CODE FOR UNIFORM SYSTEM OF MAINTENANCE, CONTROL, VERIFICATION OF COAL STOCK AND MEASUREMENT, VERIFICATION OF OVER BURDEN REMOVAL IN ALL MINES OF COAL INDIA LIMITED

(REVISION- 2020)

"Yellow Book"

(UPDATED SEPT-2024)

P R E F A C E

The “New Code for Uniform System of Maintenance Control and Verification of Coal Stock in All Mines of CIL” commonly known as “New Yellow Book” was approved by CIL Board in its 273rd Meeting held on 20th Sept., 2011 vide item no. 273.4(G) and subsequently implemented in all mines of CIL from 01.01.2012. The guidelines issued under this Code was based on the conventional technologies which were available/ in use at that point of time. Since with change of time & implementation of various modern Survey equipment like ETS (Electronic Total Station), 3DTLS (3 Dimensional Terrestrial LASER Scanner) or ALS (Airborne LASER Scanner), computation of volume directly using software are now available and are being used widely in mining segment. CIL is also implementing these technologies in it’s mines considering higher accuracy, faster progress of work, proper planning/monitoring etc. In view of above, the existing provisions of New Yellow Book is inevitably required to be revised in order to incorporate these systems of measurement and computation of Coal and OB to be followed. In view of above, a committee has been constituted vide Order no. CIL / C-1/ Yellow Book / 2018-19 / 896 Dated 19.12.2018 for suggesting the modification in provisions of OB / Coal measurement using ETS, 3D TLS & software and also modification of some other provisions.

Accordingly, the following members of the committee participated in the meetings and deliberations held on 22.01.2019 at CMPDI, Ranchi and 26.02.2019, 27.05.2019, 26.09.2019, 27.09 2019, 19.10.2019, 20.10.2019, 21.01.2020, 30.01.2020 & 31.01.2020 at CIL HQ, Kolkata and also through Video Conferences on 22.04.2020, 27.4.2020 and 28.4.2020:

Sri K K Mishra	-	Dir (Technical) CMPDI, Ranchi	- Chairman
Sri S K Jha	-	GM (Min) / Prod, CIL	- Member
Sri N. Nath*	-	CM(M), representative of GM(Prod.), CIL	- Member
Sri Rajneesh Kumar	-	GM (Geomatics), CMPDI	- Member
Sri S P Bose	-	HOD (Survey), BCCL	- Member

* Nominated after superannuation of Sri S.K. Jha.

REFERENCE OF VARIOUS MANUALS/ DOCUMENTS DISCUSSED/ CONSULTED BY THE COMMITTEE:-

1) Code for Uniform System of Maintenance, Control and Verification of Coal Stock in all Mines of CIL – 1992. (Yellow Book)

2) New Code for Uniform System of Maintenance, Control and Verification of Coal Stock in all Mines of CIL – 2012. (New Yellow Book)

3) Recommendations of the committee of S/Shri R N Mishra, G C Mrig, U Kumar constituted by Chairman CIL vide office order reference CIL: CH: 65: 379 dated 20th May 1993. (Regarding OB Measurement)

4) Letter ref. no. CIL/ C-1/ F-37/ 03/ 251 dated 8th May 2003 issued under signature of GM (Prod) CIL. (Regarding major re-handling of OB)

5) Letter ref. no. CIL/ C-1/ C. Stock/ 87/ 1015 dated 23rd Oct 1987 issued under signature of Director (Technical) CIL. (Regarding conversion factor determination)

6) Letter ref. no. CIL/ C-1/ F-37/ 96/ 3628 dated 22-11-1996 issued under signature of Director (Technical) CIL. (Regarding accepted recommendations of System Improvement)

7) Opinions / suggestions as received from CVO, CIL and CIL subsidiaries.

COAL INDIA LIMITED

A MAHARATNA COMPANY

Premises No. 04 MAR, Plot No. AF-III, Action Area – IA

New Town, Rajarhat, Kolkata - 700156

CODE FOR UNIFORM SYSTEM OF MAINTENANCE, CONTROL, VERIFICATION OF COAL STOCK AND MEASUREMENT, VERIFICATION OF OVER BURDEN REMOVAL IN ALL MINES OF COAL INDIA LIMITED

Applicability and coverage

This code is applicable to all mines/ Washeries/ Deshaling plants/ Units of CIL. Director (Tech), CIL is empowered to issue order regarding implementation, discontinuance and/or modification of any particular system / clause, which shall be applicable irrespective of the provisions of this code with an intimation to CIL Board.

(1) DIFFERENT MINING TECHNOLOGIES PRACTICED IN COAL INDIA:

A) UNDERGROUND MINES

Different mining technologies used in UG mines of CIL for coal production are as follows:

- Longwall Mining
  - Conveyor Transport up to Surface
  - Conveyor Transport up to skip loading bunker followed by skip hoisting in shaft
- Bord & Pillar Mining
  - Loading by SDLs / LHDs into Conveyors
  - Loading by SDLs into Tubs
  - Loading into Conveyors and then transferred into mine cars
  - Cutting by continuous miner, loading into shuttle cars and transferred into conveyor belt.
- Highwall Mining

B) OPENCAST MINES

Different mining technologies used in OC mines of CIL for coal production and Over Burden Removal are as follows:

Coal Production

- Shovel-Dumper combination
- Payloader-Tipper combination
- Surface miner-Payloader-Tipper combination
- Shovel-In-pit Crusher-Conveyor

Overburden Removal

- Shovel-Dumper combination
- Dragline

(2) COAL PRODUCTION, OVER BURDEN REMOVAL AND WASHERY PERFORMANCE REPORTING

2.1 UNDERGROUND MINE

i) Shift-wise Production Report (2 copies) shall be maintained in a “Bound Paged Book” and / or in any secured electronic form like “coal net/ ERP or any such other system” at Mine office, as per Form 1-A.

ii) Daily Production Report (2 copies) shall be prepared on the basis of Shift Production Reports, in a “Bound Paged Book” and/ or in any secured electronic form like “coal net/ ERP or any such other system”. The Daily Production Report shall be maintained at Mine Manager office, as per Form 2-A.

2.2 OPENCAST MINE

A) OVER BURDEN REMOVAL

i) Shift wise Overburden Removal Report (2 copies) shall be maintained in a “Bound Paged Book” and / or in any secured electronic form like “Coal net/ ERP or any such other system” for Departmental (patch wise) and Outsourced patches (patch wise and contractor wise), at Mine office as per Form 1-B and 1-C respectively.

ii) Daily Overburden Removal Report (2 copies) shall be prepared on the basis of Shift Overburden Removal Reports in a “Bound Paged Book” and/ or in any secured electronic form like “Coal net / ERP or any such other system”. The Daily Overburden Removal Report shall be maintained for Departmental (patch wise) and Outsourced patches (patch wise and contractor wise) at Mine Manager office, as per Form 2-B and 2-C respectively.

B) COAL PRODUCTION

i) Shift wise Coal Production Report (2 copies) shall be maintained in a "Bound Paged Book" and/ or in any secured electronic form like "Coal net / ERP or any such other system" for Departmental (patch wise) and Outsourced patches (patch wise and contractor wise), at Mine office as per the Form 1-D and 1-E respectively.

ii) Daily Production Report (2 copies) shall be prepared on the basis of Shift Coal Production Reports in a "Bound Paged Book" and/ or in any secured electronic form like "Coal net/ ERP or any such other system". The daily Coal Production Report shall be maintained for departmental (patch wise) and outsourced patches (patch wise and contractor wise), as per Form 2-D and 2-E respectively at Mine Manager office.

2.3 COAL WASHERY / DESHALING PLANT (DEPARTMENTAL/ OUTSOURCED)

The various points of reporting along the production cycle in a Washery/ Deshaling plant shall be

- Raw Coal Receiving point
- Raw Coal feed-in point to Washery / Deshaling Plant
- Output points for different products of Washery / Deshaling Plant

i) Shift-wise Report (2 copies) containing information in terms of Quantity and Grade wise Raw Coal received from various Collieries, Raw Coal fed to Washery/ Deshaling Plant and Washery/ Deshaling Plant Production shall be maintained (departmental/ contractor wise) in a "Bound Paged Book" and/ or in any secured electronic form like "Coal net/ ERP or any such other system", at Washery/ Deshaling Plant's office as per Form 1-F and 1-G respectively.

ii) The Daily Washery/ Deshaling Plant Production report (2 copies) shall be prepared based on the Shift Reports of Quantity and Grade of Raw Coal received, Raw Coal fed to Washery/ Deshaling Plant and Washery/ Deshaling Plant production in a "Bound Paged Book" and / or in any secured electronic form like "Coal net/ ERP or any such other system". The Daily Raw Coal received at Washery/ Deshaling Plant and Washery/ Deshaling Plant production report shall be maintained, as per Form 2-F and 2-G respectively at Washery Manager/ Project Officer office.

2.4 One copy of all daily reports shall be sent to Agent/ Project Officer office.

2.5 Daily MIS

On a daily basis, Production of Coal, Overburden Removed, Clean/ Washed/ Deshaled Coal production, separately for departmental (patch wise) and outsourced (patch wise and contractor wise) work, along with other related parameters shall be maintained in a "Bound Paged Book" and / or in any secured electronic form like "Coal net/ ERP or any such other system" at Project Officer Office in form 3-A, at Area General Manager Office in Form 3-B and at General Manager (Production) Office (Subsidiary Company HQ) in Form 3-C.

The said report in Form 3-A shall be sent from Project/ Agent office/ Washery/ Deshaling Plant office to Area office, report in Form 3-B shall be sent from Area Office to Subsidiary Company HQ and report in Form 3-C shall be sent from Subsidiary Company HQ to CIL HQ.

2.6 Monthly MIS

Monthly Production of Coal, Overburden Removed, Clean/ Washed/ Deshaled Coal production, separately for departmental (patch wise) and outsourced (patch wise and contractor wise) work, along with other related parameters shall be maintained in a "Bound Paged Book" and / or in any secured electronic form like "Coal net / ERP or any such other system" at Project Officer Office in form 4-A, at Area General Manager Office in form 4-B and at General Manager (Production) Office (Subsidiary Company HQ) in Form 4-C.

The said report in Form 4-A shall be sent from Project/ Agent office/ Washery/ Deshaling Plant office to Area office, report in Form 4-B shall be sent from Area Office to Subsidiary Company HQ and report in Form 4-C shall be sent from Subsidiary Company HQ to CIL HQ.

2.7 All reports**,** which are generated**,** shift wise/daily /monthly shall be preserved and kept secured.

(3) Coal Production, movement and Over Burden Removal

a) In OC Mines all dumpers/ tippers transporting coal from mine face to different destinations such as pit head stockyard, siding, washery, silo, etc. shall be weighed and production should be reported accordingly.

However, in case of non-availability of adequate weighing arrangement, a time bound action plan should be made for arrangement of the same and till such time, reporting of

coal production can be made on the basis of 'Dumper Factor' with the approval of Director (Technical) of the subsidiary Company mentioning specific reasons, with intimation to concerned CMD and Director (Technical), CIL.

Further in case of departmental HEMM Dumpers deployed for coal production in departmental OC Patches production should be reported on the basis of the dumper factor.

b) In case of coal transferred and coal received involving two Collieries, the quantity shall be accepted with weighment at both ends, and at the end of the month, Managers/ Agents / Project Officer of both the Collieries shall sign coal transfer statement.

However, in case of non-availability of weighing arrangement at receiving end, a time bound action plan should be made for arrangement of the same and till such time, single side weighment shall be considered with approval of Director (Technical) of the Subsidiary.

c) The detection of fire in the coal stock and loss of coal due to pilferage or any other cause should be immediately reported to the concerned Area General Manager by the concerned Colliery Manager/ Agent/ Project Officer. The concerned Area General Manager shall take immediate action to inquire in to the matter by constituting an area level committee and communicate its report to the concerned Subsidiary Company Headquarter. The Subsidiary company shall investigate the matter by a departmentally constituted committee and write off action and book adjustment, if any, should be made in accordance with the recommendations of the committee, with approval of Subsidiary Company Board.

d) In case of underground mines, where tubs/ Mine Cars are used for raising coal, carrying capacity of each tub/ Mine Car in Te shall be determined. This may be called "Tub/ Mine Car Factor". The "Tub/ Mine Car Factor" shall be determined once in a year and approved by Area General Manager.

e) In case of non-availability of weighing arrangement in opencast mines and where dumpers are used for transporting coal, carrying capacity of each dumper in Te shall be determined. This may be called "Dumper Factor". In case of Over Burden, the Dumper Factor in CuM (in-situ) for different carrying capacity shall be determined. The "Dumper Factor" shall be determined once in a year and shall have approval of Area General Manager.

f) However, in all mines, where dumpers/ tippers are used for transportation of coal from stock to different destinations like siding/ washery/silo and others, shall be weighed.

g) In case of opencast mines, where overburden is removed by Dragline, Bucket Factor and Average operating cycles per hour of Dragline shall be determined once in a year and approved by Area General Manager. {Refer Clause 10 (C)}

h) All dispatches to outside parties shall be weighed.

i) If the Railway Receipts (RR) of some wagons dispatched during the month are not received before finalizing the dispatch figure, the quantity dispatched vide these wagons shall be found out from their carrying capacities. The correct dispatched quantity shall however be available in the next month and marginal adjustment shall be made in arriving at the dispatch of the next month. The method of such adjustment is given in the subsequent para.

