

**ATTACHMENT 5
IMPACT EVALUATION**

NON-RULE STANDARD PERMIT (NRSP) MODIFICATION

SILVERTON COMPRESSOR STATION

CARDINAL DELAWARE BASIN, LLC

- TCEQ Summary Tables

Is a Full Impacts Review Required?

(1)

Based on receptor and property line distances, is a full impacts review required for any air contaminant? (Is there a receptor or property line within the specified distance of the registration? The distances are 1/4 mile for PBR Level 1, 1/2 mile for PBR Level 2, and 1 mile for Standard Permit.) First the level of authorization must be known.

Based on the Registration Total Emission Rates, this authorization falls under:

Standard Permit

What is the shortest distance in feet to any receptor from any facility/unit included in this registration?	3374.82	ft
What is the shortest distance in feet to any property line from any facility/unit included in this registration?	490	ft

Based on the nearest receptor distance:

A full impacts review is required for benzene.

Based on the nearest property line distance:

A full impacts review is required for H2S, SO2, and NO2.

(2)

Based on the net project emission increases, is a full impacts review required for any air contaminant? (Are the net project emission increases less than any of the de-minimis rates?)

Net Project Emission Increases				
Air Contaminant Name	Emission Rates			
	steady state lbs/hr	< 30 psig periodic lbs/hr	≥ 30 psig periodic lbs/hr	TPY
Benzene	0.16	0.89	0.89	0.52
H ₂ S	0.00	0.00	0.00	0.00
SO ₂	0.05	0.05	0.05	0.21
NO _x	13.16	13.16	13.16	57.65
Please explain the logic behind the values here if any values are different than the Project Total Emission Rates from the Emissions Summary tab.				

De-minimis Rates	
Air contaminant	lb/hr
Benzene	0.039
H ₂ S	0.025
SO ₂	2
NO _x	4

Based on the net project emission increases:

A full impacts review is required for benzene.
A full impacts review is NOT required for H2S.
A full impacts review is NOT required for SO2.
A full impacts review is required for NO2.

Cardinal Delaware Basin, LLC
Silverton Compressor Station

Full Impacts Review

Benzene Short Term ESL ($\mu\text{g}/\text{m}^3$):	170
Benzene Long Term ESL ($\mu\text{g}/\text{m}^3$):	4.5

Benzene Hourly Steady State - Impact Review									
EPN	Source Name	Which impacts table corresponds to this EPN?	Steady state hourly estimated emissions for each EPN (lbs/hr)	WR_{EPN_x}	$ESL_{\text{benzene, short term}}$ ($\mu\text{g}/\text{m}^3$)	Distance from emission point to nearest receptor (ft)	Height of emission release point (ft)	G_{EPN_x}	$E_{\text{max,EPN}_x}$, hourly, steady state (lb/hr)
E-1	Compressor Engine 1	Eng. 1500 < hp $\leq$ 2000	0.0054356	0.0711738	170	3374.82	27	4	3.02488677
E-2	Compressor Engine 2	Eng. 1500 < hp $\leq$ 2000	0.0054356	0.0711738	170	3374.82	27	4	3.02488677
E-3	Compressor Engine 3	Eng. 1500 < hp $\leq$ 2000	0.0054356	0.0711738	170	3374.82	25	4	3.02488677
E-4	Compressor Engine 4	Eng. 1500 < hp $\leq$ 2000	0.0054356	0.0711738	170	3374.82	27	4	3.02488677
E-5	Compressor Engine 5	Eng. 1500 < hp $\leq$ 2000	0.0054356	0.0711738	170	3374.82	27	4	3.02488677
E-6	Compressor Engine 6	Eng. 1500 < hp $\leq$ 2000	0.0054356	0.0711738	170	3374.82	27	4	3.02488677
F-1	Process Flare	Flare/Therm. Dest. Dev.	0.0259061	0.3392136	170	3374.82	20	17	3.39213636
FE	Fugitive Emissions	Fugitive	0.0178512	0.2337435	170	3374.82	3	24	1.6556833
			$E_{\text{estimated, total, hourly, steady state}}$ (lb/hr)	Total	Passed			$E_{\text{max, total, hourly, steady state}}$ (lb/hr)	
			0.076371	1				23.1971403	

Benzene Hourly Low Pressure Periodic - Impact Review									
EPN	Source Name	Which impacts table corresponds to this EPN?	Periodic (low P) hourly estimated emissions for each EPN (lbs/hr)	WR_{EPN_x}	$ESL_{\text{benzene, short term}}$ ($\mu\text{g}/\text{m}^3$)	Distance from emission point to nearest receptor (ft)	Height of emission release point (ft)	G_{EPN_x}	$E_{\text{max,EPN}_x}$, hourly, periodic (low pressure) (lb/hr)
LL-1	Oil Truck Loading	Loading	0.7232243	1	170	3374.82	3	37	4.59459459
			$E_{\text{estimated, total, hourly, periodic (low pressure)}}$ (lb/hr)	Total	Passed			$E_{\text{max, total, hourly, periodic (low pressure)}}$ (lb/hr)	
			0.7232243	1				4.59459459	

