



*A subsidiary of Pinnacle West Capital Corporation*

Palo Verde Nuclear  
Generating Station

**Robert S. Bement**  
Vice President  
Nuclear Operations

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PO Box 52034  
Phoenix, Arizona 85072-2034

291-03908-RSB/MPE/ST  
April 30, 2008

**HAND DELIVERED**

MCAQD One Stop Shop  
Emissions Inventory Intake  
501 N. 44<sup>th</sup> Street, Suite 200  
Phoenix, AZ 85008-6538

Dear Sir or Madam:

Subject: Palo Verde Nuclear Generating Station 2007 Annual Air Emissions Inventory

Palo Verde Nuclear Generating Station (PVNGS) is submitting the 2007 Air Emissions Inventory in accordance with instructions received from your office. In addition, in accordance with the PVNGS Non-Title V Air Permit (#030132) Condition 21 we are also providing a Hazardous Air Pollutant (HAPs) report (Attachment 2). Permit Condition 21 requires PVNGS to calculate emissions of HAPs emitted in quantities above 500 pounds per calendar year, and specifically requires the calculation and reporting of emissions of chloroform, xylene, toluene, and ethyl benzene.

PVNGS used electronic versions of the forms for this Emissions Inventory Report. Deletions in the text are noted in red with a strikethrough. Additions to the text are shown in blue Italics.

If you have any questions regarding this submittal, please contact Mr. Sreenath Thota at (623) 393-6537.

Based on information and belief formed after reasonable inquiry, the statements and information in this submittal are true, accurate, and complete.

Sincerely,

RSB/MPE/ST/hsc

Attachments

**ATTACHMENT 1**  
**2007 Annual Air Emission Inventory**

# **PALO VERDE NUCLEAR GENERATING STATION**

**2007 AIR EMISSIONS INVENTORY**

**Prepared for**

**MARICOPA COUNTY  
ENVIRONMENTAL SERVICES DEPARTMENT**

**Prepared by**

**ARIZONA PUBLIC SERVICE COMPANY  
PALO VERDE NUCLEAR GENERATING STATION  
ENVIRONMENTAL SECTION**

## **GENERAL INFORMATION AND BUSINESS FORM**

The following information is provided in this section:

1. Business Form
2. Process Identification Number Cross Reference Table

**MARICOPA COUNTY  
AIR QUALITY  
DEPARTMENT**

**Emissions Inventory Unit  
(602) 506-6790  
(602) 506-6985 (FAX)  
(602) 506-6704 (TDD)**

## 2007 Annual Emissions Inventory

### *Business Form*

Due Date: 04/30/2008

Permit Number: 030132

1. Owner Name: ARIZONA PUBLIC SERVICE CO
2. Business Name: PALO VERDE NUCLEAR GENERATING STATION
3. Business Street Address (Physical Location): 5801 S. WINTERSBURG RD
4. City: TONOPAH 5. Zip Code: 85354-7529
6. Number Of Employees 2300 7. Property Size: 4080.00 acres
8. SIC Code: Primary: 4911 Secondary: \_\_\_\_\_
9. NAICS Code Primary: 221113 Secondary: 221121
10. Preparer of the Inventory (primary contact for technical questions concerning this report):

Name: MARTIN P. EROH

Title: ENVIRONMENTAL SECTION LEADER

Employer: ARIZONA PUBLIC SERVICE

Telephone: (623) 393-6688

Fax: (623) 393-5442

E-mail address of preparer: [martin.eroh@aps.com](mailto:martin.eroh@aps.com)

11. Who should receive the Annual Emissions Inventory Form next year?:

Name: MARTIN P. EROH

Title: ENVIRONMENTAL SECTION LEADER

Employer: ARIZONA PUBLIC SERVICE

Address: PO BOX 52034 MS 7626

City: PHOENIX

State: AZ

Zip Code: 85072-2034

Telephone: (623) 393-6688

Fax: (623) 393-5442

Return the original copy of all completed forms to:  
MCAQD One Stop Shop  
Emissions Inventory Intake  
501 N. 44<sup>th</sup> Street, Suite 200  
Phoenix, AZ 85008 -6538

For more information, contact the Maricopa County Emissions Inventory Unit at (602) 506-6790.

Detailed instructions, sample forms and reference materials are available at:

[www.maricopa.gov/aq/divisions/planning\\_analysis/emissions\\_inventory/default.aspx](http://www.maricopa.gov/aq/divisions/planning_analysis/emissions_inventory/default.aspx)

# Data Certification Form 2007

Permit Number(s) 030132

For EACH pollution listed, total up all emissions recorded on your General Process and Evaporative Process Forms. Enter these numbers in column 1, "Totals from Process Forms". Report emissions from accidental releases in column 2. Add the figures in each row across, and enter the result in column 3, "Total Emissions."

Summary of 2007 *Annual Emissions:	(1) Totals from Process Forms	(2) + Accidental Releases	(3) = TOTAL EMISSIONS
CO	98,264	0	98,264
NHx	6,842.72	0	6,842.72
Lead	0 lbs	0 lbs	0 lbs
HAP&NON	---	---	---
VOC	62,935	0	62,935
NOx	195,636	0	195,636
SOx	2862	0	2862
PM <sub>10</sub>	15,971	0	15,971

\*Annual Emissions were calculated from permitted and permit-exempt sources

### TO COMPLETE YOUR EMISSIONS INVENTORY REPORT:

- Complete the Confidentiality Statement below.
- Sign and date this form below where indicated.
- Send the **original** copy of your completed forms to: Maricopa County Air Quality Dept., Emissions Inventory Unit, One Stop Shop, Emissions Inventory Intake, 501 N. 44<sup>th</sup> Street, Suite 200, Phoenix, AZ 85008-6538.
- Keep a copy of all forms for your records.

### CONFIDENTIALITY STATEMENT:

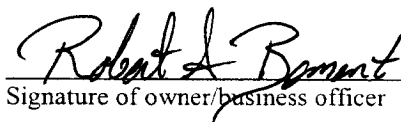
This annual emissions report contains requests to keep some data confidential.

YES  NO

If you check "YES", you must submit documentation and meet certain requirements before your data can be deemed confidential. See enclosed instructions for further details.

### CERTIFICATION STATEMENT:

I declare under penalty of perjury that the data (e.g. materials, quantities, emissions factors, controls, and annual emissions) presented herein represents the best available information and is true, accurate and complete to the best of my knowledge.

  
Signature of owner/business officer

  
Date of Signature

(623) 393-6116  
Telephone Number

**ROBERT S. BEMENT**  
Type or print full name of owner/business officer

**VP Nuclear Operations**  
Type or print full title

**PALO VERDE NUCLEAR GENERATING STATION**  
**Air Quality Permit Number: 030132**  
**Annual Emissions Calculation for 2007**

PROCESS ID/ DESCRIPTION PROCESS EMISSIONS	CO	NOX	PM10	SOX	VOC	COMMENTS
1. LIME UNLOAD	---	---	0	---	---	
2. LIME STORAGE	---	---	498	---	---	
3. LIME SUPPLY	---	---	512	---	---	
4. SODA ASH UNLOAD	---	---	0	---	---	
5. SODA ASH STORAGE	---	---	235	---	---	
6. SODA ASH SUPPLY	---	---	224	---	---	
7. MISC DIESEL ENGINES (PERMITTED)	105	489	34	6	40	
7. MISC DIESEL ENGINES (PERMIT EXEMPT)	18,544	86,157	6,062	1,013	7,032	
8. MISC GAS ENGINES (PERMITTED)	371	10	1	1	18	
8. MISC GAS ENGINES (PERMIT EXEMPT)	50,916	1,321	81	72	2,462	
9. UNIT EMERG DIESELS	27,273	102,981	1,834	1,669	2,586	
10. TSC DIESEL	339	1,281	23	21	33	
11. SEC DIESEL	37	174	12	2	14	
12. FIRE PUMP DIESELS	50	231	16	3	19	
13. ADMIN A DIESEL	266	1,000	18	16	26	
14. ADMIN B DIESEL	109	507	36	6	41	
16. AUX BOILER	0	0	0	0	0	
17. UNIT COOLING TOWERS	---	---	2,467	---	4,824	
18. RECAL FURNACE	---	---	---	---	---	Release point no longer used. Historical information only.
19. RECAL FURNACE (SOx)	---	---	---	---	---	Release point no longer used. Historical information only.
20. GTG	60	624	131	38	0	
21. CHEM DIESEL	54	251	18	3	20	
22. PORT COOLING TOWER	---	---	920	---	4	
23. SALT SILOS	---	---	757	---	---	
24. ILRT LEAK RATE	---	---	---	---	---	Only performed whe ILRT testing is required.
25. WRF COMPRESSOR	---	---	---	---	---	Release point no longer used. Historical information only.
26. ABRASIVES HOPPER	---	---	0	---	---	
27. S/G CLEAN - ADV (UNITS 1, 2, 3)	---	---	---	---	---	Only applicable when S/G Cleaning in progress.
28. S/G CLEAN - EVAP	---	---	---	---	---	Release point no longer used. Historical information only.
29. S/G CLEAN - EVAP COND	---	---	---	---	---	Only applicable when S/G Cleaning in progress.
30. S/G CLEAN - COOL TWR	---	---	---	---	---	Only applicable when S/G Cleaning in progress.
31. SEC SUBSTATION L EDG	118	454	16	8	7	
32. SEC HUBS 2,3,4 EDGS	22	153	3	3	9	
33. MISC COMB EQ - DIESEL	0	2	0	1	0	
34. MISC COMB EQ - LPG	0	1	0	0	0	

**PALO VERDE NUCLEAR GENERATING STATION**  
**Air Quality Permit Number: 030132**  
**Annual Emissions Calculation for 2007**

PROCESS ID/ DESCRIPTION	CO	NOX	PM10	SOX	VOC	COMMENTS
35. PORTABLE BOILER (CONTRACTOR)	0	0	0	0	0	
36. ABRASIVE BLASTING OPERATIONS	---	---	2,073	---	---	
<b>EVAPORATIVE EMISSIONS</b>						
51. GAS TANK AS1 WORKING LOSS	---	---	---	---	851	
52. GAS TANK AS2 STANDING LOSS	---	---	---	---	2,622	
53. GAS TANK AS1 FUELING	---	---	---	---	1,015	
54. GAS TANK AS2 WORKING LOSS	---	---	---	---	851	
55. GAS TANK AS2 STANDING LOSS	---	---	---	---	3,935	
56. GAS TANK AS2 LOADING	---	---	---	---	0	
57. GAS TANK AS2 FUELING	---	---	---	---	0	
60. ADHESIVES	---	---	---	---	12,307	
61. CLEANERS	---	---	---	---	6,524	
62. LUBRICANTS	---	---	---	---	1,400	
63. MISC CHEM USE	---	---	---	---	6,641	
64. MAINT COATINGS	---	---	---	---	4,398	
65. MAINT SOLVENTS	---	---	---	---	2,966	
66. MAINT COAT SURFACE PREP	---	---	---	---	463	
67. ASPHALT PAVING OPERATIONS	---	---	---	---	1,827	

<b>PERMITTED SOURCES ONLY</b>	<b>28,804</b>	<b>108,158</b>	<b>9,828</b>	<b>1,777</b>	<b>53,441</b>	
<b>Emissions in Tons:</b>	<b>14.40</b>	<b>54.08</b>	<b>4.91</b>	<b>0.89</b>	<b>26.72</b>	

<b>PERMITTED AND PERMIT EXEMPT SOURCES</b>	<b>98,264</b>	<b>195,636</b>	<b>15,971</b>	<b>2,862</b>	<b>62,935</b>	
<b>Emissions in Tons:</b>	<b>49.13</b>	<b>97.82</b>	<b>7.99</b>	<b>1.43</b>	<b>31.47</b>	



## **EMISSIONS SUMMARY**

This section contains the Data Certification Form. Summary sheets for the General and Evaporative Processes have been provided for reference.

## IDENTIFICATION NUMBER CROSS-REFERENCE TABLE

PROCESS ID NO.	PROCESS (P) Or EVAP (E)	DESCRIPTION	STACK NO.	CONTROL DEVICE NO. (If applicable)
<b>PROCESS SOURCES</b>				
1	P	Lin Unloading Filter Separator	1	1
2	P	Lime Storage Silos	2 Lime, 102 Recalcined lime	2 Lime, 102 recalcined lime
3	P	Lime Supply Silos	3	3
4	P	Soda Ash Unloading Filter Separator	4	4
5	P	Soda Ash Storage Silos	5	5
6	P	Soda Ash Supply Silo	6	6
7	P	Miscellaneous Portable Diesel Engines	7	
8	P	Miscellaneous Portable Gasoline Engines	8	
9	P	EDG: (Unit 1, 2, and 3) Emergency Diesel Generators	9	
10	P	Technical Support Center Diesel	10	
11	P	Security Diesel	11	
12	P	Fire Protection Pump Diesels	12	
13	P	Administration Building A Diesel	13	
14	P	Administration Building B Diesel	14	
16	P	Auxiliary Boiler	16	
17	P	Units 1, 2, and 3 Cooling Towers	17	
18, 19	P	Recalcination Furnace (RELEASE POINT REMOVED FROM PERMIT IN 2003)	18	18 quencher, venturi scrubber, 19 impingement tray separator, 118 cyclone separator, 119 high lime content
20	P	Gas Turbines	20	
21	P	Chemical Storage Building Diesel	21	
22	P	Portable Cooling Tower	22	
23	P	Salt Silos	23	23 baghouse
24	P	Rental Compressors-ILRT		
25	P	WRF Rental Air Compressor (RELEASE POINT REMOVED FROM PERMIT IN 2002)		
26	P	Abrasive Media Hopper	26	26
27	P	S/G Chemical Cleaning – ADV Stacks (2 per unit) Units 1, 2, or 3	27	
28	P	S/G Cleaning - Evaporator Discharge (RELEASE POINT REMOVED FROM PERMIT IN 2003)	28	
29	P	S/G Cleaning – Evaporator Condenser	29	
30	P	S/G Cleaning – Evaporator Condenser Cooling Tower	30	
31	P	Security Substation L Emergency Generator (179 Hp)		

## IDENTIFICATION NUMBER CROSS-REFERENCE TABLE

PROCESS ID NO.	PROCESS (P) Or EVAP (E)	DESCRIPTION	STACK NO.	CONTROL DEVICE NO. (If applicable)
32	P	Security Hubs 2, 3, 4 Emergency Diesel Generators (Total Of 3 Engines At 35 Hp Each)		
33	P	Misc. Diesel Fuel Burning Combustion Equipment (< 10 MMBtu / Hr)		
34	P	Misc. LPG Burning Combustion Equipment		
35	P	<i>Contractor Portable Boiler</i>		
36	P	<i>Abrasive Blasting Operations (confined &amp; unconfined)</i>		
<b>EVAPORATIVE SOURCES</b>				
Horizontal Fixed Roof Storage Tanks (Gasoline) AND Gasoline Fueling Operations				
51	E	AS1 Working Losses		
52	E	AS1 Standing Losses		
53	E	AS1 Fueling		
54	E	AS2 Working Losses		
55	E	AS2 Standing Losses		
56	E	AS2 Loading	56	56
57	E	AS2 Fueling		
<u>Other Evaporative Process</u>				
60	E	Adhesives		
61	E	Cleaners, Degreasers		
62	E	Lubricants		
63	E	Miscellaneous Chemical Use		
	E	Maintenance Coatings		
64		Coatings		
65		Solvent, Thinner, Diluent		
66		Surface Preparation Products		
67	E	Asphalt Paving Operations		
90	E	Ammonia Releases from Circulating Water Systems		

## STACK INFORMATION

The stack form contains stack information for each stationary stack that is connected to a control device or any stack that discharged more than 5 tons of combined pollutant emissions during the reporting year. Although no steam generator cleaning was conducted during the year the stack information was left on the form for historical information.

The latitude and longitude coordinates of the stacks were included this year. There are several process release points that are identical and were historically assigned a common stack identification number. The separate coordinates of each stack were included unless they were physically located close together where separate coordinates would not provide additional location information. These differences are described below for each release point with multiple stacks:

Lime Storage Silos – Identical stacks associated with each of nine storage silo baghouses (six for pebble lime and three for recalcined lime) were assigned a common stack identification number. The coordinates represent the common location of the group of stacks.

Lime Supply Silos - Identical stacks associated with each of three supply silo baghouses were assigned a common stack identification number. The coordinates represent the common location of the group of stacks.

Soda Ash Storage Silos – Identical stacks associated with each of six storage silo baghouses were assigned a common stack identification number. The coordinates represent the common location of the group of stacks.

Soda Ash Supply Silos - Identical stacks associated with each of two supply silo baghouses were assigned a common stack identification number. The coordinates represent the common location of the group of stacks.

Unit Emergency Diesel Generators – Identical stacks associated with each of six identical generators were assigned a common stack identification number. Each operating Unit at PVNGS (Units 1, 2, and 3) contains a pair of generators. The coordinates represent the common location of each group of two individual stacks located in Units 1, 2, and 3.

Unit Cooling Towers – There are three identical individual cooling towers per unit for a total of nine cooling towers. The cooling towers were assigned a common stack identification number. The coordinates represent the common location of each group of three towers located in Units 1, 2, and 3.

Steam Generator Cleaning Evaporator Condenser Discharge – The equipment is only brought onsite during chemical cleaning. No cleaning was done during 2004 so no coordinates are available.

Steam Generator Cleaning Evaporator Cooling Tower - The equipment is only brought onsite during chemical cleaning. No cleaning was done during 2004 so no coordinates are available.

**Stack Form 2007**

Permit Number: **030132**

1	2	3	4	5a	5b	6a	6b	6c	7
Stack ID	Stack Type Code*	Stack Height**	Exit Gas Temperature	Velocity feet/sec	Flow Rate acfm	Diameter inside inch <sup>(1)</sup>	Length / Width inside inch		Stack Name/Description (Optional)
1	D	12_ft	120°F	98.8	2070.0	8			LIME UNLOADING FILTER SEPARATOR Lat: N 33.395 Long: W 112.857
2	D	60_ft	120°F	27.6	2030.0	15	9	20	EACH OF 6 LIME STORAGE SILO BAGHOUSES Lat: N 33.395 Long: W 112.857
3	D	42_ft	120°F	19.8	1460.0	15	9	20	EACH OF 6 LIME SUPPLY SILO BAGHOUSES Lat: N 33.395 Long: W 112.857
4	D	12_ft	120°F	98.8	2070.0	8			SODA ASH UNLOADING FILTER SEPARATOR Lat: N 33.395 Long: W 112.857
5	D	60_ft	120°F	27.0	1990.0	15	9	20	PART OF 6 SODA ASH STORAGE SILO BAGHOUSES Lat: N 33.395 Long: W 112.857
6	D	43_ft	120°F	12.2	900.0	15	9	20	EACH OF 2 SODA ASH SUPPLY SILO BAGHOUSES Lat: N 33.395 Long: W 112.857
9	V	90_ft	1000°F	179.0	60000.0	32			EMERGENCY GENERATORS (EACH OF 6) Unit 1 - Lat: N 33.388 Long: W 112.861 Unit 2 - Lat: N 33.385 Long: W 112.864 Unit 3 - Lat: N 33.383 Long: W 112.864
17	V	64_ft	110°F	31.6	1342000.0	360			EACH OF 144 FANS (3 UNIT COOLING TOWERS) Unit 1 - Lat: N 33.391 Long: W 112.863 Unit 2 - Lat: N 33.388 Long: W 112.867 Unit 3 - Lat: N 33.383 Long: W 112.869
23 <sup>(2)</sup>	D	36_ft	120°F	8.3	1992.0	27	6	94	EACH OF 2 SALT SILOS Lat: N 33.396 Long: W 112.858
26	H	22_ft	120°F	9.3	1100.0	19	12	24	ABRASIVE BLAST MEDIA STORAGE HOPPER Lat: N 33.391 Long: W 112.860
27	V	89_ft	290°F	104.8	100000.0	54			EACH OF 6 ATMOS. DUMP VALVE DISCHARGE STACKS FOR UNITS 1-3 Unit 1 - Lat: N 33.388 Long: W 112.861 Unit 2 - Lat: N 33.383 Long: W 112.864 Unit 3 - Lat: N 33.383 Long: W 112.864
29	H	20_ft	110 °F	21.1	2000.0	17 <sup>(4)</sup>			STM. GENERATOR CLEANING EVAP. CONDENSER DISCHARGE No coordinates - equipment not onsite
30	V	9_ft	110 °F	48.7	23000.0	38	24	48	STM. GENERATOR CLEANING EVAP. CONDENSER COOLING TOWER No Coordinates - equipment not onsite
56	H	4ft	120°F			4			GASOLINE VAPOR BALANCE SYSTEM Lat: N 33.388 Long: W 112.857
102 <sup>(3)</sup>	D	60_ft	120°F	8.1	600	15	9	20	EACH OF 3 RECALCINED LIME STORAGE SILO BAGHOUSES (TRANSFER MODE) Lat: N 33.395 Long: W 112.857

**Stack Form 2007**

Permit Number: **030132**

1	2	3	4	5a	OR	5b	6a	OR	6b and 6c	7
Stack ID	Stack Type Code*	Stack Height**	Exit Gas Temperature	Velocity feet/sec		Flow Rate acfm	Diameter inside inch <sup>(1)</sup>		Length / Width inside inch	Stack Name/Description (Optional)
<p><sup>1</sup> Effective diameters are reported for rectangular stack dimensions. Exit Velocities were calculated using the effective diameters.</p> <p><sup>2</sup> The discharge is a circumferential slot around the bag housing. This slot is 6" high. See next page for sketch of filter and discharge.</p> <p><sup>3</sup> There are 9 lime storage silos, Process ID 2. Six of those silos typically receive direct lime deliveries. The velocities and flow rates for those silos is shown under Stack 2. The other three lime storage silos are typically used for recalcined lime storage. Stack 102 flow rates and velocities represent the system operation using the recalcined lime transfer blower. Since the recalcined lime storage silos are permitted to receive direct lime deliveries, refer to the velocities and flow rates listed under Process ID 2 for direct transfer deliveries of lime to the recalcined lime storage silos.</p> <p><sup>4</sup> The stack is a twelve inch diameter stack that ends at a "T" consisting of 12 inch horizontal pipe with two discharge points. The diameter reported is the effective diameter of both 12 inch diameter discharge points.</p>										

\* Stack Type Codes: V = Vertical unobstructed H = Horizontal unobstructed D = Downward unobstructed G = Goosneck  
W = Obstructed vertical (e.g. weather cap)

\*\* Stack height is calculated relative to the surrounding terrain. For example: the stack height of a 10 foot stack sitting on a 20 foot building is 30 feet.

## **CONTROL DEVICE INFORMATION**

Process ID 2 represents lime storage silos at PVNGS. The design and control equipment for all 9 silos is the same. There are two separate Stack and Control Device codes for the Lime Storage Silos.

- Stack 2/Control Device 2 represents the 6 silos that receive new lime deliveries.
- Stack 102/Control Device 102 represents the other three silos that receive recalcined lime.

The description for Control ID Number 26 was modified to include the type of control device.

The control equipment used for the recalcination furnace (Control ID Numbers 18, 19, 118 and 119) has been abandoned in place and is no longer used. However, information has been kept on the control device table for historical reference only.

# Control Device Form 2007

Permit Number: 030132

1	2	3	4	5	6
Control ID	Installation/Reconstruction * Date	Size or Rate Capacity**	Control Type Code	Control Device Name/Description	Stack ID
1	1/1/84	2070. cfm	018	LIME UNLOADING FILTER SEPARATOR 518 SQ FT CLOTH AREA	1
2	1/1/84	2030. cfm	018	6 LIME STORAGE SILOS BAGHOUSES 189 SQ FT CLOTH AREA	2
3	1/1/84	1460. cfm	018	6 LIME SUPPLY SILOS BAGHOUSES 189 SQ FT CLOTH AREA	3
4	1/1/84	2070. cfm	018	SODA ASH UNLOADING FILTER SEPARATOR 518 SQ FT CLOTH AREA	4
5	1/1/84	1990. cfm	018	6 SODA ASH STORAGE SILOS BAGHOUSES 189 SQ FT CLOTH AREA	5
6	1/1/84	900. cfm	018	2 SODA ASH STORAGE SILOS BAGHOUSES 189 SQ FT CLOTH AREA	6
18	1/1/84	343. cfm	053	RECAL FURNACE QUENCHER & VENTURI SCRUBER (NO LONGER IN USE - HISTORICAL REFERENCE ONLY)	
19	1/1/84	343. cfm	055	RECAL FURNACE IMPINGEMENT TRAY SEPARATOR (NO LONGER IN USE - HISTORICAL REFERENCE ONLY)	
23	1/1/84	1092. cfm	018	2 SALT SILO BAGHOUSES, 31 SQ FT CLOTH AREA	23
26	02/15/2000	1100. cfm	101	ABRASIVE BLAST MEDIA STORAGE HOPPER <b>HEPA FILTER</b>	26
56		cfm	096	VAPOR BALANCE FOR LOADING REUELING TRUCK	
102 <sup>1</sup>	1/1/84	600. cfm	018	3 RECAL LIME STORAGE SILOS BAGHOUSES 189 SQ FT CLOTH AREA	102
118	1/1/84	343. cfm	075	RECAL FURNACE CYCLONE SEPARATOR (NO LONGER IN USE - HISTORICAL REFERENCE ONLY)	
119	1/1/84	343. cfm	999	RECALCINATOR FURNACE, HIGH LIME CONTENT (NO LONGER IN USE - HISTORICAL REFERENCE ONLY)	

<sup>1</sup> Control Device 102 flow rate (600 cfm) represents the flow rate from the recalcined lime transfer blower for the 3 lime storage silos that are typically used for recalcined lime storage. The design of these silos and emissions control systems is identical to the six lime storage silos represented by Control Device 2. All 9 silos were designed and permitted for storage of either direct lime deliveries or recalcined lime. When used for direct lime delivery, the silos represented by Control Device 102 have the same flow rates, velocities, and air to cloth ratios as Control Device 2.

