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# Appendix A

## Calculation of Potential Cogeneration power from Diesel Engine Power Plants

Asia Power (Pvt) Ltd			
<b>Energy Balance for steam Generator</b>			
Exhaust flow rate per one engine is	=	16.2	kg/s
Number of Diesel Generating sets	=	8	
Hence, Exhaust flow rate from all	=	129.6	kg/s
Exhaust temperature after Engine	=	360	°C
Exhaust temperature after super heating	=	330	°C
After the steam generator, keep exhaust temperature to (Sulfur Dioxide Dew point is 170 °C)	=	260	°C
Enthalpy difference 25 bar, 224 °C vapor and liquid	=	1841	kJ/kg
Assume efficiency of the heat exchanger as (Average Boiler Efficiency)	=	80	%
Steam mass flow rate that can be generate	=	m	kg
$70 \times 1.005 \times 129.6 \times 0.8 = m \times 1841$			
$m = 3.96192$			
		14263	kg/hr
		14000	kg/hr
Take Feed water temperature as	=	80	°C
Temperature of saturated steam at 25 bar	=	224	°C
Energy required to bring 80 °C to 224 °C water at 25 bar			
$= 3.96192 \times 4.187 \times 144$			
$= 2388.75$			
<b>Heat Balance for economizer,</b>			
$129 \times 1.005 \times (260 - T_2) \times 0.8 = 2389$			
$0.8 \times 129.6 \times 1 \times (260 - T_2) = 2389$			
Temperature at the top of the stack T <sub>2</sub>	=	237.07	°C
(Sulfur Dioxide Dew point is 170 °C)	=	237	°C
Keep 1.35 safety factor			
<b>Determine the Exhaust temperature after super heater</b>			
Superheat steam up to	=	320	°C
Boiling point at 25 bar is	=	224	°C
Consider temperature of the saturated steam as	=	224	°C
Enthalpy of superheated steam at 320 °C	=	3053	kJ/Kg
Enthalpy of superheated steam at 224 °C	=	2803	kJ/Kg
Consider steam dryness fraction as	=	0.95	
<b>Heat balance for steam heating (Super Heater) and Exhaust gas flow (consider efficiency of the heater as 80%)</b>			
$16.2 \times 8 \times (350 - T_1) \times 1.005 \times 0.8 = (3053 - 2803) \times 3.96 + 0.05 \times 3.96 \times 1841$			
$129.6 \times (350 - T_1) \times 1.005 \times 0.8 = 250 \times 3.962 + 365$			
<b>Exhaust Gas temperature after the super heater (T<sub>1</sub>)</b>	=	338.2	°C
<b>Calculation of Electrical Power output</b>			
Enthalpy of superheated steam 25 bar at 320 °C	=	3053	kJ/Kg
Enthalpy of 0.5 bar condensate	=	419	kJ/Kg
Energy of 1 kg of steam to turbine	=	2634	kJ/Kg
Assume 1/6 <sup>th</sup> of steam goes to process heating			
Power available to steam turbine from steam mass flow rate 3.30	=	2634	kJ/Kg x 3.3
	=	8696.4	kW
Assume efficiency of turbine as	=	0.3	
Alternator	=	0.97	
Electrical Power Output	=	2530.7	MW
Station Consumption	=	500	kW
After considering other losses and other practical aspects, it will be able to generate	=	2000	MW
At 0.85 Pf Alternator capacity would be	=	2352.9	MVA
	=	2.4	MVA

**Energy Balance for steam Generator**

Exhaust flow rate per one engine is	=	15.8	kg/s
Number of Diesel Generating sets	=	4	
Hence, Exhaust flow rate from all	=	63.2	kg/s
Exhaust temperature after Engine	=	360	<sup>0</sup> C
Exhaust temperature after super heating	=	330	<sup>0</sup> C
After the steam generator, keep exhaust temperature to (Sulfur Dioxide Dew point is 170 <sup>0</sup> C )	=	260	<sup>0</sup> C
Enthalpy deference 25 bar, 224 <sup>0</sup> C vapor and liquid	=	1841	kJ/kg
Assume efficiency of the heat exchanger as (Average Boiler Efficiency)	=	80	%
Steam mass flow rate that can be generate	=		m kg

$70 \times 1.005 \times 63.2 \times 0.8 = m \times 1841$			
$m = 1.93205$		6955.4	kg/hr
		6500	kg/hr

Take Feed water temperature as	=	80	<sup>0</sup> C
Temperature of saturated steam at 25 bar	=	224	<sup>0</sup> C
Energy required to bring 80 <sup>0</sup> C to 224 <sup>0</sup> C water at 25 bar	=	$1.93205 \times 4.187 \times 144$	
	=	1164.88	

**Heat Balance for economizer,**

$63.2 \times 1.005 \times (260 - T_2) \times 0.8 = 1165$		<b>1165</b>	<b>kW</b>
$0.8 \times 63.2 \times 1 \times (260 - T_2) = 1165$			

Temperature at the top of the stack T <sub>2</sub>	=	237.07	<sup>0</sup> C
(Sulfur Dioxide Dew point is 170 <sup>0</sup> C )	=	237	<sup>0</sup> C
Keep 1.35 safety factor			

**Determine the Exhaust temperature after super heater**

Superheat steam up to	=	320	<sup>0</sup> C
Boiling point at 25 bar is	=	224	<sup>0</sup> C
Consider temperature of the saturated steam as	=	224	<sup>0</sup> C
Enthalpy of superheated steam at 320 <sup>0</sup> C	=	3053	kJ/Kg
Enthalpy of superheated steam at 224 <sup>0</sup> C	=	2803	kJ/Kg
Consider steam dryness fraction as	=	0.95	

**Heat balance for steam heating (Super Heater) and Exhaust gas flow (consider efficiency of the heater as 80%)**

$15.8 \times 4 \times (350 - T_1) \times 1.005 \times 0.8 = (3053 - 2803) \times 1.93 + 0.05 \times 1.93 \times 1841$			
$63.2 \times (350 - T_1) \times 1.005 \times 0.8 = 250 \times 1.932 + 178$			
<b>Exhaust Gas temperature after the super heater (T<sub>1</sub>)</b>	=	<b>341.7</b>	<sup>0</sup> C

**Calculation of Electrical Power output**

Enthalpy of superheated steam 25 bar at 320 C	=	3053	kJ/Kg
Enthalpy of 0.5 bar condensate	=	419	kJ/Kg
Energy of 1 kg of steam to turbine	=	2634	kJ/Kg

Assume 1/6 <sup>th</sup> of steam goes to process heating			
Power available to steam turbine from steam mass flow rate	1.61	=	2634 kJ/Kg x 1.61
		=	4240.8 kW

Assume efficiency of turbine as	=	0.3	
Alternator	=	0.97	

Electrical Power Output	=	1234.1	kW
Station Consumption	=	400	kW

After considering other losses and other practical aspects, it will be able to generate	=	800	kW
At 0.85 Pf Alternator capacity would be	=	941.18	kVA
	=	1	MVA

**Energy Balance for steam Generator**

Exhaust flow rate per one engine is	=	15	kg/s
Number of Diesel Generating sets	=	4	
Hence, Exhaust flow rate from all	=	60	kg/s
Exhaust temperature after Engine	=	350	<sup>0</sup> C
Exhaust temperature after super heating	=	320	<sup>0</sup> C
After the steam generator, keep exhaust temperature to (Sulfur Dioxide Dew point is 170.0 C )	=	260	<sup>0</sup> C
Enthalpy deference 25 bar, 224 <sup>0</sup> C vapor and liquid	=	1841	kJ/kg
Assume efficiency of the heat exchanger as (Average Boiler Efficiency)	=	80	%
Steam mass flow rate that can be generate	=	m	kg
$60 \times 1.005 \times 60 \times 0.8 = m \times 1841$			
$m = 1.57219$			
		5659.9	kg/hr
		5500	kg/hr
Take Feed water temperature as	=	80	<sup>0</sup> C
Temperature of saturated steam at 25 bar	=	224	<sup>0</sup> C
Energy required to bring 80 <sup>0</sup> C to 224 <sup>0</sup> C water at 25 bar			
$= 1.57219 \times 4.187 \times 144$			
$= 947.917$			
<b>Heat Balance for economizer,</b>			
$60 \times 1.005 \times (260 - T_2) \times 0.8 = 948$			kw
$0.8 \times 60 \times 1 \times (260 - T_2) = 947.9$			
Temperature at the top of the stack T <sub>2</sub>	=	240.35	<sup>0</sup> C
(Sulfur Dioxide Dew point is 170 <sup>0</sup> C )	=	230	<sup>0</sup> C
Keep 1.35 safety factor			
<b>Determine the Exhaust temperature after super heater</b>			
Superheat steam up to	=	320	<sup>0</sup> C
Boiling point at 25 bar is	=	224	<sup>0</sup> C
Consider temperature of the saturated steam as	=	224	<sup>0</sup> C
Enthalpy of superheated steam at 320 C	=	3053	kJ/Kg
Enthalpy of superheated steam at 224 <sup>0</sup> C	=	2803	kJ/Kg
Consider steam dryness fraction as	=	0.95	

**Heat balance for steam heating (Super Heater) and Exhaust gas flow (consider efficiency of the heater as 80%)**

$15 \times 4 \times (340 - T_1) \times 1.005 \times 0.8 = (3053 - 2803) \times 1.57 + 0.05 \times 1.57 \times 1841$			
$60 \times (340 - T_1) \times 1.005 \times 0.8 = 250 \times 1.572 + 145$			
<b>Exhaust Gas temperature after the super heater (T<sub>1</sub>)</b>	=	332.3	<sup>0</sup> C

**Calculation of Electrical Power output**

Enthalpy of superheated steam 25 bar at 320 C	=	3053	kJ/Kg
Enthalpy of 0.5 bar condensate	=	419	kJ/Kg
Energy of 1 kg of steam to turbine	=	2634	kJ/Kg
Assume 1/6 <sup>th</sup> of steam goes to process heating			
Power available to steam turbine from steam mass flow rate 1.31	=	2634	kJ/Kg x 1.31
	=	3451	kw
Assume efficiency of turbine as	=	0.3	
Alternator	=	0.97	
Electrical Power Output	=	1004.2	kw
Station Consumption	=	300	kw
After considering other losses and other practical aspects, it will be able to generate	=	700	kw
At 0.85 Pf Alternator capacity would be	=	823.53	kVA
	=	0.9	MVA

**Energy Balance for steam Generator**

Exhaust flow rate per one engine is	=	15	kg/s
Number of Diesel Generating sets	=	4	
Hence, Exhaust flow rate from all	=	60	kg/s
Exhaust temperature after Engine	=	350	<sup>0</sup> C
Exhaust temperature after super heating	=	320	<sup>0</sup> C
After the steam generator, keep exhaust temperature to (Sulfur Dioxide Dew point is 170 <sup>0</sup> C )	=	260	<sup>0</sup> C
Enthalpy deference 25 bar, 224 <sup>0</sup> C vapor and liquid	=	1841	kJ/kg
Assume efficiency of the heat exchanger as (Average Boiler Efficiency)	=	80	%
Steam mass flow rate that can be generate	=	m	kg

$$60 \times 1.005 \times 60 \times 0.8 = m \times 1841$$

$$m = 1.57219$$

5659.9 kg/hr  
5500 kg/hr

Take Feed water temperature as	=	80	<sup>0</sup> C
Temperature of saturated steam at 25 bar	=	224	<sup>0</sup> C
Energy required to bring 80 <sup>0</sup> C to 224 <sup>0</sup> C water at 25 bar	=	1.57219 x 4.187 x 144	
	=	947.917	

