby Calves (<3 months)	**93**	**29**
Total	**2,463**	**769**

Notes:

[1] Future expansion head limit reflects the cumulative maximum number of head that existing individual dairies can expand to, without exceeding the ROG threshold limit of 10 tons/year. Expansion of existing dairies which currently exceed the ROG threshold limit would be subject to the 50% ROG Reduction Control Measure.

[2] Existing dairies which currently exceed the ROG threshold limit would not be subject to the 50% ROG Reduction Control Measure.

[3] New dairies also include the expansion of existing dairies which currently exceed the ROG threshold limit.

[4] Total head reflects total 10% reduced future capacity minus head from existing dairies and head from expansion of existing dairies that are not required to implement the 50% ROG Control Measure.

[5] The 50% ROG Control Measure would be required for all new dairies and expansion of existing dairies which currently exceed the ROG threshold limit.

2020 Scenario Controlled ROG Emissions from Manure Decomposition

Assumes Only New Future Dairies Subject to Dairy Element 50% ROG Reduction Control Measure; Existing Dairies and Expansion Limits are Exempt from Dairy Element ROG Control Measures

Animal Type	Future Theoretical Total Head Capacity	2020 Herd Capacity
Milk cows	381,980	347,320
Dry Cows & bred heifers	57,297	52,098
Heifers (1 yr to breeding)	183,351	166,714
Calves (3 mos. To 1 year)	152,792	138,928
Baby Calves (<3 months)	30,558	27,786
Total	**805,978**	**732,846**

Animal Type	Emission Factor (lb/head-yr)	Existing Dairies					
		Existing Head	Future Expansion Head Limit[1]	Total Dairy Head (Expansion and Existing)	Emissons from Existing Head (tons/year)	Emissons from Expanded Head (tons/year)	Total Uncontrolled Emissions[2] (tons/yr)
Milk cows	12.88	124,668	24,559	149,227	803	158	961
Dry Cows & bred heifers	12.88	18,700	3,684	22,384	120	24	144
Heifers (1 yr to breeding)	12.88	59,841	11,788	71,629	385	76	461
Calves (3 mos. To 1 year)	12.88	49,867	9,824	59,691	321	63	384
Baby Calves (<3 months)	12.88	9,973	1,965	11,938	64	13	77
Total		263,049	51,820	314,868	1,694	334	2,028

Animal Type	Emission Factor (lb/head-yr)	New Dairies/Dairy Expansion[3]				
		2020 Total Head Capacity[4]	Uncontrolled Total Emission (lb/yr)	Uncontrolled Total Emission (ton/yr)	50% Emission Control (ton/yr)	Total Controlled Emissions (ton/yr)
Milk cows	12.88	198,094	2,551,462	1,276	638	638
Dry Cows & bred heifers	12.88	29,714	382,719	191	96	96
Heifers (1 yr to breeding)	12.88	95,085	1,224,699	612	306	306
Calves (3 mos. To 1 year)	12.88	79,237	1,020,585	510	255	255
Baby Calves (<3 months)	12.88	15,848	204,119	102	51	51
Total		417,978	5,383,585	2,692	1,346	1,346

	Future Conditions	
Animal Type	Total Emissions w/Implementation of Control Measure[5]	Total Net Increase in Emissions
Milk cows	**1,599**	**796**
Dry Cows & bred heifers	**240**	**119**
Heifers (1 yr to breeding)	**767**	**382**
Calves (3 mos. To 1 year)	**640**	**318**
Baby Calves (<3 months)	**128**	**64**
Total	**3,374**	**1,680**

Notes:

[1] Future expansion head limit reflects the cumulative maximum number of head that existing individual dairies can expand to, without exceeding the ROG threshold limit of 10 tons/year. Expansion of existing dairies which currently exceed the ROG threshold limit would be subject to the 50% ROG Reduction Control Measure.

[2] Existing dairies which currently exceed the ROG threshold limit would not be subject to the 50% ROG Reduction Control Measure.

[3] New dairies also include the expansion of existing dairies which currently exceed the ROG threshold limit.

[4] Total head reflects total 10% reduced future capacity minus head from existing dairies and head from expansion of existing dairies that are not required to implement the 50% ROG Control Measure.

[5] The 50% ROG Control Measure would be required for all new dairies and expansion of existing dairies which currently exceed the ROG threshold limit.

2010 Scenario Controlled Methane Emissions from Manure Decomposition

Assumes Only New Future Dairies Subject to Dairy Element 50% Methane Reduction Control Measure;
Existing Dairies and Expansion Limits are Exempt from Dairy Element Methane Control Measures

Animal Type	Future Total Head Capacity	2010 Herd Capacity
Milk cows	381,980	213,225
Dry Cows & bred heifers	57,297	31,984
Heifers (1 yr to breeding)	183,351	102,348
Calves (3 mos. To 1 year)	152,792	85,290
Baby Calves (<3 months)	30,558	17,058
Total	**805,978**	**449,904**

Animal Type	Emission Factor (lb/head-yr)	Existing Dairies					
		Existing Head	Future Expansion Head Limit[1]	Total Dairy Head (Expansion and Existing)	Emissons from Existing Head (tons/year)	Emissons from Expanded Head (tons/year)	Total Uncontrolled Emissions[2] (tons/yr)
Milk cows	112.56	124,668	24,559	149,227	7,016	1,382	8,398
Dry Cows & bred heifers	112.56	18,700	3,684	22,384	1,052	207	1,260
Heifers (1 yr to breeding)	112.56	59,841	11,788	71,629	3,368	663	4,031
Calves (3 mos. To 1 year)	112.56	49,867	9,824	59,691	2,807	553	3,359
Baby Calves (<3 months)	112.56	9,973	1,965	11,938	561	111	672
Total		263,049	51,820	314,868	14,804	2,916	17,721

Animal Type	Emission Factor (lb/head-yr)	New Dairies/Dairy Expansion[3]				
		2010 Reduced Total Head Capacity[4]	Uncontrolled Total Emission (lb/yr)	Uncontrolled Total Emission (ton/yr)	50% Emission Control (ton/yr)	Total Controlled Emissions (ton/yr)
Milk cows	112.56	63,998	7,203,602	3,602	1,801	1,801
Dry Cows & bred heifers	112.56	9,600	1,080,540	540	270	270
Heifers (1 yr to breeding)	112.56	30,719	3,457,702	1,729	864	864
Calves (3 mos. To 1 year)	112.56	25,599	2,881,441	1,441	720	720
Baby Calves (<3 months)	112.56	5,120	576,306	288	144	144
Total		135,035	15,199,590	7,600	3,800	3,800

	Future Conditions	
Animal Type	Total Emissions w/Implementation of Control Measure[5]	Total Net Increase in Emissions
Milk cows	**10,199**	**3,183**
Dry Cows & bred heifers	**1,530**	**477**
Heifers (1 yr to breeding)	**4,896**	**1,528**
Calves (3 mos. To 1 year)	**4,080**	**1,273**
Baby Calves (<3 months)	**816**	**255**
Total	**21,521**	**6,716**

Notes:

[1] Future expansion head limit reflects the cumulative maximum number of head that existing individual dairies can expand to, without exceeding the ROG threshold limit of 10 tons/year. Expansion of existing dairies which currently exceed the ROG threshold limit would be subject to the 50% Reduction Control Measure.

[2] Existing dairies which currently exceed the ROG threshold limit would not be subject to the 50% Reduction Control Measure.

[3] New dairies also include the expansion of existing dairies which currently exceed the ROG threshold limit.

[4] Total head reflects total 10% reduced future capacity minus head from existing dairies and head from expansion of existing dairies that are not required to implement the 50% Control Measure.

[5] The 50% Control Measure would be required for all new dairies and expansion of existing dairies which currently exceed the ROG threshold limit.

2020 Scenario Controlled Methane Emissions from Manure Decomposition

Assumes Only New Future Dairies Subject to Dairy Element 50% Methane Reduction Control Measure;
Existing Dairies and Expansion Limits are Exempt from Dairy Element Methane Control Measures

Animal Type	Future Total Head Capacity	2020 Herd Capacity
Milk cows	381,980	347,320
Dry Cows & bred heifers	57,297	52,098
Heifers (1 yr to breeding)	183,351	166,714
Calves (3 mos. To 1 year)	152,792	138,928
Baby Calves (<3 months)	30,558	27,786
Total	**805,978**	**732,846**

Animal Type	Emission Factor (lb/head-yr)	Existing Dairies					
		Existing Head	Future Expansion Head Limit[1]	Total Dairy Head (Expansion and Existing)	Emissons from Existing Head (tons/year)	Emissons from Expanded Head (tons/year)	Total Uncontrolled Emissions[2] (tons/yr)
Milk cows	112.56	124,668	24,559	149,227	7,016	1,382	8,398
Dry Cows & bred heifers	112.56	18,700	3,684	22,384	1,052	207	1,260
Heifers (1 yr to breeding)	112.56	59,841	11,788	71,629	3,368	663	4,031
Calves (3 mos. To 1 year)	112.56	49,867	9,824	59,691	2,807	553	3,359
Baby Calves (<3 months)	112.56	9,973	1,965	11,938	561	111	672
Total		263,049	51,820	314,868	14,804	2,916	17,721

Animal Type	Emission Factor (lb/head-yr)	New Dairies/Dairy Expansion[3]				
		2020 Reduced Total Head Capacity[4]	Uncontrolled Total Emission (lb/yr)	Uncontrolled Total Emission (ton/yr)	50% Emission Control (ton/yr)	Total Controlled Emissions (ton/yr)
Milk cows	112.56	198,094	22,297,424	11,149	5,574	5,574
Dry Cows & bred heifers	112.56	29,714	3,344,614	1,672	836	836
Heifers (1 yr to breeding)	112.56	95,085	10,702,737	5,351	2,676	2,676
Calves (3 mos. To 1 year)	112.56	79,237	8,918,970	4,459	2,230	2,230
Baby Calves (<3 months)	112.56	15,848	1,783,812	892	446	446
Total		417,978	47,047,557	23,524	11,762	11,762

	Future Conditions	
Animal Type	Total Emissions w/Implementation of Control Measure[5]	Total Net Increase in Emissions
Milk cows	**13,973**	**6,957**
Dry Cows & bred heifers	**2,096**	**1,043**
Heifers (1 yr to breeding)	**6,707**	**3,339**
Calves (3 mos. To 1 year)	**5,589**	**2,783**
Baby Calves (<3 months)	**1,118**	**557**
Total	**29,483**	**14,678**

Notes:

[1] Future expansion head limit reflects the cumulative maximum number of head that existing individual dairies can expand to, without exceeding the ROG threshold limit of 10 tons/year. Expansion of existing dairies which currently exceed the ROG threshold limit would be subject to the 50% Reduction Control Measure.

[2] Existing dairies which currently exceed the ROG threshold limit would not be subject to the 50% Reduction Control Measure.

[3] New dairies also include the expansion of existing dairies which currently exceed the ROG threshold limit.

[4] Total head reflects total 10% reduced future capacity minus head from existing dairies and head from expansion of existing dairies that are not required to implement the 50% Control Measure.

[5] The 50% Control Measure would be required for all new dairies and expansion of existing dairies which currently exceed the ROG threshold limit.

ROG & Methane Emissions from Manure Decomposition

1999 Scenario

Source	Head		emission factors (lb/head-year)			emission (lb/year)			emission (ton/year)		
			TOG	Methane	ROG	TOG	Methane	ROG	TOG	Methane	ROG
	c=axb	c	g	h	I	j=gxf	k=hxf	l=lxf	m=j/2000	n=k/2000	0=l/2000
Milk cows	124,668	124,668	160.8	112.56	12.88	20,046,614	14,032,630	1,605,734	10,023	7,016	803
Dry Cows & bred heifers	18,700	18,700	160.8	112.56	12.88	3,006,992	2,104,895	240,860	1,503	1,052	120
Heifers (1 yr to breeding)	59,841	59,841	160.8	112.56	12.88	9,622,375	6,735,662	770,752	4,811	3,368	385
Calves (3 mos. To 1 year)	49,867	49,867	160.8	112.56	12.88	8,018,646	5,613,052	642,294	4,009	2,807	321
Baby Calves (<3 months)	9,973	9,973	160.8	112.56	12.88	1,603,729	1,122,610	128,459	802	561	64
Total	**263,049**	**263,049**				42,298,356	29,608,849	3,388,098	**21,149**	**14,804**	**1,694**

2010 Scenario

Source	Projected Head		emission factors (lb/head-year)			emission (lb/year)			emission (ton/year)		
			TOG	Methane	ROG	TOG	Methane	ROG	TOG	Methane	ROG
	c	c	g	h	I	j=gxf	k=hxf	l=lxf	m=j/2000	n=k/2000	0=l/2000
Milk cows	213,225	213,225	160.8	112.56	12.88	34,286,514	24,000,560	2,746,350	17,143	12,000	1,373
Dry Cows & bred heifers	31,984	31,984	160.8	112.56	12.88	5,142,977	3,600,084	411,952	2,571	1,800	206
Heifers (1 yr to breeding)	102,348	102,348	160.8	112.56	12.88	16,457,527	11,520,269	1,318,248	8,229	5,760	659
Calves (3 mos. To 1 year)	85,290	85,290	160.8	112.56	12.88	13,714,605	9,600,224	1,098,540	6,857	4,800	549
Baby Calves (<3 months)	17,058	17,058	160.8	112.56	12.88	2,742,921	1,920,045	219,708	1,371	960	110
Total	**449,904**	**449,904**				72,344,544	50,641,181	5,794,798	**36,172**	**25,321**	**2,897**