Let A be the quantity of coal arrived at from the carrying capacities of the wagon and B is the weight of coal in these wagons as per RRs.

While arriving at the dispatch for the next month, the quantity B-A shall be added. If the figure is negative, it shall be subtracted.

Note: Dumpers include Tippers also

*Vide Office Order 475 dated 13.09.2023 –Clause no.3(a)

(4) Measurement of overburden removal

a) Measurement of over burden removal in open cast mines shall be done by using any of the system i,e, LASER scanner (Terrestrial or Airborne) and / or ETS.

b) In regard to computation of volume, for the routine measurement, the Mine may adopt any of the system either Cross Sectional Method or DTM to DTM method, but once a method is adopted that shall not be changed. However, if necessary to switch over to other system, it can be done with permission from Director (Technical) of the Subsidiary, mentioning the conditions for such change in system.

c) Original measurement data shall be preserved. Subsidiary shall provide suitable arrangement for storage for digital data.

d) In case of Over Burden, monthly measurement shall be carried out by colliery surveyor in both Hired and Departmental OC. In addition to monthly measurement of OB by Colliery Surveyor, quarterly measurement shall be carried out by a Team constituted at Area Level. For departmental OCs, half yearly and Annual measurement of over burden shall be conducted by a team to be constituted by subsidiary HQ or any other agency like CMPDI, authorized by subsidiary HQ.

e) However, the mines producing more than 1 million te of coal per annum shall be measured by CMPDI on annual basis.

f) Annual and / or Half yearly OBR measurement in all Hired HEMM Patches shall be conducted by CMPDI.

g) In case of any unforeseen circumstances / unavoidable reasons when CMPDI is unable to conduct measurements, subsidiary may engage any other agency or team, constituted at subsidiary HQ level for conducting measurement of OB, with approval of concerned CMD.

(5) Measurement of coal production

(A) Underground mines:

I. Weekly survey measurement shall be carried out to find out the quantity of coal extracted and the production reported during the previous week shall be reconciled, based on the measurement.

After reconciliation, quantity of coal extracted as derived by the survey measurement shall be final and the record of such reconciliation shall be maintained and signed by the Colliery Surveyor, Manager & Agent (Project Officer).

II. Before the commencement of extraction of pillars from an area, offset survey of the area shall be carried out and the quantity of coal (reserve) available in the area should be determined. Periodic offset survey shall subsequently be carried out with a view to find

out the quantity of coal extracted from the area. The subsequent survey shall be so timed (as far as practicable) that the quantity of coal left in stooks can be determined before they become unapproachable, due to extension of goaf. This offset survey shall not, however, be necessary for reporting production but shall enable determination of percentage of extraction, which will be useful from conservation point of view.

(B) Opencast Mines

I. Volumetric measurement of coal production can be determined in the same manner as in the case of Over Burden Removal, in case of virgin seam. If the seam is either caved in or under fire, area management shall take appropriate decision for measurement and computation of volume of coal extracted with subsequent reconciliation of the quantities with receipt/transfer, stock and dispatches.

II. In case, where the coal seam is banded with band of thickness of 1 metre or more, equipment is to be provided for taking out the band separately as overburden. However, in actual operation, sometimes band gets mixed with coal. Therefore, while reporting coal production, proper care should be taken to discount the percentage of band, if it gets mixed up with coal and discounted volume shall be reported as OB

III. In case, where the coal seam is banded with band of less than 1 metre thickness where ever Surface Miner is in operation these bands to be separated at the point of production and to be reported as over burden.

IV. In case of conventional method of drilling blasting, if such band gets mixed along with coal due to geotechnical reasons, efforts shall be made to segregate band at the point of production as far as possible. Even after, if any band gets mixed with ROM, proper care should be taken to segregate and quantify the band etc. Such quantity of band shall be accounted accordingly on monthly basis with approval of Area General Manager.

V. Suitable arrangement for segregation of band shall be made from the Stockpile as well as from dispatch point.

VI. Reporting of such bands as coal production and keeping it, as mixed stock shall not be permitted.

(6) Methodology for Survey Measurement using different modern instrument

(A) Electronic Total Station (ETS)

I. While conducting survey with ETS, permanent stations shall be established, around the area to be surveyed, by close circuit traverse survey in reference to the permanent colliery base stations with X, Y, Z Co-ordinates. Those Survey Stations shall be

established in such manner so that total area of interest is fully covered. The spot data shall be taken on random basis in close vicinity with each other, considering topography of the ground.

II. Where area to be surveyed is inaccessible due to fire, gas, subsidence etc, the spot data may be taken by reflector less mode of ETS.

III. Such spot data collected in the field shall be downloaded to Computer and then processed using available software for preparation of Plan. These data shall be interpolated on each grid point generated at 5/10/15 metre interval, as the case may be. These grids shall have specific nomenclature, preferably in Alpha Numeric System e.g. A1, A2 … B1, B2….. etc.

IV. Subsequent surveys shall be carried out in same manner and to be interpolated over the same corresponding grid points, through software, as of the initial measurement/ survey, in order to get the depth of cutting at each grid point.

V. Calculation of volume in between any two spell of survey may be determined by adopting any of the methods mentioned below:

(a) Cross Sectional Method

By generating cross sections at required interval (5/10/15 metre) using any of the suitable survey software (Like LISCAD, SURPAC, AUTOCAD etc) for both the spells of survey and superimposing on each other using suitable software. The area of all cross sections (Cut or Fill) thus can be obtained from the software and volume shall be calculated by Trapezoidal rule using spread sheet like MS EXCEL or any other similar format.

(b) DTM to DTM

By creating two different DTM (Digital Terrain Model) for initial and final or between any two spells of survey using merged/ edited/ cleaned data using suitable software. Volume may be obtained directly from the software.

(B) LASER Scanner (LS) (3D TLS or ALS)

(a) For Survey with LASER Scanner, permanent stations shall be established, around the area to be surveyed by close traverse survey w.r.t. the permanent base Stations of the Colliery. These Survey Stations shall be established in such positions; so that the entire mine area can be scanned with sufficient overlapping of scan data taken from different scan positions. Before scanning of a mine area, all bushes and trees, dwelling etc. within the area are to be removed, if there is any waterlogged area it has to be dewatered, so

that the actual surface can be scanned. In extreme unavoidable condition, only where scanning is not possible for any particular area, the spot data of only such area may be taken by ETS, which are to be incorporated with the scan data as an input data for preparation of plan to get actual profile of the mine.

(b) Scan data collected by LASER Scanner in the field shall be processed using compatible software. The raw data collected from each scan position by 3D TLS shall be geo-referenced / transformed in to the co-ordinate of colliery survey network. These data shall be interpolated on grid generated at 5/10/15-metre interval, as the case may be for preparation of plan.

(c) Subsequent surveys shall be carried out in same manner and to be interpolated over the same corresponding grid points as of the initial measurement/ survey.

(d) However, calculation of volume in between any two spell of survey may be determined by adopting any of the methods mentioned below:

i. Cross Sectional Method

By generating cross sections from processed scan data (not from the grid data) at required section interval (i.e 5/ 10/ 15m) using any suitable survey software (Like LISCAD, SURPAC, AUTOCAD etc) for both the spells of survey. The cross sections for both the spells of survey are to be superimposed on each other. Areas (Cut or Fill) of each cross section are then to be determined through software. In situ volume of excavation shall be calculated from these cross sectional areas using Trapezoidal rule using any spread sheet like MS EXCEL or any other similar format.

ii. DTM to DTM

By creating two different DTM (Digital Terrain Model) for initial and final or of any two spells of survey using merged/ edited/ cleaned point cloud data in any suitable software. In this case volume (Cut or Fill) may be obtained directly from the software.

(C): *<u>*STANDARD OPERATING PROCEDURE (SOP) FOR COAL STOCK MEASUREMENT USING TERRESTRIAL LASER SCANNER (TLS) & DTM to DTM VOLUME COMPUTATION.*</u>*

1) SOP for Coal Stock Measurement by using 3DTLS and computation of volume by adopting DTM to DTM method is as under:

a) All heaps shall be so stacked that the GL's along the periphery can be identifiable and visible, so as to ensure that TLS can be set up all around the Coal Heap for the purpose of scanning. Judicious decision shall be taken by the Team for setting up of TLS as per site conditions.
b) Grade-wise stocks shall be stacked separately, so that instrument can be set-up in between the heaps considering the field of view of TLS. Heaps shall not be overlapping with each other.
c) Heaps of Compact Coal shall be dozed & fairly levelled to maintain an overall uniform shape. This is to reduce the scan shadow and to minimise / reduce the number of scans for the area.
d) As far as practically possible, Heap of Loose Coal shall also be levelled to maintain an overall uniform shape.
e) Pillars at suitable interval around the coal heaps shall be established by a closed traverse survey and properly numbered. Interval between the pillars shall be such that, while scanning sufficient overlap of scan data can be captured.
f) A duly certified Stock Heap plan (1:4000) shall be submitted to the measurement team showing the reference pillars with its x, y, z co-ordinates, prior to start of measurement.
g) During the course of measurement by TLS, movement of dumpers / vehicles etc. shall be restricted, as far as possible, to minimise / reduce the dust / noise around the stock yard.
h) The x,y,z co-ordinates of the approved contour (GL) Plan, of all the heaps to be measured with TLS, shall be tabulated in excel file (in soft copy), and approved by Area GM, so that the same can be handed over to the measurement team for DTM generation of the ground. Hard copy of the x,y,z coordinates approved by Area GM, shall also be provided to the measurement team.
i) In case of new stock DTM of original ground level shall be taken with 3D TLS before stacking of coal & kept for future references.
j) All the relevant logistical and manpower support shall be provided to the team on requisition by team leader.

2) Methodology of Measurement & Processing:

The measurement team shall ensure that:

On receiving all the required documents e.g. Stock Heap Plan (1:4000) & Contour Plan (1:1000 / 1:500), the team shall do the reconnaissance survey of the Coal Stocks/Heaps along with the colliery officials & satisfy themselves prior to start of TLS Survey.

a) TLS shall be set up over the pre- established reference pillars or reference station established by measurement team and back sight method may be used for referencing. If the back-sight method of survey/ referencing not felt suitable by the team as per the field condition, the team shall use ETS for fixing of Survey Station & survey of reflectors/ tie-points for geo-referencing in free station method. Such traverse survey must be within the limit of permissible error specified by DGMS for surface traverse survey.
b) A closed polygon survey using ETS shall be conducted around the periphery of the Coal Heap. The same shall be considered as Coal Heap periphery during DTM to DTM volume calculation.

c) When a Coal Heap is in combination of both Compact Coal & Loose Coal, for segregation, the volume of Loose Coal shall be measured separately (using Measurement Tape/ ETS/ Levelling Instrument) and the details of the same shall be recorded.
d) The measurement team shall also record the details of TLS set up, ref. stn. Co-ordinates, and tie point co-ordinates against each Coal Heap in addition to other relevant details as mentioned in the Annual Stock measurement office order Guideline issued from CIL prior to Annual Coal Stock Measurement. Sketch plan of the coal heap/heaps shall be drawn in Measurement Book (MB) showing the positions of TLS station etc. to understand the sequence of field survey.

e) After completion of the field survey the raw data from TLS and ETS shall be downloaded. The raw & processed data of TLS, ETS and photo copy of MB shall be submitted along with the measurement report. At the end of field work raw data will be preserved in two hard disc to be provided by subsidiary companies to

the measurement team. Measurement team will submit One Hard Disc containing all measurement data to GM of the Area and other to GM (Production / Coordination / CSM) of the subsidiary company.

f) The data collected from each scan position by 3D TLS shall be registered/ geo-referenced with back sight orientation method or w.r.t. the coordinates of tie points collected by ETS. The entire scan data collected from different scan position thus transformed in to the co-ordinates of colliery survey network. The scan data collected from different scan positions are then to be merged to form a single point cloud data for the entire Coal Heap. The Scan data collected by 3D TLS in the field shall be properly cleaned through software/ manual interface before further processing.

g) By creating two different DTM (Digital Terrain Model) for Ground Level from the authenticated excel file submitted by the project authority and Coal Heap Surface (of cleaned point cloud DATA) in Riscan Pro software or any other suitable software and thus volume may be obtained directly from the software within the surveyed periphery of the coal Heap. This volume computed through DTM to DTM method by software will be treated as final. A screen shot of the result may be saved for reference & the result shall be recorded in the MB.

   For volume computation in Riscan Pro software, DTM generated from GL may be considered as reference DTM and coal surface (surveyed by team) may be considered as Base DTM. The fill volume in the result shall be considered as volume of coal in the heap. If any cut volume is shown due to any reason, the same shall be ignored.

