WORKFLOW CONSULTING LIMITED

British Coal Respiratory Disease Litigation
Dust Exposure Calculator

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What the Dust Exposure Model is for

The model is to assist in claims made regarding British Coal Respiratory Disease Litigation. It will calculate the proportion of quantum that can be expected to be recovered from the claim. The Claims Handling Agreement (especially Schedule 12 - previously known as Schedule 11) should be read to get a thorough understanding of this but essentially the model does five things to calculate this figure:

1. Estimates the exposure to dust that the claimant experienced while working in the coal mines as a figure that can be equated to exposure from smoking
2. Works out the proportion of exposure to dust compared to the exposure from smoking
3. Works out how much exposure to dust can be considered tortious ("guilty") according to an agreed set of values based on the coal area the miner was working in
4. Adjusts the tortious percentage to account for the "extra guilt" of not providing or enforcing the use of respirators when they should have been available
5. Adjusts the final proportion of damage attributed to dust exposure by the final tortious percentage to give the recoverable proportion of quantum
6. Apportions the final quantum between parties where some employment was in a Small Mine

A more detailed break down of the actual calculation algorithm is given in Detailed explanation of the calculation algorithm

How exposure to dust is assessed

Please see Schedule 12 (previously Schedule 11) of the Claims Handling Agreement for details, but briefly:

There is no easy way to judge how much dust a coal miner was exposed to during his employment and even if there was there may be factors in the type of dust that effect how much damage this would have caused. So the exposure is calculated based on the prevalence of Category 1 Pneumoconiosis in the pits the miner worked in. This data is available from Pneumoconiosis X-ray (PXR) surveys that were performed in British Coal pits.

Unfortunately the PXR surveys were performed for all workers at a pit with no consideration for job type (and the varying exposure to dust that goes with different jobs). To compensate for this a set of "Job Factors" were devised that weight the PXR scores according to the likely exposure to dust of a particular class of job.

For more information about the calculation see Detailed explanation of the calculation algorithm

For details of how PXR data is calculated between surveys and for collieries without surveys see How PXR values are estimated

Detailed explanation of the calculation algorithm

How the dust model calculates the recoverable proportion of quantum

Basically the calculation involves three main areas:
The total exposure to dust that the claimant was subjected to
The exposure to respiratory damage from smoking
The proportion of dust exposure that can be considered tortious (guilty)

The rough algorithms for calculating these areas are:

A: The total exposure to dust that the claimant was subjected to

1. For each job, for each year obtain the PXR value for the colliery and adjust this by "halving" of years and for strikes
2. Weight it by multiplying by the Job Factor and increase by the appropriate uplift
3. Add it on to the cumulated weighted PXR for the job
4. Add the job's weighted total to the total exposure
5. Adjust the final figure by a "short employment factor" - this is 0.6 for less than 4 years worked, 0.7 for less than 6 years worked, 0.8 for less than 8 years worked, 0.9 for less than 10 years worked otherwise it is 1.0 (i.e. no adjustment).

6. Convert the final weighted and adjusted dust PXR exposure figure to "equivalent dust insult units" which are effectively the equivalent number of years of moderate smoking by dividing by the an estimated percentage prevalence of Cat 1+ Pneumoconiosis (25%) and multiplying the result by the ratio of the number of years of smoking considered equivalent to this level of prevalence (35) to the number of years working it is assumed would lead to this level of prevalence (25)

B: The exposure to respiratory damage from smoking

1. For each year of smoking obtain the "smoking category" value of "equivalent dust insult units" based on how heavy the smoking was (1 for moderate, 1.5 for heavy, 0.5 for light)
2. Add each years value to a total value

C: The proportion of dust exposure that can be considered tortious (guilty)

