

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT**

**APPLICATION PROCESSING AND CALCULATIONS**

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APPL NO  
489915

DATE  
1/23/2009

ENGINEER  
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**EVALUATION FOR PERMIT TO CONSTRUCT/OPERATE**

**APPLICANT'S NAME:** TAMCO

**MAILING ADDRESS:** P O BOX 325  
RANCHO CUCAMONGA, CA 91739 - 0325

**EQUIPMENT ADDRESS:** 12459-B ARROW ROUTE, RANCHO CUCAMONGA, CA 91739 - 9601

**EQUIPMENT DESCRIPTION:**

Fuel Storage and Dispensing Facility Consisting of:

- 1) 1 - DUAL COMPARTMENT UNDERGROUND GASOLINE/DIESEL STORAGE TANK, 12,000 GALLON CAPACITY, NOT METHANOL COMPATIBLE, CONSISTING OF:  
  
A)  ONE 2,000-GALLON COMPARTMENT GASOLINE TANK, EQUIPPED WITH PHASE I VAPOR RECOVERY SYSTEM OPW (VR-102-I), AND  
  
B)  ONE 10,000-GALLON COMPARTMENT DIESEL TANK, NOT EQUIPPED WITH PHASE I VAPOR RECOVERY SYSTEM.
- 2) 1 - GASOLINE BELLOWS-LESS NOZZLE DISPENSING 1 PRODUCT EQUIPPED WITH PHASE II VAPOR RECOVERY SYSTEM, HEALY PHASE II ENHANCED VAPOR RECOVERY (EVR) SYSTEM NOT INCLUDING IN-STATION DIAGNOSTICS (ISD) SYSTEM (VR-201-H).

**BACKGROUND HISTORY:**

This application was submitted for an alteration on 9/30/2008 . The facility's proposed normal operating schedule is as follows: 24 hours/day, 7 days/week, 30 days/month and 52 weeks/year. . The facility has received 10 Notice to Comply from the District. The facility has received 15 Notice of Violation from the District. An application, A/N 154532 was previously filed with the District for this equipment.

**PROCESS DESCRIPTION:**

The gasoline storage and dispensing facility is used for storing organic products and dispensing these products into motor vehicle fuel storage tanks.

**EMISSION CALCULATIONS:**

The hydrocarbon and benzene emissions from storage tank filling and motor vehicle refueling operations are estimated by using appropriate emission factors summarized in the following table. These emission factors were developed by the District's Planning Division.

**I. Emission Factors and Control Efficiencies**

The following table summarizes the uncontrolled ROG emission factors in pounds per 1,000 gallons of gasoline throughput, benzene content of gasoline, and control efficiencies:

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*Emission Factors and Control Efficiencies for Underground Tanks*

Process Type	Uncon. ROG (Lbs/1000 Gals) of GA	Benzene Content	Control Efficiency
Loading	8.40	0.3 wt%, Vapor	95%
Breathing	0.10	0.3 wt%, Vapor	75%
Refueling*	8.30	0.3 wt%, Vapor	96%
Spillage	0.42	1.0 wt%, Liquid	0%

\*Assumes a more realistic 96% control efficiency for Phase II recovery system.

**II. Calculations**

The following equations are used for calculating ROG and Benzene emissions from gasoline (GA). The emission factors have been modified from the CAPCOA ones to fit District specific assumptions:

Net Increased Throughput = Proposed throughput - Total permitted throughput prior to the modification or average throughput for the last two years

ROG, uncontrolled = EF (Lbs-ROG/1,000 Gals-GA) x Proposed GA Throughput (1,000 Gals/Month)

ROG, controlled = ROG, uncontrolled x Control Efficiency

Benzene, uncontrolled = ROG, uncontrolled x Benzene Content in GA

Benzene, controlled = ROG, controlled x Benzene Content in GA

*Total Emission Increase - Underground Tanks*

Proposed GA Throughput (Gals/Month)	10000
Average GA Throughput (Gals/Month)	0
Net GA Throughput (Gals/Month)	10000

The total emissions are as follows:

Process Type	ROG, R1 (Lbs/Month)	ROG, R2 (Lbs/Month)	Benzene, R1 (Lbs/Month)	Benzene, R2 (Lbs/Month)
Loading	84.00	4.20	0.25	0.01
Breathing	1.00	0.25	0.00	0.00
Refueling	83.00	3.32	0.25	0.01
Spillage	4.20	4.20	0.04	0.04
Total ROG	172.20	11.97	0.55	0.07

**III. Summary of Emissions**

	Total ROG		Total Benzene	
	R1	R2	R1	R2
Monthly (lb/mo)	172.20	11.97	0.55	0.07
30-day average (lb/day)	5.74	0.40	0.02	0.00
Hourly (lb/hr)	0.24	0.02	0.00	0.00

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**CANCER RISK ASSESSMENT:**

From gasoline storage and dispensing operations, benzene is the only toxic emittant that has significant effect to the maximum individual cancer risk (MICR). Using the CAPCOA provided risk values, the staff in the District's Planning Division prepared reference MICR's for different scenarios, i.e., for underground and aboveground tanks, and for residence and workers. These MICR's are tabulated for different downwind distances from a permit unit that is located in West LA with annual gasoline throughput of one million gallons.

Once a reference MICR is determined for a given downwind distance, it has to be adjusted by using the MET factor to reflect the meteorological conditions of a permit unit's location and the actual fuel throughput of a permit unit.