2020 Scenario

Source	Projected Head		emission factors (lb/head-year)			emission (lb/year)			emission (ton/year)		
			TOG	Methane	ROG	TOG	Methane	ROG	TOG	Methane	ROG
	c	c	g	h	I	j=gxf	k=hxf	l=lxf	m=j/2000	n=k/2000	0=l/2000
Milk cows	347,320	347,320	160.8	112.56	12.88	55,849,118	39,094,382	4,473,514	27,925	19,547	2,237
Dry Cows & bred heifers	52,098	52,098	160.8	112.56	12.88	8,377,368	5,864,157	671,027	4,189	2,932	336
Heifers (1 yr to breeding)	166,714	166,714	160.8	112.56	12.88	26,807,577	18,765,304	2,147,287	13,404	9,383	1,074
Calves (3 mos. To 1 year)	138,928	138,928	160.8	112.56	12.88	22,339,647	15,637,753	1,789,406	11,170	7,819	895
Baby Calves (<3 months)	27,786	27,786	160.8	112.56	12.88	4,467,929	3,127,551	357,881	2,234	1,564	179
Total	**732,846**	**732,846**				117,841,639	82,489,147	9,439,115	**58,921**	**41,245**	**4,720**

Summary

	emission (lb/year)			**emission (ton/year)**		
Scenario	**TOG**	**Methane**	**ROG**	**TOG**	**Methane**	**ROG**
1999	42,298,356	29,608,849	3,388,098	21,149	14,804	1,694
2010	72,344,544	50,641,181	5,794,798	36,172	25,321	2,897
2,020	117,841,639	82,489,147	9,439,115	58,921	41,245	4,720

Notes:

d From Table No. 5 (Theoretical Dairy Herd Capacity in Kings County)

e From Table No. 5 (Theoretical Dairy Herd Capacity in Kings County)

g, h, I From CARB Livestock Waste Methodology and 1988, Radian.

Ammonia Emissions Generated from Manure Decomposition

Cattle	head	emission factor (lb/animal/yr) NH3	emission (lb/year) NH3	emissions (tons/year) NH3
1999 Scenario				
milk cows	124,668	28.37	3,537,230	1,769
dry cows&bred	18,700	28.37	530,585	265
heifers (1yr-bred)	59,841	8.54	510,873	255
3mo-1yr calves	49,867	3.53	176,011	88
baby calves	9,973	3.53	35,202	18
Total	263,049		4,789,901	2,395
2010 Scenario				
milk cows	213,225	28.37	6,049,864	3,025
dry cows&bred	31,984	28.37	907,480	454
heifers (1yr-bred)	102,348	8.54	873,766	437
3mo-1yr calves	85,290	3.53	301,039	151
baby calves	17,058	3.53	60,208	30
Total	449,904		8,192,356	4,096
2020 Scenario				
milk cows	347,320	28.37	9,854,591	4,927
dry cows&bred	52,098	28.37	1,478,189	739
heifers (1yr-bred)	166,714	8.54	1,423,272	712
3mo-1yr calves	138,928	3.53	490,361	245
baby calves	27,786	3.53	98,072	49
Total	732,846		13,344,485	6,672

Notes:
Emission factors obtained from 1994 Battye Report; emission factors reflect stable & storage emission factor components only.
Table No. 5 (Theoretical Dairy Capacity of Kings County).

Ammonia Emissions Generated from Manure Decomposition

Cattle	head	emission factor (lb/animal/yr) NH3	emission (lb/year) NH3	emissions (tons/year) NH3
1999 Scenario				
milk cows	124,668	74.00	9,225,432	4,613
dry cows&bred	18,700	74.00	1,383,815	692
heifers (1yr-bred)	59,841	74.00	4,428,207	2,214
3mo-1yr calves	49,867	74.00	3,690,173	1,845
baby calves	9,973	74.00	738,035	369
Total	263,049		19,465,662	**9,733**
2010 Scenario				
milk cows	213,225	74.00	15,778,619	7,889
dry cows&bred	31,984	74.00	2,366,793	1,183
heifers (1yr-bred)	102,348	74.00	7,573,737	3,787
3mo-1yr calves	85,290	74.00	6,311,448	3,156
baby calves	17,058	74.00	1,262,290	631
Total	449,904		33,292,887	16,646
2020 Scenario				
milk cows	347,320	74.00	25,701,708	12,851
dry cows&bred	52,098	74.00	3,855,256	1,928
heifers (1yr-bred)	166,714	74.00	12,336,820	6,168
3mo-1yr calves	138,928	74.00	10,280,683	5,140
baby calves	27,786	74.00	2,056,137	1,028
Total	732,846		54,230,605	27,115

Notes:
Emission factors obtained from James, et al.; emission factor does not speciate between the different cattle types (e.g., heifers, calves, cows) as it reflects the average emission factor for all cattle types; estimate assumes that ratios of cattle types are similar to the dairy studied by UC Davis in developing the emission factor.

Methane Generation from Dairy Cattle

Animal type	#cows	Emission Factor (lb CH4/head/year)	Emissions (tons CH4/year)	Notes
1999 Scenario				
milk cows	124,668	262.5	16,363	considered mature cows
dry cows&bred	18,700	152	1,421	used beef cattle mature cows since these cows are not milk cows
heifers (1yr-bred)	59,841	134.6	4,027	considered replacement cows from 12 -24 months
3mo-1yr calves	49,867	45.5	1,134	considered replacement cows from 0-12 months
baby calves	9,973	45.5	227	considered replacement cows from 0-12 months
Total	263,049		**23,173**	
2010 Scenario				
milk cows	213,225	262.5	27,986	considered mature cows
dry cows&bred	31,984	152	2,431	used beef cattle mature cows since these cows are not milk cows
heifers (1yr-bred)	102,348	134.6	6,888	considered replacement cows from 12 -24 months
3mo-1yr calves	85,290	45.5	1,940	considered replacement cows from 0-12 months
baby calves	17,058	45.5	388	considered replacement cows from 0-12 months
Total	449,904		**39,633**	
2020 Scenario				
milk cows	347,320	262.5	45,586	considered mature cows
dry cows&bred	52,098	152	3,959	used beef cattle mature cows since these cows are not milk cows
heifers (1yr-bred)	166,714	134.6	11,220	considered replacement cows from 12 -24 months
3mo-1yr calves	138,928	45.5	3,161	considered replacement cows from 0-12 months
baby calves	27,786	45.5	632	considered replacement cows from 0-12 months
Total	732,846		**64,558**	

Notes:
Emission factors obtained from CARB and Radian Report

URBEMIS 7G: Version 3.1

File Name: 99233c10.URB
Project Name: 2010 Cumulative Cow Dairy, Dairy Element
Project Location: San Joaquin Valley

DETAILED REPORT
(Tons/Year)

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2010 Temperature (F): 100 Season: Annual

EMFAC Version: EMFAC7G (10/96)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
5000-cow dairy	84.00 trips / trips/dairy	363.00	30,492.00

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Duty Autos	30.00	1.16	98.58	0.26
Light Duty Trucks	30.00	0.13	99.54	0.33
Medium Duty Trucks	0.00	1.44	98.56	
Lite-Heavy Duty Trucks	0.00	19.56	40.00	40.44
Med.-Heavy Duty Trucks	33.00	19.56	40.00	40.44
Heavy-Heavy Trucks	7.00			100.00
Urban Buses	0.00			100.00
Motorcycles	0.00	100.00 % all fuels		

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.3	7.3
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip Speeds (mph)	55	55	55	55	55	55
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
5000-cow dairy				60.0	20.0	20.0

UNMITIGATED EMISSIONS

	ROG	NOx	
5000-cow dairy	46.27	361.34	6.56
TOTAL EMISSIONS (tons/year)	46.27	361.34	6.56

Does not include correction for passby trips.
Does not include double counting adjustment for internal trips.

URBEMIS 7G: Version 3.1

File Name: 99233c20.URB
Project Name: 2020 Cumulative Cow Dairy, Dairy Element
Project Location: San Joaquin Valley

DETAILED REPORT
(Tons/Year)

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2020 Temperature (F): 100 Season: Annual

EMFAC Version: EMFAC7G (10/96)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
5000-cow dairy	84.00 trips / trips/dairy	591.00	49,644.00

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Duty Autos	30.00	1.16	98.58	0.26
Light Duty Trucks	30.00	0.13	99.54	0.33
Medium Duty Trucks	0.00	1.44	98.56	
Lite-Heavy Duty Trucks	0.00	19.56	40.00	40.44
Med.-Heavy Duty Trucks	33.00	19.56	40.00	40.44
Heavy-Heavy Trucks	7.00			100.00
Urban Buses	0.00			100.00
Motorcycles	0.00		100.00 % all fuels	

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.3	7.3
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip Speeds (mph)	55	55	55	55	55	55
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
5000-cow dairy				60.0	20.0	20.0

UNMITIGATED EMISSIONS

	ROG	NOx	PM10
5000-cow dairy	31.16	298.53	8.94
TOTAL EMISSIONS (tons/year)	31.16	298.53	8.94

Does not include correction for passby trips.
Does not include double counting adjustment for internal trips.

Revised Alternative Air Emissions

Summary of Air Pollutant Emissions from Agricultural and Dairy Operation Alternatives

Activity	Emissions (tons/year)							
	ROG	PM10[1]				Ammonia[2]		Methane
		Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 1	Scenario 2	
No Project								
Fugitive Dust								
Land Preparation	--	1,191	1,191	1,191	1,191	--	--	--
Windblown Dust	--	1,514	1,514	1,514	1,514	--	--	--
Cattle Movement at Unpaved Corral	--	5,165	10,400	769	1,548	--	--	--
Manure Decomposition	5,191	--	--	--	--	7,338	29,821	45,360
Cattle	--	--	--	--	--	--	--	71,000
TOTAL	**5,191**	**7,869**	**13,105**	**3,473**	**4,252**	**7,338**	**29,821**	**116,361**
Proposed Project								
Fugitive Dust								
Land Preparation	--	1,191	1,191	1,191	1,191	--	--	--
Windblown Dust	--	1,514	1,514	1,514	1,514	--	--	--
Cattle Movement at Unpaved Corral		3,808	6,897	567	1,026	--	--	--
Manure Decomposition	3,609	--	--	--	--	7,338	29,821	31,541
Cattle	--	--	--	--	--	--	--	71,000
TOTAL	**3,609**	**6,513**	**9,602**	**3,271**	**3,731**	**7,338**	**29,821**	**102,541**
10 Percent Herd Reduction								
Fugitive Dust								
Land Preparation	--	1,228	1,228	1,228	1,228	--	--	--
Windblown Dust	--	1,561	1,561	1,561	1,561	--	--	--
Cattle Movement at Unpaved Corral	--	3,373	6,377	502	949	--	--	--
Manure Decomposition	3,350	--	--	--	--	6,604	26,839	29,273
Cattle	--	--	--	--	--	--	--	63,900
TOTAL	**3,350**	**6,161**	**9,165**	**3,290**	**3,737**	**6,604**	**26,839**	**93,173**
50 Percent Herd Reduction								
Fugitive Dust								
Land Preparation	--	1,375	1,375	1,375	1,375	--	--	--
Windblown Dust	--	1,748	1,748	1,748	1,748	--	--	--
Cattle Movement at Unpaved Corral	--	2,196	4,297	327	639	--	--	--
Manure Decomposition	2,312	--	--	--	--	3,669	14,911	20,201
Cattle	--	--	--	--	--	--	--	35,500
TOTAL	**2,312**	**5,320**	**7,420**	**3,450**	**3,763**	**3,669**	**14,911**	**55,701**

[1] PM_{10} Scenarios are as follows:

Scenario 1: CARB PM_{10} Emission Factor; exclude all calves in PM_{10} emission estimate; and account for potential PM_{10} emission reduction during wet season;

Scenario 2: CARB PM_{10} Emission Factor; conservatively include all calves in PM_{10} emission estimate (assuming that PM_{10} emission rates for calves are equivalent to those for the heavier and larger dry cattle and heifers), and ignore potential PM_{10} emission

Scenario 3: Department of Agricultural Engineering at Texas A&M University Emission Factor; exclude all calves in PM10 emission estimate; account for potential PM_{10} emission reduction during wet season using approach consistent with Scenario 1;

Scenario 4: Department of Agricultural Engineering at Texas A&M University Emission Factor; conservatively include all calves in PM_{10} emission estimate; and ignore potential PM_{10} emission reduction during wet season.

