APPENDIX B

AIR QUALITY TECHNICAL REPORT

Prepared for

County of San Bernardino
Land Use Services Department
Advance Planning Division
385 N. Arrowhead Ave., First Floor
San Bernardino, CA 92415-0182

URS Project No. 27655127.00200

URS

1615 Murray Canyon Road, Suite 1000
San Diego, CA 92108-4314
Phone: 619.294.9400
Fax: 619.293.7920

Nursery Products - Composting Facility
Combustion Sources - Operational Equipment

Equipment Type	Fuel Type	Horsepower [2]	Hours/Day Per Unit
Rubber Tired Loaders #1	D	165	8 hrs/day
Rubber Tired Loaders #2	D	165	8 hrs/day
Rubber Tired Loaders #3	D	165	8 hrs/day
Rubber Tired Loaders #4	D	165	4 hrs/day
Misc Screen	D	190	7 hrs/day
Large Grinder	D	1000	8 hrs/month
Water Truck	D	425	3 hrs/day
Site Truck	D	425	.5 hrs/day
Windrow Turner	D	550	2 hrs/day

1. Includes water truck, and one on-site truck
2.As assumed by manufacturer specs for similar equipment
Water truck assumes dust control of road from site to Hy 58

Sum of Ems Factor #/hr		Year	Pollutant			
		2006				
Eq Name	Hp	CO	NOx	PM10	SOx	VOC
Bore/Drill Rigs	Composite	0.483	1.398	0.055	0.328	0.083
Cement and Mortar Mixers	Composite	0.047	0.081	0.006	0	0.011
Concrete/Industrial Saws	Composite	0.449	0.799	0.075	0.128	0.15
Cranes	Composite	0.36	1.095	0.056	0.196	0.094
Crawler Tractors	Composite	0.65	1.564	0.103	0.232	0.166
Crushing/Proc. Equipment	Composite	0.877	1.796	0.128	0.268	0.228
Dumpers/Tenders	Composite	0.044	0.077	0	0	0
Excavators	Composite	0.476	1.23	0.065	0.243	0.109
Forklifts	Composite	0.263	0.482	0.052	0	0.084
Generator Sets	Composite	0.33	0.678	0.05	0.001	0.098
Graders	Composite	0.553	1.537	0.079	0.276	0.135
Off-Highway Tractors	Composite	0.716	2.011	0.097	0.31	0.176
Off-Highway Trucks	Composite	0.684	2.93	0.102	0.494	0.199
Other Construction Equipment	Composite	0.592	1.432	0.066	0.223	0.121
Pavers	Composite	0.442	0.849	0.062	0.165	0.109
Paving Equipment	Composite	0.414	0.934	0.067	0.144	0.11
Plate Compactors	Composite	0.026	0.041	0.002	0	0.009
Rollers	Composite	0.368	0.738	0.055	0.139	0.086
Rough Terrain Forklifts	Composite	0.451	0.846	0.079	0.15	0.112
Rubber Tired Dozers	Composite	1.106	2.919	0.117	0.452	0.219
Rubber Tired Loaders	Composite	0.432	1.187	0.068	0.221	0.109
Scrapers	Composite	0.909	3.051	0.124	0.496	0.23
Signal Boards	Composite	0.097	0.193	0.013	0.024	0.023
Skid Steer Loaders	Composite	0.213	0.299	0.029	0.067	0.055
Surfacing Equipment	Composite	0.72	1.899	0.07	0.307	0.104
Tractors/Loaders/Backhoes	Composite	0.421	0.834	0.084	0.115	0.128
Trenchers	Composite	0.373	0.625	0.054	0.127	0.094
Welders	Composite	0.234	0.326	0.034	0	0.081

Construction Phase: Combustion Emissions from Equipment

Equipment Type	Fuel Type	Unit Count	Horse power[1]	SCAQMD CEQA Typical Load Factor	Hours/Day Per Unit	Emission Factor (CARB - OFFROAD)					LF Adjusted EF (lbs/hr)					1-HR Emission Rates (lbs/hr)					Daily Emissions (lbs)				
						HC	CO	NOx	PM	SO2	HC	CO	NOx	PM	SO2	HC	CO	NOx	PM	SO2	HC	CO	NOx	PM	SO2
Graders	D	2	250	0.59	8	0.135	0.553	1.537	0.079	0.276	0.080	0.326	0.907	0.047	0.163	0.159	0.653	1.814	0.093	0.326	1.274	5.220	14.509	0.746	2.605
Rubber Tired Loaders	D	1	165	0.59	8	0.109	0.432	1.187	0.068	0.221	0.064	0.255	0.700	0.040	0.130	0.064	0.255	0.700	0.040	0.130	0.514	2.039	5.603	0.321	1.043
Off-Highway Trucks	D	1	430	0.59	8	0.199	0.684	2.93	0.102	0.494	0.117	0.404	1.729	0.060	0.291	0.117	0.404	1.729	0.060	0.291	0.939	3.228	13.830	0.481	2.332
TOTAL																					2.728	10.488	33.942	1.548	5.980

1 Emission Factors uses Composite values as given by SCAQMD - CARB Off-Road
2 Emission Factors taken from SCAQMD off-road compilation.

SCAQMD Off-road Mobile Source Emission Factors: http://www.aqmd.gov/ceqa/handbook/offroad/offroad.html

Operation Phase: Combustion Emissions from Grading and Loading/Unloading Equipment

Equipment Type	Fuel Type	Unit Count	Horse power[1]	SCAQMD CEQA Typical Load Factor	Hours/Day Per Unit	Emission Factor (CARB - OFFROAD)[2]					LF Adjusted EF (lbs/hr)					Daily Emissions (lbs)				
						HC	CO	NOx	PM	SO2	HC	CO	NOx	PM	SO2	HC	CO	NOx	PM	SO2
Graders	D	1	250	0.59	8	0.135	0.553	1.537	0.079	0.276	0.080	0.326	0.907	0.047	0.163	0.637	2.610	7.255	0.373	1.303
Rubber Tired Loaders	D	1	165	0.59	8	0.109	0.432	1.187	0.068	0.221	0.064	0.255	0.700	0.040	0.130	0.514	2.039	5.603	0.321	1.043
Off-Highway Trucks	D	1	430	0.59	8	0.199	0.684	2.93	0.102	0.494	0.117	0.404	1.729	0.060	0.291	0.939	3.228	13.830	0.481	2.332
Total																2.091	7.878	26.687	1.175	4.678

1 Emission Factors uses "Composite" values as given by SCAQMD - CARB Off-Road
2 Emission Factors taken from SCAQMD off-road compilation.