**Heat Balance for economizer,**

$$60 \times 1.005 \times (260 - T_2) \times 0.8 = 948 \text{ kW}$$

$$0.8 \times 60 \times 1 \times (260 - T_2) = 947.9$$

Temperature at the top of the stack T <sub>2</sub>	=	240.35	<sup>0</sup> C
(Sulfur Dioxide Dew point is 170 <sup>0</sup> C )	=	230	<sup>0</sup> C
Keep 1.35 safety factor			

**Determine the Exhaust temperature after super heater**

Superheat steam up to	=	320	<sup>0</sup> C
Boiling point at 25 bar is	=	224	<sup>0</sup> C
Consider temperature of the saturated steam as	=	224	<sup>0</sup> C
Enthalpy of superheated steam at 320 <sup>0</sup> C	=	3053	kJ/Kg
Enthalpy of superheated steam at 224 <sup>0</sup> C	=	2803	kJ/Kg
Consider steam dryness fraction as	=	0.95	

**Heat balance for steam heating (Super Heater) and Exhaust gas flow (consider efficiency of the heater as 80%)**

$$15 \times 4 \times (340 - T_1) \times 1.005 \times 0.8 = (3053 - 2803) \times 1.57 + 0.05 \times 1.57 \times 1841$$

$$60 \times (340 - T_1) \times 1.005 \times 0.8 = 250 \times 1.572 + 145$$

<b>Exhaust Gas temperature after the super heater (T<sub>1</sub>)</b>	=	<b>332.3</b>	<sup>0</sup> C
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**Calculation of Electrical Power output**

Enthalpy of superheated steam 25 bar at 320 C	=	3053	kJ/Kg
Enthalpy of 0.5 bar condensate	=	419	kJ/Kg
Energy of 1 kg of steam to turbine	=	2634	kJ/Kg

Assume 1/6 <sup>th</sup> of steam goes to process heating			
Power available to steam turbine from steam mass flow rate	1.31	=	2634 kJ/Kg x 1.31
		=	3451 kW
Assume efficiency of turbine as		=	0.3
Alternator		=	0.97
Electrical Power Output		=	1004.2 kW
Station Consumption		=	300 kW
After considering other losses and other practical aspects, it will be able to generate		=	700 kW
At 0.85 Pf Alternator capacity would be		=	823.53 kVA
		=	0.9 MVA

**Energy Balance for steam Generator**

Exhaust flow rate per one engine is	=	30	kg/s
Number of Diesel Generating sets	=	6	
Hence, Exhaust flow rate from all	=	180	kg/s
Exhaust temperature after Engine	=	380	°C
Exhaust temperature after super heating	=	350	°C
After the steam generator, keep exhaust temperature to (Sulfur Dioxide Dew point is 170 °C )	=	260	°C
Enthalpy deference 25 bar, 224 °C vapor and liquid	=	1841	kJ/kg
Assume efficiency of the heat exchanger as (Average Boiler Efficiency)	=	80	%
Steam mass flow rate that can be generate	=	m	kg
$90 \times 1.005 \times 180 \times 0.8 = m \times 1841$			
$m = 7.07485$			
		25469	kg/hr
		25000	kg/hr
Take Feed water temperature as	=	80	°C
Temperature of saturated steam at 25 bar	=	224	°C
Energy required to bring 80 °C to 224 °C water at 25 bar			
$7.07485 \times 4.187 \times 144$			
$= 4265.63$			
<b>Heat Balance for economizer,</b>			
$180 \times 1.005 \times (260 - T_2) \times 0.8 = 4266$ kW			
$0.8 \times 180 \times 1 \times (260 - T_2) = 4266$			
Temperature at the top of the stack T <sub>2</sub>	=	230.52	°C
(Sulfur Dioxide Dew point is 170 °C )	=	230	°C
Keep 1.35 safety factor			
<b>Determine the Exhaust temperature after super heater</b>			
Superheat steam up to	=	340	°C
Boiling point at 25 bar is	=	224	°C
Consider temperature of the saturated steam as	=	224	°C
Enthalpy of superheated steam at 340 °C	=	3100	kJ/Kg
Enthalpy of superheated steam at 224 °C	=	2803	kJ/Kg
Consider steam dryness fraction as	=	0.95	

**Heat balance for steam heating (Super Heater) and Exhaust gas flow (consider efficiency of the heater as 80%)**

$30 \times 6 \times (370 - T_1) \times 1.005 \times 0.8 = (3100 - 2803) \times 7.07 + 0.05 \times 7.07 \times 1841$			
$180 \times (370 - T_1) \times 1.005 \times 0.8 = 297 \times 7.075 + 651$			
Exhaust Gas temperature after the super heater (T <sub>1</sub> )	=	350.6	°C

**Calculation of Electrical Power output**

Enthalpy of superheated steam 25 bar at 340 C	=	3100	kJ/Kg
Enthalpy of 0.5 bar condensate	=	419	kJ/Kg
Energy of 1 kg of steam to turbine	=	2681	kJ/Kg
Assume 1/6 <sup>th</sup> of steam goes to process heating			
Power available to steam turbine from steam mass flow rate	5.90	=	2681 kJ/Kg x 5.9
		=	15806 kW
Assume efficiency of turbine as		=	0.3
Alternator		=	0.97
Electrical Power Output		=	4599.7 kW
Station Consumption		=	500 kW
After considering other losses and other practical aspects, it will be able to generate		=	4000 kW
At 0.85 Pf Alternator capacity would be		=	4705.9 kVA
		=	4.8 MVA

**Energy Balance for steam Generator**

Exhaust flow rate per one engine is	=	16.5	kg/s
Number of Diesel Generating sets	=	14	
Hence, Exhaust flow rate from all	=	231	kg/s
Exhaust temperature after Engine	=	360	° C
Exhaust temperature after super heating	=	320	° C
After the steam generator, keep exhaust temperature to (Sulfur Dioxide Dew point is 170 °C)	=	260	° C
Enthalpy difference 25 bar, 224 °C vapor and liquid	=	1841	kJ/kg
Assume efficiency of the heat exchanger as (Average Boiler Efficiency)	=	80	%
Steam mass flow rate that can be generate	=	m	kg
$60 \times 1.005 \times 231 \times 0.8 = m \times 1841$			
$m = 6.05293$			
		21791	kg/hr
		22000	kg/hr
Take Feed water temperature as	=	80	° C
Temperature of saturated steam at 25 bar	=	224	° C
Energy required to bring 80 °C to 224 °C water at 25 bar			
$= 6.05293 \times 4.187 \times 144$			
$= 3649.48$			
<b>Heat Balance for economizer,</b>			
$231 \times 1.005 \times (260 - T_2) \times 0.8 = 3649$ kW			
$0.8 \times 231 \times 1 \times (260 - T_2) = 3649$			
Temperature at the top of the stack T <sub>2</sub>	=	240.35	° C
(Sulfur Dioxide Dew point is 170 °C)	=	230	° C
Keep 1.35 safety factor			
<b>Determine the Exhaust temperature after super heater</b>			
Superheat steam up to	=	320	° C
Boiling point at 25 bar is	=	224	° C
Consider temperature of the saturated steam as	=	224	° C
Enthalpy of superheated steam at 320 °C	=	3053	kJ/Kg
Enthalpy of superheated steam at 224 °C	=	2803	kJ/Kg
Consider steam dryness fraction as	=	0.95	

**Heat balance for steam heating (Super Heater) and Exhaust gas flow (consider efficiency of the heater as 80%)**

$16.5 \times 14 \times (350 - T_1) \times 1.005 \times 0.8 = (3053 - 2803) \times 6.05 + 0.05 \times 6.05 \times 1841$			
$231 \times (350 - T_1) \times 1.005 \times 0.8 = 250 \times 6.053 + 557$			
<b>Exhaust Gas temperature after the super heater (T<sub>1</sub>)</b>	=	334.6	° C

**Calculation of Electrical Power output**

Enthalpy of superheated steam 25 bar at 320 °C	=	3053	kJ/Kg
Enthalpy of 0.5 bar condensate	=	419	kJ/Kg
Energy of 1 kg of steam to turbine	=	2634	kJ/Kg
Assume 1/6 <sup>th</sup> of steam goes to process heating			
Power available to steam turbine from steam mass flow rate 5.04	=	2634	kJ/Kg x 5.04
	=	13286	kW
Assume efficiency of turbine as	=	0.3	
Alternator	=	0.97	
Electrical Power Output	=	3866.3	kW
Station Consumption	=	600	kW
After considering other losses and other practical aspects, it will be able to generate	=	3000	kW
At 0.85 Pf Alternator capacity would be	=	3529.4	kVA
	=	3.6	MVA

Sapugaskanda (A) Power Plant			
<b>Energy Balance for steam Generator</b>			
Exhaust flow rate per one engine is	=	36	kg/s
Number of Diesel Generating sets	=	4	
Hence, Exhaust flow rate from all	=	144	kg/s
Exhaust temperature after Engine	=	450	<sup>0</sup> C
Exhaust temperature after super heating	=	400	<sup>0</sup> C
After the steam generator, keep exhaust temperature to (Sulfur Dioxide Dew point is 170 <sup>0</sup> C )	=	280	<sup>0</sup> C
Enthalpy deference 25 bar, 224 <sup>0</sup> C vapor and liquid	=	1841	kJ/kg
Assume efficiency of the heat exchanger as (Average Boiler Efficiency)	=	80	%
Steam mass flow rate that can be generate	=		m kg
$144 \times 1.005 \times 144 \times 0.8 = m \times 1841$			
$m = 8.80426$			31695 kg/hr
			34000 kg/hr
Take Feed water temperature as	=	80	<sup>0</sup> C
Temperature of saturated steam at 25 bar	=	224	<sup>0</sup> C
Energy required to bring 80 <sup>0</sup> C to 224 <sup>0</sup> C water at 25 bar	=	$8.80426 \times 4.187 \times 144$	
	=	5308.33	
<b>Heat Balance for economizer,</b>			
$144 \times 1.005 \times (260 - T_2) \times 0.8 = 5687.5$ kW			
$0.8 \times 144 \times 1 \times (280 - T_2) = 5308$			
Temperature at the top of the stack T <sub>2</sub>	=	234.15	<sup>0</sup> C
(Sulfur Dioxide Dew point is 170 <sup>0</sup> C )	=	230	<sup>0</sup> C
Keep 1.35 safety factor			
<b>Determine the Exhaust temperature after super heater</b>			
Superheat steam up to	=	410	<sup>0</sup> C
Boiling point at 25 bar is	=	224	<sup>0</sup> C
Consider temperature of the saturated steam as	=	224	<sup>0</sup> C
Enthalpy of superheated steam at 410 C	=	3260	kJ/Kg
Enthalpy of superheated steam at 224 <sup>0</sup> C	=	2803	kJ/Kg
Consider steam dryness fraction as	=	0.95	
<b>Heat balance for steam heating (Super Heater) and Exhaust gas flow (consider efficiency of the heater as 80%)</b>			
$36 \times 4 \times (440 - T_1) \times 1.005 \times 0.8 = (3260 - 2803) \times 8.8 + 0.05 \times 8.8 \times 1841$			
$144 \times (440 - T_1) \times 1.005 \times 0.8 = 457 \times 8.804 + 810$			
<b>Exhaust Gas temperature after the super heater (T<sub>1</sub>)</b>	=	407.4	<sup>0</sup> C
<b>Calculation of Electrical Power output</b>			
Enthalpy of superheated steam 25 bar at 410 C	=	3260	kJ/Kg
Enthalpy of 0.5 bar condensate	=	419	kJ/Kg
Energy of 1 kg of steam to turbine	=	2841	kJ/Kg
Assume 1/6 <sup>th</sup> of steam goes to process heating			
Power available to steam turbine from steam mass flow rate	$7.34$	=	$2841 \times 7.34$ kJ/Kg
		=	20844 kW
Assume efficiency of turbine as		=	0.3
Alternator		=	0.97
Electrical Power Output		=	6065.6 kW
Station Consumption		=	600 kW
After considering other losses and other practical aspects, it will be able to generate		=	5000 kW
At 0.85 Pf Alternator capacity would be		=	5882.4 kVA
		=	5.9 MVA