   If the Coal heap is combination of both Loose & compact coal, the volume of Loose Coal & Compact Coal shall Segregated on the basis of Loose coal measured separately [as mentioned in point no: (C)], and recorded in MB.

h) For preparation of plan, these point cloud data shall be interpolated on 10 m grid using LisCAD/ Surpac software or any other software. And a plan in suitable scale shall be prepared using AutoCAD or any other CAD software showing:

i) Grid Levels of Ground Level (G.L.) (provided by the project vide approved contour/grid plan).
ii) Grid level of Top RL (above coal heap).
iii) Name & location of coal Heap & grade of coal
iv) Surveyed periphery of the coal heap.
v) The plan must contain a note stating the co-ordinates of reference base stations, from which the survey is carried out.
vi) The plan must be signed by the Project Surveyor, Project Manager, Agent/ Project Officer, Area Survey Officer, Addl General Manager, General Manager, CIL Team Leader & CIL Team members.

i) The measurement team shall certify that :-

"The measurement for Coal Heap No: ___, ____,____ & ____ has been done correctly using Terrestrial Laser Scanner from _____ nos. of different scan positions altogether. The loose coal over Heap No. ____, ____ & ____ has been measured correctly using _____ (Tape /ETS/Level) and recorded in MB from page no:_____ to ____. The volume of Coal calculated correctly using DTM to DTM method using _____ software and between the DTM generated by the GL's provided by the project & DTM generated from the Coal Heap surface surveyed by the measurement team."

j) All necessary certifications as mentioned in Yellow Book-2020 & Office order for Annual Coal Stock Measurement (Circulated every year) are also to be submitted by the measurement team and mines/area/subsidiary.

*** Vide Office Order No. 450 dated 01.09.2023- SOP for Coal Stock Measurement Using TLD Volume computation DTM to DTM shall be introduced as Clause 6(C).**

(7) Initial & subsequent Surveying and Levelling

(a) Before an area is taken up for opencast mining, three or more masonry pillars shall be constructed as benchmark survey station. The pillars shall be so constructed that they are inter-visible and are of permanent nature. Colliery authority has to ensure that such survey pillars are well kept till end of the project. In case of any unavoidable circumstances, proper action shall be initiated by colliery for establishing new survey pillar with information and consultation with subsidiary HQ and concerned authority. Each pillar shall be numbered and recorded on the Plan accordingly.

(b) In case of a working quarry, pillars shall be constructed on the solid ground in the virgin area of the quarry as per detail mentioned above.

(c) During processing of data in software, square grid to be drawn at 5 or 10 or 15-metre interval and sections shall be drawn preferably in Dip Rise Direction of the Mine.

(d) In case of departmental patches, which are not covered by CMPDI measurement, the initial profile survey shall be made by conducting survey by a committee, constituted either at Area/ HQ level. Such survey will give initial profile of the Opencast mine.

(e) Thereafter, every month, surveying shall be carried out by the concerned Colliery Survey team for making the updated profiles of the opencast mine, in order to arrive at the quantity of correct excavation of coal and overburden.

(f) In case of opencast mine being worked on developed workings either in single section or multi sections, a committee at area level consisting of Addl GM/ Staff Officer (Mining), Area Survey Officer, Colliery Manager, Project Officer/ Agent and Colliery Surveyor shall be constituted to determine the quantum of void, due to underground galleries, on the basis of mine plans and where it is possible by physical measurement, during the excavation of the faces. Records of such determination of void (with reference number of mine plans used / considered) duly signed by the committee members, shall be kept at Colliery and at Area. This will form the basis of calculation of extracted quantity of coal, when the pillars / stooks and partings are mined out by open cast method. This exercise is to be done on monthly basis and updated accordingly. Subsidiary shall develop a suitable SOP in regard to above and shall adopt with approval of Director (Technical) of the subsidiary.

(g) In case the workings are not approachable due to fire, subsidence or any other reasons, the quantity of coal locked in the pillars shall be assessed on the basis of mine plan, taking the average width of the gallery and height from the section of the plan.

(h) When coal seam is exposed, the levels (RL) of the top of the seam shall be taken before the coal is extracted. Similarly, the levels of the floor of the seam shall be taken before the area is back filled or allowed to get drowned.

(i) If the seam is either caved in or is under fire, Area management shall take appropriate decision, depending on the situation, for measurement and computation of volume of coal extracted with subsequent reconciliation of the quantities with receipt / transfer, stock and dispatches. However, under any circumstances, composite measurement (Over Burden + Coal) right from the initial profile to finished coal floor shall be conducted in order to determine the composite volume of excavation. Thus, while working at such un-approachable area, quantity of Over Burden shall be computed by deducting the quantity of coal from the composite measurement.

(8) Maintenance of measurement Record

(a) The plan of the quarry shall be drawn on plain paper used in plotter or on polyester paper of suitable micron on a suitable scale either 1:500 / 1:1000 / 1:2000. The ground level shall be recorded at 15m or less, as the case may be. The number / nomenclature of pillar / Survey Station shall be recorded on the plan. Each plan shall be numbered. The plan of the quarry shall be maintained at Colliery and at Area Office.

(b) Such Plan, Cross Section, Traverse Calculation, Raw Files, volume Calculation files shall be preserved in soft copy in separate media for record at Colliery and at Area office. Hard copy of Plan, Section, Volume computation for Coal and OB separately, Void deduction etc shall be kept in Soft as well as in Hard Copy for all spells of survey. The plan shall be signed by Colliery Surveyor, Manager & Agent of the mine and shall be counter signed by concerned Area officials and contractor or his authorized representative in case of outsourced / Hired HEMM patches. ***** *Colliery Surveyor and Area Survey Officer are responsible for upkeep of soft copy & hard copy of Plan, data etc. mentioned in instant clause at colliery level and Area level respectively***.**

(c) All field books and measurement reports/records shall be preserved for future reference at Colliery as well as Area.

(d) A bench mark and a base line shall be maintained at suitable places away from the quarry on firm undisturbed ground. The level and position of the survey stations shall be rechecked in reference to the benchmark and base line, every six months by Area Survey Officer or his representative.

*** vide Office Order No. 545 dated 05.10.21-Clause 8(b)**

(9) Levels to be Considered

While measuring Over Burden Removal, the levels up to the top of the seam are only relevant; if the coal top is approachable i.e. the seam is not affected due to subsidence or under fire. If the seam is either caved in or under fire, Area management shall take appropriate decision as per standard systems, depending on the situation for measurement and computation of volume of Over Burden extracted.

(10) Tub / Mine car, Dumper and Bucket Factors determination

(a) In case of underground mines, where tubs / Mine Cars are used for raising coal, carrying capacity of each tub / Mine Car in Te shall be determined. This shall be called "Tub / Mine Car Factor". The "Tub / Mine Car Factor" shall be determined once in a year and approved by Area General Manager.

(b) In case of opencast mines, where dumpers are used for transporting coal and overburden, carrying capacity of each dumper in Te and cum (in-situ) respectively shall be determined. This shall be called "Dumper Factor". The "Dumper Factor" shall be determined once in a year and approved by Area General Manager.

(c) In case of opencast mines, where overburden is removed by Dragline, Bucket Factor (In-situ volume) and Average operating cycles per hour of Dragline shall be determined once in a year and approved by Area General Manager.

Bucket Factor = Bucket capacity x Swell Factor x Bucket Fill Factor

Where, Swell Factor = In-situ Volume/ Loose Volume;

Bucket Fill Factor is percentage of bucket filled e.g. if bucket is 95% filled, then Bucket Fill factor is 0.95.

(d) Such Tub/Mine car, Dumper and Bucket factors shall be determined by a committee consisting of Area and colliery level officials comprising Survey, Mining and finance departments and such determined Dumper, Bucket and Tub/ Mine car factors shall have approval of Area General Manager.

Dumper, Bucket and Tub/Mine Car factors shall be determined once in the FY. This shall be done during the beginning month of the FY.

(e) **STANDARD OPERATING PROCEDURE (SOP) FOR DETERMINATION OF DUMPER, TUB/ MINE CAR FACTOR AND CONVERSION FACTOR OF LOOSE & COMPRESSED COAL IN THE STOCK**

Dumper, Tub/ Mine Car factor applicable for opencast and under ground mines

i. Dumper and Tub/Mine Car factors shall be determined by Area level committee by conducting actual field measurements, as per the procedure described below and such

Dumper, Tub/Mine car factor shall have approval of Area General Manager. The Area level committee shall be constituted with members as below:-

- Addl. General Manager / Staff Officer Mining - Chairman
- Area Finance Manager or representative - Member
- Area Survey Officer - Member
- Project Officer/ Agent of concerned mine - Member
- Colliery Surveyor / Survey Officer - Member

ii. Approved Dumper, Tub/ Mine Car Factors shall be used by the mine to report shift wise coal production and over burden removal.

iii. The Dumper, Tub/ Mine Car factors shall be determined grade wise for coal and for different carrying capacities of dumper for OB.

iv. During determination of Dumper, Tub/ Mine Car factors, committee members shall ensure proper loading of Coal or over burden.

v. Methodology for coal:

A. In the process of determination, initially the committee shall take the tare weight of one or more dumper.

B. Minimum 5 Dumpers, Tubs/ Mine Cars of particular capacity shall be selected and the quantity of coal loaded are to be dumped over a levelled surface and all extraneous materials are to be picked out manually.

C. Coal shall be loaded in the dumpers and weighed.

D. The net weight of Coal shall be calculated:
(Gross weight – tare weight = Net weight)

E. Dumper, Tub/Mine car factor shall be determined as:

- Tare weight of the Dumper (in Te) = X1, X2, …. Xn
- Number of dumpers, tubs/mine cars = n
- Loaded weight of the dumper (in Te) = Y1, Y2, ….. Yn
- Net weight of loaded coal, say N (in Te) = (Y1–X1) + (Y2–X2) ....+ (Yn–Xn)
- Average Dumper, Tub/Mine Car factor (in Te per Dumper, Tub/Mine Car) = N ÷ n

vi. Methodology for Over Burden (OB):

A. Minimum 5 Dumpers of particular capacity shall be selected and OB loaded is to be dumped over a levelled surface to measure the volume of total OB. Dumped OB shall be stacked in a geometrical shape, as far as possible.

B. The volume of loose OB dumped as above, shall be measured by averaging the measurements of lengths, widths & heights of the dump. Thus the volume shall be calculated as –

Volume 'V'= (L Avg. X W Avg. X H Avg.) (Unit: in CuM)

C. Volume of loose OB derived as above shall be converted to in-situ volume V1 by applying determined swell factor, which shall be provided by the mine management.

V1 = (V x Swell Factor) (Unit: in CuM) [Swell Factor = In-situ Volume/ Loose Volume]

D. If 'n' is the number of Dumpers selected, then the dumper factor of in-situ OB shall be determined as –

Dumper factor = (V1 ÷ n) (Unit: in Cum / Dumper)

vii. The entire field note/ measurements shall be recorded in MB and signed by all committee members.

viii. This system will be applicable for all departmental/ contractual OCs & UG mines.

(11) Coal Stock measurement

(a) ***Measurement of **heap/heaps of** Coal Stock shall be done using either Terrestrial LASER Scanner (3DTLS) or Electronic Total Station (ETS) or *Drone-based photogrammetry **as a principal means/instrument.***

***Provided** that in case of small loose coal heaps spread over at sidings, CHPs, and other places, which may not be practically possible to measure using ETS, having a cumulative quantity of **1000 t or less,** the measurement may be done by using conventional system i.e. Theodolite, Auto Level and Tape.*

*Provided further that due to practical difficulties smaller coal heaps having stock less than 25,000 t **and coal heaps at railway sidings** shall be exempted from measurement by 3DTLS/Drone based photogrammetry.*

(b) The ground on which coal is likely to be stacked shall be properly surveyed and levels at 10-meter interval shall be taken. A few pillars at suitable intervals around the proposed stacking place shall be constructed. The pillars shall be numbered. All coal shall be stacked at pre-fixed locations duly approved by Area GM.

(c) Coal stock shall be stacked and measured grade-wise.

(d) All Colliery/Washery/Deshaling Plant shall maintain contour plan of the stacking areas where coal stocks are to be stacked. These plans shall be duly certified for correctness and signed by Colliery Surveyor, Manager and Agent of the Colliery/Washery/Deshaling Plant. The contours shall be drawn on 1:1000 or 1:500 scale, depending on the area involved, up

to 2m contour interval for the entire coal heap. Stock Heap Plan shall have square grid pattern of not more than 10 Metre interval. Such stock heap plan showing all heaps shall be maintained in a scale 1:4000. The contour plan & stock heap plan shall have a number with signature of Colliery/Washery/Deshaling Plant Surveyor, Manager, Agent / Project Officer, Area Survey Officer, AGM / SO (Min) and Area GM.

(e) At the end of each month, the spot levels on the surface of the coal stock at the same spots, as earlier recorded, shall be measured or random data collected by ETS or 3D TLS shall be interpolated on the same spot/ grid point of contour plan. Any standard method (As mentioned in Clause no 4, 5 & 6) of measurement of stock may be adopted. This method shall be recorded at the Area, by the Area Survey Officer.

Where Drone based measurement is being adopted as method of measurement, SOP for Coal Stock Measurement using Drone Based Photogrammetry will be followed.

(f) Monthly measurement of coal stock is to be done by Colliery Surveyor at the end of each month. In addition to monthly measurement of coal stock by Colliery Surveyor, quarterly measurement shall be carried out by Coal Stock Measurement Team constituted at Area level, six monthly measurements shall be carried out by Coal Stock Measurement Team constituted at Subsidiary Company level and Annual coal stock measurement as well as Check coal stock measurement shall be carried out by Coal Stock Measurement Team constituted at Coal India Limited. This is necessary to exercise checks by the Companies and to take corrective measures by them, if any discrepancy is noticed.