SCAQMD Off-road Mobile Source Emission Factors: http://www.aqmd.gov/ceqa/handbook/offroad/offroad.html

Operation Phase: Combustion Emissions from On-Site Operational Equipment

Equipment Type		Fuel Type	Unit Count	Horse power	SCAQMD CEQA Typical Load Factor	Hours/Day Per Unit [4]	Emission Factor (lb/hr) [1]					LF Adjusted EF (lbs/hr)					1-HR Emission Rates (lbs/hr)					Daily Emissions (lbs)				
							HC	CO	NOx	PM	SO2	HC	CO	NOx	PM	SO2	HC	CO	NOx	PM	SO2	HC	CO	NOx	PM	SO2
Rubber Tired Loaders		D[5]	3	165	0.59	8	0.109	0.432	1.187	0.068	0.221	0.064	0.255	0.700	0.040	0.130	0.193	0.765	2.101	0.120	0.391	1.543	6.117	16.808	0.963	3.129
Rubber Tired Loaders		D[5]	1	165	0.59	4	0.109	0.432	1.187	0.068	0.221	0.064	0.255	0.700	0.040	0.130	0.064	0.255	0.700	0.040	0.130	0.257	1.020	2.801	0.160	0.522
Misc Screen		D[3]	1	190	0.59	7	0.13	1.05	4.56	0.13	0.015	0.079	0.617	2.690	0.078	0.009	0.079	0.617	2.690	0.078	0.009	0.552	4.316	18.833	0.549	0.063
Large Grinder		D[3]	1	1000	0.59	0.266667	0.70	5.50	24.00	0.70	0.081	0.415	3.245	14.160	0.413	0.048	0.415	3.245	14.160	0.413	0.048	0.111	0.865	3.776	0.110	0.013
Off-Highway Trucks	(Water Truck)	D[5]	2	425	0.59	3	0.199	0.684	2.93	0.102	0.494	0.117	0.404	1.729	0.060	0.291	0.235	0.807	3.457	0.120	0.583	0.704	2.421	10.372	0.361	1.749
Off-Highway Trucks	(Site Truck)	D[5]	2	425	0.59	0.5	0.199	0.684	2.93	0.102	0.494	0.117	0.404	1.729	0.060	0.291	0.235	0.807	3.457	0.120	0.583	0.117	0.404	1.729	0.060	0.291
Windrow Turner		D[2]	1	550	0.59	2	0.176	0.716	2.011	0.097	0.310	0.104	0.422	1.186	0.057	0.183	0.104	0.422	1.186	0.057	0.183	0.208	0.845	2.373	0.114	0.366
Total																						3.493	15.988	56.692	2.319	6.133

Assumed green material to use tub grinder for was done every 2-3 days as suggested.
1 Assumed CARB offroad Emission Factors as taken from SCAQMD Website
2 Assumed Offroad Emission Factor for Off-Highway Tractors

3. HP values as assumed by manufacturer data from similar equipment (Grinder: Based on Vermeer TG7000)
(Misc Screen: basedon Morbark Model PT737)
4. Hours per day are as given by client for a 24 hour operational schedule
5. Rubber Tired Loaders and Off Highway Trucksare seperated acccording to type of usage
There are four loaders on the list and half will run during the day and half at night. The turner will run half during the day and half at night. In general the equipment will run half during the day and half at night during the second shift. Assumed max capacity of biosolids and green material in hours of ope

Calculations for Emissions from Cosntruction Site Fugitive Dust

Constants:

Material silt content (s) (%)	9.2	AP-42, Table 13.2.2-1 for construction site, used for emission calculation of material handling.(clay and dirt mix)
Material moisture content (M) (%)	10	This value is the average moisture content for clay/dirt mix (assumed ground composition for facility)
Mean Vehicle Speed (S) (mph)	5	
PM10 Scaling Factor	0.75	For bulldozing only. AP-42, Table 11.9-1.
PM10 Scaling Factor	0.6	For grading only. AP-42, Table 11.9-1
Mean Wind Speed (mph)	10.9	1992-2002 Annual average wind speed measured at the DAGGETT-BARSTOW AP, California Climate Data Archive, http://www.calclim.dri.edu/ccda/stationlist.html, accessed 06/20/2006.
Water Suppression Control Efficiency	90%	Daily multiple watering
Compost Material Moisture content (%)	55	As taken from http://compost.css.cornell.edu/calc/moisture_content.html for incoming compost material

TABLE 3-1 EMISSIONS FROM BULLDOZING AND DIRT PUSHING OPERATION

Construction Phase

Equipment	Phase	Controlled PM10 EF (lbs/hr)or (lb/VMT)- for grader [1]	Maximum Miles Per day	No. Of Unit	Hrs/Day/ Unit	Hours per Year	Daily Emissions (lbs)	Annual Emissions (lbs)	24-HR (lbs/hr)	PM10 Emission Rate	
										24-HR (g/s)	Annual (g/s)
Excavator - Loader	Phase I	0.0833		1	8	352	0.67	29.33	0.0278	0.0035	0.0004
Dump Truck	Phase I	0.0833		1	8	352	0.67	29.33	0.0278	0.0035	0.0004
Excavator - Motor Grader	Phase I	0.0765	3.3400	2	8	352	0.26	53.86	0.0106	0.0013	0.0008
Total							**1.59**				

1. Using bulldozer equation in AP-42, Table 11.9-1 for all equipment (except grading which uses Grading equation in AP-42 Table 11.9-1) with the 90% control efficiency of water suppression .

Operation Phase

Equipment	Phase	Controlled PM10 EF (lbs/hr) or (lb/VMT)- for grader [1]	Maximum Miles Per day	No. Of Unit	Hrs/Day/ Unit	Hours per Year	Daily Emissions (lbs)	Annual Emissions (lbs)	24-HR (lbs/hr)	PM10 Emission Rate	
										24-HR (g/s)	Annual (g/s) - First Year
Excavator - Loader	Phase II	0.0833		1	8	480	0.67	39.99	0.028	0.0035	0.0006
Dump Truck	Phase II	0.0833		1	8	480	0.67	39.99	0.028	0.0035	0.0006
Excavator - Motor Grader	Phase II	0.0765	3.3400	1	8	480	0.26	15.33	0.011	0.0013	0.0002
Total							**1.59**				

1. Using bulldozer equation in AP-42, Table 11.9-1 for all equipment with the 90% control efficiency of water suppression .

TABLE 3-2 EMISSIONS FROM AGGREGATE HANDLING AND STORAGE

Construction Phase

Daily Compost Handled (tons)[3]	Uncontrolled EF (lbs/ton of dirt handled) [1]	Daily PM10 (lbs)	No. Of Days per Year	Annual PM10 Emission (lbs)	24-HR Emission Rate(lbs/hr)	Annual Emission Rate (lbs/hr)	24-Hr Emission Rate (g/s)	Annual Emission Rate (g/s)
1100	2.9795E-05	3.2775E-02	305	9.996	1.37E-03	0.001141127	1.72E-04	1.438E-04
2000	2.9795E-05	5.9590E-02	305	18.175	2.48E-03	0.002074777	3.13E-04	2.614E-04

1. Calculated using AP-42 Section 13.2.4, Equation. 1
2. No Control Suppression

Operation Phase

Daily Compost Handled (tons)[3]	Uncontrolled EF (lbs/ton) [1]	Daily PM10 (lbs)	No. Of Days per Year	Annual PM10 Emission (lbs)	24-HR Emission Rate(lbs/hr)	Annual Emission Rate (lbs/hr)	24-Hr Emission Rate (g/s)	Annual Emission Rate (g/s)
1100	2.9795E-05	3.2775E-02	365	11.963	1.37E-03	0.001365611	1.72E-04	1.721E-04
2000	2.9795E-05	5.9590E-02	365	21.750	2.48E-03	0.00248293	3.13E-04	3.128E-04

