सत्यमेव जयते

**File No:**
**Government of India**
**Ministry of Environment, Forest and Climate Change**
**(Issued by the State Environment Impact Assessment Authority(SEIAA), JHARKHAND)**
*******

Dated: **16/10/2025**

To,

Shri Kajal Sarkar
BHARAT COKING COAL LIMITED
Koyla Bhawan, Koyla Nagar, Dhanbad, Jharkhand, 826005 , , DHANBAD, JHARKHAND, Koyla Bhawan, 826005
erbccl2011@gmail.com

**Subject:** Grant of Terms of Reference under the provision of the EIA Notification 2006-regarding.

**Sir/Madam,**

This is in reference to your application for Grant of Terms of Reference under the provision of the EIA Notification 2006-regarding in respect of project Madhuband Colliery submitted to Ministry vide proposal number SIA/JH/CMIN/540839/2025 dated .

2. The particulars of the proposal are as below:

| | |
|---|---|
| **(i) TOR Identification No.** | TO25B0605JH5730484N |
| **(ii) File No.** | |
| **(iii) Clearance Type** | Fresh ToR |
| **(iv) Category** | B1 |
| **(v) Project/Activity Included Schedule No.** | 1(a) Mining of minerals |
| **(vii) Name of Project** | Madhuband Colliery |
| **(viii) Name of Company/Organization** | BHARAT COKING COAL LIMITED |
| **(ix) Location of Project (District, State)** | DHANBAD, JHARKHAND |
| **(x) Issuing Authority** | SEIAA |
| **(xi) Applicability of General Conditions** | no |
| **(xii) Applicability of Specific Conditions** | no |

**Plot/Survey Khasra Nos.:**

3. In view of the particulars given in the Para 1 above, the project proposal interalia including Form-1(Part A and B) were submitted to the Ministry for an appraisal by the State Environment Impact AssessmentAuthority(SEIAA) Appraisal Committee (SEIAA) in the Ministry under the provision of EIA notification 2006 and its subsequent amendments.

4. The above-mentioned proposal has been considered by State Environment Impact AssessmentAuthority(SEIAA) Appraisal Committee of SEIAA in the meeting held on 24/09/2025. The minutes of the meeting and all the Application and documents submitted [(viz. Form-1 Part A, Part B, Part C EIA, EMP)] are available on PARIVESH portal which can be accessed by scanning the QR Code above.

5. The brief about configuration of plant/equipment, products and byproducts and salient features of the project along with environment settings, as submitted by the Project proponent in Form-1 (Part A, B and C)/EIA & EMP Reports/presented during SEIAA are annexed to this EC as Annexure (1).

6. The SEIAA, in its meeting held on 24/09/2025, based on information & clarifications provided by the project proponent and after detailed deliberations recommended the proposal for grant of Terms of Reference under the provision of EIA Notification, 2006 and as amended thereof subject to stipulation of specific and general conditions as detailed in Annexure (2).

7. The SEIAA has examined the proposal in accordance with the Environment Impact Assessment (EIA) Notification, 2006 & further amendments thereto and after accepting the recommendations of the State Environment Impact AssessmentAuthority(SEIAA) Appraisal Committee hereby decided to grant Terms of Reference for instant proposal of M/s. Shri Kajal Sarkar under the provisions of EIA Notification, 2006 and as amended thereof.

8. The Ministry reserves the right to stipulate additional conditions, if found necessary.

9. The Terms of Reference to the aforementioned project is under provisions of EIA Notification, 2006. It does not tantamount to approvals/consent/permissions etc. required to be obtained under any other Act/Rule/regulation. The Project Proponent is under obligation to obtain approvals /clearances under any other Acts/ Regulations or Statutes, as applicable, to the project.

10. This issues with the approval of the Competent Authority.

**Copy To**
N/A

**Annexure 1**

**Standard Terms of Reference for (Mining of minerals)**

**1.**

| S. No | Terms of Reference |
|---|---|
| **1.1** | An EIA-EMP Report would be prepared for a combined peak capacity of .....MTPA for OC-cum-UG project which consists of .... MTPA in an ML/project area of ha for OC and .... MTPA for UG in an ML/project area of ..... ha based on the generic structure specified in Appendix III of the EIA Notification 2006. |
| **1.2** | An EIA-EMP Report would be prepared for MTPA rated capacity to cover the impacts and environment management plan for the project specific activities on the environment of the region, and the environmental quality encompassing air, water, land, biotic community, etc. through collection of data and information, generation of data on impacts including prediction modeling for..... MTPA of coal production based on approved project/Mining Plan for.....MTPA. Baseline data collection can be for any season (three months) except monsoon. |
| **1.3** | The ToRs prescribed for both opencast and underground mining are applicable for opencast – cum-underground mining. |

| S. No | Terms of Reference |
|---|---|
| **1.4** | Information on the following aspects of the corporate Environment Responsibility should also be provided for opencast, underground and opencast-cum-underground Min |
| **1.5** | Corporate Environment Responsibility: |

**Additional Terms of Reference**

N/A

**Annexure 2**

**Details of Products & By-products**

| Name of the product /By-product | Product / By-product | Quantity | Unit | Mode of Transport / Transmission | Remarks (eg. CAS number) |
|---|---|---|---|---|---|
| Coal | Coal | 1.5 | MTPA | Road/Rail | |

**State Level Environment Impact Assessment Authority, Jharkhand**
Nursery Complex, Near Dhurwa Bus Stand, P.O+P.S-Dhurwa, Ranchi, Jharkhand-834004
E-mail: msseiaa.jhk@gmail.com/chr-seiaajhr@gov.in
website: www.jseiaa.in

सत्यमेव जयते

Letter No : **EC/SEIAA/2025-26/3919/2025/** Ranchi, Date :

**To:** **Shri Kajal Sarkar**
**Project Officer,**
**Office of the General Manager, Barora Area (Area- 01),**
**M/s Bharat Coking Coal Limited, P.O. : Nawagarh,**
**District : Dhanbad, Jharkhand : 828306.**

**Sub:** Prescribing of ToR to **"Madhuband Colliery with 1.5 MTPA using open cast and underground mining of M/s Bharat Coking Coal Limited at Village : Madhuband, Sidpoki (part), Keshargarh (Part), Saderiyadih (Part), Pandubitha (Part), Bansjora (Part) and Mohanpur (Part), Anchal : Baghmara, District : Dhanbad, Jharkhand (393.77 Ha)" (Proposal No. : SIA/JH/CMIN/540839/2025).**

**Ref:** Your application No. : 43, dated - 30. 08.2025.

**Sir,**

It is in reference to the project **"Madhuband Colliery with 1.5 MTPA using open cast and underground mining of M/s Bharat Coking Coal Limited at Village : Madhuband, Sidpoki (part), Keshargarh (Part), Saderiyadih (Part), Pandubitha (Part), Bansjora (Part) and Mohanpur (Part), Anchal : Baghmara, District : Dhanbad, Jharkhand (393.77 Ha)"** submitted by you for seeking Terms of Reference (ToR).

This is a new project which has been taken for appraisal on 10.09.2025.

**Project Sector: 1(a) Mining of Minerals (Coal), Category: B1.**

**Application for Terms of Reference (ToR) as per EIA Notification, 2006.**

**Approval of Mining Plan and Mine Closure Plan:** Mining Plan along with Progressive Mine Closure Plan (PMCP) for Madhuband Colliery has been approved in 416th BCCL Board Meeting dated 30.12.2024 vide letter BCCL/CS/AF-1(A)/22(H), dated 13.01.2025.

The Project of Cluster XV (4 UG mines with a normative production of 0.325 MTPA with a peak prod. of 0.423 MTPA in a combined ML area of 1696.55 ha) of M/s Bharat Coking Coal Ltd located in Jharia coalfields has obtained Environmental Clearance vide F.No. J-

11015/100/2011-IA.II(M) dated 16.12.2013. The four mines were Kharkharee Colliery (584 Ha.) for production of 0.092 MTPA, Madhuban Colliery (393.77 Ha.) for production of 0.113 MTPA, Phularitand Colliery (340.88 Ha.) for production of 0.120 MTPA and Dharmaband Colliery (377.90 Ha.). The instant proposal is for Madhuban Colliery (393.77 Ha.) only for proudction of 1.5 MTPA underground and open cast mining. The amendment/partial surrender will be obtained from concerned authority to delineate Madhuban Colliery from cluster XV.In view of the same it may be considered as a fresh EC application.

Baseline data collection was completed from **October, 2023 to December, 2023.**

The summary of baseline data is given below.

| Parameters | Baseline status |
|---|---|
| **AmbientAirQuality** | PM10 – 43.6 µg/m$^3$ to 83.3 µg/m$^3$<br>PM2.5 – 19.8 µg/m$^3$ to 53.2 µg/m$^3$<br>SO2 – 14.1 µg/m$^3$ to 25.7 µg/m$^3$<br>NOx – 18.0 µg/m$^3$ to 31.9 µg/m$^3$<br>CO – 00.48 mg/m$^3$ to 0.94 mg/m$^3$ |
| **Noise Level** | The Leq values for day time was observed to be 39.6 dB(A) to 70.2 dB(A),while during night time 31.5 dB(A) to 59.2 dB(A). |
| **Water Quality** | **Ground Water:** All the Parameters Like pH varies from 7.21 to 7.93, Total Hardness varies from 228 mg/L to 280 mg/L, Total Dissolved Solids varies from315 mg/L to 381 mg/L, Chlorides – 41.85 mg/L to 54.38 mg/Letc. are found within the permissible limits. |
| | **Surface Water:** All the Parameters Like pH varies from 7.26 to 7.92, Total Hardness varies from 347 mg/L to 424 mg/L, Total Dissolved Solids varies from 533 mg/L to 681 mg/L, Dissolved Oxygen – 5.80 mg/L to 8.90 mg/L etc. are found within the permissible limits. Total Coliform count is measured 580 to 1400 MPN/100ml. |
| **Soil Quality** | pH- 7.38 to 7.92<br>Organic matter- 0.42 % to 0.58 %<br>Electrical Conductance - 358 µS/cm to 537 µS/cm<br>Available Nitrogen - 151.92 kg/ha to 165.88 kg/ha<br>Available Phosphorous -15.66 kg/ha to 19.72 kg/ha Available Potassium - 170.50 kg/ha to 189.42 kg/ha |
| **Ecology and** | No National Park, Wild Life Sanctuary, Bio-sphere Reserve, Elephant Reserve, Tiger Reserve is present within 10 km of |

| | |
|---|---|
| **Biodiversity** | mining lease area. Schedule-I species present in the study area. However, a site specific WLCP has been prepared for conservation of Wildlife. |
| **Socio Economic Survey** | The proposed project will provide positive impact to the nearby area. The project will provide direct and indirect employment to nearby villagers. |

**Project and Location Details:**

| Sl. | Parameter | | Details | |
|---|---|---|---|---|
| 1. | Project Name | : | Madhuband Colliery with 1.5 MTPA using open cast and underground mining. Over an area of 393.77 Halocated at Village: Madhuband, Sidpoki (Part), Keshargarh (Part), Saderiyadih (Part), Pandubitha (Part), Bansjora (Part) and Mohanpur(Part) District- Dhanbad, State – Jharkhand Proposed by M/s Bharat Coking Coal Limited. | |
| 2. | Lessee: | : | M/s Bharat Coking Coal Limited. | |
| 3. | Address | : | Village: Madhuband, Sidpoki (Part), Keshargarh (Part), Saderiyadih (Part), Pandubitha (Part), Bansjora (Part) and Mohanpur(Part) District- Dhanbad, State – Jharkhand. | |
| 4. | Lease Area | : | 393.77 Ha | 973.026 Acres |
| 5. | Type of Land | : | Non-Forest | |
| 6. | Project Cost | : | Rs. 1018 Crores | |
| 7. | EMP Budget | : | EMP Budget will be submitted with EIA report | |
| 8. | New or Expansion | : | New | |
| 9. | Mineable Reserves | : | Cu.M.: 6,93,20,000 | Million Tonnes:103.98 |
| 10. | Mine Life | : | 67 Years (OC - 9 Years & UG – 67 Years) | |
| 11. | Manpower | : | Total manpower is assessed as ~1086. | |
| 12. | Water Requirement | : | Total Water Requirement is 2100 KLD<br>Industrial Water Requirement: 1500 KLD<br>Domestic Water Requirement: 600KLD | |
| 13. | Water Source | : | Water discharged from the mine will be treated and will be used for industrial purpose. Existing water treatment plant will be used for supply of potable water. | |

| | | | |
|---|---|---|---|
| 14. | DG Set / power | : | The power requirement is 16 MW, which will be sourced from BCCL Substation.<br><br>2 nos of 1010 kVA DG set with 10 meter stack height are proposed for power backup. |
| 15. | Crusher | : | Not Applicable |
| 16. | Nearest Water Body | : | The drainage of the area is controlled by Khudia Nallah flowing south-westerly, which ultimately joins the Jamunia river further west of the area. Khudiajore is to be diverted for extracting coal by opencast, which will be diverted in the 5th Year.<br><br>Other waterbodies<br>• Jamuiya N - 0.70 Km in W<br>• Damodar River - 3.58 Km in S<br>• Garga Nadi - 3.72 Km in S<br>• Barkijharia N - 5.34 Km in NW<br>• Barama Jhor- 7.35 Km in SE<br>• Katri Nadi - 7.5 Km in E |
| 17. | Nearest Habitation | : | Village: Madhuband, Sidpoki (Part), Keshargarh (Part), Saderiyadih (Part), Pandubitha (Part), Bansjora (Part) and Mohanpur(Part) inside the Mine Lease Area. |
| 18. | Nearest Rail Station | : | Nearest railway station is Dhanbad, located 35 km away (by road) which is on the main line of Eastern Railway. |
| 19. | Nearest Airport | : | Nearest airport is Durgapur which is located 100 km away. |
| 20. | Nearest Forest | : | • PF ~ 3.48 Km in SW<br>• PF ~ 4.43 Km in N<br>• PF ~ 4.73 Km in N<br>• PF ~ 6.16 Km in N<br>• PF ~ 6.18 Km in N<br>• PF ~ 6.30 Km in N<br>• PF ~ 6.96 Km in N<br>• PF ~ 7.32 Km in N<br>• PF ~ 7.44 Km in N<br>• PF ~ 7.55 Km in N<br>• PF ~ 7.61 Km in N<br>• PF ~ 7.89 Km in N<br>• PF ~ 7.96 Km in N |

| | | | |
|---|---|---|---|
| | | | • PF ~ 8.09 Km in NW<br>• PF ~ 8.59 Km in NE<br>• PF ~ 8.85 Km in NW<br>• PF ~ 8.94 Km in N<br>• PF ~ 9.22 Km in W<br>• PF ~ 9.33 Km in NW<br>• PF ~ 9.59 Km in NW |
| 21. | Road & Highways | : | • NH-18 ~ 1.63 Km in S |

**CO-ORDINATES**

| | | | | |
|---|---|---|---|---|
| 1 | Latitude | : | From $23^0$ 45'30'' N | To $23^0$ 46'30'' N |
| 2 | Longitude | : | From $86^0$ 12'00'' E | To$86^0$ 13'30'' E |

**LAND DETAILS**

The lease area is situated in Village: Madhuband, Sidpoki (Part), Keshargarh (Part), Saderiyadih (Part), Pandubitha (Part), Bansjora (Part) and Mohanpur(Part) District- Dhanbad, State – Jharkhand.