Sapugaskanda (B) Power Plant			
<b>Energy Balance for steam Generator</b>			
Exhaust flow rate per one engine is	=	18	kg/s
Number of Diesel Generating sets	=	8	
Hence, Exhaust flow rate from all	=	144	kg/s
Exhaust temperature after Engine	=	430	<sup>0</sup> C
Exhaust temperature after super heating	=	380	<sup>0</sup> C
After the steam generator, keep exhaust temperature to (Sulfur Dioxide Dew point is 170 <sup>0</sup> C )	=	270	<sup>0</sup> C
Enthalpy deference 25 bar, 224 <sup>0</sup> C vapor and liquid	=	1841	kJ/kg
Assume efficiency of the heat exchanger as (Average Boiler Efficiency)	=	80	%
Steam mass flow rate that can be generate	=		m kg
$120 \times 1.005 \times 144 \times 0.8 = m \times 1841$			
$m = 7.54651$			
		27167	kg/hr
		27000	kg/hr
Take Feed water temperature as	=	80	<sup>0</sup> C
Temperature of saturated steam at 25 bar	=	224	<sup>0</sup> C
Energy required to bring 80 <sup>0</sup> C to 224 <sup>0</sup> C water at 25 bar			
$7.54651 \times 4.187 \times 144$			
$= 4550$			
<b>Heat Balance for economizer,</b>			
$144 \times 1.005 \times (260 - T_2) \times 0.8 = 4550$ kW			
$0.8 \times 144 \times 1 \times (270 - T_2) = 4550$			
Temperature at the top of the stack T <sub>2</sub>	=	230.7	<sup>0</sup> C
(Sulfur Dioxide Dew point is 170 <sup>0</sup> C )	=	230	<sup>0</sup> C
Keep 1.35 safety factor			
<b>Determine the Exhaust temperature after super heater</b>			
Superheat steam up to	=	400	<sup>0</sup> C
Boiling point at 25 bar is	=	224	<sup>0</sup> C
Consider temperature of the saturated steam as	=	224	<sup>0</sup> C
Enthalpy of superheated steam at 400 C	=	3237	kJ/Kg
Enthalpy of superheated steam at 224 <sup>0</sup> C	=	2803	kJ/Kg
Consider steam dryness fraction as	=	0.95	
<b>Heat balance for steam heating (Super Heater) and Exhaust gas flow (consider efficiency of the heater as 80%)</b>			
$18 \times 8 \times (420 - T_1) \times 1.005 \times 0.8 = (3237 - 2803) \times 7.55 + 0.05 \times 7.55 \times 1841$			
$144 \times (420 - T_1) \times 1.005 \times 0.8 = 434 \times 7.547 + 695$			
<b>Exhaust Gas temperature after the super heater (T<sub>1</sub>)</b>	=	392.5	<sup>0</sup> C
<b>Calculation of Electrical Power output</b>			
Enthalpy of superheated steam 25 bar at 400 C	=	3237	kJ/Kg
Enthalpy of 0.5 bar condensate	=	419	kJ/Kg
Energy of 1 kg of steam to turbine	=	2818	kJ/Kg
Assume 1/6 <sup>th</sup> of steam goes to process heating			
Power available to steam turbine from steam mass flow rate 6.29	=	2818	kJ/Kg x 6.29
	=	17722	kW
Assume efficiency of turbine as	=	0.3	
Alternator	=	0.97	
Electrical Power Output	=	5157	kW
Station Consumption	=	600	kW
After considering other losses and other practical aspects, it will be able to generate	=	4000	kW
At 0.85 Pf Alternator capacity would be	=	4705.9	kVA
	=	4.8	MVA

## Appendix B

### Dispersion Model Outputs – After implementation of Cogeneration system

#### 1. SO<sub>2</sub>

##### Inputs for the model :

\*\*\* SCREEN3 MODEL RUN \*\*\*  
\*\*\* VERSION DATED 96043 \*\*\*

##### SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	313.000
STACK HEIGHT (M)	=	32.0000
STK INSIDE DIAM (M)	=	3.4300
STK EXIT VELOCITY (M/S)	=	33.0000
STK GAS EXIT TEMP (K)	=	503.0000
AMBIENT AIR TEMP (K)	=	300.0000
RECEPTOR HEIGHT (M)	=	1.5000
URBAN/RURAL OPTION	=	RURAL
BUILDING HEIGHT (M)	=	0.1000
MIN HORIZ BLDG DIM (M)	=	0.1000
MAX HORIZ BLDG DIM (M)	=	0.1000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.  
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS  
ENTERED.



##### Stability Class and wind Speed :

\*\*\* STABILITY CLASS 1 ONLY \*\*\*  
\*\*\* ANEMOMETER HEIGHT WIND SPEED OF 1.00 M/S ONLY \*\*\*

##### Outputs from the Model:

\*\*\*\*\*  
\*\*\* SCREEN DISCRETE DISTANCES \*\*\*  
\*\*\*\*\*

\*\*\* TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING  
DISTANCES \*\*\*

DIST	CONC	U10M	USTK	MIX HT	PLUME	SIGMA		
(M)	(UG/M**3)	STAB	(M/S)	(M/S)	(M)	HT (M)	Y (M)	Z
(M)	DWASH							
20.	0.000	1	1.0	1.1	1301.1	1300.07	26.44	
25.86	NO							

100.	0.000	1	1.0	1.1	1301.1	1300.07	71.25
67.45	NO						
500.	0.8824E-04	1	1.0	1.1	1301.1	1300.07	223.64
219.52	NO						
1000.	53.78	1	1.0	1.1	1301.1	1300.07	370.66
547.55	NO						
2500.	149.8	1	1.0	1.1	1301.1	1300.07	590.39
3177.13	NO						
5000.	95.69	1	1.0	1.1	1301.1	1300.07	924.50
5000.00	NO						
7500.	70.29	1	1.0	1.1	1301.1	1300.07	1258.65
5000.00	NO						
8000.	66.80	1	1.0	1.1	1301.1	1300.07	1324.38
5000.00	NO						
9000.	60.82	1	1.0	1.1	1301.1	1300.07	1454.62
5000.00	NO						
10000.	55.88	1	1.0	1.1	1301.1	1300.07	1583.24
5000.00	NO						
20000.	31.68	1	1.0	1.1	1301.1	1300.07	2792.73
5000.00	NO						

\*\*\*\*\*  
 \*\*\* SUMMARY OF SCREEN MODEL RESULTS \*\*\*  
 \*\*\*\*\*

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
----- SIMPLE TERRAIN	149.8	2500.	0.



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**Stability Class and wind Speed :**

\*\*\* STABILITY CLASS 2 ONLY \*\*\*

\*\*\* ANEMOMETER HEIGHT WIND SPEED OF 1.00 M/S ONLY \*\*\*

**Outputs from the Model:**

\*\*\*\*\*  
 \*\*\* SCREEN DISCRETE DISTANCES \*\*\*  
 \*\*\*\*\*

\*\*\* TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR  
 FOLLOWING DISTANCES \*\*\*

DIST SIGMA (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)
20.	0.000	2	1.0	1.1	1301.1	1300.07	26.06
25.79	NO						
100.	0.000	2	1.0	1.1	1301.1	1300.07	68.75
66.84	NO						
500.	0.2617E-05	2	1.0	1.1	1301.1	1300.07	209.97
199.62	NO						
1000.	0.5518	2	1.0	1.1	1301.1	1300.07	342.91
325.24	NO						
2500.	16.75	2	1.0	1.1	1301.1	1300.07	502.57
469.55	NO						
5000.	70.70	2	1.0	1.1	1301.1	1300.07	736.72
734.51	NO						
7500.	83.19	2	1.0	1.1	1301.1	1300.07	983.47
1060.69	NO						
8000.	81.51	2	1.0	1.1	1301.1	1300.07	1032.79
1129.71	NO						
9000.	76.80	2	1.0	1.1	1301.1	1300.07	1131.04
1270.40	NO						
10000.	71.58	2	1.0	1.1	1301.1	1300.07	1228.64
1414.05	NO						
20000.	40.90	2	1.0	1.1	1301.1	1300.07	2163.11
2946.38	NO						

\*\*\* SUMMARY OF SCREEN MODEL RESULTS \*\*\*  
 \*\*\*\*\*

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	83.19	7500.	0.

\*\*\*\*\*

**Stability Class and wind Speed :**

\*\*\* STABILITY CLASS 3 ONLY \*\*\*  
 \*\*\* ANEMOMETER HEIGHT WIND SPEED OF 1.00 M/S ONLY \*\*\*

**Outputs from the Model:**

\*\*\*\*\*  
 \*\*\* SCREEN DISCRETE DISTANCES \*\*\*  
 \*\*\*\*\*

\*\*\* TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR  
 FOLLOWING DISTANCES \*\*\*

DIST SIGMA (M) Z (M)	CONC (UG/M**3) DWASH	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)
20.	0.000	3	1.0	1.1	1257.6	1256.59	25.19
25.10	NO						
100.	0.000	3	1.0	1.1	1257.6	1256.59	64.94
64.17	NO						
500.	0.1220E-05	3	1.0	1.1	1257.6	1256.59	194.24
189.15	NO						
1000.	0.3231	3	1.0	1.1	1257.6	1256.59	313.27
302.07	NO						
2500.	4.313	3	1.0	1.1	1257.6	1256.59	422.42
377.36	NO						
5000.	12.00	3	1.0	1.1	1257.6	1256.59	563.44
439.80	NO						
7500.	25.52	3	1.0	1.1	1257.6	1256.59	724.77
521.05	NO						
8000.	28.47	3	1.0	1.1	1257.6	1256.59	757.93
538.68	NO						
9000.	34.20	3	1.0	1.1	1257.6	1256.59	824.64
574.90	NO						
10000.	39.39	3	1.0	1.1	1257.6	1256.59	891.65
612.16	NO						
20000.	52.13	3	1.0	1.1	1257.6	1256.59	1554.46
1009.51	NO						

\*\*\*\*\*  
 \*\*\* SUMMARY OF SCREEN MODEL RESULTS \*\*\*  
 \*\*\*\*\*

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	52.13	20000.	0.

