NOTICE

The Ministry of Mines vide orders 16/40/2021-M.VI dated 06.04.2021 and 09.07.2021 has constituted a committee under the chairmanship of Shri Praveen Kumar, IAS (retd.), for examining the double calculation of royalty due to inclusion of royalty in calculation of ASP of minerals and developing a National Mineral Index for valuation of mineral resources as well as for determination of value for auction of mineral concessions and statutory payments for future auctions. The Terms of Reference (ToR) of the Committee *inter alia* are as below –

iii.   To suggest formulation of NMI for various minerals in a phased manner.

iv.   To consult States, stakeholder Ministries, industry associations, experts etc. for preparing its recommendations.

2. The Committee has prepared an Approach Paper on Developing National Mineral Index. The Approach paper is attached below and comments/suggestions on the same are invited from the Governments of States and Union Territories, Mining Industry, Stakeholders, Industry Associations, and other entities concerned.

3. In the public interest, the comments/suggestions may be sent within a fortnight from the date of issue of this letter.

4. The comments/suggestions may be sent via email in MS word format to the following email id:

<div align="center">jspolicy-mines@gov.in</div>

5. The subject of the email should be "Comments/ Suggestions on National Mineral Index".

6. Alternatively, the comments/suggestions may be sent via post to the following address:-

   Shri Abhishek Kumar Upadhyaya,
   Under Secretary,
   Room No. 314,Ministry of Mines,
   D-Wing, Shastri Bhawan,
   Dr Rajendra Prasad Road,
   New Delhi 110001

7. The envelope may kindly be superscribed on the top with the following:

   "Comments/ Suggestions on National Mineral Index".

Approach Paper on Developing National Mineral Index (NMI)

The Ministry of Mines vide orders 16/40/2021-M.VI dated 06.04.2021 and 09.07.2021 has constituted a committee under the chairmanship of Shri Praveen Kumar, IAS (retd.), the Terms of Reference for which included, inter alia, "To suggest formulation of NMI for various minerals in a phased manner."

Towards this end, comments/ suggestions on the structure and approach for National Mineral Index (NMI) were invited from various stakeholders vide Ministry of Mines Notice dated 20.7.2021. Further, the members of ISI in the Committee, Dr. Nachiketa Chattopadhyay and Dr. Debasis Sengupta, were asked to prepare a concept paper on the same.

Based on various inputs received and the concept paper, following approach towards development of NMI is being suggested:

1. Purpose of the Index: An index of any variable is required when there is a need to quantify the average change of the level, where the average is taken with respect to a multiple number of sources. The National Mineral Index for the country will reflect the movement of the price of that mineral as a composite of all grades and quality of the mineral in the domestic market. In ideal conditions, it should reflect the national price of the mineral.

The NMI can theoretically have multiple uses, such as for the purposes of auction over which premium can be calculated, or for determination of liability towards statutory payments, such as royalty (where it is expressed in ad valorem terms), DMF and NMET contributions; as a parameter for quoting premium on auction; use as an indicator for national price for any mineral at any point of time for use in other indices; for commodity trading as an index which can be traded on (akin to BSE index or NSE index); etc. But we have to see for what purposes this index would be suitable.

(a)   Royalty and other Statutory dues: It is seen that royalty and other dues have traditionally been calculated as a percentage of the sale value (for minerals where royalty is notified on ad valorem basis). For purpose of ease of implementation, instead of taking each sale value, the percentage is calculated on the Average Sale Price (ASP) of the mineral in the State, which is a weighted average of all sale values in the State in any particular month. Thus, the royalty and other statutory dues have been State specific and their quantum is not dependent on the national trend in prices. The National Mineral Index, giving a national trend in price, may not really reflect the actual quantum of royalty which may accrue to the State (which is specific to the sale value within the State), and hence may not be acceptable to the States. They may prefer an analogous index, such as State Mineral Index (SMI) where only the sales of the State are being reflected. Hence, NMI may not be a suitable index for determining the statutory payments such as royalty, District

Mineral Foundation (DMF) and National Mineral Exploration Trust (NMET) contributions.

(b)   Auction Premium: As far as use of NMI as a parameter for quoting premium on in auctions is concerned, it is important to note that process of auction started in 2015, and auctions are being undertaken, with the bidders quoting the premium they are willing to pay to the State as a percentage of the ASP. Thus, it is a proxy for a revenue sharing model, where the bidders quote a percentage of the revenue earned that they would be willing to share with the State. But since ASP is an artificial construct for a State (and does not actually reflect the revenue earned in any specific sale), a percentage of the same as premium would only be an approximation of revenue sharing model. This was found suitable, for ease of implementation, since ASP would be common for a State every month, and thus everyone would be aware of the premium due for the quantum mined. The issue of tracking each sale value is also obviated in this process.