\* Reconstruction means any component of the control device was replaced and the cost (fixed capital) of the new component(s) was more than half of what it would have cost to purchase or construct a new control device.

\*\* Air or water flow rate in the cubic feet per minute.



## GENERAL PROCESS FORMS

The General Process Forms came preprinted with process information. PVNGS re-entered the originals on electronic forms. The following summarizes the significant changes.

1. Two new processes were added to the emissions report. The first is for a portable diesel fired boiler used to heat water in order to perform *in situ* pipe repairs. The equipment is owned and operated by a contractor and is not stored at the facility when not in use. The second is for abrasive blasting operations (confined and unconfined) conducted at the facility. The specific release points associated with these process are:
  - Process ID 35, Contractor Portable Boiler
  - Process ID 34, Abrasive Blasting Operations (confined and unconfined).

There were no emissions from process ID 35 for 2007 reporting year.

2. There were no rail deliveries of bulk chemicals during the reporting year.
3. Process ID 24, Compressor Rental – ILRT Leak Test, was added in 2000. However, Integrated Leak Rate Testing (ILRT) is only performed periodically in accordance with Nuclear Regulatory Commission requirements. There were no emissions from this process during the reporting year.
4. The steam generating cleaning process was modified in 2003. The steam generator cleaning evaporator discharge (Process ID 28) was replaced with the steam generator evaporator condenser discharge (Process ID 29) and Steam generator evaporator condenser cooling tower (Process ID 30). The processes associated with chemical cleaning of the steam generators (S/G) typically occur once every five to seven years per Unit. Therefore, the release forms were written to cover releases from any Unit during a given year. The specific release points associated with this process are:
  - Process ID 27, Atmospheric Dump Valve Releases from S/G Chemical Cleaning (Units 1, 2, or 3)
  - Process ID 29, S/G Chemical Cleaning Evaporator Condenser Discharge
  - Process ID 30, S/G Chemical Cleaning Evaporator Condenser Cooling Tower

There was no steam generator cleaning conducted during the reporting year.

5. Emissions reported for miscellaneous diesel and gasoline engines include emissions from both small stationary engines (North Annex Back-up Generator & the Construction Pond Pumps) as well as from the remaining non-road engines.

## GENERAL PROCESS FORMS (continued)

6. The County forms were pre-printed with emissions factors for the existing processes. A one-page emissions calculation page was included as supplemental information as necessary for each process. For some processes, additional information was necessary to calculate emissions. In these instances, additional information is supplied in the section titled, "Emissions Factor Calculation Sheets". Processes with additional information are noted below.

- Combustion Sources using diesel fuel: Since actual fuel sulfur content typically varies at a value less than 0.05% by weight, the permit limit of 0.05% was used to calculate emissions in lieu of specific fuel sulfur analysis data. Actual emissions would be lower than those calculated.
- The PM10 emissions for the Unit Cooling Towers were calculated in accordance with the methodology in Permit Condition 55b. Since the emissions are a function of the TDS concentration and resulting critical droplet size diameter, the emissions factor was back calculated from the total emissions and actual operating hours.
- The VOC emission factor for the Unit Cooling Towers, Process ID 17, was adjusted to reflect site specific use of chemicals added to the towers.
- The PM10 emission factor for the Portable Cooling Towers, Process ID 22, is a function of the average measured TDS concentration. Since this concentration will vary, the emissions factor was back calculated from the total emissions and actual operating hours.
- VOC emission factors for the Various Evaporative Processes, Process ID's 60 through 67, change slightly each year depending on actual chemical use. These factors were developed based on material balance for the current year's chemical usage.
- The emissions factors for the Contractor Portable Boiler, Process ID 35, were obtained from the Maricopa County Air Quality Department Website for SIC Code 10200502 (Industrial Boiler Distillate Oil < 10 MMBtu/hr).
- The emission factor for the Abrasive Blasting Operations, Process ID 36, was obtained from AP-42, Table 13.2.6-1.
- The ammonia emission factor for Process ID 90 was updated based on release data from the year 2007.

# General Process Form 2007

Permit Number(s): 030132

Place an X in any gray cell to mark data requested to be held confidential. See Instructions for requirements for information to be deemed confidential.

- Process ID: 1
- Process Type/Description: LIME UNLOADING FILTER SEPARATOR (USED FOR RR DELIVERIES OF LIME ONLY)

3. Stack ID(s) (only if required on Stack Form) 1

4. Process TIER Code: 071099 MISCELLANEOUS INDUSTRIAL PROCESSES

SCC Code: 30510405 (8 digit number) BULK MATL UNLOADING: LIMESTONE

5. Seasonal Throughput Percent: Dec-Feb 25% Mar-May 25% Jun-Aug 25% Sep-Nov 25%

6. Normal Operating Schedule: Hours/Day 24 Days/Week 7 Hours/Year 3 Weeks/Year 3

7. Typical Hours of Operation: (military time) Start 00:00 End 23:59

8. Emissions based on: (name of material or other parameter, e.g. "rock", "diesel", "vehicle miles traveled") LIME DELIVERED BY RAIL

9.  Used (input) or  Produced (output)

10. Annual Amount: (a number) 0 % 12. - Fuel Sulfur Content (in percent)

13. Units of Measure: (for example: tons, gallons, million cu ft, acres, units produced etc.) TONS

14. Unit Conversion Factor: (if needed to convert Unit of Measure to correlate with emission factor units)

Pollutant	Emission Factor (EF) Information				Control Device Information						Estimated Actual Emissions
	16 Emission Factor (EF) (number)	17 Emission Factor Unit (lbs per)	18 Controlled EF? Yes or No	19 Calculation Method Code*	20 Capture % Efficiency	21 Primary Control Device ID	22 Secondary Control Device ID	23 Control Device(s) % Efficiency	23 Efficiency Reference Code**	25	
PM-10	0.03	TON	N	2	100.000	1		99.960	3	0 lbs	

- \*Calculation Method Codes**
- 1 = Continuous Emissions Monitoring Measurements
  - 2 = Best Guess/ Engineering Judgment
  - 3 = Material balance
  - 4 = Source Test Measurements (Stack Test)
  - 5 = AP-42/Fire Method or Emission Factor
  - 6 = State or Local Agency Emission Factor
  - 7 = Manufacturer Specifications
  - 8 = Site-Specific Emission Factor
  - 9 = Vendor Emission Factor
  - 10 = Trade Group Emission Factor
- \*\* Control Efficiency Reference Codes**
- 1 = Tested efficiency / EPA reference method
  - 2 = Tested efficiency / other source test method
  - 3 = Design value from manufacturer
  - 4 = Best Guess / engineering estimate
  - 5 = Calculated, based on material balance
  - 6 = Estimated, based on a published value



# General Process Form 2007

Permit Number(s): 030132

Place an X in any gray cell to mark data requested to be held confidential. See Instructions for requirements for information to be deemed confidential.

1. Process ID: 2
2. Process Type/Description: LOADING/UNLOADING LIME INTO STORAGE SILOS
3. Stack ID(s) (only if required on Stack Form) 2 102
4. Process TIER Code: 071099 MISCELLANEOUS INDUSTRIAL PROCESSES
5. SCC Code: 30510405 (8 digit number) BULK MATL UNLOADING: LIMESTONE
6. Seasonal Throughput Percent: Dec-Feb 25% Mar-May 25% Jun-Aug 25% Sep-Nov 25%
7. Normal Operating Schedule: Days/Week 7 Hours/Year 8760 Weeks/Year \_\_\_\_\_
8. Typical Hours of Operation: (military time) Start 00:00 End 23:59
9. Emissions based on: (name of material or other parameter, e.g. "rock", "diesel", "vehicle miles traveled") LIME
10.  Used (input) or  Produced (output)
11. Annual Amount: (a number) 16584 % 12. - Fuel Sulfur Content (in percent) \_\_\_\_\_ %
13. Units of Measure: (for example: tons, gallons, million cu ft, acres, units produced etc.) TONS
14. Unit Conversion Factor: (if needed to convert Unit of Measure to correlate with emission factor units) \_\_\_\_\_

15	Emission Factor (EF) Information				Control Device Information					
	16	17	18	19	20	21	22	23	23	25
Pollutant	Emission Factor (EF) (number)	Emission Factor Unit (lbs per Ton)	Controlled EF? Yes or No	Calculation Method Code*	Capture % Efficiency	Primary Control Device ID	Secondary Control Device ID	Control Device(s) % Efficiency	Efficiency Reference Code**	Estimated Actual Emissions
PM-10 <sup>1</sup>	0.03	LBS/TON	N	2	100.000	2		99.970	3	497.5 lbs

<sup>1</sup> There are 9 lime storage silos. The emissions control system on each silo is the same. Since all lime used was direct loaded, the emission factors associated with the primary control device is 2.

- \*Calculation Method Codes**
- 1 = Continuous Emissions Monitoring Measurements
  - 2 = Best Guess/ Engineering Judgment
  - 3 = Material balance
  - 4 = Source Test Measurements (Stack Test)
  - 5 = AP-42/Fire Method or Emission Factor
  - 6 = State or Local Agency Emission Factor
  - 7 = Manufacturer Specifications
  - 8 = Site-Specific Emission Factor
  - 9 = Vendor Emission Factor
  - 10 = Trade Group Emission Factor
- \*\* Control Efficiency Reference Codes**
- 1 = Tested efficiency / EPA reference method
  - 2 = Tested efficiency / other source test method
  - 3 = Design value from manufacturer
  - 4 = Best Guess / engineering estimate
  - 5 = Calculated, based on material balance
  - 6 = Estimated, based on a published value

**PALO VERDE NUCLEAR GENERATING STATION**  
**Air Quality Permit Number: 030132**  
**Annual Emissions Calculation for 2007**

Lime Storage Silo	MC Process ID No.: 2
PVNGS Source ID No.: AWLSNTO1A-F, AWLSNTO2A-C	MC Stack No.: 2
SCC: 30510405	MC Control ID No.: 2, 102

**Material Processed:**

	N/A	Tons
Recalcined Lime		
Lime by Truck	16,584	Tons
Lime by Rail	0	Tons
<b>Sum</b>	<b>16,584</b>	<b>Tons</b>

**CRITERIA POLLUTANT**

	EMISSIONS FACTOR	SOURCE	EMISSIONS
PM10	3.00E-02	lb/T loaded by material balance	497.5 lb

**Notes:**

- 1) Vendor data given for PM. Assume  $PM_{10} = 1/2 * PM$ .
- 2) The silo acts as an expansions vessel, allowing most of the particulate to fall out due to gravity.  
A conservative estimate of 10% going to the filter was used, 90% dropout inherent in transfer process.
- 3) Filter efficiency is 99.97%.
- 4) All of these factors are included in the emissions factor shown above.
- 5) Annual emissions reflects the sum of emissions from both recalcined lime and pebble lime.

# General Process Form 2007

Permit Number(s): 030132

Place an X in any gray cell to mark data requested to be held confidential. See Instructions for requirements for information to be deemed confidential.

1. Process ID: 3
2. Process Type/Description: LOADING/UNLOADING LIME INTO SUPPLY SILOS (6)
3. Stack ID(s) (only if required on Stack Form) 3
4. Process TIER Code: 071099 MISCELLANEOUS INDUSTRIAL PROCESSES
5. SCC Code: 30510405 (8 digit number) BULK MATL UNLOADING: LIMESTONE
6. Seasonal Throughput Percent: Dec-Feb 25% Mar-May 25% Jun-Aug 25% Sep-Nov 25%
7. Normal Operating Schedule: Days/Week 7 Hours/Year 8760 Weeks/Year 8760
8. Typical Hours of Operation: (military time) Start 00:00 End 23:59
9. Emissions based on: (name of material or other parameter, e.g. "rock", "diesel", "vehicle miles traveled") LIME PEBBLE
10.  Used (input) or  Produced (output)
11. Annual Amount: (a number) 17083 %
12. Fuel Sulfur Content (in percent) \_\_\_\_\_ %
13. Units of Measure: (for example: tons, gallons, million cu ft, acres, units produced etc.) TONS
14. Unit Conversion Factor: (if needed to convert Unit of Measure to correlate with emission factor units) \_\_\_\_\_

15	Emission Factor (EF) Information				Control Device Information					
	16	17	18	19	20	21	22	23	25	
Pollutant	Emission Factor (EF) (number)	Emission Factor Unit (lbs per Ton)	Controlled EF? Yes or No	Calculation Method Code*	Capture % Efficiency	Primary Control Device ID	Secondary Control Device ID	Control Device(s) % Efficiency	Efficiency Reference Code**	Estimated Actual Emissions
PM-10	0.03	LBS/TON	N	2	100.000	3		99.970	3	512.5 lbs

**\*Calculation Method Codes**

- 1 = Continuous Emissions Monitoring Measurements
- 2 = Best Guess/ Engineering Judgment
- 3 = Material balance
- 4 = Source Test Measurements (Stack Test)
- 5 = AP-42/Fire Method or Emission Factor
- 6 = State or Local Agency Emission Factor
- 7 = Manufacturer Specifications
- 8 = Site-Specific Emission Factor
- 9 = Vendor Emission Factor
- 10 = Trade Group Emission Factor

**\*\* Control Efficiency Reference Codes**

- 1 = Tested efficiency / EPA reference method
- 2 = Tested efficiency / other source test method
- 3 = Design value from manufacturer
- 4 = Best Guess / engineering estimate
- 5 = Calculated, based on material balance
- 6 = Estimated, based on a published value

**PALO VERDE NUCLEAR GENERATING STATION  
Air Quality Permit Number: 030132  
Annual Emissions Calculation for 2007**

Lime Supply Silos	MC Process ID No.:	3
PVNGS Source ID No.: AWLSNTO3A-F	MC Stack No.:	3
SCC: 30510405	MC Control ID No.:	3

Material Processed  
Lime Used                                      17,083    T

<b>CRITERIA POLLUTANT</b>	<b>EMISSIONS FACTOR</b>	<b>SOURCE</b>	<b>EMISSIONS</b>
PM10	3.00E-02 lb/T loaded	by material balance	512.5 lb

- Notes:**
- 1) Vendor data given for PM. Assume  $PM_{1.0} = 1/2 * PM$ .
  - 2) The silo acts as an expansions vessel, allowing most of the particulate to fall out due to gravity.  
A conservative estimate of 10% going to the filter was used, 90% dropout inherent in transfer process.
  - 3) Filter efficiency is 99.97%.
  - 4) All of these factors are included in the emissions factor shown above.
  - 5) Annual emissions reflects the sum of emissions from both recalcined lime and pebble lime.
  - 6) The sum of recalcined lime produced and pebble lime delivered is used for the amount of material.



# General Process Form 2007

Permit Number(s): 030132

Place an X in any gray cell to mark data requested to be held confidential. See Instructions for requirements for information to be deemed confidential.

1. Process ID: 4
2. Process Type/Description: SODA ASH UNLOADING FILTER SEPARATOR (USED FOR RAILROAD DELIVERIES OF SODA ASH ONLY)
3. Stack ID(s) (only if required on Stack Form) 4
4. Process TIER Code: 071099 **MISCELLANEOUS INDUSTRIAL PROCESSES**
5. SCC Code: 30510498 (8 digit number) **BULK MATL UNLOADING: MINERAL**
6. Seasonal Throughput Percent: Dec-Feb 25% Mar-May 25% Jun-Aug 25% Sep-Nov 25%
7. Normal Operating Schedule: Days/Week 7 Hours/Year 0 Weeks/Year 0
8. Typical Hours of Operation: (military time) Start 00:00 End 23:59
9. Emissions based on: (name of material or other parameter, e.g. "rock", "diesel", "vehicle miles traveled") SODA ASH
10.  Used (input) or  Produced (output)
11. Annual Amount: (a number) 0 % **12. - Fuel Sulfur Content (in percent) \_\_\_\_\_ %**
13. Units of Measure: (for example: tons, gallons, million cu ft, acres, units produced etc.) **TONS**
14. Unit Conversion Factor: (if needed to convert Unit of Measure to correlate with emission factor units) \_\_\_\_\_

15	Emission Factor (EF) Information				Control Device Information					
	16	17	18	19	20	21	22	23	25	
Pollutant	Emission Factor (EF) (number)	Emission Factor Unit (lbs per)	Controlled EF? Yes or No	Calculation Method Code*	Capture % Efficiency	Primary Control Device ID	Secondary Control Device ID	Control Device(s) % Efficiency	Efficiency Reference Code**	Estimated Actual Emissions
PM-10	0.04	TON	N	2	100.000	4		99.960	3	0 lbs

**\*Calculation Method Codes**

- 1 = Continuous Emissions Monitoring Measurements
- 2 = Best Guess/ Engineering Judgment
- 3 = Material balance
- 4 = Source Test Measurements (Stack Test)
- 5 = AP-42/Fire Method or Emission Factor

**\*\* Control Efficiency Reference Codes**

- 1 = Tested efficiency / EPA reference method
- 2 = Tested efficiency / other source test method
- 3 = Design value from manufacturer
- 4 = Best Guess / engineering estimate
- 5 = Calculated, based on material balance
- 6 = Estimated, based on a published value

**PALO VERDE NUCLEAR GENERATING STATION**  
**Air Quality Permit Number: 030132**  
**Annual Emissions Calculation for 2007**

Soda Ash Unloading Filter-Separator	MC Process ID No.:	4
PVNGS Source ID No.: AWSXNS01	MC Stack No.:	4
SCC: 30510498	MC Control ID No.:	4

Material Delivered by Rail 0 Tons

<u>CRITERIA POLLUTANT</u>	<u>EMISSIONS FACTOR</u>	<u>SOURCE</u>	<u>EMISSIONS</u>
PM10	4.00E-02 lb/T loaded	by material balance	0.0 lb

**General Process Form 2007**

Permit Number(s): 030132

Place an X in any gray cell to mark data requested to be held confidential. See Instructions for requirements for information to be deemed confidential.

1. Process ID: 5
2. Process Type/Description: LOADING/UNLOADING SODA ASH INTO STORAGE SILOS (6)
3. Stack ID(s) (only if required on Stack Form) 5
4. Process TIER Code: 071099 MISCELLANEOUS INDUSTRIAL PROCESSES
5. SCC Code: 30510498 (8 digit number) BULK MATL UNLOADING: MINERAL
6. Seasonal Throughput Percent: Dec-Feb 25% Mar-May 25% Jun-Aug 25% Sep-Nov 25%
7. Normal Operating Schedule: Hours/Day 24 Days/Week 7 Hours/Year 8760 Weeks/Year
8. Typical Hours of Operation: (military time) Start 00:00 End 23:59
9. Emissions based on: (name of material or other parameter, e.g. "rock", "diesel", "vehicle miles traveled") SODA ASH
10.  Used (input) or  Produced (output)
11. Annual Amount: (a number) 7818 %
12. -- Fuel Sulfur Content (in percent) TONS
13. Units of Measure: (for example: tons, gallons, million cu ft, acres, units produced etc.) TONS
14. Unit Conversion Factor: (if needed to convert Unit of Measure to correlate with emission factor units)

15	Emission Factor (EF) Information				Control Device Information					
	16	17	18	19	20	21	22	23	23	25
Pollutant	Emission Factor (EF) (number)	Emission Factor Unit (lbs per Ton)	Controlled EF? Yes or No	Calculation Method Code*	Capture % Efficiency	Primary Control Device ID	Secondary Control Device ID	Control Device(s) % Efficiency	Efficiency Reference Code**	Estimated Actual Emissions
PM-10	0.03	LBS/TON	N	2	100.000	5		99.970	3	234.5 lbs

**\*Calculation Method Codes**

- 1 = Continuous Emissions Monitoring Measurements
- 2 = Best Guess/ Engineering Judgment
- 3 = Material balance
- 4 = Source Test Measurements (Stack Test)
- 5 = AP-42/Fire Method or Emission Factor

**\*\* Control Efficiency Reference Codes**

- 1 = Tested efficiency / EPA reference method
- 2 = Tested efficiency / other source test method
- 3 = Design value from manufacturer
- 4 = Best Guess / engineering estimate
- 5 = Calculated, based on material balance
- 6 = Estimated, based on a published value

**PALO VERDE NUCLEAR GENERATING STATION**  
**Air Quality Permit Number: 030132**  
**Annual Emissions Calculation for 2007**

Soda Ash Storage Silos	MC Process ID No.: 5
PVNGS Source ID No.: AWSXNTO1A-F	MC Stack No.: 5
SCC: 30510498	MC Control ID No.: 5

<b>Material Processed</b>	
Soda Ash by Truck	7,818 Tons
Soda Ash by Rail	0 Tons
<b>Sum</b>	<b>7,818 Tons</b>

<u>CRITERIA POLLUTANT</u>	<u>EMISSIONS FACTOR</u>	<u>SOURCE</u>	<u>EMISSIONS</u>
PM10	3.00E-02 lb/T loaded	by material balance	234.5 lb

**Notes:**

- 1) Vendor data given for PM. Assume  $PM_{10} = 1/2 * PM$ .
- 2) The silo acts as an expansions vessel, allowing most of the particulate to fall out due to gravity.  
A conservative estimate of 10% going to the filter was used, 90% dropout inherent in transfer process.
- 3) Filter efficiency is 99.97%.
- 4) All of these factors are included in the emissions factor shown above.

# General Process Form 2007

Permit Number(s): 030132

Place an X in any gray cell to mark data requested to be held confidential. See Instructions for requirements for information to be deemed confidential.

1. Process ID: 6
2. Process Type/Description: LOADING/UNLOADING SODA ASH INTO SUPPLY SILOS (2)
3. Stack ID(s) (only if required on Stack Form) 6
4. Process TIER Code: 071099 MISCELLANEOUS INDUSTRIAL PROCESSES
5. SCC Code: 30510498 (8 digit number) BULK MATL UNLOADING; MINERAL
6. Seasonal Throughput Percent: Dec-Feb 25% Mar-May 25% Jun-Aug 25% Sep-Nov 25%
7. Normal Operating Schedule: Hours/Day 24 Days/Week 7 Hours/Year 8760 Weeks/Year
8. Typical Hours of Operation: (military time) Start 00:00 End 23:59
9. Emissions based on: (name of material or other parameter, e.g. "rock", "diesel", "vehicle miles traveled") SODA ASH
10.  Used (input) or  Produced (output)
11. Annual Amount: (a number) 7464 %
12. Fuel Sulfur Content (in percent)        %
13. Units of Measure: (for example: tons, gallons, million cu ft, acres, units produced etc.) TONS
14. Unit Conversion Factor: (if needed to convert Unit of Measure to correlate with emission factor units)

15	Emission Factor (EF) Information				Control Device Information					
	16	17	18	19	20	21	22	23	25	
Pollutant	Emission Factor (EF) (number)	Emission Factor Unit (lbs per/Ton)	Controlled EF? Yes or No	Calculation Method Code*	Capture % Efficiency	Primary Control Device ID	Secondary Control Device ID	Control Device(s) % Efficiency	Efficiency Reference Code**	Estimated Actual Emissions
PM-10	0.03	TON	N	2	100.000	6		99.970	3	224 lbs

**\*Calculation Method Codes**

- 1 = Continuous Emissions Monitoring Measurements
- 2 = Best Guess/ Engineering Judgment
- 3 = Material balance
- 4 = Source Test Measurements (Stack Test)
- 5 = AP-42/Fire Method or Emission Factor
- 6 = State or Local Agency Emission Factor
- 7 = Manufacturer Specifications
- 8 = Site-Specific Emission Factor
- 9 = Vendor Emission Factor
- 10 = Trade Group Emission Factor

**\*\* Control Efficiency Reference Codes**

- 1 = Tested efficiency / EPA reference method
- 2 = Tested efficiency / other source test method
- 3 = Design value from manufacturer
- 4 = Best Guess / engineering estimate
- 5 = Calculated, based on material balance
- 6 = Estimated, based on a published value

**PALO VERDE NUCLEAR GENERATING STATION**  
**Air Quality Permit Number: 030132**  
**Annual Emissions Calculation for 2007**

<b>Soda Ash Supply Silo</b>	<b>MC Process ID No.:</b>	<b>6</b>
<b>PVNGS Source ID No.: AWSXNTO2A,B</b>	<b>MC Stack No.:</b>	<b>6</b>
<b>SCC: 30510498</b>	<b>MC Control ID No.:</b>	<b>6</b>

**Material Processed**                                **7,464 Tons**

<b>CRITERIA POLLUTANT</b>	<b>EMISSIONS FACTOR</b>	<b>SOURCE</b>	<b>EMISSIONS</b>
PM10	3.00E-02 lb/T loaded	by material balance	223.9 lb

**Notes:**

- 1) Vendor data given for PM. Assume  $PM_{10} = 1/2 * PM$ .
- 2) The silo acts as an expansions vessel, allowing most of the particulate to fall out due to gravity.  
A conservative estimate of 10% going to the filter was used, 90% dropout inherent in transfer process.
- 3) Filter efficiency is 99.97%.
- 4) All of these factors are included in the emissions factor shown above.
- 5) The amount of soda ash delivered is used as the amount of material.