**Stability Class and wind Speed :**

\*\*\* STABILITY CLASS 4 ONLY \*\*\*  
 \*\*\* ANEMOMETER HEIGHT WIND SPEED OF 1.00 M/S ONLY \*\*\*

**Outputs from the Model:**

\*\*\*\*\*  
 \*\*\* SCREEN DISCRETE DISTANCES \*\*\*  
 \*\*\*\*\*

\*\*\* TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR  
 FOLLOWING DISTANCES \*\*\*

DIST SIGMA (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)
20.	0.000	4	1.0	1.2	1188.4	1187.40	24.07
24.02	NO						
100.	0.000	4	1.0	1.2	1188.4	1187.40	60.69
60.31	NO						
500.	0.8114E-06	4	1.0	1.2	1188.4	1187.40	179.50
176.77	NO						
1000.	0.2700	4	1.0	1.2	1188.4	1187.40	287.30
280.94	NO						
2500.	2.544	4	1.0	1.2	1188.4	1187.40	365.37
335.15	NO						
5000.	2.635	4	1.0	1.2	1188.4	1187.40	441.04
341.82	NO						
7500.	2.725	4	1.0	1.2	1188.4	1187.40	534.65
349.03	NO						
8000.	2.748	4	1.0	1.2	1188.4	1187.40	554.50
350.52	NO						
9000.	2.801	4	1.0	1.2	1188.4	1187.40	594.90
353.54	NO						
10000.	2.861	4	1.0	1.2	1188.4	1187.40	636.00
356.61	NO						
20000.	3.570	4	1.0	1.2	1188.4	1187.40	1057.59
385.80	NO						

\*\*\*\*\*  
 \*\*\* SUMMARY OF SCREEN MODEL RESULTS \*\*\*  
 \*\*\*\*\*

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	3.570	20000.	0.

**Stability Class and wind Speed :**

\*\*\* STABILITY CLASS 3 ONLY \*\*\*  
 \*\*\* ANEMOMETER HEIGHT WIND SPEED OF 1.00 M/S ONLY \*\*\*

**Outputs from the Model:**

\*\*\*\*\*  
 \*\*\* SCREEN DISCRETE DISTANCES \*\*\*  
 \*\*\*\*\*  
 \*\*\* TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR  
 FOLLOWING DISTANCES \*\*\*

DIST SIGMA (M)	CONC (UG/M**3) DWASH	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)
20.	0.000	3	1.0	1.1	1257.6	1256.59	25.19
25.10	NO						
100.	0.000	3	1.0	1.1	1257.6	1256.59	64.94
64.17	NO						
500.	0.1220E-05	3	1.0	1.1	1257.6	1256.59	194.24
189.15	NO						
1000.	0.3231	3	1.0	1.1	1257.6	1256.59	313.27
302.07	NO						
2500.	4.313	3	1.0	1.1	1257.6	1256.59	422.42
377.36	NO						
5000.	12.00	3	1.0	1.1	1257.6	1256.59	563.44
439.80	NO						
7500.	25.52	3	1.0	1.1	1257.6	1256.59	724.77
521.05	NO						
8000.	28.47	3	1.0	1.1	1257.6	1256.59	757.93
538.68	NO						
9000.	34.20	3	1.0	1.1	1257.6	1256.59	824.64
574.90	NO						
10000.	39.39	3	1.0	1.1	1257.6	1256.59	891.65
612.16	NO						
20000.	52.13	3	1.0	1.1	1257.6	1256.59	1554.46
1009.51	NO						

\*\*\*\*\*  
 \*\*\* SUMMARY OF SCREEN MODEL RESULTS \*\*\*  
 \*\*\*\*\*

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	52.13	20000.	0.

**Stability Class and wind Speed :**

\*\*\* STABILITY CLASS 6 ONLY \*\*\*  
 \*\*\* ANEMOMETER HEIGHT WIND SPEED OF 1.00 M/S ONLY \*\*\*

**Outputs from the Model:**

\*\*\*\*\*  
 \*\*\* SCREEN DISCRETE DISTANCES \*\*\*  
 \*\*\*\*\*

\*\*\* TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR  
 FOLLOWING DISTANCES \*\*\*

DIST SIGMA (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)
20.	0.000	6	1.0	1.9	10000.0	178.01	16.85
16.84	NO						
100.	0.5795	6	1.0	1.9	10000.0	178.01	37.98
37.83	NO						
500.	4.354	6	1.0	1.9	10000.0	178.01	45.42
42.55	NO						
1000.	6.234	6	1.0	1.9	10000.0	178.01	53.74
43.99	NO						
2500.	14.06	6	1.0	1.9	10000.0	178.01	88.41
48.34	NO						
5000.	27.90	6	1.0	1.9	10000.0	178.01	151.53
53.95	NO						
7500.	41.76	6	1.0	1.9	10000.0	178.01	213.65
58.61	NO						
8000.	44.03	6	1.0	1.9	10000.0	178.01	225.87
59.40	NO						
9000.	48.40	6	1.0	1.9	10000.0	178.01	250.11
60.92	NO						
10000.	52.54	6	1.0	1.9	10000.0	178.01	274.10
62.38	NO						
20000.	74.91	6	1.0	1.9	10000.0	178.01	502.68
73.32	NO						

\*\*\*\*\*  
 \*\*\* SUMMARY OF SCREEN MODEL RESULTS \*\*\*  
 \*\*\*\*\*

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	74.91	20000.	0.



## 2. SO<sub>2</sub>- 3m/s

### Stability Class and wind Speed :

\*\*\* STABILITY CLASS 1 ONLY \*\*\*

\*\*\* ANEMOMETER HEIGHT WIND SPEED OF 3.00 M/S ONLY \*\*\*

### Outputs from the Model:

\*\*\*\*\*

\*\*\* SCREEN DISCRETE DISTANCES \*\*\*

\*\*\* TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES \*\*\*

DIST SIGMA (M)	CONC (UG/M**3) DWASH	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)
20.	0.000	1	3.0	3.3	960.0	454.69	12.72
11.47	NO						
100.	0.000	1	3.0	3.3	960.0	454.69	34.71
26.05	NO						
500.	2.031	1	3.0	3.3	960.0	454.69	130.06
122.84	NO						
1000.	177.7	1	3.0	3.3	960.0	454.69	232.35
465.19	NO						
2500.	83.00	1	3.0	3.3	960.0	454.69	481.54
3158.71	NO						
5000.	46.52	1	3.0	3.3	960.0	454.69	859.08
5000.00	NO						
7500.	32.99	1	3.0	3.3	960.0	454.69	1211.41
5000.00	NO						
8000.	31.23	1	3.0	3.3	960.0	454.69	1279.57
5000.00	NO						
9000.	28.27	1	3.0	3.3	960.0	454.69	1413.95
5000.00	NO						
10000.	25.85	1	3.0	3.3	960.0	454.69	1545.95
5000.00	NO						
20000.	14.42	1	3.0	3.3	960.0	454.69	2771.77
5000.00	NO						

\*\*\*\*\*

\*\*\* SUMMARY OF SCREEN MODEL RESULTS \*\*\*

\*\*\*\*\*

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	177.7	1000.	0.

**Stability Class and wind Speed :**

\*\*\* STABILITY CLASS 2 ONLY \*\*\*  
 \*\*\* ANEMOMETER HEIGHT WIND SPEED OF 3.00 M/S ONLY \*\*\*

**Outputs from the Model:**

\*\*\*\*\*  
 \*\*\* SCREEN DISCRETE DISTANCES \*\*\*  
 \*\*\*\*\*

\*\*\* TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES \*\*\*

DIST SIGMA (M) Z (M)	CONC (UG/M**3) DWASH	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)
20.	0.000	2	3.0	3.3	960.0	454.69	11.91
11.31	NO						
100.	0.000	2	3.0	3.3	960.0	454.69	29.24
24.42	NO						
500.	0.7946E-03	2	3.0	3.3	960.0	454.69	104.81
82.15	NO						
1000.	10.91	2	3.0	3.3	960.0	454.69	184.88
149.57	NO						
2500.	95.22	2	3.0	3.3	960.0	454.69	368.64
322.17	NO						
5000.	62.27	2	3.0	3.3	960.0	454.69	652.74
650.25	NO						
7500.	43.37	2	3.0	3.3	960.0	454.69	922.24
1004.18	NO						
8000.	41.02	2	3.0	3.3	960.0	454.69	974.66
1076.83	NO						
9000.	37.07	2	3.0	3.3	960.0	454.69	1078.22
1223.62	NO						
10000.	33.86	2	3.0	3.3	960.0	454.69	1180.20
1372.17	NO						
20000.	18.71	2	3.0	3.3	960.0	454.69	2135.97
2926.51	NO						

\*\*\*\*\*  
 \*\*\* SUMMARY OF SCREEN MODEL RESULTS \*\*\*  
 \*\*\*\*\*

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	95.22	2500.	0.

**Stability Class and wind Speed :**

\*\*\* STABILITY CLASS 3 ONLY \*\*\*  
 \*\*\* ANEMOMETER HEIGHT WIND SPEED OF 3.00 M/S ONLY \*\*\*

**Outputs from the Model:**

\*\*\*\*\*  
 \*\*\* SCREEN DISCRETE DISTANCES \*\*\*  
 \*\*\*\*\*

\*\*\* TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR  
 FOLLOWING DISTANCES \*\*\*

DIST SIGMA (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)
20.	0.000	3	3.0	3.4	960.0	440.20	11.11
10.88	NO						
100.	0.000	3	3.0	3.4	960.0	440.20	24.63
22.51	NO						
500.	0.1387E-04	3	3.0	3.4	960.0	440.20	82.82
70.08	NO						
1000.	1.338	3	3.0	3.4	960.0	440.20	142.67
116.02	NO						
2500.	34.16	3	3.0	3.4	960.0	440.20	263.86
183.26	NO						
5000.	70.80	3	3.0	3.4	960.0	440.20	456.78
290.87	NO						
7500.	62.75	3	3.0	3.4	960.0	440.20	645.35
403.34	NO						
8000.	59.87	3	3.0	3.4	960.0	440.20	682.38
425.87	NO						
9000.	54.26	3	3.0	3.4	960.0	440.20	755.79
470.85	NO						
10000.	49.20	3	3.0	3.4	960.0	440.20	828.38
515.68	NO						
20000.	25.46	3	3.0	3.4	960.0	440.20	1519.05
954.09	NO						

\*\*\*\*\*  
 \*\*\* SUMMARY OF SCREEN MODEL RESULTS \*\*\*  
 \*\*\*\*\*

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	70.80	5000.	0.

**Stability Class and wind Speed :**

\*\*\* STABILITY CLASS 4 ONLY \*\*\*  
 \*\*\* ANEMOMETER HEIGHT WIND SPEED OF 3.00 M/S ONLY \*\*\*

**Outputs from the Model:**

\*\*\*\*\*  
 \*\*\* SCREEN DISCRETE DISTANCES \*\*\*  
 \*\*\*\*\*

\*\*\* TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR  
 FOLLOWING DISTANCES \*\*\*

DIST SIGMA (M) Z (M)	CONC (UG/M**3) DWASH	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)
20.	0.000	4	3.0	3.6	960.0	417.13	10.41
10.31	NO						
100.	0.000	4	3.0	3.6	960.0	417.13	21.66
20.58	NO						
500.	0.6342E-06	4	3.0	3.6	960.0	417.13	68.86
61.40	NO						
1000.	0.3093	4	3.0	3.6	960.0	417.13	115.31
98.41	NO						
2500.	4.222	4	3.0	3.6	960.0	417.13	191.39
124.34	NO						
5000.	8.110	4	3.0	3.6	960.0	417.13	312.49
141.33	NO						
7500.	12.44	4	3.0	3.6	960.0	417.13	434.73
157.97	NO						
8000.	13.28	4	3.0	3.6	960.0	417.13	458.92
161.24	NO						
9000.	14.88	4	3.0	3.6	960.0	417.13	506.99
167.70	NO						
10000.	16.37	4	3.0	3.6	960.0	417.13	554.64
174.07	NO						
20000.	22.70	4	3.0	3.6	960.0	417.13	1010.75
227.98	NO						

\*\*\*\*\*  
 \*\*\* SUMMARY OF SCREEN MODEL RESULTS \*\*\*  
 \*\*\*\*\*

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	22.70	20000.	0.