1. For each job, for each year that is after the limitation date get the tortious percentage based on the year and coal area
2. Weight the tortious value for halved years etc.
3. Add the weighted tortious value to the cumulator
4. If we are in the "respirator" period (period is different for underground and surface) then:
5. Use the Respirator Factor for the job and weight this for any halve years or strikes
6. Add this weighted value to a cumulated respirator value
7. The cumulated respirator factor is then averaged by dividing by the number of years worked in the "respirator period"
8. The total of the tortious dust percentages in the "respirator period" divided by the number of years worked in this period represents the amount (percentage) of dust that might have been reduced by dust suppression measures.
9. Taking the above from 100% gives the percentage of tortious dust that was irreducible by dust suppression measures - this is the dust that respirators could have protected against and multiplying this by the average respirator factor gives the extra "guilt" for lack of respirator - this is then progressively capped by agreement to the calculated value if below 10% or 10% plus half the amount above 10% if over 10%.
10. This is then re-multiplied by the number of years in the respirator period and added to the tortious dust exposure after limitation outside the respirator period to and averaged over the total number of years post limitation to give the final tortious percentage

The values from A,B and C are then combined to give the final quantum by dividing the dust units in A byt the total dust and smoke units in A and B to get the percentage exposure due to dust and multiplying the result by the tortious percentage found in C.

Non Claims Handling Agreement Jobs:

Changes have been made to allow the handling of "non Claims Handling Agreement" (non CHA) jobs as laid out in instruction letter of 18 November 2002 and follow up correspondence. The processing involves:
Adding a set of job factors that are set as non CHA – and have their "equivalent dusty time" set as specified in the instruction
Adding a matching set of respirator factors for these jobs
The exposure for the non-CHA jobs are then calculated as in the normal algorithm but proportiuoned by the "equivalent dusty time"

Surface Dusty Work:

The model has also be altered to allow for the agreement to include surface dusty jobs if the overall number of years in underground dusty exposure equals or exceeds 5 years. This is achieved by:
Adding up the number of years in employment (adjusted for "dusty time" and strikes) in both non CHA and "CHA qualifying" (see below) jobs and if this is greater than or equal to 5 years then including the non CHA jobs in the calculation at whatever "dusty time percentage" applies.
If the total adjusted years was below 5 then ignoring any surface dusty time in the job history.

The non CHA Jobs:

Job Factor Name	Job Factor	% "Dusty Time"
Under Manager (non CHA 1.0 @ 100%)	1.00	100
Deputy Manager (non CHA 1.0 @ 66.6%)	1.00	66.6
Manager (non CHA 1.0 @ 50%)	1.00	50

Safety Engineer (non CHA 1.0 @ 25%)	1.00	25
Mechanical Engineer (non CHA 1.0 @ 25%)	1.00	25
Electrical Engineer (non CHA 1.0 @ 20%)	1.00	20
Surveyor (non CHA 0.7 @ 50%)	0.70	50
Survey Office Staff (non CHA 0.7 @ 50%)	0.70	50
Safety Officer (non CHA 1.0 @ 50%)	1.00	50
Ventilation Officer (non CHA 1.0 @ 50%)	1.00	50
Assistant Ventilation Officer (non CHA 1.0 @ 66.6)	1.00	66.6
Dust Suppression Officer (non CHA 1.0 @ 100%)	1.00	100
Mech/Elec Deputies/Assistants (non CHA 1.0 @ 60%)	1.00	60
Small Mines (1.75)	1.75	100

Respirator Factor name	**Respirator Factor**
Under Manager (non CHA 30)	30
Deputy Manager (non CHA 30)	30
Manager (non CHA 30)	30
Safety Engineer (non CHA 30)	30
Mechanical Engineer (non CHA 30)	30
Electrical Engineer (non CHA 30)	30
Surveyor (non CHA 30)	30
Survey Office Staff (non CHA 30)	30
Safety Officer (non CHA 30)	30
Ventilation Officer (non CHA 30)	30
Assistant Ventilation Officer (non CHA 30)	30
Dust Suppression Officer (non CHA 30)	30
Mech/Elec Deputies/Assistants (non CHA 30)	30
Small Mines (20)	20

Important Assumptions:

In calculating the years of underground employment to ensure that the minimum of 5 has been attained any "strike" year was excluded

The following job factors were taken as being "normal CHA service" in calculating to ensure that the minimum of 5 years service has been attained (**please note this does include the surface work that has been agreed even if it was non dusty)**:

Job Factor
Face Worker (1.5)
Rippers and Packers (1.5)
Development Worker (1.3)
Overmen/Deputies (1.0)
Underground Craftsmen (1.0)
Conveyor and Haulage Attendants (0.7)
Other occupations underground (0.7)
Underground but occupations not known (1.0)
Bord & Pillar working (2.0)
Surface - Dusty occupations (0.5)
Surface - Non dusty (0.0)

The following "special" job factors were not included in calculating to ensure that the minimum of 5 years service has been attained:

Job Factor
No data available: U/G
No data available: Surface

Strike (0)
Job break (single years only)

All non CHA respirator factors were taken to run from 1965 to mid 1985

In the main calculation both CHA and non CHA job are assumed to contribute to continuity of service so will affect the "halving" of years (e.g. if CHA job from 1969 to 1970 then non CHA from 1971 to 1972 the 1970 year will **not** be halved in the CHA job)

How PXR values are estimated

In order to calculate the dust exposure it is necessary to have a PXR survey value for each year at each pit. Unfortunately surveys were not conducted at all pits and were not performed every year but in a number of "rounds" in various Coal Board areas. Also the surveys only started in the 1950's. The following procedures are used to assign values to the "missing" years and pits:

1. Area averages are calculated by adding up actual survey data in survey year ranges for surveys in the area and dividing by the number of surveys found to give a flat value for the years of the survey for that area.
2. Collieries with actual survey data are then calculated using linear extrapolation before first survey and after last and linear interpolation between surveys.
3. Collieries with no survey data are initially filled in with the area average values for their area.
4. Finally equivalent colliery values are overlaid on top of whatever data has been set for the colliery so far in steps 2 and 3. So for example if Colliery B is entered as equivalent to colliery A from 1967 to 1983 then the data for each year from 1967 to 1983 for colliery A is copied in to the matrix to replace that already there for colliery B in that period. This allows for mergers and pits that were part of a combined survey group.

What is the Job Factor

The Job Factor is an estimated (and negotiated) factor by which the PXR survey data for a particular year is adjusted to take into account the likely relative dust exposure for the particular job type.

The main Job Factors are details in Schedule 12 (previously Schedule 11) of the Claims Handling Agreement but in addition to these the model has some "special" markers to allow for special data entry requirements - these are:

No data available: U/G	To temporarily "ignore" the job because of missing or disputed data so that a figure can at least be obtained that **could** be the basis for a negotiated interim payment - use this value for Underground jobs
No data available: Surface	To temporarily "ignore" the job because of missing or disputed data and while surface data figures are still being negotiated so that a figure can at least be obtained that **could** be the basis for a negotiated interim payment - use this value for Surface jobs
Strike (0)	To indicate a strike year when area averages are used (note the main coal miner's strike should be entered with start and end years of 1984. If you are not using area averages then data regarding whether or not the pit was on strike is already held in the model
Job break (single years only)	A quirk of the year entry method means that if a claimant had a job break of a single year it could not be recorded (see Employment Start/End Year rules for details) - so use this factor to indicate a single year not working (with any colliery chosen)

The model has also been designed to allow calculation for surface workers once data has been agreed - hence the "Surface - enclosed dusty (0.5)" and "Surface - negligible dust (0.0)" factors.

What is the Respirator Factor

The Respirator Factor is an estimated (and negotiated) factor to account for the extra "guilt" in not providing or enforcing the use of a respirator when it should have been available. Essentially this is used to scale up the "tortious" percentages for the particular year. The main Respirator Factors are details in Schedule 12

(previously Schedule 11) of the Claims Handling Agreement but in addition to these the model has some "special" markers to allow for special data entry requirements - these are:

No data available: U/G	To temporarily "ignore" the job because of missing or disputed data so that a figure can at least be obtained that **could** be the basis for a negotiated interim payment - use this value for Underground jobs
No data available: Surface	To temporarily "ignore" the job because of missing or disputed data and while surface data figures are still being negotiated so that a figure can at least be obtained that **could** be the basis for a negotiated interim payment - use this value for Surface jobs
Strike (0)	To indicate a strike year when area averages are used (note the main coal miner's strike should be entered with start and end years of 1984 with the job that overlapped the strike split into two one ending in 1983 the other starting in 1985). If you are not using area averages then data regarding whether or not the pit was on strike is already held in the model
Job break (single years only)	A quirk of the year entry method means that if a claimant had a job break of a single year it could not be recorded (see Employment Start/End Year rules for details) - so use this factor to indicate a single year not working (with any colliery chosen)