# General Process Form 2007

Permit Number(s): **030132**

Place an X in any gray cell to mark data requested to be held confidential. See Instructions for requirements for information to be deemed confidential.

1. Process ID: 7

2. Process Type/Description: **MISC. PORTABLE DIESEL ENGINES < 600 HP (NON-ROAD AND MOVABLE STATIONARY ENGINES)**

3. Stack ID(s) (only if required on Stack Form) \_\_\_\_\_

4. Process TIER Code: 020599 **FUEL COMB. INDUSTRIAL: INTERNAL COMBUSTION**

5. SCC Code: 20200102 (8 digit number) **IND: DISTIL. OIL (DIESEL) - RECIP**

6. Seasonal Throughput Percent: Dec-Feb 25% Mar-May 25% Jun-Aug 25% Sep-Nov 25%

7. Normal Operating Schedule: Hours/Day 24 Days/Week 7 Hours/Year 8760 Weeks/Year \_\_\_\_\_

8. Typical Hours of Operation: (military time) Start 00:00 End 23:59

9. Emissions based on: (name of material or other parameter, e.g. "rock", "diesel", "vehicle miles traveled") **DIESEL**

10.  Used (input) or  Produced (output)

11. Annual Amount: (a number) 143,454 **12. - Fuel Sulfur Content (in percent) 0.05 %**

13. Units of Measure: (for example: tons, gallons, million cu ft, acres, units produced etc.) **GALS**

14. Unit Conversion Factor: (if needed to convert Unit of Measure to correlate with emission factor units) 0.001

Pollutant	Emission Factor (EF) Information					Control Device Information					Estimated Actual Emissions
	15 Emission Factor (EF) (number)	16 Emission Factor Unit (lbs per)	17 Emission Factor Unit (lbs per)	18 Controlled EF? Yes or No	19 Calculation Method Code*	20 Capture % Efficiency	21 Primary Control Device ID	22 Secondary Control Device ID	23 Control Device(s) % Efficiency	23 Efficiency Reference Code**	
CO	130	M GALS	M GALS	N	5						18,649 lbs
NOX	604	M GALS	M GALS	N	5						86,646 lbs
PM-10	42.5	M GALS	M GALS	N	5						6096 lbs
SOX	7.1	M GALS	M GALS	N	3						1019 lbs
VOC	49.3	M GALS	M GALS	N	5						7072 lbs

### \*Calculation Method Codes

- 1 = Continuous Emissions Monitoring Measurements
- 2 = Best Guess/ Engineering Judgment
- 3 = Material balance
- 4 = Source Test Measurements (Stack Test)
- 5 = AP-42/Fire Method or Emission Factor
- 6 = State or Local Agency Emission Factor
- 7 = Manufacturer Specifications
- 8 = Site-Specific Emission Factor
- 9 = Vendor Emission Factor
- 10 = Trade Group Emission Factor

### \*\* Control Efficiency Reference Codes

- 1 = Tested efficiency / EPA reference method
- 2 = Tested efficiency / other source test method
- 3 = Design value from manufacturer
- 4 = Best Guess / engineering estimate
- 5 = Calculated, based on material balance
- 6 = Estimated, based on a published value

Emission calculation includes both permitted (810 gallons) and permit exempt equipment (142,644 gallons) for total of (143,454 gallons) (Process ID 7)

**PALO VERDE NUCLEAR GENERATING STATION**  
**Air Quality Permit Number: 030132**  
**Annual Emissions Calculation for 2007**

Miscellaneous Portable Diesel Engines (Permit Exempt)

PVNGS Source ID No.: None

SCC: 20200102

MC Process ID No.: ~

Fuel Use 142,644 gal

<u>CRITERIA POLLUTANT</u>	<u>EMISSIONS FACTOR</u>	<u>SOURCE</u>	<u>EMISSIONS</u>
CO	1.30E+02 lb/M gal	AP-42, Sect. 3.3	18,544 lb
NO <sub>2</sub>	6.04E+02 lb/M gal	AP-42, Sect. 3.3	86,157 lb
PM10	4.25E+01 lb/M gal	AP-42, Sect. 3.3	6,062 lb
SO <sub>2</sub>	7.10E+00 lb/M gal	by material balance	1,013 lb
Ozone (VOC)	4.93E+01 lb/M gal	AP-42, Sect. 3.3	7,032 lb

**Notes:**

- 1) Emissions calculations are for non-road engines and movable stationary sources.
- 2) All of this equipment was less than 600 hp. Emissions are based on fuel consumption.
- 3) Low sulfur fuel (<0.05% S by wt) is burned in this equipment. However, for calculation purposes, a maximum fuel sulfur content of 0.05 % by weight at a fuel density of 7.1 lbs / gal was assumed.
- 4) Emission calculation includes both permitted (1718 gallons) and permit exempt equipment (62885) for total of (64603)



**PALO VERDE NUCLEAR GENERATING STATION**  
**Air Quality Permit Number: 030132**  
**Annual Emissions Calculation for 2007**

Miscellaneous Portable Diesel Engines (Permitted) MC Process ID No.: 7  
 PVNGS Source ID No.: None  
 SCC: 20200102

Fuel Use 810 gal

<u>CRITERIA POLLUTANT</u>	<u>EMISSIONS FACTOR</u>	<u>SOURCE</u>	<u>EMISSIONS</u>
CO	1.30E+02 lb/M gal	AP-42, Sect. 3.3	105 lb
NO <sub>2</sub>	6.04E+02 lb/M gal	AP-42, Sect. 3.3	489 lb
PM10	4.25E+01 lb/M gal	AP-42, Sect. 3.3	34 lb
SO <sub>2</sub>	7.10E+00 lb/M gal	by material balance	6 lb
Ozone (VOC)	4.93E+01 lb/M gal	AP-42, Sect. 3.3	40 lb

**Notes:**

- 1) Emissions calculations are for non-road engines and movable stationary sources.
- 2) All of this equipment was less than 600 hp. Emissions are based on fuel consumption.
- 3) Low sulfur fuel (<0.05% S by wt) is burned in this equipment. However, for calculation purposes, a maximum fuel sulfur content of 0.05 % by weight at a fuel density of 7.1 lbs / gal was assumed.
- 4) Emission calculation includes both permitted (1718 gallons) and permit exempt equipment (62885 gallons) for total of (64603 gallon)

# General Process Form 2007

Permit Number(s): 030132

Place an X in any gray cell to mark data requested to be held confidential. See Instructions for requirements for information to be deemed confidential.

1. Process ID: 8
2. Process Type/Description: MISC PORTABLE GASOLINE ENGINES (NON-ROAD AND MOVABLE STATIONARY ENGINES)
3. Stack ID(s) (only if required on Stack Form) \_\_\_\_\_
4. Process TIER Code: 020599
5. SCC Code: 20200301 (8 digit number)
6. Seasonal Throughput Percent: Dec-Feb 25% Mar-May 25% Jun-Aug 25% Sep-Nov 25%
7. Normal Operating Schedule: Days/Week 7 Hours/Year 8760 Weeks/Year \_\_\_\_\_
8. Typical Hours of Operation: (military time) Start 00:00 End 23:59
9. Emissions based on: (name of material or other parameter, e.g. "rock", "diesel", "vehicle miles traveled") GASOLINE
10.  Used (input) or  Produced (output)
11. Annual Amount: (a number) 6492 %
12. Fuel Sulfur Content (in percent) \_\_\_\_\_ %
13. Units of Measure: (for example: tons, gallons, million cu ft, acres, units produced etc.) GALS
14. Unit Conversion Factor: (if needed to convert Unit of Measure to correlate with emission factor units) 0.001

Pollutant	Emission Factor (EF) Information					Control Device Information					Estimated Actual Emissions
	15 Emission Factor (EF) (number)	16 Emission Factor Unit (lbs per)	17 Emission Factor Unit (lbs per)	18 Controlled EF? Yes or No	19 Calculation Method Code*	20 Capture % Efficiency	21 Primary Control Device ID	22 Secondary Control Device ID	23 Control Device(s) % Efficiency	23 Efficiency Reference Code**	
CO	7900	M GALS	M GALS	N	5						51,287 lbs
NOX	205	M GALS	M GALS	N	5						1331 lbs
PM <sub>10</sub>	12.6	M GALS	M GALS	N	5						82 lbs
SOX	11.1	M GALS	M GALS	N	3						73 lbs
VOC	382	M GALS	M GALS	N	5						2480 lbs

Emission calculation includes both permitted (47 gallons) and permit exempt equipment (6,445 gallons) for total of (6492 gallons) (Process ID 8)

### \*Calculation Method Codes

- 1 = Continuous Emissions Monitoring Measurements
- 2 = Best Guess/ Engineering Judgment
- 3 = Material balance
- 4 = Source Test Measurements (Stack Test)
- 5 = AP-42/Fire Method or Emission Factor

- 6 = State or Local Agency Emission Factor
- 7 = Manufacturer Specifications
- 8 = Site-Specific Emission Factor
- 9 = Vendor Emission Factor
- 10 = Trade Group Emission Factor

### \*\* Control Efficiency Reference Codes

- 1 = Tested efficiency / EPA reference method
- 2 = Tested efficiency / other source test method
- 3 = Design value from manufacturer
- 4 = Best Guess / engineering estimate
- 5 = Calculated, based on material balance
- 6 = Estimated, based on a published value

**PALO VERDE NUCLEAR GENERATING STATION**  
**Air Quality Permit Number: 030132**  
**Annual Emissions Calculation for 2007**

Miscellaneous Portable Gasoline Engines (Permit Exempt) MC Process ID No.: 8  
 PVNGS Source ID No.: None  
 SCC: 20200301

Fuel Use 6,445 gal

<u>CRITERIA POLLUTANT</u>	<u>EMISSIONS FACTOR</u>	<u>SOURCE</u>	<u>EMISSIONS</u>
CO	7.90E+03 lb/Mgal	AP-42, Sect. 3.3	50,916 lb
NO <sub>2</sub>	2.05E+02 lb/Mgal	AP-42, Sect. 3.3	1,321 lb
PM10	1.26E+01 lb/Mgal	AP-42, Sect. 3.3	81 lb
SO <sub>2</sub>	1.11E+01 lb/Mgal	AP-42, Sect. 3.3	72 lb
Ozone (VOC)	3.82E+02 lb/Mgal	AP-42, Sect. 3.3	2,462 lb

**Notes:**

- 1) Emissions rates are based fuel consumption.
- 2) Emissions factors are based on AP-42 Section 3.3 Gasoline and Diesel Industrial Engines dated 10/96.
- 3) Gasoline Heating Value is 20,300 BTU/lb.

**PALO VERDE NUCLEAR GENERATING STATION**  
**Air Quality Permit Number: 030132**  
**Annual Emissions Calculation for 2007**

Miscellaneous Portable Gasoline Engines (Permitted) PVNGS Source ID No.: None SCC: 20200301	MC Process ID No.: 8
---	----------------------

Fuel Use 47 gal

<u>CRITERIA POLLUTANT</u>	<u>EMISSIONS FACTOR</u>	<u>SOURCE</u>	<u>EMISSIONS</u>
CO	7.90E+03 lb/Mgal	AP-42, Sect. 3.3	371 lb
NO <sub>2</sub>	2.05E+02 lb/Mgal	AP-42, Sect. 3.3	10 lb
PM10	1.26E+01 lb/Mgal	AP-42, Sect. 3.3	1 lb
SO <sub>2</sub>	1.11E+01 lb/Mgal	AP-42, Sect. 3.3	1 lb
Ozone (VOC)	3.82E+02 lb/Mgal	AP-42, Sect. 3.3	18 lb

**Notes:**

- 1) Emissions rates are based fuel consumption.
- 2) Emissions factors are based on AP-42 Section 3.3 Gasoline and Diesel Industrial Engines dated 10/96.
- 3) Gasoline Heating Value is 20,300 BTU/lb.

# General Process Form 2007

Permit Number(s): 030132

Place an X in any gray cell to mark data requested to be held confidential. See Instructions for requirements for information to be deemed confidential.

1. Process ID: 9
2. Process Type/Description: 6 EMERGENCY GENERATORS @ 7670 HP, NRC-SAFETY POWER "EDG"
3. Stack ID(s) (only if required on Stack Form) 9
4. Process TIER Code: 020599
5. SCC Code: 20200401 (8 digit number)
6. Seasonal Throughput Percent: Dec-Feb 25% Mar-May 25% Jun-Aug 25% Sep-Nov 25%
7. Normal Operating Schedule: Hours/Day 24 Days/Week 7 Hours/Year 705 Weeks/Year 52
8. Typical Hours of Operation: (military time) Start 00:00 End 23:59
9. Emissions based on: (name of material or other parameter, e.g. "rock", "diesel", "vehicle miles traveled") DIESEL
10.  Used (input) or  Produced (output)
11. Annual Amount: (a number) 235116
12. Units of Measure: (for example: tons, gallons, million cu ft, acres, units produced etc.) GALS
13. Unit Conversion Factor: (if needed to convert Unit of Measure to correlate with emission factor units) 0.001

Pollutant	Emission Factor (EF) Information				Control Device Information						
	15 Emission Factor (EF) (number)	16 Emission Factor Unit (lbs per)	17 Emission Factor Unit (lbs per)	18 Controlled EF? Yes or No	19 Calculation Method Code*	20 Capture % Efficiency	21 Primary Control Device ID	22 Secondary Control Device ID	23 Control Device(s) % Efficiency	23 Efficiency Reference Code**	25 Estimated Actual Emissions
CO	116	M GALS	M GALS	N	5						27,273 lbs
NOX	438	M GALS	M GALS	N	5						102,981 lbs
PM-10	7.85	M GALS	M GALS	N	5						1,834 lbs
SOX	7.1	M GALS	M GALS	N	3						1,669 lbs
VOC	11.2	M GALS	M GALS	N	5						2,586 lbs

**\*Calculation Method Codes**

- 1 = Continuous Emissions Monitoring Measurements
- 2 = Best Guess/ Engineering Judgment
- 3 = Material balance
- 4 = Source Test Measurements (Stack Test)
- 5 = AP-42/Fire Method or Emission Factor

**\*\* Control Efficiency Reference Codes**

- 1 = Tested efficiency / EPA reference method
- 2 = Tested efficiency / other source test method
- 3 = Design value from manufacturer
- 4 = Best Guess / engineering estimate
- 5 = Calculated, based on material balance
- 6 = Estimated, based on a published value

**PALO VERDE NUCLEAR GENERATING STATION**  
**Air Quality Permit Number: 030132**  
**Annual Emissions Calculation for 2007**

Emergency Diesel Generators, Units 1-3, PVNGS Source ID No.: 1,2,3 M-DGA, DGB-HO1 SCC: 20200401	MC Process ID No.: - MC Stack No.: 9
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Operating Hours                    622.0 hrs (aggregate)  
 Fuel Use Rate                    378 gallons per hour  
 Total Fuel Use                    235,116 gallons (estimated)

CRITERIA POLLUTANT	EMISSIONS FACTOR	SOURCE	EMISSIONS
CO	1.160E+02 lb/M gal	AP-42, Sect. 3,4	27,273 lb
NO <sub>2</sub>	4.380E+02 lb/M gal	AP-42, Sect. 3,4	102,981 lb
PM10	7.800E+00 lb/M gal	AP-42, Sect. 3,4	1,834 lb
SO <sub>2</sub>	7.100E+00 lb/M gal	by material balance	1,669 lb
Ozone (VOC)	1.100E+01 lb/M gal	AP-42, Sect. 3,4	2,586 lb

**Notes:**

- 1) Emissions rates are based on nameplate full load (maximum) fuel consumption.
- 2) The fuel sulfur content was 0.04 % S by weight at a density of 7.1 lbs fuel / gal.
- 3) Low sulfur fuel (<0.05% S by wt) is burned in this equipment. However, for calculation purposes, a maximum fuel sulfur content of 0.05 % by weight at a fuel density of 7.1 lbs / gal was assumed.

# General Process Form 2007

Permit Number(s): **030132**

Place an X in any gray cell to mark data requested to be held confidential. See Instructions for requirements for information to be deemed confidential.

1. Process ID: 10
2. Process Type/Description: TSC GENERATOR, 1000 HP
3. Stack ID(s) (only if required on Stack Form) \_\_\_\_\_
4. Process TIER Code: 020599
5. SCC Code: 20200401 (8 digit number)
6. Seasonal Throughput Percent: Dec-Feb 25% Mar-May 25% Jun-Aug 25% Sep-Nov 25%
7. Normal Operating Schedule: Days/Week 7 Hours/Year 125 Weeks/Year 52
8. Typical Hours of Operation: (military time) Start 00:00 End 23:59
9. Emissions based on: (name of material or other parameter, e.g. "rock", "diesel", "vehicle miles traveled") DIESEL
10.  Used (input) or  Produced (output)
11. Annual Amount: (a number) 2925 12. Fuel Sulfur Content (in percent) 0.05 %
13. Units of Measure: (for example: tons, gallons, million cu ft, acres, units produced etc.) GALS
14. Unit Conversion Factor: (if needed to convert Unit of Measure to correlate with emission factor units) 0.001

Pollutant	Emission Factor (EF) Information					Control Device Information					Estimated Actual Emissions
	15 Emission Factor (EF) (number)	16 Emission Factor Unit (lbs per)	17 Controlled EF? Yes or No	18 Calculation Method Code*	19 Capture % Efficiency	20 Primary Control Device ID	21 Secondary Control Device ID	22 Control Device(s) % Efficiency	23 Efficiency Reference Code**	24 25	
CO	116	M GALS	N	5							339 lbs
NOX	438	M GALS	N	5							1281 lbs
PM-10	7.80	M GALS	N	5							23 lbs
SOX	7.1	M GALS	N	3							21 lbs
VOC	11.2	M GALS	N	5							33 lbs

\*Calculation Method Codes

- 1 = Continuous Emissions Monitoring Measurements
- 2 = Best Guess/ Engineering Judgment
- 3 = Material balance
- 4 = Source Test Measurements (Stack Test)
- 5 = AP-42/Fire Method or Emission Factor

\*\* Control Efficiency Reference Codes

- 1 = Tested efficiency / EPA reference method
- 2 = Tested efficiency / other source test method
- 3 = Design value from manufacturer
- 4 = Best Guess / engineering estimate
- 5 = Calculated, based on material balance
- 6 = Estimated, based on a published value

**PALO VERDE NUCLEAR GENERATING STATION**  
**Air Quality Permit Number: 030132**  
**Annual Emissions Calculation for 2007**

Technical Support Center Emergency Diesel	MC Process ID No.: 10
PVNGS Source ID No.: AMDGNOTO1	MC Stack No.: 10
SCC: 20200401	

Operating Hours	39	hrs
Fuel Use Rate	75	gal/hr
Total Fuel Use	2,925	gal (estimated)

CRITERIA POLLUTANT	EMISSIONS FACTOR	SOURCE	EMISSIONS
CO	1.160E+02 lb/M gal	AP-42, Sect. 3.4	339 lb
NO <sub>2</sub>	4.380E+02 lb/M gal	AP-42, Sect. 3.4	1281 lb
PM10	7.800E+00 lb/M gal	AP-42, Sect. 3.4	23 lb
SO <sub>2</sub>	7.100E+00 lb/M gal	by material balance	21 lb
Ozone (VOC)	1.120E+01 lb/M gal	AP-42, Sect. 3.4	33 lb

**Notes:**

- 1) Operating hours were rounded to the nearest whole number
- 2) Emissions rates are based on nameplate full load (maximum) fuel consumption.
- 3) Low sulfur fuel (<0.05% S by wt) is burned in this equipment. However, for calculation purposes, a maximum fuel sulfur content of 0.05 % by weight at a fuel density of 7.1 lbs / gal was assumed.



**General Process Form 2007**

Permit Number(s): 030132

Place an X in any gray cell to mark data requested to be held confidential. See Instructions for requirements for information to be deemed confidential.

- 1. Process ID: 11
- 2. Process Type/Description: SECURITY GENERATOR, 227 HP
- 3. Stack ID(s) (only if required on Stack Form) \_\_\_\_\_
- 4. Process TIER Code: 020599 FUEL COMB. INDUSTRIAL: INTERNAL COMBUSTION
- 5. SCC Code: 20200102 (8 digit number) INDUSTRIAL: DISTILLATE OIL; RECIP
- 6. Seasonal Throughput Percent: Dec-Feb 25% Mar-May 25% Jun-Aug 25% Sep-Nov 25%
- 7. Normal Operating Schedule: Hours/Day 24 Days/Week 7 Hours/Year 37.5 Weeks/Year 52
- 8. Typical Hours of Operation: (military time) Start 00:00 End 23:59
- 9. Emissions based on: (name of material or other parameter, e.g. "rock", "diesel", "vehicle miles traveled") DIESEL
- 10.  Used (input) or  Produced (output)
- 11. Annual Amount: (a number) 288 12. Fuel Sulfur Content (in percent) 0.05 %
- 13. Units of Measure: (for example: tons, gallons, million cu ft, acres, units produced etc.) GALS
- 14. Unit Conversion Factor: (if needed to convert Unit of Measure to correlate with emission factor units) 0.001

Pollutant	Emission Factor (EF) Information					Control Device Information					Estimated Actual Emissions
	15 Emission Factor (EF) (number)	16 Emission Factor Unit (lbs per)	17 Emission Factor Unit (lbs per)	18 Controlled EF? Yes or No	19 Calculation Method Code*	20 Capture % Efficiency	21 Primary Control Device ID	22 Secondary Control Device ID	23 Control Device(s) % Efficiency	23 Efficiency Reference Code**	
CO	130	M GALS	M GALS	N	5						37 lbs
NOX	604	M GALS	M GALS	N	5						174 lbs
PM-10	42.5	M GALS	M GALS	N	5						12 lbs
SOX	7.1	M GALS	M GALS	N	3						2 lbs
VOC	49.3	M GALS	M GALS	N	5						14 lbs

**\*Calculation Method Codes**

- 1 = Continuous Emissions Monitoring Measurements
- 2 = Best Guess/ Engineering Judgment
- 3 = Material balance
- 4 = Source Test Measurements (Stack Test)
- 5 = AP-42/Fire Method or Emission Factor

**\*\* Control Efficiency Reference Codes**

- 1 = Tested efficiency / EPA reference method
- 2 = Tested efficiency / other source test method
- 3 = Design value from manufacturer
- 4 = Best Guess / engineering estimate
- 5 = Calculated, based on material balance
- 6 = Estimated, based on a published value

**PALO VERDE NUCLEAR GENERATING STATION**  
**Air Quality Permit Number: 030132**  
**Annual Emissions Calculation for 2007**

Security Headquarters Emergency Generator	MC Process ID No.: 11
PVNGS Source ID No.: AASKNEO1	MC Stack No.: 11
SCC: 20200102	

Operating Hours	32	hr	
Fuel Use Rate	9	gal/hr	
Total Fuel Use	288	gal (estimated)	

CRITERIA POLLUTANT	EMISSIONS FACTOR	SOURCE	MONTHLY EMISSIONS
CO	1.30E+02 lb/M gal	AP-42, Sect. 3.3	37 lb
NO <sub>2</sub>	6.04E+02 lb/M gal	AP-42, Sect. 3.3	174 lb
PM10	4.25E+01 lb/M gal	AP-42, Sect. 3.3	12 lb
SO <sub>2</sub>	7.10E+00 lb/M gal	by material balance	2 lb
Ozone (VOC)	4.93E+01 lb/M gal	AP-42, Sect. 3.3	14 lb

**Notes:**  
1) Emission rates are based on the nameplate full load (maximum) fuel consumption.  
2) Low sulfur fuel (<0.05% S by wt) is burned in this equipment. However, for calculation purposes, a maximum fuel sulfur content of 0.05 % by weight at a fuel density of 7.1 lbs / gal was assumed.