**Stability Class and wind Speed :**

\*\*\* STABILITY CLASS 5 ONLY \*\*\*  
 \*\*\* ANEMOMETER HEIGHT WIND SPEED OF 3.00 M/S ONLY \*\*\*

**Outputs from the Model:**

\*\*\*\*\*  
 \*\*\* SCREEN DISCRETE DISTANCES \*\*\*  
 \*\*\*\*\*

\*\*\* TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR  
 FOLLOWING DISTANCES \*\*\*

DIST SIGMA (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)
20.	0.000	5	3.0	4.5	10000.0	163.83	8.52
8.46	NO						
100.	0.000	5	3.0	4.5	10000.0	163.83	17.02
16.27	NO						
500.	2.517	5	3.0	4.5	10000.0	163.83	46.35
39.78	NO						
1000.	6.588	5	3.0	4.5	10000.0	163.83	63.35
43.43	NO						
2500.	31.16	5	3.0	4.5	10000.0	163.83	123.05
53.54	NO						
5000.	76.20	5	3.0	4.5	10000.0	163.83	222.08
67.25	NO						
7500.	98.80	5	3.0	4.5	10000.0	163.83	317.02
78.06	NO						
8000.	101.4	5	3.0	4.5	10000.0	163.83	335.59
80.06	NO						
9000.	105.2	5	3.0	4.5	10000.0	163.83	372.35
83.90	NO						
10000.	107.4	5	3.0	4.5	10000.0	163.83	408.66
87.58	NO						
20000.	93.00	5	3.0	4.5	10000.0	163.83	753.26
115.61	NO						

\*\*\*\*\*  
 \*\*\* SUMMARY OF SCREEN MODEL RESULTS \*\*\*  
 \*\*\*\*\*

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	107.4	10000.	0.

**Stability Class and wind Speed :**

\*\*\* STABILITY CLASS 6 ONLY \*\*\*  
 \*\*\* ANEMOMETER HEIGHT WIND SPEED OF 3.00 M/S ONLY \*\*\*

**Outputs from the Model:**

\*\*\*\*\*  
 \*\*\* SCREEN DISCRETE DISTANCES \*\*\*  
 \*\*\*\*\*

\*\*\* TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR  
 FOLLOWING DISTANCES \*\*\*

DIST SIGMA (M) Z (M)	CONC (UG/M**3) DWASH	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)
20.	0.000	6	3.0	5.7	10000.0	133.23	6.92
6.89	NO						
100.	0.000	6	3.0	5.7	10000.0	133.23	13.23
12.80	NO						
500.	0.9839	6	3.0	5.7	10000.0	133.23	34.05
30.12	NO						
1000.	2.279	6	3.0	5.7	10000.0	133.23	44.55
32.11	NO						
2500.	11.47	6	3.0	5.7	10000.0	133.23	83.14
37.86	NO						
5000.	31.73	6	3.0	5.7	10000.0	133.23	148.51
44.80	NO						
7500.	49.50	6	3.0	5.7	10000.0	133.23	211.52
50.31	NO						
8000.	52.02	6	3.0	5.7	10000.0	133.23	223.86
51.23	NO						
9000.	56.55	6	3.0	5.7	10000.0	133.23	248.30
52.99	NO						
10000.	60.43	6	3.0	5.7	10000.0	133.23	272.44
54.66	NO						
20000.	71.79	6	3.0	5.7	10000.0	133.23	501.78
66.87	NO						

\*\*\*\*\*  
 \*\*\* SUMMARY OF SCREEN MODEL RESULTS \*\*\*  
 \*\*\*\*\*

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	71.79	20000.	0.

### 3. NO<sub>x</sub>

#### Inputs to the Model :

##### SIMPLE TERRAIN INPUTS:

```

SOURCE TYPE           =           POINT
EMISSION RATE (G/S)  =         279.800
STACK HEIGHT (M)     =         32.0000
STK INSIDE DIAM (M)  =          3.4300
STK EXIT VELOCITY (M/S) =        33.0000
STK GAS EXIT TEMP (K) =        503.0000
AMBIENT AIR TEMP (K) =        300.0000
RECEPTOR HEIGHT (M) =          1.5000
URBAN/RURAL OPTION   =           RURAL
BUILDING HEIGHT (M)  =          0.1000
MIN HORIZ BLDG DIM (M) =          0.1000
MAX HORIZ BLDG DIM (M) =          0.1000

```

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.  
 THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

#### Stability Class and wind Speed :

```

*** STABILITY CLASS 1 ONLY ***
*** ANEMOMETER HEIGHT WIND SPEED OF 1.00 M/S ONLY ***

```

#### Outputs from the Model:

```

*****
*** SCREEN DISCRETE DISTANCES ***
*****

```

```

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR
FOLLOWING DISTANCES ***

```

DIST SIGMA (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)
20.	0.000	1	1.0	1.1	1301.1	1300.07	26.44
25.86	NO						
100.	0.000	1	1.0	1.1	1301.1	1300.07	71.25
67.45	NO						
500.	0.7888E-04	1	1.0	1.1	1301.1	1300.07	223.64
219.52	NO						
1000.	48.08	1	1.0	1.1	1301.1	1300.07	370.66
547.55	NO						
2500.	134.0	1	1.0	1.1	1301.1	1300.07	590.39
3177.13	NO						

5000.	85.54	1	1.0	1.1	1301.1	1300.07	924.50
5000.00	NO						
7500.	62.83	1	1.0	1.1	1301.1	1300.07	1258.65
5000.00	NO						
8000.	59.71	1	1.0	1.1	1301.1	1300.07	1324.38
5000.00	NO						
9000.	54.37	1	1.0	1.1	1301.1	1300.07	1454.62
5000.00	NO						
10000.	49.95	1	1.0	1.1	1301.1	1300.07	1583.24
5000.00	NO						
20000.	28.32	1	1.0	1.1	1301.1	1300.07	2792.73
5000.00	NO						

\*\*\*\*\*  
 \*\*\* SUMMARY OF SCREEN MODEL RESULTS \*\*\*  
 \*\*\*\*\*

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
-----	-----	-----	-----
SIMPLE TERRAIN	134.0	2500.	0.





**Stability Class and wind Speed :**

\*\*\* STABILITY CLASS 2 ONLY \*\*\*

\*\*\* ANEMOMETER HEIGHT WIND SPEED OF 1.00 M/S ONLY \*\*\*

**Outputs from the Model:**

\*\*\*\*\*  
 \*\*\* SCREEN DISCRETE DISTANCES \*\*\*  
 \*\*\*\*\*

\*\*\* TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR  
 FOLLOWING DISTANCES \*\*\*

DIST SIGMA (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)
20.	0.000	2	1.0	1.1	1301.1	1300.07	26.06
25.79	NO						
100.	0.000	2	1.0	1.1	1301.1	1300.07	68.75
66.84	NO						
500.	0.2340E-05	2	1.0	1.1	1301.1	1300.07	209.97
199.62	NO						
1000.	0.4933	2	1.0	1.1	1301.1	1300.07	342.91
325.24	NO						
2500.	14.97	2	1.0	1.1	1301.1	1300.07	502.57
469.55	NO						
5000.	63.20	2	1.0	1.1	1301.1	1300.07	736.72
734.51	NO						
7500.	74.36	2	1.0	1.1	1301.1	1300.07	983.47
1060.69	NO						
8000.	72.87	2	1.0	1.1	1301.1	1300.07	1032.79
1129.71	NO						
9000.	68.66	2	1.0	1.1	1301.1	1300.07	1131.04
1270.40	NO						
10000.	63.99	2	1.0	1.1	1301.1	1300.07	1228.64
1414.05	NO						
20000.	36.56	2	1.0	1.1	1301.1	1300.07	2163.11
2946.38	NO						

\*\*\*\*\*  
 \*\*\* SUMMARY OF SCREEN MODEL RESULTS \*\*\*  
 \*\*\*\*\*

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	74.36	7500.	0.

**Stability Class and wind Speed:**

\*\*\* STABILITY CLASS 3 ONLY \*\*\*

\*\*\* ANEMOMETER HEIGHT WIND SPEED OF 1.00 M/S ONLY \*\*\*

**Outputs from the Model:**

\*\*\*\*\*  
 \*\*\* SCREEN DISCRETE DISTANCES \*\*\*  
 \*\*\*\*\*

\*\*\* TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR  
 FOLLOWING DISTANCES \*\*\*

DIST SIGMA (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)
20.	0.000	3	1.0	1.1	1257.6	1256.59	25.19
25.10	NO						
100.	0.000	3	1.0	1.1	1257.6	1256.59	64.94
64.17	NO						
500.	0.1090E-05	3	1.0	1.1	1257.6	1256.59	194.24
189.15	NO						
1000.	0.2888	3	1.0	1.1	1257.6	1256.59	313.27
302.07	NO						
2500.	3.855	3	1.0	1.1	1257.6	1256.59	422.42
377.36	NO						
5000.	10.73	3	1.0	1.1	1257.6	1256.59	563.44
439.80	NO						
7500.	22.81	3	1.0	1.1	1257.6	1256.59	724.77
521.05	NO						
8000.	25.45	3	1.0	1.1	1257.6	1256.59	757.93
538.68	NO						
9000.	30.57	3	1.0	1.1	1257.6	1256.59	824.64
574.90	NO						
10000.	35.22	3	1.0	1.1	1257.6	1256.59	891.65
612.16	NO						
20000.	46.60	3	1.0	1.1	1257.6	1256.59	1554.46
1009.51	NO						

\*\*\*\*\*  
 \*\*\* SUMMARY OF SCREEN MODEL RESULTS \*\*\*  
 \*\*\*\*\*

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	46.60	20000.	0.

**Stability Class and wind Speed :**

\*\*\* STABILITY CLASS 4 ONLY \*\*\*  
 \*\*\* ANEMOMETER HEIGHT WIND SPEED OF 1.00 M/S ONLY \*\*\*

**Outputs from the Model:**

\*\*\*\*\*  
 \*\*\* SCREEN DISCRETE DISTANCES \*\*\*  
 \*\*\*\*\*

\*\*\* TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR  
 FOLLOWING DISTANCES \*\*\*

DIST SIGMA (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)
20.	0.000	4	1.0	1.2	1188.4	1187.40	24.07
24.02	NO						
100.	0.000	4	1.0	1.2	1188.4	1187.40	60.69
60.31	NO						
500.	0.7254E-06	4	1.0	1.2	1188.4	1187.40	179.50
176.77	NO						
1000.	0.2414	4	1.0	1.2	1188.4	1187.40	287.30
280.94	NO						
2500.	2.274	4	1.0	1.2	1188.4	1187.40	365.37
335.15	NO						
5000.	2.355	4	1.0	1.2	1188.4	1187.40	441.04
341.82	NO						
7500.	2.436	4	1.0	1.2	1188.4	1187.40	534.65
349.03	NO						
8000.	2.457	4	1.0	1.2	1188.4	1187.40	554.50
350.52	NO						
9000.	2.504	4	1.0	1.2	1188.4	1187.40	594.90
353.54	NO						
10000.	2.557	4	1.0	1.2	1188.4	1187.40	636.00
356.61	NO						
20000.	3.191	4	1.0	1.2	1188.4	1187.40	1057.59
385.80	NO						

\*\*\*\*\*  
 \*\*\* SUMMARY OF SCREEN MODEL RESULTS \*\*\*  
 \*\*\*\*\*

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	3.191	20000.	0.