(g) In-situ coal lying in quarry bench shall not be considered as stock and should not therefore be measured as stock.

(h) Mixed stock or coal stock on fire shall not be included in the physical stock measurement of ROM coal.

(i) In case of bunkers, it is difficult and somewhat dangerous to take spot levels of the coal in the bunker. As such, visual estimation may be resorted to. Wagons may be loaded from bunkers filled up to different levels. To find out the tonnages of coal in bunkers filled up to different levels, observations may have to be carried out for a period of at least 30 days. The tonnages dispatched corresponding to different level can be recorded. Little variation will not matter in the long run. However, if coal is pushed out of the bunker to accommodate more coal than its designed capacity, same procedure as for the measurement of ground stock, has to be adopted.

(j) The quantity taken out from overloaded wagons at the railway weighbridges and kept there on Colliery account, shall be taken into stock.

(k) The coal in wagons standing at the siding shall be taken in stock.

(l) * ***STANDARD OPERATING PROCUDURE (SOP) FOR COAL STOCK MEASUREMENT USING DRONE BASED PHOTOGRAMMETRY & DTM TO DTM VOLUME COMPUTATION.***

SOP for Coal Stock Measurement by using Drone based Photogrammetry and computation of volume by adopting DTM to DTM method is as under:

a) All heaps shall be so stacked that the GL's along the periphery can be identifiable and visible. The coal heap shall not be under the canopy of trees, so that it is visible from Drone flying above it. At least two (2) metres clear space shall be available around the coal heap. Coal Heap shall not be stacked over OB Dump.

b) Grade-wise stocks shall be stacked separately, Heaps shall not be overlapping with each other. At least two (2) metres clear space shall be kept between such heaps.

c) Heaps of Compact Coal shall be dozed & fairly levelled to maintain an overall uniform shape. This is to increase the accuracy of the measurement.

d) A duly certified Stock Heap plan (1:4000) shall be submitted to the measurement team showing the reference pillars (Base Stations) with its x, y, z co-ordinates, prior to start of measurement. The coordinates shall be in WGS 84/ UTM coordinate system.

e) During the course of measurement/ flight of Drone, movement of dumpers/ vehicles etc. shall be strictly restricted.

f) The x, y, z co-ordinates of the approved contour (GL) Plan, of all the heaps to be measured, shall be tabulated in excel file (in soft copy), and approved by Area GM, so that the same can be handed over to the measurement team for DTM generation of the ground. Hard copy of the x, y, z coordinates approved by Area GM, shall also be provided to the measurement team in WGS 84/ UTM coordinate system.

g) In case of new stock, DTM of original ground level shall be taken with Drone based photogrammetry supported by DGPS, before stacking of coal & kept for future references.

h) All the relevant logistical and manpower support shall be provided to the team on requisition by team leader.

Methodology of Measurement & Processing:

The measurement team shall ensure that:

On receiving all the required documents e.g. Stock Heap Plan (1:4000) & Contour Plan (1:1000 / 1:500), the team shall do the reconnaissance survey of the Coal Stocks/Heaps along with the colliery officials & ensure that it conforms to the provisions of this SOP, prior to start of Survey.

A) DGPS Base Unit shall be set up at known Base Station for recording of the data.

B) A survey using DGPS Rover Unit shall be conducted around the periphery of the Coal Heap. The same shall be considered as Coal Heap periphery during DTM to DTM volume calculation.

C) Ground Control Points (GCPs) shall be placed/ marked on and around the coal heap. The GCPs shall be clearly visible in Drone based Photographs. Some (at least 3) GCP's of permanent in nature around the periphery shall be set up for regular use. The spacing of GCPs shall be maximum 100 m apart on top of coal heap, but minimum three (3) GCPs shall be placed on top. Nos. of GCPs to be placed around the periphery on ground shall be at least 1.5 times the nos. of GCPs placed on the top.

D) The DGPS Rover unit shall be set-up on the GCPs, one by one and record the data.

E) The Drone (preferably PPK enabled) unit shall be fixed with Optical Sensor (Camera) of at least 24 MP. Mission Planning shall be done in the Ground Control Station of the Drone.

F) Survey of the coal heap shall be done by Drone based photogrammetry. Drone shall be flown from any suitable levelled and open surface. At least 5m x 5m open levelled surface will be required for take off and landing of UAV.

G) The DGPS Data shall be downloaded and processed in its software to get the coordinates of the periphery and GCPs.

H) The Drone data shall be downloaded and processed in the photogrammetric software for generation of DTM, on the basis of coordinates of GCPs, captured through DGPS. The data shall be cleaned of any noises before volume computation.

I) For Volume Computation, DTM to DTM method shall be used in the suitable photogrammetry Software or any point cloud data processing software used in Survey. Thus volume may be obtained directly from the software within the surveyed periphery of the coal Heap. This volume computed through DTM to DTM method by software will be treated as final. A screen shot of the result may be saved for reference & the result shall be recorded in the MB.

J) When a Coal Heap is in combination of both Compact Coal & Loose Coal, for segregation, the volume of Loose Coal shall be measured separately (using Measurement Tape/ ETS/ Levelling Instrument) and the details of the same shall be recorded.

K) The measurement team shall also record the details of Drone and sensor used, reference stations, Co-ordinates, and GCP co-ordinates against each Coal Heap in addition to other relevant details as mentioned in the Annual Stock measurement office

order Guideline issued from CIL prior to Annual Coal Stock Measurement. Sketch plan of the coal heap/heaps shall be drawn in Measurement Book (MB)

L) The data of DGPS and Drone based photogrammetry (in soft copy) and photo copy of MB shall be submitted along with the measurement report. At the end of field work data will be preserved in two indexed hard disc to be provided by subsidiary companies to the measurement team. Measurement team will submit One Hard Disc containing all measurement data to GM of the Area and other to GM (Production / Coordination / CSM) of the subsidiary company.

M) Following documents may be kept for documentation & record :

a) Certified copies of the Ground contour Plan & Location Plan for the Coal Heaps by the Project.

b) Certified list showing Co-ordinates of DGPS base stations, Co-ordinates of GCP's of permanent in nature by the Project.

c) DGPS Co-ordinates of the Base & other GCP's after post processing.

d) The MB containing the details of measurement, instruments and other loose measurements, if any, done by the Team.

e) Screen shot showing the DTM to DTM Volume computed by the Software.

f) The measurement team shall also certify that:-

"The measurement for Coal Heap No: ___, ____, ____ & ____ has been done correctly using Drone Based Photogrammetry. The loose coal over Heap No. ____, ____ & ____ has been measured correctly using _____ (Tape /ETS/Level) and recorded in MB from page no:_____ to ____. The volume of Coal calculated correctly using DTM to DTM method using _____ software and between the DTM generated by the GL's provided by the project & DTM generated from the Coal Heap surface surveyed by the measurement team."

g) All necessary certifications as mentioned in Yellow Book & Office order for Annual Coal Stock Measurement (Circulated every year) are also to be submitted by the measurement team and mines/area/subsidiary.

h) Due to practical difficulties smaller coal heaps having stock less than 25000 te. shall be exempted from Drone Based measurement.

i) Drone based survey may be carried out in such dumps where there is no interference of any kind which can hamper the acquisition of data by drone. DGCA guidelines shall be followed for survey by drone.

List of Equipment:

1. Drone - preferably PPK enabled, along with accessories.
2. Optical Sensor (Camera) to be mounted on drone- at least 24 MP.
3. DGPS - One Base and at least one Rover Unit along with accessories.
4. DGPS Data Processing Software.
5. Drone Ground Control Station - Laptop/ toughbook/ controller unit.
6. Drone Mission Planning software.
7. Photogrammetry software with volumetric computation module/ Point cloud data processing software with DTM to DTM volumetric computation module.
8. High end workstations- Minimum 64 GB RAM (Preferably 128 GB RAM), 1 TB SSD or facility of Cloud data processing platform.
9. All Accessories of Drone and DGPS equipment

Office Order no. 42 dated 08.12.2023-*Drone Based Measurement for coal stock was adopted [Modification in clause 11(a)&11(e)] and SOP for Coal Stock Measurement was introduced.

Office Order no. 568 dated 18.11.2023- **Further redrafted clause no. 11(a) shall be adopted and coal heap at railway siding shall be exempted from 3DTLS/ Drone Based Measurement.

(12) Conversion of weight to volume and vice-versa

(a) The density of the particular seam in operation shall be determined and volume of coal extracted in cubic meter shall be multiplied by the density to arrive at the production in Te.

(b) If the seam is not approachable for direct volumetric measurement, using ETS or 3D TLS, due to either caving/ subsidence or under fire, the quantity of volume of coal extracted may be calculated from quantity of production reported and using the same seam wise density of coal, with subsequent reconciliation of the quantities with receipt / transfer, stock & dispatches.

(c) Such density/ specific gravity of in-situ coal of each seam proposed to be worked or being worked shall be determined by any of the Govt Scientific Institution/ CMPDI and the same must have approval of Director (Technical) of the Subsidiary company. Periodicity of determination of seam wise in-situ coal density may be considered as once in a year or subsidiary company may introduce a suitable SOP duly approved by Director (Technical) of the subsidiary company.

(13) Conversion factor (Volume to Weight) for heaps of coal/ coke/ product(s) from Washery/ Deshaling plant of Mine, Coke Plant & Siding

i. Conversion factor (Cum/ Te) of loose and compact heaps of Coal / Coke / product(s) from Washery/ Deshaling plant shall be determined by a committee duly constituted and approved by Director (Technical) of the subsidiary. The committee for determination of conversion factor shall be constituted with members as follows:

- Addl GM / Staff officer Mining posted at Area – Chairman.
- Area Manager Finance or representative – Member.
- Area Survey Officer – Member.
- Agent / Project Officer Concerned unit – Member.
- Representative of GM (Prod) HQ (mining discipline) - Member.
- Survey Executive from HQ – Member.

ii. The conversion factor shall be determined as per the procedure described below:-

A. The conversion factors shall be determined heap wise/ grade wise separately. For loose heaps, only grade wise conversion factor shall be determined.

B. Conversion factor determined three years earlier to 1st March of every year should be re-determined. However, determination within the stipulated period also shall be done in case of change in grade of coal and any new heap created.

C. Committee during determination of conversion factor shall examine and confirm the status of the Coal/ Coke / product(s) from Washery / Deshaling plant stock such as whether LOOSE or COMPACT.

iii. Conversion factor of loose heap of Coal/ Coke/ product(s) from Washery/ Deshaling plant

A. In the process of determination, initially the committee shall take the tare weight of one or more tippers.

B. For loose heap, some quantity loose Coal/ Coke / product(s) from Washery/ Deshaling plant, free from extraneous materials shall be loaded in the tipper and weighed at the same weighbridge. Thus, the net weight shall be calculated as –

Net weight 'N' = (Gross weight – Tare weight) (Unit :in Te)

C. The Coal/ Coke/ product(s) from Washery/ Deshaling plant so weighed, shall be stacked over a levelled surface in a geometrical shape, as far as possible

D. The committee shall measure the volume of loose Coal/ Coke/ product(s) from Washery/ Deshaling plant, stacked as mentioned above, by averaging the measurements of lengths, widths & heights of the stack. Thus the volume shall be calculated as –

Volume 'V' = (L Avg. X W Avg. X H Avg.) (Unit: in CuM)

E. Thus, the conversion factor (CF) of loose Coal/ Coke/ product(s) from Washery/ Deshaling plant, to be derived by dividing the volume by net weight of the Coal/ coke / product(s) from Washery / Deshaling plant

Conversion Factor, CF = (V ÷ N) (Unit: in Cum / Te)

Above procedure shall be repeated for at least 3 samples to derive the average conversion factor.

iv. Conversion factor of compact Coal/ Coke/ product(s) from Washery/ Deshaling plant, heap

A. In the process of determination, initially the committee shall take the tare weight of one or more tippers.

B. Pits/ trenches shall be dug over the Coal/ Coke/ product(s) from Washery/ Deshaling plant, heaps as far as possible in geometrical shape measuring about 1.5m X 1.0m X 1.0m depth. The committee shall measure the volume of compact coal by averaging the measurements of length, width & height of the trench / pit and record the volume. Thus, the volume shall be calculated as:

   Volume 'V' = (L Avg. X W Avg. X H Avg.) (Unit: in CuM)

C. The volume (V2) of extraneous materials segregated from the dug out coal/ coke/ product(s) from Washery/ Deshaling plant, shall be stacked separately, measured and deducted from volume (V1) of trench / pit.

   Thus the net volume of Coal/ Coke / product(s) from Washery/ Deshaling plant shall be computed as: V3 = (V1 – V2) (Unit: in CuM)

D. Dug out Coal/ Coke/ product(s) from Washery/ Deshaling plant shall be filled/ packed into poly bags and loaded in the same tipper. The net weight (N1) of sample shall be calculated as :

   N1= (Gross weight – Tare weight) (Unit :in Te)

E. The conversion factor (CF) of that compact Coal/ Coke/ product(s) from Washery/ Deshaling plant heap shall be derived by dividing the volume by net weight of the sample so collected.

