

Scrutiny comments in respect of Mudhvay Limestone area, M.L/Sy.No.26Part, 8P1/P2/P9,18/3P & part over an area of 251.90Ha, (Mudhvay Sub-block 'C' Auctioned Area for which LOI issued under rule 10(2) of Mineral Auction Rules, 2015) for non-forest, A-category fully mechanized, situated in Mudhvay –village, Lakhpat-Taluka, Kachchh-Distt. of Gujarat-State for approval of Mining Plan under Rule 16 of MCR,2016 & PMCP under Rule 23 of MCDR,2017 of M/s Adani Cementation Limited.

**01. Cover page-** (i) survey number of area/auction block should be given. (ii) IBM registration number & mine code mentioned as not applicable are incorrect. It needs correction with IBM registration number.

**02. Introduction-** (i) The past history of commencement of auction process from participation to successful bidder/LOI grant should be discussed in text with supporting documents (ii) The proposed capacity of clinkerization/cement plant unit & location shown in NW direction of limestone deposit should be justified with valid reason. (iii) The proposed location should be outside the lease area & non-mineralized zone. (iv) The copy of distance of Narayan Sarovar dam from south of block or nearest corner of lease boundary of 2km should be submitted. (v) The copy of ESZ notification dated 28/4/2017 regarding instant lease area falling out side Wild Life Sanctuary/Dam should be submitted.

**03. General:-** (i) The name of nominated owner/ partners of company with ID, full address & contact details should be given in text/tabular form. All relevant information should be given in respective column at page-6. (ii) number of state wise lease already held by applicant should be submitted with type of mineral, location, area etc.

**04. Location & Accessibility:** -(i) The telephone & fax number, email ID of company etc. should be given. It needs correction. (ii) The copy of ownership right/ area acquired type of land as per form-I&IV/Govt. revenue records should be translated & submitted in Hindi/English the form of annexure. (iii) The copy of distance of Narayan Sarovar dam from nearest corner of lease boundary should be submitted.

**05. Feasibility report** is not prepared taking into consideration of various important aspects like handling of such huge OB not deal in precise manner, OB handling clubbed with direct mining cost should be made separately, Economic viability not discussed in light of different anticipated constraints in LOI area like final product handling from applied area to plant location, availability other additive minerals, etc. The feasibility report should be discussed & suitably linked to the reserves estimated with latest economic parameters and viability of project should be discussed & concluded.

**06. Geology & Exploration-** (a) Future exploration proposals need to be given as per the rule 12(3) of MCDR,2017 with an objective of bringing entire mineralized area under G1 category and future exploration planning needs to be given accordingly. (b) Approx. dimension of the area mentioned as 2.4km length & 1.3km as width appears to be incorrect and mismatching with the total auctioned (LOI) area. Further, under the lithological description of Mudhvay Sub-block C, average analysis/test results of individual litho-units/formation need to be given separately in order to understand the avg. quality of litho-units in the area. (c) Basic criteria/parameters adopted to change the name of litho-units like low grade limestone, Cement grade limestone and high grade limestone is not discussed in detailed manner. Further, vertical quality consistency/representation of litho-formation may also be considered while assigning such type of nomenclature. (d) Page-32, Table-A1.3: Under the details of exploration carried out in the auctioned area in the past is not incorporated with grid interval of such drilled boreholes, chemical analysis test results of samples, inclination of drilling, etc. (e) Future exploration is not given in correct manner as the individual year wise total borehole proposed to be drilled are not furnished separately whereas total cumulative exploration proposed by 49 core borehole throughout plan period which is not acceptable. (f) Position of reserves & resources estimated by SURPAC block modelling as per the State Geological report should be given in concise tabulated manner. Further, qualified persons (R.K. Consultant) should adopt the same nomenclature/grade wise R&R estimation pattern as given in State Geological report instead of furnishing LG, MG & HG reserves & resources in this report. (g) Reserves and resources estimation as per the cross section method are not given in correct manner as the individual section wise area for estimated reserves/resources quantity have not been demarcation over individual sections. Further, given sectional area also appears to be incorrect. Moreover, sectional representation also seems to be inverted. (h) In whole Reserves & Resources estimation exercise various prominent & very important consideration like economical viability of this deposit in view of such huge overburden, likely ore:OB ratio, possibility of intersection of ground water, necessary permission required in case working below ground water table, etc. not discussed under the feasibility part of this text report. (i) Reserves have been categorised in to High grade, Medium grade & low grade limestone but the mechanism/procedure adopted to convert these reserves & resources from block modelling estimation to cross sections method not discussed in the chapter. (j) Detailed calculations for estimation of blocked resources have not been given. Further, probable reserves under 121 & 122 category should be furnished separately for easy understanding. (k) Applied LOI area is in close proximity of coastal area and role of role of ground water table plays very vital role in re-estimation of reserves and resources. Accordingly, reserves & resources need to be estimated above the ground water table and below ground water table. But, this aspect is neither discussed nor any supporting hydrogeological report is enclosed. (l) The entire