**Stability Class and wind Speed :**

\*\*\* STABILITY CLASS 5 ONLY \*\*\*  
 \*\*\* ANEMOMETER HEIGHT WIND SPEED OF 1.00 M/S ONLY \*\*\*

**Outputs from the Model:**

\*\*\*\*\*  
 \*\*\* SCREEN DISCRETE DISTANCES \*\*\*  
 \*\*\*\*\*

\*\*\* TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR  
 FOLLOWING DISTANCES \*\*\*

DIST SIGMA (M) Z (M)	CONC (UG/M**3) DWASH	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)
20.	0.000	5	1.0	1.5	10000.0	222.13	20.12
20.10	NO						
100.	0.5288	5	1.0	1.5	10000.0	222.13	48.04
47.78	NO						
500.	6.393	5	1.0	1.5	10000.0	222.13	60.67
55.81	NO						
1000.	10.04	5	1.0	1.5	10000.0	222.13	74.47
58.47	NO						
2500.	25.43	5	1.0	1.5	10000.0	222.13	129.12
66.32	NO						
5000.	57.49	5	1.0	1.5	10000.0	222.13	225.50
77.81	NO						
7500.	83.70	5	1.0	1.5	10000.0	222.13	319.43
87.33	NO						
8000.	88.16	5	1.0	1.5	10000.0	222.13	337.86
89.11	NO						
9000.	96.23	5	1.0	1.5	10000.0	222.13	374.40
92.58	NO						
10000.	103.2	5	1.0	1.5	10000.0	222.13	410.53
95.93	NO						
20000.	122.9	5	1.0	1.5	10000.0	222.13	754.28
122.06	NO						

\*\*\*\*\*  
 \*\*\* SUMMARY OF SCREEN MODEL RESULTS \*\*\*  
 \*\*\*\*\*

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	122.9	20000.	0.

**Stability Class and wind Speed :**

\*\*\* STABILITY CLASS 6 ONLY \*\*\*  
 \*\*\* ANEMOMETER HEIGHT WIND SPEED OF 1.00 M/S ONLY \*\*\*

**Outputs from the Model:**

\*\*\*\*\*  
 \*\*\* SCREEN DISCRETE DISTANCES \*\*\*  
 \*\*\*\*\*

\*\*\* TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR  
 FOLLOWING DISTANCES \*\*\*

DIST SIGMA (M) Z (M)	CONC (UG/M**3) DWASH	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)
20.	0.000	6	1.0	1.9	10000.0	178.01	16.85
16.84	NO						
100.	0.5181	6	1.0	1.9	10000.0	178.01	37.98
37.83	NO						
500.	3.892	6	1.0	1.9	10000.0	178.01	45.42
42.55	NO						
1000.	5.573	6	1.0	1.9	10000.0	178.01	53.74
43.99	NO						
2500.	12.57	6	1.0	1.9	10000.0	178.01	88.41
48.34	NO						
5000.	24.94	6	1.0	1.9	10000.0	178.01	151.53
53.95	NO						
7500.	37.33	6	1.0	1.9	10000.0	178.01	213.65
58.61	NO						
8000.	39.36	6	1.0	1.9	10000.0	178.01	225.87
59.40	NO						
9000.	43.26	6	1.0	1.9	10000.0	178.01	250.11
60.92	NO						
10000.	46.97	6	1.0	1.9	10000.0	178.01	274.10
62.38	NO						
20000.	66.97	6	1.0	1.9	10000.0	178.01	502.68
73.32	NO						

\*\*\*\*\*  
 \*\*\* SUMMARY OF SCREEN MODEL RESULTS \*\*\*  
 \*\*\*\*\*

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	66.97	20000.	0.

**Stability Class and wind Speed :**

\*\*\* STABILITY CLASS 1 ONLY \*\*\*

\*\*\* ANEMOMETER HEIGHT WIND SPEED OF 3.00 M/S ONLY \*\*\*

**Outputs from the Model:**

\*\*\*\*\*  
 \*\*\* SCREEN DISCRETE DISTANCES \*\*\*  
 \*\*\*\*\*

\*\*\* TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR  
 FOLLOWING DISTANCES \*\*\*

DIST SIGMA (M) Z (M)	CONC (UG/M**3) DWASH	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)
20.	0.000	1	3.0	3.3	960.0	454.69	12.72
11.47	NO						
100.	0.000	1	3.0	3.3	960.0	454.69	34.71
26.05	NO						
500.	1.815	1	3.0	3.3	960.0	454.69	130.06
122.84	NO						
1000.	158.8	1	3.0	3.3	960.0	454.69	232.35
465.19	NO						
2500.	74.19	1	3.0	3.3	960.0	454.69	481.54
3158.71	NO						
5000.	41.59	1	3.0	3.3	960.0	454.69	859.08
5000.00	NO						
7500.	29.49	1	3.0	3.3	960.0	454.69	1211.41
5000.00	NO						
8000.	27.92	1	3.0	3.3	960.0	454.69	1279.57
5000.00	NO						
9000.	25.27	1	3.0	3.3	960.0	454.69	1413.95
5000.00	NO						
10000.	23.11	1	3.0	3.3	960.0	454.69	1545.95
5000.00	NO						
20000.	12.89	1	3.0	3.3	960.0	454.69	2771.77
5000.00	NO						

\*\*\*\*\*  
 \*\*\* SUMMARY OF SCREEN MODEL RESULTS \*\*\*  
 \*\*\*\*\*

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	158.8	1000.	0.

**Stability Class and wind Speed :**

\*\*\* STABILITY CLASS 2 ONLY \*\*\*

\*\*\* ANEMOMETER HEIGHT WIND SPEED OF 3.00 M/S ONLY \*\*\*

**Outputs from the Model:**

\*\*\*\*\*  
 \*\*\* SCREEN DISCRETE DISTANCES \*\*\*  
 \*\*\*\*\*

\*\*\* TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR  
 FOLLOWING DISTANCES \*\*\*

DIST SIGMA (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)
20.	0.000	2	3.0	3.3	960.0	454.69	11.91
11.31	NO						
100.	0.000	2	3.0	3.3	960.0	454.69	29.24
24.42	NO						
500.	0.7103E-03	2	3.0	3.3	960.0	454.69	104.81
82.15	NO						
1000.	9.750	2	3.0	3.3	960.0	454.69	184.88
149.57	NO						
2500.	85.12	2	3.0	3.3	960.0	454.69	368.64
322.17	NO						
5000.	55.66	2	3.0	3.3	960.0	454.69	652.74
650.25	NO						
7500.	38.77	2	3.0	3.3	960.0	454.69	922.24
1004.18	NO						
8000.	36.67	2	3.0	3.3	960.0	454.69	974.66
1076.83	NO						
9000.	33.14	2	3.0	3.3	960.0	454.69	1078.22
1223.62	NO						
10000.	30.27	2	3.0	3.3	960.0	454.69	1180.20
1372.17	NO						
20000.	16.73	2	3.0	3.3	960.0	454.69	2135.97
2926.51	NO						

\*\*\*\*\*  
 \*\*\* SUMMARY OF SCREEN MODEL RESULTS \*\*\*  
 \*\*\*\*\*

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	85.12	2500.	0.

**Stability Class and wind Speed :**

\*\*\* STABILITY CLASS 4 ONLY \*\*\*  
 \*\*\* ANEMOMETER HEIGHT WIND SPEED OF 3.00 M/S ONLY \*\*\*

**Outputs from the Model:**

\*\*\*\*\*  
 \*\*\* SCREEN DISCRETE DISTANCES \*\*\*  
 \*\*\*\*\*

\*\*\* TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR  
 FOLLOWING DISTANCES \*\*\*

DIST SIGMA (M) Z (M)	CONC (UG/M**3) DASH	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)
20.	0.000	4	3.0	3.6	960.0	417.13	10.41
10.31	NO						
100.	0.000	4	3.0	3.6	960.0	417.13	21.66
20.58	NO						
500.	0.5669E-06	4	3.0	3.6	960.0	417.13	68.86
61.40	NO						
1000.	0.2765	4	3.0	3.6	960.0	417.13	115.31
98.41	NO						
2500.	3.774	4	3.0	3.6	960.0	417.13	191.39
124.34	NO						
5000.	7.250	4	3.0	3.6	960.0	417.13	312.49
141.33	NO						
7500.	11.12	4	3.0	3.6	960.0	417.13	434.73
157.97	NO						
8000.	11.87	4	3.0	3.6	960.0	417.13	458.92
161.24	NO						
9000.	13.30	4	3.0	3.6	960.0	417.13	506.99
167.70	NO						
10000.	14.63	4	3.0	3.6	960.0	417.13	554.64
174.07	NO						
20000.	20.29	4	3.0	3.6	960.0	417.13	1010.75
227.98	NO						

\*\*\*\*\*  
 \*\*\* SUMMARY OF SCREEN MODEL RESULTS \*\*\*  
 \*\*\*\*\*

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	20.29	20000.	0.



**Stability Class and wind Speed :**

\*\*\* STABILITY CLASS 5 ONLY \*\*\*  
 \*\*\* ANEMOMETER HEIGHT WIND SPEED OF 3.00 M/S ONLY \*\*\*

**Outputs from the Model:**

\*\*\*\*\*  
 \*\*\* SCREEN DISCRETE DISTANCES \*\*\*  
 \*\*\*\*\*

\*\*\* TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR  
 FOLLOWING DISTANCES \*\*\*

DIST SIGMA (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)
20.	0.000	5	3.0	4.5	10000.0	163.83	8.52
8.46	NO						
100.	0.000	5	3.0	4.5	10000.0	163.83	17.02
16.27	NO						
500.	2.250	5	3.0	4.5	10000.0	163.83	46.35
39.78	NO						
1000.	5.890	5	3.0	4.5	10000.0	163.83	63.35
43.43	NO						
2500.	27.85	5	3.0	4.5	10000.0	163.83	123.05
53.54	NO						
5000.	68.12	5	3.0	4.5	10000.0	163.83	222.08
67.25	NO						
7500.	88.32	5	3.0	4.5	10000.0	163.83	317.02
78.06	NO						
8000.	90.66	5	3.0	4.5	10000.0	163.83	335.59
80.06	NO						
9000.	94.04	5	3.0	4.5	10000.0	163.83	372.35
83.90	NO						
10000.	96.02	5	3.0	4.5	10000.0	163.83	408.66
87.58	NO						
20000.	83.14	5	3.0	4.5	10000.0	163.83	753.26
115.61	NO						

\*\*\*\*\*  
 \*\*\* SUMMARY OF SCREEN MODEL RESULTS \*\*\*  
 \*\*\*\*\*

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	96.02	10000.	0.

**Stability Class and wind Speed :**

\*\*\* STABILITY CLASS 6 ONLY \*\*\*

\*\*\* ANEMOMETER HEIGHT WIND SPEED OF 3.00 M/S ONLY \*\*\*

**Outputs from the Model:**

\*\*\*\*\*  
 \*\*\* SCREEN DISCRETE DISTANCES \*\*\*  
 \*\*\*\*\*

\*\*\* TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR  
 FOLLOWING DISTANCES \*\*\*

DIST SIGMA (M) Z (M)	CONC (UG/M**3) DWASH	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)
20.	0.000	6	3.0	5.7	10000.0	133.23	6.92
6.89	NO						
100.	0.000	6	3.0	5.7	10000.0	133.23	13.23
12.80	NO						
500.	0.8795	6	3.0	5.7	10000.0	133.23	34.05
30.12	NO						
1000.	2.038	6	3.0	5.7	10000.0	133.23	44.55
32.11	NO						
2500.	10.26	6	3.0	5.7	10000.0	133.23	83.14
37.86	NO						
5000.	28.36	6	3.0	5.7	10000.0	133.23	148.51
44.80	NO						
7500.	44.25	6	3.0	5.7	10000.0	133.23	211.52
50.31	NO						
8000.	46.50	6	3.0	5.7	10000.0	133.23	223.86
51.23	NO						
9000.	50.55	6	3.0	5.7	10000.0	133.23	248.30
52.99	NO						
10000.	54.02	6	3.0	5.7	10000.0	133.23	272.44
54.66	NO						
20000.	64.17	6	3.0	5.7	10000.0	133.23	501.78
66.87	NO						

\*\*\*\*\*  
 \*\*\* SUMMARY OF SCREEN MODEL RESULTS \*\*\*  
 \*\*\*\*\*

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	64.17	20000.	0.