**Village: Madhuband**

| Khata No. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 119 | 117 | 36 | 47 | 31 | 101 | 109 | 120 | 18 | 57 |
| 27 | 52 | 43 | 89 | 97 | 54 | 70 | 98 | 58 | 86 |
| 33 | 85 | 60 | 42 | 25 | 17 | 103 | 2 | 19 | 78 |
| 83 | 94 | 112 | 30 | 110 | 11 | 100 | 1 | 50 | 5 |
| 106 | 21 | 4 | 9 | 13 | 32 | 65 | 45 | 105 | 107 |
| 20 | 102 | 88 | 75 | 35 | 96 | 108 | 61 | 62 | 104 |
| 22 | 73 | 39 | 111 | 74 | 28 | 116 | 55 | 72 | 92 |
| 110 | 56 | 66 | 3 | 118 | 15 | 90 | 66 | 54 | 23 |
| 118 | 56 | 1 | 5 | 24 | 91 | 114 | 81 | 40 | 35 |
| 73 | 26 | 16 | 83 | 76 | 108 | | | | |

| Khasra No. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 6 | 7 | 8 | 9 | 10 | 27 | 28 | 29 | 30 | 31 |

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| 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 |
| 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 |
| 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 |
| 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 |
| 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 |
| 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 |
| 98 | 99 | 100 | 101 | 102 | 103 | 104 | 105 | 106 | 107 |
| 108 | 109 | 110 | 111 | 112 | 113 | 114 | 115 | 116 | 117 |
| 118 | 119 | 120 | 121 | 122 | 123 | 124 | 125 | 126 | 127 |
| 128 | 129 | 130 | 131 | 132 | 133 | 134 | 135 | 136 | 137 |
| 138 | 139 | 140 | 141 | 142 | 143 | 144 | 145 | 146 | 147 |
| 148 | 149 | 150 | 151 | 152 | 153 | 154 | 155 | 156 | 157 |
| 158 | 159 | 160 | 161 | 162 | 163 | 164 | 165 | 166 | 167 |
| 168 | 169 | 170 | 171 | 172 | 173 | 174 | 175 | 176 | 177 |
| 178 | 179 | 180 | 181 | 182 | 183 | 184 | 185 | 186 | 187 |
| 188 | 189 | 190 | 191 | 192 | 193 | 194 | 195 | 196 | 197 |
| 198 | 199 | 200 | 201 | 202 | 203 | 204 | 205 | 206 | 207 |
| 208 | 209 | 210 | 211 | 212 | 213 | 214 | 215 | 216 | 217 |
| 218 | 219 | 220 | 221 | 222 | 223 | 224 | 225 | 226 | 227 |
| 228 | 229 | 230 | 231 | 232 | 233 | 234 | 235 | 236 | 237 |
| 238 | 239 | 240 | 241 | 242 | 243 | 244 | 245 | 246 | 247 |
| 248 | 249 | 250 | 251 | 252 | 253 | 254 | 255 | 256 | 257 |
| 258 | 259 | 260 | 261 | 262 | 263 | 264 | 265 | 266 | 267 |
| 268 | 269 | 270 | 271 | 272 | 273 | 274 | 275 | 276 | 277 |
| 278 | 279 | 280 | 281 | 282 | 283 | 284 | 285 | 286 | 287 |
| 288 | 289 | 290 | 291 | 292 | 293 | 294 | 295 | 296 | 297 |

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| 298 | 299 | 300 | 301 | 302 | 303 | 304 | 305 | 306 | 307 |
| 308 | 309 | 310 | 311 | 312 | 313 | 314 | 315 | 316 | 317 |
| 318 | 319 | 320 | 321 | 322 | 323 | 324 | 325 | 326 | 327 |
| 328 | 329 | 330 | 331 | 332 | 333 | 334 | 335 | 336 | 337 |
| 338 | 339 | 340 | 341 | 342 | 343 | 344 | 345 | 346 | 347 |
| 348 | 349 | 350 | 351 | 352 | 353 | 354 | 355 | 356 | 357 |
| 358 | 359 | 360 | 361 | 362 | 363 | 364 | 365 | 366 | 367 |
| 368 | 369 | 370 | 371 | 372 | 373 | 374 | 375 | 376 | 377 |
| 378 | 379 | 380 | 381 | 382 | 383 | 384 | 385 | 386 | 387 |
| 388 | 389 | 390 | 391 | 392 | 393 | 394 | 395 | 396 | 397 |
| 398 | 399 | 400 | 401 | 402 | 403 | 404 | 405 | 406 | 407 |
| 408 | 409 | 410 | 411 | 412 | 413 | 414 | 415 | 416 | 417 |
| 418 | 419 | 420 | 421 | 422 | 423 | 424 | 425 | 426 | 427 |
| 428 | 429 | 430 | 431 | 432 | 433 | 434 | 435 | 436 | 437 |
| 438 | 439 | 440 | 441 | 442 | 443 | 444 | 445 | 446 | 447 |
| 448 | 449 | 450 | 451 | 452 | 453 | 454 | 455 | 456 | 457 |
| 458 | 459 | 460 | 461 | 462 | 463 | 464 | 465 | 466 | 467 |
| 468 | 469 | 470 | 471 | 472 | 473 | 474 | 475 | 476 | 477 |
| 478 | 479 | 480 | 481 | 482 | 483 | 484 | 485 | 486 | 487 |
| 488 | 489 | 490 | 491 | 492 | 493 | 494 | 495 | 496 | 497 |
| 498 | 499 | 500 | 501 | 502 | 503 | 504 | 505 | 506 | 507 |
| 508 | 509 | 510 | 511 | 512 | 513 | 514 | 515 | 516 | 517 |
| 518 | 519 | 520 | 521 | 522 | 523 | 524 | 525 | 526 | 527 |
| 528 | 529 | 530 | 531 | 532 | 533 | 534 | 535 | 536 | 537 |
| 538 | 539 | 540 | 541 | 542 | 543 | 544 | 545 | 546 | 547 |
| 548 | 549 | 550 | 551 | 552 | 553 | 554 | 555 | 556 | 557 |

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|---|---|---|---|---|---|---|---|---|---|
| 558 | 559 | 560 | 561 | 562 | 563 | 564 | 565 | 566 | 567 |
| 568 | 569 | 570 | 571 | 572 | 573 | 574 | 575 | 576 | 577 |
| 578 | 579 | 580 | 581 | 582 | 583 | 584 | 585 | 586 | 587 |
| 588 | 589 | 590 | 591 | 592 | 593 | 594 | 595 | 596 | 597 |
| 598 | 599 | 600 | 601 | 602 | 603 | 604 | 605 | 606 | 607 |
| 608 | 609 | 610 | 611 | 612 | 613 | 614 | 615 | 616 | 617 |
| 618 | 619 | 620 | 621 | 622 | 623 | 624 | 625 | 626 | 627 |
| 628 | 629 | 630 | 631 | 632 | 633 | 634 | 635 | 636 | 637 |
| 638 | 639 | 640 | 641 | 642 | 643 | 644 | 645 | 646 | 647 |
| 648 | 649 | 650 | 651 | 652 | 653 | 654 | 655 | 656 | 657 |
| 658 | 659 | 660 | 661 | 662 | 663 | 664 | 665 | 666 | 667 |
| 668 | 669 | 670 | 671 | 672 | 673 | 674 | 675 | 676 | 677 |
| 678 | 679 | 680 | 681 | 682 | 683 | 684 | 685 | 686 | 687 |
| 688 | 689 | 690 | 691 | 692 | 693 | 694 | 695 | 696 | 697 |
| 698 | 699 | 700 | 701 | 702 | 703 | 704 | 705 | 706 | 707 |
| 708 | 709 | 710 | 711 | 712 | 713 | 714 | 715 | 716 | 717 |
| 718 | 719 | 720 | 721 | 722 | 723 | 724 | 725 | 726 | 727 |
| 728 | 729 | 730 | 731 | 732 | 733 | 734 | 735 | 736 | 737 |
| 738 | 739 | 740 | 741 | 742 | 743 | 744 | 745 | 746 | 747 |
| 748 | 749 | 750 | 751 | 752 | 753 | 754 | 755 | 756 | 757 |
| 758 | 759 | 760 | 761 | 762 | 763 | 764 | 765 | 766 | 767 |
| 768 | 769 | 770 | 771 | 772 | 773 | 774 | 775 | 776 | 777 |
| 778 | 779 | 780 | 781 | 783 | 784 | 785 | 786 | 787 | 788 |
| 789 | 791 | 792 | 793 | 794 | 795 | 796 | 797 | 798 | 799 |
| 800 | 801 | 802 | 803 | 804 | 805 | 806 | 807 | 808 | 809 |
| 810 | 811 | 812 | 813 | 814 | 815 | 816 | 817 | 818 | 819 |

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|---|---|---|---|---|---|---|---|---|---|
| 820 | 821 | 822 | 823 | 824 | 825 | 826 | 827 | 828 | 829 |
| 830 | 831 | 832 | 833 | 834 | 835 | 836 | 837 | 838 | 839 |
| 840 | 841 | 842 | 843 | 844 | 845 | 846 | 847 | 848 | 849 |
| 850 | 851 | 852 | 853 | 854 | 855 | 856 | 857 | 858 | 859 |
| 860 | 861 | 862 | 863 | 864 | 865 | 866 | 867 | 868 | 869 |
| 870 | 871 | 872 | 873 | 874 | 875 | 876 | 877 | 878 | 879 |
| 880 | 881 | 882 | 883 | 884 | 885 | 887 | 888 | 889 | 890 |
| 891 | 892 | 893 | 894 | 895 | 896 | 897 | 898 | 899 | 900 |
| 901 | 902 | 903 | 904 | 905 | 906 | 907 | 908 | 909 | 910 |
| 911 | 912 | 913 | 914 | 915 | 916 | 917 | 918 | 919 | 920 |
| 921 | 922 | 923 | 924 | 925 | 926 | 927 | 928 | 929 | 930 |
| 931 | 932 | 933 | 934 | 935 | 936 | 937 | 938 | 939 | 940 |
| 941 | 942 | 943 | 944 | 945 | 946 | 947 | 948 | 949 | 950 |
| 951 | 952 | 953 | 954 | 955 | 956 | 957 | 958 | 959 | 960 |
| 961 | 962 | 963 | 964 | 965 | 966 | 967 | 968 | 969 | 970 |
| 971 | 972 | 973 | 974 | 975 | 976 | 977 | 978 | 979 | 980 |
| 981 | 982 | 983 | 984 | 985 | 986 | 987 | 988 | 989 | 990 |
| 991 | 992 | 993 | 994 | 995 | 996 | 997 | 998 | 999 | 1000 |
| 1001 | 1002 | 1003 | 1004 | 1005 | 1006 | 1007 | 1008 | 1009 | 1010 |
| 1011 | 1012 | 1013 | 1014 | 1015 | 1016 | 1017 | 1018 | 1019 | 1020 |
| 1021 | 1022 | 1023 | 1024 | 1025 | 1026 | 1027 | 1028 | 1029 | 1030 |
| 1031 | 1032 | 1033 | 1034 | 1035 | 1036 | 1037 | 1038 | 1039 | 1040 |
| 1041 | 1042 | 1043 | 1044 | 1045 | 1046 | 1047 | 1048 | 1049 | 1050 |
| 1051 | 1052 | 1053 | 1054 | 1055 | 1056 | 1057 | 1058 | 1059 | 1060 |
| 1061 | 1062 | 1063 | 1064 | 1065 | 1066 | 1067 | 1068 | 1069 | 1070 |
| 1071 | 1072 | 1073 | 1074 | 1075 | 1076 | 1077 | 1078 | 1079 | 1080 |

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|---|---|---|---|---|---|---|---|---|---|
| 1081 | 1082 | 1083 | 1084 | 1085 | 1086 | 1087 | 1088 | 1089 | 1090 |
| 1091 | 1092 | 1093 | 1094 | 1095 | 1096 | 1097 | 1098 | 1099 | 1100 |
| 1101 | 1102 | 1103 | 1104 | 1105 | 1106 | 1107 | 1108 | 1109 | 1110 |
| 1111 | 1112 | 1113 | 1114 | 1115 | 1116 | 1117 | 1118 | 1119 | 1120 |
| 1121 | 1122 | 1123 | 1124 | 1125 | 1126 | 1127 | 1128 | 1129 | 1130 |
| 1131 | 1132 | 1133 | 1134 | 1135 | 1136 | 1137 | 1138 | 1139 | 1140 |
| 1141 | 1142 | 1143 | 1144 | 1145 | 1146 | 1147 | 1148 | 1149 | 1150 |
| 1151 | 1152 | 1153 | 1154 | 1155 | 1156 | 1157 | 1158 | 1159 | 1160 |
| 1161 | 1162 | 1163 | 1164 | 1165 | 1166 | 1167 | 1168 | 1169 | 1170 |
| 1171 | 1172 | 1173 | 1174 | 1175 | 1176 | 1177 | 1178 | 1179 | 1180 |
| 1181 | 1182 | 1183 | 1184 | 1185 | 1186 | 1187 | 1188 | 1189 | 1191 |
| 1192 | 1193 | 1194 | 1195 | 1196 | 1197 | 1198 | 1199 | 1200 | 1201 |
| 1202 | 1203 | 1204 | 1205 | 1206 | 1207 | 1208 | 1209 | 1210 | 1211 |
| 1212 | 1213 | 1214 | 1215 | 1216 | 1217 | 1218 | 1219 | 1221 | 1222 |
| 1223 | 1224 | 1225 | 1226 | 1227 | 1228 | 1229 | 1231 | 1232 | 1233 |
| 1234 | 1235 | 1236 | 1237 | 1238 | 1239 | 1241 | 1243 | 1244 | 1245 |
| 1246 | 1247 | 1248 | 1249 | 1250 | 1251 | 1252 | 1253 | 1254 | 1255 |
| 1256 | 1257 | 1258 | 1259 | 1260 | 1261 | 1262 | 1264 | 1265 | 1266 |
| 1267 | 1268 | 1269 | 1270 | 1271 | 1272 | 1273 | 1274 | 1275 | 1276 |
| 1277 | 1278 | 1279 | 1280 | 1282 | 1283 | 1284 | 1285 | 1286 | 1287 |
| 1288 | 1289 | 1290 | 1291 | 1292 | 1293 | 1294 | 1295 | 1296 | 1298 |
| 1299 | 1300 | 1301 | 1302 | 1303 | 1304 | 1305 | 1306 | 1307 | 1308 |
| 1309 | 1310 | 1311 | 1312 | 1313 | 1314 | 1315 | 1316 | 1317 | 1318 |
| 1319 | 1320 | 1321 | 1322 | 1323 | 1324 | 1325 | 1326 | 1327 | 1328 |
| 1329 | 1330 | 1331 | 1332 | 1335 | 1336 | 1338 | 1339 | 1340 | 1341 |
| 1342 | 1345 | 1346 | 1347 | 1348 | 1349 | 1350 | 1351 | 1352 | 1353 |

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|---|---|---|---|---|---|---|---|---|---|
| 1354 | 1355 | 1356 | 1358 | 1359 | 1360 | 1361 | 1362 | 1363 | 1364 |
| 1365 | 1366 | 1367 | 1368 | 1369 | 1370 | 1372 | 1373 | 1374 | 1375 |
| 1376 | 1377 | 1378 | 1379 | 1380 | 1381 | 1382 | 1385 | 1386 | 1387 |
| 1388 | 1389 | 1392 | 1393 | 1394 | 1395 | 1396 | 1397 | 1398 | 1399 |
| 1400 | 1401 | 1402 | 1403 | 1404 | 1405 | 1406 | 1407 | 1408 | 1409 |
| 1410 | 1411 | 1412 | 1413 | 1415 | 1416 | 1417 | 1418 | 1419 | 1420 |
| 1421 | 1422 | 1423 | 1424 | 1425 | 1426 | 1427 | 1428 | 1430 | 1431 |
| 1432 | 1433 | 1434 | 1435 | 1436 | 1437 | 1438 | 1439 | 1440 | 1441 |
| 1442 | 1443 | 1444 | 1445 | 1446 | 1447 | 1448 | 1449 | 1450 | 1451 |
| 1452 | 1453 | 1454 | 1455 | 1456 | 1457 | 1458 | 1459 | 1460 | 1461 |
| 1462 | 1463 | 1464 | 1465 | 1466 | 1467 | 1468 | 1469 | 1470 | 1471 |
| 1473 | 1474 | 1475 | 1476 | 1477 | 1478 | 1479 | 1480 | 1481 | 1482 |
| 1483 | 1484 | 1485 | 1486 | 1487 | 1488 | 1489 | 1490 | 1491 | 1492 |
| 1493 | 1494 | 1495 | 1496 | 1497 | 1498 | 1499 | 1500 | 1501 | 1502 |
| 1503 | 1504 | 1505 | 1506 | 1507 | 1508 | 1509 | 1510 | 1511 | 1512 |
| 1513 | 1514 | 1515 | 1516 | 1517 | 1518 | 1519 | 1520 | 1521 | 1522 |
| 1523 | 1524 | 1525 | 1526 | 1527 | 1528 | 1529 | 1530 | 1531 | 1532 |
| 1533 | 1534 | 1535 | 1536 | 1537 | 1538 | 1539 | 1540 | 1541 | 1542 |
| 1543 | 1544 | 1545 | 1546 | 1547 | 1548 | 1549 | 1550 | 1551 | 1552 |
| 1553 | 1554 | 1555 | 1556 | 1557 | 1558 | 1559 | 1560 | 1561 | 1562 |
| 1563 | 1564 | 1565 | 1566 | 1567 | 1568 | 1569 | 1570 | 1571 | 1572 |
| 1573 | 1574 | 1575 | 1576 | 1577 | 1578 | 1579 | 1580 | 1581 | 1582 |
| 1583 | 1584 | 1585 | 1586 | 1587 | 1588 | 1589 | 1590 | 1591 | 1592 |
| 1593 | 1594 | 1595 | 1596 | 1597 | 1598 | 1599 | 1600 | 1601 | 1602 |
| 1603 | 1604 | 1605 | 1606 | 1607 | 1608 | 1609 | 1610 | 1611 | 1612 |
| 1613 | 1614 | 1615 | 1616 | 1617 | 1618 | 1619 | 1620 | 1621 | 1622 |