1. Calculated using AP-42 Section 13.2.4, Equation. 1
2. No Control Suppression

TABLE 3-3 EMISSIONS FROM VEHICLE TRAFFIC ON UNPAVED ROAD AND PARKING LOT

Construction Phase

Vehicle Type	Mean Vehicle Weight (tons)[5]	Uncontr. PM10 EF (lbs/VMT) [1]	Adj. PM10 EF (lbs/VMT) [2]	No. Of Unit	Round Trips /Day/ Unit[3]	Round Trip Distance (mile)[4]	Daily VMT (all units)	Water Suppression Efficiency	Controlled Hourly Emission Rate (lbs/hr)	Daily Emissions (lbs)	First Year- Total No. of Days Operated	VMT/ First Year	First Year Emissions (lbs)	First Year Annual Emission Rate (lbs/hr)
Loaders	4	1.34	1.27	6	8	0.50	24	0.9	0.127	3.040	305	7320	927.33	0.13
Water Truck	29	3.28	3.09	1	72	0.25	18	0.9	0.232	5.561	365	6570	2029.75	0.23
General Site HD Truck	8	1.84	1.73	1	12	0.50	6	0.9	0.043	1.038	365	2190	378.99	0.04
Total Unpaved Road										9.640				
Worker's Vehicles in Parking lot[6]	2	0.98	0.93	5	2	0.25	2.40	0.9	0.009	0.223	365	876	81.24	0.01

Operation Phase

Vehicle Type	Mean Vehicle Weight (tons) [5]	Uncontr. PM10 EF (lbs/VMT) [1]	Adj. PM10 EF (lbs/VMT) [2]	No. Of Unit	Round Trips /Day/ Unit[3]	Round Trip Distance (mile)[4]	Daily VMT (all units)	Water Suppression Efficiency	Controlled Hourly Emission Rate (lbs/hr)	Daily Emissions (lbs)	Subsequent Years Total No. of Days Operated	VMT/ Year (subsequent Years)	Subsequent Years Emissions (lbs)	Subsequent Years Annual Emission Rates (lbs/hr)
Compost Delivery trucks[7]	30	3.33	3.14	48	1	0.50	24	0.9	0.314	7.529	365	8760	2747.94	0.3137
Turner	12.5	2.24	2.12	1	5	1.00	5	0	0.441	10.577	365	1825	3860.74	0.4407
General Site HD Truck	8	1.84	1.73	1	2	0.50	1	0.9	0.007	0.173	365	365	63.17	0.0072
Loader	4	1.34	1.27	4	28	0.50	56	0.9	0.296	7.094	365	20440	2589.44	0.2956
Water Truck	29	3.28	3.09	1	9	0.25	2.25	0.9	0.029	0.695	365	821.25	253.72	0.0290
Total Unpaved Road (no Delivery Trucks)										18.540				
Total Unpaved Road										26.069				
Worker's Vehicles in Parking lot[6]	2	0.98	0.93	5	2	0.25	2.40	0.9	0.009	0.223	365	876	81.24	0.0093

1. AP-42, Section 13.2.2, Equation 1a.
2. AP-42, Section 13.2.2, Equation 2. Estimated 21 days with precipitation > 0.01 inch, according to historical precipitation data collected at Barstow, CA, Western Regional Climate Center, http://www.wrcc.dri.edu/summary/climsmsca.html, accessed 06/20/06.
3. Round trips/day uses 1 trip per hour for service trucks, and pickups for construction phase 1, and 2 trips per day under regular operation. Water trucks operate 3 times per hour. Dump trucks average 48 per day
4. Distances measured from plot plan from highway along access road to center of construction area and parking lot.
5. Mean Weight as Estimated by Equipment Usage as given by client
6. Average number of workers (10)/1.25 persons per vehicle.
7. Assumes Average load of compost per day = 1100TPD

Access Road Unpaved Emissions

Vehicle Type	Mean Vehicle Weight (tons) [5]	Uncontr. PM10 EF (lbs/VMT) [1]	Adj. PM10 EF (lbs/VMT) [2]	No. Of Unit	#Trips /Day/ Unit	One-Way Trip Distance (mile)	Daily VMT (all units)	Water Suppression Efficiency	Controlled ER for 24-HR Standard (lbs/hr)	Daily Emissions (lbs)	Subsequent Years Total No. of Days Operated	VMT/ Year (subsequent Years)	Subsequent Years Emissions (lbs)	Subsequent Years Annual Emission Rates (lbs/hr)
Compost Delivery trucks Loaded	30	3.33	3.14	48	1	0.95	45.5	0.9	0.594	14.259	365	16591	5204.43	0.5941
Compost Delivery trucks Unloaded	7	1.73	1.63	48	1	0.95	45.5	0.9	0.309	7.407	365	16591	2703.72	0.3086
										21.7 total lb/day			7908.15	total lb/yr
													3.95	total ton/yr

TOTAL Fugitive Dust from Construction	33.18	lb/day
TOTAL Fugitive Dust from Operations	49.38	lb/day

NOTE does not include Fugitive dust from Windrow Turning

Calculations for Fugitive Dust Emissions from Windrow Turning

Constants:

Mean Wind Speed (mph)	10.9	1992-2002 Annual average wind speed measured at the DAGGETT-BARSTOW AP, California Climate Data Archive, http://www.calclim.dri.edu/ccda/stationlist.html, accessed 06/20/2006.
Compost Material Moisture content (%) at 30 days	30	As interpolated from an assumed a final compost moisture content of 5%
Compost Material Moisture content (%) at 45 days	17.5	As interpolated from an assumed a final compost moisture content of 5%

TABLE 3-1 EMISSIONS FROM AGGREGATE HANDLING AND STORAGE

Year 1

Daily Compost Handled (tons)	Uncontrolled EF (lbs/ton of dirt handled) [1]	Daily PM10 (lbs)	No. Of Days per Year	Annual PM10 Emission (lbs)	24-HR Emission Rate(lbs/hr)	Annual Emission Rate (lbs/hr)	24-Hr Emission Rate (g/s)	Annual Emission Rate (g/s)
1100	1.0883E-04	1.1971E-01	305	36.512	4.99E-03	0.004168073	6.28E-04	5.252E-04
2000	1.0883E-04	2.1766E-01	305	66.386	9.07E-03	0.007578315	1.14E-03	9.549E-04

1. Calculated using AP-42 Section 13.2.4, Equation. 1
2. No Control Suppression

Subsequent Years

Daily Compost Handled (tons)	Uncontrolled EF (lbs/ton) [1]	Daily PM10 (lbs)	No. Of Days per Year	Annual PM10 Emission (lbs)	24-HR Emission Rate(lbs/hr)	Annual Emission Rate (lbs/hr)	24-Hr Emission Rate (g/s)	Annual Emission Rate (g/s)
1100	1.0883E-04	1.1971E-01	365	43.695	4.99E-03	0.004988022	6.28E-04	6.285E-04
2000	1.0883E-04	2.1766E-01	365	79.446	9.07E-03	0.00906913	1.14E-03	1.143E-03

1. Calculated using AP-42 Section 13.2.4, Equation. 1 using assumed maisture content for compost

CALCULATIONS FOR EMISSIONS FROM CONSTRUCTION RELATED ONROAD VEHICLES

TABLE 4-1 EMISSION FACTOR FOR ONROAD VEHICLES

Onroad Vehicle	Fuel Type	Vehicle Count	Weight (lbs)	Vehicle Type	EF (g/mile) [1,2]				
					TOC	CO	NOx	PM10	SO2
Highway Vehicles									
Passenger Vehicles [4]	G/D	5	4000	LDA	1.31E-01	3.01E+00	3.33E-01	2.90E-02	3.00E-03

1. EMFAC2002, San Bernardino County annual average in 2007.
2. EMFAC parameters at 65*F and 55 Relative humidity
3. Weight as estimated in Fugitive Emission Sheet
4. all fuels at 50MPH

TABLE 4-2 EMISSION CALCULATION FOR ONROAD VEHICLES

Onroad Vehicles	Total Hours Required [3]	Total Days / Year	Number of One-Way Trips / Day / Unit	One Way Trip Distance (mile)	Daily Total VMT	Daily Emissions (lbs)				
						TOC	CO	NOx	PM10	SO2
Highway Vehicles										
Passenger Vehicles [2]	2	365	2	50	500	0.144	3.318	0.367	0.032	0.003