#### 4. SPM

##### Inputs to the Model :

SIMPLE TERRAIN INPUTS:  
SOURCE TYPE = POINT  
EMISSION RATE (G/S) = 15.3000  
STACK HEIGHT (M) = 32.0000  
STK INSIDE DIAM (M) = 3.4300  
STK EXIT VELOCITY (M/S) = 33.0000  
STK GAS EXIT TEMP (K) = 503.0000  
AMBIENT AIR TEMP (K) = 300.0000  
RECEPTOR HEIGHT (M) = 1.5000  
URBAN/RURAL OPTION = RURAL  
BUILDING HEIGHT (M) = 0.1000  
MIN HORIZ BLDG DIM (M) = 0.1000  
MAX HORIZ BLDG DIM (M) = 0.1000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.  
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

##### Stability Class and wind Speed :

\*\*\* STABILITY CLASS 1 ONLY \*\*\*  
\*\*\* ANEMOMETER HEIGHT WIND SPEED OF 1.00 M/S ONLY \*\*\*

##### Outputs from the Model:

\*\*\*\*\*  
\*\*\* SCREEN DISCRETE DISTANCES \*\*\*  
\*\*\*\*\*

\*\*\* TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES \*\*\*

DIST SIGMA (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)
20.	0.000	1	1.0	1.1	1301.1	1300.07	26.44
25.86	NO						
100.	0.000	1	1.0	1.1	1301.1	1300.07	71.25
67.45	NO						
500.	0.4313E-05	1	1.0	1.1	1301.1	1300.07	223.64
219.52	NO						
1000.	2.629	1	1.0	1.1	1301.1	1300.07	370.66
547.55	NO						

2500.	7.325	1	1.0	1.1	1301.1	1300.07	590.39
3177.13	NO						
5000.	4.678	1	1.0	1.1	1301.1	1300.07	924.50
5000.00	NO						
7500.	3.436	1	1.0	1.1	1301.1	1300.07	1258.65
5000.00	NO						
8000.	3.265	1	1.0	1.1	1301.1	1300.07	1324.38
5000.00	NO						
9000.	2.973	1	1.0	1.1	1301.1	1300.07	1454.62
5000.00	NO						
10000.	2.731	1	1.0	1.1	1301.1	1300.07	1583.24
5000.00	NO						
20000.	1.548	1	1.0	1.1	1301.1	1300.07	2792.73
5000.00	NO						

\*\*\*\*\*  
 \*\*\* SUMMARY OF SCREEN MODEL RESULTS \*\*\*  
 \*\*\*\*\*

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	7.325	2500.	0.



**Stability Class and wind Speed :**

\*\*\* STABILITY CLASS 2 ONLY \*\*\*  
 \*\*\* ANEMOMETER HEIGHT WIND SPEED OF 1.00 M/S ONLY \*\*\*

**Outputs from the Model:**

\*\*\*\*\*  
 \*\*\* SCREEN DISCRETE DISTANCES \*\*\*  
 \*\*\*\*\*

\*\*\* TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR  
 FOLLOWING DISTANCES \*\*\*

DIST SIGMA (M) Z (M)	CONC (UG/M**3) DWASH	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)
20.	0.000	2	1.0	1.1	1301.1	1300.07	26.06
25.79	NO						
100.	0.000	2	1.0	1.1	1301.1	1300.07	68.75
66.84	NO						
500.	0.1279E-06	2	1.0	1.1	1301.1	1300.07	209.97
199.62	NO						
1000.	0.2697E-01	2	1.0	1.1	1301.1	1300.07	342.91
325.24	NO						
2500.	0.8187	2	1.0	1.1	1301.1	1300.07	502.57
469.55	NO						
5000.	3.456	2	1.0	1.1	1301.1	1300.07	736.72
734.51	NO						
7500.	4.066	2	1.0	1.1	1301.1	1300.07	983.47
1060.69	NO						
8000.	3.984	2	1.0	1.1	1301.1	1300.07	1032.79
1129.71	NO						
9000.	3.754	2	1.0	1.1	1301.1	1300.07	1131.04
1270.40	NO						
10000.	3.499	2	1.0	1.1	1301.1	1300.07	1228.64
1414.05	NO						
20000.	1.999	2	1.0	1.1	1301.1	1300.07	2163.11
2946.38	NO						

\*\*\*\*\*  
 \*\*\* SUMMARY OF SCREEN MODEL RESULTS \*\*\*  
 \*\*\*\*\*

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	4.066	7500.	0.

**Stability Class and wind Speed :**

\*\*\* STABILITY CLASS 3 ONLY \*\*\*  
 \*\*\* ANEMOMETER HEIGHT WIND SPEED OF 1.00 M/S ONLY \*\*\*

**Outputs from the Model:**

\*\*\*\*\*  
 \*\*\* SCREEN DISCRETE DISTANCES \*\*\*  
 \*\*\*\*\*

\*\*\* TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR  
 FOLLOWING DISTANCES \*\*\*

DIST SIGMA (M) Z (M)	CONC (UG/M**3) DWASH	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)
20.	0.000	3	1.0	1.1	1257.6	1256.59	25.19
25.10	NO						
100.	0.000	3	1.0	1.1	1257.6	1256.59	64.94
64.17	NO						
500.	0.5962E-07	3	1.0	1.1	1257.6	1256.59	194.24
189.15	NO						
1000.	0.1579E-01	3	1.0	1.1	1257.6	1256.59	313.27
302.07	NO						
2500.	0.2108	3	1.0	1.1	1257.6	1256.59	422.42
377.36	NO						
5000.	0.5868	3	1.0	1.1	1257.6	1256.59	563.44
439.80	NO						
7500.	1.248	3	1.0	1.1	1257.6	1256.59	724.77
521.05	NO						
8000.	1.392	3	1.0	1.1	1257.6	1256.59	757.93
538.68	NO						
9000.	1.672	3	1.0	1.1	1257.6	1256.59	824.64
574.90	NO						
10000.	1.926	3	1.0	1.1	1257.6	1256.59	891.65
612.16	NO						
20000.	2.548	3	1.0	1.1	1257.6	1256.59	1554.46
1009.51	NO						

\*\*\*\*\*  
 \*\*\* SUMMARY OF SCREEN MODEL RESULTS \*\*\*  
 \*\*\*\*\*

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	2.548	20000.	0.

**Stability Class and wind Speed :**

\*\*\* STABILITY CLASS 4 ONLY \*\*\*  
 \*\*\* ANEMOMETER HEIGHT WIND SPEED OF 1.00 M/S ONLY \*\*\*

**Outputs from the Model:**

```

*****
*** SCREEN DISCRETE DISTANCES ***
*****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR
FOLLOWING DISTANCES ***

      DIST      CONC          U10M   USTK   MIX HT   PLUME   SIGMA
SIGMA
      (M)      (UG/M**3)   STAB  (M/S)  (M/S)    (M)    HT (M)   Y (M)
Z (M)  DWASH
-----
20.    0.000           4     1.0    1.2   1188.4 1187.40  24.07
24.02  NO
100.   0.000           4     1.0    1.2   1188.4 1187.40  60.69
60.31  NO
500.   0.3966E-07      4     1.0    1.2   1188.4 1187.40 179.50
176.77 NO
1000.  0.1320E-01      4     1.0    1.2   1188.4 1187.40 287.30
280.94 NO
2500.  0.1244           4     1.0    1.2   1188.4 1187.40 365.37
335.15 NO
5000.  0.1288           4     1.0    1.2   1188.4 1187.40 441.04
341.82 NO
7500.  0.1332           4     1.0    1.2   1188.4 1187.40 534.65
349.03 NO
8000.  0.1343           4     1.0    1.2   1188.4 1187.40 554.50
350.52 NO
9000.  0.1369           4     1.0    1.2   1188.4 1187.40 594.90
353.54 NO
10000. 0.1398           4     1.0    1.2   1188.4 1187.40 636.00
356.61 NO
20000. 0.1745           4     1.0    1.2   1188.4 1187.40 1057.59
385.80 NO
  
```

```

*****
*** SUMMARY OF SCREEN MODEL RESULTS ***
*****
  
```

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	0.1745	20000.	0.

**Stability Class and wind Speed :**

\*\*\* STABILITY CLASS 5 ONLY \*\*\*  
 \*\*\* ANEMOMETER HEIGHT WIND SPEED OF 1.00 M/S ONLY \*\*\*

**Outputs from the Model:**

\*\*\*\*\*  
 \*\*\* SCREEN DISCRETE DISTANCES \*\*\*  
 \*\*\*\*\*

\*\*\* TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR  
 FOLLOWING DISTANCES \*\*\*

DIST SIGMA (M) Z (M)	CONC (UG/M**3) DWASH	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)
20.10	0.000 NO	5	1.0	1.5	10000.0	222.13	20.12
47.78	0.2892E-01 NO	5	1.0	1.5	10000.0	222.13	48.04
55.81	0.3496 NO	5	1.0	1.5	10000.0	222.13	60.67
58.47	0.5492 NO	5	1.0	1.5	10000.0	222.13	74.47
66.32	1.390 NO	5	1.0	1.5	10000.0	222.13	129.12
77.81	3.143 NO	5	1.0	1.5	10000.0	222.13	225.50
87.33	4.577 NO	5	1.0	1.5	10000.0	222.13	319.43
89.11	4.821 NO	5	1.0	1.5	10000.0	222.13	337.86
92.58	5.262 NO	5	1.0	1.5	10000.0	222.13	374.40
95.93	5.642 NO	5	1.0	1.5	10000.0	222.13	410.53
122.06	6.722 NO	5	1.0	1.5	10000.0	222.13	754.28

\*\*\*\*\*  
 \*\*\* SUMMARY OF SCREEN MODEL RESULTS \*\*\*  
 \*\*\*\*\*

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	6.722	20000.	0.



**Stability Class and wind Speed:**

\*\*\* STABILITY CLASS 6 ONLY \*\*\*  
 \*\*\* ANEMOMETER HEIGHT WIND SPEED OF 1.00 M/S ONLY \*\*\*

**Outputs from the Model:**

\*\*\*\*\*  
 \*\*\* SCREEN DISCRETE DISTANCES \*\*\*  
 \*\*\*\*\*

\*\*\* TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR  
 FOLLOWING DISTANCES \*\*\*

DIST SIGMA (M) Z (M)	CONC (UG/M**3) DASH	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)
20.	0.000	6	1.0	1.9	10000.0	178.01	16.85
16.84	NO						
100.	0.2833E-01	6	1.0	1.9	10000.0	178.01	37.98
37.83	NO						
500.	0.2128	6	1.0	1.9	10000.0	178.01	45.42
42.55	NO						
1000.	0.3047	6	1.0	1.9	10000.0	178.01	53.74
43.99	NO						
2500.	0.6872	6	1.0	1.9	10000.0	178.01	88.41
48.34	NO						
5000.	1.364	6	1.0	1.9	10000.0	178.01	151.53
53.95	NO						
7500.	2.042	6	1.0	1.9	10000.0	178.01	213.65
58.61	NO						
8000.	2.152	6	1.0	1.9	10000.0	178.01	225.87
59.40	NO						
9000.	2.366	6	1.0	1.9	10000.0	178.01	250.11
60.92	NO						
10000.	2.568	6	1.0	1.9	10000.0	178.01	274.10
62.38	NO						
20000.	3.662	6	1.0	1.9	10000.0	178.01	502.68
73.32	NO						

\*\*\*\*\*  
 \*\*\* SUMMARY OF SCREEN MODEL RESULTS \*\*\*  
 \*\*\*\*\*

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	3.662	20000.	0.