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|---|---|---|---|---|---|---|---|---|---|
| 1623 | 1624 | 1625 | 1626 | 1627 | 1628 | 1629 | 1630 | 1631 | 1632 |
| 1633 | 1634 | 1635 | 1636 | 1637 | 1638 | 1639 | 1640 | 1641 | 1642 |
| 1643 | 1644 | 1645 | 1646 | 1647 | 1648 | 1649 | 1650 | 1651 | 1652 |
| 1653 | 1654 | 1655 | 1656 | 1657 | 1658 | 1659 | 1660 | 1661 | 1662 |
| 1663 | 1664 | 1665 | 1666 | 1667 | 1668 | 1669 | 1670 | 1671 | 1672 |
| 1673 | 1674 | 1675 | 1676 | 1677 | 1678 | 1679 | 1680 | 1681 | 1682 |
| 1683 | 1684 | 1685 | 1686 | 1687 | 1688 | 1689 | 1690 | 1691 | 1692 |
| 1693 | 1694 | 1695 | 1696 | 1697 | 1698 | 1699 | 1700 | 1701 | 1702 |
| 1703 | 1704 | 1705 | 1706 | 1707 | 1708 | 1709 | 1710 | 1711 | 1712 |
| 1713 | 1714 | 1715 | 1716 | 1717 | 1718 | 1719 | 1720 | 1721 | 1722 |
| 1723 | 1724 | 1725 | 1726 | 1727 | 1728 | 1729 | 1730 | 1731 | 1732 |
| 1733 | 1734 | 1735 | 1736 | 1737 | 1738 | 1739 | 1740 | 1741 | 1742 |
| 1743 | 1744 | 1745 | 1746 | 1747 | 1748 | 1749 | 1750 | 1751 | 1752 |
| 1753 | 1754 | 1755 | 1756 | 1757 | 1758 | 1759 | 1761 | 1762 | 1763 |
| 1764 | 1765 | 1766 | 1767 | 1768 | 1769 | 1770 | 1771 | 1772 | 1773 |
| 1774 | 1775 | 1776 | 1777 | 1778 | 1779 | 1780 | 1781 | 1782 | 1783 |
| 1784 | 1785 | 1786 | 1787 | 1788 | 1789 | 1790 | 1791 | 1792 | 1793 |
| 1794 | 1795 | 1796 | 1797 | 1798 | 1799 | 1800 | 1801 | 1802 | 1803 |
| 1804 | 1805 | 1806 | 1807 | 1808 | 1809 | 1810 | 1811 | 1812 | 1813 |
| 1814 | 1815 | 1816 | 1817 | 1818 | 1819 | 1820 | 1821 | 1822 | 1823 |
| 1824 | 1825 | 1826 | 1827 | 1828 | 1829 | 1830 | 1831 | 1832 | 1833 |
| 1834 | 1835 | 1836 | 1837 | 1838 | 1839 | 1840 | 1841 | 1842 | 1843 |
| 1844 | 1845 | 1846 | 1847 | 1848 | 1849 | 1850 | 1851 | 1852 | 1853 |
| 1854 | 1855 | 1856 | 1857 | 1858 | 1859 | 1860 | 1861 | 1862 | 1863 |
| 1864 | 1865 | 1866 | 1867 | 1868 | 1869 | 1870 | 1871 | 1872 | 1873 |
| 1874 | 1875 | 1876 | 1877 | 1878 | 1879 | 1880 | 1881 | 1882 | 1883 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1884 | 1885 | 1886 | 1887 | 1888 | 1889 | 1890 | 1891 | 1892 | 1893 |
| 1894 | 1895 | 1896 | 1897 | 1898 | 1899 | 1900 | 1901 | 1902 | 1903 |
| 1904 | 1905 | 1906 | 1907 | 1908 | 1909 | 1910 | 1911 | 1912 | 1913 |
| 1914 | 1915 | 1916 | 1917 | 1918 | 1919 | 1920 | 1921 | 1922 | 1923 |
| 1925 | 1926 | 1927 | 1928 | 1929 | 1930 | 1931 | 1932 | 1933 | 1934 |
| 1935 | 1936 | 1937 | 1938 | 1939 | 1940 | 1941 | 1942 | 1943 | 1944 |
| 1945 | 1946 | 1947 | 1948 | 1949 | 1950 | 1951 | 1952 | 1953 | 1954 |
| 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 |
| 1965 | 1966 | 1967 | 1968 | 1969 | 1970 | 1971 | 1972 | 1973 | 1974 |
| 1975 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 |
| 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 |
| 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
| 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
| 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 |
| 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 |
| 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 |
| 2047 | 2048 | 2049 | 2050 | 2051 | 2052 | 2053 | 2054 | 2055 | 2056 |
| 2057 | 2058 | 2059 | 2060 | 2061 | 2062 | 2063 | 2064 | 2065 | 2066 |
| 2067 | 2068 | 2069 | 2070 | 2071 | 2072 | 2073 | 2074 | 2075 | 2076 |
| 2077 | 2078 | 2079 | 2080 | 2081 | 2082 | 2083 | 2084 | 2085 | 2086 |
| 2087 | 2088 | 2089 | 2090 | 2091 | 2092 | 2093 | 2094 | 2095 | 2096 |
| 2097 | 2098 | 2099 | 2100 | 2101 | 2102 | 2103 | 2104 | 2105 | 2106 |
| 2107 | 2108 | 2109 | 2110 | 2111 | 2112 | 2113 | 2114 | 2115 | 2116 |
| 2117 | 2118 | 2119 | 2120 | 2121 | 2122 | 2123 | 2124 | 2125 | 2126 |
| 2127 | 2128 | 2129 | 2130 | 2131 | 2132 | 2133 | 2134 | 2135 | 2136 |
| 2137 | 2138 | 2139 | 2140 | 2141 | 2142 | 2143 | 2144 | 2145 | 2146 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2147 | 2148 | 2149 | 2150 | 2151 | 2152 | 2153 | 2154 | 2155 | 2156 |
| 2157 | 2158 | 2159 | 2160 | 2161 | 2162 | 2163 | 2164 | 2165 | 2166 |
| 2167 | 2168 | 2169 | 2170 | 2171 | 2172 | 2173 | 2174 | 2175 | 2176 |
| 2177 | 2178 | 2179 | 2180 | 2181 | 2182 | 2183 | 2184 | 2185 | 2186 |
| 2187 | 2188 | 2189 | 2190 | 2191 | 2192 | 2193 | 2194 | 2195 | 2196 |
| 2197 | 2198 | 2199 | 2200 | 2201 | 2202 | 2203 | 2204 | 2205 | 2206 |
| 2207 | 2208 | 2209 | 2210 | 2211 | 2212 | 2213 | 2214 | 2215 | 2216 |
| 2217 | 2218 | 2219 | 2220 | 2221 | 2222 | 2223 | 2224 | 2225 | 2226 |
| 2227 | 2228 | 2229 | 2230 | 2231 | 2232 | 2233 | 2234 | 2235 | 2236 |
| 2237 | 2238 | 2239 | 2240 | 2241 | 2242 | 2243 | 2244 | 2245 | 2246 |
| 2247 | 2248 | 2249 | 2250 | 2251 | 2252 | 2253 | 2254 | 2255 | 2256 |
| 2257 | 2258 | 2259 | 2260 | 2261 | 2262 | 2263 | 2264 | 2265 | 2266 |
| 2267 | 2268 | 2269 | 2270 | 2271 | 2272 | 2273 | 2274 | 2275 | 2276 |
| 2277 | 2278 | 2279 | 2280 | 2281 | 2282 | 2283 | 2285 | 2286 | 2287 |
| 2288 | 2289 | 2290 | 2292 | 2293 | 2294 | 2295 | 2296 | 2297 | 2298 |
| 2299 | 2300 | 2302 | 2303 | 2304 | 2305 | 2306 | 2307 | 2308 | 2309 |
| 2310 | 2311 | 2312 | 2313 | 2314 | 2315 | 2316 | 2317 | 2318 | 2319 |
| 2320 | 2321 | 2322 | 2323 | 2324 | 2326 | 2327 | 2328 | 2329 | 2330 |
| 2331 | 2332 | 2333 | 2334 | 2335 | 2336 | 2337 | 2338 | 2339 | 2340 |
| 2341 | 2342 | 2343 | 2344 | 2345 | 2346 | 2347 | 2348 | 2349 | 2350 |
| 2353 | 2354 | 306/2355 | 1742/2356 | 1472/2357 | 1440/2358 | 2113/2359 | 652/2360 | 485/2361 | 1428/2362 |
| 208/2363 | 1746/2364 | 1427/2365 | 1429/2366 | 2143/2367 | 2228/2368 | 782 | 790 | 886 | 1190 |
| 1220 | 1230 | 1240 | 1242 | 1263 | 1281 | 1297 | 1319 | 1333 | 1334 |
| 1337 | 1343 | 1344 | 1357 | 1371 | 1383 | 1384 | 1390 | 1391 | 1429 |
| 1472 | 1644 | 2325 | 1414 | 1760 | 1924 | 1976 | 1977 | 2291 | |

**Village: Mohanpur**

| Khata no. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | | | | |

| Khasra no. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 10 | 19 | 24 | 25 | 26 | 29 | 31 | 32 | 37 | 43 |
| 46 | 73 | 8 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 20 | 38 | 39 | 40 | 41 | 42 | 45 | 49 | 64 | 66 |
| 71 | 9 | 11 | 21 | 22 | 23 | 27 | 28 | 30 | 44 |
| 47 | 48 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 |
| 58 | 59 | 60 | 61 | 62 | 63 | 65 | 67 | 68 | 69 |
| 70 | 72 | | | | | | | | |

**Village: Keshargarh**

| Khata no. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 134 | 71 | 132 | 136 | 83 | 106 | 9 | 65 | 22 | 33 |
| 135 | 53 | 34 | 27 | 52 | 60 | 105 | 66 | 107 | 124 |
| 104 | 62 | 120 | 109 | 98 | 73 | 72 | 97 | 108 | 48 |
| 119 | 101 | 89 | 15 | 129 | 128 | 70 | 76 | 122 | 78 |
| 32 | 7 | 44 | 57 | 54 | 38 | 56 | 130 | 14 | 64 |

| Khasra no. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 727 | 728 | 729 | 730 | 832 | 833 | 868 | 869 | 870 | 871 |
| 872 | 873 | 874 | 875 | 876 | 877 | 878 | 878 | 879 | 880 |
| 881 | 882 | 883 | 884 | 885 | 886 | 887 | 888 | 889 | 890 |
| 891 | 892 | 893 | 894 | 895 | 896 | 897 | 898 | 899 | 900 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 901 | 902 | 903 | 904 | 905 | 906 | 907 | 908 | 909 | 910 |
| 911 | 912 | 913 | 914 | 915 | 916 | 917 | 918 | 919 | 920 |
| 921 | 922 | 923 | 924 | 925 | 926 | 927 | 928 | 929 | 930 |
| 931 | 932 | 933 | 934 | 935 | 936 | 937 | 938 | 939 | 940 |
| 941 | 942 | 943 | 944 | 945 | 946 | 947 | 948 | 949 | 950 |
| 951 | 952 | 953 | 954 | 955 | 956 | 957 | 958 | 959 | 960 |
| 961 | 962 | 963 | 964 | 965 | 966 | 967 | 968 | 969 | 970 |
| 971 | 972 | 973 | 974 | 975 | 976 | 977 | 978 | 979 | 980 |
| 981 | 982 | 983 | 984 | 985 | 986 | 987 | 988 | 989 | 990 |
| 991 | 992 | 993 | 994 | 995 | 996 | 997 | 998 | 999 | 1000 |
| 1001 | 1002 | 1003 | 1004 | 1005 | 1006 | 1007 | 1008 | 1009 | 1010 |
| 1011 | 1012 | 1013 | 1014 | 1015 | 1016 | 1017 | 1018 | 1019 | 1020 |
| 1021 | 1022 | 1023 | 1024 | 1025 | 1026 | 1027 | 1028 | 1029 | 1030 |
| 1031 | 1032 | 1033 | 1034 | 1035 | 1036 | 1037 | 1038 | 1039 | 1040 |
| 1041 | 1042 | 1043 | 1044 | 1045 | 1046 | 1047 | 1048 | 1049 | 1050 |
| 1051 | 1052 | 1053 | 1054 | 1055 | 1056 | 1057 | 1058 | 1059 | 1060 |
| 1061 | 1062 | 1063 | 1064 | 1065 | 1066 | 1067 | 1068 | 1069 | 1070 |
| 1071 | 1072 | 1073 | 1074 | 1075 | 1076 | 1077 | 1078 | 1079 | 1080 |
| 1081 | 1082 | 1083 | 1088 | 1091 | | | | | |

**Village: Bansjora**

| Khata no. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 113 | 158 | 311 | 334 | 157 | 55 | 39 | 157 | 167 | 270 |
| 167 | 198 | 77 | 126 | 197 | 274 | | | | |

| Khasra no. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2 | 3 | 8 | 14 | 1601 | 1602 | 1603 | 1604 | 1605 | 1606 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1607 | 1615 | 1616 | 1617 | 1618 | 1619 | 1620 | 1621 | 1622 | 1623 |
| 1624 | 1627 | 1628 | 1629 | 1630 | | | | | |

**Village: Shidpoki**

| Khata no. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 47 | 15 | 16 | 49 | 33 | 22 | 7 | 5 | 10 | 26 |
| 20 | 13 | 30 | 9 | 34 | 50 | 48 | 51 | 2 | 3 |
| 18 | 41 | 46 | 38 | 43 | 28 | 32 | 23 | 11 | 6 |
| 31 | | | | | | | | | |

| Khasra no. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 |
| 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 |
| 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 |
| 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 |
| 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 |
| 80 | 81 | 82 | 148 | 149 | 150 | 151 | 152 | 153 | 154 |
| 159 | 160 | 161 | 162 | 163 | 164 | 165 | 166 | 167 | 168 |
| 325 | 326 | 330 | 331 | 332 | 333 | 334 | 335 | 336 | 337 |
| 338 | 339 | 340 | 341 | 342 | 343 | 344 | 345 | 346 | 347 |
| 348 | 349 | 350 | 351 | 352 | 353 | 354 | 355 | 356 | 357 |
| 358 | 359 | 360 | 361 | 362 | 363 | 364 | 365 | 366 | 367 |
| 368 | 369 | 370 | 371 | 372 | 373 | 374 | 375 | 376 | 377 |
| 378 | 379 | 380 | 381 | 382 | 383 | 384 | 385 | 386 | 387 |
| 388 | 389 | 390 | 391 | 392 | 393 | 394 | 395 | 396 | 397 |
| 398 | 399 | 400 | 401 | 402 | 403 | 404 | 405 | 406 | 407 |
| 408 | 409 | 410 | 411 | 412 | 413 | 414 | 415 | 416 | 417 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 418 | 419 | 420 | 421 | 422 | 423 | 424 | 425 | 426 | 427 |
| 428 | 429 | 430 | 431 | 432 | 433 | 434 | 435 | 436 | 437 |
| 438 | 439 | 440 | 441 | 442 | 443 | 444 | 445 | 446 | 447 |
| 448 | 449 | 450 | 451 | 452 | 453 | 454 | 455 | 456 | 457 |
| 458 | 459 | 460 | 461 | 462 | 463 | 464 | 465 | 466 | 467 |
| 468 | 469 | 470 | 471 | 472 | 473 | 474 | 475 | 476 | 477 |
| 478 | 479 | 483 | 484 | | | | | | |

**Village: Sadariyadih**

| Khata no. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 64 | 49 | 60 | 53 | 85 | 68 | 4 | 58 | 84 | 6 |
| 79 | 75 | 29 | 76 | 17 | 56 | 67 | 44 | 77 | 15 |
| 8 | 5 | 74 | 39 | 7 | 32 | 83 | 57 | 82 | 80 |
| 24 | 34 | 37 | 42 | 21 | 27 | 10 | 36 | 65 | 16 |
| 61 | 19 | | | | | | | | |

| Khasra no. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 829 | 830 | 831 | 832 | 833 | 834 | 835 | 836 | 837 | 838 |
| 839 | 840 | 841 | 842 | 843 | 844 | 845 | 846 | 847 | 848 |
| 849 | 850 | 851 | 852 | 853 | 854 | 855 | 856 | 857 | 858 |
| 859 | 860 | 861 | 862 | 863 | 864 | 865 | 866 | 867 | 868 |
| 869 | 870 | 871 | 872 | 873 | 874 | 875 | 876 | 877 | 878 |
| 879 | 880 | 881 | 882 | 883 | 884 | 885 | 886 | 887 | 888 |
| 889 | 890 | 893 | 953 | 955 | 956 | 958 | 959 | 960 | 961 |
| 962 | 963 | 964 | 965 | 966 | 967 | 968 | 969 | 970 | 971 |
| 972 | 973 | 974 | 975 | 976 | 977 | 978 | 979 | 980 | 981 |
| 982 | 983 | 984 | 985 | 986 | 987 | 988 | 989 | 990 | 991 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 992 | 993 | 994 | 995 | 996 | 997 | 998 | 999 | 1000 | 1001 |
| 1002 | 1003 | 1004 | 1005 | 1006 | 1007 | 1008 | 1009 | 1010 | 1011 |
| 1012 | 1013 | 1014 | 1015 | 1016 | 1017 | 1018 | 1019 | 1020 | 1021 |
| 1022 | 1023 | 1024 | 1025 | 1026 | 1027 | 1028 | 1029 | 1030 | 1031 |
| 1032 | 1033 | 1034 | 1035 | 1036 | 1037 | 1038 | 1039 | 1040 | 1041 |
| 1042 | 1043 | 1044 | 1045 | 1046 | 1047 | 1048 | 1049 | 1050 | 1051 |
| 1052 | 1053 | 1054 | 1055 | 1056 | 1057 | 1058 | 1059 | 1060 | 1061 |
| 1062 | 1063 | 1064 | 1065 | 1066 | 1067 | 1068 | 1069 | 1070 | 1071 |
| 1072 | 1073 | 1074 | 1075 | 1076 | 1077 | 1078 | 1079 | 1080 | 1081 |
| 1082 | 1083 | 1084 | 1085 | 1086 | 1087 | 1088 | 1089 | 1090 | 1091 |
| 1092 | 1093 | 1094 | 1095 | 1096 | 1097 | 1098 | 1099 | 1100 | 1101 |
| 1102 | 1103 | 1104 | 1105 | 1106 | 1107 | 1108 | 1109 | 1110 | 1111 |
| 1112 | 1113 | 1114 | 1115 | 1116 | 1117 | 1118 | 1119 | 1120 | 1121 |
| 1122 | 1123 | 1124 | 1125 | 1126 | 1127 | 1128 | 1129 | 1130 | 1131 |
| 1132 | 1133 | 1134 | 1135 | 1136 | 1137 | 1138 | 1140 | 1141 | 1142 |
| 1143 | 1144 | 1145 | 1146 | 1147 | 1148 | 1149 | 1150 | 1151 | 1152 |
| 1153 | 1154 | 1155 | 1156 | 1157 | 1158 | 1159 | 1160 | 1161 | 1162 |
| 1163 | 1164 | 1165 | 1166 | 1167 | 1168 | 1169 | 1170 | 1171 | 1172 |
| 1173 | 1174 | 1175 | 1176 | 1177 | 1179 | 1180 | 1181 | 1182 | 1183 |
| 1184 | 1185 | 1186 | 1187 | 1188 | 1189 | 1190 | 1191 | 1192 | 1193 |
| 1194 | 1195 | 1196 | 1197 | 1198 | 1199 | 1200 | 1201 | 1201 | 1203 |
| 1204 | 1205 | 1206 | 1207 | 1208 | 1209 | 1210 | 1211 | 1212 | 1213 |
| 1214 | 1215 | 1216 | 1217 | 1218 | 1219 | 1220 | 1221 | 1222 | 1223 |
| 1224 | 1225 | 1226 | 1227 | 1228 | 1229 | 1230 | 1231 | 1232 | 1233 |
| 1234 | 1235 | 1236 | 1237 | 1238 | 1239 | 1240 | 1241 | 1242 | 1243 |
| 1247 | 1248 | 1249 | 1250 | 1251 | 1252 | 1253 | 1254 | 1255 | 1266 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1267 | 1268 | 1269 | 1270 | 1271 | 1272 | 1273 | 1274 | 1275 | 1276 |
| 1277 | 1278 | 1279 | 1280 | 1281 | 1282 | 1283 | 1284 | 1285 | 1286 |
| 1287 | 1288 | 1289 | 1290 | 1291 | 1293 | 1294 | 1295 | 1296 | 1309 |
| 1310 | 1311 | 1312 | 1314 | 1315 | 1316 | 1317 | 1319 | 1320 | 1321 |
| 1322 | 1323 | 1703 | | | | | | | |