1. Based on Fully Operational Facility
2. Assumed all workers travel from Barstow
3. as assumed given delivery schedule as given by NP

EMISSION CALCULATIONS FOR CONSTRUCTION RELATED ONROAD VEHICLES

TABLE 4-1 EMISSION FACTOR FOR ONROAD VEHICLES

Onroad Vehicle	Fuel Type	Vehicle Count	Weight (lbs)	Vehicle Type	EF (g/mile) [1,2]				
					TOC	CO	NOx	PM10	SO2
Highway Vehicles									
Truck - Compost Semi Empty [4]	D	1	14000	LHD	1.07E-01	1.36E+00	1.43E+00	3.50E-02	5.00E-03
Compost Delivery Truck [4]	D	1	60000	HHD	5.63E-01	3.73E+00	1.27E+01	2.24E-01	2.00E-02

1. EMFAC2002, San Bernardino County annual average in 2007.
2. EMFAC parameters at 65*F and 55 Relative humidity
3. Weight as estimated in Fugitive Emission Sheet
4. all fuels at 50MPH

TABLE 4-2 EMISSION CALCULATION FOR ONROAD VEHICLES

Onroad Vehicles	Total Hours Required [3]	Total Days / Year	Number of One-Way Trips / Day / Unit	One Way Trip Distance (mile)	Daily Total VMT	Daily Emissions (lbs)					Annual Emissions (lbs)			
						TOC	CO	NOx	PM10	SO2	TOC	CO	NOx	PM10
Highway Vehicles														
Heavy Duty Compost Semi - Outbound Empty [3]	3	365	14	100	1353.8	0.319	4.065	4.256	0.104	0.015	117	1,484	1,554	38
Heavy Duty Compost Semi - Inbound full [3]	13	365	88	100	8800	10.922	72.441	246.386	4.346	0.388	3,987	26,441	89,931	1,586
Compost Semi - Outbound Full [3]	13	365	74	100	7446.2	9.242	61.297	208.481	3.677	0.328	3,373	22,373	76,095	1,342
Total					**Total**	**20 lbs**	**138 lbs**	**459 lbs**	**8 lbs**	**1 lbs**	**7477 lbs**	**50298 lbs**	**167580 lbs**	**2966 lbs**
					Total						**3.7 tons**	**25.1 tons**	**83.8 tons**	**1.5 tons**

1. Based on Fully Operational Facility
2. Assumed all workers travel from Barstow
3. Averagedistance for travel within the Inland Empire (location of both source and destination of compost)
3. as assumed given delivery schedule as given by NP

Theory of odor dispersion modeling. A dispersion modeling analysis was conducted to obtain a quantitative estimate of potential odor impacts from the windrow operations of the proposed Nursery Products composting facility. Active windrow composting emissions are considered to be the most important source of odors from this type of facility.

The quantitative measure of odor level is typically expressed in terms of a dilution to threshold (D/T) ratio. For example the 'detection threshold' is the minimum amount of odor-free dilution air volume multiples needed to just prevent an individual from detecting the odor. This threshold varies from person to person. The 'recognition threshold' occurs at lower dilutions (higher concentrations) and represents the D/T ratio at which characteristics such as odor's character and relative pleasantness are noticeable. Finally, the 'annoyance threshold' is the strength at which people complain about an odor. As the D/T increases, individuals generally consider the odor to be stronger.

Based on information provided by Nursery Products, LLC, a model simulation was conducted for the full project buildout scenario, i.e., windrows over most of the approximately 0.5 mile x 0.5 mile site area. The design layout for the composting site is approximate. The Industrial Source Complex Short Term 3 (ISCST3), a standard EPA dispersion model, was used to simulate the dilution of odorous substances during atmospheric transport of these odors from the facility to points just offsite and nearby residences. Rings of receptors were placed at the distances to the residences, as well as gridded receptors surrounding the site boundary. Meteorological data used for the modeling consisted of three years of surface data obtained from the Barstow/Dagget Air Field for the years 1988 through 1990 combined with twice daily upper-air soundings from Desert Rock. Rural dispersion coefficients were selected based on the rural character and remoteness of the site from the nearest communities.

Based on odor measurements conducted at another composting facility processing similar feedstock materials, an initial odor concentration of 170 D/T was used for a feedstock blend of green wastes and biosolids. This emission strength was assumed for a total of 100 volume sources (15 feet by 15 feet by 12 feet high) arrayed across the entire site in 20 hypothetical windrows. Use of this maximum observed odor intensity for all windrows on the site is quite conservative, since, as noted previously odor generation declines rapidly with composting time, and many of the windrows at any point in time will have reached a stage with lower odor emissions.

In accordance with standard odor modeling practice a peak to mean ratio of 2 to 1 was applied to the maximum predicted hourly odor concentrations at each receptor for 2-minute averages in order to account for the fact that the human detection of odors occurs on a short time scale. Based on the odor complaints received by the South Coast Air Quality Management District (SCAQMD) over the years, and the agency's experience with D/T levels associated with those complaints, the District has determined that a 10 D/T odor is an acceptable threshold, with a preferred level of below 5 D/T.

Nursery Products - VOCs Emissions

Daily maxium materials received (tons)	
Biosolid	1000
Green Material	1000
Total	2000

Annual maxium materials received (tons)	400,000
Daily average materials received (tons)	**1100**

VOCs Emissions Calculation				
Emission Factor (lb/ton Compost Mix)[1]	Daily average materials received (tons)	Daily Emissions (tons)	Annual Duration (day)	Annual Emissions (tons)
1.78	1100	0.97900	365	357.34

VOCs Emissions	
Annual (tons)	**357.34**
Average Daily (lbs)	**1958.00**

[1] Emission factor from SCAQMD Rule 1133

Nursery Products - Ammonia Emissions

Daily maxium materials received (tons)	
Biosolid	1000
Green Material	1000
Total	2000

