



CMGP - Coal Mine Gas Predictor

This new computer software predicts coal mine gas quantity and ventilation requirements for the individual longwalls and the entire mine.

Calculations include influence of local geology, weekly and daily coal production, gas composition, ventilation underground disturbances, barometric pressure changes and gas drainage system contribution in longwall absolute gassiness.



Coal Mine Gas Predictor (CMGP)

**Prediction of coal mine gas quantity
during longwall extraction**

Based on

- local geology
- in situ gas contents
- gas composition
- mining system
- coal production level, and
- gas drainage efficiency

Outputs predicted & calculated

- Coal mine gas quantity released during longwall extraction for various daily coal production levels
- Ventilation requirements in longwall return for designated CH₄ percentage



CMGP - input data



Lunagas[®]
Coal mine gas specialists

COAL MINE GAS PREDICTOR (CMGP)

Longwall specific gas emission (SGE) relative gassiness prediction

Mine name	Demo Mine
Longwall name/number	Panel 17
Worked seam name	409/3
Borehole location/number	BJ-8B

Assumptions

Longwall face length (metres)	184.00
Worked seam thickness (metres)	1.75
Weekly coal production (tonnes)	15,000
Worked seam gas content (m ³ gas/tonne in situ)	6.72
Methane concentration in mine gas (%)	96.00
Other gas components in mine gas (%)	4.00
Basic or advanced simulation (B or A)	A
In seam pre-drainage efficiency (%)	0.00
Longwall retreat rate (metres/week)	35.83

Coefficients and calculations

Gas drainage coefficient	SGE advanced simulation 'A' Including gas drainage coefficient	
	Coal seams affected by gas drainage suction	13.55
Gas drainage vacuum (mmHg)	Other coal seams not affected by gas drainage suction	11.40
113.00	Total SGE 'A'	24.95
Worked seam gas release		Contribution of free gas from porous rocks and old workings (%)
41.10		
Coefficient (%)		12.00%



CMGP - input data (**metric**) and SGE (**relative gassiness**) calculations

Units	Coal seam name/number	In situ gas content (d.a.f.)	Coal seam thickness (coal only)	Distance from worked seam	Strata relaxation or gas emission magnitude	SGE basic simulation 'B' Excluding gas drainage coefficient	
		m ³ gas/tonne	metres		%	Individual gas sources m ³ gas/t.coal mined	Contribution to total SGE %
7	404/4	8.35	2.20	171.60	8.84	0.93	3.87
6	406/2	7.05	0.60	136.20	15.58	0.38	1.57
5	407/ 1	6.06	2.60	108.90	24.11	2.17	9.06
4	407/2	6.13	1.10	96.60	29.36	1.13	4.72
3	407/3	6.15	1.20	94.60	30.31	1.28	5.33
2	409/1	6.65	1.40	14.60	100.00	5.32	22.19
1	409/2	6.65	0.70	13.30	100.00	2.66	11.11
Roof coal seams summary		-	9.80	-	-	13.86	57.86
Worked coal seam		6.72	1.75	-	41.10	2.76	11.53
1	409/3	6.75	0.50	2.60	100.00	1.93	8.05
2	409/4	6.90	2.30	26.70	54.45	4.94	20.62
3	409/5	6.94	0.30	33.10	39.18	0.47	1.95
Floor coal seams summary		-	3.10	-	-	7.34	30.61
Total			14.65	Total SGE 'B'		23.96	100.00

Total Specific Gas Emission (SGE)

Including free gas from porous rocks
and old workings

(m³gas per tonne of coal mined)

27.95

26.83

1.12

Coal mine gas

Methane only

Other gas only



CMGP Absolute Gassiness - input data

COAL MINE GAS PREDICTOR (CMGP)

Longwall gas make (GMP) absolute gassiness prediction

Mine name	Demo Mine
Longwall name/number	Panel 17
Borehole location/number	BJ-8B

Assumptions

Weekly coal production (tonnes)		15,000
Specific Gas Emission (m ³ gas/tonne of coal mined)		27.95
Ventilation underground disturbances & sudden barometric pressure changes	Maximum coefficient	1.30
	Average coefficient	1.10
Worked days (weekly worked hours / 24)		5.00
Longwall post-drainage efficiency (%)		30.00

Predicted factor

9.25

Curve type selection



1



2

Daily coal production increment

500

(tonnes/day)