[2] Ammonia Scenarios are as follows:

Scenario 1: 1994 Development and Selection of Ammonia Emission Factors, developed by Battye, et al. for the U.S. EPA

Scenario 2: Terry James, et al. Emission Factor

PM10 EMISSIONS FROM EXISTING AGRICULTURAL LAND PREPARATION

Crop	Acreage Information							PM10 Emission		Acre-pass schedule														
	Harvested Acres (1999) Countywide (ac)	fraction of total Harvested	Acreage Available (ac)	Allocated Existing Crop Acres	EF (lb/acre-pass)	Annual Acre-Pass/Acre	annual Acre Passes	PM10 Emissions (ton/year)	PM10 Emissions (ton/acre pass per acre)	Acre-pass schedule														total
a	b	c	d	e=cxd	f	g	h=gxe	I=fxh/2000	j=I/g	k	k	k	k	k	k	k	k	k	k	k	k	k
Alfalfa*	50,200	0.12	245,300	28,657	4.63	1.25	35,822	83	66	jan	oct	nov	dec											4
Alfalfa, seed	20,800	0.05	245,300	11,874	4.63	1.25	14,842	34	27	jan	oct	nov	dec											4
Hay, other	1,900	0.004	245,300	1,085	4.63	1.25	1,356	3	3	jan	oct	nov	dec											4
Barley	9,100	0.02	245,300	5,195	4.63	1	5,195	12	12	nov	dec													2
Corn (silage)	47,700	0.11	245,300	27,230	4.63	4	108,921	252	63	jan	mar	mar	nov	dec										5
Cotton (lint, all varieties)	199,000	0.46	245,300	113,602	4.63	4	454,407	1,051	263	feb	mar	nov	dec											4
Cotton (lseed, all varieties)	3,300	0.01	245,300	1,884	4.63	4	7,535	17	4	feb	mar	nov	dec											4
Pasture, fescue	11,000	0.03	245,300	6,279	4.63	0	0	0	0	--	--	--	--											0
Safflower	16,500	0.04	245,300	9,419	4.63	2	18,838	44	22	nov	dec													2
Sugar beets	5,000	0.01	245,300	2,854	4.63	5	14,272	33	7	jan	feb	mar	apr	may	jun	jul	aug	sept	oct	nov	dec			12
Wheat	62,000	0.14	245,300	35,394	4.63	1	35,394	82	82	nov	dec													2
Wheat, seed**	3,200	0.01	245,300	1,827	4.63	1	1,827	4	4	nov	dec													2
TOTAL																								

PM10 EMISSIONS FROM EXISTING AGRICULTURAL LAND PREPARATION

Crop	December & March Reduction				January & February Reduction				No Reduction			Equivalent PM10 Emissions (ton/year)
	Reduction Factor	# of months occuring in Dec & Mar	# acre passes in Dec &/or Mar	Dec & Mar Emissions (ton)	Reduction Factor	# of months occuring in Jand & Feb	# acre passes in Jan &/or Feb	Jan & Feb Emissions (ton)	Remaining months	# acre/passes in other months	Nonreduced emission (ton)	
a	l	m	n	o=jxlxn	p	q	r	s=jxpxr	t	u	v=kxu	w=o+s+v
Alfalfa*	0.75	1	0.31	16	0.50	1	0.31	10	2	0.63	41	**67**
Alfalfa, seed	0.75	1	0.31	6	0.50	1	0.31	4	2	0.63	17	**28**
Hay, other	0.75	1	0.31	1	0.50	1	0.31	0	2	0.63	2	**3**
Barley	0.75	1	0.50	5	0.50	0	0.00	0	1	0.50	6	**11**
Corn (silage)	0.75	3	2.40	113	0.50	1	0.80	25	1	0.80	50	**189**
Cotton (lint, all varieties)	0.75	2	2.00	394	0.50	1	1.00	131	1	1.00	263	**788**
Cotton (lseed, all varieties)	0.75	2	2.00	7	0.50	1	1.00	2	1	1.00	4	**13**
Pasture, fescue	0.75	0	0.00	0	0.50	0	0.00	0	0	0.00	0	**0**
Safflower	0.75	1	1.00	16	0.50	0	0.00	0	1	1.00	22	**38**
Sugar beets	0.75	2	0.83	4	0.50	2	0.83	3	8	3.33	22	**29**
Wheat	0.75	1	0.50	31	0.50	0	0.00	0	1	0.50	41	**72**
Wheat, seed**	0.75	1	0.50	2	0.50	0	0.00	0	1	0.50	2	**4**
TOTAL												**1,241**

Calculations based on CARB, Section 7.4, Agricultural land Preparation, Updated August 1997, Emission Inventory Procedural manual, Volume III
Methods for Assessing Area Source Emissions and guidance from CARB, Patrick Gaffney (8/16/99 personal communication with R. Del Rosario, BASELINE)
Data in column d based on Table 2, Summary of Crop Acre-Passes from EI.
Emission Factor assumes a s (silt content) = 22.7 %, according to CARB (8/30/99)
Existing cropland acreages based on site visit by BASELINE in July 1999.
b - Data from Section H of Table 5 (Nitrogen and Salt Generation Calculation) of Dairy Element
c - Data from Section H of Table 5 (Nitrogen and Salt Generation Calculation) of Dairy Element; ratio of crop to total crop harvested, excluding double crop acreage since total crops include double cropped acres.
d - Data from Section C of Table 5 (Nitrogen and Salt Generation Calculation) of Dairy Element
f - Data from CARB Section 7.4, Agricultural land Preparation, Updated August 1997, Emission Inventory Procedural manual, Volume III
g - Data from CARB Section 7.4 (Table 2), Agricultural land Preparation, Updated August 1997, Emission Inventory Procedural manual, Volume III
k - Data from crop calendars created by CARB (provided to R.Del Rosario on 8/16/99 by Patrick Gaffney of CARB).
l, p - Data from CARB Section 7.4, Agricultural land Preparation, Updated August 1997, Emission Inventory Procedural manual, Volume III

* Assumes land preparation passes are similar to hay land preparation passes.
** Assumes land preparation passes are similar to wheat/barley land preparation passes.

PM10 EMISSIONS FROM EXISTING DAIRY OPERATIONS (CATTLE CORRAL DUST)

				Scenario 1 (CARB emission factor; include rain effects; ignore calves)								
Source	Existing	ratio	Head	PM10 EF (tons/head-yr)	PM10 Emissions (tons/yr)	PM10 Emissions (tons/month)	PM10 redn in Jan and Feb	PM10 Emissions Jan and Feb	PM10 redn in Dec & Mar	PM10 Emissions Dec & Mar	PM10 Emissions other months	Total PM10 Emissions (tons/yr)
	a	b	c=axb	d	e=cxd	f=e/12	g	h=2xgxf	I	j=2xfxI	k=fx8	l=k+j+h
Milk cows	124,668											
Dry Cows & bred heifers	--	0.150	18,700	0.024528	459	38	0.5	38	0.75	57	306	401
Heifers (1 yr to breeding)	--	0.480	59,841	0.024528	1468	122	0.5	122	0.75	183	979	1284
Calves (3 mos. To 1 year)	--	0.400	49,867	0	0	0	0.5	0	0.75	0	0	0
Baby Calves (<3 months)	--	0.080	9,973	0	0	0	0.5	0	0.75	0	0	0
Total			**138,382**									**1,686**

	Scenario 2 (CARB emission factor; ignore rain effects; include calves)		Scenario 3 (USDA AAQTF Emission Factor; include rainfall effects; ignore calves)									Scenario 4 (USDA AAQTF Emission Factor; ignore rainfall; include calves)	
Source	PM10 EF (tons/head-yr)	PM10 Emissions (tons/yr)	PM10 EF (tons/head-yr)	PM10 Emissions (tons/yr)	PM10 Emissions (tons/month)	PM10 redn in Jan and Feb	PM10 Emissions Jan and Feb	PM10 redn in Dec & Mar	PM10 Emissions Dec & Mar	PM10 Emissions other months	Total PM10 Emissions (tons/year)	PM10 EF (tons/head-yr)	PM10 Emissions (tons/yr)
	m	n=mxc	o	p=oxc	q=p/12	r	s=rx2xq	t	u=2xtxq	v=8xq	w=v+u+s	x	y=xxc
Milk cows													
Dry Cows & bred heifers	0.02453	459	0.00365	68	6	0.5	6	0.75	9	46	60	0.00365	68
Heifers (1 yr to breeding)	0.02453	1,468	0.00365	218	18	0.5	18	0.75	27	146	191	0.00365	218
Calves (3 mos. To 1 year)	0.02453	1,223	0	0	0	0.0	0	0.75	0	0	0	0.00365	182
Baby Calves (<3 months)	0.02453	245	0	0	0	0.0	0	0.75	0	0	0	0.00365	36
Total		**3,394**									**251**		**505**

Notes:

a Total milk cows in Kings County, based on Table No. 5 (Theoretical Dairy Capacity of Kings County)

b Ratio of milk cow to support stock for total cattle capacity in Kings County, as provided in Table No. 5(Theoretical Dairy Capacity of Kings County)

c Table No. 5 did not provide data for support stock.

d PM10 Emission factor obtained from CARB's Section 7.6 (Cattle Feedlot Dust), March 1989, Emission Inventory Procedural Manual and from USEPA AP42 4th edition; Emission factor assumes a PM10 percent of 48%, based on CARB's Section 7.6. PM10EF = (280lb/1000head-day) x (0.48 PM10) x (365 day/yr) / (2000 lb/ton) = 0.024528 tons/head-year. The emission factor used is for beef cattle in cattle feedlots since PM10 emission factors for support stock at dairy facilities are not available.

g, l According to CARB (personal communication between Mr. Patrick Gaffney), CARB and Ms. Rhodora Del Rosario, BASELINE, on 8/30/99, CARB has not published data that identifies the rainfall volume that would reduce reduce PM10 emissions from feedlot corrals. Based on the lack of data, CARB suggested that published PM10 reductions applied for land preparation be used for feedlot calculations.

o PM10 Emission factor obtained from Confined Livestock Air Quality Committee of the USDA Agricultural Air Quality Committee of the USDA Agricultural Air Quality Task Force, Air Quality Research & Technology Transfer Programs for Concentrated Animal Feeding Operations Air Quality Research and Technoloy Transfer White Paper and Recommendations for Concentrated Animal Feeding Operations, Adopted by USDA Agricultural Air Quality Task Force, Washington D.C., July 19, 2000; emission factor reflects non-annualized value since rainfall effects in Texas would different compared to California.

PM10 EMISSIONS FROM FUTURE AGRICULTURAL LAND PREPARATION 10% HERD REDUCTION

	Acreage Information							PM10 Emission		Acre-pass schedule														
Crop	Future Crops	fraction of total future crops	Acreage Available (ac)	Allocated Existing Crop Acres	EF (lb/acre-pass)	Annual Acre-Pass/Acre	annual Acre Passes	PM10 Emissions (ton/year)	PM10 Emissions (ton/acre pass per acre)	Acre-pass schedule														total
a	b	c	d	e	f	g	h=gxe	I=fxh/2000	j=I/g	k	k	k	k	k	k	k	k	k	k	k	k	k
Alfalfa*	42,060	0.12	242,770	28,362	4.63	1.25	35,452	82	66	jan	oct	nov	dec											4
Alfalfa, seed	17,427	0.05	242,770	11,751	4.63	1.25	14,689	34	27	jan	oct	nov	dec											4
Hay, other	1,592	0.004	242,770	1,074	4.63	1.25	1,342	3	2	jan	oct	nov	dec											4
Barley	7,624	0.02	242,770	5,141	4.63	1	5,141	12	12	nov	dec													2
Corn (silage)	39,965	0.11	242,770	26,949	4.63	4	107,796	249	62	jan	mar	mar	nov	dec										5
Cotton (lint, all varieties)	166,732	0.46	242,770	112,430	4.63	4	449,720	1,040	260	feb	mar	nov	dec											4
Cotton (lseed, all varieties)	2,765	0.01	242,770	1,864	4.63	4	7,458	17	4	feb	mar	nov	dec											4
Pasture, fescue	9,216	0.03	242,770	6,214	4.63	0	0	0	0	--	--	--	--											0
Safflower	13,825	0.04	242,770	9,322	4.63	2	18,645	43	22	nov	dec													2
Sugar beets	4,189	0.01	242,770	2,825	4.63	5	14,124	33	7	jan	feb	mar	apr	may	jun	jul	aug	sept	oct	nov	dec			12
Wheat	51,947	0.14	242,770	35,029	4.63	1	35,029	81	81	nov	dec													2
Wheat, seed**	2,681	0.01	242,770	1,808	4.63	1	1,808	4	4	nov	dec													2
TOTAL																								