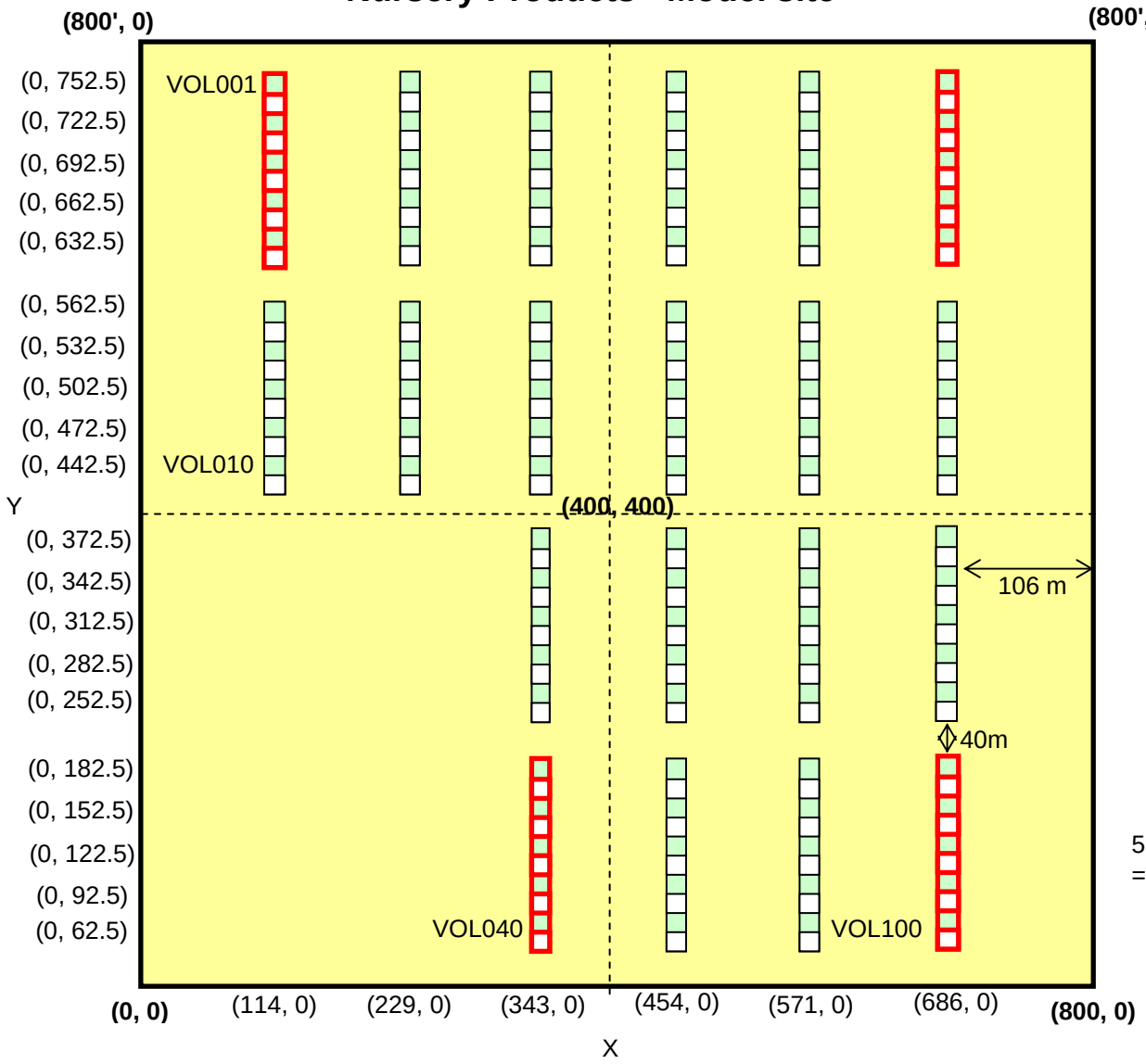
Annual maxium materials received (tons)	400,000
Daily average materials received (tons)	**1100**

Ammonia Emissions Calculation				
Emission Factor (lb/ton Compost Mix)[1]	Daily average materials received (tons)	Daily Emissions (tons)	Annual Duration (day)	Annual Emissions (tons)
2.93	1100	1.61150	365	588.20

Ammonia Emissions	
Annual (tons)	**588.20**
Average Daily (lbs)	**3223.00**
Average Hourly Emissions from All Windrows (g/s)	**16.94**
Average Hourly Emissions from each volume source (g/s)	**0.1694**

[1] Emission factor from SCAQMD Rule 1133

Nursery Products - Model site

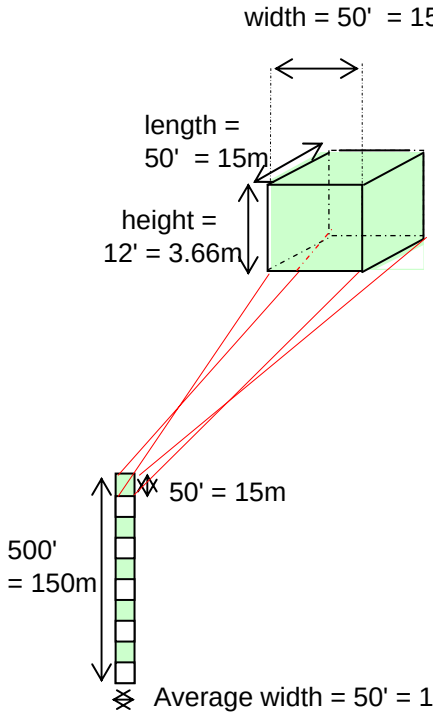


Total Volume Source numbers = 100

Odor emissions from each volume source

= 170 (D/T) x 0.01 (m/sec) x 225

EACH VOLUME SOURCE



EACH WINDROW

Nursery Products - Source grid view (odor)

source ID	source description	Easting (X)	Northing (Y)	Base Elevation	Release Height	Horizontal Dimension	Vertical Dimension	DOVERT
VOL001	odor	114	752.5	0	3.66	3.5	1.7	0.000383
VOL002	odor	114	722.5	0	3.66	3.5	1.7	0.000383
VOL003	odor	114	692.5	0	3.66	3.5	1.7	0.000383
VOL004	odor	114	662.5	0	3.66	3.5	1.7	0.000383
VOL005	odor	114	632.5	0	3.66	3.5	1.7	0.000383
VOL006	odor	114	562.5	0	3.66	3.5	1.7	0.000143625
VOL007	odor	114	532.5	0	3.66	3.5	1.7	0.000143625
VOL008	odor	114	502.5	0	3.66	3.5	1.7	0.000143625
VOL009	odor	114	472.5	0	3.66	3.5	1.7	0.000143625
VOL010	odor	114	442.5	0	3.66	3.5	1.7	0.000143625
VOL011	odor	229	752.5	0	3.66	3.5	1.7	0.000143625
VOL012	odor	229	722.5	0	3.66	3.5	1.7	0.000143625
VOL013	odor	229	692.5	0	3.66	3.5	1.7	0.000143625
VOL014	odor	229	662.5	0	3.66	3.5	1.7	0.000143625
VOL015	odor	229	632.5	0	3.66	3.5	1.7	0.000143625
VOL016	odor	229	562.5	0	3.66	3.5	1.7	0.000143625
VOL017	odor	229	532.5	0	3.66	3.5	1.7	0.000143625
VOL018	odor	229	502.5	0	3.66	3.5	1.7	0.000143625
VOL019	odor	229	472.5	0	3.66	3.5	1.7	0.000143625
VOL020	odor	229	442.5	0	3.66	3.5	1.7	0.000143625
VOL021	odor	343	752.5	0	3.66	3.5	1.7	0.000143625
VOL022	odor	343	722.5	0	3.66	3.5	1.7	0.000143625
VOL023	odor	343	692.5	0	3.66	3.5	1.7	0.000143625
VOL024	odor	343	662.5	0	3.66	3.5	1.7	0.000143625
VOL025	odor	343	632.5	0	3.66	3.5	1.7	0.000143625
VOL026	odor	343	562.5	0	3.66	3.5	1.7	0.000143625
VOL027	odor	343	532.5	0	3.66	3.5	1.7	0.000143625
VOL028	odor	343	502.5	0	3.66	3.5	1.7	0.000143625
VOL029	odor	343	472.5	0	3.66	3.5	1.7	0.000143625
VOL030	odor	343	442.5	0	3.66	3.5	1.7	0.000143625
VOL031	odor	343	372.5	0	3.66	3.5	1.7	0.000143625
VOL032	odor	343	342.5	0	3.66	3.5	1.7	0.000143625
VOL033	odor	343	312.5	0	3.66	3.5	1.7	0.000143625
VOL034	odor	343	282.5	0	3.66	3.5	1.7	0.000143625
VOL035	odor	343	252.5	0	3.66	3.5	1.7	0.000143625
VOL036	odor	343	182.5	0	3.66	3.5	1.7	0.000383
VOL037	odor	343	152.5	0	3.66	3.5	1.7	0.000383
VOL038	odor	343	122.5	0	3.66	3.5	1.7	0.000383
VOL039	odor	343	92.5	0	3.66	3.5	1.7	0.000383
VOL040	odor	343	62.5	0	3.66	3.5	1.7	0.000383
VOL041	odor	454	752.5	0	3.66	3.5	1.7	0.000143625
VOL042	odor	454	722.5	0	3.66	3.5	1.7	0.000143625
VOL043	odor	454	692.5	0	3.66	3.5	1.7	0.000143625
VOL044	odor	454	662.5	0	3.66	3.5	1.7	0.000143625
VOL045	odor	454	632.5	0	3.66	3.5	1.7	0.000143625
VOL046	odor	454	562.5	0	3.66	3.5	1.7	0.000143625
VOL047	odor	454	532.5	0	3.66	3.5	1.7	0.000143625
VOL048	odor	454	502.5	0	3.66	3.5	1.7	0.000143625
VOL049	odor	454	472.5	0	3.66	3.5	1.7	0.000143625
VOL050	odor	454	442.5	0	3.66	3.5	1.7	0.000143625
VOL051	odor	454	372.5	0	3.66	3.5	1.7	0.000143625
VOL052	odor	454	342.5	0	3.66	3.5	1.7	0.000143625
VOL053	odor	454	312.5	0	3.66	3.5	1.7	0.000143625
VOL054	odor	454	282.5	0	3.66	3.5	1.7	0.000143625