Entering details for a claimant

The list below summarised the steps required to enter the details for a claimant miner and calculate the proportion of quantum that can be claimed:

1. Click on to the Claimant/Case Details Tab and click Add and enter the basic details for this claimant
2. Click on to the Employment History Tab and click add to enter a record into the history. Choose the colliery pit from the drop down list, enter the start and end years for the job and choose the appropriate Job Factor and Respirator Factor then click Save
   See Entering Employment History for more details of doing this.
3. Repeat the above for all the miner's coal working history
4. Click on the Smoking History Tab if this miner ever smoked. Click on Add to enter a new record and choose the appropriate category from the list and enter either the start and end year or the number of years - then click save
5. Repeat the above for the miner's full smoking history
6. Click on the Calculation Tab and click the "Do Calculation" button

Entering Employment History

There are a number of considerations to be taken when entering a coal miner's employment history:

1. It is not necessary to enter the history in chronological order
2. You need to make a separate entry for each pit worked at and each change of job function or respirator use at each pit
3. Choose the pit the miner worked at from the list (if it is not there follow this procedure, if the employment was in a Small Mine - check this section)
4. Enter the start and end year for the specific employment record - there are complex rules for these years, please see Employment Start/End Year Rules

Employment Start/End Year rules

When the model was developed a compromise had to be made on the usability and the complexity of the calculations involved. It was known that often employment history records were somewhat vague so a system that insisted on true dates for the start and end of each job would have been unhelpful. To deal with this it was decided that only the year would be entered but this obviously has an effect on short periods of employment (less than a year) and at the change between jobs.
The following rules are applied to the start and end years entered for a job:

1. The first year of a period of continuous employment in the coal industry is treated as half a year.
2. The last year of a period of continuous employment in the coal industry is treated as half a year.
3. At each change of jobs if the last year of the first job is entered as the same year as the first year of the next job then it will be treated as half a year for each job (e.g. job 1 ends in 1955, job 2 starts in 1955 means first half of 1955 allocated to job 1, second half of 1955 allocated to job 2)
4. At each change of jobs if the last year of the first job is entered as the year immediately before the first year of the next job then they will be treated as whole years for each job (e.g. job 1 ends in 1955, job 2 starts in 1956 means all of 1955 allocated to job 1, all of 1956 allocated to job 2)
5. At each change of jobs if there is a break in years between the last year of the first job and the first year of the next job then they will be treated as half years for each job (e.g. job 1 ends in 1955, job 2 starts in 1960 means (second) half of 1955 allocated to job 1, (second) half of 1960 allocated to job 2)

What to do if the pit is missing

If the pit a claimant claims to have worked at is not in the list then follow the following checks:

BRITISH COAL / NATIONAL COAL BOARD PIT

1. Check the name of the pit with the claimant - was it known by more than one name? Often pits had local names that did not match their official names.
2. If there is no alternative name for the pit in the list use the "Area Average" pit for the appropriate coal area from the list.
3. If you find you are getting many claims for a pit that is not listed contact IRISC to let them know of the pit so it can be investigated and possibly included in a future update - see the support page for contact information.

Please Note: Normally if a pit was on strike during the Coal Miner's Strike it is recorded as part of the dust data and the system will automatically take this into consideration - however if you have to use an area average the strike has to be manually entered by using the special Strike Job and Respirator factor with start and end years set to 1984. The employment entry then needs to be split into two - one ending in 1983 and the other starting in 1985

Note: If the employment was in a Small Mine - check this section)

Dealing with employment in Small Mines

As from Release 3 the model has been adjusted to allow calculation for Small Mines employment according to agreements that have been reached between the Small Mines, the CSG and DTI/IRISC. - of liability If the pit a claimant claims to have worked at is not in the list then follow the following checks:

SMALL MINES

1. Find out which area the Small Mine
2. Choose the pseudo "Small Mine" colliery from the list for that area - e.g. "Small Mines; Small Mines N Yorkshire" for a Small Mine in North Yorkshire
3. Enter the start and end years as normal
4. An extra data entry box headed "For non NCB/BC Small Mines enter name below" should appear - enter the name of the Small Mine here if known - if you need to enter more than one employment history record for the same mine it is important to spell and type the name identically so that the same employer is liable
5. The Job Factor for Small Mines employment MUST be the new "Small Mines (1.75)" factor
6. The Respirator Factor for Small Mines employment can either be the new "Small Mines (20)" factor or the existing "Respirator worn (0)" factor if a respirator was worn.