# General Process Form 2007

Permit Number(s): 030132

Place an X in any gray cell to mark data requested to be held confidential. See Instructions for requirements for information to be deemed confidential.

1. Process ID: 12
2. Process Type/Description: FIRE PROTECTION PUMPS, 2 @ 190 HP
3. Stack ID(s) (only if required on Stack Form) \_\_\_\_\_
4. Process TIER Code: 020599
5. SCC Code: 20200102 (8 digit number)
6. Seasonal Throughput Percent: Dec-Feb 25% Mar-May 25% Jun-Aug 25% Sep-Nov 25%
7. Normal Operating Schedule: Hours/Day 24 Days/Week 7 Hours/Year 60.2 Weeks/Year \_\_\_\_\_
8. Typical Hours of Operation: (military time) Start 00:00 End 23:59
9. Emissions based on: (name of material or other parameter, e.g. "rock", "diesel", "vehicle miles traveled") DIESEL
10.  Used (input) or  Produced (output)
11. Annual Amount: (a number) 382
12. Fuel Sulfur Content (in percent) 0.05 %
13. Units of Measure: (for example: tons, gallons, million cu ft, acres, units produced etc.) GALS
14. Unit Conversion Factor: (if needed to convert Unit of Measure to correlate with emission factor units) 0.001

Pollutant	Emission Factor (EF) Information					Control Device Information						Estimated Actual Emissions
	15 Emission Factor (EF) (number)	16 Emission Factor Unit (lbs per)	17 Emission Factor Unit (lbs per)	18 Controlled EF? Yes or No	19 Calculation Method Code*	20 Capture % Efficiency	21 Primary Control Device ID	22 Secondary Control Device ID	23 Control Device(s) % Efficiency	23 Efficiency Reference Code**	25	
CO	130	M GALS		N	5							50 lbs
NOX	604	M GALS		N	5							237 lbs
PM-10	42.5	M GALS		N	5							16 lbs
SOX	7.1	M GALS		N	3							3 lbs
VOC	49.3	M GALS		N	5							19 lbs

### \*Calculation Method Codes

- 1 = Continuous Emissions Monitoring Measurements
- 2 = Best Guess/ Engineering Judgment
- 3 = Material balance
- 4 = Source Test Measurements (Stack Test)
- 5 = AP-42/Fire Method or Emission Factor

- 6 = State or Local Agency Emission Factor
- 7 = Manufacturer Specifications
- 8 = Site-Specific Emission Factor
- 9 = Vendor Emission Factor
- 10 = Trade Group Emission Factor

### \*\* Control Efficiency Reference Codes

- 1 = Tested efficiency / EPA reference method
- 2 = Tested efficiency / other source test method
- 3 = Design value from manufacturer
- 4 = Best Guess / engineering estimate
- 5 = Calculated, based on material balance
- 6 = Estimated, based on a published value

**PALO VERDE NUCLEAR GENERATING STATION**  
**Air Quality Permit Number: 030132**  
**Annual Emissions Calculation for 2007**

Fire Protection Pump	MC Process ID No.: 12
PVNGS Source ID No.: AMFPNPO1A/B	MC Stack No.: 12
SCC: 20200102	

Operating Hours	39	hours	
Fuel Use Rate	9.8	gal/hr per pump	
Total Fuel Use	382	gal (estimated)	

<u>CRITERIA POLLUTANT</u>	<u>EMISSIONS FACTOR</u>	<u>SOURCE</u>	<u>EMISSIONS</u>
CO	1.30E+02 lb/M gal	AP-42, Sect. 3.3	50 lb
NO <sub>2</sub>	6.04E+02 lb/M gal	AP-42, Sect. 3.3	231 lb
PM10	4.25E+01 lb/M gal	AP-42, Sect. 3.3	16 lb
SO <sub>2</sub>	7.10E+00 lb/M gal	by material balance	3 lb
Ozone (VOC)	4.93E+01 lb/M gal	AP-42, Sect. 3.3	19 lb

**Notes:**

- 1) Emission rates are based on the nameplate full load (maximum) fuel consumption.
- 2) Low sulfur fuel (<0.05% S by wt) is burned in this equipment. However, for calculation purposes, a maximum fuel sulfur content of 0.05 % by weight at a fuel density of 7.1 lbs / gal was assumed.

# General Process Form 2007

Permit Number(s): 030132

Place an X in any gray cell to mark data requested to be held confidential. See Instructions for requirements for information to be deemed confidential.

1. Process ID: 13
2. Process Type/Description: ADMIN-A GENERATOR, 600 HP
3. Stack ID(s) (only if required on Stack Form) \_\_\_\_\_
4. Process TIER Code: 020599
5. SCC Code: 20200401 (8 digit number)
6. Seasonal Throughput Percent: Dec-Feb 25% Mar-May 25% Jun-Aug 25% Sep-Nov 25%
7. Normal Operating Schedule: Hours/Day 24 Days/Week 7 Hours/Year 37.2 Weeks/Year \_\_\_\_\_
8. Typical Hours of Operation: (military time) Start 00:00 End 23:59
9. Emissions based on: (name of material or other parameter, e.g. "rock", "diesel", "vehicle miles traveled") DIESEL
10.  Used (input) or  Produced (output)
11. Annual Amount: (a number) 2280 12. Fuel Sulfur Content (in percent) 0.05 %
13. Units of Measure: (for example: tons, gallons, million cu ft, acres, units produced etc.) GALS
14. Unit Conversion Factor: (if needed to convert Unit of Measure to correlate with emission factor units) 0.001

Pollutant	Emission Factor (EF) Information					Control Device Information					Estimated Actual Emissions
	15 Emission Factor (EF) (number)	16 Emission Factor Unit (lbs per)	17 Controlled EF? Yes or No	18 Calculation Method Code*	19 Capture % Efficiency	20 Primary Control Device ID	21 Secondary Control Device ID	22 Control Device(s) % Efficiency	23 Efficiency Reference Code**	24	
CO	116	M GALS	N	5							266 lbs
NOX	438	M GALS	N	5							1000 lbs
PM-10	7.85	M GALS	N	5							18 lbs
SOX	7.1	M GALS	N	3							16 lbs
VOC	11.2	M GALS	N	5							26 lbs

### \*Calculation Method Codes

- 1 = Continuous Emissions Monitoring Measurements
- 2 = Best Guess/ Engineering Judgment
- 3 = Material balance
- 4 = Source Test Measurements (Stack Test)
- 5 = AP-42/Fire Method or Emission Factor

### \*\* Control Efficiency Reference Codes

- 6 = State or Local Agency Emission Factor
- 7 = Manufacturer Specifications
- 8 = Site-Specific Emission Factor
- 9 = Vendor Emission Factor
- 10 = Trade Group Emission Factor
- 1 = Tested efficiency / EPA reference method
- 2 = Tested efficiency / other source test method
- 3 = Design value from manufacturer
- 4 = Best Guess / engineering estimate
- 5 = Calculated, based on material balance
- 6 = Estimated, based on a published value

# PALO VERDE NUCLEAR GENERATING STATION

## Air Quality Permit Number: 030132

### Annual Emissions Calculation for 2007

Administration Building A Diesel	MC Process ID No.: 13
PVNGS Source ID No.: A Generator	MC Stack No.: 13
SCC: 20200401	

Operating Hours	76	hr	
Fuel Use Rate	30	gal/hr	
Total Fuel Use	2280	gal (estimated)	

<u>CRITERIA POLLUTANT</u>	<u>EMISSIONS FACTOR</u>	<u>SOURCE</u>	<u>EMISSIONS</u>
CO	1.165E+02 lb/M gal	AP-42, Sect. 3.3	266 lb
NO <sub>2</sub>	4.385E+02 lb/M gal	AP-42, Sect. 3.3	1000 lb
PM10	7.804E+00 lb/M gal	AP-42, Sect. 3.3	18 lb
SO <sub>2</sub>	7.100E+00 lb/M gal	by material balance	16 lb
Ozone (VOC)	1.122E+01 lb/M gal	AP-42, Sect. 3.3	26 lb

**Notes:**

- 1) Emission rates are based on the nameplate full load (maximum) fuel consumption.
- 2) Low sulfur fuel (<0.05% S by wt) is burned in this equipment. However, for calculation purposes, a maximum fuel sulfur content of 0.05 % by weight at a fuel density of 7.1 lbs / gal was assumed.

# General Process Form 2007

Permit Number(s): 030132

Place an X in any gray cell to mark data requested to be held confidential. See Instructions for requirements for information to be deemed confidential.

1. Process ID: 14
2. Process Type/Description: ADMIN-B GENERATOR, 289 HP
3. Stack ID(s) (only if required on Stack Form) \_\_\_\_\_
4. Process TIER Code: 020599 FUEL COMR. INDUSTRIAL; INTERNAL COMBUSTION
5. SCC Code: 20200102 (8 digit number) IND: DISTIL. OIL (DIESEL) -RECIP
6. Seasonal Throughput Percent: Dec-Feb 25% Mar-May 25% Jun-Aug 25% Sep-Nov 25%
7. Normal Operating Schedule: Hours/Day 24 Days/Week 7 Hours/Year 30.8 Weeks/Year \_\_\_\_\_
8. Typical Hours of Operation: (military time) Start 00:00 End 23:59
9. Emissions based on: (name of material or other parameter, e.g. "rock", "diesel", "vehicle miles traveled") DIESEL
10.  Used (input) or  Produced (output)
11. Annual Amount: (a number) 840 12. - Fuel Sulfur Content (in percent) 0.05 %
13. Units of Measure: (for example: tons, gallons, million cu ft, acres, units produced etc.) GALS
14. Unit Conversion Factor: (if needed to convert Unit of Measure to correlate with emission factor units) 0.001

Pollutant	Emission Factor (EF) Information					Control Device Information					Estimated Actual Emissions
	15	16	17	18	19	20	21	22	23	23	
	Emission Factor (EF) (number)	Emission Factor Unit (lbs per)	Controlled EF? Yes or No	Calculation Method Code*	Capture % Efficiency	Primary Control Device ID	Secondary Control Device ID	Control Device(s) % Efficiency	Efficiency Reference Code**		
CO	130	M GALS	N	5						109 lbs	
NOX	604	M GALS	N	5						507 lbs	
PM-10	42.5	M GALS	N	5						36 lbs	
SOX	7.1	M GALS	N	3						6 lbs	
VOC	49.3	M GALS	N	5						41 lbs	

### \*Calculation Method Codes

- 1 = Continuous Emissions Monitoring Measurements
- 2 = Best Guess/ Engineering Judgment
- 3 = Material balance
- 4 = Source Test Measurements (Stack Test)
- 5 = AP-42/Fire Method or Emission Factor

### \*\* Control Efficiency Reference Codes

- 6 = State or Local Agency Emission Factor
- 7 = Manufacturer Specifications
- 8 = Site-Specific Emission Factor
- 9 = Vendor Emission Factor
- 10 = Trade Group Emission Factor
- 1 = Tested efficiency / EPA reference method
- 2 = Tested efficiency / other source test method
- 3 = Design value from manufacturer
- 4 = Best Guess / engineering estimate
- 5 = Calculated, based on material balance
- 6 = Estimated, based on a published value

**PALO VERDE NUCLEAR GENERATING STATION**  
**Air Quality Permit Number: 030132**  
**Annual Emissions Calculation for 2007**

Administration Building B Diesel PVNGS Source ID No.: B Generator SCC: 20200102	MC Process ID No.: 14 MC Stack No.: 14
---	---

Operating Hours	70	hr	
Fuel Use Rate	12	gal/hr	
Total Fuel Use	840	gal (estimated)	

CRITERIA POLLUTANT	EMISSIONS FACTOR	SOURCE	EMISSIONS
CO	1.30E+02 lb/M gal	AP-42, Sect. 3.3	109 lb
NO <sub>2</sub>	6.04E+02 lb/M gal	AP-42, Sect. 3.3	507 lb
PM10	4.25E+01 lb/M gal	AP-42, Sect. 3.3	36 lb
SO <sub>2</sub>	7.10E+00 lb/M gal	by material balance	6 lb
Ozone (VOC)	4.93E+01 lb/M gal	AP-42, Sect. 3.3	41 lb

**Notes:**

- 1) Emission rates are based on the nameplate full load (maximum) fuel consumption.
- 2) Low sulfur fuel (<0.05% S by wt) is burned in this equipment. However, for calculation purposes, a maximum fuel sulfur content of 0.05 % by weight at a fuel density of 7.1 lbs / gal was assumed.



# General Process Form 2007

Permit Number(s): 030132

Place an X in any gray cell to mark data requested to be held confidential. See Instructions for requirements for information to be deemed confidential.

1. Process ID: 16
2. Process Type/Description: AUXILIARY BOILER
3. Stack ID(s) (only if required on Stack Form) \_\_\_\_\_
4. Process TIER Code: 020202 **FUEL COMB. INDUSTRIAL: OIL-DISTILLATE**
5. SCC Code: 10100501 (8 digit number) **UTIL: GRDES 1&2 OIL-NORMFIRE**
6. Seasonal Throughput Percent: Dec-Feb 25% Mar-May 25% Jun-Aug 25% Sep-Nov 25%
7. Normal Operating Schedule: Days/Week 7 Hours/Year \_\_\_\_\_ Weeks/Year \_\_\_\_\_
8. Typical Hours of Operation: (military time) Start 00:00 End 23:59
9. Emissions based on: (name of material or other parameter, e.g. "rock", "diesel", "vehicle miles traveled") **DIESEL**

10.  Used (input) or  Produced (output)
11. Annual Amount: (a number) 0 **12. Fuel Sulfur Content (in percent) 0.05 %**

13. Units of Measure: (for example: tons, gallons, million cu ft, acres, units produced etc.) GALS
14. Unit Conversion Factor: (if needed to convert Unit of Measure to correlate with emission factor units) 0.001

Pollutant	Emission Factor (EF) Information					Control Device Information					Estimated Actual Emissions
	15 Emission Factor (EF) (number)	16 Emission Factor Unit (lbs per)	17 Emission Factor Unit (lbs per)	18 Controlled EF? Yes or No	19 Calculation Method Code*	20 Capture % Efficiency	21 Primary Control Device ID	22 Secondary Control Device ID	23 Control Device(s) % Efficiency	23 Efficiency Reference Code**	
CO	5	M GALS		N	5						0 lbs
NOX	24	M GALS		N	5						0 lbs
PM-10 <sup>1</sup>	2	M GALS		N	5						0 lbs
SOX	7.1	M GALS		N	3						0 lbs
VOC <sup>1</sup>	0.2	M GALS		N	6						0 lbs

<sup>1</sup> Updated emissions factors from County website for SCC Code. See Calculation Sheet No. 5

### \*Calculation Method Codes

- 1 = Continuous Emissions Monitoring Measurements
- 2 = Best Guess/ Engineering Judgment
- 3 = Material balance
- 4 = Source Test Measurements (Stack Test)
- 5 = AP-42/Fire Method or Emission Factor
- 6 = State or Local Agency Emission Factor
- 7 = Manufacturer Specifications
- 8 = Site-Specific Emission Factor
- 9 = Vendor Emission Factor
- 10 = Trade Group Emission Factor

### \*\* Control Efficiency Reference Codes

- 1 = Tested efficiency / EPA reference method
- 2 = Tested efficiency / other source test method
- 3 = Design value from manufacturer
- 4 = Best Guess / engineering estimate
- 5 = Calculated, based on material balance
- 6 = Estimated, based on a published value

**PALO VERDE NUCLEAR GENERATING STATION**  
**Air Quality Permit Number: 030132**  
**Annual Emissions Calculation for 2007**

<b>Auxiliary Boiler</b>	<b>MC Process ID No.: 16</b>
<b>PVNGS Source ID No.: ASN-B02</b>	<b>MC Stack No.: 16</b>
<b>SCC: 10100501</b>	

**Hours of Operation**                      Less than 1 hr  
**Fuel Consumption**                        0 gal

<u>CRITERIA POLLUTANT</u>	<u>EMISSIONS FACTOR</u>	<u>SOURCE</u>	<u>EMISSIONS</u>
CO	5.00E+00 lb/M gal	Maricopa County	0 lb
NO <sub>2</sub>	2.40E+01 lb/M gal	Maricopa County	0 lb
PM10	2.00E+00 lb/M gal	Maricopa County	0.0 lb
SO <sub>2</sub>	7.10E+00 lb/M gal	by material balance	0 lb
Ozone (VOC)	2.00E-01 lb/M gal	Maricopa County	0.00 lb

**Notes:**

- 1) Emissions are based on the metered fuel consumption.
- 2) Low sulfur fuel (<0.05% S by wt) is burned in this equipment. However, for calculation purposes, a maximum fuel sulfur content of 0.05 % by weight at a fuel density of 7.1 lbs / gal was assumed.

**General Process Form 2007**

Permit Number(s): 030132

Place an X in any gray cell to mark data requested to be held confidential. See Instructions for requirements for information to be deemed confidential.

1. Process ID: 17
2. Process Type/Description: 3 UNIT COOLING TOWERS, W/ 3 TOWERS PER UNIT (TOTAL HOURS OF OPERATION)
3. Stack ID(s) (only if required on Stack Form) 17
4. Process TIER Code: 140699 **MISCELLANEOUS: COOLING TOWERS**
5. SCC Code: 38500101 (8 digit number)
6. Seasonal Throughput Percent: Dec-Feb 25% Mar-May 25% Jun-Aug 25% Sep-Nov 25%
7. Normal Operating Schedule: Hours/Day 24 Days/Week 7 Hours/Year 8760 Weeks/Year
8. Typical Hours of Operation: (military time) Start 00:00 End 23:59
9. Emissions based on: (name of material or other parameter, e.g. "rock", "diesel", "vehicle miles traveled") HRS OF OPERATION, AGGREGATE
10.  Used (input) or  Produced (output)
11. Annual Amount: (a number) 23304 12. Fuel Sulfur Content (in percent) %
13. Units of Measure: (for example: tons, gallons, million cu ft, acres, units produced etc.) HRS OF OPERATION
14. Unit Conversion Factor: (if needed to convert Unit of Measure to correlate with emission factor units)

15	Emission Factor (EF) Information				Control Device Information					
	16	17	18	19	20	21	22	23	23	25
Pollutant	Emission Factor (EF) (number)	Emission Factor Unit (lbs per)	Controlled EF? Yes or No	Calculation Method Code*	Capture % Efficiency	Primary Control Device ID	Secondary Control Device ID	Control Device(s) % Efficiency	Efficiency Reference Code**	Estimated Actual Emissions
PM-10 <sup>1</sup>	<del>4.976</del> 0.105861	HR OF OPERATI	N	8						2467 lbs
VOC <sup>1</sup>	<del>0.272</del> 0.207	HR OF OPERATI	N	3						4824 lbs

<sup>1</sup> Emission factors updated based on engineering calculation and material balance. See Calculation Sheet No. 2.

- \*Calculation Method Codes**
- 1 = Continuous Emissions Monitoring Measurements
  - 2 = Best Guess/ Engineering Judgment
  - 3 = Material balance
  - 4 = Source Test Measurements (Stack Test)
  - 5 = AP-42/Fire Method or Emission Factor
  - 6 = State or Local Agency Emission Factor
  - 7 = Manufacturer Specifications
  - 8 = Site-Specific Emission Factor
  - 9 = Vendor Emission Factor
  - 10 = Trade Group Emission Factor
- \*\* Control Efficiency Reference Codes**
- 1 = Tested efficiency / EPA reference method
  - 2 = Tested efficiency / other source test method
  - 3 = Design value from manufacturer
  - 4 = Best Guess / engineering estimate
  - 5 = Calculated, based on material balance
  - 6 = Estimated, based on a published value

**PALO VERDE NUCLEAR GENERATING STATION**  
**Air Quality Permit Number: 030132**  
**Annual Emissions Calculation for 2007**

Units 1, 2, and 3 Cooling Tower  
 PVNGS ID No.: CWN-W01,2,3  
 SCC Code: 38500101

MC Process ID No.: 17 (includes all 3 units, all coolers)  
 MC Stack No.: 17

Cumulative Operating Days (all units): 971.0 days  
 Cumulative Operating Hours (all Units) 23,304 hrs

POLLUTANTS	EMISSIONS FACTOR	SOURCE	ANNUAL EMISSIONS
PM10	1.0587E-01 lb/hr	Non-Title V Permit Application	2,467 lb
VOC (Total)	2.070E-01 lb/hr	Materials balance & CARB	4,824 lb

**Non Chloroform VOC Emission Factor:**  
 Total Non Chloroform VOC = (6,900 gallons of AF1091)(0.067 lbs VOC / gallon) = 0.460 lbs  
 Non Chloroform VOC Emission Factor = (460 lbs) / (23304 hr) = 0.020 lb / hr

**Chloroform VOC Emission Factor:**  
 The chloroform emissions factor of 20 kg-s/cubic m-yr, was obtained from Table 8.6-2, Emission Factor for Volatile Organic Compounds from "Emissions Characteristics of Cooling Towers. Using Reclaimed Wastewater in California", Science Applications, Inc., prepared for California State Air Resources Board, August 11, 1981.  
 Chloroform VOC Emissions Factor = (20 kg-s/cubic m-yr)(1 yr/365 d)(1 d / 24 hr)(2.2 lb / kg) (1 min / 60 s) (1 cubic m / 264.1 gal) (Circulating Water Flow in gal / min)  
 Chloroform VOC Emissions Factor = (20 kg-s/cubic m-yr)(1 yr/365 d)(1 d / 24 hr)(2.2 lb / kg) (1 min / 60 s) (1 cubic m / 264.1 gal) (590,000 gal/min)  
 Chloroform VOC Emissions Factor = 0.187 lbs / hr

**Total VOC Emission Factor:**  
 VOC Emissions Factor = Non Chloroform Emissions Factor + Chloroform Emissions Factor  
 VOC Emissions Factor = 0.020 lb / hr + 0.187 lb / hr  
 VOC Emissions Factor = 0.207 lb / hr

**PALO VERDE NUCLEAR GENERATING STATION**  
**Air Quality Permit Number: 030132**  
**Annual Emissions Calculation for 2007**

**Release Points 18 & 19: Recalcination Furnace**

NOTE: THESE RELEASE POINTS HAVE BEEN DELETED FROM THE PERMIT.  
MAINTAIN NUMBER FOR HISTORIAL PURPOSES ONLY

# General Process Form 2007

Permit Number(s): 030132

Place an X in any gray cell to mark data requested to be held confidential. See Instructions for requirements for information to be deemed confidential.