VOL055	odor	454	252.5	0	3.66	3.5	1.7	0.000143625
VOL056	odor	454	182.5	0	3.66	3.5	1.7	0.000143625
VOL057	odor	454	152.5	0	3.66	3.5	1.7	0.000143625
VOL058	odor	454	122.5	0	3.66	3.5	1.7	0.000143625
VOL059	odor	454	92.5	0	3.66	3.5	1.7	0.000143625
VOL060	odor	454	62.5	0	3.66	3.5	1.7	0.000143625
VOL061	odor	571	752.5	0	3.66	3.5	1.7	0.000143625
VOL062	odor	571	722.5	0	3.66	3.5	1.7	0.000143625
VOL063	odor	571	692.5	0	3.66	3.5	1.7	0.000143625
VOL064	odor	571	662.5	0	3.66	3.5	1.7	0.000143625
VOL065	odor	571	632.5	0	3.66	3.5	1.7	0.000143625
VOL066	odor	571	562.5	0	3.66	3.5	1.7	0.000143625
VOL067	odor	571	532.5	0	3.66	3.5	1.7	0.000143625
VOL068	odor	571	502.5	0	3.66	3.5	1.7	0.000143625
VOL069	odor	571	472.5	0	3.66	3.5	1.7	0.000143625
VOL070	odor	571	442.5	0	3.66	3.5	1.7	0.000143625
VOL071	odor	571	372.5	0	3.66	3.5	1.7	0.000143625
VOL072	odor	571	342.5	0	3.66	3.5	1.7	0.000143625
VOL073	odor	571	312.5	0	3.66	3.5	1.7	0.000143625
VOL074	odor	571	282.5	0	3.66	3.5	1.7	0.000143625
VOL075	odor	571	252.5	0	3.66	3.5	1.7	0.000143625
VOL076	odor	571	182.5	0	3.66	3.5	1.7	0.000143625
VOL077	odor	571	152.5	0	3.66	3.5	1.7	0.000143625
VOL078	odor	571	122.5	0	3.66	3.5	1.7	0.000143625
VOL079	odor	571	92.5	0	3.66	3.5	1.7	0.000143625
VOL080	odor	571	62.5	0	3.66	3.5	1.7	0.000143625
VOL081	odor	686	752.5	0	3.66	3.5	1.7	0.000383
VOL082	odor	686	722.5	0	3.66	3.5	1.7	0.000383
VOL083	odor	686	692.5	0	3.66	3.5	1.7	0.000383
VOL084	odor	686	662.5	0	3.66	3.5	1.7	0.000383
VOL085	odor	686	632.5	0	3.66	3.5	1.7	0.000383
VOL086	odor	686	562.5	0	3.66	3.5	1.7	0.000143625
VOL087	odor	686	532.5	0	3.66	3.5	1.7	0.000143625
VOL088	odor	686	502.5	0	3.66	3.5	1.7	0.000143625
VOL089	odor	686	472.5	0	3.66	3.5	1.7	0.000143625
VOL090	odor	686	442.5	0	3.66	3.5	1.7	0.000143625
VOL091	odor	686	372.5	0	3.66	3.5	1.7	0.000143625
VOL092	odor	686	342.5	0	3.66	3.5	1.7	0.000143625
VOL093	odor	686	312.5	0	3.66	3.5	1.7	0.000143625
VOL094	odor	686	282.5	0	3.66	3.5	1.7	0.000143625
VOL095	odor	686	252.5	0	3.66	3.5	1.7	0.000143625
VOL096	odor	686	182.5	0	3.66	3.5	1.7	0.000383
VOL097	odor	686	152.5	0	3.66	3.5	1.7	0.000383
VOL098	odor	686	122.5	0	3.66	3.5	1.7	0.000383
VOL099	odor	686	92.5	0	3.66	3.5	1.7	0.000383
VOL100	odor	686	62.5	0	3.66	3.5	1.7	0.000383

Nursery Products - Source grid view (ammonia)