**Stability Class and wind Speed :**

\*\*\* STABILITY CLASS 1 ONLY \*\*\*

\*\*\* ANEMOMETER HEIGHT WIND SPEED OF 3.00 M/S ONLY \*\*\*

**Outputs from the Model:**

\*\*\*\*\*  
 \*\*\* SCREEN DISCRETE DISTANCES \*\*\*  
 \*\*\*\*\*

\*\*\* TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR  
 FOLLOWING DISTANCES \*\*\*

DIST SIGMA (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)
20.	0.000	1	3.0	3.3	960.0	454.69	12.72
11.47	NO						
100.	0.000	1	3.0	3.3	960.0	454.69	34.71
26.05	NO						
500.	0.9927E-01	1	3.0	3.3	960.0	454.69	130.06
122.84	NO						
1000.	8.684	1	3.0	3.3	960.0	454.69	232.35
465.19	NO						
2500.	4.057	1	3.0	3.3	960.0	454.69	481.54
3158.71	NO						
5000.	2.274	1	3.0	3.3	960.0	454.69	859.08
5000.00	NO						
7500.	1.613	1	3.0	3.3	960.0	454.69	1211.41
5000.00	NO						
8000.	1.527	1	3.0	3.3	960.0	454.69	1279.57
5000.00	NO						
9000.	1.382	1	3.0	3.3	960.0	454.69	1413.95
5000.00	NO						
10000.	1.264	1	3.0	3.3	960.0	454.69	1545.95
5000.00	NO						
20000.	0.7048	1	3.0	3.3	960.0	454.69	2771.77
5000.00	NO						

\*\*\*\*\*  
 \*\*\* SUMMARY OF SCREEN MODEL RESULTS \*\*\*  
 \*\*\*\*\*

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	8.684	1000.	0.

**Stability Class and wind Speed :**

\*\*\* STABILITY CLASS 2 ONLY \*\*\*  
 \*\*\* ANEMOMETER HEIGHT WIND SPEED OF 3.00 M/S ONLY \*\*\*

**Outputs from the Model:**

\*\*\*\*\*  
 \*\*\* SCREEN DISCRETE DISTANCES \*\*\*  
 \*\*\*\*\*

\*\*\* TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR  
 FOLLOWING DISTANCES \*\*\*

DIST SIGMA (M) Z (M)	CONC (UG/M**3) DWASH	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)
20.	0.000	2	3.0	3.3	960.0	454.69	11.91
11.31	NO						
100.	0.000	2	3.0	3.3	960.0	454.69	29.24
24.42	NO						
500.	0.3884E-04	2	3.0	3.3	960.0	454.69	104.81
82.15	NO						
1000.	0.5331	2	3.0	3.3	960.0	454.69	184.88
149.57	NO						
2500.	4.655	2	3.0	3.3	960.0	454.69	368.64
322.17	NO						
5000.	3.044	2	3.0	3.3	960.0	454.69	652.74
650.25	NO						
7500.	2.120	2	3.0	3.3	960.0	454.69	922.24
1004.18	NO						
8000.	2.005	2	3.0	3.3	960.0	454.69	974.66
1076.83	NO						
9000.	1.812	2	3.0	3.3	960.0	454.69	1078.22
1223.62	NO						
10000.	1.655	2	3.0	3.3	960.0	454.69	1180.20
1372.17	NO						
20000.	0.9146	2	3.0	3.3	960.0	454.69	2135.97
2926.51	NO						

\*\*\*\*\*  
 \*\*\* SUMMARY OF SCREEN MODEL RESULTS \*\*\*  
 \*\*\*\*\*

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	4.655	2500.	0.

**Stability Class and wind Speed :**

\*\*\* STABILITY CLASS 3 ONLY \*\*\*

\*\*\* ANEMOMETER HEIGHT WIND SPEED OF 3.00 M/S ONLY \*\*\*

**Outputs from the Model:**

\*\*\*\*\*  
 \*\*\* SCREEN DISCRETE DISTANCES \*\*\*  
 \*\*\*\*\*

\*\*\* TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR  
 FOLLOWING DISTANCES \*\*\*

DIST SIGMA (M) Z (M)	CONC (UG/M**3) DWASH	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)
20.	0.000	3	3.0	3.4	960.0	440.20	11.11
10.88	NO						
100.	0.000	3	3.0	3.4	960.0	440.20	24.63
22.51	NO						
500.	0.6782E-06	3	3.0	3.4	960.0	440.20	82.82
70.08	NO						
1000.	0.6542E-01	3	3.0	3.4	960.0	440.20	142.67
116.02	NO						
2500.	1.670	3	3.0	3.4	960.0	440.20	263.86
183.26	NO						
5000.	3.461	3	3.0	3.4	960.0	440.20	456.78
290.87	NO						
7500.	3.067	3	3.0	3.4	960.0	440.20	645.35
403.34	NO						
8000.	2.927	3	3.0	3.4	960.0	440.20	682.38
425.87	NO						
9000.	2.652	3	3.0	3.4	960.0	440.20	755.79
470.85	NO						
10000.	2.405	3	3.0	3.4	960.0	440.20	828.38
515.68	NO						
20000.	1.244	3	3.0	3.4	960.0	440.20	1519.05
954.09	NO						

\*\*\*\*\*  
 \*\*\* SUMMARY OF SCREEN MODEL RESULTS \*\*\*  
 \*\*\*\*\*

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	3.461	5000.	0.

**Stability Class and wind Speed :**

\*\*\* STABILITY CLASS 4 ONLY \*\*\*

\*\*\* ANEMOMETER HEIGHT WIND SPEED OF 3.00 M/S ONLY \*\*\*

**Outputs from the Model:**

\*\*\*\*\*  
 \*\*\* SCREEN DISCRETE DISTANCES \*\*\*  
 \*\*\*\*\*

\*\*\* TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR  
 FOLLOWING DISTANCES \*\*\*

DIST SIGMA (M) Z (M)	CONC (UG/M**3) DWASH	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)
20.	0.000	4	3.0	3.6	960.0	417.13	10.41
10.31	NO						
100.	0.000	4	3.0	3.6	960.0	417.13	21.66
20.58	NO						
500.	0.3100E-07	4	3.0	3.6	960.0	417.13	68.86
61.40	NO						
1000.	0.1512E-01	4	3.0	3.6	960.0	417.13	115.31
98.41	NO						
2500.	0.2064	4	3.0	3.6	960.0	417.13	191.39
124.34	NO						
5000.	0.3964	4	3.0	3.6	960.0	417.13	312.49
141.33	NO						
7500.	0.6080	4	3.0	3.6	960.0	417.13	434.73
157.97	NO						
8000.	0.6489	4	3.0	3.6	960.0	417.13	458.92
161.24	NO						
9000.	0.7274	4	3.0	3.6	960.0	417.13	506.99
167.70	NO						
10000.	0.8000	4	3.0	3.6	960.0	417.13	554.64
174.07	NO						
20000.	1.110	4	3.0	3.6	960.0	417.13	1010.75
227.98	NO						

\*\*\*\*\*  
 \*\*\* SUMMARY OF SCREEN MODEL RESULTS \*\*\*  
 \*\*\*\*\*

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	1.110	20000.	0.

**Stability Class and wind Speed :**

\*\*\* STABILITY CLASS 5 ONLY \*\*\*  
 \*\*\* ANEMOMETER HEIGHT WIND SPEED OF 3.00 M/S ONLY \*\*\*

**Outputs from the Model:**

\*\*\*\*\*  
 \*\*\* SCREEN DISCRETE DISTANCES \*\*\*  
 \*\*\*\*\*

\*\*\* TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR  
 FOLLOWING DISTANCES \*\*\*

DIST SIGMA (M) Z (M)	CONC (UG/M**3) DWASH	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)
20.	0.000	5	3.0	4.5	10000.0	163.83	8.52
8.46	NO						
100.	0.000	5	3.0	4.5	10000.0	163.83	17.02
16.27	NO						
500.	0.1230	5	3.0	4.5	10000.0	163.83	46.35
39.78	NO						
1000.	0.3221	5	3.0	4.5	10000.0	163.83	63.35
43.43	NO						
2500.	1.523	5	3.0	4.5	10000.0	163.83	123.05
53.54	NO						
5000.	3.725	5	3.0	4.5	10000.0	163.83	222.08
67.25	NO						
7500.	4.830	5	3.0	4.5	10000.0	163.83	317.02
78.06	NO						
8000.	4.957	5	3.0	4.5	10000.0	163.83	335.59
80.06	NO						
9000.	5.142	5	3.0	4.5	10000.0	163.83	372.35
83.90	NO						
10000.	5.250	5	3.0	4.5	10000.0	163.83	408.66
87.58	NO						
20000.	4.546	5	3.0	4.5	10000.0	163.83	753.26
115.61	NO						

\*\*\*\*\*  
 \*\*\* SUMMARY OF SCREEN MODEL RESULTS \*\*\*  
 \*\*\*\*\*

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	5.250	10000.	0.

**Stability Class and wind Speed :**

\*\*\* STABILITY CLASS 6 ONLY \*\*\*  
 \*\*\* ANEMOMETER HEIGHT WIND SPEED OF 3.00 M/S ONLY \*\*\*

**Outputs from the Model:**

\*\*\*\*\*  
 \*\*\* SCREEN DISCRETE DISTANCES \*\*\*  
 \*\*\*\*\*

\*\*\* TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR  
 FOLLOWING DISTANCES \*\*\*

DIST SIGMA (M) Z (M)	CONC (UG/M**3) DWASH	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)
20.	0.000	6	3.0	5.7	10000.0	133.23	6.92
6.89	NO						
100.	0.000	6	3.0	5.7	10000.0	133.23	13.23
12.80	NO						
500.	0.4809E-01	6	3.0	5.7	10000.0	133.23	34.05
30.12	NO						
1000.	0.1114	6	3.0	5.7	10000.0	133.23	44.55
32.11	NO						
2500.	0.5609	6	3.0	5.7	10000.0	133.23	83.14
37.86	NO						
5000.	1.551	6	3.0	5.7	10000.0	133.23	148.51
44.80	NO						
7500.	2.420	6	3.0	5.7	10000.0	133.23	211.52
50.31	NO						
8000.	2.543	6	3.0	5.7	10000.0	133.23	223.86
51.23	NO						
9000.	2.764	6	3.0	5.7	10000.0	133.23	248.30
52.99	NO						
10000.	2.954	6	3.0	5.7	10000.0	133.23	272.44
54.66	NO						
20000.	3.509	6	3.0	5.7	10000.0	133.23	501.78
66.87	NO						

\*\*\*\*\*  
 \*\*\* SUMMARY OF SCREEN MODEL RESULTS \*\*\*  
 \*\*\*\*\*

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	3.509	20000.	0.



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