1. Process ID: 20
2. Process Type/Description: 2 DIESEL FIRED "GAS" TURBINES, NRC LEVEL ENERGY POWER, CO, NOX, PM10  
ESF FROM VENDOR
3. Stack ID(s) (only if required on Stack Form) \_\_\_\_\_
4. Process TIER Code: 020599
5. SCC Code: 20200101 (8 digit number)
6. Seasonal Throughput Percent: Dec-Feb 25% Mar-May 25% Jun-Aug 25% Sep-Nov 25%
7. Normal Operating Schedule: Days/Week 7 Hours/Year 53.8 Weeks/Year \_\_\_\_\_
8. Typical Hours of Operation: (military time) Start 00:00 End 23:59
9. Emissions based on: (name of material or other parameter, e.g. "rock", "diesel", "vehicle miles traveled") DIESEL
10.  Used (input) or  Produced (output)
11. Annual Amount: (a number) 5337
12. Fuel Sulfur Content (in percent) 0.05 %
13. Units of Measure: (for example: tons, gallons, million cu ft, acres, units produced etc.) GALS
14. Unit Conversion Factor: (if needed to convert Unit of Measure to correlate with emission factor units) 0.001

Pollutant	Emission Factor (EF) Information					Control Device Information					Estimated Actual Emissions	
	15 Emission Factor (EF) (number)	16 11.3	17 M GALS	18 Controlled EF? Yes or No	19 N	20 Capture % Efficiency	21 Primary Control Device ID	22 Secondary Control Device ID	23 Control Device(s) % Efficiency	23 Efficiency Reference Code**		
CO												60 lbs
NOX												624 lbs
PM-10												131 lbs
SOX												38 lbs
VOC												0.3 lbs

Annual amount is 5337 gallons aggregate. Unit of measure was converted to correlate with emission factor (5337/1000 = 5.337)

### \*Calculation Method Codes

- 1 = Continuous Emissions Monitoring Measurements
- 2 = Best Guess/ Engineering Judgment
- 3 = Material balance
- 4 = Source Test Measurements (Stack Test)
- 5 = AP-42/Fire Method or Emission Factor
- 6 = State or Local Agency Emission Factor
- 7 = Manufacturer Specifications
- 8 = Site-Specific Emission Factor
- 9 = Vendor Emission Factor
- 10 = Trade Group Emission Factor

### \*\* Control Efficiency Reference Codes

- 1 = Tested efficiency / EPA reference method
- 2 = Tested efficiency / other source test method
- 3 = Design value from manufacturer
- 4 = Best Guess / engineering estimate
- 5 = Calculated, based on material balance
- 6 = Estimated, based on a published value

**PALO VERDE NUCLEAR GENERATING STATION**  
**Air Quality Permit Number: 030132**  
**Annual Emissions Calculation for 2007**

Station Blackstart Turbine PVNGS Source ID No.: AMGTNKO1A/B SCC: 20200101	MC Process ID No.: 20 MC Stack No.: 20
---	---

Operating Hours                      45                      hours  
 Fuel Consumption                    5,337                   gallons (aggregate)

CRITERIA POLLUTANT	EMISSIONS FACTOR	SOURCE	EMISSIONS
CO	1.13E+01                      lb/M gal	Vendor data	60 lb
NO <sub>2</sub>	1.17E+02                      lb/M gal	Vendor data	624 lb
PM10	2.46E+01                      lb/M gal	Vendor data	131 lb
SO <sub>2</sub>	7.10E+00                      lb/M gal	by material balance	38 lb
Ozone (VOC)	5.62E-02                      lb/M gal	AP-42, Sect. 3.1	0.3 lb

**Notes:**

- 1) Fuel Consumption was based on fuel totalizer readings.
- 2) Low sulfur fuel (<0.05% S by wt) is burned in this equipment. However, for calculation purposes, a maximum fuel sulfur content of 0.05 % by weight at a fuel density of 7.1 lbs / gal was assumed.
- 3) Vendor data given for PM. PM10 assumed equivalent to PM.
- 4) The VOC emissions factor is based on AP-42 Section 3.1 Stationary Gas Turbines dated 04/00.

# General Process Form 2007

Permit Number(s): 030132

Place an X in any gray cell to mark data requested to be held confidential. See Instructions for requirements for information to be deemed confidential.

1. Process ID: 21
2. Process Type/Description: CHEMICAL STORAGE BLDG GENERATOR, 150 HP
3. Stack ID(s) (only if required on Stack Form) \_\_\_\_\_
4. Process TIER Code: 020599 FUEL COMB. INDUSTRIAL: INTERNAL COMBUSTION
5. SCC Code: 20200102 (*8 digit number*) INDUSTRIAL: DISTILLATE OIL: RECIP
6. Seasonal Throughput Percent: Dec-Feb 25% Jun-Aug 25% Sep-Nov 25%
7. Normal Operating Schedule: Hours/Day 24 Days/Week 7 Hours/Year 40 Weeks/Year \_\_\_\_\_
8. Typical Hours of Operation: (military time) Start 00:00 End 23:59
9. Emissions based on: (name of material or other parameter, e.g. "rock", "diesel", "vehicle miles traveled") DIESEL
10.  Used (input) or  Produced (output)
11. Annual Amount: (a number) 415 GALS
12. Fuel Sulfur Content (in percent) 0.05%
13. Units of Measure: (for example: tons, gallons, million cu ft, acres, units produced etc.) \_\_\_\_\_
14. Unit Conversion Factor: (if needed to convert Unit of Measure to correlate with emission factor units) 0.001

Pollutant	Emission Factor (EF) Information					Control Device Information					Estimated Actual Emissions
	15 Emission Factor (EF) (number)	16 Emission Factor Unit (lbs per)	17 Emission Factor Unit (lbs per)	18 Controlled EF? Yes or No	19 Calculation Method Code*	20 Capture % Efficiency	21 Primary Control Device ID	22 Secondary Control Device ID	23 Control Device(s) % Efficiency	23 Efficiency Reference Code**	
CO	130.0	M GALS	M GALS	N	5						54 lbs
NOX	604.0	M GALS	M GALS	N	5						257 lbs
PM-10	42.5	M GALS	M GALS	N	5						18 lbs
SOX	7.1	M GALS	M GALS	N	3						3 lbs
VOC	49.3	M GALS	M GALS	N	5						20 lbs

### \*Calculation Method Codes

- 1 = Continuous Emissions Monitoring Measurements
- 2 = Best Guess/ Engineering Judgment
- 3 = Material balance
- 4 = Source Test Measurements (Stack Test)
- 5 = AP-42/Fire Method or Emission Factor

### \*\* Control Efficiency Reference Codes

- 6 = State or Local Agency Emission Factor
- 7 = Manufacturer Specifications
- 8 = Site-Specific Emission Factor
- 9 = Vendor Emission Factor
- 10 = Trade Group Emission Factor
- 1 = Tested efficiency / EPA reference method
- 2 = Tested efficiency / other source test method
- 3 = Design value from manufacturer
- 4 = Best Guess / engineering estimate
- 5 = Calculated, based on material balance
- 6 = Estimated, based on a published value



**PALO VERDE NUCLEAR GENERATING STATION**  
**Air Quality Permit Number: 030132**  
**Annual Emissions Calculation for 2007**

Chemical Storage Building Diesel PVNGS Source ID No.: C Generator SCC: 20200102	MC Process ID No.: 21 MC Stack No.: 21
---	---

Operating Hours	61	hrs	
Fuel Use Rate	6.8	gal/hr	
Total Fuel Use	415	gal (estimated)	

CRITERIA POLLUTANT	EMISSIONS FACTOR	SOURCE	EMISSIONS
CO	1.30E+02 lb/M gal	AP-42, Sect. 3.3	54 lb
NO <sub>2</sub>	6.04E+02 lb/M gal	AP-42, Sect. 3.3	251 lb
PM10	4.25E+01 lb/M gal	AP-42, Sect. 3.3	18 lb
SO <sub>2</sub>	7.10E+00 lb/M gal	by material balance	3 lb
Ozone (VOC)	4.93E+01 lb/M gal	AP-42, Sect. 3.3	20 lb

**Notes:**

- 1) Emission rates are based on the nameplate full load (maximum) fuel consumption.
- 2) Low sulfur fuel (<0.05% S by wt) is burned in this equipment. However, for calculation purposes, a maximum fuel sulfur content of 0.05 % by weight at a fuel density of 7.1 lbs / gal was assumed.

# General Process Form 2007

Permit Number(s): 030132

Place an X in any gray cell to mark data requested to be held confidential. See Instructions for requirements for information to be deemed confidential.

1. Process ID: 22
2. Process Type/Description: PORTABLE COOLING TOWER (UNITS ARE BASED ON TDS-HRS. EF BACK CALCULATED)
3. Stack ID(s) (only if required on Stack Form) \_\_\_\_\_
4. Process TIER Code: 140699 MISCELLANEOUS: COOLING TOWERS
5. SCC Code: 38500101 (8 digit number) COOLING TOWERS: PROC COOLING: MECH DRAFT
6. Seasonal Throughput Percent: Dec-Feb 25% Mar-May 25% Jun-Aug 25% Sep-Nov 25%
7. Normal Operating Schedule: Hours/Day 24 Days/Week 7 Hours/Year 1392 Weeks/Year \_\_\_\_\_
8. Typical Hours of Operation: (military time) Start 00:00 End 23:59
9. Emissions based on: (name of material or other parameter, e.g. "rock", "diesel", "vehicle miles traveled") HRS OF OPERATION
10.  Used (input) or  Produced (output)
11. Annual Amount: (a number) 2136 % 12. - Fuel Sulfur Content (in percent) \_\_\_\_\_ %
13. Units of Measure: (for example: tons, gallons, million cu ft, acres, units produced etc.) HRS OF OPERATION
14. Unit Conversion Factor: (if needed to convert Unit of Measure to correlate with emission factor units) \_\_\_\_\_

15	Emission Factor (EF) Information				Control Device Information					
	16	17	18	19	20	21	22	23	23	25
Pollutant	Emission Factor (EF) (number)	Emission Factor Unit (lbs per)	Controlled EF? Yes or No	Calculation Method Code*	Capture % Efficiency	Primary Control Device ID	Secondary Control Device ID	Control Device(s) % Efficiency	Efficiency Reference Code**	Estimated Actual Emissions
PM-10 <sup>1</sup>	0.208	HR OF OPERATI	N	5						920 lbs
	0.431									
VOC <sup>1</sup>	0.0019	HR OF OPERATI	N	2						4 lbs

<sup>1</sup> Emissions factor back-calculated using AP-42 methodology and published VOC emissions factors. See Calculation Sheet No. 3

### \*Calculation Method Codes

- 1 = Continuous Emissions Monitoring Measurements
- 2 = Best Guess/ Engineering Judgment
- 3 = Material balance
- 4 = Source Test Measurements (Stack Test)
- 5 = AP-42/Fire Method or Emission Factor

### \*\* Control Efficiency Reference Codes

- 6 = State or Local Agency Emission Factor
- 7 = Manufacturer Specifications
- 8 = Site-Specific Emission Factor
- 9 = Vendor Emission Factor
- 10 = Trade Group Emission Factor
- 1 = Tested efficiency / EPA reference method
- 2 = Tested efficiency / other source test method
- 3 = Design value from manufacturer
- 4 = Best Guess / engineering estimate
- 5 = Calculated, based on material balance
- 6 = Estimated, based on a published value

**PALO VERDE NUCLEAR GENERATING STATION**  
**Air Quality Permit Number: 030132**  
**Annual Emissions Calculation for 2007**

**PORTABLE COOLING TOWER** MC Process ID No.: 22  
 SCC Code: 38500101 MC Stack No.: 22

Average TDS 7,120 ppm  
 Operating Days 89 days  
 Operating Hours 2136 hours

<b>POLLUTANTS</b>	<b>EMISSIONS FACTOR</b>	<b>SOURCE</b>	<b>EMISSIONS</b>
PM10	4.31E-01 lb/hr	manufacturer's data	920 lb
VOC (Chloroform)	1.90E-03 lb/hr	CARB Reference	

**Particulate Matter:**

Emissions factors for PM<sub>10</sub> and chloroform are derived from formulas below.

Where:

CFR = circulating flow rate (gpm) (2 cells) = 6,000

F1 = Liquid Drift Rate (fraction of flow rate) = 0.0002% = 0.00002

PM-10 (lb/hr) = CFR x F1 x 8.4 lb/gal x 60 min/hr x (1/1,000,000 ppm) x Average TDS

PM-10 (lb/hr) = {6000 x 0.00002 x 8.4 x 60 x (1/1,000,000) x 7,120} = 0.431 lbs/hr

**Chloroform:**

The chloroform emissions factor of 20 kg-s/cubic m-yr, was obtained from Table 8.6-2, Emission Factor for Volatile Organic Compounds from "Emissions Characteristics of Cooling Towers Using Reclaimed Wastewater in California", Science Applications, Inc., prepared for California State Air Resources Board, August 11, 1981.

Chloroform VOC Emissions Factor = (20 kg-s/cubic m-yr)(1 yr/365 d)(1 d / 24 hr)(2.2 lb / kg) (1 min / 60 s) (1 cubic m / 264.1 gal) (Circulating Water Flow in gal / m

Chloroform VOC Emissions Factor = (20 kg-s/m-yr)(1 yr/365 d)(1 d / 24 hr)(2.2 lb / kg) (1 min / 60 s) (1 cubic m / 264.1 gal) (6,000 gal/min)

Chloroform VOC Emissions Factor = 0.00190 lb / hr

# General Process Form 2007

Permit Number(s): 030132

Place an X in any gray cell to mark data requested to be held confidential. See Instructions for requirements for information to be deemed confidential.

1. Process ID: 23
2. Process Type/Description: LOADING/UNLOADING SALT SILOS (2)
3. Stack ID(s) (only if required on Stack Form) 23
4. Process TIER Code: 071099 MISCELLANEOUS INDUSTRIAL PROCESSES
5. SCC Code: 30510498 (8 digit number) BULK MATL UNLOADING: MINERAL
6. Seasonal Throughput Percent: Dec-Feb 25% Mar-May 25% Jun-Aug 25% Sep-Nov 25%
7. Normal Operating Schedule: Days/Week 7 Hours/Year 8760 Weeks/Year \_\_\_\_\_
8. Typical Hours of Operation: (military time) Start 00:00 End 23:59
9. Emissions based on: (name of material or other parameter, e.g. "rock", "diesel", "vehicle miles traveled") SALT
10.  Used (input) or  Produced (output)
11. Annual Amount: (a number) 7568 %
12. Fuel Sulfur Content (in percent) \_\_\_\_\_ %
13. Units of Measure: (for example: tons, gallons, million cu ft, acres, units produced etc.) TONS
14. Unit Conversion Factor: (if needed to convert Unit of Measure to correlate with emission factor units) \_\_\_\_\_

15	Emission Factor (EF) Information				Control Device Information					
	16	17	18	19	20	21	22	23	23	25
Pollutant	Emission Factor (EF) (number)	Emission Factor Unit (lbs per)	Controlled EF? Yes or No	Calculation Method Code*	Capture % Efficiency	Primary Control Device ID	Secondary Control Device ID	Control Device(s) % Efficiency	Efficiency Reference Code**	Estimated Actual Emissions
PM-10	0.1	TON	N	2	100.000	23		99.000	3	757 lbs

**\*Calculation Method Codes**

- 1 = Continuous Emissions Monitoring Measurements
- 2 = Best Guess/ Engineering Judgment
- 3 = Material balance
- 4 = Source Test Measurements (Stack Test)
- 5 = AP-42/Fire Method or Emission Factor

**\*\* Control Efficiency Reference Codes**

- 1 = Tested efficiency / EPA reference method
- 2 = Tested efficiency / other source test method
- 3 = Design value from manufacturer
- 4 = Best Guess / engineering estimate
- 5 = Calculated, based on material balance
- 6 = Estimated, based on a published value

**PALO VERDE NUCLEAR GENERATING STATION**  
**Air Quality Permit Number: 030132**  
**Annual Emissions Calculation for 2007**

Salt Silos	MC Process ID No.:	23
PVNGS Source ID No.: AMSSMS02A,B	MC Stack No.:	23
SCC: 30510498	MC Control ID No.:	23

Material Processed                      7,568 Tons

<u>CRITERIA POLLUTANT</u>	<u>EMISSIONS FACTOR</u>	<u>SOURCE</u>	<u>EMISSIONS</u>
PM10	1.00E-01                      lb/T loaded	by material balance	757.0 lb

**Notes:**

- 1) Vendor data given for PM. Assume  $PM_{10} = 1/2 \times PM$ .
- 2) The silo acts as an expansions vessel, allowing most of the particulate to fall out due to gravity. The salt delivered is a large particle size. A conservative estimate of 1.0% going to the filter was used, 99% dropout inherent in transfer process.
- 3) Filter efficiency is 99%.
- 4) All of these factors are included in the emissions factor shown above.

# General Process Form 2007

Permit Number(s): 030132

Place an X in any gray cell to mark data requested to be held confidential. See Instructions for requirements for information to be deemed confidential.

1. Process ID: 24
2. Process Type/Description: ILRT LEAK TEST RENTAL COMPRESSOR - REQUIRED EVERY 10 YEARS
3. Stack ID(s) (only if required on Stack Form) \_\_\_\_\_
4. Process TIER Code: 020599 FUEL COMB. INDUSTRIAL: INTERNAL COMBUSTION
5. SCC Code: 20200102 (8 digit number) INDUSTRIAL: DISTILLATE OIL: RECIP
6. Seasonal Throughput Percent: Dec-Feb 25% Mar-May 25% Jun-Aug 25% Sep-Nov 25%
7. Normal Operating Schedule: Days/Week 7 Hours/Year 0 Weeks/Year \_\_\_\_\_
8. Typical Hours of Operation: (military time) Start 00:00 End 23:59
9. Emissions based on: (name of material or other parameter, e.g. "rock", "diesel", "vehicle miles traveled") DIESEL
10.  Used (input) or  Produced (output)
11. Annual Amount: (a number) 0 % 12. - Fuel Sulfur Content (in percent) \_\_\_\_\_ %
13. Units of Measure: (for example: tons, gallons, million cu ft, acres, units produced etc.) GALS
14. Unit Conversion Factor: (if needed to convert Unit of Measure to correlate with emission factor units) 0.001

Pollutant	Emission Factor (EF) Information					Control Device Information				
	15	16	17	18	19	20	21	22	23	23
	Emission Factor (EF) (number)	Emission Factor Unit (lbs per)	Controlled EF? Yes or No	Calculation Method Code*	Capture % Efficiency	Primary Control Device ID	Secondary Control Device ID	Control Device(s) % Efficiency	Efficiency Reference Code**	Estimated Actual Emissions
CO	0.74	M GALS	N	7						0 lbs
NOX	6.1	M GALS	N	7						0 lbs
PM-10	0.1	M GALS	N	7						0 lbs
SOX	0.0852	M GALS	N	7						0 lbs
VOC	0.02	M GALS	N	7						0 lbs

- \*Calculation Method Codes**
- 1 = Continuous Emissions Monitoring Measurements
  - 2 = Best Guess/ Engineering Judgment
  - 3 = Material balance
  - 4 = Source Test Measurements (Stack Test)
  - 5 = AP-42/Fire Method or Emission Factor
- \*\* Control Efficiency Reference Codes**
- 1 = Tested efficiency / EPA reference method
  - 2 = Tested efficiency / other source
  - 3 = Design value from manufacturer
  - 4 = Best Guess / engineering estimate
  - 5 = Calculated, based on material balance
  - 6 = Estimated, based on a published value

**PALO VERDE NUCLEAR GENERATING STATION**  
**Air Quality Permit Number: 030132**  
**Annual Emissions Calculation for 2007**

**Release Point 24: ILRT Compressors**

NOT INCLUDED - ONLY NEED TO ADD ONCE PER 10 YEARS.

# General Process Form 2007

Permit Number(s): 030132

Place an X in any gray cell to mark data requested to be held confidential. See Instructions for requirements for information to be deemed confidential.

1. Process ID: 26
2. Process Type/Description: ABRASIVE BLAST MEDIA STORAGE HOPPER
3. Stack ID(s) (only if required on Stack Form) 26
4. Process TIER Code: 071099 MISCELLANEOUS INDUSTRIAL PROCESSES
5. SCC Code: 30900201 (8 digit number) ABRASIVE BLASTING: METAL: GENERAL
6. Seasonal Throughput Percent: Dec-Feb 25% Mar-May 25% Jun-Aug 25% Sep-Nov 25%
7. Normal Operating Schedule: Hours/Day 24 Days/Week 7 Hours/Year 8760 Weeks/Year
8. Typical Hours of Operation: (military time) Start 00:00 End 23:59
9. Emissions based on: (name of material or other parameter, e.g. "rock", "diesel", "vehicle miles traveled") ABRASIVE BLAST MEDIA
10.  Used (input) or  Produced (output)
11. Annual Amount: (a number) 0 12. - Fuel Sulfur Content (in percent) \_\_\_\_\_ %
13. Units of Measure: (for example: tons, gallons, million cu ft, acres, units produced etc.) TONS
14. Unit Conversion Factor: (if needed to convert Unit of Measure to correlate with emission factor units) \_\_\_\_\_

Pollutant	Emission Factor (EF) Information				Control Device Information					Estimated Actual Emissions	
	15 Emission Factor (EF) (number)	16 Emission Factor Unit (lbs per)	17 Emission Factor Unit (lbs per)	18 Controlled EF? Yes or No	19 Calculation Method Code*	20 Capture % Efficiency	21 Primary Control Device ID	22 Secondary Control Device ID	23 Control Device(s) % Efficiency		23 Efficiency Reference Code**
PM-10	0.2	TONS		N	2	100.000	26		99.00	3	0 lbs

\*Calculation Method Codes  
 1 = Continuous Emissions Monitoring Measurements  
 2 = Best Guess/ Engineering Judgment  
 3 = Material balance  
 4 = Source Test Measurements (Stack Test)  
 5 = AP-42/Fire Method or Emission Factor

\*\* Control Efficiency Reference Codes  
 1 = Tested efficiency / EPA reference method  
 2 = Tested efficiency / other source test method  
 3 = Design value from manufacturer  
 4 = Best Guess / engineering estimate  
 5 = Calculated, based on material balance  
 6 = State or Local Agency Emission Factor  
 7 = Manufacturer Specifications  
 8 = Site-Specific Emission Factor  
 9 = Vendor Emission Factor  
 10 = Trade Group Emission Factor



**PALO VERDE NUCLEAR GENERATING STATION**  
**Air Quality Permit Number: 030132**  
**Annual Emissions Calculation for 2007**

<b>Abrasive Media Hopper</b>	<b>MC Process ID No.:</b> 26
<b>PVNGS Source No. - None Assigned</b>	<b>MC Stack No.:</b> 26
<b>SCC 30900201</b>	<b>MC Control ID No.:</b> 26

**Material Loaded** **0 Tons**

<b>CRITERIA POLLUTANT</b>	<b>EMISSIONS FACTOR</b>	<b>SOURCE</b>	<b>EMISSIONS</b>
PM10	2.00E-01 lb/T loaded	by material balance	0.0 lb

**Notes:**

- 1) Assumes 99% dropout rate of material due to large particle size. Only 1% goes to filter.
- 2) Filter efficiency based on typical value for HEPA filters of 99.00 %
- 3) Assumes all emissions are PM10.

# General Process Form 2007

Permit Number(s): 030132

Place an X in any gray cell to mark data requested to be held confidential. See Instructions for requirements for information to be deemed confidential.

1. Process ID: 27
2. Process Type/Description: STEAM GENERATOR CHEMICAL CLEANING - ATMOS. DUMP VALVE STACKS UNITS 1, 2, 3
3. Stack ID(s) (only if required on Stack Form) 27
4. Process TIER Code: 071099 MISCELLANEOUS INDUSTRIAL PROCESSES
5. SCC Code: 39999999 (*8 digit number*) MISC. INDUSTRIAL PORCESS: OTHER NOT CLASSIFIED
6. Seasonal Throughput Percent: Dec-Feb 0% Mar-May 0% Jun-Aug 0% Sep-Nov 100%
7. Normal Operating Schedule: Hours/Day 12 Days/Week 1 Hours/Year 12 Weeks/Year 12
8. Typical Hours of Operation: (*military time*) Start 00:00 End 23:59
9. Emissions based on: (name of material or other parameter, e.g. "rock", "diesel", "vehicle miles traveled") HRS OF OPERATION (VENT TIME)
10.  Used (*input*) or  Produced (*output*)
11. Annual Amount: (*a number*) 0 % 12 - Fuel Sulfur Content (in percent)          %
13. Units of Measure: (for example: tons, gallons, million cu ft, acres, units produced etc.) HRS OF OPERATION
14. Unit Conversion Factor: (if needed to convert Unit of Measure to correlate with emission factor units)

Pollutant	Emission Factor (EF) Information					Control Device Information					Estimated Actual Emissions	
	15	16	17	18	19	20	21	22	23	23		
CO	9.9		HR OF OPERATI	N	2							0 lbs
VOC	102		HR OF OPERATI	N	2							0 lbs
NHX	9.9		HR OF OPERATI	N	2							0 lbs

- \*Calculation Method Codes**
- 1 = Continuous Emissions Monitoring Measurements
  - 2 = Best Guess/ Engineering Judgment
  - 3 = Material balance
  - 4 = Source Test Measurements (Stack Test)
  - 5 = AP-42/Fire Method or Emission Factor
- \*\* Control Efficiency Reference Codes**
- 1 = Tested efficiency / EPA reference method
  - 2 = Tested efficiency / other source test method
  - 3 = Design value from manufacturer
  - 4 = Best Guess / engineering estimate
  - 5 = Calculated, based on material balance
  - 6 = Estimated, based on a published value

# General Process Form 2007

Permit Number(s): 030132

Place an X in any gray cell to mark data requested to be held confidential. See Instructions for requirements for information to be deemed confidential.