limestone has been divided into three categories to facilitate the production and mineral conservation of mineral. But, blending scenario of these HG, LG & MG to meet the desired feed limestone quality not discussed. (m) Ultimate depth of mineralisation is considered up to -84MSL but at the same time huge amount of overburden is proposed to be encountered from the area. But, variable depth of OB based on the exploratory drilling being encountered is neither discussed in estimation of R&R nor in excavation planning. Further, analysis report of overburden may also be provided in final submission.

**06. Mining-** Page-45,(a) It was observed during inspection that only two boundary pillars of 1&7 no. were available/erected in field & RL of pillar as shown on surface plan & collar level of nearest drilled borehole is not matching. It should be discussed & justified. (b) It was observed during inspection that no core boreholes plugging/evidences were available in filed, therefore copy of field photographs of core borehole drilling, if any should be submitted. (c) The production & development tables given at Page-47 is not as per manual of appraisal of mining plan,2014 & it needs correction. (d) There is no sub grade term, only mineral rejects should be discussed as per IBM manual. It needs correction. (e) Page-47, the total quantity of ROM should be sum of low grade+medium grade+High grade, instead of ROM & grade wise given separately. It needs correction. (f) Page-49 to 53, The tentative quality/grade of ROM/waste in first/second/third/forth & fifth year of plan period should be discussed with NABL analysis (10% of total sample) accredited Laboratory only duly signed by authorized person with date & place. (g) Page-54,The detail calculation of yearly ROM production & development handling should be discussed & given with proposed Latitude & longitude, top & bottom RL, tentative grade/quality as shown on plan & section (h) The cut-off grade & threshold value of limestone mineral should be discussed as per IBM circular 2009. {Limestone-Cao-34 %( min), Mgo-4 %( max.)}. (i) The above threshold & below cutoff grade should be consider as mineral rejects, if not-utilized for captive use. (j) Page-54, The mine design parameter should be discussed with Geo-chemical study of OB/clay/rock benches up to 20-30m depth & scientific study for should be carried out & submitted (k) The 70 degree bench slope in 6m height & 20m width in clay/OB should be justified.(l) Without Geo-chemical study of rock, 70degree pit slope in soft rock/clay benches is not correct. It needs correction. (m) All Geological reserves/ Block able reserves calculation & Year-wise production & development calculation tables should be modified up to available true depth of potential area. (n) It should be discussed the employment potential as required under MMR, 1961/MCDR, 88. (o) It is not clarified whether mining machinery /manpower own purchased / hired/contract etc. (p) The statutory barrier of 50m from existing HT power line, not belonging to owner, public road, nallah etc. should be shown & leaving as per provision of MCR, 1960.(q) Page-61, The details calculation & optimization of proposed HEMM of Surface miner with shovel & loader combination, capacity of machines & cycle time, max targeted total handling (ROM+Waste), man & machine requirement should be discussed & justified. (r) The plant waste should not be proposed & discussed, if located outside lease area. It needs correction. More over nothing is mentioned about the quality & generation of cement plant waste. (s) Bench slice plans are to be enclosed; since it is a case of a category FM mines with production exceeding 1.0 million tonnes per annum. (t) The number of faces to be worked should be justified so that minimum area is opened for progressive reclamation of the mined out area.