**Village: Pandhuabhita**

| Khata no. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 15 | 10 | 2 | 33 | 32 | | | | | |

| Khasra no. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 134 | 137 | 251 | 254 | 255 | 38 | 41 | 125 | 126 | 127 |
| 128 | 129 | 130 | 131 | 132 | 133 | 135 | 136 | 138 | 252 |
| 253 | | | | | | | | | |

## STATUTORY CLEARANCES

| | | | |
|---|---|---|---|
| 1 | Land Document | : | The mining lease has been vested through the Coking Coal (Nationalisation) Act, 1972 and Coal Mines (Nationalisation) Act, 1973 and Mineral Concession (Amendment) Rules 2021. |
| 2 | CO | : | The CO, Baghmara (Dhanbad) vide letter no. 728, dated 03.06.2025 has mentioned the plot no. of the project is not recorded as "Jungle- Jhari" in R.S. Khatiyan & Register II. |
| 3 | DFO Wild Life | : | DFO, Wildlife Division, Hazaribag vide letter no. 911, dated 28.05.2025 certified that the proposed project site is outside Eco Sensitive Zone of Parasnath & Topchanchi Wildlife Sanctuary. |
| 4 | DFO Territorial | : | Divisional Forest Officer, Dhanbad Forest Division vide letter no. 1253, dated 29.05.2025 certified that the distance of reserved / protected forest is more than 250 meters from proposed project site. |
| 5 | Mine Plan Approval | : | Mining Plan along with Progressive Mine Closure Plan (PMCP) for Madhuband Colliery has been approved in 416$^{th}$ BCCL Board Meeting dated 30.12.2024 vide letter BCCL/CS/AF-1(A)/22(H), |

| | | | |
|---|---|---|---|
| | | | dated 13.01.2025. |

**WORKING DETAILS**

| | | | | |
|---|---|---|---|---|
| **1.** | Mining Method | : | Mining is proposed by both opencast and UG methods | |
| **2.** | Quarry Area | : | End of Life –79.53 ha | Life of Mine – 67 Years (OC - 9 Years & UG – 67 Years) |
| **3.** | Waste Generation | : | Total waste proposed to be generated is 66.82 Mbcum and out of this 22.36Mbcum is proposed to be dumped in external dump and rest to be dumped internally.<br><br>The waste is proposed to be dumped in two external dumps, initially in the southern part of the block and in the north eastern part of the block.<br><br>External dump is proposed in north eastern part (Ex Dump-1), 39.04 Ha is proposed to accommodate 15.65 Mbcum.<br><br>External dump 2 is proposed in southern part of the lease (Sector C) in an area of 45.05Ha which will accommodate 6.71 Mbcum.<br><br>External dumping is proposed till Year 7 and internal dumping will partly commence. | |
| **4.** | Stripping Ratio | : | 10.38 cum/tonne | |
| **5.** | Size of the Bench | : | Maximum bench height (m) for opencast workings - 9 Meter<br><br>Bench width (m) for opencast workings – 9 Meter<br><br>Bench slope - $70^0$ | |
| **6.** | Working Days | : | 300 days/ year, 4 overlapping shifts of 6 hours each | |
| **7.** | Elevation range of the mine site | : | Minimum- 189.02 m RL<br><br>Maximum- 227.66 m RL | |

| | | | |
|---|---|---|---|
| 8. | Topography of Mine | : | Undulating topography with a gentle slope towards west |
| 9. | Explosive Requirement | : | Consumption of Explosive have been recalculated which is now 30 Kg/day forunderground Mining operations and 8 Tonne /day for Opencast operations. |
| 10. | Diesel/Fuel requirement | : | 20 Kl / Day |

**Production Details:**

| Year (s) | Production Plan | | Total Coal (Mt) |
|---|---|---|---|
| | OC (upto 11 year) | UG | |
| 1 | - | - | - |
| 2 | - | 0.14 | 0.14 |
| 3 | 0.14 | 0.16 | 0.30 |
| 4 | 0.45 | 0.30 | 0.75 |
| 5-8 | 0.80 | 0.30 | 1.10 |
| 9 | 1.05 | 0.30 | 1.35 |
| 10 | 1.05 | 0.45 | 1.50 |
| 11 | 0.55 | 0.45 | 1.00 |
| 12- 31 | - | 0.45 | 0.45 |
| 32 | - | 0.90 | 0.90 |
| 33-63 | - | 1.20 | 1.20 |
| 64 | - | 1.00 | 1.00 |
| 65 | - | 1.00 | 1.00 |
| 66 | - | 0.50 | 0.50 |
| 67 | - | 0.36 | 0.36 |
| Grand Total | 6.44 | 52.96 | 59.40 |

## LAND USE

Pre Mining - Land use of Madhuband Colliery is as below:

| Land Type | | Area |
|---|---|---|
| Tenancy | Agricultural | 87.2 |
| | Township/ Homestead land | 2 |
| | Grazing | -- |
| | Barren | 104.6 |
| | Road | -- |
| | Community/ other use | -- |
| | **Sub-total** | **193.80** |
| BCCL | service buildings/ Mine infrastructure | 4 |
| | Coal stack | 2.6 |
| | Homestead | 8 |
| | Plantation | 2 |
| | Road | 2.23 |
| | Barren | 80.74 |
| | **Sub-total** | **99.57** |
| Govt Non-Forest | Agricultural | 0 |
| | Township | -- |
| | Grazing | -- |
| | Barren/other use | 71.21 |
| | Water Bodies | 6.82 |
| | **Sub-total** | **78.03** |
| Forest | Reserve | 0 |
| | Protected | 0 |
| | **Railway** | **22.37** |
| | Free-Hold | 0 |
| **Total** | | **393.77** |

During mining Land use details

| S. No | Land Use | During mining (Ha) |
|---|---|---|
| 1 | External Dump area | 84.090 |
| 2 | Top Soil dump area | 3.000 |
| 3 | Open Pit/ Excavation | 79.530 |
| 4 | Roads | 3.920 |
| 5 | Infrastructure/ Built up area | 4.610 |
| 6 | Greenbelt area | 4.330 |
| 7 | River diversion channel | 2.790 |
| 8 | Settling Pond | 1.160 |
| 9 | Coal Stack & CHP | 2.140 |
| 10 | Fly ash dumping, if any | - |
| 11 | Undisturbed Area | 208.200 |
| **Total** | | **393.77** |

**Post mining Land use details**

| S.No | Land Use | Land use area Post Mining (Ha) | | | | | |
|---|---|---|---|---|---|---|---|
| | | Plantation | Water Body | Public Use | Undisturbed | Others | Total |
| 1 | External Dump area | 84.09 | - | - | - | - | 84.09 |
| 2 | Top Soil dump area | 3.00 | | | | | 3.00 |
| 3 | Open Pit/ Excavation | 63.95 | 15.58 | - | - | - | 79.53 |
| 4 | Roads | - | - | 3.92 | - | - | 3.92 |
| 5 | Infrastructure / Built up area | 4.61 | - | - | - | - | 4.61 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 6 | Greenbelt area | 4.33 | - | - | - | - | 4.33 |
| 7 | River diversion channel | - | 2.79 | - | - | - | 2.79 |
| 8 | Settling Pond | 1.16 | - | - | - | - | 1.16 |
| 9 | Coal Stack & CHP | 2.14 | - | - | - | - | 2.14 |
| 10 | Fly ash dumping, if any | - | - | - | - | - | - |
| 11 | Undisturbed Area | - | - | - | 208.20 | - | 208.20 |
| | **Total** | **163.28** | **18.37** | **3.92** | **208.20** | - | **393.77** |

## ENVIRONMENT MANAGEMENT

### Green Belt Development

The Boundary greenbelt will start with operation of mine. The progressive and post mining plantation will be done from 9$^{th}$ year onwards. Total 163.28 Ha. will be under plantation after the closure of mining operations.

As per EC dated 16.12.2013, Total afforestation plan shall be implemented covering an area of 621.28 Ha. out of which plantation over an area of 80.72 Ha. has been carried out till date in the Cluster XV, breakup of same will be provided in the EIA/EMP report.

The general considerations for green belt plan are as follows:

- Planting of trees shall be undertaken in rows around the roads and external dump.
- Local/indigenous fast-growing trees shall be planted.
- The trees shall be protected by plantation of non-palatable shrub species to avoid browsing by animals.
- Watering and manuring shall be done at regular intervals. Regular monitoring on the growth of the plants shall be done.
- It is proposed to continue developing the wide green belts and plantation. The density of the plantation shall be 2500 trees per hectare shall be planted or consultation from reputed agencies in green belt development can be sought.
- 3-tier plantation shall be carried out, i.e., 3 layers of plantation viz. grasses/herbs,

shrubs and trees shall be planted. Grasses/herbs will help bind the soil together thus preventing soil erosion, and shrubs and trees will help break the wind at different altitudes thus preventing the spread of dust.

- Apart from this green belt, plantation shall also be done surrounding the official buildings.

**Solid Waste Management**

**Total OB Removal for Opencast operations** - 62.37M.Cum

**Total Topsoil Removalfor Opencast operations** – 4.45 M.Cum

**Water Pollution Control Measures:**

1. The clogged water during rainy season will be pumped out from the quarries and will be tested before discharge to nearby cultivated field. Apart from this, there is no change on water environment.
2. There will be no wastewater generated from the mining operations. Only domestic waste water will be generated, which will be treated in septic tank/soak pits.

**Surface Water& Ground Water Management:**

1. Mining will intersect the ground water table during the plan period as per approved mining plan.
2. Khudiajore is to be diverted for extracting coal by opencast during 5$^{th}$ year of opencast operation as per approved Mine Plan for which necessary clearance will be taken.

**Air Pollution Control Measures:**

1. The ambient air quality will be monitored at decided locationsonce in every six months. Monitoring will be carried out forTwenty-Four hours and sample collection will be as per the norms laid down by MoEF&CC.
2. Emission of dust due to movement of vehicles and blasting will produce impact on air, necessary mitigation will be followed to avoid emission.
3. Dust suppression measures like spraying / sprinkling of water to keep the surface wet will be carried out.

**Noise Pollution Control Measures:**

1. Proper maintenance of all machines will be carried out, which help in reducing the generation of noise during operations.
2. Noise generated by equipments is intermittent and does not cause much adverse impact.
3. Periodical monitoring of noise will be done to adopt corrective actions wherever needed.
4. Plantation will be taken up along the approach roads. The plantation minimizes propagation of noise and also arrests dust.

**Topsoil Management:**

4.45 Cu.m of Topsoil will be generated during opencast mining operations, After the final grading, the topsoil would be redistributed in a manner that achieves an approximate uniform stable thickness consistent with the post mining land uses, contours, and surface water drainage system.

The top soil obtained will be stored separately as Top soil dump and will be used in plantation activities of the mine.

Part of the soil will be used for tree plantation around the periphery of the external dump and all along the sides of surface haul road and approach road, and in and around the industrial and residential area. Biological reclamation work will follow in concurrent manner. In the final stage topsoil preserved will be spread over internal dump and plantation will be done over these solid wastes i.e., overburden.

**Undertaking submitted affirming:**

a. Permission from concerned department along with action plan and design details for diversion of Khudia Jore nalla will be submitted with EIA/EMP report
b. The safety zone around railway line will be maintained as per statutory regulations and as per directions of the concerned authorities. If any working/tunneling etc is required then statutory permission will be obtained from concerned authorities.
c. Ground water table will be intersected for which necessary permission shall be obtained.
d. Consumption of Explosive have been recalculated which is now 30 Kg/day forunder ground Mining operations and 8 Tonne /day for Opencast operations
e. If any changes are noticed in future regarding the report issued by the ministry of coal, then the applicable laws / rules will be binding on the Project Authorities and all necessary steps will be taken in this regard
f. The Boundary Pillars of the proposed mine lease area will be maintained properly.
g. The plantation work will be completed as per the approved Mining Plan. Thereafter the same will be maintained up to the Conceptual stage of the Mine.
h. Sufficient water spray using water tankers will be done for effective dust suppression within the mine lease area and on haul roads.
i. All the mining machineries / equipment and transport vehicles should be maintained in good condition and annually tested for fitness and PUC and records to be maintained.
j. If tree felling is required permission from Competent authority will be obtained.

**Baseline Result for the Air Monitoring Locations**

| Pollutant | Location Codes | Max. | Min. | Avg. | 98 Percentile | NAAQS |
|---|---|---|---|---|---|---|
| PM10 (µg/m3) | A-1 | 74.10 | 67.50 | 71.11 | 74.05 | 100 |
| | A-2 | 49.90 | 43.60 | 46.67 | 49.90 | |
| | A-3 | 65.30 | 56.90 | 59.85 | 65.30 | |
| | A-4 | 56.20 | 48.80 | 52.63 | 55.95 | |
| | A-5 | 60.20 | 51.20 | 54.48 | 59.85 | |
| | A-6 | 83.30 | 76.60 | 79.33 | 83.25 | |
| | A-7 | 79.70 | 71.80 | 75.77 | 79.45 | |
| | A-8 | 69.70 | 62.60 | 66.31 | 69.60 | |
| PM2.5 (µg/m3) | A-1 | 46.40 | 38.30 | 42.54 | 46.30 | 60 |
| | A-2 | 23.20 | 19.80 | 21.13 | 22.95 | |
| | A-3 | 36.00 | 30.50 | 33.15 | 35.85 | |
| | A-4 | 27.20 | 23.20 | 24.78 | 27.00 | |
| | A-5 | 31.50 | 28.00 | 29.55 | 31.40 | |
| | A-6 | 53.20 | 46.30 | 49.85 | 53.05 | |
| | A-7 | 50.20 | 42.80 | 46.17 | 49.95 | |
| | A-8 | 41.60 | 35.20 | 38.05 | 41.40 | |
| NOX (µg/m3) | A-1 | 28.00 | 23.70 | 26.07 | 27.95 | 80 |
| | A-2 | 19.60 | 18.00 | 18.86 | 19.55 | |
| | A-3 | 24.10 | 20.10 | 22.17 | 23.90 | |
| | A-4 | 20.60 | 18.50 | 19.48 | 20.60 | |
| | A-5 | 22.30 | 19.40 | 20.75 | 22.20 | |
| | A-6 | 31.90 | 29.10 | 30.48 | 31.80 | |
| | A-7 | 29.80 | 27.10 | 28.71 | 29.75 | |
| | A-8 | 26.20 | 21.60 | 23.47 | 25.95 | |
| SO2 (µg/m3) | A-1 | 22.50 | 19.40 | 20.91 | 22.40 | 80 |
| | A-2 | 15.20 | 14.10 | 14.77 | 15.20 | |
| | A-3 | 18.60 | 16.30 | 17.49 | 18.50 | |
| | A-4 | 15.80 | 14.70 | 15.37 | 15.80 | |
| | A-5 | 16.50 | 15.10 | 15.78 | 16.50 | |
| | A-6 | 25.70 | 22.80 | 24.64 | 25.70 | |
| | A-7 | 24.30 | 21.20 | 22.58 | 24.25 | |
| | A-8 | 20.30 | 17.60 | 19.21 | 20.25 | |
| CO (mg/m3) | A-1 | 0.79 | 0.74 | 0.77 | 0.79 | 2 |
| | A-2 | 0.56 | 0.48 | 0.53 | 0.56 | |
| | A-3 | 0.74 | 0.60 | 0.66 | 0.73 | |

| Pollutant | Location Codes | Max. | Min. | Avg. | 98 Percentile | NAAQS |
|---|---|---|---|---|---|---|
| | A-4 | 0.65 | 0.51 | 0.57 | 0.64 | |
| | A-5 | 0.66 | 0.58 | 0.62 | 0.66 | |
| | A-6 | 0.94 | 0.84 | 0.89 | 0.94 | |
| | A-7 | 0.87 | 0.79 | 0.83 | 0.87 | |
| | A-8 | 0.76 | 0.65 | 0.71 | 0.76 | |
| $O_3$ (µg/m3) | A-1 | 19.85 | 8.59 | 14.07 | 19.78 | 180 |
| | A-2 | 14.58 | 8.10 | 11.59 | 14.57 | |
| | A-3 | 16.85 | 8.21 | 13.77 | 16.80 | |
| | A-4 | 14.60 | 8.38 | 11.57 | 14.59 | |
| | A-5 | 15.99 | 8.52 | 11.93 | 15.90 | |
| | A-6 | 19.86 | 8.02 | 14.12 | 19.82 | |
| | A-7 | 19.79 | 10.64 | 15.27 | 19.67 | |
| | A-8 | 17.34 | 8.07 | 12.46 | 17.20 | |