1. Process ID: 29
2. Process Type/Description: STEAM GENERATOR CHEMICAL CLEANING - EVAPORATOR CONDENSER DISCHARGE
3. Stack ID(s) (only if required on Stack Form) 29
4. Process TIER Code: 071099 MISCELLANEOUS INDUSTRIAL PROCESSES
5. SCC Code: 39999999 (8 digit number) MISC. INDUSTRIAL PROCESS: OTHER NOT CLASSIFIED
6. Seasonal Throughput Percent: Dec-Feb 0% Mar-May 0% Jun-Aug 0% Sep-Nov 100%
7. Normal Operating Schedule: Hours/Day 24 Days/Week 7 Hours/Year 1080 Weeks/Year \_\_\_\_\_
8. Typical Hours of Operation: (military time) Start 00:00 End 23:59
9. Emissions based on: (name of material or other parameter, e.g. "rock", "diesel", "vehicle miles traveled") GALLONS PROCESSED
10.  Used (input) or  Produced (output)
11. Annual Amount: (a number) 0 %
12. -- Fuel Sulfur Content (in percent) \_\_\_\_\_ %
13. Units of Measure: (for example: tons, gallons, million cu ft, acres, units produced etc.) GALS
14. Unit Conversion Factor: (if needed to convert Unit of Measure to correlate with emission factor units) \_\_\_\_\_

15	Emission Factor (EF) Information				Control Device Information					
	16	17	18	19	20	21	22	23	23	25
Pollutant	Emission Factor (EF) (number)	Emission Factor Unit (lbs per)	Controlled EF? Yes or No	Calculation Method Code*	Capture % Efficiency	Primary Control Device ID	Secondary Control Device ID	Control Device(s) % Efficiency	Efficiency Reference Code**	Estimated Actual Emissions
NHX	0.032247	GALLONS	N	2						0 lbs

\*Calculation Method Codes  
 1 = Continuous Emissions Monitoring Measurements  
 2 = Best Guess/Engineering Judgment  
 3 = Material balance  
 4 = Source Test Measurements (Stack Test)  
 5 = AP-42/Fire Method or Emission Factor

\*\* Control Efficiency Reference Codes  
 1 = Tested efficiency / EPA reference method  
 2 = Tested efficiency / other source test method  
 3 = Design value from manufacturer  
 4 = Best Guess / engine-ring estima.  
 5 = Calculated, based on material balance  
 6 = Estimated, based on a published value

# General Process Form 2007

Permit Number(s): 030132

Place an X in any gray cell to mark data requested to be held confidential. See Instructions for requirements for information to be deemed confidential.

- 1. Process ID: 30
- 2. Process Type/Description: STEAM GENERATOR CHEMICAL CLEANING - EVAPORATOR COOLING TOWER
- 3. Stack ID(s) (only if required on Stack Form) 30
- 4. Process TIER Code: 071099 MISCELLANEOUS INDUSTRIAL PROCESSES
- 5. SCC Code: 39999999 (8 digit number) MISC. INDUSTRIAL PROCESS; OTHER NOT CLASSIFIED
- 6. Seasonal Throughput Percent: Dec-Feb 0% Mar-May 0% Jun-Aug 0% Sep-Nov 100%
- 7. Normal Operating Schedule: Hours/Day 24 Days/Week 7 Hours/Year 1080
- 8. Typical Hours of Operation: (military time) Start 00:00 End 23:59
- 9. Emissions based on: (name of material or other parameter, e.g. "rock", "diesel", "vehicle miles traveled") HOURS OF OPERATION
- 10.  Used (input) or  Produced (output)
- 11. Annual Amount: (a number) 0 %
- 12. Fuel Sulfur Content (in percent) \_\_\_\_\_ %
- 13. Units of Measure: (for example: tons, gallons, million cu ft, acres, units produced etc.) HRS OF OPERATION
- 14. Unit Conversion Factor: (if needed to convert Unit of Measure to correlate with emission factor units) \_\_\_\_\_

Pollutant	Emission Factor (EF) Information				Control Device Information						Estimated Actual Emissions
	16 Emission Factor (EF) (number)	17 Emission Factor Unit (lbs per)	18 Controlled EF? Yes or No	19 Calculation Method Code*	20 Capture % Efficiency	21 Primary Control Device ID	22 Secondary Control Device ID	23 Control Device(s) % Efficiency	23 Efficiency Reference Code**	25	
PM10	0.015	HR OF OPERATI	N	2							0 lbs*

\* Not in use for 2007

- \*Calculation Method Codes
  - 1 = Continuous Emissions Monitoring Measurements
  - 2 = Best Guess/ Engineering Judgment
  - 3 = Material balance
  - 4 = Source Test Measurements (Stack Test)
  - 5 = AP-42/Fire Method or Emission Factor
- \*\* Control Efficiency Reference Codes
  - 1 = Tested efficiency / EPA reference method
  - 2 = Tested efficiency / other source test method
  - 3 = Design value from manufacturer
  - 4 = Best Guess / engineering estimate
  - 5 = Calculated, based on material balance
  - 6 = Estimated, based on a published value

**General Process Form 2007**

Permit Number(s): 030132

Place an X in any gray cell to mark data requested to be held confidential. See Instructions for requirements for information to be deemed confidential.

- 1. Process ID: 31
- 2. Process Type/Description: SECURITY SUBSTATION EMERGENCY GENERATOR (179 HP)
- 3. Stack ID(s) (only if required on Stack Form) \_\_\_\_\_
- 4. Process TIER Code: 020599
- 5. SCC Code: 20200102 (8 digit number)
- 6. Seasonal Throughput Percent: Dec-Feb 25% Mar-May 25% Jun-Aug 25% Sep-Nov 25%
- 7. Normal Operating Schedule: Hours/Day 24 Days/Week 7 Hours/Year 16 Weeks/Year 52
- 8. Typical Hours of Operation: (military time) Start 00:00 End 23:59
- 9. Emissions based on: (name of material or other parameter, e.g. "rock", "diesel", "vehicle miles traveled") DIESEL
- 10.  Used (input) or  Produced (output)
- 11. Annual Amount: (a number) 1115
- 12. Fuel Sulfur Content (in percent) 0.05 %
- 13. Units of Measure: (for example: tons, gallons, million cu ft, acres, units produced etc.) GALS
- 14. Unit Conversion Factor: (if needed to convert Unit of Measure to correlate with emission factor units) 0.001

Pollutant	Emission Factor (EF) Information					Control Device Information						Estimated Actual Emissions
	15 Emission Factor (EF) (number)	16 Emission Factor Unit (lbs per)	17 Emission Factor Unit (lbs per)	18 Controlled EF? Yes or No	19 Calculation Method Code*	20 Capture % Efficiency	21 Primary Control Device ID	22 Secondary Control Device ID	23 Control Device(s) % Efficiency	23 Efficiency Reference Code**	25	
CO	106	M GALS	M GALS	N	7						118 lbs	
NOX	407	M GALS	M GALS	N	7						454 lbs	
PM-10	14.6	M GALS	M GALS	N	7						16 lbs	
SOX	7.1	M GALS	M GALS	N	3						8 lbs	
VOC	6.34	M GALS	M GALS	N	7						7 lbs	

**\*Calculation Method Codes**

- 1 = Continuous Emissions Monitoring Measurements
- 2 = Best Guess/ Engineering Judgment
- 3 = Material balance
- 4 = Source Test Measurements (Stack Test)
- 5 = AP-42/Fire Method or Emission Factor
- 6 = State or Local Agency Emission Factor
- 7 = Manufacturer Specifications
- 8 = Site-Specific Emission Factor
- 9 = Vendor Emission Factor
- 10 = Trade Group Emission Factor

**\*\* Control Efficiency Reference Codes**

- 1 = Tested efficiency / EPA reference method
- 2 = Tested efficiency / other source
- 3 = Design value from manufacturer
- 4 = Best Guess / engineering estimate
- 5 = Calculated, based on material balance
- 6 = Estimated, based on a published value

**PALO VERDE NUCLEAR GENERATING STATION**  
**Air Quality Permit Number: 030132**  
**Annual Emissions Calculation for 2007**

Security Substation L Emergency Diesel Generator MC Process ID No.: 31  
 PVNGS Source ID No.: AMQFNH01\*A\*Engine  
 SCC: 20200102

**Operating Hours** 136.0 hr  
**Fuel Use Rate** 8.2 gal/hr  
**Fuel Use** 1,115 gal

<u>CRITERIA POLLUTANT</u>	<u>EMISSIONS FACTOR</u>	<u>SOURCE</u>	<u>EMISSIONS</u>
CO	1.06E+02 lb/Mgal	Vendor Data	118 lb
NO <sub>2</sub>	4.07E+02 lb/Mgal	Vendor Data	454 lb
PM10	1.46E+01 lb/Mgal	Vendor Data	16 lb
SO <sub>2</sub>	7.10E+00 lb/Mgal	by material balance	8 lb
Ozone (VOC)	6.34E+00 lb/Mgal	Vendor Data	7 lb

**Notes:**

- 1) Low sulfur fuel (<0.05% S by wt) is burned in this equipment. However, for calculation purposes, a maximum fuel sulfur content of 0.05 % by weight at a fuel density of 7.1 lbs / gal was assumed.
- 2) Calculated from the following vendor emission data, engine power of 170 bhp, and fuel use rate of 8.2 gal / hr:  
 $CO (lb/Mgal) = [(2.33 g / hp - hr) (170 hp) (1 lb / 454 g)] / [(8.2 gal fuel / hr) (1 Mgal / 1000 gal)] = 106 lb / Mgal$   
 $NOx (lb/hr) = [(8.92 g / hp - hr) (170 hp) (1 lb / 454 g)] / [(8.2 gal fuel / hr) (1 Mgal / 1000 gal)] = 407 lb NOx / Mgal$   
 $PM10 (lb/hr) = [(0.33 g / hp - hr) (170 hp) (1 lb / 454 g)] / [(8.2 gal fuel / hr) (1 Mgal / 1000 gal)] = 15.1 lb PM10 / Mgal$   
 $VOC (lb/hr) = [0.14 g / hp - hr) (170 hp) (1 lb / 454 g)] / [(8.2 gal fuel / hr) (1 Mgal / 1000 gal)] = 6.34 lb VOC / Mgal$

# General Process Form 2007

Permit Number(s): 030132

Place an X in any gray cell to mark data requested to be held confidential. See Instructions for requirements for information to be deemed confidential.

1. Process ID: 32
2. Process Type/Description: SECURITY HUBS 2,3,4 EMERGENCY DIESEL GENERATORS (TOTAL OF 3 ENGINES AT 35 HP EACH)
3. Stack ID(s) (only if required on Stack Form) \_\_\_\_\_
4. Process TIER Code: 020599
5. SCC Code: 20200102 (8 digit number)
6. Seasonal Throughput Percent: Dec-Feb 25% Mar-May 25% Jun-Aug 25% Sep-Nov 25%
7. Normal Operating Schedule: Hours/Day 24 Days/Week 7 Hours/Year 66 Weeks/Year 52
8. Typical Hours of Operation: (military time) Start 00:00 End 23:59
9. Emissions based on: (name of material or other parameter, e.g. "rock", "diesel", "vehicle miles traveled") DIESEL (AGGREGATE)
10.  Used (input) or  Produced (output)
11. Annual Amount: (a number) 397
12. Fuel Sulfur Content (in percent) 0.05 %
13. Units of Measure: (for example: tons, gallons, million cu ft, acres, units produced etc.) GALS
14. Unit Conversion Factor: (if needed to convert Unit of Measure to correlate with emission factor units) 0.001

Pollutant	Emission Factor (EF) Information					Control Device Information						Estimated Actual Emissions
	15 Emission Factor (EF) (number)	16 54.8	17 Emission Factor Unit (lbs per)	18 Controlled EF? Yes or No	19 Calculation Method Code*	20 Capture % Efficiency	21 Primary Control Device ID	22 Secondary Control Device ID	23 Control Device(s) % Efficiency	23 Efficiency Reference Code**	25	
CO		M GALS		N	7						22 lbs	
NOX		M GALS		N	7						153 lbs	
PM-10		M GALS		N	7						3 lbs	
SOX		M GALS		N	3						3 lbs	
VOC		M GALS		N	7						9 lbs	

### \*Calculation Method Codes

- 1 = Continuous Emissions Monitoring Measurements
- 2 = Best Guess/ Engineering Judgment
- 3 = Material balance
- 4 = Source Test Measurements (Stack Test)
- 5 = AP-42/Fire Method or Emission Factor

- 6 = State or Local Agency Emission Factor
- 7 = Manufacturer Specifications
- 8 = Site-Specific Emission Factor
- 9 = Vendor Emission Factor
- 10 = Trade Group Emission Factor

### \*\* Control Efficiency Reference Codes

- 1 = Tested efficiency / EPA refer
- 2 = Tested efficiency / other source test method
- 3 = Design value from manufacturer
- 4 = Best Guess / engineering estimate
- 5 = Calculated, based on material balance
- 6 = Estimated, based on a published value

**PALO VERDE NUCLEAR GENERATING STATION**  
**Air Quality Permit Number: 030132**  
**Annual Emissions Calculation for 2007**

Security Hubs 2-4 Emergency Diesel Generators MC Process ID No.: 32  
 PVNGS Source ID No.: AMQFNH01\*B, C, & D\*Engine  
 SCC: 20200102

Operating Hours (aggregate)      189.0    hr  
 Fuel Use Rate                            2.1    gal/hr  
 Fuel Use                                    397    gal

<u>CRITERIA POLLUTANT</u>	<u>EMISSIONS FACTOR</u>	<u>SOURCE</u>	<u>EMISSIONS</u>
CO	5.47E+01    lb/Mgal	Vendor Data	22 lb
NO <sub>2</sub>	3.85E+02    lb/Mgal	Vendor Data	153 lb
PM10	7.14E+00    lb/Mgal	Vendor Data	3 lb
SO <sub>2</sub>	7.10E+00    lb/Mgal	by material balance	3 lb
Ozone (VOC)	2.20E+01    lb/Mgal	Vendor Data	9 lb

**Notes:**

- 1) Low sulfur fuel (<0.05% S by wt) is burned in this equipment. However, for calculation purposes, a maximum fuel sulfur content of 0.05 % by weight at a fuel density of 7.1 lbs / gal was assumed.
- 2) Calculated from the following vendor emission data, engine power of 170 bhp, and fuel use rate of 2.1 gal / hr:  
 $CO \text{ (lb/Mgal)} = [(1.49 \text{ g / hp - hr}) (35 \text{ hp}) (1 \text{ lb / 454 g})] / [(2.1 \text{ gal fuel / hr}) (1 \text{ Mgal / 1000 gal})] = 54.7 \text{ lb / Mgal}$   
 $NOx \text{ (lb/hr)} = [(10.5 \text{ g / hp - hr}) (35 \text{ hp}) (1 \text{ lb / 454 g})] / [(2.1 \text{ gal fuel / hr}) (1 \text{ Mgal / 1000 gal})] = 385 \text{ lb NOx / Mgal}$   
 $PM10 \text{ (lb/hr)} = [(0.20 \text{ g / hp - hr}) (35 \text{ hp}) (1 \text{ lb / 454 g})] / [(2.1 \text{ gal fuel / hr}) (1 \text{ Mgal / 1000 gal})] = 7.34 \text{ lb PM10 / Mgal}$   
 $VOC \text{ (lb/hr)} = [0.60 \text{ g / hp - hr}) (35 \text{ hp}) (1 \text{ lb / 454 g})] / [(2.1 \text{ gal fuel / hr}) (1 \text{ Mgal / 1000 gal})] = 22 \text{ lb VOC / Mgal}$



# General Process Form 2007

Permit Number(s): 030132

Place an X in any gray cell to mark data requested to be held confidential. See Instructions for requirements for information to be deemed confidential.

1. Process ID: 33
2. Process Type/Description: MISC. DIESEL FUEL BURNING COMBUSTION EQUIPMENT (<10 MMBTU / HR)
3. Stack ID(s) (only if required on Stack Form) \_\_\_\_\_
4. Process TIER Code: 010202
5. SCC Code: 10200503 (8 digit number)
6. Seasonal Throughput Percent: Dec-Feb 25% Mar-May 25% Jun-Aug 25% Sep-Nov 25%
7. Normal Operating Schedule: Hours/Day 24 Days/Week 7 Hours/Year 17.8 Weeks/Year 52
8. Typical Hours of Operation: (military time) Start 00:00 End 23:59
9. Emissions based on: (name of material or other parameter, e.g. "rock", "diesel", "vehicle miles traveled") DIESEL
10.  Used (input) or  Produced (output)
11. Annual Amount: (a number) 79
12. Fuel Sulfur Content (in percent) 0.05 %
13. Units of Measure: (for example: tons, gallons, million cu ft, acres, units produced etc.) GALS
14. Unit Conversion Factor: (if needed to convert Unit of Measure to correlate with emission factor units) 0.001

15	Emission Factor (EF) Information				Control Device Information					
	16	17	18	19	20	21	22	23	23	25
Pollutant	Emission Factor (EF) (number)	Emission Factor Unit (lbs per)	Controlled EF? Yes or No	Calculation Method Code*	Capture % Efficiency	Primary Control Device ID	Secondary Control Device ID	Control Device(s) % Efficiency	Efficiency Reference Code**	Estimated Actual Emissions
CO	5	M GALS	N	6						0 lbs
NOX	20	M GALS	N	6						2 lbs
PM-10	2	M GALS	N	6						0.2 lbs
SOX	7.1	M GALS	N	3						7 lbs
VOC	0.2	M GALS	N	6						0 lbs

**\*Calculation Method Codes**

- 1 = Continuous Emissions Monitoring Measurements
- 2 = Best Guess/ Engineering Judgment
- 3 = Material balance
- 4 = Source Test Measurements (Stack Test)
- 5 = AP-42/Fire Method or Emission Factor

**\*\* Control Efficiency Reference Codes**

- 1 = Tested efficiency / EPA reference method
- 2 = Tested efficiency / other source test method
- 3 = Design value from manufacturer
- 4 = Test Guess / engineering estimate
- 5 = Calculated, based on material balance
- 6 = Estimated, based on a published value



# General Process Form 2007

Permit Number(s): 030132

Place an X in any gray cell to mark data requested to be held confidential. See Instructions for requirements for information to be deemed confidential.

1. Process ID: 34
2. Process Type/Description: MISC. LPG BURNING COMBUSTION EQUIPMENT
3. Stack ID(s) (only if required on Stack Form) \_\_\_\_\_
4. Process TIER Code: 010301 FUEL COMB. ELEC. UTIL.: GAS
5. SCC Code: 10201002 (8 digit number) INDUSTRIAL: LPG: PROPANE
6. Seasonal Throughput Percent: Dec-Feb 25% Mar-May 25% Jun-Aug 25% Sep-Nov 25%
7. Normal Operating Schedule: Hours/Day 24 Days/Week 7 Hours/Year 2.1 Weeks/Year 52
8. Typical Hours of Operation: (military time) Start 00:00 End 23:59
9. Emissions based on: (name of material or other parameter, e.g. "rock", "diesel", "vehicle miles traveled") LPG (PROPANE)
10.  Used (input) or  Produced (output)
11. Annual Amount: (a number) 40 % 12. - Fuel Sulfur Content (in percent)
13. Units of Measure: (for example: tons, gallons, million cu ft, acres, units produced etc.) GALS
14. Unit Conversion Factor: (if needed to convert Unit of Measure to correlate with emission factor units) 0.001

Pollutant	Emission Factor (EF) Information				Control Device Information						Estimated Actual Emissions	
	15 Emission Factor (EF) (number)	16 Emission Factor Unit (lbs per)	17 Emission Factor Unit (lbs per)	18 Controlled EF? Yes or No	19 Calculation Method Code*	20 Capture % Efficiency	21 Primary Control Device ID	22 Secondary Control Device ID	23 Control Device(s) % Efficiency	23 Efficiency Reference Code**		
CO	3.2	M GALS		N	6							0.13lbs
NOX	19	M GALS		N	6							0.75 lbs
PM-10	0.6	M GALS		N	6							0.02 lbs
SOX	0.02	M GALS		N	6							0 lbs
VOC	0.6	M GALS		N	6							0.02 lbs

\*Calculation Method Codes  
 1 = Continuous Emissions Monitoring Measurements  
 2 = Best Guess/ Engineering Judgment  
 3 = Material balance  
 4 = Source Test Measurements (Stack Test)  
 5 = AP-42/Fire Method or Emission Factor

\*\* Control Efficiency Reference Codes  
 1 = Tested efficiency / EPA reference method  
 2 = Tested efficiency / other source test method  
 3 = Design value from manufacturer  
 4 = L-1 Guess / engineering estimate  
 5 = Calculated, based on material balance  
 6 = Estimated, based on a published value



**General Process Form 2007**

Permit Number(s): 030132

Place an X in any gray cell to mark data requested to be held confidential. See Instructions for requirements for information to be deemed confidential.

- 15. Process ID: 35
- 16. Process Type/Description: Contractor Portable Boiler - Not in use in 2007
- 17. Stack ID(s) (only if required on Stack Form) \_\_\_\_\_
- 18. Process TIER Code: 010202 FUEL COMB. ELEC. UTIL.: OIL- DISTILLATE
- 19. SCC Code: 10200503 (8 digit number) INDUSTRIAL, DISTILLATE OIL: <10MMBTU/HR
- 20. Seasonal Throughput Percent: Dec-Feb 25% Mar-May 25% Jun-Aug 25% Sep-Nov 25%
- 21. Normal Operating Schedule: Hours/Day 24 Days/Week 7 Hours/Year 99 Weeks/Year \_\_\_\_\_
- 22. Typical Hours of Operation: (military time) Start 00:00 End 23:59
- 23. Emissions based on: (name of material or other parameter, e.g. "rock", "diesel", "vehicle miles traveled") DIESEL
- 24.  Used (input) or  Produced (output)
- 25. Annual Amount: (a number) 0 12. - Fuel Sulfur Content (in percent) 0.05%
- 26. Units of Measure: (for example: tons, gallons, million cu ft, acres, units produced etc.) GALS
- 27. Unit Conversion Factor: (if needed to convert Unit of Measure to correlate with emission factor units) 0.001

15	Emission Factor (EF) Information					Control Device Information					25
	16	17	18	19	20	21	22	23	23	Estimated Actual Emissions	
Pollutant	Emission Factor (EF) (number)	Emission Factor Unit (lbs per)	Controlled EF? Yes or No	Calculation Method Code*	Capture % Efficiency	Primary Control Device ID	Secondary Control Device ID	Control Device(s) % Efficiency	Efficiency Reference Code**		
CO	5.0	M GALS	N	5						0 lbs	
NOX	20.0	M GALS	N	5						0 lbs	
PM-10	2.0	M GALS	N	5						0 lbs	
SOX	7.2	M GALS	N	5						0 lbs	
VOC	0.2	M GALS	N	5						0 lbs	
										lbs	

**\*Calculation Method Codes**  
 1 = Continuous Emissions Monitoring Measurements  
 2 = Best Guess/ Engineering Judgment  
 3 = Material balance  
 4 = Source Test Measurements (Stack Test)  
 5 = AP-42/Fire Method or Emission Factor

**\*\* Control Efficiency Reference Code:**  
 1 = Test efficiency / EPA reference method  
 2 = Tested efficiency / other source test method  
 3 = Design value from manufacturer  
 4 = Best Guess / engineering estimate  
 5 = Calculated, based on material balance  
 6 = Estimated, based on a published value



# General Process Form 2007

Permit Number(s): 030132

Place an X in any gray cell to mark data requested to be held confidential. See Instructions for requirements for information to be deemed confidential.

- 28. Process ID: 36
- 29. Process Type/Description: ABRASIVE BLASTING OPERATIONS (CONFINED & UNCONFINED)
- 30. Stack ID(s) (only if required on Stack Form) \_\_\_\_\_
- 31. Process TIER Code: 071099 MISC INDUSTRIAL PROC
- 32. SCC Code: 30900201 (8 digit number) ABRASIVE BLASTING: METAL: GENERAL
- 33. Seasonal Throughput Percent: Dec-Feb 25% Mar-May 25% Jun-Aug 25% Sep-Nov 25%
- 34. Normal Operating Schedule: Hours/Day 24 Days/Week 7 Hours/Year 1080 Weeks/Year 52
- 35. Typical Hours of Operation: (military time) Start 00:00 End 23:59
- 36. Emissions based on: (name of material or other parameter, e.g. "rock", "diesel", "vehicle miles traveled") ABRASIVE BLAST MEDIA
- 37.  Used (input) or  Produced (output)
- 38. Annual Amount: (a number) 79.74 % 12. - Fuel Sulfur Content (in percent)
- 39. Units of Measure: (for example: tons, gallons, million cu ft, acres, units produced etc.) TONS
- 40. Unit Conversion Factor: (if needed to convert Unit of Measure to correlate with emission factor units) \_\_\_\_\_

15	Emission Factor (EF) Information				Control Device Information					
	16	17	18	19	20	21	22	23	25	
Pollutant	Emission Factor (EF) (number)	Emission Factor Unit (lbs per)	Controlled EF? Yes or No	Calculation Method Code*	Capture % Efficiency	Primary Control Device ID	Secondary Control Device ID	Control Device(s) % Efficiency	Efficiency Reference Code**	Estimated Actual Emissions
PM-10	26	TONS	N	5						2073 lbs

\*Calculation Method Codes  
 1 = Continuous Emissions Monitoring Measurements  
 2 = Best Guess/ Engineering Judgment  
 3 = Material balance  
 4 = Source Test Measurements (Stack Test)  
 5 = AP-42/Fire Method or Emission Factor

\*\* Control Efficiency Reference Codes  
 1 = Tested efficiency / FPA referen...  
 2 = ...d efficiency / other source test method  
 3 = Design value from manufacturer  
 4 = Best Guess / engineering estimate  
 5 = Calculated, based on material balance  
 6 = Estimated, based on a published value





## EVAPORATIVE PROCESS FORMS

The Evaporative Process Forms were preprinted with much of the process information.