50 % HERD REDUCTION

	Acreage Information							PM10 Emission		Acre-pass schedule														
Crop	Future Crops	fraction of total future crops	Acreage Available (ac)	Allocated Existing Crop Acres	EF (lb/acre-pass)	Annual Acre-Pass/Acre	annual Acre Passes	PM10 Emissions (ton/year)	PM10 Emissions (ton/acre pass per acre)	Acre-pass schedule														total
a	b	c	d	e	f	g	h=gxe	I=fxh/2000	j=I/g	k	k	k	k	k	k	k	k	k	k	k	k	k
Alfalfa*	42,060	0.12	271,918	31,767	4.63	1.25	39,709	92	73	jan	oct	nov	dec											4
Alfalfa, seed	17,427	0.05	271,918	13,162	4.63	1.25	16,453	38	30	jan	oct	nov	dec											4
Hay, other	1,592	0.004	271,918	1,202	4.63	1.25	1,503	3	3	jan	oct	nov	dec											4
Barley	7,624	0.02	271,918	5,758	4.63	1	5,758	13	13	nov	dec													2
Corn (silage)	39,965	0.11	271,918	30,185	4.63	4	120,738	279	70	jan	mar	mar	nov	dec										5
Cotton (lint, all varieties)	166,732	0.46	271,918	125,929	4.63	4	503,715	1,165	291	feb	mar	nov	dec											4
Cotton (lseed, all varieties)	2,765	0.01	271,918	2,088	4.63	4	8,353	19	5	feb	mar	nov	dec											4
Pasture, fescue	9,216	0.03	271,918	6,961	4.63	0	0	0	0	--	--	--	--											0
Safflower	13,825	0.04	271,918	10,442	4.63	2	20,883	48	24	nov	dec													2
Sugar beets	4,189	0.01	271,918	3,164	4.63	5	15,819	37	7	jan	feb	mar	apr	may	jun	jul	aug	sept	oct	nov	dec			12
Wheat	51,947	0.14	271,918	39,234	4.63	1	39,234	91	91	nov	dec													2
Wheat, seed**	2,681	0.01	271,918	2,025	4.63	1	2,025	5	5	nov	dec													2
TOTAL																								

PM10 EMISSIONS FROM FUTURE AGRICULTURAL LAND PREPARATION 10% HERD REDUCTION

Crop	December & March Reduction				January & February Reduction				No Reduction			Equivalent
	Reduction Factor	# of months occuring in Dec & Mar	# acre passes in Dec &/or Mar	Dec & Mar Emissions (ton)	Reduction Factor	# of months occuring in Jan & Feb	# acre passes in Jan &/or Feb	Jan & Feb Emissions (ton)	Remaining months	# acre/passes in other months	Nonreduced emission (ton)	**PM10 Emissions (ton/year)**
a	l	m	n	o=ixlxn	p	q	r	s=ixpxr	t	u	v=ixt	**w=o+s+v**
Alfalfa*	0.75	1	0.31	15	0.50	1	0.31	10	2	0.63	41	**67**
Alfalfa, seed	0.75	1	0.31	6	0.50	1	0.31	4	2	0.63	17	**28**
Hay, other	0.75	1	0.31	1	0.50	1	0.31	0	2	0.63	2	**3**
Barley	0.75	1	0.50	4	0.50	0	0.00	0	1	0.50	6	**10**
Corn (silage)	0.75	3	2.40	112	0.50	1	0.80	25	1	0.80	50	**187**
Cotton (lint, all varieties)	0.75	2	2.00	390	0.50	1	1.00	130	1	1.00	260	**780**
Cotton (lseed, all varieties)	0.75	2	2.00	6	0.50	1	1.00	2	1	1.00	4	**13**
Pasture, fescue	0.75	0	0.00	0	0.50	0	0.00	0	0	0.00	0	**0**
Safflower	0.75	1	1.00	16	0.50	0	0.00	0	1	1.00	22	**38**
Sugar beets	0.75	2	0.83	4	0.50	2	0.83	3	8	3.33	22	**29**
Wheat	0.75	1	0.50	30	0.50	0	0.00	0	1	0.50	41	**71**
Wheat, seed**	0.75	1	0.50	2	0.50	0	0.00	0	1	0.50	2	**4**
TOTAL												**1,228**

50 % HERD RED

Crop	December & March Reduction				January & February Reduction				No Reduction			Equivalent
	Reduction Factor	# of months occuring in Dec & Mar	# acre passes in Dec &/or Mar	Dec & Mar Emissions (ton)	Reduction Factor	# of months occuring in Jan & Feb	# acre passes in Jan &/or Feb	Jan & Feb Emissions (ton)	Remaining months	# acre/passes in other months	Nonreduced emission (ton)	**PM10 Emissions (ton/year)**
a	l	m	n	o=ixlxn	p	q	r	s=ixpxr	t	u	v=ixt	**w=o+s+v**
Alfalfa*	0.75	1	0.31	17	0.50	1	0.31	11	2	0.63	46	**75**
Alfalfa, seed	0.75	1	0.31	7	0.50	1	0.31	5	2	0.63	19	**31**
Hay, other	0.75	1	0.31	1	0.50	1	0.31	0	2	0.63	2	**3**
Barley	0.75	1	0.50	5	0.50	0	0.00	0	1	0.50	7	**12**
Corn (silage)	0.75	3	2.40	126	0.50	1	0.80	28	1	0.80	56	**209**
Cotton (lint, all varieties)	0.75	2	2.00	437	0.50	1	1.00	146	1	1.00	291	**874**
Cotton (lseed, all varieties)	0.75	2	2.00	7	0.50	1	1.00	2	1	1.00	5	**14**
Pasture, fescue	0.75	0	0.00	0	0.50	0	0.00	0	0	0.00	0	**0**
Safflower	0.75	1	1.00	18	0.50	0	0.00	0	1	1.00	24	**42**
Sugar beets	0.75	2	0.83	5	0.50	2	0.83	3	8	3.33	24	**32**
Wheat	0.75	1	0.50	34	0.50	0	0.00	0	1	0.50	45	**79**
Wheat, seed**	0.75	1	0.50	2	0.50	0	0.00	0	1	0.50	2	**4**
TOTAL												**1,375**

Calculations based on CARB, Section 7.4, Agricultural land Preparation, Updated August 1997, Emission Inventory Procedural manual, Volume III
Methods for Assessing Area Source Emissions and guidance from CARB, Patrick Gaffney (8/16/99 personal communication with R. Del Rosario, BASELINE)
Data in column d based on Table 2, Summary of Crop Acre-Passes from EI.
Emission Factor assumes a s (silt content) = 22.7 %, according to CARB (8/30/99)
Existing cropland acreages based on site visit by BASELINE in July 1999.
b - Data from Section H of Table 5 (Nitrogen and Salt Generation Calculation) of Dairy Element
c - Data from Section H of Table 5 (Nitrogen and Salt Generation Calculation) of Dairy Element; ratio of crop to total crop harvested, excluding double crop acreage since total crops include double cropped acres.
f - Data from CARB Section 7.4, Agricultural land Preparation, Updated August 1997, Emission Inventory Procedural manual, Volume III
g - Data from CARB Section 7.4 (Table 2), Agricultural land Preparation, Updated August 1997, Emission Inventory Procedural manual, Volume III
k - Data from crop calendars created by CARB (provided to R.Del Rosario on 8/16/99 by Patrick Gaffney of CARB).
l, p - Data from CARB Section 7.4, Agricultural land Preparation, Updated August 1997, Emission Inventory Procedural manual, Volume III

* Assumes land preparation passes are similar to hay land preparation passes.

PM10 EMISSIONS FROM WINDBLOWN DUST

Case	Area (ac)	PM10 EF (ton/ac/yr)	PM10 Emission (tons/yr)
Existing Croplands	245,300	0.006428	1,577
Future Croplands	235,483	0.006428	1,514
10% Herd Reduction	242,770	0.006428	1,561
50 % Herd Reduction	271,918	0.006428	1,748

PM10 EF = PM10 emission factor for nonpasture agricultural lands in Kings County, San Joaquin Valley Air Basin; emission factor obtained from Section 7.12 (Windblown Dust - Agricultural Lands), Updated August 1997, Emission Inventory Procedural Manual, Vol III
PM10EF = 0.5 * 0.012856; 0.5 reflects % of PM that is PM10
Acreage assumes 26.21 cows per dairy acre (per Table No. 5).

Added cropland from herd reduction

type	ratio	cows/acre	acres/cow	Total Future Capacity	10% reduced herd size	Added Cropland from 10% Reduced Herd Size	50% reduced herd size	Added Cropland from 10% Reduced Herd Size
milk cow	1	26	0.04	381,980	343,782	1,457	190,990	7,287
Dry Cows & bred heifers	0.150	4	0.25	57,297	51,567	1,457	28,649	7,287
Heifers (1 yr to breeding)	0.480	13	0.08	183,351	165,016	1,457	91,676	7,287
Calves (3 mos. To 1 year)	0.400	10	0.10	152,792	137,513	1,457	76,396	7,287
Baby Calves (<3 months)	0.080	2	0.48	30,558	27,502	1,457	15,279	7,287
Total			0.94	805,978	725,380	7,287	402,989	36,435

PM10 EMISSIONS: 10 % HERD REDUCTION; DAIRY OPERATIONS (CATTLE CORRAL DUST)

	Head Capacity						Scenario 1 (CARB Emission Factor; include rain effects; ignore calves)								
Source	Existing	Support stock to milk cow ratio	Existing Head	Total Head Capacity	Future New Head Capacity	10% reduced herd size	PM10 EF (tons/head-yr)	PM10 Emissions (tons/year)	PM10 Emissions (tons/month)	PM10 redn in Jan and Feb	PM10 Emissions Jan and Feb	PM10 redn in Dec & Mar	PM10 Emissions Dec & Mar	PM10 Emissions other months	Total PM10 Emissions (tons/year)
	a	b	c=a x b	d	e=d-c	e1=dx0.9	f	g=fxe1	h=g/12	I	j=2xixh	k	l=2xkxh	m=hx8	n=m+l +j
Milk Cow	124,668														
Dry Cows & bred heifers	--	0.150	18,700	57,297	38,597	51,567	0.02453	1,265	105	0.5	105	0.75	158	843	1,107
Heifers (1 yr to breeding)	--	0.480	59,841	183,351	123,510	165,016	0.02453	4,048	337	0.5	337	0.75	506	2,698	3,542
Calves (3 mos. To 1 year)	--	0.400	49,867	152,792	102,925	137,513	0.00000	0	0	0.5	0	0.75	0	0	0
Baby Calves (<3 months)	--	0.080	9,973	30,558	20,585	27,502	0.00000	0	0	0.5	0	0.75	0	0	0
Total															**4,648**

	Scenario 2 (CARB Emission Factor; ignore rain effects; include calves)		Scenario 3 (USDA AAQTF Emission Factor; include rainfall effects, exclude calves)										Scenario 4 (USDA AAQTF Emission Factor; exclude rainfall effects, include calves)		
Source	PM10 EF (tons/head-yr)	PM10 Emissions (tons/year)	PM10 EF (lb/1000hd-day)	PM10 EF (tons/head-yr)	PM10 Emissions (tons/year)	PM10 Emissions (tons/month)	PM10 redn in Jan and Feb	PM10 Emissions Jan and Feb	PM10 redn in Dec & Mar	PM10 Emissions Dec & Mar	PM10 Emissions other months	Total PM10 Emissions (tons/year)	PM10 EF (lb/1000hd-day)	PM10 EF (tons/head-yr)	PM10 Emissions (tons/year)
	o	p=oxe1	q	r=qx365/(2000x1000)	s=rxe1	t=s/12	u	v=2xtxu	w	x=2xwxt	y=tx8	z=y+x+v	aa	ab=aax365/(2000x1000)	ac=abxe1
Milk cows															
Dry Cows & bred heifers	0.02453	1,265	20	0.00365	188	16	0.5	16	0.75	24	125	165	20	0.00365	188
Heifers (1 yr to breeding)	0.02453	4,048	20	0.00365	602	50	0.5	50	0.75	75	402	527	20	0.00365	602
Calves (3 mos. To 1 year)	0.02453	3,373	0	0.00000	0	0	0.5	0	0.75	0	0	0	20	0.00365	502
Baby Calves (<3 months)	0.02453	675	0	0.00000	0	0	0.5	0	0.75	0	0	0	20	0.00365	100
Total		**9,360**										**692**			**1,393**

PM10 EMISSIONS: 50 % HERD REDUCTION; DAIRY OPERATIONS (CATTLE CORRAL DUST)

	Head Capacity						Scenario 1 (CARB Emission Factor; include rain effects; ignore calves)								
Source	Existing	Support stock to milk cow ratio	Existing Head	Total Head Capacity	Future Head Capacity	50% reduced herd size	PM10 EF (tons/head-yr)	PM10 Emissions (tons/year)	PM10 Emissions (tons/month)	PM10 redn in Jan and Feb	PM10 Emissions Jan and Feb	PM10 redn in Dec & Mar	PM10 Emissions Dec & Mar	PM10 Emissions other months	Total PM10 Emissions (tons/year)
	a	b	c=a x b	d	e=d-c	e1=dx0.5	f	g=fxe1	h=g/12	I	j=2xixh	k	l=2xkxh	m=hx8	n=m+l +j
Milk Cow	124,668														
Dry Cows & bred heifers	--	0.150	18,700	57,297	38,597	28,649	0.02453	703	59	0.5	59	0.75	88	468	615
Heifers (1 yr to breeding)	--	0.480	59,841	183,351	123,510	91,676	0.02453	2,249	187	0.5	187	0.75	281	1,499	1,968
Calves (3 mos. To 1 year)	--	0.400	49,867	152,792	102,925	76,396	0.00000	0	0	0.5	0	0.75	0	0	0
Baby Calves (<3 months)	--	0.080	9,973	30,558	20,585	15,279	0.00000	0	0	0.5	0	0.75	0	0	0
Total															**2,582**