**07. Conceptual Mine Planning-** Page-66-(a) The tentative conceptual mining should be discussed in text up to life of mine/lease period based upon above scrutiny. (b) The land use pattern should be mentioned as on date and subsequent plan period/conceptual/lease period by considering five year block period. (c) Drilling & blasting, if not required, should be deleted & rock breaker or surface miner may be proposed near Public road/historical monuments. (d)The conceptual period of mining proposals as shown in plan & section should be discussed in text in tabular form. (e) Page-68, 6m height & 20m width of benches should be discussed properly. (f) Without Geo-chemical study of rock, 70degree pit slope in soft rock/clay benches is not correct. It needs correction. (g) The proposal below water table should be as per Hydro-Geological study reports recommendation only. It needs modifications. (h) Page-71 to 76, Simultaneously backfilling/Reclamation is not feasible from 6<sup>th</sup> year of plan period onwards since depth wise mineral reserves are present. It needs correction. (i) The proposed dumping of OB should be non-mineralized ground & if on mineralized area, it should be temporary in nature only. It needs correction. (j) The year wise environment protective measures should be discussed & proposed in plan & conceptual period in core & buffer zone. (k) Dump Design: - The ultimate dump slope should be preferably maintained at 20-22° with individual terraces slopes not exceeding 37° & catch drains of the individual terrace should be connected to the garland drain outside the periphery of the dump followed by settling tanks to avoid wash offs. Each terrace should also have a provision of berms at the outer end to reduce gully formation due to rainwater wash offs. (l) The life of mine calculated by projecting the 6<sup>th</sup> year onward production at the tune of 12 Million tonnes per annum and is given as 15 years which is not appropriate. The life of mine may be calculated based on only 5 yrs. proposed plan period production only. Accordingly, given table on page-44 may be omitted. (m) The ultimate pit limit in the mining area and deepest availability of limestone mineral is considered in meticulous manner as the various constraints like ground water table likely to be intersected, various limestone quality parameters likely to be changed at lower level like increasing trend of SO<sub>3</sub>%, Cl% etc. not discussed at all.

**08. Mine Drainage-** (i) Page-77, The copy of report of Water table of area of 13m bgl in the surrounding as taken from "Ground water year book" West Central Region, Ahmadabad Dec.,2016 should be submitted in the form of annexure. (ii)

The mining proposal & challenges from -13m to -36m msl should be discussed properly with all precautionary measures.(iii) The proposal for carrying out of Hydro-geological study and report should be submitted before commencement of mining operations/actual excavation. (iv)The water balance chart should be discussed upon inrush of flow of water & outgoing pumping/discharge arrangements.

**09. Stacking of top soil & use of mineral, mineral rejects /sub-grade material & disposal of waste** (i) Page-79 to 85, The proposal of waste dumping should be on non-mineralized area & if mineralized area, it should be temporary in nature. (ii) The plant waste should not be proposed & discussed; it needs correction & modification in all relevant pages & plan and sections. (iii) The above threshold & below cut off grade should be discussed in mineral rejects. (iv) The sufficient number of chemical analysis reports of OB/waste & mineral rejects, ROM etc should be given from NABL accredited Laboratory only duly signed by authorized person with date & place. (v) The year wise generation of mineral rejects & waste quantity should be discussed in tabular form. (vi) The proposed location, latitude & longitude, RL should be given in text. (vi) The chemical composition of different grade of limestone requirement & blending should be discussed.

**10. Processing of ROM and Mineral rejects-** (i) The plant waste is not require & proposed. It needs correction. (ii) The discharge of pit water shown as zero is incorrect. It needs correction. The present water table of -13m to proposed mine workings up to -36m M in plan & conceptual period should be

**11. PMCP-**Page-90, (i) the base line information/existing pattern should be discussed about human settlement, public buildings, place of worship, monuments, wild sanctuary/eco sensitive zone in vicinity of 60m & 500m radius of lease boundary in text. (ii) Entire lease area having natural grown vegetation, prominent surface features should be discussed in text & shown on plan (iii) The year wise environment protective measures/afforestation/plantation etc. as per MOEF&CC, Pollution control board guidelines should be proposed within 7.5m statutory barrier/non-mineralized zone with suitable protective measures/water pipeline arrangement/ dump retaining wall etc should be proposed. (iv) Location of different monitoring stations as per IBM/MOEF guidelines and frequency of monitoring may be discussed in text in tabular form.