Van refueling operations from a bulk delivery vessel are no longer conducted. The gasoline emissions for working and Standing losses, Process ID's 51, 52, 54, and 55, were determined using EPA Tanks 4.0.9d computer program. Emissions for loading operations, Process ID's 53, 56, and 57, were determined using County emissions factors. Supplemental emissions information is provided under the section titled, "Gasoline Tank Emissions."

Evaporative Process ID's 60 through 67 were determined from site wide product use information by merging database information from material purchase and distribution, material chemical information, and daily user logs. The amount of materials and VOC emissions were determined by this compilation. The emissions factor was back-calculated from these results. This submittal includes the summary information for each evaporative process. Detailed information is maintained and available upon request.

A detailed ammonia emissions analysis for water treatment activities was conducted for the 1998 emissions summary. During 2007 this analysis was updated based on current emissions calculations and use data. These results are now used as a basis to estimate ammonia emissions. The summary data is provided for Process ID 90, Ammonia Releases.

# Evaporative Process Form 2007

Permit Number(s): 030132

Place an X in any gray cell to mark data requested to be held confidential. See Instructions for requirements for information to be deemed confidential.

1. Process Type/Description: HORIZONTAL FIXED ROOF STORAGE TANKS, CALC USING EPA TANKS 4.0.9D
2. Process TIER Code: 090212 STORAGE & TRANSPORT: PETROLEUM PROD - NON-RESALE
3. Seasonal Throughput Percent: Dec-Feb 25% Mar-May 25% Jun-Aug 25% Sep-Nov 25%
4. Normal Operating Schedule: Hours/Day 24 Days/Week 7 Hours/Year 8760 Weeks/Year
5. Typical Hours of Operation: (military time) Start 00:00 End 23:59

6	7	8	9		10		11		12	13	14		15
			Material Type	Annual Usage Input	lb l	VOC, HAP&NON or NHx	Emission Factor	EF Units (lbsl)			Pounds of pollutant* sent off site	Capture % Efficiency	
51		GASOLINE (AS1), WORKING	851	LB	VOC	1.0	LB			%		%	851
52		GASOLINE (AS1), STANDING	2622	LB	VOC	1.0	LB			%		%	2,622
53		GASOLINE (AS1), FUELING	86773	GL	VOC	0.0117	LB			%		%	1015
54		GASOLINE (AS2), WORKING	851	LB	VOC	1.0	LB			%		%	851
55		GASOLINE (AS2), STANDING	3935	LB	VOC	1.0	LB			%		%	3,935

The emissions for Process ID's 51 through 55 were determined using the EPA Tanks 4.09d computer program. See the section "Gasoline Tank Emissions" for more information on these processes.

NOTE: Do NOT change pre-printed Process ID numbers. See the instructions for information on how to delete materials that are no longer used, or to assign Process ID numbers for new materials.

\* If you have off-site recycling/disposal of any of the materials listed above, you must complete an Off-Site Recycling/Disposal Form to receive credit for reduced emissions.

### \*\*Control Efficiency Reference Codes

- 1 = Tested efficiency / EPA reference method
- 2 = Tested efficiency / other source test method
- 3 = Design value from manufacturer
- 4 = Best Guess / engineering estimate
- 5 = Calculated, based on material balance
- 6 = Estimated, based on a published value

# Evaporative Process Form 2007

Permit Number(s): 030132

Place an X in any gray cell to mark data requested to be held confidential. See Instructions for requirements for information to be deemed confidential.

- Process Type/Description: GAS. LOADING LOSSES: #56 TO REFUEL TRUCK; #57 VANS FROM TRUCKS
- Process TIER Code: 090212 **STORAGE & TRANSPORT: PETROLEUM PROD - NON-RESALE**
- Seasonal Throughput Percent: Dec-Feb 25% Mar-May 25% Jun-Aug 25% Sep-Nov 25%
- Normal Operating Schedule: Hours/Day 24 Days/Week 7 Hours/Year 8760 Weeks/Year \_\_\_\_\_
- Typical Hours of Operation: (military time) Start 00:00 End 23:59

6	7	8	9		10		11		12	13	14		15	
			Annual Usage Input	lb or gal	VOC, HAP&NON or NHx	Emission Factor	EF Units (lbs per)	Pounds of pollutant* sent off site			Capture % Efficiency	Control ID		Control % Efficiency
56	56	GASOLINE (AS2), LOADING	0	GL	VOC	0.01045		GAL		100.00 %	56	90.00 %	6	0
57		GASOLINE (AS2), FUELING	0	GL	VOC	0.0117		GAL		%		%		0

#56 and #57 are not in use.

NOTE: Do NOT change pre-printed Process ID numbers. See the instructions for information on how to delete materials that are no longer used, or to assign Process ID numbers for new materials.

\* If you have off-site recycling/disposal of any of the materials listed above, you must complete an Off-Site Recycling/Disposal Form to receive credit for reduced emissions.

### \*\*Control Efficiency Reference Codes

- 1 = Tested efficiency / EPA reference method
- 2 = Tested efficiency / other source test method
- 3 = Design value from manufacturer
- 4 = Best Guess / engineering estimate
- 5 = Calculated, based on material balance
- 6 = Estimated, based on a published value

## **Gasoline Tank Emissions**

The EPA Tanks 4.0.9d computer program was used to determine the working and standing losses for gasoline storage tanks. A printout of the reports from that program is provided in this section.

The loading and filling losses are determined based on the emissions factors provided by Maricopa County.

**TANKS 4.0.9d**  
**Emissions Report - Summary Format**  
**Individual Tank Emission Totals**

**Emissions Report for: Annual**

**AS-1 (2007 Emissions)Corrected 04-08 - Horizontal Tank**  
**Tonopah, Arizona**

Components	Losses(lbs)		
	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 9)	851.05	2,621.95	3,472.99
Hexane (-n)	5.31	16.35	21.66
Benzene	5.98	18.42	24.39
Isooctane	7.25	22.34	29.59
Toluene	6.90	21.27	28.18
Ethylbenzene	0.48	1.47	1.95
Xylene (-m)	2.00	6.17	8.17
Isopropyl benzene	0.08	0.26	0.34
1,2,4-Trimethylbenzene	0.17	0.53	0.70
Cyclohexane	0.82	2.52	3.34
Unidentified Components	822.05	2,532.61	3,354.66

**TANKS 4.0.9d**  
**Emissions Report - Summary Format**  
**Tank Identification and Physical Characteristics**

**Identification**

User Identification:	AS-2 (2007 Emissions)
City:	Tonopah
State:	Arizona
Company:	Palo Verde Nuclear Generating Station - APS
Type of Tank:	Horizontal Tank
Description:	Large gasoline tank at autoshop

**Tank Dimensions**

Shell Length (ft):	37.00
Diameter (ft):	9.50
Volume (gallons):	12,000.00
Turnovers:	0.00
Net Throughput(gal/yr):	86,773.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	N

**Paint Characteristics**

Shell Color/Shade:	White/White
Shell Condition	Good

**Breather Vent Settings**

Vacuum Settings (psig):	-0.06
Pressure Settings (psig)	0.12

Meteorological Data used in Emissions Calculations: Phoenix, Arizona (Avg Atmospheric Pressure = 14.12 psia)

**TANKS 4.0.9d**  
**Emissions Report - Summary Format**  
**Individual Tank Emission Totals**

**Emissions Report for: Annual**

**AS-2 (2007 Emissions) - Horizontal Tank**  
**Tonopah, Arizona**

Components	Losses(lbs)		
	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 9)	851.05	3,935.43	4,786.48

# Evaporative Process Form 2007

Permit Number(s): 030132

Place an X in any gray cell to mark data requested to be held confidential. See Instructions for requirements for information to be deemed confidential.

1. Process Type/Description: ADHESIVES (GLUES, EPOXY GLUES, CAULKS, ETC.)
2. Process TIER Code: 080401 SOLVENT USE: SURFACE COATING- INDUSTRIAL ADHESIVES
3. Seasonal Throughput Percent: Dec-Feb 25% Mar-May 25% Jun-Aug 25% Sep-Nov 25%
4. Normal Operating Schedule: Hours/Day 24 Days/Week 7 Hours/Year 8760 Weeks/Year 52
5. Typical Hours of Operation: (military time) Start 00:00 End 23:59

6	7	8	9		10	11		12	13	14		15
			Annual Usage Input	lb or gal		VOC, HAP&NON or NHx	Emission Factor			EF Units (lbs per)	Pounds of pollutant* sent off site	
60		ADHESIVES	5047	gal	VOC	2.44	LB		%			12307

<sup>1</sup> Emissions factor back-calculated using material balance. See Calculation Sheet No. 4.

NOTE: Do NOT change pre-printed Process ID numbers. See the instructions for information on how to determine materials that are no longer used, or to assign Process ID numbers for new materials.

\* If you have off-site recycling/disposal of any of the materials listed above, you must complete an Off-Site Recycling/Disposal Form to receive credit for reduced emissions.

\*\*Control Efficiency Reference Codes

- 1 = Tested efficiency / EPA reference method
- 2 = Tested efficiency / other source test method
- 3 = Design value from manufacturer
- 4 = Best Guess / engineering estimate
- 5 = Calculated, based on material balance
- 6 = Estimated, based on a published value



# Evaporative Process Form 2007

Permit Number(s): 030132

Place an X in any gray cell to mark data requested to be held confidential. See Instructions for requirements for information to be deemed confidential.

1. Process Type/Description: CLEANERS, DEGREASERS, ETC.
2. Process TIER Code: 080103 SOLVENT USE: DEGREASING - COLD CLEANING
3. Seasonal Throughput Percent: Dec-Feb 25% Mar-May 25% Jun-Aug 25% Sep-Nov 25%
4. Normal Operating Schedule: Hours/Day 24 Days/Week 7 Hours/Year 8760 Weeks/Year 52
5. Typical Hours of Operation: (military time) Start 00:00 End 23:59

6	7	8	9		10	11		12	13	14		15
			Annual Usage Input	lb or gal		VOC, HAP&NON or NHx	Emission Factor			EF Units (lbs per)	Pounds of pollutant* sent off site	
61		CLEANERS	1931	gal	VOC	3.38	LB		%		%	6524

<sup>1</sup> Emissions factor back-calculated using material balance. See Calculation Sheet No. 4.

NOTE: Do NOT change pre-printed Process ID numbers. See the instructions for information on how to delete materials that are no longer used, or to assign Process ID numbers for new materials.

\* If you have off-site recycling/disposal of any of the materials listed above, you must complete an Off-Site Recycling/Disposal Form to receive credit for reduced emissions.

### \*\*Control Efficiency Reference Codes

- 1 = Tested efficiency / EPA reference method
- 2 = Tested efficiency / other source test method
- 3 = Design value from manufacturer
- 4 = Best Guess / engineering estimate
- 5 = Calculated, based on material balance
- 6 = Estimated, based on a published value

# Evaporative Process Form 2007

Permit Number(s): 030132

Place an X in any gray cell to mark data requested to be held confidential. See Instructions for requirements for information to be deemed confidential.

- Process Type/Description: LUBRICANTS
- Process TIER Code: 071099 MISCELLANEOUS INDUSTRIAL PROCESSES
- Seasonal Throughput Percent: Dec-Feb 25% Mar-May 25% Jun-Aug 25% Sep-Nov 25%
- Normal Operating Schedule: Hours/Day 24 Days/Week 7 Hours/Year 8760 Weeks/Year 52
- Typical Hours of Operation: (military time) Start 00:00 End 23:59

6 Process ID	7 Stack ID(s)	8 Material Type	9 Annual Usage Input		10 VOC, HAP&NON or NHx	11 Emission Factor		12 Pounds of pollutant* sent off site	13 Capture % Efficiency	14 Control % Efficiency		15 Estimated Emissions (lbs/yr)
			lb or gal	gal		Emission Factor	Control ID			Control Efficiency	Control Efficiency Code**	
62		LUBRICANTS	467	gal	VOC	2.999	LB		%		%	1400

\* Emissions factor back-calculated using material balance. See Calculation Sheet No. 4.

NOTE: Do NOT change pre-printed Process ID numbers. See the instructions for information on how to delete materials that are no longer used, or to assign Process ID numbers for new materials.

\* If you have off-site recycling/disposal of any of the materials listed above, you must complete an Off-Site Recycling/Disposal Form to receive credit for reduced emissions.

### \*\*Control Efficiency Reference Codes

- |  |  |   |
|--|--|---|
| 1 = Tested efficiency / EPA reference method | 2 = Tested efficiency / other source test method | 3 = Design value from manufacturer        |
| 4 = Best Guess / engineering estimate        | 5 = Calculated, based on material balance        | 6 = Estimated, based on a published value |

# Evaporative Process Form 2007

Permit Number(s): 030132

Place an X in any gray cell to mark data requested to be held confidential. See Instructions for requirements for information to be deemed confidential.

1. Process Type/Description: MISCELLANEOUS (INCLUDES LABORATORY & WATER TREATMENT CHEMICALS, INKS, JANITORIAL ETC)
2. Process TIER Code: 071099 MISCELLANEOUS INDUSTRIAL PROCESSES
3. Seasonal Throughput Percent: Dec-Feb 25% Mar-May 25% Jun-Aug 25% Sep-Nov 25%
4. Normal Operating Schedule: Hours/Day 24 Days/Week 7 Hours/Year 8760 Weeks/Year 52
5. Typical Hours of Operation: (military time) Start 00:00 End 23:59

6	7	8	9		10	11		12	13	14		15
			Annual Usage Input	lb or gal		Emission Factor	EF Units (lbs per)			Control ID	Control % Efficiency	
63		MISC CHEMICALS	10098	gal	VOC	0.66	LB		%		%	6647

<sup>1</sup> Emissions factor back-calculated using material balance. See Calculation Sheet No. 4.

NOTE: Do NOT change pre-printed Process ID numbers. See the instructions for information on how to delete materials that are no longer used, or to assign Process ID numbers for new materials.

\* If you have off-site recycling/disposal of any of the materials listed above, you must complete an Off-Site Recycling/Disposal Form to receive credit for reduced emissions.

### \*\*Control Efficiency Reference Codes

- 1 = Tested efficiency / EPA reference method
- 2 = Tested efficiency / other source test method
- 3 = Design value from manufacturer
- 4 = Best Guess / engineering estimate
- 5 = Calculated, based on material balance
- 6 = Estimated, based on a published value

# Evaporative Process Form 2007

Permit Number(s): 030132

Place an X in any gray cell to mark data requested to be held confidential. See Instructions for requirements for information to be deemed confidential.

1. Process Type/Description: GENERAL MAINTENANCE PAINTING (PAINTS, SOLVENTS, THINNERS, SEALANTS, ETC.)

2. Process TIER Code: 080419 SOLVENT USE: SURFACE COATING- MAINTENANCE COATING

3. Seasonal Throughput Percent: Dec-Feb 25% Mar-May 25% Jun-Aug 25% Sep-Nov 25%

4. Normal Operating Schedule: Hours/Day 24 Days/Week 7 Hours/Year 8760 Weeks/Year 52

5. Typical Hours of Operation: (military time) Start 00:00 End 23:59

6 Process ID	7 Stack ID(s)	8 Material Type	9 Annual Usage Input		10 VOC, HAP&NON or NHX	11 Emission Factor		12 Pounds of pollutant* sent off site	13 Capture % Efficiency	14 Control Efficiency		15 Estimated Emissions (lbs/yr)
			lb or gal	Input		EF Units (lbs per)	Control ID			Control % Efficiency	Code**	
64		COATINGS	3391	gal	VOC	1.30	LB		%			4398
65		SOLVENTS, THINNERS	413	gal	VOC	7.18	LB		%			2966
66		SURFACE PREP FILLERS, CLNRS, ETC	549	gal	VOC	0.84	LB		%			463

\* Emissions factor back-calculated using material balance. See Calculation Sheet No.4.

NOTE: Do NOT change pre-printed Process ID numbers. See the instructions for information on how to delete materials that are no longer used, or to assign Process ID numbers for new materials.

\* If you have off-site recycling/disposal of any of the materials listed above, you must complete an Off-Site Recycling/Disposal Form to receive credit for reduced emissions.

### \*\*Control Efficiency Reference Codes

- 1 = Tested efficiency / EPA reference method
- 2 = Tested efficiency / other source test method
- 3 = Design value from manufacturer
- 4 = Best Guess / engineering estimate
- 5 = Calculated, based on material balance
- 6 = Estimated, based on a published value

# Evaporative Process Form 2007

Permit Number(s): 030132

Place an X in any gray cell to mark data requested to be held confidential. See Instructions for requirements for information to be deemed confidential.

1. Process Type/Description: ASPHALT PAVING OPERATIONS (REVISED)

2. Process TIER Code: 080602 SOLVENT USE: NONINDUSTRIAL - OTHER ASPHALT

3. Seasonal Throughput Percent: Dec-Feb 25% Mar-May 25% Jun-Aug 25% Sep-Nov 25%

4. Normal Operating Schedule: Hours/Day 24 Days/Week 7 Hours/Year 8760 Weeks/Year 52

5. Typical Hours of Operation: (military time) Start 00:00 End 23:59

6 Process ID	7 Stack ID(s)	8 Material Type	9 Annual Usage Input		10 VOC, HAP&NON or NHx	11 Emission Factor	12 Pounds of pollutant* sent off site	13 Capture % Efficiency	14 Control Efficiency		15 Estimated Emissions (lbs/yr)
			lb or gal	gal					Control ID	Control Efficiency Code**	
67		ASPHALT PRODUCTS	66,768	gal	VOC	0.02736					1826

\* Emissions factor back-calculated using material balance. See Calculation Sheet No. 4.

NOTE: Do NOT change pre-printed Process ID numbers. See the instructions for information on how to delete materials that are no longer used, or to assign Process ID numbers for new materials.

\* If you have off-site recycling/disposal of any of the materials listed above, you must complete an Off-Site Recycling/Disposal Form to receive credit for reduced emissions.

### \*\*Control Efficiency Reference Codes

- 1 = Tested efficiency / EPA reference method
- 2 = Tested efficiency / other source test method
- 3 = Design value from manufacturer
- 4 = Best Guess / engineering estimate
- 5 = Calculated, based on material balance
- 6 = Estimated, based on a published value

# Evaporative Process Form 2007

Permit Number(s): 030132

Place an X in any gray cell to mark data requested to be held confidential. See Instructions for requirements for information to be deemed confidential.

1. Process Type/Description: AMMONIA RELEASES FROM CIRCULATING WATER SYSTEMS (REVISED)

2. Process TIER Code: 071099 MISCELLANEOUS INDUSTRIAL PROCESSES

3. Seasonal Throughput Percent: Dec-Feb 25% Mar-May 25% Jun-Aug 25% Sep-Nov 25%

4. Normal Operating Schedule: Hours/Day 24 Days/Week 7 Hours/Year 8760 Weeks/Year 52

5. Typical Hours of Operation: (military time) Start 00:00 End 23:59

6 Process ID	7 Stack ID(s)	8 Material Type	9 Annual Usage Input		10 VOC, HAP&NON or NHx		11 Emission Factor		12 Pounds of pollutant* sent off site	13 Capture % Efficiency	14 Control Efficiency Code**		15 Estimated Emissions (lbs/yr)
			lb or gal	gal	lb or gal	NHx					Control ID	Control % Efficiency	
90		AMMONIUM HYDROXIDE	508,186	gal	NHx		0.013465	LB		%		%	6842.72

<sup>1</sup> Emissions factor back-calculated using material balance. See Calculation Sheet No. 9.

NOTE: Do NOT change pre-printed Process ID numbers. See the instructions for information on how to delete materials that are no longer used, or to assign Process ID numbers for new materials.

\* If you have off-site recycling/disposal of any of the materials listed above, you must complete an Off-Site Recycling/Disposal Form to receive credit for reduced emissions.

**\*\*Control Efficiency Reference Codes**

- 1 = Tested efficiency / EPA reference method
- 2 = Tested efficiency / other source test method
- 3 = Design value from manufacturer
- 4 = Best Guess / engineering estimate
- 5 = Calculated, based on material balance
- 6 = Estimated, based on a published value

## **EMISSIONS FACTOR CALCULATION SHEETS**

Additional emissions calculation information has been provided for the following processes:

Calculation Sheet No. 1 – Diesel Fuel Combustion Sources

(Process ID 7, 9, 10, 11, 12, 13, 14, 16, 20, 21, 24, 31, 32, 33, 35)

Calculation Sheet No. 2 – Unit Cooling Towers

(Process ID 17)

Calculation Sheet No. 3 – Portable Cooling Tower

(Process ID 22)

Calculation Sheet No. 4 – Various Evaporative Processes

(Process ID 60, 61, 62, 63, 64, 65, 66, 67)

Calculation Sheet No. 5 – Abrasive Blasting Operations (confined & unconfined)

(Process ID 36)

# EMISSIONS FACTOR CALCULATION SHEET NO 1

Permit Number: 030132

Process ID No. 7, 9, 10, 11, 12, 13, 14, 16, 20, 21, 24, 31, 32, 33, 35

Process Description: Diesel Combustion Sources

Description of Correction: Calculation of Fuel Sulfur Content and SOX Emission Factors

SO<sub>2</sub> emissions are derived from the fuel sulfur content. All sulfur in the fuel is assumed to be converted to SO<sub>2</sub> during combustion. In lieu of actual fuel sulfur analyses, a maximum fuel sulfur content at the permit limit of 0.05% was used in all of the calculations. Actual fuel sulfur content was less than this value so actual emissions will be lower. The following method was used to calculate the SO<sub>2</sub> emissions factor.

## ***SO<sub>2</sub> Emissions Factor (lb SO<sub>2</sub> / M GAL) Calculation Method:***

$$\text{SO}_2 \text{ Emissions Factor} = \text{Fuel Sulfur Content (\%S)} \times (1 \text{ lb S}/100 \text{ lb fuel}) \times (2 \text{ lb SO}_2/\text{lb S}) \\ \times (7.1 \text{ lb fuel}/\text{gal}) \times (1000 \text{ gal}/\text{M GAL})$$

$$= \text{Fuel Sulfur Content (\%S)} \times (142)$$

$$= (0.05) \times (142) = 0.71 \text{ lb SO}_2 / \text{M GAL}$$



## EMISSIONS FACTOR CALCULATION SHEET NO 2

Permit Number: 030132

Process ID No. 17

Process Description: Unit Cooling Towers

Description of Correction: Updated to PM-10 and VOC Emission Factors

The methodology for calculating PM-10 from the Unit Cooling Towers was based on a source test that was conducted on Unit 3 cooling tower 1 in July 2006. The methodology is a refinement of the AP-42 method that calculated a critical droplet diameter that contains enough dissolved solids that will create a 10-micron diameter solid particle upon evaporation of the water. Based on a measured particle size distribution, the mass fraction of droplets less than the critical droplet diameter can then be used to estimate the PM-10 fraction emitted from the towers. This method was incorporated into permit Condition 55b.

VOC emissions from the cooling towers were re-assessed. Chloroform emissions were calculated using an emissions factor obtained from Table 8.6-2 in "Emissions Characteristics of Cooling Towers Using Reclaimed Wastewater in California", Science Applications, Inc., prepared for the California State Air Resources Board and dated August 11, 1981.

The water treatment chemicals used in the cooling tower were evaluated for VOC content. It was conservatively assumed that all of the VOC added to the towers evaporated.

The following sections describe the methods used to derive the emissions factors used.

### ***PM-10 Emission Factor Calculation Method:***

PM-10 emissions were calculated using the formula presented in Permit Condition 55b. This formula uses monthly average TDS concentrations and operating hours to calculate a critical droplet diameter. The mass fraction of droplets with diameters equal or less than the critical droplet diameters can be extrapolated from the table included as part of Permit Condition 55b. These calculations need to be performed monthly. The emissions factor used was based on the total monthly emissions calculated using the formula in permit condition 55b divided by the total operating hours in the year. Copies of the permit pages and monthly calculation results attached.