*Noise level data*

| Sr. No. | Locations | Avg. Day Time Noise Level Leq. dB(A) | Avg. Night Time Noise Level Leq. dB(A) |
|---|---|---|---|
| | | Day Time (6:00 AM to 10:00 PM) | Night Time (10:00PM to 6:00 AM) |
| 1. | Core Zone (Madhuban Village) | 50.50 | 40.7 |
| 2. | Barrha Village | 53.92 | 43.56 |
| 3. | Kanrra village near Mahuda Mor | 52.31 | 42.55 |
| 4. | Lohpiti Village | 52.20 | 41.92 |
| 5. | Dugda Village | 53.15 | 43.62 |
| 6. | Matigarh Village BCCL colony | 51.92 | 41.90 |
| 7. | Barora Area BCCL | 51.11 | 40.81 |
| 8. | Nawgarh village | 52.55 | 42.76 |

**CPCB Noise Standards in dB(A) Leq**

| | | |
|---|---|---|
| Industrial Area | 75 | 70 |
| Commercial Area | 65 | 55 |
| Residential Area | 55 | 45 |
| Silence Zone | 50 | 40 |

Ground Water Quality Data (October to December 2023)

| S. No. | Parameter | Core Zone (Madhuban Village) (GW1) | Nawgarh village (GW2) | Ranidih Village (GW3) | Nutandih Village (GW4) | Lohpiti Village (GW5) | Dugda Village (GW6) | Sijua Basti (GW7) | Kanudih Village (GW8) | Panruabhitha Village (GW9) | Muraidih village (GW10) | Limits of IS:10500 -2012 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | Acceptable limit | Permissible limit in the Absence of Alternate Source |
| **Physical Parameters** | | | | | | | | | | | | | |
| 1. | pH (at 25 $^0$C) | 7.21 | 7.45 | 7.31 | 7.25 | 7.39 | 7.47 | 7.93 | 7.82 | 7.22 | 7.36 | 6.5 to 8.5 | No Relaxation |
| 2. | Colour (Hazen) | *BLQ(**LOQ-1.0) | *BLQ(**LOQ-1.0) | *BLQ(**LOQ-1.0) | *BLQ(**LOQ-1.0) | *BLQ(**LOQ-1.0) | *BLQ(**LOQ-1.0) | *BLQ(**LOQ-1.0) | *BLQ(**LOQ-1.0) | *BLQ(**LOQ-1.0) | *BLQ(**LOQ-1.0) | 5 | 15 |
| 3. | Turbidity (NTU) | *BLQ(**LOQ-1.0) | *BLQ(**LOQ-1.0) | *BLQ(**LOQ-1.0) | *BLQ(**LOQ-1.0) | *BLQ(**LOQ-1.0) | *BLQ(**LOQ-1.0) | *BLQ(**LOQ-1.0) | *BLQ(**LOQ-1.0) | *BLQ(**LOQ-1.0) | *BLQ(**LOQ-1.0) | 1 | 5 |
| 4. | Odour | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable |
| 5. | Taste | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable |
| **Chemical Parameters** | | | | | | | | | | | | | |
| 6. | Total Hardness as $CaCO_3$ (mg/l) | 252 | 228 | 242 | 244 | 262 | 275 | 278 | 262 | 280 | 269 | 200 | 600 |
| 7. | Calcium as Ca (mg/l) | 30.64 | 42.25 | 39.98 | 43.75 | 35.70 | 32.24 | 38.16 | 31.92 | 44.65 | 36.74 | 75 | 200 |
| 8. | Alkalinity as $CaCO_3$(mg/l) | 182.79 | 194.95 | 186.07 | 194.24 | 192.68 | 185.96 | 191.85 | 195.38 | 188.84 | 190.62 | 200 | 600 |
| 9. | Chloride as Cl (mg/l) | 42.52 | 51.48 | 54.38 | 48.65 | 41.98 | 47.37 | 44.95 | 41.85 | 48.34 | 45.52 | 250 | 1000 |
| 10. | Cyanide as CN (mg/l) | *BLQ(**LOQ-0.02) | *BLQ(**LOQ-0.02) | *BLQ(**LOQ-0.02) | *BLQ(**LOQ-0.02) | *BLQ(**LOQ-0.02) | *BLQ(**LOQ-0.02) | *BLQ(**LOQ-0.02) | *BLQ(**LOQ-0.02) | *BLQ(**LOQ-0.02) | *BLQ(**LOQ-0.02) | 0.05 | No Relaxation |
| 11. | Magnesium as Mg (mg/l) | 42.62 | 29.73 | 34.51 | 32.71 | 41.97 | 47.23 | 44.37 | 44.27 | 40.91 | 43.04 | 30 | 100 |
| 12. | Total Dissolved Solids (mg/l) | 344 | 337 | 318 | 328 | 381 | 342 | 329 | 315 | 378 | 366 | 500 | 2000 |
| 13. | Sulphate as $SO_4$ (mg/l) | 23.13 | 24.89 | 27.90 | 28.47 | 25.62 | 21.35 | 20.49 | 22.84 | 25.63 | 23.04 | 200 | 400 |
| 14. | Fluoride as F (mg/l) | 0.21 | 0.24 | 0.26 | 0.22 | 0.27 | 0.24 | 0.26 | 0.20 | 0.21 | 0.23 | 1.0 | 1.5 |
| 15. | Nitrate as | 2.14 | 2.66 | 2.15 | 2.59 | 2.35 | 2.38 | 2.81 | 2.63 | 2.47 | 0.27 | 45 | No Relaxation |

| S. No. | Parameter | Core Zone (Madhuban Village) (GW1) | Nawgarh village (GW2) | Ranidih Village (GW3) | Nutandih Village (GW4) | Lohpiti Village (GW5) | Dugda Village (GW6) | Sijua Basti (GW7) | Kanudih Village (GW8) | Panruabhitha Village (GW9) | Muraidih village (GW10) | Limits of IS:10500 -2012 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | Acceptable limit | Permissible limit in the Absence of Alternate Source |
| | $NO_3$ (mg/l) | | | | | | | | | | | | |
| 16. | Iron as Fe (mg/l) | 0.51 | 0.42 | 0.46 | 0.48 | 0.55 | 0.49 | 0.58 | 0.61 | 0.53 | 0.45 | 1.0 | No relaxation |
| 17. | Aluminium as Al(mg/l) | *BLQ(**LOQ-0.005) | *BLQ(**LOQ-0.005) | *BLQ(**LOQ-0.005) | *BLQ(**LOQ-0.005) | *BLQ(**LOQ-0.005) | *BLQ(**LOQ-0.005) | *BLQ(**LOQ-0.005) | *BLQ(**LOQ-0.005) | *BLQ(**LOQ-0.005) | *BLQ(**LOQ-0.005) | 0.03 | 0.2 |
| 18. | Boron (mg/l) | *BLQ(**LOQ-0.01) | *BLQ(**LOQ-0.01) | *BLQ(**LOQ-0.01) | *BLQ(**LOQ-0.01) | *BLQ(**LOQ-0.01) | *BLQ(**LOQ-0.01) | *BLQ(**LOQ-0.01) | *BLQ(**LOQ-0.01) | *BLQ(**LOQ-0.01) | *BLQ(**LOQ-0.01) | 0.5 | 1 |
| 19. | Chromium as Cr (mg/l) | *BLQ(**LOQ-0.002) | *BLQ(**LOQ-0.002) | *BLQ(**LOQ-0.002) | *BLQ(**LOQ-0.002) | *BLQ(**LOQ-0.002) | *BLQ(**LOQ-0.002) | *BLQ(**LOQ-0.002) | *BLQ(**LOQ-0.002) | *BLQ(**LOQ-0.002) | *BLQ(**LOQ-0.002) | 0.05 | No Relaxation |
| 20. | Phenolic Compounds (mg/l) | *BLQ(**LOQ-0.0005) | *BLQ(**LOQ-0.0005) | *BLQ(**LOQ-0.0005) | *BLQ(**LOQ-0.0005) | *BLQ(**LOQ-0.0005) | *BLQ(**LOQ-0.0005) | *BLQ(**LOQ-0.0005) | *BLQ(**LOQ-0.0005) | *BLQ(**LOQ-0.0005) | *BLQ(**LOQ-0.0005) | 0.001 | 0.002 |
| 21. | Mineral Oil (mg/l) | *BLQ(**LOQ-0.1) | *BLQ(**LOQ-0.1) | *BLQ(**LOQ-0.1) | *BLQ(**LOQ-0.1) | *BLQ(**LOQ-0.1) | *BLQ(**LOQ-0.1) | *BLQ(**LOQ-0.1) | *BLQ(**LOQ-0.1) | *BLQ(**LOQ-0.1) | *BLQ(**LOQ-0.1) | 0.5 | No Relaxation |
| 22. | Anionic Detergents as MBAS (mg/l) | *BLQ(**LOQ-0.05) | *BLQ(**LOQ-0.05) | *BLQ(**LOQ-0.05) | *BLQ(**LOQ-0.05) | *BLQ(**LOQ-0.05) | *BLQ(**LOQ-0.05) | *BLQ(**LOQ-0.05) | *BLQ(**LOQ-0.05) | *BLQ(**LOQ-0.05) | *BLQ(**LOQ-0.05) | 0.2 | 1.0 |
| 23. | Zinc as Zn (mg/l) | 0.45 | 0.51 | 0.42 | 0.47 | 0.57 | 0.52 | 0.58 | 0.54 | 0.46 | 0.53 | 5 | 15 |
| 24. | Copper as Cu (mg/l) | *BLQ(**LOQ-0.002) | *BLQ(**LOQ-0.002) | *BLQ(**LOQ-0.002) | *BLQ(**LOQ-0.002) | *BLQ(**LOQ-0.002) | *BLQ(**LOQ-0.002) | *BLQ(**LOQ-0.002) | *BLQ(**LOQ-0.002) | *BLQ(**LOQ-0.002) | *BLQ(**LOQ-0.002) | 0.05 | 1.5 |
| 25. | Manganese as Mn (mg/l) | *BLQ(**LOQ-0.01) | *BLQ(**LOQ-0.01) | *BLQ(**LOQ-0.01) | *BLQ(**LOQ-0.01) | *BLQ(**LOQ-0.01) | *BLQ(**LOQ-0.01) | *BLQ(**LOQ-0.01) | *BLQ(**LOQ-0.01) | *BLQ(**LOQ-0.01) | *BLQ(**LOQ-0.01) | 0.1 | 0.3 |
| 26. | Cadmium as Cd (mg/l) | *BLQ(**LOQ-0.002) | *BLQ(**LOQ-0.002) | *BLQ(**LOQ-0.002) | *BLQ(**LOQ-0.002) | *BLQ(**LOQ-0.002) | *BLQ(**LOQ-0.002) | *BLQ(**LOQ-0.002) | *BLQ(**LOQ-0.002) | *BLQ(**LOQ-0.002) | *BLQ(**LOQ-0.002) | 0.003 | No Relaxation |

| S. No. | Parameter | Core Zone (Madhuban Village) (GW1) | Nawgarh village (GW2) | Ranidih Village (GW3) | Nutandih Village (GW4) | Lohpiti Village (GW5) | Dugda Village (GW6) | Sijua Basti (GW7) | Kanudih Village (GW8) | Panruabitha Village (GW9) | Muraidih village (GW10) | Limits of IS:10500 -2012 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | Acceptable limit | Permissible limit in the Absence of Alternate Source |
| 27 | Lead as Pb(mg/l) | *BLQ(**LOQ-0.002) | *BLQ(**LOQ-0.002) | *BLQ(**LOQ-0.002) | *BLQ(**LOQ-0.002) | *BLQ(**LOQ-0.002) | *BLQ(**LOQ-0.002) | *BLQ(**LOQ-0.002) | *BLQ(**LOQ-0.002) | *BLQ(**LOQ-0.002) | *BLQ(**LOQ-0.002) | 0.01 | No Relaxation |
| 28. | Selenium as Se (mg/l) | *BLQ(**LOQ-0.001) | *BLQ(**LOQ-0.001) | *BLQ(**LOQ-0.001) | *BLQ(**LOQ-0.001) | *BLQ(**LOQ-0.001) | *BLQ(**LOQ-0.001) | *BLQ(**LOQ-0.001) | *BLQ(**LOQ-0.001) | *BLQ(**LOQ-0.001) | *BLQ(**LOQ-0.001) | 0.01 | No Relaxation |
| 29. | Arsenic as As (mg/l) | *BLQ(**LOQ-0.005) | *BLQ(**LOQ-0.005) | *BLQ(**LOQ-0.005) | *BLQ(**LOQ-0.005) | *BLQ(**LOQ-0.005) | *BLQ(**LOQ-0.005) | *BLQ(**LOQ-0.005) | *BLQ(**LOQ-0.005) | *BLQ(**LOQ-0.005) | *BLQ(**LOQ-0.005) | 0.01 | 0.05 |
| 30. | Mercury as Hg (mg/l) | *BLQ(**LOQ-0.0005) | *BLQ(**LOQ-0.0005) | *BLQ(**LOQ-0.0005) | *BLQ(**LOQ-0.0005) | *BLQ(**LOQ-0.0005) | *BLQ(**LOQ-0.0005) | *BLQ(**LOQ-0.0005) | *BLQ(**LOQ-0.0005) | *BLQ(**LOQ-0.0005) | *BLQ(**LOQ-0.0005) | 0.001 | No Relaxation |
| | **Microbiological Parameters** | | | | | | | | | | | | |
| 31. | Total Coliform (MPN/100ml) | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | - | 10.00 |
| 32. | E. Coli (MPN/100ml) | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |

**Surface Water Quality Data**

| S. No | Parameter | Test-Method | Unit | Result | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | SW1 | SW2 | SW3 | SW4 | SW5 | SW6 | SW7 | SW8 | SW9 | SW10 |
| 1 | pH (at 25 $^{o}$C) | IS3025 (P-11) | -- | 7.55 | 7.41 | 7.51 | 7.26 | 7.45 | 7.92 | 7.84 | 7.73 | 7.62 | 7.43 |
| 2 | Colour | IS3025 (P-4) | Hazen | 23 | 20 | 21 | 19 | 23 | 18 | 20 | 21 | 16 | 18 |
| 3 | Turbidity | IS3025 (P-10) | NTU | 88 | 96 | 90 | 83 | 88 | 104 | 99 | 92 | 85 | 78 |
| 4 | Odour | IS3025 (P-5) | -- | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable |
| 5 | Total Hardness as $CaCO_3$ | IS3025 (P-21) | mg/l | 347 | 395 | 404 | 424 | 362 | 409 | 359 | 376 | 406 | 405 |

| S. No | Parameter | Test-Method | Unit | Result | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | SW1 | SW2 | SW3 | SW4 | SW5 | SW6 | SW7 | SW8 | SW9 | SW10 |
| 6 | Calcium as Ca | IS3025 (P-40) | mg/l | 95.7 | 84.57 | 93.67 | 85.92 | 88.65 | 82.07 | 90.56 | 84.53 | 92.51 | 86.08 |
| 7 | Alkalinity as $CaCO_3$ | IS3025 (P-23) | mg/l | 258.21 | 237.45 | 224.32 | 242.38 | 250.11 | 232.13 | 247.42 | 234.71 | 213.28 | 230.97 |
| 8 | Chloride as Cl | IS 3025 (P-32) | mg/l | 107.94 | 110.89 | 100.92 | 115.24 | 118.34 | 126.27 | 109.96 | 96.19 | 98.63 | 93.28 |
| 9 | Residual free Chlorine | IS 3025 (P-26) | mg/l | *BLQ (**LOQ-0.15) | *BLQ (**LOQ-0.15) | *BLQ (**LOQ-0.15) | *BLQ (**LOQ-0.15) | *BLQ (**LOQ-0.15) | *BLQ (**LOQ-0.15) | *BLQ (**LOQ-0.15) | *BLQ (**LOQ-0.15) | *BLQ (**LOQ-0.15) | *BLQ(**LOQ-0.15) |
| 10 | Cyanide as CN | IS 3025 (P-27) | mg/l | *BLQ (**LOQ-0.02) | *BLQ (**LOQ-0.02) | *BLQ (**LOQ-0.02) | *BLQ (**LOQ-0.02) | *BLQ (**LOQ-0.02) | *BLQ (**LOQ-0.02) | *BLQ (**LOQ-0.02) | *BLQ (**LOQ-0.02) | *BLQ (**LOQ-0.02) | *BLQ(**LOQ-0.02) |
| 11 | Magnesium as Mg | APHA , 3500 Mg B Calculation method | mg/l | 26.18 | 44.6 | 41.26 | 50.83 | 34.11 | 49.52 | 32.22 | 40.01 | 42.45 | 46.12 |
| 12 | Total Dissolved Solids | IS3025 (P-16) | mg/l | 559 | 533 | 679 | 663 | 573 | 638 | 659 | 681 | 554 | 615 |
| 13 | Total Suspended solids | IS 3025 (P-17) | mg/l | 85 | 81 | 73 | 83 | 95 | 75 | 93 | 82 | 74 | 73 |
| 14 | Dissolved Oxygen | IS 3025 (P-38) | mg/l | 6.8 | 6.3 | 5.8 | 6.4 | 6 | 6.8 | 8.9 | 6.6 | 6.7 | 6.2 |
| 15 | Sulphate as $SO_4$ | IS3025 (P-24) | mg/l | 63.91 | 72.51 | 73.99 | 72.67 | 64.45 | 71.04 | 60.16 | 63.25 | 68.49 | 72.51 |
| 16 | Fluoride as F | APHA , 4500-F⁻ B& D | mg/l | 0.44 | 0.47 | 0.45 | 0.48 | 0.49 | 0.44 | 0.43 | 0.44 | 0.48 | 0.45 |
| 17 | BOD (3 Days at $27^0$C) | IS 3025,P-44 | mg/l | 6.15 | 9.8 | 9.64 | 7.6 | 10.11 | 9.84 | 6.94 | 5.59 | 5.98 | 8.63 |
| 18 | COD | APHA, 5220 B, Open Reflux Method | mg/l | 20 | 18 | 27 | 25 | 18 | 20 | 21 | 18 | 19 | 23 |
| 19 | Conductivity (at 25 $^0$C) | IS3025 (P-14) | mS/cm | 0.924 | 0.892 | 1.115 | 1.082 | 0.968 | 1.048 | 1.091 | 1.124 | 0.926 | 1.108 |
| 20 | Nitrate as $NO_3$ | IS3025 (P-34) | mg/l | 39.48 | 43 | 44.88 | 44.97 | 40.96 | 44.23 | 49.12 | 35.34 | 47.54 | 47.34 |
| 21 | Sodium as Na | IS3025 (P-45) | mg/l | 187 | 189 | 63 | 54 | 171 | 175 | 172 | 63 | 61 | 176 |