Please Note: As no Coal Miner's Strike information is known for the Small Mines then in the unlikely event that the mine was on strike it must be manually entered by using the special Strike Job and Respirator factor with start and end years set to 1984 and the ordinary area average selected as the mine. The small mines employment should then be set as two periods one ending in 1983 and the second starting in 1985.

The Menu Options

The following menu options are available:

File/Exit	Exit the program
View/Output on screen	Tick this option to have the results of the calculation show directly on the calculation tab
View/Output as Print Preview	Tick this option to have the results of the calculation show in a separate "Print Preview" window - from this the results can be printed or saved to an Adobe Acrobat PDF file
View/Output as HTML	Tick this option to have the results of the calculation saved to a temporary HTML file and displayed in your default web browser (usually Internet Explorer) - **note - due to the way web browsers work if it is using cached pages you may need to use the refresh button in your browser to see the results of the next calculation.**
View/Detail	If this option is ticked then the output of the calculation will include a lot more detail - untick it for normal summary output.
Tools/Options	Set options about where data files reside etc. - see Options Screen
Help/Contents	Display the main contents page of this help file
Help/Support	Display the help file page showing support contact details
Help/About	Display copyright and developer details, but more importantly the versions of the various components of the program see The About Screen

The Configuration (INI) File

The system is holds various settings in a configuration file (INI file). By default this will be BCRDL.INI in the same directory that you installed the application. However the system can be set to use another INI file by altering the shortcut to the program and specifying the full path of the INI file on the command line parameters

The INI file holds a mixture of system and user parameters - to allow network administrators to hold the databases on a central file server and maintain the "system" parameters centrally the INI file can be set to refer to another "system" INI file and any values in this other than for example screen size settings will override the values in the local INI file. To activate this feature a "System INI File" needs to be specified on the Tools/Options screen (or in the main INI file as key SystemIni in section Setup). If this points to a different file to the normal INI then the following occurs when each INI setting (except SystemIni itself) is read:
The key is read from the "local" INI file applying normal defaults
The key is read from the "system" INI file but set to default to the value obtained in step one if the key is not specified
This means that only keys to be overridden need to be defined in the system INI file - typically these will be the locations of the databases and the "Jurisdiction" key.

Note in normal use the settings would be maintained by using the Tools/Option menu item. The detailed settings available are listed in The INI File Keys

The INI File Keys

Section [Setup]

System setup information

SystemIni	The full path to the system "override" INI file - this file can be set to override settings in the local INI file. It is never written to by the program so only Read only access is required

Section [DustModel]

Information for the dust calculation engine

DustDatabase	The full path to the database that holds the PXR Data (usually DUSTDATA.MDB). On first run this database needs to be accessed read write to initialise the PXR matrix (only raw data points are distributed to keep the data file size down - and interpolated/extrapolated values are calculated on first use). Subsequently the file could be copied to a read only central location.
Jurisdiction	The system is designed to handle both Scottish and English/Welsh claims. A value of

	0 (zero) means English/Welsh, 1 (one) means Scottish.

Section [Data]

Information about the data entry program

Database	The full path to the database that holds the claimant data (usually BCRDL.MDB). This could be shared on a central file server but testing in this mode has only been limited.

Section [Screen]

Information about the start up size and position of the screen.

WindowState	Indicates the state of the window, 0 = Normal, 1 = Minimised, 2 = Maximised
Left	The leftmost position of the main form (in TWIPS)
Top	The top position of the main form (in TWIPS)
Width	The width of the main form (in TWIPS)
Height	The height of the main form (in TWIPS)

Section [Output]

Information for program output

HTMLFile	The full path to the temporary HTML file that will be created if HTML output is chosen - this must not be a shared file and read/write access is required.