   CF = V3 ÷ N1 (Unit: in Cum /Te)

   Above procedure shall be repeated for every 50m x 50m grid, however samples shall not be less than 3 for a heap.

F. CIL/ subsidiaries should explore the possibility of use of scientific method for determination of Conversion factor of compact heap by using Nuclear Densitometer, Mechanical Auger etc., till such time above method should be adopted.

G. The entire event of determination of conversion factor shall be video-taped and preserved.

For both cases for determination of conversion factor and dumper, tub/ mine car factor, committee members shall sign all weighment slips, the field note/ measurements shall be recorded in MB and signed by all committee members. The weighment slips must bear the signature of Weighbridge in-charge.

Note:

Loose coal - Coal not firmly/ tightly stacked in a place and not subjected to any external compaction.

Compact coal - Coal closely and tightly stacked by using external compaction and which is not loose.

(14) Production, Dispatches and Stock of Soft and Hard Cokes

Similar method as described for coal shall be adopted for determining production, dispatches and stock of soft and hard cokes.

(15) Quantity of coal Required for Coke Making

(a) Each stack of coal for making soft coke may be measured and converted to weight, by the methods stated above. The quantity of slack required for controlling the burning of the heap may be experimentally determined in respect of different sizes of "Bhatta" and a figure as percentage of soft coke produced can be arrived at. The steam and slack coals required for production of soft coke for a particular month can thus be determined.

(b) In case of hard coke the capacity of each oven in terms of raw coal may be determined experimentally and the coal used in a particular period may be determined by multiplying the capacity by the number of charges during the period.

(16) Issue of Coal for Boiler Consumption

Norms for consumption of coal in boilers are given below:

(a) For a vertical boiler – 4 tonnes per day

(b) For a Lancashire boiler – 8 tonnes per day

(c) A register at each consuming point shall be maintained showing the receipt of coal every day.

(17) Issue of Coal for Workshop

No norm is being fixed for workshop as the consumption at the workshop varies widely, depending upon the nature and quantum of work done at each workshop. However, a register shall be maintained at each workshop showing the receipt of coal.

(18) Inter and Intra Area coal transfer shall have administrative approval of Director (Technical) of the subsidiary and Area General Manager, respectively.

(19) Action for variation in Coal & OB measurement

(a) The stock that is under fire shall be measured separately with the remark of extent of fire and action taken for extinguishing the fire. This measurement of fire stock shall be done separately and a separate report shall be made for that. This fire stock should not come in the measured stock of ROM saleable coal.

(b) Reconciliation between Book Stock and Measured Stock of coal production and OB removal shall be carried out on quarterly basis within 15 days from the end of each quarter.

(c) In case of coal stock measurement, variation shall be determined by comparison with book stock and measured quantity in every month/quarter/half year/ annual. The permissible tolerance of variation in quantity for all coal stock measurements shall be (+/-)5% of the book stock.

(d) During the coal stock measurement, so long the variation is within the permissible limit (+/-) 5% of the book stock, the reported / derived book stock shall be considered as the closing stock for the month/ quarter/ half year/ annual as the case may be, and no action is required to be taken.

(e) In case of variation in coal stock is more than the permissible limit (+/-)5% during monthly measurement by colliery survey team, a committee at area level shall be constituted to examine the matter in detail and submit its report with recommendation for further necessary action.

(f) Final adjustment in book stock shall be made on the basis of quarterly / half yearly / annual measurement and subsequent reconciliation & closing of accounts. In case the measured Coal Stock is beyond the permissible limit of (+/-) 5%, the measured stock shall be adopted as Book Stock.

(g) In case of variation in the coal stock is more than the permissible limit (+/- 5%) in quarterly/ half yearly/ annual measurement/ surprise check measurement conducted by special team constituted by CIL or Subsidiary Management, the reasons for such variation shall be *********identified & in case of (-)ve variation [shortage], shall be enquired to fix up the responsibility for such shortage,* by a departmentally constituted committee at subsidiary HQ level and write off / *********write in* action and book adjustment shall be

made in accordance with the recommendations of this committee, only after it has been approved by the Subsidiary Company Board.

(h) During the coal stock measurement even if the coal shortage is more than 5% but less than 2000 te, the reported/ derived book stock shall be considered as the closing stock for the quarter/half year/ annual measurement as the case may be. Penal action for such small shortages shall be under discretion of CMD of concerned subsidiary .

(i) Monthly measured Over Burden as per measurement done by colliery survey team shall be considered as firm reported figure of OB removal for the month.

(j) In case of overburden removal, variation shall be determined by comparison with the firm reported quantity with quarterly / half yearly / annual measurements. The permissible tolerance of variation in quantity of all OB measurements shall be as follows:

(i) (+/-) 5% for OB < 2.5 Lcum per quarter;

(ii) (+/-) 3% for OB 2.5 Lcum to 12.5 Lcum per quarter.

(iii) (+/-) 2% for OB >12.5 Lcum per quarter.

(k) During the OB measurement, so long the variation is within the slab of permissible limits, no action is required to be taken.

(l) In case of variation in OB measurement in quarterly / half yearly / annual measurement is found beyond the slabs of permissible tolerance, reason for the variation shall be enquired and identified by a departmentally constituted committee at subsidiary HQ level to fix up responsibility and action shall be taken in accordance with the recommendations of this committee.

(m) This permissible tolerance, is being considered as measurement tolerance due to instrumental error, error due to measurement of irregular volume and human error etc., and should not be written off.

(20) Re-handling of Loose dumped OB

(a) In some cases certain quantities of overburden removed are required to be re-handled. Re-handling of overburden by departmental machineries up to 5% of annual ***departmental*** in-situ OB removal of current FY, as per Annual Action Plan (AAP), shall have prior approval of Area General Manager. Quantity more than 5% shall have prior approval of Director (Technical) of concerned Subsidiary Company, except for re-handling by Dragline.

(b) The volume of such re-handling of OB shall be separately calculated and reported. All re-handling proposals shall have proper justification.

(c) However, for the re-handling of OB ** *("loose dumped OB")* by hiring of HEMM, the same shall be dealt as per the provisions of NIT / Work Order.

(21) Responsibility

Colliery Surveyor, Area Survey officer, Manager, Agent / Project Officer, AGM/Staff Officer (Mining) and Area General Manager shall be responsible for proper maintenance of coal stock and OB removal. Responsibility for ****shortage* in coal stock and ***shortage/surplus* in OB removal shall be fixed as per the outcome of the enquiry conducted under clause 19.

(22) Penalty

Disciplinary action may be taken against the responsible officials as per applicable rules.

(23) Appropriate changes necessitated by the provisions of this Yellow Book shall be incorporated into the ERP System with the approval of competent authority.

Note: The provisions for **Norms for Domestic Consumption** and **Manual Quarry** as in New Yellow Book – 2012 have been deleted in Yellow Book- Revision 2020, as they are no longer relevant in the present context.

*** Office Order No. 447 dated 25.09.2024-Clause no. 20(a)**

*** * Office Order No. 545 dated 05.10.2021- Clause no. 20(c) &(21)**

***** Office Order No. 475 dated 13.09.2023 Clause no. 19(g) & 21**

ANNEXURE – A

YELLOW BOOK – (REVISION – 2020)

(FORMAT SECTION)

FORMAT FOR REPORTING OF COAL PRODUCTION, OB REMOVAL, MOVEMENT OF COAL, PRODUCTION OF WASHERY, COKE & DESHALEING PLANT PRODUCTS AT DIFFERENT LEVEL (UNIT TO CIL)

Shift-wise Production Report (Under Ground)

Form 1 - A

Name of Subsidiary _____ Name of Area _____

Name of the mine:

Name of the Pit / Incline:

Departmental :

Date:

Shift:

Name of the Seam	Name of the District	No. of P / R Loader	SDL / LHD / Cont. Miner / LW / Other		Hours			Shot firing Detail			PRODUCTION			Tub/Mine Car Factor	Total Production (in Te)	Roof Bolting (Nos)
			Sl No.	Name / No.	Working	BD	Idle	Name of the face	No. of Hole blasted	Explosive Blasted (kg)	TUB/MINE CAR Nos.	SKIP Nos.	BELT CONV			

Remarks:

Overman Shift Inch Shift Engineer / Foreman

Designation

Contractual:

Name of the Contractor:

Date:

Shift:

Name of the Seam	Name of the District	SDL / LHD / Cont. Miner / LW / Other		Hours			Shot firing Detail			PRODUCTION			Tub/Mine Car Factor	Total Production (in Te)	Roof Bolting (Nos)
		Sl No.	Name / No.	Working	BD	Idle	Name of the face	No. of Hole blasted	Explosive Blasted (kg)	TUB/MINE CAR Nos.	SKIP Nos.	BELTCONV			

Remarks:

Overman Shift Inch Shift Engineer / Foreman

Designation

Authorized representative of contractor

Shift-wise Production Report (Opencast, Overburden) Departmental

Form 1 - B

Name of Subsidiary _____ Name of Area _____

Name of the mine:

Name of the Pit/Patch:

Date:

Shift:

1(a) Excavator

Sl	Name / No.	Bench No.	Hours			OB Quantity (Cum)		
			Working	BD	Idle	Solid	Re-handled	Total

1(b) Surface Miner

Sl	Name / No.	Bench No.	Hours			OB Quantity (Cum)
			Working	BD	Idle	

2 Dragline

Sl	Name / No.	Bench No.	Hours			Bucket Capacity Cu.m.	Avg. No. of Operating cycle Nos. / Hr.	OB Quantity (cum)		
			Working	BD	Idle			Solid	Re-handled	Total

3(a) Dumper / Tipper-Departmental

Sl	Name / No.	Bench No.	Hours			Dumper Factor	Trips	OB Quantity (' cum)		
			Working	BD	Idle	Cum / Trip	Nos.	Solid	Re-handled	Total

3(b) Dumper / Tipper-Hired

Sl	Vendor Name .	Bench No.	Dumper Factor	Trips	OB Quantity (' cum)		
			Cum / Trip	Nos.	Solid	Re-handled	Total

4 Drill

Sl	Name / No.	Bench No.	Hours			Drilling			
			Working	BD	Idle	Bench	No. of Shot holes drilled	Drilling metre	Total

5 Explosive

Sl	Bench	No. of holes Charged	No. of holes Blasted	Explosive charged	Explosive blasted
				Te	Te

6 Breakdown Report

Sl	M/C. No. (Exc/Dump/Dozer/Drill/Dragline)	Type of B/Down	Duration		Total Downtime (Hr)
			From	To	

Remarks:

Overman

Shift Inch
Designation

Shift Engineer / Foreman

Shift-wise production Report (Opencast, Overburden) Outsourced Patch

Form 1 – C

Name of Subsidiary _____ Name of Area _____

Name of the mine:

Name of the Pit/Patch:

Name of the Contractor:

Date:

Shift:

1 Excavator

Sl	Name / No.	Bench No.	OB Quantity (' cu meter)		
			Solid	Rehandling/Loose Dumped OB	Total

2 Dumper/Tipper

Sl	Name / No.	Bench No.	Dumper Factor	Trips	OB Quantity (' cum)		
			Cum / Trip	Nos.	Solid	Rehandling/ Loose Dumped OB	Total

3 Drill

Sl	Name / No.	Bench No.	Drilling			
			Bench	No. of Shot holes drilled	Drilling meter	Total

4 Explosive

Sl	Bench	No. of holes Charged	No. of holes Blasted	Explosive charged	Explosive blasted
				Te	Te

Remarks:

Overman **Foreman** **Shift inch (Designation)**

Authorized representative of contractor

Shift-wise Production Report (Opencast, Coal) Departmental

Form 1 - D

Name of Subsidiary _____ Name of Area _____

Name of the mine:

Name of the Pit/Patch :

Name of Seam:

Date:

Shift:

1(a) Excavator

Sl	Name / No.	Bench No.	Hours			Coal Qnty. excavated (' Te)
			Working	BD	Idle	

1 (b) Surface Miner

Sl	Name / No.	Bench No.	Hours			Coal Qnty. Cut (' Te)
			Working	BD	Idle	

2(a) Dumper / Tipper - Departmental

Sl	Name / No.	Bench No.	Hours			Without weighment			With weighment	
			Working	BD	Idle	Dumper Factor Te / Trip	Trips Nos.	Coal Quantity (' T)	Trips No.s	Coal Quantity (' T)

2(b) Dumper / Tipper - Hired

Sl	Vendor Name.	Bench No.	Without weighment			With weighment	
			Dumper Factor Te / Trip	Trips Nos.	Coal Quantity (' T)	Trips No.s	Coal Quantity (' T)
			Total				

3 Drill

Sl	Name /No.	Bench No.	Hours			Drilling			
			Working	BD	Idle	Bench	No. of Shot holes drilled	Drilling meter	Total

4 Explosive

Sl	Bench no.	No. of holes Charged	No. of holes Blasted	Explosive charged	Explosive blasted
				Te	Te

5 Breakdown Report

Sl	M/C. No. (Exc/Dump/Dozer/Drill/Surface Miner)	Type of B/Down	Duration		Total Downtime (Hr)
			From	To	

Remarks:

Overman Shift Inch Designation Shift Engineer/ Foreman

Shift-wise Production Report (Opencast, Coal) Outsourced

Form 1 - E

Name of Subsidiary _____ Name of Area _____

Name of the mine:

Name of the Pit/ Patch:

Name of the contractor:

Date:

Shift;

1(a) Excavator

Sl	Name / No.	Bench No.	Coal Qnty. excavated (' Te)

1 (b) Surface Miner

Sl	Name / No.	Bench No.	Coal Qnty. Cut (' Te)

2. Dumper / Tipper

Sl	Name / No.	Bench No.	Without weighment			With weighment	
			Dumper Factor	Trips	Coal Quantity	Trips	Coal Quantity
			Te / Trip	Nos.	(' T)	No.s	(' T)

3. Drill

Sl	Name / No.	Bench No.	Drilling			
			Bench	No. of Shot holes drilled	Drilling meter	Total

4. Explosive

Sl	Bench	No. of holes Charged	No. of holes Blasted	Explosive charged	Explosive blasted
				Te	Te

Remarks:

Overman Shift Engineer/Foreman Shift Inch(Designation)

Authorized representative of Contractor

Shift Report – Washery / Deshaling Plant

Raw Coal Received

Form 1F

Name of Subsidiary _____ Name of Area _____

Name of Washery / Deshaling Plant:

Departmental / Contractual:

Name of the Contractor:

Date :

Shift :

Colliery	Grade of Coal	Quantity received (Te)
1		
2		
3		
4		
5		

Prepared by :

Signed by(Raw Coal In-charge) :

Authorized representative of contractor

Shift Report – Washery / Deshaling Plant

Form 1G

Name of Subsidiary _____ Name of Area _____

Name of Washery / Deshaling Plant:

Departmental / Contractual:

Name of the Contractor:

Date :

Shift:

Raw coal fed (Te)	Production of washed / Deshaled coal(' Te)				Yield (%)			
	Clean/ Deshaled Coal	Middling	Rejects	Slurry	Clean/ Deshaled Coal	Middling	Reject	Slurry

Prepared by

Signed by Shift
Washery/ Deshaling plant -
Incharge

Authorized representative of contractor

Daily Production Report (Under Ground)

Form 2 - A

Name of Subsidiary _____ Name of Area _____

Name of the mine:

Name of the Pit / Incline:

Departmental :

Date:

Name of the Seam	Name of the District	No. of P / R Loader	SDL / LHD / Cont. Miner / LW / Other		Hours			Shot firing Detail			PRODUCTION			Tub/Mine Car Factor	Total Production (in Te)	Roof Bolting (Nos)
			Sl No.	Name / No.	Working	BD	Idle	Name of the face	No. of Hole blasted	Explosive Blasted (kg)	TUB/MINE CAR Nos.	SKIP Nos.	BELTCONV			

Remarks:

Head of Statistical Dept Prod Inch. / ACM Colliery Engineer Manager

Contractual:

Name of the Contractor:

Date:

Name of the Seam	Name of the District	SDL / LHD / Cont. Miner / LW / Other		Hours			Shot firing Detail			PRODUCTION			Tub/Mine Car Factor	Total Production (in Te)	Roof Bolting (Nos)
		Sl No.	Name / No.	Working	BD	Idle	Name of the face	No. of Hole blasted	Explosive Blasted (kg)	TUB/MINE CAR Nos.	SKIP Nos.	BELTCONV			

Remarks:

Head of Statistical Dept Prod Inch. / ACM Colliery Engineer Manager

Authorized representative of contractor

Daily Production Report (Opencast, Overburden) Departmental

Form - 2 B

Name of Subsidiary _____ Name of Area _____

Name of the mine:

Name of the Pit/ Patch :

Date:

1. Excavator

Sl	Name / No.	Hours			OB Quantity (Cum)			Diesel Issued
		Working	BD	Idle	Solid	Rehandling	Total	In Lit

2. Dragline

Sl	Name / No.	Hours			OB Quantity (Cum)		
		Working	BD	Idle	Solid	Rehandling	Total

3. Dumper

Sl	Name / No.	Hours			Dumper Factor	Trips Nos.	OB Quantity (Cum)			Diesel Issued
		Working	BD	Idle	Cum / Trip		Solid	Rehandling	Total	In Lit

4 Drill

Sl	Name / No.	Hours			Drilling				Diesel Issued
		Working	BD	Idle	Bench	No. of Shot holes drilled	Drilling meter	Total	In Lit

5 Explosive

Sl	Bench	No. of holes Charged	No. of holes Blasted	Explosive charged	Explosive blasted
				Te	Te

6 Breakdown Report

Sl	M/C. No. (Exc/Dump/Dozer/Drill/Dragline)	Type of B/Down	Duration		Total Downtime (Hr)
			From	To	

Remarks:

Head of Statistical Dept . Prod Inch. / ACM Colliery Engineer Manager

Daily production Report (Opencast, Overburden) Outsourced Patch

Form 2 – C

Name of Subsidiary _____ Name of Area _____

Name of the mine:

Name of the Pit/ Patch:

Name of the Contractor:

Date:

Shift:

1 Excavator

Sl	Name / No.	OB Quantity (Cum)		
		Solid	Rehandling/Loose Dumped OB	Total

2 Dumper

Sl	Name / No.	Dumper Factor	Trips	OB Quantity (Cum)		
		Cum / Trip	Nos.	Solid	Rehandling//Loose Dumped OB	Total

3 Drill

Sl	Name / No.	Drilling			
		Bench	No. of Shot holes drilled	Drilling meter	Total

4 Explosive

Sl	Bench	No. of Holes Charged	No. of Holes Blasted	Explosive charged	Explosive blasted
				Te	Te

Remarks :

Head of Statistical Dept. Prod Inch. / ACM Colliery Engineer Manager

Authorized representative of contractor

Daily Production Report (Opencast, Coal) Departmental

Form 2 – D

Name of Subsidiary _____ Name of Area _____

Name of the mine:

Name of the Pit/ Patch :

Date:

1(a) Excavator

Sl	Name / No.	Hours			Coal Qnty. Excavated (' Te)	Diesel Issued
		Working	BD	Idle		In Lit

1 (b) Surface Miner

Sl	Name / No.	Hours			Coal Qnty. Cut (' Te)	Diesel Issued
		Working	BD	Idle		In Lit

2 Dumper

Sl	Name / No.	Bench No.	Hours			Without weighment			With weighment		Diesel Issued
			Working	BD	Idle	Dumper factor	Trips	Coal Quantity	Trips	Coal Quantity	In Lit
						Te / Trip	Nos.	(' T)	No.s	(' T)	

3 Drill

Sl	Name / No.	Hours			Drilling				Diesel Issued
		Working	BD	Idle	Bench	No. of Shot holes drilled	Drilling metre	Total	In Lit

4 Explosive

Sl	Bench	No. of holes Charged	No. of holes Blasted	Explosive charged	Explosive blasted
				Te	Te

5 Breakdown Report

Sl	M/C. No. (Exc/Dump/Dozer/Drill)	Type of B/Down	Duration		Total Downtime (Hr)
			From	To	

Remarks:

Head of Statistical Dept. Prod Inch. / ACM Colliery Engineer Manager

Daily production Report (Opencast, Coal) Outsourced

Form 2 – E

Name of Subsidiary _____ Name of Area _____

Name of the mine:

Name of the Pit/Patch:

Name of the Contractor:

Date:

1(a) Excavator

Sl	Name / No.	Coal Qnty. Excavated (' Te)

1(b) Surface Miner

Sl	Name / No.	Coal Qnty. Cut (' Te)

2. Dumper

Sl	Name / No.	Without weighment			With weighment	
		Dumper Factor	Trips	Coal Quantity	Trips	Coal Quantity
		Te / Trip	Nos.	(In Te)	No.s	(In Te)

3 Drill

Sl	Name / No.	Drilling			
		Bench	No. of Shot holes drilled	Drilling metre	Total

4 Explosive

Sl	Bench	No. of Holes Charged	No. of Holes Blasted	Explosive charged	Explosive blasted
				Te	Te

Remarks :

Head of Statistical Dept. Prod Inch. / ACM Colliery Engineer Manager

Authorized representative of contractor

Daily Report – Washery/ Deshaling Plant

Raw Coal Received

Form 2F

Name of Subsidiary:

Name of Area:

Name of Washery / Deshaling Plant:

Departmental / Contractual:

Name of Contractor:

Date:

Colliery	Grade of Coal	Quantity received(' Te)
1		
2		
3		
4		
5		

Prepared by(Head of Statistical Dept) :

Signed by :
Project Officer / Washery/
Deshaling Plant Incharge.

Authorized representative of contractor

Daily Production Report

Washery / Deshaling Plant

Form 2G

Name of Subsidiary:

Name of Area:

Name of the Washery / Deshaling Plant:

Departmental / Contractual:

Name of Contractor:

Date :

Shift	Raw coal fed (Te)	Production of Washed / Deshaled coal (' Te)				Yield (%)			
		Clean/ Deshaled Coal	Middling	Rejects	Slurry	Clean/ Deshaled Coal	Middling	Reject	Slurry
1									
2									
3									

Prepared by (Head of Statistical Dept.)

Signed by
Project Officer / Washery/ Deshaling Plant Incharge.

Authorized representative of contractor

Form 3(A)

Daily Production Report

(Colliery / Washery / Deshaling Plant to Area)

Name of the Mine :

Date:

(i) Production Details

Mode	Seam	Grade	On date (Te)		Prog Month (Te)		Prog. Year (Te)	
			Target	Actual	Target	Actual	Target	Actual
Coal UG(Dept)								
Coal UG(Hired)-Contactor wise								
Coal UG(Tot)								
Coal OC(Dept)								
Coal OC(Hired)-Contractor wise								
Coal OC(Tot)								
Coal Total								

(ii) OB Removal

(a) Solid

Mode	Ondate(cum)		Prog Month (cum)		Prog Year (cum)	
	Target	Actual	Target	Actual	Target	Actual
Departmental						
Outsourcing – Contractor wise						
Total						

(b) Rehandling **/ *Loose Dumped OB***

Mode	Ondate(cum)		Prog Month (cum)		Prog Year (cum)	
	Target	Actual	Target	Actual	Target	Actual
Departmental **/*(Rehandling)***						
Outsourcing – Contractor wise ***(Rehandling/ Loose Dumped OB)***						
Total						

(iii) [a] Despatch

Mode	Grade	On date (Te)		Prog Month (Te)		Prog. Year (Te)	
		Target	Actual	Target	Actual	Target	Actual
Rail							
MGR							
Road							
Others (Specify belt / ropeway / etc.							

(iii) [b] Details about movement of coal

Opening Stock on date		Production On date (Te)	Despatch	Inter colliery transfers				Colliery Consumption	Closing Book Stock
Grade	Quantity (Te)		On date (Te) Actual	Name of Colliery / Washery/ Deshaling plant (coal sent to)	On date (Te)	Name of Colliery (coal received from)	On date (Te)	On date (Te)	Quantity* (Te)

* Closing stock = Opening stock + Production + Transfer in - Despatch - Transfer out - Colliery consumption.

Form – 3 (A)

(iv) Coal Washery / Deshaling Plant Production (Department / contractual)

Name of the Contractor:

a. Production Details

Raw coal received (source / gradewise)		**Item**	**Production (Te)**						**Yield (%)**		
			On date		**Prog Month**		**Prog. Year**		**On date**	**Prog. Month**	**Prog. Year**
Source	**Grade**		**Target**	**Actual**	**Target**	**Actual**	**Target**	**Actual**			
1		**Clean Coal/ Deshaled Coal**									
2											
3											
1		**Middling**									
2											
3											
1		**Slurry**									
2											
3											
1		**Reject**									
2											
3											

b. Details about movement of washed / Deshaled coal

Opening Book Stock (Te) on date					Despatch (Te)				Closing Book Stock (Te)				
Raw Coal	Clean Coal / Deshaled Coal	Middling	Slurry	Reject	Clean Coal / Deshaled Coal	Middling	Slurry	Reject	Raw Coal	Clean Coal / Deshaled Coal	Middling	Slurry	Reject
					On date	On date	On date	On date					
					Actual	Actual	Actual	Actual					

(v) Manshift Details

Mode	Manshift (Nos)	
	On date	Prog. month
UG (Dept)		
UG (Hired)		
OC(Dept)		
OC(Hired)		
Surface(Dept)		
Surface(Hired)		
Total(Dept/Hired)		

VI) Explosive Details

Mode	Explosive (kg)	
	On date	Prog.month
UG(Dept)		
UG(Hired)		
OC (OB) (Dept)		
OC (OB) (Hired)		
OC (Coal) (Dept)		
OC (Coal) (Hired)		
Total		

Remarks :

Prepared by :
Project Statistical Dept ……..

Signed by :
Project.Officer……..