2



CMGP Absolute Gassiness - calculations

Daily coal production	Coal mine gas make quantity - absolute gassiness				Quantity of air required in longwall return for methane or other gas to be diluted to designated thresholds		
	Longwall total gas make-emission ventilation + drainage	Ventilation only		Coal mine gas drained	Methane thresholds %		Other gas threshold %
		Methane	Other gas		Maximum	Determined	
tonnes	(m ³ gas per minute)				(m ³ air per minute)		
	Maximum quantity of coal mine gas or methane				Maximum quantity of ventilation air		
500	26.02	17.49	0.73	7.81	874	1,166	58
1000	32.70	21.98	0.92	9.81	1,099	1,465	73
1500	37.83	25.42	1.06	11.35	1,271	1,695	85
2000	42.15	28.33	1.18	12.65	1,416	1,889	94
2500	45.96	30.89	1.29	13.79	1,544	2,059	103
3000	49.41	33.20	1.38	14.82	1,660	2,213	111
3500	52.57	35.33	1.47	15.77	1,766	2,355	118
4000	55.52	37.31	1.55	16.66	1,866	2,487	124
4500	58.29	39.17	1.63	17.49	1,959	2,611	131
5000	60.91	40.93	1.71	18.27	2,046	2,729	136

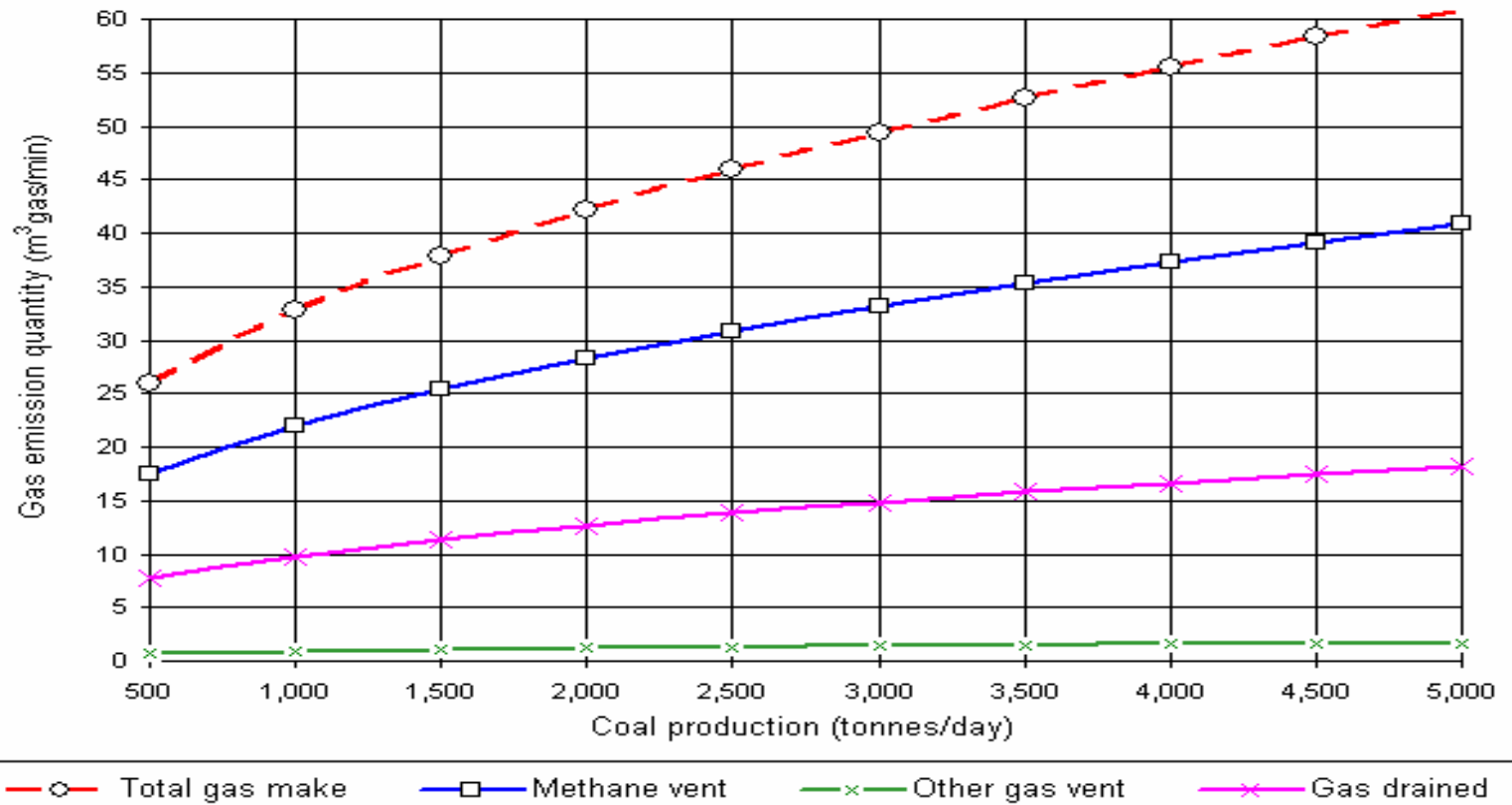


CMGP Absolute Gassiness - graphs

COAL MINE GAS PREDICTOR (CMGP)

Longwall gas make (GMP) absolute gassiness prediction

Maximum gas make quantity - absolute gassiness





CMGP Ventilation Requirements - graphs