**12. financial assurance**, Page-54, -Land use pattern should be mentioned as start of mining plan instead of scheme of mining. It needs correction. The land used details should be updated/modified based upon the above scrutiny.

During the pendency of approval, if there is any change in the name / address / ownership of mining lease, it should be informed promptly. All plan and section, text & tables should be modified based on above scrutiny.

**16.Plan & sections:** - The plan & section should be mentioned, modified & updated plates as per above scrutiny & provision of appraisal of mining plan ,2014 & Rule 32 of MCDR, 2017 in further submission.

1. **Key Plan:** Land use status i.e. Govt. land, private land & forest land etc must be shown by different colour code. Narayan Serovar dam, Eco sensitive zone should be marked.
2. **Surface Plan:** It was observed during inspection that surface level of area & collar level of drilled borehole is not matching with respect to field. Reconcile & resurvey the mine area, erected the BP in field with number, latitude, longitude, RL etc as per guidelines. The natural vegetation, statutory barrier of electric power line, public road, nallah etc. should be shown & leaving barrier as per provision of MCR, 1960. The surface plan should be signed & certified by mine surveyor/mine manager with date & place.
3. **Surface geological plan & Sections:** Surface geology/formation marked as concealed limestone of Maniyara Fort & Fulra formation appears to be incorrect, area under G2 level of exploration not marked correctly, strike/dip of litho-units not shown uniformly, geological cross sections not marked w.r.t strike & dip of the formation of the area, geological sections not prepared on natural scale, litho-contacts not matching with given BHs logs, probable reserves (121 & 122) also not marked correctly over sections, lithology marked beyond closing depth of BH also appears to be incorrect, some drilled boreholes are also not marked over sections, mine office proposed in 7.5m statutory barrier.
4. **Production & Development plan & sections:** The production proposal should be given with in interpolations of extreme boreholes & true depth persistent of boreholes. The year wise quality of ROM/Waste is not matching with respect to borehole logs. The yearly proposals should be updated/modified based upon above scrutiny. The year wise proposal should be shown properly with benches, top & bottom RL & area, quantity & grade etc. The protective measures, approach roads to working pits etc. should be proposed & shown properly. The area & location of waste dumping should be judicially shown on non-mineralized area or temporary in nature on mineralized area. The

production & development sections should be reconcile with borehole logs quality & furnish correctly. (Plate-5S.)

5. **Conceptual Plan:** The pit position of mine at conceptual stage of tentative mining should be shown in conceptual plan with showing plan & block period of mining with levels as given in existing & proposed land used details.
6. **Reclamation Plan-**Existing & proposed afforestation/backfilling is not shown properly in plan. Garland drain, retaining wall, rain water management and mine water discharge system is not shown in this plan.
7. **Environment Plan:** The plate is not prepared as per rule 32 of MCDR 2017 to show other details population, village boundary, types of land& features in 60m & 500 areas etc. Narayan Sarovar Dam, Eco sensitive zone should be marked.
8. **Financial Assurance Area Plan-** The break-up of land area utilization in plan should be given in table & text.

**Annexure:**

1. All supporting documents from first grant of lease to till date, Mining plan & subsequent SOM/Modification/FMCP approval should be given in chronological order. The other relevant information/annexure/copy in Gujarati should be translated in either English or Hindi should be enclosed.
2. In case of A-fully Mechanized mines having ROM production > 1 MT , a video footage of 5 minutes is submitted covering mining, dumping waste materials and other allied activities in CD form.
3. The latest chemical analysis report of ore/mineral rejects/waste etc. in proposed area should be submitted from an NABL accredited Laboratory.
4. The copy of colored lease boundary pillars with number, RL, latitude and longitude as specified marked on it etc. should be submitted.
5. The further submission of document should be properly binding having sufficient strength and the plates are properly folded so that they can be accessed easily.

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