Form 3 (B)

Daily Production Report
(Area to HQ)

Area: ---------- *Date:* ----------

C O A L

(i) Production Details

Colliery Name	Mode	Seam	Grade	On date (Te)		Prog Month (Te)		Prog. Year (Te)	
				Target	Actual	Target	Actual	Target	Actual
1)	Coal UG(Dept)								
	Coal UG (Hired/Contractorwise)								
	Coal UG (Tot)								
	Coal OC (Dept)								
	Coal OC (Hired/Contractor wise)								
	Coal OC (Tot)								
	Coal Total (UG + OC)								
2)	Coal UG(Dept)								
	Coal UG (Hired/Contractor wise)								
	Coal UG (Tot)								
	Coal OC (Dept)								
	Coal OC (Hired/Contractor wise)								
	Coal OC (Tot)								
	Coal Total (UG + OC)								
Total for Area	Coal UG(Dept)								
	Coal UG (Hired/Contractor wise)								
	Coal UG (Tot)								
	Coal OC (Dept)								
	Coal OC (Hired/Contractor wise)								
	Coal OC (Tot)								
	Coal Total (UG + OC)								

(ii) OB Removal

(a) Solid

Colliery Name	Mode	On date (cum)		Prog Month (cum)		Prog Year (cum)	
		Target	Actual	Target	Actual	Target	Actual
1)	Departmental						
	Outsourcing - Contractor wise						
	Total						
2)	Departmental						
	Outsourcing - Contractor wise						
	Total						
Total for Area	Departmental						
	Outsourcing - Contractor wise						
	Total						

(b) Rehandling **/ *Loose Dumped OB***

Colliery Name	Mode	On date (cum)		Prog Month(cum)		Prog Year (cum)	
		Target	Actual	Target	Actual	Target	Actual
1)	Departmental ***Rehandling***						
	Outsourcing - Contractor wise ***Rehandling/Loose Dumped OB***						
	Total						
2)	Departmental ***Rehandling***						
	Outsourcing - Contractor wise ***Rehandling/Loose Dumped OB***						
	Total						
Total for Area	Departmental ***Rehandling***						
	Outsourcing - Contractor wise ***Rehandling /Loose Dumped OB***						
	Total						

Form 3(B)

(iii) [a] Despatch

Colliery name	Mode	Grade	On date (Te)		Prog Month (Te)		Prog. Year (Te)	
			Target	Actual	Target	Actual	Target	Actual
1)	Rail							
	MGR							
	Road							
	Others (Specify belt / ropeway/etc.)							
2)	Rail							
	MGR							
	Road							
	Others (Specify belt / ropeway/etc.)							
Total for Area	Rail							
	MGR							
	Road							
	Others (Specify belt / ropeway/etc.)							

(iii) [b] Details about movement of coal

Colliery name	Opening Stock on date		Production On date (tones)	Despatch	Inter colliery transfers				Colliery Consumption	Closing Book Stock
	Grade	Quantity (Te)		On date (Te) Actual	Name of Colliery / Washery/ Deshaling plant (coal sent to)	On date (Te)	Name of Colliery (coal received from)	On date (Te)	On date (Te)	Quantity* (Te)
1)										
2)										
Total for Area										

* Closing stock = Opening stock + Production + Transfer in - Despatch - Transfer out - Colliery consumption.

Form – 3 (B)

(iv) Coal Washery / Deshaling Plant Production (Departmental/Contractual)

Name of Contractor:

a. Production Details

Washery Name	Raw coal received (source / grade wise)		Item	Production (Te)						Yield (%)		
				On date		Prog Month		Prog. Year		On date	Prog. Month	Prog. Year
	Source	Grade		Target	Actual	Target	Actual	Target	Actual			
1)	1		Clean / Deshaled Coal									
	2		Middling									
	3		Slurry									
	4		Reject									
2)	1		Clean / Deshaled Coal									
	2		Middling									
	3		Slurry									
	4		Reject									
Total for Area	1		Clean / Deshaled Coal									
	2		Middling									
	3		Slurry									
	4		Reject									

b. Details about movement of washed/Deshaled coal

Washery/ Deshaling Plant Name	Opening Book Stock (Te) on date					Despatch (Te)				Closing Book Stock (Te)				
	Raw Coal	Clean / Deshaled Coal	Middling	Slurry	Reject	Clean / Deshaled Coal	Middling	Slurry	Reject	Raw Coal	Clean / Deshaled Coal	Middling	Slurry	Reject
						On date	On date	On date	On date					
						Actual	Actual	Actual	Actual					
1)														
2)														
Total for Area														

(v) Manshift Details

Colliery/Wshery/ Deshaling Plant Name	Mode	Manshift (Nos)	
		On date	Prog. month
1)	UG(Dept)		
	UG(Hired)		
	OC(Dept)		
	OC(Hired)		
	Surface(Dept)		
	Surface(Hired)		
	Total(Dept/Hired)		
2)	UG(Dept)		
	UG(Hired)		
	OC(Dept)		
	OC(Hired)		
	Surface(Dept)		
	Surface(Hired)		
	Total(Dept/Hired)		
Total for Area	UG(Dept)		
	UG(Hired)		
	OC(Dept)		
	OC(Hired)		
	Surface(Dept)		
	Surface(Hired)		
	Total(Dept/Hired)		

(VI) Explosive Details

Colliery Name	Mode	Explosive (kg)	
		On date	Prog. month
1)	UG(Dept)		
	UG(Hired)		
	OC (OB) (Dept)		
	OC (OB) (Hired)		
	OC (Coal) (Dept)		
	OC (Coal) (Hired)		
	Total		
2)	UG(Dept)		
	UG(Hired)		
	OC (OB) (Dept)		
	OC (OB) (Hired)		
	OC (Coal) (Dept)		
	OC (Coal) (Hired)		
	Total		
Total for Area	UG(Dept)		
	UG(Hired)		
	OC (OB) (Dept)		
	OC (OB) (Hired)		
	OC (Coal) (Dept)		
	OC (Coal) (Hired)		
	Total		

Remarks:

Prepared by (Area Statistical Dept)----------

Signed by (GM / AGM) ----------

Form 3 (C)

Daily Production Report
(HQ to CIL)

Company: ---------- *Date:* ----------

C O A L

(i) Production Details

Name of the Area	Mode	Seam	Grade	On date (Te)		Prog Month (Te)		Prog. Year (Te)	
				Target	Actual	Target	Actual	Target	Actual
1)	Coal UG(Dept)								
	Coal UG(Hired)								
	Coal UG (Tot)								
	Coal OC (Dept)								
	Coal OC (Hired)								
	Coal OC (Tot)								
	Coal Total (UG + OC)								
2)	Coal UG(Dept)								
	Coal UG(Hired)								
	Coal UG (Tot)								
	Coal OC (Dept)								
	Coal OC (Hired)								
	Coal OC (Tot)								
	Coal Total (UG + OC)								
Total for Company	Coal UG(Dept)								
	Coal UG(Hired)								
	Coal UG (Tot)								
	Coal OC (Dept)								
	Coal OC (Hired)								
	Coal OC (Tot)								
	Coal Total (UG + OC)								

(ii) OB Removal

(a) Solid

Name of the Area	Mode	On date (cum)		Prog Month (cum)		Prog Year (cum)	
		Target	Actual	Target	Actual	Target	Actual
1)	Departmental						
	Outsourcing						
	Total						
2)	Departmental						
	Outsourcing						
	Total						
Total for Company	Departmental						
	Outsourcing						
	Total						

(b) Rehandling **/ *Loose Dumped OB***

Name of the Area	Mode	On date (cum)		Prog Month (cum)		Prog Year (cum)	
		Target	Actual	Target	Actual	Target	Actual
1)	Departmental ***Rehandling***						
	Outsourcing – Contractor wise ***Rehandling/ Loose Dumped OB***						
	Total						
2)	Departmental ***Rehandling***						
	Outsourcing – Contractor wise ***Rehandling/ Loose Dumped OB***						
	Total						
Total for Company	Departmental ***Rehandling***						
	Outsourcing – Contractor wise ***Rehandling/ Loose Dumped OB***						
	Total						

Form 3(C)

(iii) [a] Despatch

Name of the Area	Mode	Grade	On date (Te)		Prog Month (Te)		Prog. Year (Te)	
			Target	Actual	Target	Actual	Target	Actual
1)	Rail							
	MGR							
	Road							
	Others (Specify belt / ropeway/etc.)							
2)	Rail							
	MGR							
	Road							
	Others (Specify belt / ropeway/etc.)							
Total for Company	Rail							
	MGR							
	Road							
	Others (Specify belt / ropeway/etc.)							

(iii) [b] Details about movement of coal

Name of the Area	Opening Stock on date		Production On date (Te)	Despatch	Inter colliery transfers				Colliery Consumption	Closing Book Stock
	Grade	Quantity (Te)		On date (Te) Actual	Name of Colliery / Washery/Deshaled (coal sent to)	On date (Te)	Name of Colliery (coal received from)	On date (Te)	On date (Te)	Quantity* (Te)
1)										
2)										
Total for Company										

* Closing stock = Opening stock + Production + Transfer in - Despatch - Transfer out - Colliery consumption.

Form – 3 (C)

(iv) Coal Washery /Deshaling Plant Production (Departmental/Cotractual)

a. Production Details

Washery /Deshaling Plant Name	Raw coal received (source / gradewise)		Item	Production (Te)						Yield (%)		
				On date		Prog Month		Prog. Year		On date	Prog. Month	Prog. Year
	Source	Grade		Target	Actual	Target	Actual	Target	Actual			
1)	1		Clean / Deshaled Coal									
	2		Middling									
	3		Slurry									
	4		Reject									
2)	1		Clean / Deshaled Coal									
	2		Middling									
	3		Slurry									
	4		Reject									
Total for Company	1		Clean / Deshaled Coal									
	2		Middling									
	3		Slurry									
	4		Reject									

b. Details about movement of washed / Deshaled coal

Washery Name	Opening Book Stock (Te) on date					Despatch (Te)				Closing Book Stock (Te)				
	Raw Coal	Clean / Deshaled Coal	Middling	Slurry	Reject	Clean / Deshaled Coal	Middling On date Actual	Slurry	Reject	Raw Coal	Clean / Deshaled Coal	Middling	Slurry	Reject
						On date		On date	On date					
						Actual		Actual	Actual					
1)														
2)														
Total for Company														

(v) Manshift Details

Name of the Area	Mode	Manshift (Nos)	
		On date	Prog. month
1)	UG(Dept)		
	UG(Hired)		
	OC(Dept)		
	OC(Hired)		
	Surface(Dept)		
	Surface(Hired)		
	Total **(Dept/Hired)**		
2)	UG(Dept)		
	UG(Hired)		
	OC(Dept)		
	OC(Hired)		
	Surface(Dept)		
	Surface(Hired)		
	Total **(Dept/Hired)**		
Total for Company	UG(Dept)		
	UG(Hired)		
	OC(Dept)		
	OC(Hired)		
	Surface(Dept)		
	Surface(Hired)		
	Total **(Dept/Hired)**		

(vi) Explosive Details

Name of the Area	Mode	Explosive (kg)	
		On date	Prog. month
1)	UG(Dept)		
	UG(Hired)		
	OC (OB) (Dept)		
	OC (OB) (Hired)		
	OC (Coal) (Dept)		
	OC (Coal) (Hired)		
	Total		
2)	UG(Dept)		
	UG(Hired)		
	OC (OB) (Dept)		
	OC (OB) (Hired)		
	OC (Coal) (Dept)		
	OC (Coal) (Hired)		
	Total		
Total for Company	UG(Dept)		
	UG(Hired)		
	OC (OB) (Dept)		
	OC (OB) (Hired)		
	OC (Coal) (Dept)		
	OC (Coal) (Hired)		
	Total		

Remarks:

Prepared by (HO Statistical Dept)----------

Signed by (GM - PROD) ----------

Form – 4 (A)

Monthly Production Report
(Colliery / Washery /Deshaling Plant to Area)

Colliery:---------- *Month:* ----------

(i) Production Details

Mode	**Seam**	**Grade**	**This month (Te)**		**Prog. Year (Te)**	
			Target	**Actual**	**Target**	**Actual**
Coal UG(Dept)						
Coal UG(Hired-Contractor wise)						
Coal UG(Tot)						
Coal OC(Dept)						
Coal OC(Hired-Contractor wise)						
Coal OC(Tot)						
Coal Total (UG + OC)						

(ii) OB Removal

(a) Solid

Mode	**This month (cum)**		**Prog. Year (cum)**	
	Target	**Actual**	**Target**	**Actual**
Departmental				
Outsourcing - Contractor wise				
Total				

(b) Rehandling **/ *Dumped Loose OB***

Mode	**This month (cum)**		**Prog. Year (cum)**	
	Target	**Actual**	**Target**	**Actual**
Departmental ***Rehandling***				
Outsourcing - Contractor wise ***Rehandling/ Dumped Loose OB***				
Total				

(iii) [a] Despatch

Mode	Grade	This Month (Te)		Prog. Year (Te)	
		Target	Actual	Target	Actual
Rail					
MGR					
Road					
Others (Specify belt / ropeway / etc.					

(iii) [b] Details about movement of coal

Opening Stock on 1st day of month		Production This month (tones)	Despatch	Inter colliery transfers				Colliery Consumption	Closing Book Stock on last day of month
Grade	Quantity (Te)		This month (Te) Actual	On date (Te)	This month (Te)	Name of Colliery (coal received from)	This month (Te)	This month (Te)	Quantity* (Te)

* Closing stock = Opening stock + Production + Transfer in - Despatch - Transfer out - Colliery consumption.