source ID	source description	Easting (X)	Northing (Y)	Base Elevation	Release Height	Horizontal Dimension	Vertical Dimension	Ammonia
VOL001	Ammonia	114	752.5	0	3.66	3.5	1.7	0.1694
VOL002	Ammonia	114	722.5	0	3.66	3.5	1.7	0.1694
VOL003	Ammonia	114	692.5	0	3.66	3.5	1.7	0.1694
VOL004	Ammonia	114	662.5	0	3.66	3.5	1.7	0.1694
VOL005	Ammonia	114	632.5	0	3.66	3.5	1.7	0.1694
VOL006	Ammonia	114	562.5	0	3.66	3.5	1.7	0.1694
VOL007	Ammonia	114	532.5	0	3.66	3.5	1.7	0.1694
VOL008	Ammonia	114	502.5	0	3.66	3.5	1.7	0.1694
VOL009	Ammonia	114	472.5	0	3.66	3.5	1.7	0.1694
VOL010	Ammonia	114	442.5	0	3.66	3.5	1.7	0.1694
VOL011	Ammonia	229	752.5	0	3.66	3.5	1.7	0.1694
VOL012	Ammonia	229	722.5	0	3.66	3.5	1.7	0.1694
VOL013	Ammonia	229	692.5	0	3.66	3.5	1.7	0.1694
VOL014	Ammonia	229	662.5	0	3.66	3.5	1.7	0.1694
VOL015	Ammonia	229	632.5	0	3.66	3.5	1.7	0.1694
VOL016	Ammonia	229	562.5	0	3.66	3.5	1.7	0.1694
VOL017	Ammonia	229	532.5	0	3.66	3.5	1.7	0.1694
VOL018	Ammonia	229	502.5	0	3.66	3.5	1.7	0.1694
VOL019	Ammonia	229	472.5	0	3.66	3.5	1.7	0.1694
VOL020	Ammonia	229	442.5	0	3.66	3.5	1.7	0.1694
VOL021	Ammonia	343	752.5	0	3.66	3.5	1.7	0.1694
VOL022	Ammonia	343	722.5	0	3.66	3.5	1.7	0.1694
VOL023	Ammonia	343	692.5	0	3.66	3.5	1.7	0.1694
VOL024	Ammonia	343	662.5	0	3.66	3.5	1.7	0.1694
VOL025	Ammonia	343	632.5	0	3.66	3.5	1.7	0.1694
VOL026	Ammonia	343	562.5	0	3.66	3.5	1.7	0.1694
VOL027	Ammonia	343	532.5	0	3.66	3.5	1.7	0.1694
VOL028	Ammonia	343	502.5	0	3.66	3.5	1.7	0.1694
VOL029	Ammonia	343	472.5	0	3.66	3.5	1.7	0.1694
VOL030	Ammonia	343	442.5	0	3.66	3.5	1.7	0.1694
VOL031	Ammonia	343	372.5	0	3.66	3.5	1.7	0.1694
VOL032	Ammonia	343	342.5	0	3.66	3.5	1.7	0.1694
VOL033	Ammonia	343	312.5	0	3.66	3.5	1.7	0.1694
VOL034	Ammonia	343	282.5	0	3.66	3.5	1.7	0.1694
VOL035	Ammonia	343	252.5	0	3.66	3.5	1.7	0.1694
VOL036	Ammonia	343	182.5	0	3.66	3.5	1.7	0.1694
VOL037	Ammonia	343	152.5	0	3.66	3.5	1.7	0.1694
VOL038	Ammonia	343	122.5	0	3.66	3.5	1.7	0.1694
VOL039	Ammonia	343	92.5	0	3.66	3.5	1.7	0.1694
VOL040	Ammonia	343	62.5	0	3.66	3.5	1.7	0.1694
VOL041	Ammonia	454	752.5	0	3.66	3.5	1.7	0.1694
VOL042	Ammonia	454	722.5	0	3.66	3.5	1.7	0.1694
VOL043	Ammonia	454	692.5	0	3.66	3.5	1.7	0.1694
VOL044	Ammonia	454	662.5	0	3.66	3.5	1.7	0.1694
VOL045	Ammonia	454	632.5	0	3.66	3.5	1.7	0.1694
VOL046	Ammonia	454	562.5	0	3.66	3.5	1.7	0.1694
VOL047	Ammonia	454	532.5	0	3.66	3.5	1.7	0.1694
VOL048	Ammonia	454	502.5	0	3.66	3.5	1.7	0.1694
VOL049	Ammonia	454	472.5	0	3.66	3.5	1.7	0.1694
VOL050	Ammonia	454	442.5	0	3.66	3.5	1.7	0.1694
VOL051	Ammonia	454	372.5	0	3.66	3.5	1.7	0.1694
VOL052	Ammonia	454	342.5	0	3.66	3.5	1.7	0.1694
VOL053	Ammonia	454	312.5	0	3.66	3.5	1.7	0.1694
VOL054	Ammonia	454	282.5	0	3.66	3.5	1.7	0.1694
VOL055	Ammonia	454	252.5	0	3.66	3.5	1.7	0.1694
VOL056	Ammonia	454	182.5	0	3.66	3.5	1.7	0.1694
VOL057	Ammonia	454	152.5	0	3.66	3.5	1.7	0.1694

VOL058	Ammonia	454	122.5	0	3.66	3.5	1.7	0.1694
VOL059	Ammonia	454	92.5	0	3.66	3.5	1.7	0.1694
VOL060	Ammonia	454	62.5	0	3.66	3.5	1.7	0.1694
VOL061	Ammonia	571	752.5	0	3.66	3.5	1.7	0.1694
VOL062	Ammonia	571	722.5	0	3.66	3.5	1.7	0.1694
VOL063	Ammonia	571	692.5	0	3.66	3.5	1.7	0.1694
VOL064	Ammonia	571	662.5	0	3.66	3.5	1.7	0.1694
VOL065	Ammonia	571	632.5	0	3.66	3.5	1.7	0.1694
VOL066	Ammonia	571	562.5	0	3.66	3.5	1.7	0.1694
VOL067	Ammonia	571	532.5	0	3.66	3.5	1.7	0.1694
VOL068	Ammonia	571	502.5	0	3.66	3.5	1.7	0.1694
VOL069	Ammonia	571	472.5	0	3.66	3.5	1.7	0.1694
VOL070	Ammonia	571	442.5	0	3.66	3.5	1.7	0.1694
VOL071	Ammonia	571	372.5	0	3.66	3.5	1.7	0.1694
VOL072	Ammonia	571	342.5	0	3.66	3.5	1.7	0.1694
VOL073	Ammonia	571	312.5	0	3.66	3.5	1.7	0.1694
VOL074	Ammonia	571	282.5	0	3.66	3.5	1.7	0.1694
VOL075	Ammonia	571	252.5	0	3.66	3.5	1.7	0.1694
VOL076	Ammonia	571	182.5	0	3.66	3.5	1.7	0.1694
VOL077	Ammonia	571	152.5	0	3.66	3.5	1.7	0.1694
VOL078	Ammonia	571	122.5	0	3.66	3.5	1.7	0.1694
VOL079	Ammonia	571	92.5	0	3.66	3.5	1.7	0.1694
VOL080	Ammonia	571	62.5	0	3.66	3.5	1.7	0.1694
VOL081	Ammonia	686	752.5	0	3.66	3.5	1.7	0.1694
VOL082	Ammonia	686	722.5	0	3.66	3.5	1.7	0.1694
VOL083	Ammonia	686	692.5	0	3.66	3.5	1.7	0.1694
VOL084	Ammonia	686	662.5	0	3.66	3.5	1.7	0.1694
VOL085	Ammonia	686	632.5	0	3.66	3.5	1.7	0.1694
VOL086	Ammonia	686	562.5	0	3.66	3.5	1.7	0.1694
VOL087	Ammonia	686	532.5	0	3.66	3.5	1.7	0.1694
VOL088	Ammonia	686	502.5	0	3.66	3.5	1.7	0.1694
VOL089	Ammonia	686	472.5	0	3.66	3.5	1.7	0.1694
VOL090	Ammonia	686	442.5	0	3.66	3.5	1.7	0.1694
VOL091	Ammonia	686	372.5	0	3.66	3.5	1.7	0.1694
VOL092	Ammonia	686	342.5	0	3.66	3.5	1.7	0.1694
VOL093	Ammonia	686	312.5	0	3.66	3.5	1.7	0.1694
VOL094	Ammonia	686	282.5	0	3.66	3.5	1.7	0.1694
VOL095	Ammonia	686	252.5	0	3.66	3.5	1.7	0.1694
VOL096	Ammonia	686	182.5	0	3.66	3.5	1.7	0.1694
VOL097	Ammonia	686	152.5	0	3.66	3.5	1.7	0.1694
VOL098	Ammonia	686	122.5	0	3.66	3.5	1.7	0.1694
VOL099	Ammonia	686	92.5	0	3.66	3.5	1.7	0.1694
VOL100	Ammonia	686	62.5	0	3.66	3.5	1.7	0.1694

Nursery Products - Odor ISCST3 Model Results

1 HR

Model	File	Pollutant	Average	Group	Rank	Max. Conc (D/T)	Max. (x)	Max. (y)	Concentration (D/T) 0.5 miles	1.5 miles	2.5 miles	8 miles	Elev.	Time	Met File	Source	Groups	Rec
ISCST3	odor_ISC_modeling_0720_88_DOVERT.USF	DOVERT	1-HR	ALL	1ST	**10.77**	680	800	0.979	0.580	0.398	0.175	0	88010320	bd1988w.met	100	1	4824
ISCST3	odor_ISC_modeling_0720_89_DOVERT.USF	DOVERT	1-HR	ALL	1ST	8.51	680	800	**1.8606**	**0.9175**	**0.873**	**0.448**	0	89101819	bd1989w.met	100	1	4824
ISCST3	odor_ISC_modeling_0720_90_DOVERT.USF	DOVERT	1-HR	ALL	1ST	9.59	680	800	0.973	0.582	0.489	0.246	0	90113019	bd1990w.met	100	1	4824