Benzene Hourly High Pressure Periodic - Impact Review									
EPN	Source Name	Which impacts table corresponds to this EPN?	Periodic (high P) hourly estimated emissions for each EPN (lbs/hr)	WR _{EPNx}	ESL _{-benzene, short term} (µg/m ³)	Distance from emission point to nearest receptor (ft)	Height of emission release point (ft)	G _{EPNx}	E _{max,EPNx, hourly,periodic(hi gh pressure)} (lb/hr)
MSS	Compressor Blowdowns	Fugitive	0.0880726	1	170	3374.82	3	24	7.08333333
			E _{estimated,total i,hourly,periodic (high pressure)} (lb/hr)	Total	Passed				E _{max,total, hourly,periodic(hi gh pressure)} (lb/hr)
			0.0880726	1					7.08333333

Benzene Annual - Impact Review									
EPN	Source Name	What amount of time is this source is emitting? (hrs/yr)	Which impacts table corresponds to this EPN?	Annual estimated emissions for each EPN (tons/yr)	WR _{EPNx}	ESL _{-benzene, long term} (µg/m ³)	Distance from emission point to nearest receptor (ft)	Height of emission release point (ft)	E _{max,EPNx, annual} (tons/yr)
E-1	Compressor Engine 1	8760	Eng. 1500 < hp ≤ 2000	0.023808	0.0458876	4.5	3374.82	27	3.2
E-2	Compressor Engine 2	8760	Eng. 1500 < hp ≤ 2000	0.023808	0.0458876	4.5	3374.82	27	3.2
E-3	Compressor Engine 3	8760	Eng. 1500 < hp ≤ 2000	0.023808	0.0458876	4.5	3374.82	25	3.2
E-4	Compressor Engine 4	8760	Eng. 1500 < hp ≤ 2000	0.023808	0.0458876	4.5	3374.82	27	3.2
E-5	Compressor Engine 5	8760	Eng. 1500 < hp ≤ 2000	0.023808	0.0458876	4.5	3374.82	27	3.2
E-6	Compressor Engine 6	8760	Eng. ≤ 250 hp	0.023808	0.0458876	4.5	3374.82	27	3.2
LL-1	Oil Truck Loading	8760	Loading	0.1704959	0.3286143	4.5	3374.82	3	29.6
F-1	Process Flare	8760	Flare/Therm. Dest. Dev.	0.1135612	0.2188782	4.5	3374.82	20	13.6
FE	Fugitive Emissions	8760	Fugitive	0.0781884	0.1507006	4.5	3374.82	3	19.2
MSS	Maintenance Startup and Shutdown, Compressor Blowdowns	8760	Fugitive	0.0137393	0.0264812	4.5	3374.82	3	19.2
			E _{estimated,total i,annual} (tons/yr)	Total	Passed				E _{max,total, annual} (tons/yr)
			0.5188329	1					30.1719

Cardinal Delaware Basin, LLC
Silverton Compressor Station

Full Impacts Review

NO ₂ Hourly NAAQS (µg/m ³):	188
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NO ₂ Hourly Steady State - Impact Review									
EPN	Source Name	Which impacts table corresponds to this EPN?	Steady state hourly estimated NO ₂ emissions for each EPN (lbs/hr)	WR _{EPNx}	AAQS _{NO2} , hourly (µg/m ³)	Distance from emission point to nearest property line (ft)	Height of emission release point (ft)	G _{EPNx}	E _{max,EPNx} , hourly,steadystate (lb/hr)
E-1	Compressor Engine 1	Eng. 1500 < hp ≤ 2000	1.9566128	0.1486422	188	490	27	5	5.58894598
E-2	Compressor Engine 2	Eng. 1500 < hp ≤ 2000	1.9566128	0.1486422	188	490	27	5	5.58894598
E-3	Compressor Engine 3	Eng. 1500 < hp ≤ 2000	1.9566128	0.1486422	188	490	25	5	5.58894598
E-4	Compressor Engine 4	Eng. 1500 < hp ≤ 2000	1.9566128	0.1486422	188	490	27	7	3.99210427
E-5	Compressor Engine 5	Eng. 1500 < hp ≤ 2000	1.9566128	0.1486422	188	490	27	7	3.99210427
E-6	Compressor Engine 6	Eng. 1500 < hp ≤ 2000	1.9566613	0.1486459	188	490	27	7	3.99220319
F-1	Process Flare	Flare/Therm. Dest. Dev.	1.3495537	0.1025244	188	490	20	58	0.33232055
GR-BS	Glycol Reboiler	Flare/Therm. Dest. Dev.	0.0739618	0.0056188	188	490	10	58	0.0182127
			E _{estimated,total, hourly, steady state (lb/hr)}	Total	Passed			E _{max,total, hourly, steady state (lb/hr)}	
			13.163241	1				29.0937829	