Form 4 (A)

(iv) Coal Washery/Deshaling Plat Production(Departmental/Contractual)

Name of the Contractor

a. Production Details

Raw coal received (source / gradewise)		Item	Production (Te)				Yield (%)	
			This Month		Prog. Year		This Month	Prog. Year
Source	Grade		Target	Actual	Target	Actual		
1		Clean / Deshaled coal						
2								
3								
1		Middling						
2								
3								
1		Slurry						
2								
3								
1		Reject						
2								
3								

b. Details about movement of washed / Deshaled coal

Opening Book Stock on 1st day of month (Te)					Despatch (Te)				Closing Book Stock on last day of month (Te)				
Raw Coal	Clean / Deshaled coal	Middling	Slurry	Reject	Clean / Deshaled coal	Middling	Slurry	Reject	Raw Coal	Clean / Deshaled coal	Middling	Slurry	Reject
					This month	This month	This month	This month					
					Actual	Actual	Actual	Actual					

(v) Manshift Details

Mode	Manshift (Nos)	
	This month	Prog. Year
UG (Dept)		
UG (Hired)		
OC(Dept)		
OC(Hired)		
Surface(Dept)		
Surface(Hired)		
Total(Dept/Hired)		

(vi) Explosive Details

Mode	Explosive (kg)	
	This month	Prog. Year
UG(Dept)		
UG(Hired)		
OC (OB) (Dept)		
OC (OB) (Hired)		
OC (Coal) (Dept)		
OC (Coal) (Hired)		
Total		

Remarks :

Prepared by (Project Statistical Dept)-

Signed by (Project.Officer) --

Form -4 (B)

Monthly Production Report
(Area to HQ)

Area:---------- *Month:*----------

C O A L
(i) Production Details

Colliery Name	Mode	Seam	Grade	This Month (Te)		Prog Year (Te)	
				Target	Actual	Target	Actual
1)	Coal UG (Dept)						
	Coal UG (Hired- Contractor wise)						
	Coal UG (Tot)						
	Coal OC (Dept)						
	Coal OC (Hired- Contractor wise)						
	Coal OC (Tot)						
	Coal Total (UG+OC)						
2)	Coal UG (Dept)						
	Coal UG (Hired- Contractor wise)						
	Coal UG (Tot)						
	Coal OC (Dept)						
	Coal OC (Hired- Contractor wise)						
	Coal OC (Tot)						
	Coal Total (UG+OC)						
Total for Area	Coal UG (Dept)						
	Coal UG (Hired- Contractor wise)						
	Coal UG (Tot)						
	Coal OC (Dept)						
	Coal OC (Hired- Contractor wise)						
	Coal OC (Tot)						
	Coal Total (UG+OC)						

(ii) OB Removal

(a) Solid

Colliery Name	Mode	This Month (cum)		Prog Year (cum)	
		Target	Actual	Target	Actual
1)	Departmental				
	Outsourcing – Contractor wise				
	Total				
2)	Departmental				
	Outsourcing – Contractor wise				
	Total				
Total for Area	Departmental				
	Outsourcing – Contractor wise				
	Total				

(b) Rehandling **/ *Loose Dumped OB***

Colliery Name	Mode	This Month (cum)		Prog Year (cum)	
		Target	Actual	Target	Actual
1)	Departmental - ***Rehandling***				
	Outsourcing – Contractor wise ***Rehandling/ Loose Dumped OB***				
	Total				
2)	Departmental -Rehandling				
	Outsourcing – Contractor wise ***Rehandling /Loose Dumped OB***				
	Total				
Total for Area	Departmental- Rehandling				
	Outsourcing – Contractor wise ***Rehandling /Loose Dumped OB***				
	Total				

Form 4(B)

(iii) [a] Despatch

Colliery name	Mode	Grade	This Month (Te)		Prog. Year (Te)	
			Target	Actual	Target	Actual
1)	Rail					
	MGR					
	Road					
	Others (Specify belt / ropeway/etc.)					
2)	Rail					
	MGR					
	Road					
	Others (Specify belt / ropeway/etc.)					
Total for Area	Rail					
	MGR					
	Road					
	Others (Specify belt / ropeway/etc.)					

(iii) [b] Details about movement of coal

Colliery name	Opening Stock on 1st day of month		Production This month (tones)	Despatch	Inter colliery transfers				Colliery Consumption	Closing Book Stock on last day of month Quantity* (Te)
	Grade	Quantity (Te)		This month (Te) Actual	Name of Colliery / Washery/ Deshaling plant (coal sent to)	This month (Te)	Name of Colliery (coal received from)	This month (Te)	This month (Te)	
1)										
2)										
Total for Area										

* Closing stock = Opening stock + Production + Transfer in - Despatch - Transfer out - Colliery consumption.

Form – 4 (B)

(iv) Coal Washery / Deshaling Plant Production (Departmental/Contractual)

Name of the Contractor:

a. Production Details

Washery/Deshaling Plant Name	Raw coal received (source / grade wise)		Item	Production (Te)				Yield (%)	
				This Month		Prog. Year		This Month	Prog. Year
	Source	Grade		Target	Actual	Target	Actual		
1)	1		Clean/Deshaled Coal						
	2		Middling						
	3		Slurry						
	4		Reject						
2)	1		Clean/Deshaled Coal						
	2		Middling						
	3		Slurry						
	4		Reject						
Total for Area	1		Clean/Deshaled Coal						
	2		Middling						
	3		Slurry						
	4		Reject						

b. Details about movement of washed / Deshaled coal

Washery/ Deshaling Plant Name	Opening Book Stock on 1st day of month (Te)					Despatch (Te)				Closing Book Stock on last day of month (Te)				
	Raw Coal	Clean /Deshaled Coal	Middling	Slurry	Reject	Clean /Deshaled Coal	Middling	Slurry	Reject	Raw Coal	Clean/ Deshaled Coal	Middling	Slurry	Reject
						This month	This month	This month	This month					
						Actual	Actual	Actual	Actual					
1)														
2)														
Total for Area														

(v) Manshift Details

Colliery/ Wshery/ Deshaling Plant Name	Mode	Manshift (Nos)	
		This month	Prog. Year
1)	UG(Dept)		
	UG(Hired)		
	OC(Dept)		
	OC(Hired)		
	Surface(Dept)		
	Surface(Hired)		
	Total**(Dept/Hired)**		
2)	UG(Dept)		
	UG(Hired)		
	OC(Dept)		
	OC(Hired)		
	Surface(Dept)		
	Surface(Hired)		
	Total**(Dept/Hired)**		
Total for Area	UG(Dept)		
	UG(Hired)		
	OC(Dept)		
	OC(Hired)		
	Surface(Dept)		
	Surface(Hired)		
	Total**(Dept/Hired)**		

(vi) Explosive Details

Colliery Name	Mode	Explosive (kg)	
		This month	Prog. Year
1)	UG(Dept)		
	UG(Hired)		
	OC (OB) (Dept)		
	OC (OB) (Hired)		
	OC (Coal) (Dept)		
	OC (Coal) (Hired)		
	Total		
2)	UG(Dept)		
	UG(Hired)		
	OC (OB) (Dept)		
	OC (OB) (Hired)		
	OC (Coal) (Dept)		
	OC (Coal) (Hired)		
	Total		
Total for Area	UG(Dept)		
	UG(Hired)		
	OC (OB) (Dept)		
	OC (OB) (Hired)		
	OC (Coal) (Dept)		
	OC (Coal) (Hired)		
	Total		

Remarks :

Prepared by (Area Statistical Dept)----------

Signed by (GM / AGM) ----------

Form - 4 (C)

Monthly Production Report
(HQ to CIL)

Company:---------- *Month:----------*

C O A L
(i) Production Details

Name of the Area	Mode	Seam	Grade	This Month (Te)		Prog. Year (Te)	
				Target	Actual	Target	Actual
1)	Coal UG (Dept)						
	Coal UG (Hired)						
	Coal UG (Tot)						
	Coal OC (Dept)						
	Coal OC (Hired)						
	Coal OC (Tot)						
	Coal Total (UG+ OC)						
2)	Coal UG (Dept)						
	Coal UG (Hired)						
	Coal UG (Tot)						
	Coal OC (Dept)						
	Coal OC (Hired)						
	Coal OC (Tot)						
	Coal Total (UG+ OC)						
Total for Company	Coal UG (Dept)						
	Coal UG (Hired)						
	Coal UG (Tot)						
	Coal OC (Dept)						
	Coal OC (Hired)						
	Coal OC (Tot)						
	Coal Total (UG+ OC)						

(ii) OB Removal

(a) Solid

Name of the Area	Mode	This Month (cum)		Prog Year (cum)	
		Target	Actual	Target	Actual
1)	Departmental				
	Outsourcing				
	Total				
2)	Departmental				
	Outsourcing				
	Total				
Total for Company	Departmental				
	Outsourcing				
	Total				

(b) Rehandling / ***Loose Dumped OB***

Name of the Area	Mode	This Month (cum)		Prog Year (cum)	
		Target	Actual	Target	Actual
1)	Departmental - ***Rehandling***				
	Outsourcing – Contractor wise ***Rehandling /Loose Dumped OB***				
	Total				
2)	Departmental - *Rehandling*				
	Outsourcing – Contractor wise ***Rehandling /Loose Dumped OB***				
	Total				
Total for Company	Departmental - *Rehandling*				
	Outsourcing – Contractor wise ***Rehandling /Loose Dumped OB***				
	Total				

Form 4(C)

(iii) [a] Despatch

Name of the Area	Mode	Grade	This Month (Te)		Prog. Year (Te)	
			Target	Actual	Target	Actual
1)	Rail					
	MGR					
	Road					
	Others (Specify belt / ropeway/etc.)					
2)	Rail					
	MGR					
	Road					
	Others (Specify belt / ropeway/etc.)					
Total for Company	Rail					
	MGR					
	Road					
	Others (Specify belt / ropeway/etc.)					

(iii) [b] Details about movement of coal

Name of the Area	Opening Stock on 1st day of month		Production This month (Te)	Despatch	Inter colliery transfers				Colliery Consumption	Closing Book Stock on last day of month Quantity* (Te)
	Grade	Quantity (Te)		This month (Te) Actual	Name of Colliery / Washery/Deshaling plant (coal sent to)	This month (Te)	Name of Colliery (coal received from)	This month (Te)	This month (Te)	
1)										
2)										
Total for Company										

* Closing stock = Opening stock + Production + Transfer in - Despatch - Transfer out - Colliery consumption.

Form 4 (C)

(iv) Coal WasheryDeshaled Plant Production (Departmental/Contractual)

Name of Contractor:

a. Production Details

Washery/ Deshaling Plant Name	Raw coal received (source / grade wise)		Item	Production (Te)				Yield (%)	
				This Month		Prog. Year		This Month	Prog. Year
	Source	Grade		Target	Actual	Target	Actual		
1)	1		Clean / Deshaled Coal						
	2		Middling						
	3		Slurry						
	4		Reject						
2)	1		Clean / Deshaled Coal						
	2		Middling						
	3		Slurry						
	4		Reject						
Total for Company	1		Clean / Deshaled Coal						
	2		Middling						
	3		Slurry						
	4		Reject						

b. Details about movement of washed / Deshaled coal

Washery/ Deshaled Plant Name	Opening Book Stock on 1st day of month (Te)					Despatch (Te)				Closing Book Stock on last day of month (Te)				
	Raw Coal	Clean / Deshaled Coal	Middling	Slurry	Reject	Clean / Deshaled Coal	Middling	Slurry	Reject	Raw Coal	Clean / Deshaled Coal	Middling	Slurry	Reject
						This month	This month	This month	This month					
						Actual	Actual	Actual	Actual					
1)														
2)														
Total for Company														

(v) Manshift Details

Name of the Area	Mode	Manshift (Nos)	
		This month	Prog. Year
1)	UG(Dept)		
	UG(Hired)		
	OC(Dept)		
	OC(Hired)		
	Surface(Dept)		
	Surface(Hired)		
	Total **(Dept/Hired)**		
2)	UG(Dept)		
	UG(Hired)		
	OC(Dept)		
	OC(Hired)		
	Surface(Dept)		
	Surface(Hired)		
	Total **(Dept/Hired)**		
Total for Company	UG(Dept)		
	UG(Hired)		
	OC(Dept)		
	OC(Hired)		
	Surface(Dept)		
	Surface(Hired)		
	Total **(Dept/Hired)**		

(VI) Explosive Details

Name of the Area	Mode	Explosive (kg)	
		This month	Prog. Year
1)	UG(Dept)		
	UG(Hired)		
	OC (OB) (Dept)		
	OC (OB) (Hired)		
	OC (Coal) (Dept)		
	OC (Coal) (Hired)		
	Total		
2)	UG(Dept)		
	UG(Hired)		
	OC (OB) (Dept)		
	OC (OB) (Hired)		
	OC (Coal) (Dept)		
	OC (Coal) (Hired)		
	Total		
Total for Company	UG(Dept)		
	UG(Hired)		
	OC (OB) (Dept)		
	OC (OB) (Hired)		
	OC (Coal) (Dept)		
	OC (Coal) (Hired)		
	Total		

Remarks:

Prepared by (HO Statistical Dept)----------

Signed by (CGM / GM PROD) ----------