CHP TOOL

You can record details of your CHP Here:	**South Tyneside General Hospital**
Additional comments:	Scenario 2: 520kWe CHP Chimney Height Based on Contract 22meters

CHP AQ Tool v1.3

This tool is in 4 Sections. Please complete each section as required by entering information in the yellow cells.
Yellow cells will appear as you make your selections.
If you wish to change your selections part way through, it is recommended you clear the contents from yellow cells manually as only yellow cells are used in the calculations.
You can also click the Clear AQ Tool Button on the right (you must have macros enabled - see Info on Macros)

Info on Macros:
This tool used Macros to clear cells but they are not required for calculations. Macros may have been automatically disabled and will need to be enabled to use the Clear buttons. Please contact your IT deparment or use the Help functions.

Section 1

		Help Column
Select CHP Technology	Gas Engine	Select Type of CHP from Drop Down Menu. Gas Engine is same as Internal Combustion Engine
Select Engine Type	Spark Ignition	
Select Fuel Type	Natural Gas	
Select to specify ELV or use assumptions based on Power Output Range of Gas Engine CHP (kWe)	Using installation specific data or have an ELV	Select from Drop down list. If compliance with an ELV can be guaranteed, inputting the ELV will ensure the most reliable result. If no ELV is available, impact will be estimated based on the review of UK CHP emissions
	Please go to Section 2	

Your Notes:

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Section 2

For users wishing to input installation specific information on Exhaust flow-rate and/or NOx in-stack concentrations.

Please complete the yellow cells as they appear based on your choices.

Enter the Power Output of your CHP (kWe)	520	Enter a number from 1 to 20000 kWe (20MWe)
Please select which data you wish to provide	Emission Factor NOx g/kWh	Select from Drop Down List. Choose emission factor , tonnes/year, or Emission Limit Value
Enter Emission Factor NOx g/kWh	1.4	
	Please go to Section 4 Impact Calculator Below	

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Section 3: Determination of Emissions factors and Emissions based on Section 1 or 2

Based on sections 1 or 2, the following are calculated for the CHP

Your Notes:

NOx Emission Factor (grams/kWh)	1.402	Based on installation specific emission factor provided in Section 2
NOx Emission Rate (grams/second/kWe Output)	0.00039	Based on installation specific emission factor provided in Section 2
NOx Emission Rate (g/sec)	0.20	Based on the installation specific information provided in Section 2.
Annual Emissions NOx (tonnes/year)	6.39	Based on the intallation specific information provided in Section 2.
	Please go to Section 4 Air Quality Impacts Calculator.	

Section 4: Air Quality Impacts Calculator

This calculator is based on LAQM.TG(09) Industrial Nomograms for NO_2. The CHP screening tool calculates only with the annual mean NO_2 impact, and is based on the relevant nomograms for industrial sources in LAQM.TG(09) – Figures 5.2 and 5.3 - which in turn are based on ADMS2 dispersion modelling runs for both tall stacks and near-ground level releases (i.e. when a nearby building renders the effective stack height as less than 10 m). The result of the Excel-based spreadsheet is the maximum, annual mean ground level NO_2 concentration; therefore, re-iterative runs of the tool would be necessary to derive a minimum permissible stack height to achieve a given ground level NO_2 concentration.

Please complete the yellow cells as they appear based on your choices.

If you wish to change your selections part way through, it is recommended you clear the contents from yellow cells manually as only yellow cells are used in the calculations. You can also click the Clear Impacts tool on the right . (you must have macros enabled - see Note: Info on Macros)

Enter Stack Height (m)	22	If your stack height is more than 10m you may enter building information below. If your stack height is =<10m (i.e.Ground Level/Fugitive) then building height is not applicable.
Enter Building Height (m). This the height of the dominant large building near the stack. It can be the building on which the stack sits.	15	Enter height of the tallest building within 5 stack heights of the stack. If no building then leave blank or enter 0.
Enter Stack Diameter (m)	2.7	Enter Stack Diameter between 0.5m and 11.9m. Leaving blank assumes a short stack/fugitve source.
Calculated Effective Stack Height (m). This method for calculating the effective stack height is consistent with that as set out in LAQM.TG(09)	11.62	
	A tall stack with height greater than 10m will be assumed by impacts calculator.	
	12	

Results

CHP Tonnes NOx per Annum (based on Sections 1,2 or 3)	6.39	The tool includes all the assumptions/limitations inherent in LAQM.TG(09) i.e. a 10 – 25 m/s efflux velocity
Estimated Maximum Annual Mean NO_2 Contribution from CHP (ug/m^3), or Contribution from CHP at nearest receptor (ug/m3) for short stacks	**0.39**	The CHP screening tool does not take account of background NO_2 level; it calculates only the contribution of the stack to the maximum NO_2 annual mean concentration at the worst-case location. This locations will be different for varying stack heights and diameters.

The result from this tool is conservative, and errs on the side of caution. Only ground level impacts are considered. It is likely that the application of a detailed dispersion model using installation-specific values for exit velocity, volumetric flow-rate and flue gas temperature, and local meteorological data, would give a lower result.