The following is the parameters used for calculating the MICR for this application. The distances are from the center of emission source to the nearest receptor areas:

Tank Type	= Underground
GA Throughput (MMGals-GA/Year)	= 0.1200
Facility Zone	= 32
MET Factor	= 0.54
Downwind Distance to Residence (Meters)	= 914
Downwind Distance to Workers (Meters)	= 68

A reference MICR is determined for a given downwind distance in the following manner:

1. If the downwind distance is less than or equal to minimum pre-defined distance, use the MICR at the minimum distance.
2. If the downwind distance is greater than or equal to maximum pre-defined distance, use the MICR at the maximum distance.
3. Find MICRs two distances, i.e., one for nearest higher distance and the other one for nearest lower distance, and interpolate them.

$$\text{MICR, ref} = \text{MICR, low} + [(\text{MICR, high} - \text{MICR, low}) / (\text{High Dist} - \text{Low Dist})] \\ * (\text{Downwind Dist} - \text{Low Dist})$$

where,

MICR, ref	= Reference MICR at a given downwind distance
MICR, low	= MICR at a lower interpolate distance
MICR, high	= MICR at a higher interpolate distance
Low Dist	= Lower interpolate distance
High Dist	= Higher interpolate distance
Downwind Dist	= Given downwind distance

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*MICR - Underground Tanks*

MICR for Residences

Reference MICR [in-a-million / (1 MMGal-GA/Year)]  
= 0.012

Adjusted MICR (in-a-million)

= (Reference MICR) x (MET factor) x (Annual Fuel Throughput)  
= 0.012 x 0.54 x 0.1200 = 0.001

MICR for Workers

Reference MICR [in-a-million / (1 MMGal-GA/Year)]  
= 0.247

Adjusted MICR (in-a-million)

= (Reference MICR) x (MET factor) x (Annual Fuel Throughput)  
= 0.247 x 0.54 x 0.1200 = 0.016

**Calculation for Non-Cancer Health Effects:**

The chronic and acute non-cancer health effects for benzene, xylene and toluene are not being calculated. This is based on the CAPCOA Gasoline Service Station Industrywide Risk Assessment Guidelines, Appendix I, finding that the benzene cancer risk of 10 in a million will be exceeded far sooner than the Hazard Index for benzene, xylene or toluene.

**Modeling Assumptions:**

The modeling assumes the generic station operates 24 hours/day, with 80% of the emissions occurring between 6:00 AM and 8:00 PM, and the remaining 20% of the emissions occurring between 8:00 PM and 6:00 AM. In addition, the refueling and spillage emissions were modeled as volume sources and the loading and breathing emissions as point sources (Sample ISCST3 model input files for the generic retail station are documented in AQMD Industrywide Guidelines).

**Risk Calculations:**

The revised risk calculation for 1,000,000 gallons a year throughput for the different distances (20, 25, 30....1000 meters) are based on the benzene inhalation cancer potency factor of 0.1/(mg/kg-day).

**RULES EVALUATION:**

**Rule 212** The maximum individual cancer risk is less than ten-in-one million. There is no school located within 1,000-feet from this facility. Public notice is exempt.

**Rule 461** All gasoline and methanol (if any) tanks are equipped with CARB Phase I vapor controls. All tanks are also equipped with submerged fill tubes. All nozzles serving the gasoline and methanol, if any, tanks are equipped with Phase II vapor controls. Therefore, this facility complies with Rule 461.

**Rule 1170** None of underground fuel storage tanks at this facility is methanol compatible. These tanks were installed prior to July 1, 1988. This facility complies with the provisions of this rule.

**Rule 1401** The facility's MICR to the most sensitive area is 0.016 in-a-million. The facility complies with this rule.

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**Rule REGXIII**

As stated in the evaluation, since there is no throughput increase nor additional nozzle, the net emission increase is   0   pounds/day..

1. Offset

Since facility PTE for VOCs:

[ ] = 4 tons per year, no offsets are needed.

[ ] > 4 tons/year, ERC required. The facility will purchase ERC for \_\_\_\_\_pounds/day of VOCs.

2. BACT

BACT requirements (if emission increase is greater than 1 pound/day) met with compliance with Rule 461.

3. Modeling: Not required for VOCs. Complies with Rule.

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**Reference MICR Chart - Underground Tanks**

(a) MICR for Residential Areas - Underground Tanks per One Million Gallons of Gasoline

Dist(m)	20	25	30	40	50	60	70	75	80	90
MICR	7.283	5.542	4.364	2.897	2.054	1.528	1.181	1.05	0.939	0.765

Dist(m)	100	125	150	175	200	250	300	350	400	450
MICR	0.636	0.427	0.307	0.232	0.181	0.12	0.086	0.065	0.051	0.041

Dist(m)	500	600	700	800	900	1000
MICR	0.034	0.024	0.018	0.014	0.012	0.01

(b) MICR for Commercial Areas - Underground Tanks per One Million Gallons of Gasoline

Dist(m)	20	25	30	40	50	60	70	75	80	90
MICR	1.437	1.094	0.861	0.572	0.405	0.302	0.233	0.207	0.185	0.151

Dist(m)	100	125	150	175	200	250	300	350	400	450
MICR	0.125	0.084	0.061	0.046	0.036	0.024	0.017	0.013	0.01	0.008

Dist(m)	500	600	700	800	900	1000
MICR	0.007	0.005	0.004	0.003	0.002	0.002

**MET Factors for Facility Zones**

Zone	1	2	3	4	5	6	7	8	9	10	11	12
MET	0.45	1.00	0.69	0.97	0.51	0.56	0.59	0.64	0.65	1.18	0.65	0.71

Zone	13	15	16	17	18	19	20	21	22	23	24	25
MET	0.70	0.70	0.58	0.57	0.60	0.45	0.60	0.45	0.78	0.78	0.78	0.78

Zone	26	27	28	29	30	31	32	33	34	35	36	37	38
MET	0.78	0.78	0.78	0.53	0.73	0.73	0.54	0.54	0.78	1.19	0.54	0.78	1.19