	Scenario 2 (CARB Emission Factor; ignore rain effects; include calves)		Scenario 3 (USDA AAQTF Emission Factor; include rainfall effects, exclude calves)										Scenario 4 (USDA AAQTF Emission Factor; exclude rainfall effects, include calves)		
Source	PM10 EF (tons/head-yr)	PM10 Emissions (tons/year)	PM10 EF (lb/1000hd-day)	PM10 EF (tons/head-yr)	PM10 Emissions (tons/year)	PM10 Emissions (tons/month)	PM10 redn in Jan and Feb	PM10 Emissions Jan and Feb	PM10 redn in Dec & Mar	PM10 Emissions Dec & Mar	PM10 Emissions other months	Total PM10 Emissions (tons/year)	PM10 EF (lb/1000hd-day)	PM10 EF (tons/head-yr)	PM10 Emissions (tons/year)
	o	p=oxe1	q	r=qx365/(2000x1000)	s=rxe1	t=s/12	u	v=2xtxu	w	x=2xwxt	y=tx8	z=y+x+v	aa	ab=aax365/(2000x1000)	ac=abxe1
Milk cows															
Dry Cows & bred heifers	0.02453	703	20	0.00365	105	9	0.5	9	0.75	13	70	91	20	0.00365	105
Heifers (1 yr to breeding)	0.02453	2,249	20	0.00365	335	28	0.5	28	0.75	42	223	293	20	0.00365	335
Calves (3 mos. To 1 year)	0.02453	1,874	0	0.00000	0	0	0.5	0	0.75	0	0	0	20	0.00365	279
Baby Calves (<3 months)	0.02453	375	0	0.00000	0	0	0.5	0	0.75	0	0	0	20	0.00365	56
Total		**5,200**										**384**			**774**

Notes:

f PM10 Emission factor obtained from CARB's Section 7.6 (Cattle Feedlot Dust), March 1989, Emission Inventory Procedural Manual and from USEPA AP42 4th edition; Emission factor assumes a PM10 percent of 48%, based on CARB's Section 7.6. PM10EF = (280lb/1000head-day) x (0.48 PM10) x (365 day/yr) / (2000 lb/ton) = 0.024528 tons/head-year. The emission factor used is for beef cattle in cattle feedlots since PM10 emission factors for support stock at dairy facilities are not available.

i, k According to CARB (personal communication between Mr. Patrick Gaffney), CARB and Ms. Rhodora Del Rosario, BASELINE, on 8/30/99, CARB has not published data that identifies the rainfall volume that would reduce reduce PM10 emissions from feedlot corrals. Based on the lack of data, CARB suggested that published PM10 reductions applied for land preparation be used for feedlot calculations.

q PM10 Emission factor obtained from Confined Livestock Air Quality Committee of the USDA Agricultural Air Quality Committee of the USDA Agricultural Air Quality Task Force, Air Quality Research & Technology Transfer Programs for Concentrated Animal Feeding Operations Air Quality Research and Technoloy Transfer White Paper and Recommendations for Concentrated Animal Feeding Operations, Adopted by USDA Agricultural Air Quality Task Force, Washington D.C., July 19, 2000; emission factor reflects non-annualized value since rainfall effects in Texas would different compared to California.

ROG EMISSIONS FROM EXISTING DAIIRES AND LIMITED EXPANDED DAIRIES

	Existing Conditions[1]									Total Expansion Limit								
Dairy	Milk cows	Dry Cows & bred heifers	Heifers (1 yr to breeding)	Calves (3 mos. To 1 year)	Baby Calves (<3 months)	Total Head	ROG (lb/year)	ROG (ton/year)	Exceed ROG Threshold (ton/year)	Milk cows	Dry Cows & bred heifers	Heifers (1 yr to breeding)	Calves (3 mos. To 1 year)	Baby Calves (<3 months)	Total Expan-sion Head	ROG (lb/year)	ROG (ton/year)	Exceed ROG Threshold (ton/year)
Maximum Limit	*705*	*106*	*338*	*282*	*56*	*1,488*	*19,160*	*9.58*	*no*	--	--	--	--	--	--	--	--	--
1	81	12	39	*32*	*6*	171	2,201	1	no	624	94	300	250	50	1,317	16,958	8	no
2	98	15	47	*39*	*8*	207	2,663	1	no	607	91	291	243	49	1,281	16,496	8	no
3	110	17	53	*44*	*9*	232	2,989	1	no	595	89	286	238	48	1,255	16,170	8	no
4	118	18	56	*47*	*9*	248	3,197	2	no	587	88	282	235	47	1,239	15,962	8	no
5	118	18	56	*47*	*9*	248	3,197	2	no	587	88	282	235	47	1,239	15,962	8	no
6	133	20	64	*53*	*11*	281	3,615	2	no	572	86	275	229	46	1,207	15,545	8	no
7	164	25	79	*66*	*13*	346	4,457	2	no	541	81	260	216	43	1,142	14,703	7	no
8	166	25	80	*66*	*13*	350	4,511	2	no	539	81	259	216	43	1,137	14,648	7	no
9	176	26	85	*71*	*14*	372	4,796	2	no	529	79	254	211	42	1,115	14,364	7	no
10	176	26	85	*71*	*14*	372	4,796	2	no	529	79	254	211	42	1,115	14,364	7	no
11	176	26	85	*71*	*14*	372	4,796	2	no	529	79	254	211	42	1,115	14,364	7	no
12	176	26	85	*71*	*14*	372	4,796	2	no	529	79	254	211	42	1,115	14,364	7	no
13	183	27	88	*73*	*15*	386	4,973	2	no	522	78	251	209	42	1,101	14,186	7	no
14	200	30	96	*80*	*16*	422	5,435	3	no	505	76	242	202	40	1,066	13,724	7	no
15	235	35	113	*94*	*19*	496	6,395	3	no	470	70	225	188	38	991	12,765	6	no
16	235	35	113	*94*	*19*	496	6,395	3	no	470	70	225	188	38	991	12,765	6	no
17	235	35	113	*94*	*19*	496	6,395	3	no	470	70	225	188	38	991	12,765	6	no
18	235	35	113	*94*	*19*	496	6,395	3	no	470	70	225	188	38	991	12,765	6	no
19	236	35	113	*94*	*19*	498	6,414	3	no	469	70	225	188	38	990	12,746	6	no
20	259	39	124	*104*	*21*	546	7,034	4	no	446	67	214	178	36	941	12,126	6	no
21	294	44	141	*118*	*24*	621	7,993	4	no	411	62	197	164	33	867	11,167	6	no
22	298	45	143	*119*	*24*	629	8,099	4	no	407	61	195	163	33	859	11,061	6	no
23	318	48	153	*127*	*25*	671	8,642	4	no	387	58	186	155	31	817	10,517	5	no
24	324	49	155	*129*	*26*	683	8,793	4	no	381	57	183	153	31	805	10,367	5	no
25	326	49	156	*130*	*26*	688	8,860	4	no	379	57	182	152	30	800	10,300	5	no
26	334	50	160	*134*	*27*	705	9,077	5	no	371	56	178	148	30	783	10,083	5	no
27	340	51	163	*136*	*27*	717	9,240	5	no	365	55	175	146	29	770	9,920	5	no
28	341	51	164	*136*	*27*	720	9,272	5	no	364	55	175	146	29	768	9,888	5	no
29	352	53	169	*141*	*28*	743	9,566	5	no	353	53	169	141	28	745	9,593	5	no
30	353	53	169	*141*	*28*	745	9,592	5	no	352	53	169	141	28	743	9,568	5	no
31	353	53	169	*141*	*28*	745	9,592	5	no	352	53	169	141	28	743	9,568	5	no
32	353	53	169	*141*	*28*	745	9,592	5	no	352	53	169	141	28	743	9,568	5	no
33	363	54	174	*145*	*29*	766	9,865	5	no	342	51	164	137	27	722	9,295	5	no
34	376	56	181	*151*	*30*	794	10,231	5	no	329	49	158	131	26	693	8,928	4	no
35	376	56	181	*151*	*30*	794	10,231	5	no	329	49	158	131	26	693	8,928	4	no
36	388	58	186	*155*	*31*	819	10,545	5	no	317	48	152	127	25	669	8,615	4	no
37	388	58	186	*155*	*31*	819	10,551	5	no	317	48	152	127	25	668	8,609	4	no
38	389	58	187	*156*	*31*	821	10,572	5	no	316	47	152	126	25	667	8,588	4	no
39	400	60	192	*160*	*32*	844	10,871	5	no	305	46	146	122	24	644	8,289	4	no
40	408	61	196	*163*	*33*	861	11,088	6	no	297	45	143	119	24	627	8,072	4	no
41	412	62	198	*165*	*33*	869	11,191	6	no	293	44	141	117	23	619	7,969	4	no
42	412	62	198	*165*	*33*	869	11,191	6	no	293	44	141	117	23	619	7,969	4	no
43	412	62	198	*165*	*33*	869	11,191	6	no	293	44	141	117	23	619	7,969	4	no
44	412	62	198	*165*	*33*	869	11,191	6	no	293	44	141	117	23	619	7,969	4	no
45	427	64	205	*171*	*34*	901	11,605	6	no	278	42	133	111	22	587	7,555	4	no
46	441	66	212	*176*	*35*	931	11,985	6	no	264	40	127	106	21	557	7,175	4	no
47	449	67	216	*180*	*36*	947	12,202	6	no	256	38	123	102	20	540	6,957	3	no
48	457	69	219	*183*	*37*	964	12,420	6	no	248	37	119	99	20	523	6,740	3	no
49	459	69	220	*184*	*37*	968	12,474	6	no	246	37	118	98	20	519	6,686	3	no
50	465	70	223	*186*	*37*	981	12,637	6	no	240	36	115	96	19	506	6,522	3	no
51	471	71	226	*188*	*38*	993	12,789	6	no	234	35	113	94	19	495	6,371	3	no
52	471	71	226	*188*	*38*	993	12,789	6	no	234	35	113	94	19	495	6,371	3	no
53	483	72	232	*193*	*39*	1,019	13,126	7	no	222	33	107	89	18	468	6,033	3	no

ROG EMISSIONS FROM EXISTING DAIIRES AND LIMITED EXPANDED DAIRIES

	Existing Conditions[1]									Total Expansion Limit								
Dairy	Milk cows	Dry Cows & bred heifers	Heifers (1 yr to breeding)	Calves (3 mos. To 1 year)	Baby Calves (<3 months)	Total Head	ROG (lb/year)	ROG (ton/year)	Exceed ROG Threshold (ton/year)	Milk cows	Dry Cows & bred heifers	Heifers (1 yr to breeding)	Calves (3 mos. To 1 year)	Baby Calves (<3 months)	Total Expan-sion Head	ROG (lb/year)	ROG (ton/year)	Exceed ROG Threshold (ton/year)
54	486	73	233	*194*	*39*	1,025	13,208	7	no	219	33	105	88	18	462	5,952	3	no
55	496	74	238	*198*	*40*	1,047	13,480	7	no	209	31	100	84	17	441	5,680	3	no
56	497	75	239	*199*	*40*	1,049	13,507	7	no	208	31	100	83	17	439	5,653	3	no
57	503	75	241	*201*	*40*	1,061	13,670	7	no	202	30	97	81	16	426	5,490	3	no
58	517	78	248	*207*	*41*	1,091	14,050	7	no	188	28	90	75	15	397	5,109	3	no
59	518	78	249	*207*	*41*	1,093	14,078	7	no	187	28	90	75	15	395	5,082	3	no
60	531	80	255	*212*	*42*	1,120	14,431	7	no	174	26	84	70	14	367	4,729	2	no
61	547	82	263	*219*	*44*	1,154	14,866	7	no	158	24	76	63	13	333	4,294	2	no
62	550	83	264	*220*	*44*	1,161	14,947	7	no	155	23	74	62	12	327	4,212	2	no
63	553	83	265	*221*	*44*	1,167	15,029	8	no	152	23	73	61	12	321	4,131	2	no
64	559	84	268	*224*	*45*	1,179	15,187	8	no	146	22	70	58	12	308	3,973	2	no
65	562	84	270	*225*	*45*	1,186	15,273	8	no	143	21	69	57	11	302	3,886	2	no
66	565	85	271	*226*	*45*	1,192	15,355	8	no	140	21	67	56	11	295	3,805	2	no
67	571	86	274	*228*	*46*	1,205	15,518	8	no	134	20	64	54	11	283	3,642	2	no
68	579	87	278	*232*	*46*	1,222	15,735	8	no	126	19	60	50	10	266	3,424	2	no
69	588	88	282	*235*	*47*	1,241	15,986	8	no	117	18	56	47	9	246	3,173	2	no
70	588	88	282	*235*	*47*	1,241	15,986	8	no	117	18	56	47	9	246	3,173	2	no
71	595	89	286	*238*	*48*	1,255	16,170	8	no	110	17	53	44	9	232	2,989	1	no
72	600	90	288	*240*	*48*	1,266	16,306	8	no	105	16	50	42	8	222	2,854	1	no
73	601	90	288	*240*	*48*	1,268	16,333	8	no	104	16	50	42	8	219	2,826	1	no
74	632	95	303	*253*	*51*	1,334	17,176	9	no	73	11	35	29	6	154	1,984	1	no
75	637	96	306	*255*	*51*	1,344	17,312	9	no	68	10	33	27	5	143	1,848	1	no
76	642	96	308	*257*	*51*	1,355	17,448	9	no	63	9	30	25	5	133	1,712	1	no
77	645	97	310	*258*	*52*	1,361	17,529	9	no	60	9	29	24	5	127	1,631	1	no
78	650	98	312	*260*	*52*	1,372	17,665	9	no	55	8	26	22	4	116	1,495	1	no
79	651	98	312	*260*	*52*	1,374	17,692	9	no	54	8	26	22	4	114	1,468	1	no
80	676	101	325	*271*	*54*	1,427	18,384	9	no	29	4	14	11	2	60	775	0	no
81	680	102	326	*272*	*54*	1,435	18,480	9	no	25	4	12	10	2	53	679	0	no
82	689	103	331	*276*	*55*	1,454	18,725	9	no	16	2	8	6	1	34	435	0	no
83	696	104	334	*278*	*56*	1,469	18,915	9	no	9	1	4	4	1	19	245	0	no
84	700	105	336	*280*	*56*	1,477	19,024	10	no	5	1	2	2	0	11	136	0	no
85	706	106	339	*282*	*56*	1,490	19,187	10	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
86	715	107	343	*286*	*57*	1,509	19,432	10	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
87	737	111	354	*295*	*59*	1,555	20,029	10	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
88	749	112	360	*300*	*60*	1,580	20,356	10	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
89	752	113	361	*301*	*60*	1,587	20,437	10	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
90	765	115	367	*306*	*61*	1,614	20,782	10	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
91	800	120	384	*320*	*64*	1,688	21,742	11	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
92	801	120	384	*320*	*64*	1,690	21,769	11	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
93	803	120	385	*321*	*64*	1,694	21,823	11	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
94	811	122	389	*324*	*65*	1,711	22,041	11	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
95	820	123	394	*328*	*66*	1,730	22,285	11	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
96	824	124	395	*329*	*66*	1,738	22,381	11	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
97	824	124	395	*329*	*66*	1,738	22,381	11	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
98	824	124	395	*329*	*66*	1,738	22,381	11	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
99	830	125	398	*332*	*66*	1,751	22,557	11	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
100	833	125	400	*333*	*67*	1,758	22,638	11	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
101	869	130	417	*348*	*70*	1,834	23,617	12	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
102	882	132	424	*353*	*71*	1,862	23,980	12	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
103	882	132	424	*353*	*71*	1,862	23,980	12	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
104	882	132	424	*353*	*71*	1,862	23,980	12	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
105	885	133	425	*354*	*71*	1,867	24,052	12	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
106	931	140	447	*372*	*74*	1,964	25,302	13	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
107	968	145	465	*387*	*77*	2,042	26,307	13	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
108	979	147	470	*392*	*78*	2,066	26,606	13	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes

ROG EMISSIONS FROM EXISTING DAIIRES AND LIMITED EXPANDED DAIRIES

	Existing Conditions[1]									Total Expansion Limit								
Dairy	Milk cows	Dry Cows & bred heifers	Heifers (1 yr to breeding)	Calves (3 mos. To 1 year)	Baby Calves (<3 months)	Total Head	ROG (lb/year)	ROG (ton/year)	Exceed ROG Threshold (ton/year)	Milk cows	Dry Cows & bred heifers	Heifers (1 yr to breeding)	Calves (3 mos. To 1 year)	Baby Calves (<3 months)	Total Expan-sion Head	ROG (lb/year)	ROG (ton/year)	Exceed ROG Threshold (ton/year)
109	985	148	473	*394*	*79*	2,078	26,769	13	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
110	989	148	475	*396*	*79*	2,087	26,878	13	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
111	1,000	150	480	*400*	*80*	2,110	27,177	14	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
112	1,000	150	480	*400*	*80*	2,110	27,177	14	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
113	1,023	153	491	*409*	*82*	2,159	27,802	14	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
114	1,026	154	492	*410*	*82*	2,165	27,884	14	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
115	1,027	154	493	*411*	*82*	2,167	27,911	14	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
116	1,028	154	493	*411*	*82*	2,169	27,938	14	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
117	1,029	154	494	*412*	*82*	2,171	27,965	14	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
118	1,103	165	529	*441*	*88*	2,327	29,976	15	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
119	1,117	168	536	*447*	*89*	2,357	30,357	15	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
120	1,118	168	536	*447*	*89*	2,358	30,374	15	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
121	1,140	171	547	*456*	*91*	2,405	30,982	15	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
122	1,149	172	552	*460*	*92*	2,424	31,226	16	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
123	1,154	173	554	*462*	*92*	2,435	31,362	16	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
124	1,157	174	555	*463*	*93*	2,441	31,444	16	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
125	1,176	176	565	*471*	*94*	2,482	31,973	16	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
126	1,190	179	571	*476*	*95*	2,511	32,341	16	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
127	1,200	180	576	*480*	*96*	2,532	32,612	16	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
128	1,232	185	591	*493*	*99*	2,600	33,482	17	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
129	1,235	185	593	*494*	*99*	2,606	33,572	17	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
130	1,253	188	601	*501*	*100*	2,644	34,053	17	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
131	1,319	198	633	*528*	*106*	2,783	35,846	18	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
132	1,353	203	649	*541*	*108*	2,855	36,769	18	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
133	1,371	206	658	*548*	*110*	2,893	37,260	19	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
134	1,400	210	672	*560*	*112*	2,954	38,048	19	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
135	1,640	246	787	*656*	*131*	3,460	44,570	22	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
136	1,641	246	788	*656*	*131*	3,463	44,597	22	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
137	1,830	275	878	*732*	*146*	3,861	49,734	25	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
138	1,859	279	892	*744*	*149*	3,922	50,522	25	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
139	1,879	282	902	*752*	*150*	3,965	51,066	26	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
140	1,925	289	924	*770*	*154*	4,062	52,316	26	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
141	2,154	323	1,034	*862*	*172*	4,545	58,539	29	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
142	2,463	369	1,182	*985*	*197*	5,197	66,937	33	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
143	2,545	382	1,222	*1,018*	*204*	5,370	69,165	35	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
144	2,594	389	1,245	*1,038*	*208*	5,473	70,497	35	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
145	2,600	390	1,248	*1,040*	*208*	5,486	70,660	35	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
146	2,932	440	1,407	*1,173*	*235*	6,187	79,683	40	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
147	4,430	665	2,126	*1,772*	*354*	9,347	120,394	60	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
148	4,889	733	2,347	*1,956*	*391*	10,316	132,868	66	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
149	4,980	747	2,390	*1,992*	*398*	10,508	135,341	68	yes	NA	NA	NA	NA	NA	NA	NA	NA	yes
TOTAL	**124,668**	**18,700**	**59,841**	**49,867**	**9,973**	**263,049**	**3,388,091**	**1,694**		**24,559**	**3,684**	**11,788**	**9,824**	**1,965**	**51,820**		**334**	

[1] Herd size based on year 2000 milk cows in Kings County, obtained from Carol Collar, Farm Advisor U.C, Cooperative

Extension. Support stock based on ratio of milk cows to support stock, as identified in Table 5 of the Dairy Element.

Future Capacity PM10 Emissions from Corrals

Assumes All New Future and Expanded Dairies Subject to Dairy Element 50% Reduction Control Measure
10% Reduced Herd Size

	Uncontrolled Emissions					50% Controlled Emission Reduction from Future New and Expanded Dairies							Controlled Future Conditions	
Animal Type	Existing Head	Future 10% Reduced Total Head Capacity	Emissons from Existing Head (tons/year)	Emissons from 10% Reduced Total Head Capacity (tons/year)	Net Increase in Emissons under Future Conditions (tons per year)	Emissions from Future Expanded and New Dairies (tons/year)	Emissions from Future Expanded and New Dairies (tons/month)	Zero % reduction in Jan and Feb (tons/2months)	25% further reduction in Dec. & Mar. (tons/2 months)	50% reduction from Apr through Nov (tons/8 months)	50% reduction year round (tons/year)	Total Controlled Emission Reduction (tons/year)	Total Future Conditions (tons/year)	Total Net Emission Increase under Future Conditions (tons/year)
Scenario 1														
Milk cows	124,668	343,782	-	-	-	-	-	-	-	-	NA	-	-	-
Dry Cows & bred heifers	18,700	51,567	401	1,107	705	705	59	118	78.42	206	NA	402	803	402
Heifers (1 yr to breeding)	59,841	165,016	1,284	3,542	2,257	2,257	188	376	250.93	658	NA	1,286	2,570	1,286
Calves (3 mos. To 1 year)	49,867	137,513	-	-	-	-	-	-	-	-	NA	-	-	-
Baby Calves (<3 months)	9,973	27,502	-	-	-	-	-	-	-	-	NA	-	-	-
Total	263,049	**725,380**	1,686	4,648	2,963	2,963	247	494	329	864	NA	1,687	3,373	**1,687**
Scenario 2														
Milk cows	124,668	343,782	-	-	-	-	-	NA	NA	NA	-	-	-	-
Dry Cows & bred heifers	18,700	51,567	459	1,265	806	806	67	NA	NA	NA	403	403	862	403
Heifers (1 yr to breeding)	59,841	165,016	1,468	4,048	2,580	2,580	215	NA	NA	NA	1,290	1,290	2,758	1,290
Calves (3 mos. To 1 year)	49,867	137,513	1,223	3,373	2,150	2,150	179.15	NA	NA	NA	1,075	1,075	2,298	1,075
Baby Calves (<3 months)	9,973	27,502	245	675	430	430	35.83	NA	NA	NA	215	215	460	215
Total	263,049	**725,380**	3,394	9,360	5,966	5,966	497	NA	NA	NA	2,983	2,983	6,377	**2,983**
Scenario 3														
Milk cows	124,668	343,782	-	-	-	-	-	-	-	-	NA	-	-	-
Dry Cows & bred heifers	18,700	51,567	60	165	105	105	9	17	11.67	31	NA	60	120	60
Heifers (1 yr to breeding)	59,841	165,016	191	527	336	336	28	56	37.34	98	NA	191	382	191
Calves (3 mos. To 1 year)	49,867	137,513	-	-	-	-	-	-	-	-	NA	-	-	-
Baby Calves (<3 months)	9,973	27,502	-	-	-	-	-	-	-	-	NA	-	-	-
Total	263,049	**725,380**	251	692	441	441	37	73	49	129	NA	251	502	**251**
Scenario 4														
Milk cows	124,668	343,782	-	-	-	-	-	NA	NA	NA	-	-	-	-
Dry Cows & bred heifers	18,700	51,567	68	188	120	120	10	NA	NA	NA	60	60	128	60
Heifers (1 yr to breeding)	59,841	165,016	218	602	384	384	32	NA	NA	NA	192	192	410	192
Calves (3 mos. To 1 year)	49,867	137,513	182	502	320	320	26.66	NA	NA	NA	160	160	342	160
Baby Calves (<3 months)	9,973	27,502	36	100	64	64	5.33	NA	NA	NA	32	32	68	32
Total	263,049	**725,380**	505	1,393	888	888	74	NA	NA	NA	444	444	949	**444**

Future Capacity PM10 Emissions from Corrals

Assumes All New Future and Expanded Dairies Subject to Dairy Element 50% Reduction Control Measure
50% Reduced Herd Size

	Uncontrolled Emissions					50% Controlled Emission Reduction from Future New and Expanded Dairies							Controlled Future Conditions	
Animal Type	Existing Head	Future 50% Reduced Total Head Capacity	Emissons from Existing Head (tons/year)	Emissons from 50% Reduced Total Head Capacity (tons/year)	Net Increase in Emissons under Future Conditions (tons per year)	Emissions from Future Expanded and New Dairies (tons/year)	Emissions from Future Expanded and New Dairies (tons/month)	Zero % reduction in Jan and Feb (tons/2months)	25% further reduction in Dec. & Mar. (tons/2 months)	50% reduction from Apr through Nov (tons/8 months)	50% reduction year round (tons/year)	Total Controlled Emission Reduction (tons/year)	Total Future Conditions (tons/year)	Total Net Emission Increase under Future Conditions (tons/year)
Scenario 1														
Milk cows	124,668	190,990	-	-	-	-	-	-	-	-	NA	-	-	-
Dry Cows & bred heifers	18,700	28,649	401	615	214	214	18	36	23.74	62	NA	122	523	122
Heifers (1 yr to breeding)	59,841	91,676	1,284	1,968	683	683	57	114	75.95	199	NA	389	1,673	389
Calves (3 mos. To 1 year)	49,867	76,396	-	-	-	-	-	-	-	-	NA	-	-	-
Baby Calves (<3 months)	9,973	15,279	-	-	-	-	-	-	-	-	NA	-	-	-
Total	263,049	**402,989**	1,686	2,582	897	897	75	149	100	262	NA	511	2,196	**511**
Scenario 2														
Milk cows	124,668	190,990	-	-	-	-	-	NA	NA	NA	-	-	-	-
Dry Cows & bred heifers	18,700	28,649	459	703	244	244	20	NA	NA	NA	122	122	581	122
Heifers (1 yr to breeding)	59,841	91,676	1,468	2,249	781	781	65	NA	NA	NA	390	390	1,858	390
Calves (3 mos. To 1 year)	49,867	76,396	1,223	1,874	651	651	54.22	NA	NA	NA	325	325	1,548	325
Baby Calves (<3 months)	9,973	15,279	245	375	130	130	10.84	NA	NA	NA	65	65	310	65
Total	263,049	**402,989**	3,394	5,200	1,806	1,806	150	NA	NA	NA	903	903	4,297	**903**
Scenario 3														
Milk cows	124,668	190,990	-	-	-	-	-	-	-	-	NA	-	-	-
Dry Cows & bred heifers	18,700	28,649	60	91	32	32	3	5	3.53	9	NA	18	78	18
Heifers (1 yr to breeding)	59,841	91,676	191	293	102	102	8	17	11.30	30	NA	58	249	58
Calves (3 mos. To 1 year)	49,867	76,396	-	-	-	-	-	-	-	-	NA	-	-	-
Baby Calves (<3 months)	9,973	15,279	-	-	-	-	-	-	-	-	NA	-	-	-
Total	263,049	**402,989**	251	384	133	133	11	22	15	39	NA	76	327	**76**
Scenario 4														
Milk cows	124,668	190,990	-	-	-	-	-	NA	NA	NA	-	-	-	-
Dry Cows & bred heifers	18,700	28,649	68	105	36	36	3	NA	NA	NA	18	18	86	18
Heifers (1 yr to breeding)	59,841	91,676	218	335	116	116	10	NA	NA	NA	58	58	277	58
Calves (3 mos. To 1 year)	49,867	76,396	182	279	97	97	8.07	NA	NA	NA	48	48	230	48
Baby Calves (<3 months)	9,973	15,279	36	56	19	19	1.61	NA	NA	NA	10	10	46	10
Total	263,049	**402,989**	505	774	269	269	22	NA	NA	NA	134	134	639	**134**