| S. No | Parameter | Test-Method | Unit | Result | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | SW1 | SW2 | SW3 | SW4 | SW5 | SW6 | SW7 | SW8 | SW9 | SW10 |
| 22 | Potassium as K | IS3025 (P-45) | mg/l | 12 | 12.35 | 35.04 | 38.87 | 43.82 | 13.5 | 12.43 | 34.53 | 2.56 | 11.5 |
| 23 | Iron as Fe | VEL/STP/ICP/W-01, Issue date.-01, 01/11/21 | mg/l | 2.15 | 1.64 | 1.76 | 1.82 | 2.22 | 1.94 | 1.83 | 2.25 | 2.11 | 1.78 |
| 24 | Aluminium as Al | VEL/STP/ICP/W-01, Issue date.-01, 01/11/21 | mg/l | *BLQ (**LOQ-0.005) | *BLQ (**LOQ-0.005) | *BLQ (**LOQ-0.005) | *BLQ (**LOQ-0.005) | *BLQ (**LOQ-0.005) | *BLQ (**LOQ-0.005) | *BLQ (**LOQ-0.005) | *BLQ (**LOQ-0.005) | *BLQ (**LOQ-0.005) | *BLQ(**LOQ-0.005) |
| 25 | Boron | VEL/STP/ICP/W-01, Issue date.-01, 01/11/21 | mg/l | 0.93 | 0.95 | 0.82 | 0.89 | 0.61 | 0.75 | 0.63 | 0.74 | 0.84 | 0.55 |
| 26 | Chromium as Cr | VEL/STP/ICP/W-01, Issue date.-01, 01/11/21 | mg/l | *BLQ (**LOQ-0.002) | *BLQ (**LOQ-0.002) | *BLQ (**LOQ-0.002) | *BLQ (**LOQ-0.002) | *BLQ (**LOQ-0.002) | *BLQ (**LOQ-0.002) | *BLQ (**LOQ-0.002) | *BLQ (**LOQ-0.002) | *BLQ (**LOQ-0.002) | *BLQ(**LOQ-0.002) |
| 27 | Phenolic Compounds | IS3025 (P-43) | mg/l | *BLQ (**LOQ-0.0005) | *BLQ (**LOQ-0.0005) | *BLQ (**LOQ-0.0005) | *BLQ (**LOQ-0.0005) | *BLQ (**LOQ-0.0005) | *BLQ (**LOQ-0.0005) | *BLQ (**LOQ-0.0005) | *BLQ (**LOQ-0.0005) | *BLQ (**LOQ-0.0005) | *BLQ(**LOQ-0.0005) |
| 28 | Mineral Oil | IS 3025 (P-39) | mg/l | *BLQ (**LOQ-0.1) | *BLQ (**LOQ-0.1) | *BLQ (**LOQ-0.1) | *BLQ (**LOQ-0.1) | *BLQ (**LOQ-0.1) | *BLQ (**LOQ-0.1) | *BLQ (**LOQ-0.1) | *BLQ (**LOQ-0.1) | *BLQ (**LOQ-0.1) | *BLQ(**LOQ-0.1) |
| 29 | Anionic Detergents as MBAS | VEL/STP/ICP/W-01, Issue date.-01, 01/11/21 | mg/l | *BLQ (**LOQ-0.05) | *BLQ (**LOQ-0.05) | *BLQ (**LOQ-0.05) | *BLQ (**LOQ-0.05) | *BLQ (**LOQ-0.05) | *BLQ (**LOQ-0.05) | *BLQ (**LOQ-0.05) | *BLQ (**LOQ-0.05) | *BLQ (**LOQ-0.05) | *BLQ(**LOQ-0.05) |
| 30 | Zinc as Zn | VEL/STP/ICP/W-01, Issue date.-01, | mg/l | 1.77 | 2.18 | 1.86 | 2.25 | 1.94 | 1.76 | 2.14 | 2.29 | 2.15 | 1.59 |

| S. No | Parameter | Test-Method | Unit | Result | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | SW1 | SW2 | SW3 | SW4 | SW5 | SW6 | SW7 | SW8 | SW9 | SW10 |
| | | 01/11/21 | | | | | | | | | | | |
| 31 | Copper as Cu | VEL/STP/ICP/W-01, Issue date.-01, 01/11/21 | mg/l | 0.57 | 0.61 | 0.39 | 0.69 | 0.49 | 0.35 | 0.72 | 0.32 | 0.42 | 0.57 |
| 32 | Manganese as Mn | VEL/STP/ICP/W-01, Issue date.-01, 01/11/21 | mg/l | *BLQ (**LOQ-0.01) | *BLQ (**LOQ-0.01) | *BLQ (**LOQ-0.01) | *BLQ (**LOQ-0.01) | *BLQ (**LOQ-0.01) | *BLQ (**LOQ-0.01) | *BLQ (**LOQ-0.01) | *BLQ (**LOQ-0.01) | *BLQ (**LOQ-0.01) | *BLQ(**LOQ-0.01) |
| 33 | Cadmium as Cd | VEL/STP/ICP/W-01, Issue date.-01, 01/11/21 | mg/l | *BLQ (**LOQ-0.002) | *BLQ (**LOQ-0.002) | *BLQ (**LOQ-0.002) | *BLQ (**LOQ-0.002) | *BLQ (**LOQ-0.002) | *BLQ (**LOQ-0.002) | *BLQ (**LOQ-0.002) | *BLQ (**LOQ-0.002) | *BLQ (**LOQ-0.002) | *BLQ(**LOQ-0.002) |
| 34 | Total Coliform | APHA 23rd edition, 9221 B | MPN/100ml | 580 | 630 | 1100 | 1300 | 1100 | 1100 | 1400 | 1300 | 840 | 1100 |
| 35 | Fecal Coliform | APHA 23rd edition, 9221 E | MPN/100ml | 390 | 460 | 700 | 700 | 630 | 580 | 840 | 580 | 430 | 840 |

## Physico- Chemical Properties of Soil (October to December 23)

| | | S-01 | S-02 | S-03 | S-04 | S-05 | S-06 | S-07 | S-08 | S-09 | S-10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S.No. | Parameter | Core Zone (Madhuban Village) | Near Kharkaree village | Forest area near Ranidih | Near Pathargadia village | Near Modidih or Koradih village | Near Lohpiti Village | Near Dugda Village | Near Kanudih Bridge | Near Panruabhitha Village | Near Muraidih Village |
| 1. | pH (at 25 $^{0}$C) | 7.38 | 7.62 | 7.84 | 7.61 | 7.52 | 7.75 | 7.42 | 7.65 | 7.92 | 7.67 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2. | Conductivity (mS/cm) | 0.358 | 0.469 | 0.378 | 0.437 | 0.513 | 0.587 | 0.478 | 0.545 | 0.418 | 0.397 |
| 3. | Soil Texture | Sand-45 | Sand-44 | Sand-39 | Sand-40 | Sand-39 | Sand-42 | Sand-44 | Sand-40 | Sand-41 | Sand-42 |
| | | Silt-42 | Silt-37 | Silt-39 | Silt-36 | Silt-40 | Silt-45 | Silt-37 | Silt-39 | Silt-35 | Silt-43 |
| | | Clay-13 | Clay-19 | Clay-22 | Clay-24 | Clay-21 | Clay-13 | Clay-19 | Clay-21 | Clay-24 | Clay-15 |
| 4. | Color | Yellowish Brown | Yellowish Brown | Yellowish Brown | Yellowish Brown | Yellowish Brown | Yellowish Brown | Yellowish Brown | Yellowish Brown | Yellowish Brown | Yellowish Brown |
| 5. | Water holding capacity (%) | 31.2 | 34.1 | 39.6 | 36.8 | 38.9 | 35.4 | 34.2 | 37.6 | 36.9 | 36.6 |
| 6. | Bulk density (gm/cc) | 1.48 | 1.38 | 1.40 | 1.33 | 1.45 | 1.37 | 1.42 | 1.32 | 1.39 | 1.41 |
| 7. | Chloride as Cl (mg/kg) | 20.68 | 22.44 | 21.60 | 18.49 | 23.04 | 22.73 | 22.42 | 23.82 | 19.43 | 20.51 |
| 8. | Calcium as Ca (mg/kg) | 32.38 | 35.17 | 33.11 | 36.69 | 34.98 | 32.68 | 28.93 | 34.49 | 36.88 | 33.12 |
| 9. | Sodium as Na (mg/kg) | 42.11 | 46.52 | 41.11 | 43.65 | 41.76 | 45.34 | 41.62 | 45.63 | 44.29 | 40.56 |
| 10. | Potassium as K (kg/ha.) | 174.08 | 179.04 | 188.26 | 186.49 | 170.5 | 175.07 | 189.42 | 174.52 | 171.58 | 180.66 |
| 11. | Organic Matter (%) | 0.46 | 0.49 | 0.44 | 0.42 | 0.51 | 0.53 | 0.55 | 0.58 | 0.54 | 0.46 |
| 12. | Magnesium as Mg (mg/kg) | 14.58 | 13.97 | 12.87 | 13.45 | 14.12 | 14.85 | 15.56 | 13.66 | 15.72 | 14.11 |
| 13. | Available Nitrogen as N (kg/ha.) | 161.79 | 153.82 | 159.75 | 151.92 | 161.10 | 163.69 | 165.88 | 159.65 | 164.62 | 162.65 |
| 14. | Available Phosphorus (kg/ha.) | 18.05 | 19.49 | 16.26 | 18.33 | 17.43 | 18.27 | 15.66 | 19.72 | 15.82 | 16.49 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 15. | Zinc as Zn (mg/kg) | 7.46 | 1.88 | 1.24 | 11.14 | 6.94 | 7.64 | 11.35 | 10.77 | 4.99 | 9.13 |
| 16. | Manganese as Mn (mg/kg) | 3.67 | 3.31 | 8.42 | 3.33 | 4.01 | 3.66 | 3.82 | 3.99 | 3.32 | 3.89 |
| 17. | Chromium as Cr (mg/kg) | 0.86 | 0.97 | 0.82 | 0.76 | 1.01 | 0.77 | 0.84 | 0.92 | 0.78 | 0.85 |
| 18. | Lead as Pb (mg/kg) | 1.77 | 1.75 | 1.71 | 1.84 | 0.74 | 1.84 | 0.88 | 1.73 | 0.76 | 0.78 |
| 19. | Cadmium as Cd (mg/kg) | *BLQ (**LOQ – 0.5) | *BLQ (**LOQ – 0.5) | *BLQ (**LOQ – 0.5) | *BLQ (**LOQ – 0.5) | *BLQ (**LOQ – 0.5) | *BLQ (**LOQ – 0.5) | *BLQ (**LOQ – 0.5) | *BLQ (**LOQ – 0.5) | *BLQ (**LOQ – 0.5) | *BLQ (**LOQ – 0.5) |
| 20. | Copper as Cu (mg/kg) | 1.32 | 2.04 | 1.78 | 2.26 | 1.75 | 2.15 | 1.42 | 2.19 | 1.89 | 2.41 |

SEAC, Jharkhand has recommended the ToRs in its **126th** meeting held on **09th, 10th, 11th, 12th and 13th September, 2025,** for undertaking detailed EIA / EMP study and SEIAA, Jharkhand has granted the ToRs in its **126th** meeting held on **24th & 25th September, 2025**. The SEAC has recommended following conditions:

**Specific Conditions:**

i. In compliance of OM no.F.No. IA3-22/3/2024-IA.III (E-241594) dated 24.07.2024 of MoEF&CC, Govt. of India plantation of saplings shall be carried out in the earmarked green belt area as the part of tree plantation campaign "*Ek Ped Ma Ke Naam*" and the details of the same shall be uploaded in the MeriLiFE Portal (https://merilife.nic.in). 10% of the total green belt proposed shall be allocated under this clause.

ii. This project is a part of cluster EC vide F.No. J-11015/100/2011-IA.II(M), dated 16.12.2013. Hence, the PAs are required to Delineate Madhuband Colliery from the above cluster EC before submitting the final EIA / EMP to SEAC for consideration of EC.

iii. Permission for diversion of existing seasonal Nala is to be obtained from the competent authority and process of diversion is to be completed before operation of mining activity.

iv. The safety zone around railway line will be maintained as per statutory regulations.

## TERMS OF REFERENCE (TOR) FOR OPEN CAST COAL MINING

**The TORs prescribed for undertaking detailed EIA study are as follows:**

1. The EIA Report shall be prepared for ..... MTPA rated capacity in an ML / project area of ..... ha based on the generic structure specified in Appendix III of the EIA Notification, 2006.

2. An EIA-EMP Report would be prepared for ..... MTPA rated capacity to cover the impacts and management plan for the project specific activities on the environment of the region, and the environmental quality encompassing air, water, land, biotic community, etc. through collection of data and information, generation of data on impacts including prediction modeling for ..... MTPA of coal production based on approved project/Mining Plan for ..... MTPA . Baseline data collection can be for any season except monsoon.

3. A map specifying locations of the State, District and Project location should be provided.

4. A Study area map of the core zone and 10 km area of the buffer zone (1: 50,000 scale) clearly delineating the major topographical features such as the land use, surface drainage pattern including rivers/streams/nullahs/canals, locations of human habitations, major constructions including railways, roads, pipelines, major industries/mines and other polluting sources. In case of ecologically sensitive areas such as Biosphere Reserves/National Parks/WL Sanctuaries/ Elephant Reserves, forests (Reserved/Protected), migratory corridors of fauna, and areas where endangered fauna and plants of medicinal and economic importance found in the 15 km study area should be given.

5. Land use map (1: 50,000 scale) based on a recent satellite imagery of the study area may also be provided with explanatory note on the land use.

6. Map showing the core zone delineating the agricultural land (irrigated and un-irrigated, uncultivable land as defined in the revenue records, forest areas (as per records), along with other physical features such as water bodies, etc should be furnished.

7. A contour map showing the area drainage of the core zone and 25 km of the study area (where the water courses of the core zone ultimately join the major rivers/streams outside the lease/project area) should also be clearly indicated in the separate map.

8. A detailed Site plan of the mine showing the proposed break-up of the land for mining operations such as the quarry area, OB dumps, green belt, safety zone, buildings, infrastructure, CHP, ETP, Stockyard, township/colony (within and adjacent to the ML), undisturbed area -if any, and landscape features such as existing roads, drains/natural water bodies to be left undisturbed along with any natural drainage adjoining the lease /project areas, and modification thereoff in terms of construction of embankments/bunds, proposed diversion/re-channelling of the water courses, etc., approach roads, major haul roads, etc should be indicated.

9. In case of any proposed diversion of nallah/canal/river, the proposed route of diversion /modification of drainage and their realignment, construction of embankment etc. should also be shown on the map as per the approval of Irrigation and Flood Control Department of the concerned state.

10. Similarly if the project involves diversion of any road/railway line passing through the ML/project area, the proposed route of diversion and its realignment should be shown in the map.

11. Break up of lease/project area as per different land uses and their stage of acquisition should be provided.

Land use details for opencast project should be given as per the following table :

| S. N. | Land use | Within ML area | Outside ML area | Total |
|---|---|---|---|---|
| 1. | Agricultural land | | | |
| 2. | Forest land | | | |
| 3. | Wasteland | | | |
| 4. | Grazing land | | | |
| 5. | Surface water bodies | | | |
| 6. | Settlements | | | |
| 7. | Others (specify) | | | |
| | | | | |

12. Break-up of lease/project area as per mining operations should be provided.

13. Impact of changes in the land use due to the project, if much of the land being acquired is predominantly agricultural land/forestland/grazing land.

14. One-season (non-monsoon) primary baseline data on environmental quality - air (PM10, PM2.5, SOx, NOx and heavy metals such as Hg, Pb, Cr, As, etc), noise, water (surface and groundwater), soil - along with one-season met data coinciding with the same season for AAQ collection period should be provided.

15. Map of the study area (1: 50, 000 scale) (core and buffer zone clearly delineating the location of various sampling stations superimposed with location of habitats, other industries/mines, polluting sources should be provided. The number and location of the stations in both core and buffer zones should be selected on the basis of size of lease/project area, the proposed impacts in the downwind (air)/downstream (surface water)/groundwater regime (based on flow). One station should be in the upwind/upstream/non-impact/non-polluting area as a control station. The monitoring should be as per CPCB guidelines and parameters for water testing for both ground water and surface water as per ISI standards and CPCB classification wherever applicable. Values should be provided based on desirable limits.