Sharing data files among users

It is possible to save the claimant data database (default name BCRDL.MDB) on a shared network directory so that the same database can be accessed by multiple users. However if you do this you should be aware of the following provisos

1. The file must be held on a directory where users will have read/write access to the whole directory (as the Access database engine needs to be able to create lock files in the directory)
2. Extreme care must be taken when upgrading the software as all users will need to be upgraded to the latest version at once before they should be allowed to access the shared data file (i.e. the system does not support mixed versions of the client software accessing the same shared database).
3. After upgrading **a single copy** of the client software should be run first so that if the central database needs upgrading it will not encounter problems getting exclusive access to the database to preform the upgrade.
4. The system uses "optimistic" record locking so that if two users make changes to the same record the last to save will receive an error
5. The system has not been extensively tested in a multi-user environment

To share the BCRDL.MDB data file select the shared file from the Tools/Options dialog - or alter the INI file manually. You may also want to see Sharing data with the Pension Loss Calculator.

It is also possible to share the dust model internal information database (DUSTDATA.MDB) - but there is little benefit in doing this.

Sharing data with the Pension Loss Calculator

The data file used to hold claimant data for the BCRDL Dust Exposure Calculator and Pension Loss Calculator have been kept compatible so that it should be possible to share a single database between the two models to avoid re-entering claimant information etc. All the provisos listed in Sharing data files among users still apply but in addition beware of the following:

1. The default file names are different - either can be chosen
2. When updating either the Pension Loss Calculator or the Dust Exposure Calculator you will need to ensure all users are out of both systems

3. Problems may occur if two users try to update the same case - even if one is in the Dust Exposure Calculator and the other in the Pension Loss Calculator.
4. The Pension Loss Calculator will use the Recoverable Quantum figure calculated by the Dust Exposure Calculator but if it is edited in the Pension Loss Calculator the version will be changed to "Manual".

Please take care if working in this mode - and also note that due to limitations of the Access database engine this mode would not be suitable for large numbers of users all using the same database.

Getting Support

The DTI are providing front line support for this program through the IRISC support desk - the primary support is via email. If you do not have access to internet email see Other Ways of Contacting Support

Email: helpdust@capita.co.uk

Please try to give as much detail as possible with any support request - if the request is related to problems installing or running the program then ensure you provide the following information:

1. The versions of the Dust Data Entry Program, Calculation Engine and Dust Database (these can be found on the Help/About screen)
2. The operating system you are using (Windows 95, 98, NT, 2000 etc.)
3. The specification of your PC (include processor type, amount of RAM memory, amount of free disk space etc.)
4. A brief description of the area the problem occurred in (e.g installing, entering claimant details, entering employment details etc.)
5. As detailed a description as possible of the problem that occurred with the **full text** of any error message that was displayed if possible.

Although Workflow Consulting Limited developed the program they are unable to offer direct support. Any support requests requiring their attention will be sent on to Workflow Consulting Limited by the IRISC support desk so please do not contact Workflow Consulting Limited directly with normal support requests.

However Workflow Consulting Limited can help with importing data from other database systems into the model or integrating it with case management systems. This help would be chargeable and subject to a separate agreement between your firm and Workflow Consulting Limited. If you are interested in such assistance please email enquiries@workflowconsulting.co.uk with full details of what you require.

Other Ways of Contacting Support

The DTI are providing front line support for this program through the IRISC support desk - this can be contacted in the following ways:

Email:	helpdust@capita.co.uk
Telephone:	0845 601 3630 Helpline available from 9:00am to 5:00pm Monday to Friday only
Fax:	0114 203 4491 Ensure submissions are clearly marked "Dust Model Help"
Post:	Dust Model Help IRISC Queens House 105 Queen Street Sheffield S1 1GN
DX:	Dust Model Help DX 722180 SHEFFIELD 37

Workflow Consulting Limited

Workflow Consulting Limited are a consultancy specialising in the application of workflow analysis and software to improve and automate business processes. The company has particular experience in the legal sector and has worked with a number of large firms of solicitors.

If you are interested in the services of Workflow Consulting Limited please contact James Horsley by:

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