10% Herd Reduction Controlled ROG Emissions from Manure Decomposition

Assumes Only New Future Dairies Subject to Dairy Element 50% ROG Reduction Control Measure;
Existing Dairies and Expansion Limits are Exempt from Dairy Element ROG Control Measures

Animal Type	Future Total Head Capacity	10% Reduced Herd Capacity
Milk cows	381,980	343,782
Dry Cows & bred heifers	57,297	51,567
Heifers (1 yr to breeding)	183,351	165,016
Calves (3 mos. To 1 year)	152,792	137,513
Baby Calves (<3 months)	30,558	27,502
Total	**805,978**	**725,380**

Animal Type	Emission Factor (lb/head-yr)	**Existing Dairies**					
		Existing Head	Future Expansion Head Limit[1]	Total Dairy Head (Expansion and Existing)	Emissons from Existing Head (tons/year)	Emissons from Expanded Head (tons/year)	Total Uncontrolled Emissions[2] (tons/yr)
Milk cows	12.88	124,668	24,559	149,227	803	158	961
Dry Cows & bred heifers	12.88	18,700	3,684	22,384	120	24	144
Heifers (1 yr to breeding)	12.88	59,841	11,788	71,629	385	76	461
Calves (3 mos. To 1 year)	12.88	49,867	9,824	59,691	321	63	384
Baby Calves (<3 months)	12.88	9,973	1,965	11,938	64	13	77
Total		263,049	51,820	314,868	1,694	334	2,028

Animal Type	Emission Factor (lb/head-yr)	**New Dairies/Dairy Expansion[3]**				
		10% Reduced Total Head Capacity[4]	Uncontrolled Total Emission (lb/yr)	Uncontrolled Total Emission (ton/yr)	50% Emission Control (ton/yr)	Total Controlled Emissions (ton/yr)
Milk cows	12.88	194,555	2,505,888	1,253	626	626
Dry Cows & bred heifers	12.88	29,183	375,883	188	94	94
Heifers (1 yr to breeding)	12.88	93,387	1,202,830	601	301	301
Calves (3 mos. To 1 year)	12.88	77,822	1,002,355	501	251	251
Baby Calves (<3 months)	12.88	15,564	200,468	100	50	50
Total		410,512	5,287,424	2,644	1,322	1,322

	Future Conditions	
Animal Type	Total Emissions w/Implementation of Control Measure[5]	Total Net Increase in Emissions
Milk cows	**1,587**	**785**
Dry Cows & bred heifers	**238**	**118**
Heifers (1 yr to breeding)	**762**	**377**
Calves (3 mos. To 1 year)	**635**	**314**
Baby Calves (<3 months)	**127**	**63**
Total	**3,350**	**1,656**

Notes:

[1] Future expansion head limit reflects the cumulative maximum number of head that existing individual dairies can expand to, without exceeding the ROG threshold limit of 10 tons/year. Expansion of existing dairies which currently exceed the ROG threshold limit would be subject to the 50% ROG Reduction Control Measure.

[2] Existing dairies which currently exceed the ROG threshold limit would not be subject to the 50% ROG Reduction Control Measure.

[3] New dairies also include the expansion of existing dairies which currently exceed the ROG threshold limit.

[4] Total head reflects total 10% reduced future capacity minus head from existing dairies and head from expansion of existing dairies that are not required to implement the 50% ROG Control Measure.

[5] The 50% ROG Control Measure would be required for all new dairies and expansion of existing dairies which currently exceed the ROG threshold limit.

50% Herd Reduction Controlled ROG Emissions from Manure Decomposition

Assumes Only New Future Dairies Subject to Dairy Element 50% ROG Reduction Control Measure; Existing Dairies and Expansion Limits are Exempt from Dairy Element ROG Control Measures

Animal Type	Future Total Head Capacity	50% Reduced Herd Capacity
Milk cows	381,980	190,990
Dry Cows & bred heifers	57,297	28,649
Heifers (1 yr to breeding)	183,351	91,676
Calves (3 mos. To 1 year)	152,792	76,396
Baby Calves (<3 months)	30,558	15,279
Total	**805,978**	**402,989**

Animal Type	Emission Factor (lb/head-yr)	Existing Dairies					
		Existing Head	Future Expansion Head Limit[1]	Total Dairy Head (Expansion and Existing)	Emissons from Existing Head (tons/year)	Emissons from Expanded Head (tons/year)	Total Uncontrolled Emissions[2] (tons/yr)
Milk cows	12.88	124,668	24,559	149,227	803	158	961
Dry Cows & bred heifers	12.88	18,700	3,684	22,384	120	24	144
Heifers (1 yr to breeding)	12.88	59,841	11,788	71,629	385	76	461
Calves (3 mos. To 1 year)	12.88	49,867	9,824	59,691	321	63	384
Baby Calves (<3 months)	12.88	9,973	1,965	11,938	64	13	77
Total		263,049	51,820	314,868	1,694	334	2,028

Animal Type	Emission Factor (lb/head-yr)	New Dairies/Dairy Expansion[3]				
		50% Reduced Total Head Capacity[4]	Uncontrolled Total Emission (lb/yr)	Uncontrolled Total Emission (ton/yr)	50% Emission Control (ton/yr)	Total Controlled Emissions (ton/yr)
Milk cows	12.88	41,763	537,915	269	134	134
Dry Cows & bred heifers	12.88	6,264	80,687	40	20	20
Heifers (1 yr to breeding)	12.88	20,046	258,200	129	65	65
Calves (3 mos. To 1 year)	12.88	16,705	215,166	108	54	54
Baby Calves (<3 months)	12.88	3,341	43,033	22	11	11
Total		88,121	1,135,000	568	284	284

	Future Conditions	
Animal Type	Total Emissions w/Implementation of Control Measure[5]	Total Net Increase in Emissions
Milk cows	**1,096**	**293**
Dry Cows & bred heifers	**164**	**44**
Heifers (1 yr to breeding)	**526**	**140**
Calves (3 mos. To 1 year)	**438**	**117**
Baby Calves (<3 months)	**88**	**23**
Total	**2,312**	**617**

Notes:

[1] Future expansion head limit reflects the cumulative maximum number of head that existing individual dairies can expand to, without exceeding the ROG threshold limit of 10 tons/year. Expansion of existing dairies which currently exceed the ROG threshold limit would be subject to the 50% ROG Reduction Control Measure.

[2] Existing dairies which currently exceed the ROG threshold limit would not be subject to the 50% ROG Reduction Control Measure.

[3] New dairies also include the expansion of existing dairies which currently exceed the ROG threshold limit.

[4] Total head reflects total 50% reduced future capacity minus head from existing dairies and head from expansion of existing dairies that are not required to implement the 50% ROG Control Measure.

[5] The 50% ROG Control Measure would be required for all new dairies and expansion of existing dairies which currently exceed the ROG threshold limit.

10% Herd Reduction Controlled Methane Emissions from Manure Decomposition

Assumes Only New Future Dairies Subject to Dairy Element 50% Methane Reduction Control Measure; Existing Dairies and Expansion Limits are Exempt from Dairy Element Methane Control Measures

Animal Type	Future Total Head Capacity	10% Reduced Herd Capacity
Milk cows	381,980	343,782
Dry Cows & bred heifers	57,297	51,567
Heifers (1 yr to breeding)	183,351	165,016
Calves (3 mos. To 1 year)	152,792	137,513
Baby Calves (<3 months)	30,558	27,502
Total	**805,978**	**725,380**

Animal Type	Emission Factor (lb/head-yr)	**Existing Dairies**					
		Existing Head	Future Expansion Head Limit[1]	Total Dairy Head (Expansion and Existing)	Emissons from Existing Head (tons/year)	Emissons from Expanded Head (tons/year)	Total Uncontrolled Emissions[2] (tons/yr)
Milk cows	112.56	124,668	24,559	149,227	7,016	1,382	8,398
Dry Cows & bred heifers	112.56	18,700	3,684	22,384	1,052	207	1,260
Heifers (1 yr to breeding)	112.56	59,841	11,788	71,629	3,368	663	4,031
Calves (3 mos. To 1 year)	112.56	49,867	9,824	59,691	2,807	553	3,359
Baby Calves (<3 months)	112.56	9,973	1,965	11,938	561	111	672
Total		263,049	51,820	314,868	14,804	2,916	17,721

Animal Type	Emission Factor (lb/head-yr)	**New Dairies/Dairy Expansion[3]**				
		10% Reduced Total Head Capacity[4]	Uncontrolled Total Emission (lb/yr)	Uncontrolled Total Emission (ton/yr)	50% Emission Control (ton/yr)	Total Controlled Emissions (ton/yr)
Milk cows	112.56	194,555	21,899,144	10,950	5,475	5,475
Dry Cows & bred heifers	112.56	29,183	3,284,872	1,642	821	821
Heifers (1 yr to breeding)	112.56	93,387	10,511,623	5,256	2,628	2,628
Calves (3 mos. To 1 year)	112.56	77,822	8,759,658	4,380	2,190	2,190
Baby Calves (<3 months)	112.56	15,564	1,751,909	876	438	438
Total		410,512	46,207,205	23,104	11,552	11,552

	Future Conditions	
Animal Type	Total Emissions w/Implementation of Control Measure[5]	Total Net Increase in Emissions
Milk cows	**13,873**	**6,857**
Dry Cows & bred heifers	**2,081**	**1,029**
Heifers (1 yr to breeding)	**6,659**	**3,291**
Calves (3 mos. To 1 year)	**5,549**	**2,743**
Baby Calves (<3 months)	**1,110**	**549**
Total	**29,273**	**14,468**

Notes:

[1] Future expansion head limit reflects the cumulative maximum number of head that existing individual dairies can expand to, without exceeding the ROG threshold limit of 10 tons/year. Expansion of existing dairies which currently exceed the ROG threshold limit would be subject to the 50% Reduction Control Measure.

[2] Existing dairies which currently exceed the ROG threshold limit would not be subject to the 50% Reduction Control Measure.

[3] New dairies also include the expansion of existing dairies which currently exceed the ROG threshold limit.

[4] Total head reflects total 10% reduced future capacity minus head from existing dairies and head from expansion of existing dairies that are not required to implement the 50% Control Measure.

[5] The 50% Control Measure would be required for all new dairies and expansion of existing dairies which currently exceed the ROG threshold limit.