16. Study on the existing flora and fauna in the study area (10km) should be carried out by an institution of relevant discipline. The list of flora and fauna duly authenticated separately for the core and study area and a statement clearly specifying whether the study area forms a part of the migratory corridor of any endangered fauna should be given. If the study area has endangered flora fauna and, or if the area is occasionally visited or used as a habitat by Schedule-I fauna, or if the project falls within 15 km of an ecologically sensitive area, or used as a migratory corridor then a Comprehensive Conservation Plan should be prepared and submitted with EIA-EMP Report; and comments from the CWLW of the State Govt. should also be obtained and furnished.

17. Details of mineral reserves, geological status of the study area and the seams to be worked, ultimate working depth and progressive stage-wise working scheme until the end of mine life should be provided on the basis of the approved rated capacity and calendar plans of production from the approved Mining Plan. Geological maps and sections should be included.

18. Details of mining methods, technology, equipment to be used, etc., rationale for selection of specified technology and equipment proposed to be used vis-à-vis the potential impacts should be provided.

19. Impact of mining on hydrology, modification of natural drainage, diversion and channeling of the existing rivers/water courses flowing though the ML and adjoining the lease/project and the impact on the existing users and impacts of mining operations thereon.

20. Detailed water balance along with flow chart should be provided. The break-up of water requirement for the various mine operations should be given separately.

21. Source of water for use in mine, sanction of the competent authority in the State Govt. and impacts vis-à-vis the competing users should be given.

22. Impact of mining and water abstraction use in mine on the hydrogeology and groundwater regime within the core zone and 10 km buffer zone including long-term monitoring measures should be provided. Details of rainwater harvesting and measures for recharge of groundwater should be reflected in case there is a declining trend of groundwater availability and/or if the area falls within dark/grey zone.

23. Impact of blasting, noise and vibrations should be given.

24. Impacts of mining on the AAQ and predictions based on modeling using the ISCST-3 (Revised) or latest model should be provided.

25. Impacts of mineral transportation within the mining area and outside the lease/project along with flow-chart indicating the specific areas generating fugitive emissions should be provided. Impacts of transportation, handling, transfer of mineral and waste on air quality, generation of effluents from workshop, management plan for maintenance of HEMM, machinery, equipment should be given. Details of various facilities such as rest

areas and canteen for workers and effluents/pollution load emanating from these activities should also be provided.

26. Effort be made to reduce/eliminate road transport of coal inside and outside mine and for mechanized loading of coal through CHP / Silo entirely wagons and into trucks / tippers.

27. Details of waste OB and topsoil generated as per the approved calendar programme, and their management shown in figures as well explanatory notes tables giving progressive development and mine closure plan, green belt development, backfilling programme and conceptual post mining land use should be given. OB dump heights and terracing based on slope stability studies with a max of 28o angle as the ultimate slope should be given. Sections of final dumps (both longitudinal and cross section) with relation to the adjacent area should be shown.

28. Efforts be made for maximizing progressive internal dumping of O.B., sequential mining , external dump on coal bearing area and later rehandling into the mine void.--to reduce land degradation.

29. Impact of change in land use from mining operations and wether the land can be restored to agriculture use post mining.

30. Progressive Green belt and Ecological restoration /afforestation plan (both in text, figures and in the tabular form as per the format of MOEF&CC given below) and selection of species (native) based on original survey/land use should be given.

31. Conceptual Final Mine Closure Plan and post mining land use and restoration of land/habitat to the status of pre- mining should be provided. A Plan for the ecological restoration of the mined out area and post mining land use should be prepared with detailed cost provisions. Impact and management of wastes and issues of rehandling (wherever applicable) and backfilling and progressive mine closure and reclamation should be detailed.

Table 3 : Post-Mining land use pattern of ML / Project area (ha)

| Land use during mining | Land use (ha) | | | | |
|---|---|---|---|---|---|
| External OB dump | Plantation | Water body | Public use | Undisturbed | Total |
| Top soil dump | | | | | |
| Excavation | | | | | |
| Roads | | | | | |
| Built up area | | | | | |
| Green belt | | | | | |
| Undisturbed area | | | | | |
| | Total | | | | |

32. Flow chart of water balance should be provided. Treatment of effluents from workshop, township, domestic wastewater, mine water discharge, etc. should be provided. Details of STP in colony and ETP in mine should be given. Recycling of water to the max. possible extent should be accorded ?.

33. Occupational health issues. Baseline data on the health of the population in the impact zone and measures for occupational health and safety of the personnel and manpower in the mine should be given.

34. Risk Assessment and Disaster Preparedness and Management Plan should be provided.

35. Integration of the Environmental Management Plan with measures for minimizing use of natural resources - water, land, energy, etc. should be carried out.

36. Cost of EMP (capital and recurring) should be included in the project cost and for progressive and final mine closure plan.

37. Details of R&R. Detailed project specific R&R Plan with data on the existing socio-economic status of the population (including tribals, SC/ST, BPL families) found in the study area and broad plan for resettlement of the displaced population, site for the resettlement colony, alternate livelihood concerns/employment for the displaced people, civic and housing amenities being offered, etc and costs along with the schedule of the implementation of the R&R Plan should be given.

38. CSR Plan along with details of villages and specific budgetary provisions (capital and recurring) for specific activities over the life of the project should be given.

39. Corporate Environment Responsibility:

a) The Company must have a well laid down Environment Policy approved by the Board of Directors.
b) The Environment Policy must prescribe for standard operating process/procedures to bring into focus any infringements/deviation/violation of the environmental or forest norms/conditions.

c) The hierarchical system or Administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions must be furnished.

d) To have proper checks and balances, the company should have a well laid down system of reporting of non-compliances/violations of environmental norms to the Board of Directors of the company and/or shareholders or stakeholders at large.

40. Details on Public Hearing should cover the information relating to notices issued in the newspaper, proceedings/minutes of public hearing, the points raised by the general public and commitments made by the proponent and the action proposed with budgets in

suitable time frame. These details should be presented in a tabular form. If the Public Hearing is in the regional language, an authenticated English Translation of the same should be provided.

41. In built mechanism of self-monitoring of compliance of environmental regulations should be indicated.

42. Status of any litigations/ court cases filed/pending on the project should be provided.

43. Submission of sample test analysis of Characteristics of coal: This should include details on grade of coal and other characteristics such as ash content, S and heavy metals including levels of Hg, As, Pb, Cr etc.

44. Copy of clearances/approvals such as Forestry clearances, Mining Plan Approval, mine closer plan approval. NOC from Flood and Irrigation Dept. (if req.), etc. wherever applicable.

Details on the Forest Clearance should be given as per the format given :

| Total ML / Project area (ha) | Total forest land (ha) | Date of FC | Extent of forest land | Balance area for which FC is yet to be obtained | Status of application for diversion of forest land |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

45. Besides the above, the below mentioned general points should also be followed:-

a) A note confirming compliance of the TOR, with cross referencing of the relevant sections / pages of the EIA report should be provided.

b) All documents may be properly referenced with index and continuous page numbering.

c) Where data are presented in the report especially in tables, the period in which the data were collected and the sources should be indicated.

d) Where the documents provided are in a language other than English, an English translation should be provided.

e) The Questionnaire for environmental appraisal of mining projects as prescribed by the Ministry shall also be filled and submitted.

f) Approved mine plan along with copy of the approval letter for the proposed capacity should also be submitted.

g) While preparing the EIA report, the instructions for the proponents and instructions for the consultants issued by MoEF vide O.M. No. J-11013

/41/2006-IA.II(I) dated 4th August, 2009, which are available on the website of this Ministry should also be followed.

h) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the F.R for securing the TOR) should be brought to the attention of SEIAA, Jharkhand with reasons for such changes and permission should be sought, as the TOR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH process again with the revised documentation.

The EIA report should also include

1. surface plan of the area indicating Contours of main topographic features, drainage and mining area.

2. geological maps and sections and

3. sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.

After preparing the draft EIA (as per the generic structure prescribed in Appendix- III of the EIA Notification, 2006) covering the above mentioned issues, the proponent will get the public hearing conducted and take further necessary action for obtaining environmental clearance in accordance with the procedure prescribed under the EIA Notification, 2006.

46. The Prescribed ToRs is valid as per O.M. F. No. IA3-22/10/2022-IA.III[E177258], dated 08.06.2022 of MoEF&CC, Govt. of India.

## TERMS OF REFERENCE (TOR) FOR UG COAL MINING

**[GREEN FIELD & BROWN FIELD]**

i. An EIA-EMP Report shall be prepared for.....MTPA peak rated capacity in a mining lease (ML) area of ..... ha based on the generic structure specified in Appendix-III of the EIA Notification, 2006.

ii. The cover page of the EIA report shall consists of project title with location, applicable schedule of the EIA Notification, 2006, ToR letter No. with date, study period along with EIA consultant & laboratory details with reference of QCI/NABET/NABL accreditation certificate.

**Introduction about the project:**

i. Details regarding project capacity (peak rated capacity in MTPA) and mining lease area (ha), details regarding project proponent and project location (including coalfield

/ coal block & geographical location), significance/need of the project and coal linkage.

ii. Details of mine plan and mine closure plan approval from Competent Authority should be furnished for green field and expansion projects. Reference of the Vesting Order should also be provided.

iii. Details of the chronology of past EC regarding the project and its implementation status (in case of expansion proposals) shall be provided

**Project Details and Description**

i. Details w.r.t location of the project - Coordinates w.r.t the mining lease boundary (including kml in polygon format) to be provided and submitted as location plan. A toposheet depicting the core zone (mine infrastructural area) and buffer zone (10 kms radius from periphery of the core zone) on 1:25,000 scale. (including all eco-sensitive areas and environmentally sensitive places)

ii. Details of sensitive environmental receptors (habitation / school / river or water body / forest / areas of archaeological significance, etc.) within 10 kms from the periphery of the core zone shall be provided. Details w.r.t need for diversion of water body / road / railway / transmission lines to be indicated.

iii. Details of mineral reserves, geological status of the mining lease area and the seams to be worked, ultimate working depth, gassiness of seams to be worked and progressive stage-wise working scheme until the end of mine life should be provided on the basis of the approved peak rated capacity and calendar plans of production from the approved Mining Plan. Geological maps and section should be included.

iv. Details of mining methods, technology, equipment to be used, etc., rationale for selection of specified technology and equipment proposed to be used vis-à-vis the potential impacts on air quality, noise & vibration on account of mineral transportation, coal handling & storage/stockyard, etc. should be provided. Details w.r.t manpower engaged in the project shall also be included.

v. Submission of sample test analysis of characteristics of coal: This should include details on grade of coal and other characteristics such as ash content, sulphur and heavy metals including levels of Hg, As, Pb and Cr.

vi. Details w.r.t utilities required for the project including power, fuel, water supply, including source of the utilities.

vii. Details w.r.t infrastructural facilities planned as a part of the project including incline, ventilation shafts, CHP, ETP, Stockyard, township/colony, magazine, etc.

viii. Project proponent should clearly show the transport route & details of transportation route (*viz.* Type of road, width of road, Pavement Condition Index, V/C of road etc.) of the mineral and protection and mitigative measures to be adopted while transporting the mineral. The coal or lignite evacuation facility should be through conveyor or railway or any environmentally friendly transport other than road transport from mine sites to the railway siding for projects with PRC more than 2

MTPA, as per new Guidelines for preparation of Mining Plan and Mine Closure Plan from MoC dated 31.01.2025. Also, preference to be given to eliminate road transport by adopting environment friendly transport of coal evacuation and opt for mechanized loading for projects with peak rated capacity even upto 2 MTPA.

ix. A detailed site plan of the mine showing the proposed break-up of the land for mining operations such as the mine entries / incline, UG seams and panels, green belt, safety zone, buildings, infrastructure, CHP, ETP, Stockyard, township/colony (within and adjacent to the ML), undisturbed area-if any, and landscape features such as existing roads, drains/natural water bodies to be left undisturbed along with any natural drainage adjoining the lease /project areas, and modification thereof in terms of construction of embankments/bunds, proposed diversion/re-channeling of the water courses, etc., approach roads, *etc.* should be indicated.

x. Project proponent shall submit the drone video & geo-tagged photographs of mine lease area to be mined, including infrastructural area and proposed transportation route.

xi. It must be endeavored to locate the mine inclines and ventilation shafts at least 100 m from habitations. In case such 100 m buffer is not possible, justification for the same shall be provided. Project proponent should ensure that no forestland is diverted to the extent feasible for setting up of the mine infrastructure facilities.

xii. Original land use (agricultural land/ forest land (*if applicable)* /grazing land/waste land/water bodies) of the area should be provided as per the tables given below. Impacts of project, if any on the land use, in particular, agricultural land/forestland/grazing land/water bodies falling within the mining lease area, acquired for mining operations should be analyzed. Extent of area under surface rights and mining rights should be specified. A map depicting the same shall also be submitted.

**Pre-Mining Land use**

| Sl. No. | ML/Project Land-use | Area under Surface Rights only (ha) | Area under Mining Rights (ha) | Area under Both / All Rights (ha) |
|---|---|---|---|---|
| 1. | Agricultural Land | | | |
| 2. | Forest Land | | | |
| 3. | Grazing Land | | | |
| 4. | Settlements | | | |
| 5. | Water bodies | | | |
| 5. | Others(specify) | | | |
| | TOTAL | | | |

**Break-up of Area under Surface Rights only**

| Sl. No. | Details | Area (ha) under Surface Rights only |
|---|---|---|
| 1. | Buildings | |
| 2. | Infrastructure | |
| 3. | Roads | |
| 4. | Water bodies | |
| 5. | Others(specify) | |
| | **Total** | |

**Land Use during Mining Phase**

| Sl. No. | Details | Area under Surf ace Rights only ( ha) | | | Area under Min ing Rights [beneath surface ] (ha) | | | Area under Both /All Rights (ha) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Forest Land | Non-forest land | Total | Forest Land | Non-forest land | Total | Forest Land | Non-forest land | Total |
| 1 | UG Extraction / Working area (beneath surface) | | | | | | | | | |
| 2 | Industrial Infrastructure (Mine entry / incline, stockyard / siding / magazine, etc.) | | | | | | | | | |
| 3 | Other infrastructure (office buildings, utilities, treatment plants, colony etc.) | | | | | | | | | |
| 4 | Roads | | | | | | | | | |
| 5 | Greenbelt | | | | | | | | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 6 | Water body | | | | | | | | | |
| 7 | Undisturbed/ vacant area / safety zone | | | | | | | | | |
| | **TOTAL** | | | | | | | | | |

In case of expansion proposals, the above table must be provided for

(1) Present land use as per existing EC and
(2) Proposed land use in terms of expansion proposal

**Land Use Status - Post Mining Phase**

| Sl. No. | Details | Plantation | Water Body | Public Infrastruc-ture | Un-disturbed areas | Subsided Area | Total |
|---|---|---|---|---|---|---|---|
| 1. | UG Extraction / Working area (beneath surface) | | | | | | |
| 2. | Industrial Infrastructure (Mine entry / incline, | | | | | | |
| 3. | stockyad / siding / magazine, etc.) | | | | | | |
| 4. | Other infrastructure (office buildings, utilities, treatment plants, colony etc.) | | | | | | |
| 5. | **Roads** | | | | | | |
| 6. | **Green belt** | | | | | | |
| 7. | **Water body** | | | | | | |
| 8. | Undisturbed / vacant area / safety zone | | | | | | |
| 9. | Total | | | | | | |

In case of expansion proposals, the above table must be provided for

(1) Post mining land use as per existing EC and

(2) Proposed post mining land use in terms of expansion proposal

xiii. A list of major industries within study area (10 km radius from the periphery of the core zone) with name, products manufactured and distance from core zone and the location of the industries shall be depicted in the study area map.