Annual

Model	File	Pollutant	Average	Group	Rank	Max. Conc (D/T)	Max. (x)	Max. (y)	Concentration (D/T) 0.5 miles	1.5 miles	2.5 miles	8 miles	Elev.	Time	Met File	Source	Groups	Rec
ISCST3	odor_ISC_modeling_0720_88_DOVERT.USF	DOVERT	ANNUAL	ALL	1ST	0.322	800	680	0.062	0.015	0.007	0.001	0	1 YRS	bd1988w.met	100	1	4824
ISCST3	odor_ISC_modeling_0720_89_DOVERT.USF	DOVERT	ANNUAL	ALL	1ST	0.317	800	680	0.059	0.016	0.008	0.002	0	1 YRS	bd1989w.met	100	1	4824
ISCST3	odor_ISC_modeling_0720_90_DOVERT.USF	DOVERT	ANNUAL	ALL	1ST	0.328	800	680	**0.062**	**0.016**	**0.008**	**0.002**	0	1 YRS	bd1990w.met	100	1	4824

Assumes the 4 corner windrows emit the maximum odor emissions (ie new windrows)
Initial odor concentration for each source in the windrow 170 D/T
the remaining 16 windrows emit 37.5% of a new windrow odor emissions
Initial odor concentration for each source in the windrow 63.75 D/T
peak to mean ratio = 2

Modeled odor concentration (D/T) at Indicated Distance				
Site Boundary	**0.5 miles**	**1.5 miles**	**2.5 miles**	**8 miles**
21.53	1.958	1.161	0.797	0.349
17.03	**3.721**	**1.835**	**1.746**	**0.896**
19.18	1.947	1.164	0.978	0.493

Nursery Products - Ammonia ISCST3 Model Results

1 HR

Model	File	Pollutant	Average	Group	Rank	Max. Conc	Max. (x)	Max. (y)	Concentration				Elev.	Time	Met File	Source	Groups	Rec
									0.5 miles	1.5 miles	2.5 miles	8 miles						
ISCST3	ammonia_ISC_modeling_0720_88_AMMONIA.USF	AMMONIA	1-HR	ALL	1ST	6908	570	800	979	510	392	160	0	88012104	bd1988w.met	100	1	4824
ISCST3	ammonia_ISC_modeling_0720_89_AMMONIA.USF	AMMONIA	1-HR	ALL	1ST	5181	570	800	1441	932	824	400	0	89040423	bd1989w.met	100	1	4824
ISCST3	ammonia_ISC_modeling_0720_90_AMMONIA.USF	AMMONIA	1-HR	ALL	1ST	5069	680	800	951	520	456	219	0	90113019	bd1990w.met	100	1	4824

Annual

Model	File	Pollutant	Average	Group	Rank	Max. Conc	Max. (x)	Max. (y)	Concentration				Elev.	Time	Met File	Source	Groups	Rec
									0.5 miles	1.5 miles	2.5 miles	8 miles						
ISCST3	ammonia_ISC_modeling_0720_88_AMMONIA.USF	AMMONIA	ANNUAL	ALL	1ST	255	800	500	55.3	13.5	6.5	1.3	0	1 YRS	bd1988w.met	100	1	4824
ISCST3	ammonia_ISC_modeling_0720_89_AMMONIA.USF	AMMONIA	ANNUAL	ALL	1ST	249	800	500	52.7	14.1	7.1	1.4	0	1 YRS	bd1989w.met	100	1	4824
ISCST3	ammonia_ISC_modeling_0720_90_AMMONIA.USF	AMMONIA	ANNUAL	ALL	1ST	260	800	490	55.2	14.4	7.1	1.3	0	1 YRS	bd1990w.met	100	1	4824

Modeled ammonia concentration (ug/m3) at Indicated Distance				
Site Boundary	0.5 miles	1.5 miles	2.5 miles	8 miles
6908	979	510	392	160
5181	**1441**	**932**	**824**	**400**
5069	951	520	456	219

Nursery Products

Travel Emission Decrease Calculations

This table shows that emissions from hauling to existing are greater than the emissions that result from hauling to the proposed facility. Thus, emissions from this activity are not attributable to this project.

Biosolid Distribution Study

Composting Site	Percent of Total Biosolids
Kern Co.	44.18%
Arizona	43.44%

Emission Factors [1] (lb/mile)

VOC	CO	NOx	PM10	SOx
5.63E-01	3.734	1.27E+01	2.24E-01	2.00E-02

1 Data from EMFAC2002 Emission Factors for On-Road Heavy Heavy Duty Diesel Trucks in San Bernardino County

Existing Conditions

	Total Amt of Biosolids	Distance to Composting Sites (mi)		Amt of Biosolids (TPY) [2]		Number of Truck Trips per Year [3]		Total Miles Travelled per Year per Site		Total Miles Travelled	Total Emissions Per Year (TPY)				
	TPY	Kern Co. (Bakersfield)	Arizona (Phoenix area)	Kern Co.	Arizona	Kern Co.	Arizona	Kern Co.	Arizona	mi/yr	VOC	CO	NOx	PM10	SOx
Riverside Co (from Indio, CA)	156,890	196	235	69,314.00	68,153.02	6,027	5,926	1,181,352	1,392,692	2,574,044	724.59	4,805.74	16,403.09	288.29	25.74
San Bernardino Co. (from San Bern)	62,126	130	295	27,447.27	26,987.53	2,387	2,347	310,273	692,289	1,002,562	282.22	1,871.78	6,388.83	112.29	10.03
Total Combined	219,016	326	530	96,761	95,141	8,414	8,273	1,491,625	2,084,981	3,576,606	1,006.81	6,677.52	22,791.92	400.58	35.77

2 Assumes that 43.44% of total routes to Arizona, and 44.18% routes to Kern Co. and 12.39% get routed to "other" facilities

3 Assumes each truck carries 23 tons per trip and makes two trips (to and from) per load

Predicted Conditions

	Total Amt of Biosolids	Distance to Composting Sites	Amt of Biosolids [2]	Number of Truck Trips per Year [3]	Total Miles Travelled per Year	Total Emissions Per Year (TPY)				
	TPY	(mi)	(TPY)	(roundtrip)	(miles/yr)	VOC	CO	NOx	PM10	SOx
Riverside Co (from Indio, CA)	156,890	105	137,451	11,952	1,254,990	353.28	2,343.07	7,997.43	140.56	12.55
San Bernardino Co. (from San Bern)	62,126	56	54,429	4,733	265,044	74.61	494.84	1,688.99	29.68	2.65
Total Combined	219,016	161	191,880	16,685	1,520,034	427.89	2,837.90	9,686.42	170.24	15.20

2 Assumes that 43.44% of total routes to Arizona, and 44.18% routes to Kern Co. and 12.39% get routed to "other" facilities

3 Assumes each truck carries 23 tons per trip and makes two trips (to and from) per load

Emission Reduction From Proposed Composting Route

	Total Emissions Per Year (TPY)				
	VOC	CO	NOx	PM10	SOx
Existing Route	1,006.81	6,677.52	22,791.92	400.58	35.77
Proposed Route	427.89	2,837.90	9,686.42	170.24	15.20
Total Difference = Proposed - Existing	-578.93	-3,839.62	-13,105.51	-230.34	-20.57