The emissions factor reported on the form was calculated as follows:

$$\begin{aligned} \text{PM-10 Emissions Factor for year} &= (2467 \text{ lb PM-10}) / (23,304 \text{ hr}) \\ &= 0.105 \text{ lbs PM10 / hr} \end{aligned}$$

*The new emission factors were approved by Maricopa County after the source test results were obtained and reviewed.*

## EMISSIONS FACTOR CALCULATION SHEET NO 2

Permit Number: 030132

Process ID No. 17

Process Description: Unit Cooling Towers

Description of Correction: Updated to PM-10 and VOC Emission Factors

### ***VOC Emission Factor Calculation Method:***

The cooling towers were examined for VOC emissions. Testing indicates that chloroform is formed as a by-product when the cooling tower circulating water is chlorinated. The amount of chloroform produced can vary widely. Chloroform emissions were calculated from an emissions factor (20 kg-s/m<sup>3</sup>-yr) obtained from Table 8.6-2 in "Emissions Characteristics of Cooling Towers Using Reclaimed Wastewater in California", Science Applications, Inc., prepared for the California State Air Resources Board and dated August 11, 1981 (see attached copy of table). The design circulating flow rate of 590,000 gallons per minute was used in the calculation.

$$\begin{aligned}\text{VOC Emissions Factor 1} &= (20 \text{ kg-s/ m}^3\text{-yr})(1 \text{ yr}/365 \text{ d})(2.2 \text{ lb / kg}) (1 \text{ min} / 60 \text{ s}) \\ &\quad \times (1 \text{ m}^3 / 264.1 \text{ gal}) (590,000 \text{ gal / min}) (1 \text{ d} / 24 \text{ hr}) \\ &= 0.187 \text{ lb VOC / hr}\end{aligned}$$

Water treatment chemicals are also added to the cooling tower water to reduce potential foaming of the water. The concentration in the circulating water is maintained in the parts per million level. Conservatively assuming that all of the VOC contained in the water treatment chemicals evaporates through the towers, a non-chloroform VOC emissions factor can be determined.

One chemical used during 2007 that contained VOC at a tested concentration of 0.07 lbs / gallon was Foamtrol AF1091. The amounts used during 2006 were based on use records and total operating hours. During 2007, twenty three totes containing 300 gallons each of AF1091 (6,900 gallons total) were purchased. The non-chloroform emissions were calculated from the following:

$$\begin{aligned}\text{VOC Emissions Factor 2} &= (6,000 \text{ gal AF1091}) (0.07 \text{ lb / gal}) / 23,304 \text{ hr} \\ &= 0.018 \text{ lbs / hr}\end{aligned}$$

The VOC Emissions Factor is the sum of the chloroform and non-chloroform VOC emissions factors.

$$\text{VOC Emission Factor} = 0.187 + 0.018 = 0.205 \text{ lbs/hr}$$

## **PERMIT CONDITIONS**

### **PALO VERDE NUCLEAR GENERATING STATION Permit Number 030132**

The Permittee shall complete and submit the Compliance Plan within 120 days of exceeding the hydrogen sulfide emission limitation.  
[Rule 220, §303]

## **COOLING TOWERS OPERATIONS**

### **54. Operating Limitations:**

The Permittee shall limit the total dissolved solids (TDS) concentration of the circulating water of each cooling tower unit to 30,000 ppm. The Permittee may calculate this value as a rolling average for the month based on the weekly TDS sampling described below.

[Rule 220, §302.2]

### **55. Monitoring & Record Keeping:**

The Permittee shall conduct the following monitoring and shall retain records on-site for a period of no less than 5 years from the date of such record.

#### **a. Total Dissolved Solids Concentration (TDS):**

1. On a weekly basis, when the towers are in operation, the Permittee shall measure and record the TDS concentration in the circulating water of each unit cooling tower system (only one sample is required for each unit cooling tower system. A cooling tower system consists of three towers and a common circulating water system.). If the towers are not in operation on the scheduled day for sampling, the Permittee shall obtain a sample on the next day the cooling tower is operating.
2. On a monthly basis, the Permittee shall calculate and record an arithmetic average of the weekly samples collected in the calendar month.
3. On a monthly basis, when the portable cooling tower is in operation, the Permittee shall measure and record the TDS concentration in the circulating water of each portable cooling tower system. If the towers are not in operation for the entire month, no sample is required.

[Rule 220 §302.5] [Locally enforceable only]

#### **b. Emissions Calculations:**

1. On a monthly basis within 20 days following the end of each calendar month, the Permittee shall calculate and record PM10 emissions from each cooling tower unit using the applicable equation specified below. Emissions from the portable cooling tower are not required to be calculated during months it has not been operated:

**PERMIT CONDITIONS**

**PALO VERDE NUCLEAR GENERATING STATION**

Permit Number 030132

- (a) For each unit cooling tower system (one for each of Units 1, 2, and 3), monthly emissions shall be calculated using the following equation:

$$PM_{10} = (8.4 \times 10^{-6})(24)(60) (F_1) (F_D) (CFR) (TDS) (D)$$

$$PM_{10} = 0.0121 (F_1) (F_D) (CFR) (TDS) (D)$$

where,

PM<sub>10</sub> = PM<sub>10</sub> emissions (tons/number of operating days);

CFR = circulating water flowrate in gallons per minute;

TDS = the monthly average total dissolved solids concentration (ppm);

D = the cumulative days of cooling tower operation during the month (days).

F<sub>1</sub> = 0.00001 (0.00075% from salt drift study);

F<sub>D</sub> = the cumulative mass fraction of drift droplets emitted that will result in PM<sub>10</sub> emissions determined by linear interpolation from Table 1 using the droplet diameter calculated from the following equation:

$$D_c = \frac{1301}{TDS^{1/3}}$$

where:

D<sub>c</sub> = the drift droplet diameter that will evaporate and produce a solid particle with a diameter of 10 microns.

**PERMIT CONDITIONS**

**PALO VERDE NUCLEAR GENERATING STATION  
Permit Number 030132**

Table 1  
PVNGS Unit Cooling Tower Particle Size Distribution

D <sub>c</sub> Droplet Diameter (micron, μm)	F <sub>D</sub> Cumulative Mass Fraction ( < Diameter)	D <sub>c</sub> Droplet Diameter (micron, μm)	F <sub>D</sub> Cumulative Mass Fraction ( < Diameter)
0	0.00000	475	0.36724
15	0.00009	550	0.39493
25	0.00036	650	0.40655
35	0.00500	750	0.41994
45	0.02828	850	0.43192
55	0.06739	950	0.44923
65	0.09640	1100	0.47234
85	0.12894	1300	0.51496
100	0.14447	1500	0.56629
120	0.15897	1700	0.59469
140	0.17381	1900	0.65639
165	0.19692	2100	0.71808
195	0.21905	2300	0.84833
225	0.23927	2500	0.84833
255	0.25994	2700	0.84833
285	0.27691	2900	0.90231
325	0.30455	3100	0.90231
375	0.32817	3300	0.90231
425	0.34979	3500	1.00000

After the completion of the source test in Permit Condition 56, and after the Permittee has received a written approval of the source test report by the Department, the Permittee

**PALO VERDE NUCLEAR GENERATING STATION**  
**Air Quality Permit Number: 030132**  
**Annual Emissions Calculation for 2007**

**UNIT 1**

Month	Average TDS (ppm)	Operating Days (days)	Critical Droplet Diameter (µm)	Mass Fraction	PM10 Emissions (lbs)	Lower Table Values		Upper Table Values	
						Diameter	Mass Fraction	Diameter	Mass Fraction
January	25,160	31.0	44.4	0.00124	69.0	0	0.00000	50	0.00140
February	248,580	28.0	20.69	0.00058	288.1	0	0.00000	50	0.00140
March	28,295	31.0	42.69	0.0012	75.1	0	0.00000	50	0.00140
April	27,825	30.0	42.93	0.0012	71.5	0	0.00000	50	0.00140
May	22,253	22.0	46.25	0.0013	45.4	0	0.00000	50	0.00140
June	1,660	7.0	109.88	0.03688	30.7	90	0.07680	110	0.03710
July	6,767	31.0	68.78	0.00619	92.7	50	0.00140	70	0.00650
August	27,396	31.0	43.16	0.00121	73.3	0	0.00000	50	0.00140
September	28,000	30.0	42.84	0.0012	71.9	0	0.00000	50	0.00140
October	24,484	31.0	44.8	0.00125	67.7	0	0.00000	50	0.00140
November	21,425	30.0	46.84	0.00131	60.1	0	0.00000	50	0.00140
December	23,415	31.0	45.48	0.00127	65.8	0	0.00000	50	0.00140
<b>Totals for Year</b>	<b>N/A</b>	<b>333.0</b>	<b>N/A</b>	<b>N/A</b>	<b>1,011</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>

**UNIT 2**

Month	Average TDS (ppm)	Operating Days (days)	Critical Droplet Diameter (µm)	Cumulative Mass Fraction	PM10 Emissions for (lbs)	Lower Table Values		Upper Table Values	
						Diameter	Mass Fraction	Diameter	Mass Fraction
January	24,480	31.0	44.82	0.00125	67.6	0	0.00000	50	0.00140
February	22,155	28.0	46.32	0.0013	57.6	0	0.00000	50	0.00140
March	26,715	31.0	42.49	0.00119	75.6	0	0.00000	50	0.00140
April	26,940	30.0	43.4	0.00122	70.4	0	0.00000	50	0.00140
May	27,976	31.0	42.86	0.0012	74.3	0	0.00000	50	0.00140
June	29,055	30.0	42.32	0.00118	73.4	0	0.00000	50	0.00140
July	27,860	31.0	42.92	0.0012	74.0	0	0.00000	50	0.00140
August	26,664	31.0	43.55	0.00122	72.0	0	0.00000	50	0.00140
September	27,842	30.0	42.93	0.0012	71.5	0	0.00000	50	0.00140
October	23,692	31.0	45.3	0.00127	66.6	0	0.00000	50	0.00140
November	27,285	30.0	43.23	0.00121	70.6	0	0.00000	50	0.00140
December	24,145	31.0	45.01	0.00126	67.3	0	0.00000	50	0.00140
<b>Totals for Year</b>	<b>N/A</b>	<b>365.0</b>	<b>N/A</b>	<b>N/A</b>	<b>847</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>

**UNIT 3**

Month	Average TDS (ppm)	Operating Days (days)	Critical Droplet Diameter (µm)	Cumulative Mass Fraction	PM10 Emissions for (lbs)	Lower Table Values		Upper Table Values	
						Diameter	Mass Fraction	Diameter	Mass Fraction
January	24,160	31.0	45	0.00126	67.4	0	0.00000	50	0.00140
February	22,805	28.0	45.88	0.00128	58.3	0	0.00000	50	0.00140
March	27,935	31.0	42.88	0.0012	74.2	0	0.00000	50	0.00140
April	24,827	30.0	44.6	0.00125	66.4	0	0.00000	50	0.00140
May	23,784	31.0	45.24	0.00127	66.8	0	0.00000	50	0.00140
June	28,595	30.0	42.54	0.00119	72.9	0	0.00000	50	0.00140
July	27,180	31.0	43.27	0.00121	72.8	0	0.00000	50	0.00140
August	26,436	31.0	43.67	0.00122	71.4	0	0.00000	50	0.00140
September	24,045	30.0	45.07	0.00126	64.9	0	0.00000	50	0.00140
October	0	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
November	0	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
December	0	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>Totals for Year</b>	<b>N/A</b>	<b>273.0</b>	<b>N/A</b>	<b>N/A</b>	<b>615</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>



## EMISSIONS FACTOR CALCULATION SHEET NO 3

Permit Number: 030132

Process ID No. 22

Process Description: Portable Cooling Tower

Description of Correction: Updated PM-10 and VOC Emission Factors

The emissions inventory forms allow the use of only one conversion factor unit per process (i.e. hours or TDS). "Hours of Operation" has been selected as the common unit. Emissions and emissions factors that were back calculated are provided below.

### ***PM-10 Emission Factor Calculation:***

PM-10 emissions can be calculated from the following formula:

$$\text{PM (lb/hr)} = \text{CFR} \times \text{F1} \times 8.4 \text{ lb/gal} \times 60 \text{ min/hr} \times (1/10^6 \text{ ppm}) \times \text{TDS}$$

Where:

CFR = circulating flow rate (gpm) (2 cells) = 6,000

F1 = Liquid Drift Rate (fraction of flow rate) = 0.002% = 0.00002

Average TDS = 7,120 ppm

Substituting in the parameters gives:

$$\text{PM (lb/hr)} = [6000 \times 0.00002 \times 8.4 \times 60 \times (1/10^6)] \times 7,120 \text{ lbs/hr} = 0.431 \text{ lb / hr}$$

### ***VOC Emissions Factor Calculation Method***

Chloroform VOC emissions were calculated from an emissions factor (20 kg-s/m<sup>3</sup>-yr) obtained from Table 8.6-2 in "Emissions Characteristics of Cooling Towers Using Reclaimed Wastewater in California", Science Applications, Inc., prepared for the California State Air Resources Board and dated August 11, 1981 (see Calculation Sheet No. 2 for copy of table). The design circulating flow rate of 6,000 gallons per minute was used in the calculation.

$$\begin{aligned} \text{VOC Emissions Factor 1} &= (20 \text{ kg-s/ m}^3\text{-yr})(1 \text{ yr}/365 \text{ d})(2.2 \text{ lb / kg}) (1 \text{ min / 60 s}) \\ &\quad \times (1 \text{ m}^3 / 264.1 \text{ gal}) (6,000 \text{ gal / min}) (1 \text{ d / 24 hr}) \\ &= 0.0019 \text{ lb VOC / hr} \end{aligned}$$



# EMISSIONS FACTOR CALCULATION SHEET NO 4

Permit Number: 030132

Process ID No. 60, 61, 62, 63, 64, 65, 66, 67

Process Description: Various Evaporative Processes

Description of Correction: Updated VOC Emissions Factors

Evaporative Process ID's 60 through 67 were determined from site wide product use information by merging database information from material purchase and distribution, material chemical information, and daily user logs. The amount of materials and VOC emissions were determined by this compilation. The emissions factor was back-calculated from these results. This submittal includes the summary information for each evaporative process. Detailed information is maintained and available upon request.

The emissions factors used were determined from the following equation:

$$\text{VOC Emission Factor} = (\text{Total lbs VOC Emitted}) / (\text{Total gallons material used})$$

A summary of the evaporative data and emission factor calculations is provided below:

Process ID	Process Description	Total VOC Emitted (lbs)	Total Gallons Used (gal)	VOC Emissions Factor (lb / gal)
60	Adhesives	12307	5047	2.44
61	Cleaners	6524	1931	3.38
62	Lubricants	1400	467	2.99
63	Misc	6641	10098	0.66
64	Coatings - Paints	4398	3391	1.30
65	Coatings - Solvents	2966	413	7.18
66	Coatings - Surface Prep	463	549	0.84
67	Asphalt Products	1826	66768	0.027

## 13.2.6 Abrasive Blasting

### 13.2.6.1 General<sup>1-2</sup>

Abrasive blasting is the use of abrasive material to clean or texturize a material such as metal or masonry. Sand is the most widely used blasting abrasive. Other abrasive materials include coal slag, smelter slags, mineral abrasives, metallic abrasives, and synthetic abrasives. Industries that use abrasive blasting include the shipbuilding industry, automotive industry, and other industries that involve surface preparation and painting. The majority of shipyards no longer use sand for abrasive blasting because of concerns about silicosis, a condition caused by respiratory exposure to crystalline silica. In 1991, about 4.5 million tons of abrasives, including 2.5 million tons of sand, 1 million tons of coal slag, 500 thousand tons of smelter slag, and 500 thousand tons of other abrasives were used for domestic abrasive blasting operations.

### 13.2.6.2 Process Description<sup>1-9</sup>

Abrasive blasting systems typically include three essential components: an abrasive container (i. e., blasting pot); a propelling device; and a blasting nozzle or nozzles. The exact equipment used depends to a large extent on the specific application and type(s) of abrasive.

Three basic methods can be used to project the abrasive towards the surface being cleaned: air pressure; centrifugal wheels; or water pressure. Air blast (or dry) systems use compressed air to propel the abrasive using either a suction-type or pressure-type process. Centrifugal wheel systems use a rotating impeller to mechanically propel the abrasive by a combination of centrifugal and inertial forces. Finally, the water (or wet) blast method uses either air pressure or water pressure to propel an abrasive slurry towards the cleaned surface.

Abrasive materials used in blasting can generally be classified as sand, slag, metallic shot or grit, synthetic, or other. The cost and properties associated with the abrasive material dictate its application. The following discusses the general classes of commonly used abrasives.

Silica sand is commonly used for abrasive blasting where reclaiming is not feasible, such as in unconfined abrasive blasting operations. Sand has a rather high breakdown rate, which can result in substantial dust generation. Worker exposure to free crystalline silica is of concern when silica sand is used for abrasive blasting.

Coal and smelter slags are commonly used for abrasive blasting at shipyards. Black Beauty<sup>TM</sup>, which consists of crushed slag from coal-fired utility boilers, is a commonly used slag. Slags have the advantage of low silica content, but have been documented to release other contaminants, including hazardous air pollutants (HAP), into the air.

Metallic abrasives include cast iron shot, cast iron grit, and steel shot. Cast iron shot is hard and brittle and is produced by spraying molten cast iron into a water bath. Cast iron grit is produced by crushing oversized and irregular particles formed during the manufacture of cast iron shot. Steel shot is produced by blowing molten steel. Steel shot is not as hard as cast iron shot, but is much more durable. These materials typically are reclaimed and reused.

Synthetic abrasives, such as silicon carbide and aluminum oxide, are becoming popular substitutes for sand. These abrasives are more durable and create less dust than sand. These materials typically are reclaimed and reused.

Other abrasives include mineral abrasives (such as garnet, olivine, and staurolite), cut plastic, glass beads, crushed glass, and nutshells. As with metallic and synthetic abrasives, these other abrasives are generally used in operations where the material is reclaimed. Mineral abrasives are reported to create significantly less dust than sand and slag abrasives.

The type of abrasive used in a particular application is usually specific to the blasting method. Dry blasting is usually done with sand, metallic grit or shot, aluminum oxide (alumina), or silicon carbide. Wet blasters are operated with either sand, glass beads, or other materials that remain suspended in water.

### 13.2.6.3 Emissions And Controls<sup>1,3,5-11</sup>

#### Emissions —

Particulate matter (PM) and particulate HAP are the major concerns relative to abrasive blasting. Table 13.2.6-1 presents total PM emission factors for abrasive blasting as a function of wind speed. Higher wind speeds increase emissions by enhanced ventilation of the process and by retardation of coarse particle deposition.

Table 13.2.6-1 also presents fine particulate emission factors for abrasive blasting. Emission factors are presented for PM-10 and PM-2.5, which denote particles equal to or smaller than 10 and 2.5 microns in aerodynamic diameter, respectively. Emissions of PM of these size fractions are not significantly wind-speed dependent. Table 13.2.6-1 also presents an emission factor for controlled emissions from an enclosed abrasive blasting operation controlled by a fabric filter; the blasting media was 30/40 mesh garnet.

Limited data from Reference 3 give a comparison of total PM emissions from abrasive blasting using various media. The study indicates that, on the basis of tons of abrasive used, total PM emissions from abrasive blasting using grit are about 24 percent of total PM emissions from abrasive blasting with sand. The study also indicates that total PM emissions from abrasive blasting using shot are about 10 percent of total PM emissions from abrasive blasting with sand.

Hazardous air pollutants, typically particulate metals, are emitted from some abrasive blasting operations. These emissions are dependent on both the abrasive material and the targeted surface.

#### Controls —

A number of different methods have been used to control the emissions from abrasive blasting. These methods include: blast enclosures; vacuum blasters; drapes; water curtains; wet blasting; and reclaim systems. Wet blasting controls include not only traditional wet blasting processes but also high pressure water blasting, high pressure water and abrasive blasting, and air and water abrasive blasting. For wet blasting, control efficiencies between 50 and 93 percent have been reported. Fabric filters are used to control emissions from enclosed abrasive blasting operations.

Table 13.2.6-1. PARTICULATE EMISSION FACTORS FOR ABRASIVE BLASTING<sup>a</sup>

EMISSION FACTOR RATING: E

Source	Particle size	Emission factor, lb/1,000 lb abrasive
Sand blasting of mild steel panels <sup>b</sup> (SCC 3-09-002-02)	Total PM	
	5 mph wind speed	27
	10 mph wind speed	55
	15 mph wind speed	91
	PM-10 <sup>c</sup>	13
	PM-2.5 <sup>c</sup>	1.3
Abrasive blasting of unspecified metal parts, controlled with a fabric filter <sup>d</sup> (SCC 3-09-002-04)	Total PM	0.69

a One lb/1,000 lb is equal to 1 kg/Mg. Factors represent uncontrolled emissions, unless noted.  
SCC = Source Classification Code.

b Reference 10.

c Emissions of PM-10 and PM-2.5 are not significantly wind-speed dependent.

d Reference 11. Abrasive blasting with garnet blast media.

References For Section 13.2.6

1. C. Cowherd and J. Kinsey, *Development Of Particulate And Hazardous Emission Factors For Outdoor Abrasive Blasting*, EPA Contract No. 68-D2-0159, Midwest Research Institute, Kansas City, MO, June 1995.
2. Written communication from J. D. Hansink, Barton Mines Corporation, Golden, CO, to Attendees of the American Waterways Shipyard Conference, Pedido Beach, AL, October 28, 1991.
3. South Coast Air Quality Management District, *Section 2: Unconfined Abrasive Blasting*, Draft Document, El Monte, CA, September 8, 1988.
4. A. W. Mallory, "Guidelines For Centrifugal Blast Cleaning", *J. Protective Coatings And Linings*, 1(1), June 1984.
5. B. Baldwin, "Methods Of Dust-Free Abrasive Blast Clearing", *Plant Engineering*, 32(4), February 16, 1978.
6. B. R. Appleman and J. A. Bruno, Jr., "Evaluation Of Wet Blast Cleaning Units", *J. Protective Coatings And Linings*, 2(8), August 1985.

7. M. K. Snyder and D. Bendersky, *Removal Of Lead-Based Bridge Paints*, NCHRP Report 265, Transportation Research Board, Washington, DC, December 1983.
8. J. A. Bruno, "Evaluation Of Wet Abrasive Blasting Equipment", *Proceedings Of The 2nd Annual International Bridge Conference*, Pittsburgh, PA, June 17-19, 1985.
9. J. S. Kinsey, *Assessment Of Outdoor Abrasive Blasting*, Interim Report, EPA Contract No. 68-02 4395, Work Assignment No. 29, U. S. Environmental Protection Agency, Research Triangle Park, NC, September 11, 1989.
10. J. S. Kinsey, S. Schliesser, P. Murowchick, and C. Cowherd, *Development Of Particulate Emission Factors For Uncontrolled Abrasive Blasting Operations*, EPA Contract No. 68-D2-0159, Midwest Research Institute, Kansas City, MO, February 1995.
11. *Summary Of Source Test Results, Poly Engineering, Richmond, CA, Bay Area Air Quality Management District, San Francisco, CA, November 19, 1990.*
12. *Emission Factor Documentation For AP-42 Section 13.2.6, Abrasive Blasting, Final Report*, Midwest Research Institute, Cary, NC, September 1997.

# EMISSIONS FACTOR CALCULATION SHEET NO 8

Permit Number: 030132

Process ID No. 90

Process Description: AMMONIA RELEASES FROM CIRCULATING WATER SYSTEMS

Description of Correction: Ammonia Emission Factor

A detailed ammonia emissions analysis for water treatment activities was performed during 2006. Ammonia releases from all emissions sources due to use of ammonium hydroxide during the year 2006 was calculated in order to update the emissions factor. Results of the calculations are attached. The emissions factor was based on the total amount of ammonia released during 2006 and the total amount of ammonium hydroxide used during the year. The emissions factor accounts for all releases of ammonia due to use in the secondary system.

$$\begin{aligned}\text{Ammonia EF (lb / NH}_3\text{OH lb)} &= (\text{total ammonia released in lbs}) / (\text{total ammonium hydroxide used in lbs}) \\ &= 6,843 \text{ lbs} / 508,186 \text{ NH}_3\text{OH lbs} \\ &= 0.0134 \text{ lbs} / \text{NH}_3\text{OH lbs}\end{aligned}$$

**ATTACHMENT 2**  
**2007 Annual HAPS Report**

**Palo Verde Nuclear Generating Station  
Air Quality Permit 030132  
2007 Annual HAPS Report**

<b>Summary of 2007 Annual Emissions</b>	<b>Total Process Emissions* (tons)</b>	<b>Accidental Releases (tons)</b>	<b>Total Emissions (tons)</b>
<b>Xylene</b>	<b>1.13</b>	<b>0</b>	<b>1.13</b>
<b>Ethyl Benzene</b>	<b>0.19</b>	<b>0</b>	<b>0.19</b>
<b>Toluene</b>	<b>0.73</b>	<b>0</b>	<b>0.73</b>
<b>Chloroform</b>	<b>1.30</b>	<b>0</b>	<b>1.30</b>
<b>Total</b>	<b>3.35</b>	<b>0</b>	<b>3.35</b>

*\* - In accordance with Permit Condition 21, only those HAPS with emissions for the calendar year greater than 500 lbs are listed.*