**Baseline Data Generation**

i. A study area map of the core zone (mine infrastructure area) and 10 kms area (1:50,000 scale), from the periphery of core zone, clearly delineating the major topographical features such as the land use, surface drainage pattern including rivers/streams/nallahs/canals, locations of human habitations, major constructions including railways, roads, pipelines, major industries/mines and other polluting sources shall be prepared.

ii. In case of ecologically sensitive areas such as ESZ/ESA/National Park/Wildlife Sanctuary/Biosphere Reserve/Tiger Reserve/Elephant Reserve/Tiger Corridor/ Elephant Corridor are found to be within 10 kms from the boundary of the mining lease, the nearest distance from such sites should be duly certified by Chief Wildlife Warden (CWW) and the same shall be included in the EIA/EMP report.

iii. The environmental baseline data collection shall be of three months' period and can be for any season except monsoon season, as per the below table:

| Attributes | Sampling, Frequency and Remarks |
|---|---|
| **A. Air Environment** | |
| **Micro-Meteorological**<br><br>• Wind speed (Hourly)<br>• Wind direction<br>• Dry bulb temperature<br>• Wet bulb temperature<br>• Relative humidity<br>• Rainfall<br>• Solar radiation<br>• Cloud cover | Minimum 1 site in the core zone<br>Hourly continuous data shall be recorded The sampling shall be as per:<br><br>• IS 5182 Part 1-20<br>• Site specific primary data is essential<br>• Secondary data from IMD, CPCB guidelines to be considered.<br><br>Project proponent has to plot the wind rose diagram using the typical meteorological year (TMY) data for the period considered for the study. |

| | |
|---|---|
| **Pollutants**<br>Core Zone: 4 parameters as per Coal Mines, GSR 742 (E) dated 25.09.2000<br>Buffer zone: 12 parameters as per NAAQS, 2009 | Collection of one season (90 days) AAQ data (except in monsoon season)<br>To be monitored at 10 locations (2 locations within the core zone and 8 locations in the buffer zone) Monitoring stations in the core zone as well as buffer zone should be based on pre-dominant wind direction, habitations and terrain features. The direction and distance of monitoring stations with respect to project location should be clearly specified with geo-coordinates. The monitoring stations should cover upwind, downwind, cross wind directions, human settlements and sensitive areas.<br>Sampling and report preparation should be as per:<br>• National Ambient Air Quality Standards, CPCB Notification and Standards for Coal Mines, GSR 742 (E) dated 25.09.2000.<br>• Sampling as per CPCB guidelines<br>• Min., max., average and 98% values for each of the AAQ parameters from data of all AAQ stations should be provided as an annexure to the EIA Report.<br>• Summary of the air quality along with predicted values of air pollutants should be provided in the EIA Report.<br>• NABL accredited laboratory |
| **B. Noise** | |
| Noise levels | To be monitored at 6 locations (2 locations within the core zone and 4 locations in the buffer zone) Noise levels at outer limits of the core zone during daytime and night time and noise levels within 1 to 3 kms from the core zone & coal transportation |

| | |
|---|---|
| | route especially at habitation should be monitored. The monitoring locations for sampling shall be selected as per the sources and magnitude of noise pollution.<br>Sampling and report preparation as per:<br>• As per CPCB norms and Standards for Coal Mines, GSR 742 (E) dtd 25.09.2000.<br>• NABL accredited laboratory<br>Summary of the noise level should be provided in the EIA Report. |
| **C. Water** | |
| **For Surface Water**<br>• Arsenic<br>• BOD<br>• Cadmium<br>• Chlorides<br>• Copper<br>• Dissolved Oxygen<br>• Fluoride<br>• Hexavalent Chromium,<br>• Iron<br>• Lead<br>• Nitrate<br>• pH value<br>• Phenolic compounds<br>• Selenium<br>• Sulphate<br>• Total Dissolved Solids<br>• Total Suspended Solids<br>• Zinc<br>Any other relevant parameters | Upstream and downstream sampling of all the relevant surface water bodies (minimum 6 locations) in the core and buffer zone shall be carried out.<br>Samples for water quality should be collected and analysed as per:<br>• Designated best use water quality criteria, CPCB<br>• NABL accredited laboratory<br>• Standard methodology for collection of surface water (BIS standards) |
| **For Ground Water**<br>Relevant parameters as per BIS: 10500 (latest edition) | Ground water monitoring data should be collected at minimum of 6 locations (from existing wells /tube wells) from the core and buffer zone shall be included.<br>Samples for water quality should be collected and analysed as per: |

| | |
|---|---|
| | • NABL accredited laboratory<br>• Standard methodology for collection of ground water (BIS standards)<br>• Summary of surface and ground water quality should be provided in the EIA Report. |
| **D. Soil Environment** | |
| **Soil**<br><br>• Texture<br>• pH<br>• Electrical conductivity<br>• Cation exchange capacity | Sampling shall be done at various type of soils (agriculture/forest/barren etc.) within the core and buffer zone (across minimum 5 locations).<br>Samples for soil should be collected and analysed as per:<br><br>• NABL accredited laboratory |
| • Sodium Absorption Ratio (SAR)<br>• Water holding capacity<br>• Permeability<br>• Available NPK<br>• Available Organic Carbon | • Standard methodology for collection of soil samples<br>• ICAR standards for available NPK to be followed. |
| E. **Land Use** | Land use based on Digital Survey of entire study area (including core and buffer zone) using Satellite Remote Sensing survey (1:50000) |
| **F. Biological Environment** | |
| **Flora**<br>(both aquatic* and terrestrial)<br><br>• Vegetation-species list, economic importance, forest produce, medicinal value<br>• Importance value index (IVI) of trees<br>• Diversity indices<br>• Rare and endangered species<br><br>*Aquatic assessment requirement in case of proximity of ML area to river / perennial nallah. | Detailed description of flora and fauna (terrestrial and aquatic) existing in the core and buffer zone shall be given with special reference to rare, endemic and endangered species. Indicator species which indicate ecological and environment degradation should be identified and included to clearly state whether the proposed project would result into any adverse effect on any species.<br>Secondary data to be collected from Government offices, NGOs, published literature. |

| | |
|---|---|
| **Fauna**<br>(both aquatic* and terrestrial)<br><br>• Enumeration of zoo plankton and benthos<br>• Fisheries<br>• Diversity indices<br>• Rare and endangered species<br>• Avi fauna<br>• Details of Sanctuaries / National Park /<br>• Biosphere reserve Migratory routes/CRZ/ Marine Parks<br><br>*Aquatic assessment requirement in case of proximity of ML area to river / perennial nallah. | |
| **G. Socio-Economic** | |
| • Demographic structure, traditional skills, sources of livelihood<br>• Socio-economic profile of the people with in 2, 5 and 10 km from the core zone. | • Measures for occupational health and safety of the manpower in the mine should be given. |
| • Human settlement, health status, sources of livelihood<br>• Data relating to historically, culturally and ecologically important places in core as well as buffer areas<br>• Information on notified tribal settlements, if any<br>• Infrastructure resource base<br>• Health status: Morbidity pattern<br>• Education | • Socio-economic survey shall be based on proportionate, stratified and random sampling method.<br>• Primary data collection through questionnaire<br>• Secondary data from census records, statistical hard books, topo sheets, health records and relevant official records available with Govt. Agencies |

iv. Map (1:50,000 scale) of the study area (core and buffer zone) showing the location of various sampling stations superimposed with location of habitats, other industries/mines, polluting sources, should be provided.

v. A contour map showing the area drainage of the core zone and surrounding 10 kms radius should be depicted such as to clearly indicate the water courses and the location where they ultimately join with major rivers / streams.

vi. The data generated should be validated through secondary data sources / published

literature (example - routine environmental monitoring or CAAQMS, CEQMS data (if available) for mines/projects in vicinity).

vii. Summary of the baseline environmental data and inference w.r.t cause of deviations in concentrations of environmental parameters.

**Impact assessment and mitigation measures Air**

i. In case of expansion proposals, Cumulative Environmental Impact Assessment study of all the existing and proposed projects in the 10 kms radius of the core zone area shall be conducted and the same shall be included the in EIA/EMP report. Details of industrial units present in 10 kms radius of the core zone shall be earmarked in map and submitted.

ii. The impact of construction (particularly if constructed in forest land) and associated mitigation measures must also be provided.

iii. In case of proximity of mining infrastructure to habitation/water bodies, adequate safety measures should be provided as per the Coal Mining Regulations, 2017 and DGMS circulars issued from time to time and environmental protection measures like wind barriers, Vertical Greenery System (VGS), avenue/buffer plantation, etc.

iv. Impacts of mineral handling & transportation within the mining area and outside the lease/project along with flow-chart indicating the specific areas generating fugitive emissions should be provided, especially w.r.t impact on habitation in case of transportation through village roads. Impacts of generation of effluents from workshop, sewage, etc. & management plan for maintenance of machinery/equipment should be given. Details of various facilities such as rest areas and canteen for workers and effluents/pollution load emanating from these activities should also be provided.

v. Air quality modelling should be carried out for prediction of impact of the project on air quality of the area. It should *interalia* take into account the emissions from DG sets if any, impact of movement of vehicles for transportation of coal. The details of the model used and input parameters for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and habitations. The wind roses showing pre-dominant wind direction may also be indicated on the map.

vi. The number and efficiency of mobile/static water sprinkling system along the main mineral transportation road inside the mine, approach roads to the mine/stockyard/siding should be provided and details w.r.t frequency of their use/operation to ensure efficient mitigation in terms of air quality should be provided.

vii. Impacts of CHP, if any on air and water quality should be given. A flow chart showing water balance along with the details of zero discharge should be provided.

viii. Project proponent shall explore feasibility for transitioning towards adoption of EVs and eco-friendly mode of transport.

**Noise**

i. Measures for noise control in the work zone and surrounding areas should be provided. All the DG sets should have proper acoustic measures to reduce noise pollution.

**Water**

i. Impact of mining and water abstraction from the mine on the hydrogeology and groundwater regime (both dynamic and static resources) within the core zone and 10 kms buffer zone including long-term monitoring measures should be provided. Details of rainwater harvesting and measures for recharge of groundwater in the buffer zone should be reflected. Necessary mitigation measures w.r.t quality of mine water, treatment, utilization and discharge of mine water must be provided.
ii. Treatment facility should be based on mine water characteristics and domestic waste water characteristics.

**Hydrogeology**

i. Impact of proposed project/activity on hydrological regime of the area shall be assessed and report be submitted. Hydrological studies as per GEC 2015 guidelines to be prepared and submitted.
ii. Detailed water balance should be provided (breakup of water requirement as per different activities in the mining operations, including for sand stowing). Source of water for use in mine, sanction of the Competent Authority in the State Govt. and impacts vis-à-vis the competing users should be provided.
iii. In case of need for river/nallah diversion, impact assessment and proper mitigation plan is required; diversion plan approved by competent authority is to be submitted.

**Land**

i. Conceptual Final Mine Closure Plan and post mining land use and restoration of land/habitat to the pre-mining status to the extent possible should be provided and submitted with detailed cost provisions.
ii. The details regarding Progressive Mine Development and Conceptual Final Mine Closure Plan should also be provided and shown in plans/drawings.
iii. The project proponent shall prepare comprehensive plantation plan including number of saplings to be planted, location of plantation, target for survival rate and budget all along the periphery of mine infrastructure. Plantation plan should be prepared in such a way that 80% of the plantation to be carried out in first 5 years and for the remaining years the proposal for gap filling should be provided. The seedling of height not less than 2 meters to be selected and accordingly cost of plantation needs to be decided. The plantation plan should cover areas other than core zone.
iv. Project proponent is advised to submit an action plan towards implementation of the

'Ek Ped Maa Ke Naam' Campaign which was launched on 5th June 2024 on the occasion of the World Environment Day to increase the forest cover across the Country. This plantation drive is other than green belt development. The action in this regard shall be submitted concerned RO in six monthly report.

Flora & Fauna

i. If the study area (core and buffer zone) has endangered flora and fauna, or if the area is occasionally visited or used as a habitat by Schedule-I species, or if the project falls within 10 kms of an ecologically sensitive area, or used as a migratory corridor then a Comprehensive Conservation Plan along with the appropriate budgetary provision should be prepared and submitted with EIA-EMP Report; and comments/observation from the CWLW of the State Govt. should also be obtained and furnished.

**Waste Management**

i. Quantification of solid and hazardous wastes, including corresponding impacts and management plan to be provided.
ii. Project proponent shall submit the action plan to adhere to the Plastic Waste Management Rules 2016 and to adhere Ministry's OM dated 18/07/2022.

**Additional studies**

i. Risk assessment and management as per the Coal Mining Regulations, 2017 and other applicable statutes must be summarized in the EIA/EMP report. Measures for addressing occupational health and safety risks of the personnel and manpower engaged in the mine should be submitted in line with work zone regulations. The risk assessment studies must be undertaken by qualified institutes engaged in mine planning projects and the detailed report may be attached as annexure to the EIA/EMP report. These studies may be aligned with DGMS norms.
ii. Study on subsidence including modelling for prediction, mitigation/prevention of subsidence, continuous monitoring measures, and safety issues should be carried out from reputed institutes equipped for the same. The subsidence study should *interalia* include seismic characteristics of the location of the project site. Summary of the same along with the mitigation measures should be included in the EIA/EMP report and detailed report should be attached as Annexure.
iii. Traffic assessment study to be done considering transportation of coal from the coal stockyard either upto siding or upto nearest public transport route/highway. Adequacy of existing roads, impact due to additional traffic and proposed management / mitigation measures to be provided.
iv. In case of diversion of power line / transmission lines / railway line / roads – the impact assessment of such diversions and corresponding mitigation proposed in line

with the permissions/NoC obtained from the competent Authority shall be provided.

v. Assessment of carbon emission intensity of the project should be summarized in the EIA/EMP report including measures to reduce the same in line with GoI NDC commitments / SDGs should be provided. The detailed report may be attached as an annexure to the EIA/EMP report.

vi. Details w.r.t R&R plan should be summarized in the EIA/EMP report. Detailed project specific R&R Plan with data on the existing socio- economic status of the population (including tribals, SC/ST, BPL families) found in the study area and broad plan for resettlement of the displaced population, site for the resettlement colony, alternate livelihood concerns/employment for the displaced people, civic and housing amenities being offered, etc. and costs along with the schedule of the implementation of the R&R Plan should be given as annexure to the EIA/EMP report.

vii. In case the project is located either in Critically Polluted Area or in Severely Polluted Area, the proponent must submit additional action plan to address environmental safeguards as per OM dated 31st October, 2019 (Ref. F. No. 22-23/2018-IA.III (Pt)).

viii. Signed copy of complete Public Hearing Proceedings (forwarding letter to MoEF&CC by SPCB, notice issued in newspaper for PH, PH MoM, Attendance sheet, PH photographs, written representations received during public hearing and written communication submitted, notarized copy of English translation of PH proceeding including written representation and response submitted) to be enclosed as Annexures to the EIA/EMP report.

ix. Action plan duly addressing the issues raised during the Public Hearing and Consultation with physical and financial outlay as per Ministry's OM dated 30.09.2020 shall be included as per the table given below:

| Proposed Activities under Public Hearing | Place of Implementation (Physical targets) | Year wise financial outlay in, Rs. Lakhs | | | | | |
|---|---|---|---|---|---|---|---|
| | | Year - 1 | Year - 2 | Year - 3 | Year - 4 | Year - 5 | Total |
| | | | | | | | |

**Environmental Management Plan**

i. Summary containing mitigation measures to be adopted for each environment component during development and operation phase of UG coal mining shall be submitted.

ii. Details of the Environment Management Cell

iii. Performance monitoring of pollution control devices and Effluent Treatment Plant shall be furnished.

iv. Cost of Environmental Management Plan (capital and recurring) should be included in the project cost and for progressive and final mine closure plan.

v. Corporate Environment Policy:

   a. The Company must have a well laid down Environment Policy approved by the Board of Directors.
   b. The Environment Policy must prescribe for standard operating process/procedures to bring into focus any infringements /deviation/violation of the environmental or forest norms/conditions.
   c. The hierarchical system or Administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions must be furnished.
   d. To have proper checks and balances, the company should have a well laid down system of reporting of non-compliances/violations of environmental norms to the Board of Directors of the company and/or shareholders or stakeholders at large.

vi. In built mechanism of self-monitoring of compliance of environmental regulations should be indicated.

**Environmental Monitoring Plan**

i. Details w.r.t environmental monitoring plan in terms of air (including fugitive emissions), noise, water, soil to ensure effectiveness of mitigation measures deployed shall be provided

ii. Total capital cost and recurring cost/annum for environmental pollution control measures shall be included.

**Project Benefits**

i. Details regarding benefits of the project w.r.t improvements in physical and social infrastructure, employment potential and other tangible benefits to be provided.

**Legal and statutory approvals and details w.r.t litigations**

i. Status of any litigations/ court cases filed/pending on the project should be provided in below format

| S. No. | Name of the Court/Tribunal | Name of the specific Court/ Bench | Case Category | Status of court case | Orders/Directions of the court, if any, and its relevance with the |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| | | | | | **proposed project** |
| | | | | | |

i. Copy of clearances/approvals such as Forestry Clearance, Mining Plan / Mine Closure Plan approval, NOC from CGWA, NOC from Flood and Irrigation Dept. (if req.), NBWL, NTCA, etc. wherever applicable.

ii. Details on the Forestry Clearance *(if forest land is involved)* should be given as per the format given:

| **Total ML /Project Area (ha)** | **Total Forest Land (ha)** | **Status w.r.t FC received** | | **Status w.r.t balance Forest Land** | |
|---|---|---|---|---|---|
| | | Date of FC | Extent Of Forest Land | Balance area For which FC is yet to be obtained | Status of appl. For diversion of forest land |
| | | | | | |
| | | | | | |

iii. In case of expansion proposals, Certified Compliance Report (CCR) from RO, MoEF&CC is required to be submitted.

iv. Necessary coordination shall be made with concerned SPCB (who is responsible for Compliance of OM dated 14.01.2025) regarding streamlining the implementation of GSR 702 and GSR 703 dated 12.11.2024 through which projects requiring prior EC were exempted from requirement of CTE.

v. In case of diversion of water body / road / railway lines / transmission line, approval for the same from competent authority must be submitted.

**Summary and conclusion**

i. An executive summary of the report covering key findings of EIA/EMP study are to be provided.

**Details regarding consultant and laboratories engaged**

i. It should be ensured that only NABET-accredited consultants shall be engaged for the preparation of EIA/EMP Reports. PP shall ensure that the accreditation of the consultant is valid during the collection of baseline data, preparation of EIA/EMP

report and the appraisal process. The PP and consultant should submit an undertaking the information and data provided in the EIA Report and submitted to the Ministry are factually correct and the PP and consultant are fully accountable for the same.

ii. Project proponent shall submit the EIA/EMP report after the plagiarism check using authenticated plagiarism software.

iii. The Prescribed ToRs is valid as per O.M. F. No. IA3-22/10/2022-IA.III[E177258], dated 08.06.2022 of MoEF&CC, Govt. of India.

Sd/-
Member Secretary
State Level Environment Impact
Assessment Authority, Jharkhand

Memo No : **EC/SEIAA/2025-26/3919/2025/** 440 Dated: 06-10-2025

Copy to:

1. Member Secretary, Jharkhand State Pollution Control Board, Ranchi for information and necessary action.
2. Regional Office, Ministry of Environment, Forest and Climate Change, Govt. of India, 2nd Floor, Jharkhand State Housing Board (HQ), Harmu Chowk, Ranchi, Jharkhand – 834002.
3. Member Secretary, SEAC, Jharkhand, Ranchi for information and necessary action.

Sd/- 16/10/25
Member Secretary
State Level Environment Impact
Assessment Authority, Jharkhand

Signature Not Verified

Digitally Signed by : Smt Smitha Pankaj
Member Secretary, SEIAA

Date: 16/10/2025