50% Herd Reduction Controlled Methane Emissions from Manure Decomposition

Assumes Only New Future Dairies Subject to Dairy Element 50% Reduction Control Measure; Existing Dairies and Expansion Limits are Exempt from Dairy Element Control Measures

Animal Type	Future Total Head Capacity	50% Reduced Herd Capacity
Milk cows	381,980	190,990
Dry Cows & bred heifers	57,297	28,649
Heifers (1 yr to breeding)	183,351	91,676
Calves (3 mos. To 1 year)	152,792	76,396
Baby Calves (<3 months)	30,558	15,279
Total	**805,978**	**402,989**

Animal Type	Emission Factor (lb/head-yr)	Existing Dairies					
		Existing Head	Future Expansion Head Limit[1]	Total Dairy Head (Expansion and Existing)	Emissons from Existing Head (tons/year)	Emissons from Expanded Head (tons/year)	Total Uncontrolled Emissions[2] (tons/yr)
Milk cows	112.56	124,668	24,559	149,227	7,016	1,382	8,398
Dry Cows & bred heifers	112.56	18,700	3,684	22,384	1,052	207	1,260
Heifers (1 yr to breeding)	112.56	59,841	11,788	71,629	3,368	663	4,031
Calves (3 mos. To 1 year)	112.56	49,867	9,824	59,691	2,807	553	3,359
Baby Calves (<3 months)	112.56	9,973	1,965	11,938	561	111	672
Total		263,049	51,820	314,868	14,804	2,916	17,721

Animal Type	Emission Factor (lb/head-yr)	New Dairies/Dairy Expansion[3]				
		50% Reduced Total Head Capacity[4]	Uncontrolled Total Emission (lb/yr)	Uncontrolled Total Emission (ton/yr)	50% Emission Control (ton/yr)	Total Controlled Emissions (ton/yr)
Milk cows	112.56	41,763	4,700,876	2,350	1,175	1,175
Dry Cows & bred heifers	112.56	6,264	705,131	353	176	176
Heifers (1 yr to breeding)	112.56	20,046	2,256,428	1,128	564	564
Calves (3 mos. To 1 year)	112.56	16,705	1,880,351	940	470	470
Baby Calves (<3 months)	112.56	3,341	376,065	188	94	94
Total		88,121	9,918,852	4,959	2,480	2,480

	Future Conditions	
Animal Type	Total Emissions w/Implementation of Control Measure[5]	Total Net Increase in Emissions
Milk cows	**9,574**	**2,557**
Dry Cows & bred heifers	**1,436**	**384**
Heifers (1 yr to breeding)	**4,595**	**1,228**
Calves (3 mos. To 1 year)	**3,829**	**1,023**
Baby Calves (<3 months)	**766**	**205**
Total	**20,201**	**5,396**

Notes:

[1] Future expansion head limit reflects the cumulative maximum number of head that existing individual dairies can expand to, without exceeding the ROG threshold limit of 10 tons/year. Expansion of existing dairies which currently exceed the ROG threshold limit would be subject to the 50% Reduction Control Measure.

[2] Existing dairies which currently exceed the ROG threshold limit would not be subject to the 50% Reduction Control Measure.

[3] New dairies also include the expansion of existing dairies which currently exceed the ROG threshold limit.

[4] Total head reflects total 10% reduced future capacity minus head from existing dairies and head from expansion of existing dairies that are not required to implement the 50% Control Measure.

[5] The 50% Control Measure would be required for all new dairies and expansion of existing dairies which currently exceed the ROG threshold limit.

ROG & Methane Emissions from Manure Decomposition

10% Herd Reduction

Source	Existing	ratio	Head	Future Head (	Future 10% Reduced Total Head Capacity	emission factors (lb/head-year)			emission (lb/year)			emission (ton/year)		
						TOG	Methane	ROG	TOG	Methane	ROG	TOG	Methane	ROG
	a	b	c=axb	c1	c2	d	e	f	g=cxd	h=cxe	I=cxf	j=g/2000	k=h/2000	L=I/2000
Milk cows	124,668	1	124,668	381,980	343,782	160.8	112.56	12.88	55,280,146	38,696,102	4,427,940	27,640	19,348	2,214
Dry Cows & bred heifers		0.150	18,700	57,297	51,567	160.8	112.56	12.88	8,292,022	5,804,415	664,191	4,146	2,902	332
Heifers (1 yr to breeding)		0.480	59,841	183,351	165,016	160.8	112.56	12.88	26,534,557	18,574,190	2,125,418	13,267	9,287	1,063
Calves (3 mos. To 1 year)		0.400	49,867	152,792	137,513	160.8	112.56	12.88	22,112,058	15,478,441	1,771,176	11,056	7,739	886
Baby Calves (<3 months)		0.080	9,973	30,558	27,502	160.8	112.56	12.88	4,422,354	3,095,648	354,231	2,211	1,548	177
Total			**263,050**	**805,978**	**725,380**				116,641,136	81,648,795	9,342,955	**58,321**	**40,824**	**4,671**

50% Herd Reduction

Source	Existing	ratio	Head	Future Head (	Future 50% Reduced Total Head Capacity	emission factors (lb/head-year)			emission (lb/year)			emission (ton/year)		
						TOG	Methane	ROG	TOG	Methane	ROG	TOG	Methane	ROG
	m1	m2	m3=m1xm2	m4	m5	n	o	p	q=mxn	r=mxo	s=mxp	t=q/2000	u=r/2000	v=s/2000
Milk cows	124,668	1	124,668	381,980	190,990	160.8	112.56	12.88	30,711,192	21,497,834	2,459,966	15,356	10,749	1,230
Dry Cows & bred heifers		0.150	18,700	57,297	28,649	160.8	112.56	12.88	4,606,679	3,224,675	368,995	2,303	1,612	184
Heifers (1 yr to breeding)		0.480	59,841	183,351	91,676	160.8	112.56	12.88	14,741,420	10,318,994	1,180,788	7,371	5,159	590
Calves (3 mos. To 1 year)		0.400	49,867	152,792	76,396	160.8	112.56	12.88	12,284,477	8,599,134	983,987	6,142	4,300	492
Baby Calves (<3 months)		0.080	9,973	30,558	15,279	160.8	112.56	12.88	2,456,863	1,719,804	196,795	1,228	860	98
Total			**263,050**	**805,978**	**402,989**				64,800,631	45,360,442	5,190,531	**32,400**	**22,680**	**2,595**

Summary

	emission (lb/year)			**emission (ton/year)**		
Scenario	**TOG**	**Methane**	**ROG**	**TOG**	**Methane**	**ROG**
10% Reduced Herd Capacity	116,641,136	81,648,795	9,342,955	58,321	40,824	4,671
50% Reduced Herd Capacity	64,800,631	45,360,442	5,190,531	32,400	22,680	2,595

Notes:

Existing & Future data From Table No. 5 (Theoretical Dairy Herd Capacity in Kings County)

Ratio of milk cow to support stock for total cattle capacity in Kings County, as provided in Table No. 5(Theoretical Dairy Capacity of Kings County)

Emission factors are from CARB Livestock Waste Methodology and 1988, Radian; assumed emission factor published is for milk cows; adjusted head to equivalent head using Animal Unit (AU) conversion factors.

Ammonia Emissions Generated from Manure Decomposition

Cattle	head	emission factor (lb/animal/yr) NH3	emission (lb/year) NH3	emissions (tons/year) NH3
10% Herd Reduction				
milk cows	343,782	28.37	9,754,196	4,877
dry cows&bred	51,567	28.37	1,463,129	732
heifers (1yr-bred)	165,016	8.54	1,408,777	704
3mo-1yr calves	137,513	3.53	485,365	243
baby calves	27,502	3.53	97,072	49
Total	725,380		13,208,540	6,604
50% Herd Reduction				
milk cows	190,990	28.37	5,418,998	2,709
dry cows&bred	28,649	28.37	812,850	406
heifers (1yr-bred)	91,676	8.54	782,654	391
3mo-1yr calves	76,396	3.53	269,647	135
baby calves	15,279	3.53	53,929	27
Total	402,989		7,338,078	3,669

Notes:
Emission factors obtained from 1994 Battye Report; emission factors reflect stable & storage emission factor components only.

Ammonia Emissions Generated from Manure Decomposition

Cattle	head	emission factor (lb/animal/yr) NH3	emission (lb/year) NH3	emissions (tons/year) NH3
10% Herd Reduction				
milk cows	343,782	74.00	25,439,868	12,720
dry cows&bred	51,567	74.00	3,815,980	1,908
heifers (1yr-bred)	165,016	74.00	12,211,177	6,106
3mo-1yr calves	137,513	74.00	10,175,947	5,088
baby calves	27,502	74.00	2,035,163	1,018
Total	725,380		53,678,135	**26,839**
50% Herd Reduction				
milk cows	190,990	74.00	14,133,260	7,067
dry cows&bred	28,649	74.00	2,119,989	1,060
heifers (1yr-bred)	91,676	74.00	6,783,987	3,392
3mo-1yr calves	76,396	74.00	5,653,304	2,827
baby calves	15,279	74.00	1,130,646	565
Total	402,989		29,821,186	14,911

Notes:
Emission factors obtained from James, T., Freitas, N., Ashbaugh, L., and D. Meyer, 1997, Field Estimates of Ammonia Volatilization from Cattle Production Facilities. In Proceedings of Emission Inventory Specialty Conference, Air and Waste Management Association, Pittsburgh, PA. pp. 259-267.
Emission factor does not speciate between the different cattle types (e.g., heifers, calves, cows) as it reflects the average emission factor for all cattle
types; estimate assumes that ratios of cattle types are similar to the dairy studied
in developing the emission factor.

Methane Generation from Dairy Cattle

Animal type	#cows	Emission Factor (lb CH4/head/year)	Emissions (tons CH4/year)	Notes
10% Herd Reduction				
milk cows	343,782	262.5	45,121	considered mature cows
dry cows&bred	51,567	152	3,919	used beef cattle mature cows since these cows are not milk cows
heifers (1yr-bred)	165,016	134.6	11,106	considered replacement cows from 12 -24 months
3mo-1yr calves	137,513	45.5	3,128	considered replacement cows from 0-12 months
baby calves	27,502	45.5	626	considered replacement cows from 0-12 months
Total	725,380		**63,900**	
50% Herd Reduction				
milk cows	190,990	262.5	25,067	considered mature cows
dry cows&bred	28,649	152	2,177	used beef cattle mature cows since these cows are not milk cows
heifers (1yr-bred)	91,676	134.6	6,170	considered replacement cows from 12 -24 months
3mo-1yr calves	76,396	45.5	1,738	considered replacement cows from 0-12 months
baby calves	15,279	45.5	348	considered replacement cows from 0-12 months
Total	402,989		**35,500**	

Notes:
Emission factors obtained from CARB and Radian Report

URBEMIS 7G: Version 3.1

File Name: 99233ALL.URB
Project Name: 5000-Cow Dairy, Dairy Element
Project Location: San Joaquin Valley

DETAILED REPORT
(Tons/Year)

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2020 Temperature (F): 100 Season: Annual

EMFAC Version: EMFAC7G (10/96)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
5000-cow dairy	84.00 trips / trips/dairy	76.00	6,384.00

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Duty Autos	30.00	1.16	98.58	0.26
Light Duty Trucks	30.00	0.13	99.54	0.33
Medium Duty Trucks	0.00	1.44	98.56	
Lite-Heavy Duty Trucks	0.00	19.56	40.00	40.44
Med.-Heavy Duty Trucks	33.00	19.56	40.00	40.44
Heavy-Heavy Trucks	7.00			100.00
Urban Buses	0.00			100.00
Motorcycles	0.00		100.00 % all fuels	

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.3	7.3
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip Speeds (mph)	55	55	55	55	55	55
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
5000-cow dairy				60.0	20.0	20.0

UNMITIGATED EMISSIONS

	ROG	NOx	PM10
5000-cow dairy	4.01	38.39	1.15
TOTAL EMISSIONS (tons/year)	4.01	38.39	1.15

Does not include correction for passby trips.
Does not include double counting adjustment for internal trips.

URBEMIS 7G: Version 3.1

File Name: 9923310P.URB
Project Name: 10% Herd Reduction, Dairy Element
Project Location: San Joaquin Valley

DETAILED REPORT
(Tons/Year)

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2020 Temperature (F): 100 Season: Annual

EMFAC Version: EMFAC7G (10/96)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
5000-cow dairy	84.00 trips / trips/dairy	69.00	5,796.00

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Duty Autos	30.00	1.16	98.58	0.26
Light Duty Trucks	30.00	0.13	99.54	0.33
Medium Duty Trucks	0.00	1.44	98.56	
Lite-Heavy Duty Trucks	0.00	19.56	40.00	40.44
Med.-Heavy Duty Trucks	33.00	19.56	40.00	40.44
Heavy-Heavy Trucks	7.00			100.00
Urban Buses	0.00			100.00
Motorcycles	0.00	100.00 % all fuels		

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.3	7.3
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip Speeds (mph)	55	55	55	55	55	55
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
5000-cow dairy				60.0	20.0	20.0

UNMITIGATED EMISSIONS

	ROG	NOx	PM10
5000-cow dairy	3.64	34.85	1.04
TOTAL EMISSIONS (tons/year)	3.64	34.85	1.04

Does not include correction for passby trips.
Does not include double counting adjustment for internal trips.

URBEMIS 7G: Version 3.1

File Name: 9923350P.URB
Project Name: 50% Herd Reduction, Dairy Element
Project Location: San Joaquin Valley

DETAILED REPORT
(Tons/Year)

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2020 Temperature (F): 100 Season: Annual

EMFAC Version: EMFAC7G (10/96)

Summary of Land Uses:

Unit Type	Trip Rate	Size	Total Trips
5000-cow dairy	84.00 trips / trips/dairy	38.00	3,192.00

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Duty Autos	30.00	1.16	98.58	0.26
Light Duty Trucks	30.00	0.13	99.54	0.33
Medium Duty Trucks	0.00	1.44	98.56	
Lite-Heavy Duty Trucks	0.00	19.56	40.00	40.44
Med.-Heavy Duty Trucks	33.00	19.56	40.00	40.44
Heavy-Heavy Trucks	7.00			100.00
Urban Buses	0.00			100.00
Motorcycles	0.00	100.00 % all fuels		

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.3	7.3
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip Speeds (mph)	55	55	55	55	55	55
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
5000-cow dairy				60.0	20.0	20.0

UNMITIGATED EMISSIONS

	ROG	NOx	PM10
5000-cow dairy	2.00	19.19	0.57
TOTAL EMISSIONS (tons/year)	2.00	19.19	0.57

Does not include correction for passby trips.
Does not include double counting adjustment for internal trips.