But the drawback in this method is that ASP, based on sales being limited to a State, is volatile. Because of this there may be large changes from month to month on the total revenue for the state and also the liability of the lessee companies in any month. There is thus a need for having a more stable index, which can help in having a better financial planning, both for the state and the mine lessees. A more stable index would also help in bidders being able to have a better assessment of their liabilities at the time of bidding, leading to more realistic biddings.

The NMI, being moderated through sales data throughout the country (instead of being limited to any particular State) will be theoretically more stable than a State level ASP. And in the sense that it is also an artificial construct like ASP, fundamentally, there may not be any objection on NMI being used as a parameter for quoting premium on during auctions. Since this will be known a priori before the bidding, the bidders would be able to make a better assessment of NMI trends (compared to ASP trends which would be more volatile) and quote accordingly. Thus, it would bring more stability in auctions and lead to more informed decisions by bidders. How this NMI would be used for auctions is discussed later in this paper.

(c)   Other Uses: NMI can be suitably used for any other use where the mineral index, or change in trend of mineral prices, is relevant. One use can be as an indicator for national price for any mineral at any point of time for use in other indices. Or Exchanges may also design products for commodity trading with NMI as an index which can be traded on. However, these are all non-statutory uses and the using parties may adopt the index if they find that the same is suitable for them.

2.   Structure of the NMI system: It is proposed that there will be two levels of indices. One would be the State Mineral Index (SMI), calculated for each State separately based on

a suitable central value (preferably weighted median) of sales made from the mines within the State (either for domestic consumption or exports) in any month, as compared to the central value of sales in the base month. Another will be the NMI, which will be based on the central value (preferably weighted median) of sales taking into account both all the sales made within the country (either for domestic consumption or exports), and also imports of the specified month. The same will be compared to the central value for the base month, to arrive at the NMI.

The value of SMI for the base month (which would be based on sales in the base month in the State) and NMI for the base month (which would be based on all sales and import in the base month) would be taken as 100. This base month can be any month which Government may decide, and can even be a month which has gone by, since the sales and import data are being captured every month in the present systems. However, attempt should be there that the base month should reflect normal business activity in the sector as far as possible, and should not be distorted due to any black swan event, such as pandemic.

The SMI and NMI would be then calculated every month, based on central value of sales/imports of that month, as compared to the central value in the base month.

3. Method of NMI/SMI calculation:

(a) Theoretical Principle: In case of minerals, there are different grades of a particular mineral in a mine. One may be interested in the average price movement of different grades of the mineral taken together for that mine. The problem can be generalised to incorporate price movements of different mines in a region (State or Country).

For instance, we may want to know how prices have changed on an average for Iron Ore as a whole in a State. Since different grades of a mineral have different market demands and volume of sales over distinct time points, tracking an overall Average Sale Price (ASP) of all grades taken together will represent the change which results due to either the changes in prices or in volume of sales/production or both. Thus, it is not a representative change in price.

To overcome this, the standard practice is to fix a basket of quantities of different grades of a mineral and evaluate the price of this basket at different time points. Since the quantities are pre-fixed, this change in the value of the basket represents the average price change only. Fixing the basket essentially helps in isolating the effect of the price changes from changes in observed values so that price changes can be compared over time, which is the objective of the index formation.

The problem of finding a proper index is essentially a judicious choice of the basket which is in line with the use of the index. For instance, if we wish to

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evaluate the price index of a mineral corresponding to a State, we may first ascertain the quantities of different grades of the minerals that will be/ have been extracted from the mines in the State over different points of time. A time average of these quantities can be taken to be the basket of choice. If we now assign values to the constituents of the basket by the ASPs of different grades, and compute the aggregate values, we get the representative values of the basket at different periods. Fixing one base period and comparing the relative values of the basket, we get the state price index of the mineral. This index can be used to evaluate the potential revenue stream of a mine, assuming that the demand conditions across grades remain more or less stable.

In a similar way, we can consider all the States together along with imports with grades now having national proportions as weights to compute the national index.

The unit prices of each grade (ASP) can be taken as the weighted median of the individual transactions in the grade, to overcome the problem of outliers.

(d)   Methodology: We would have to first arrive at the basket of various grades for any particular mineral which would constitute different weights of various grades. For this the relative sale of various grades over past four years may be taken into account. Based on relative use of various grades over the past four years, the basket for any particular mineral would be decided. This basket can be revised once in three years by Government, to capture the changing trends in consumption in the country.

[Two approaches:

Approach I: The basket will be like q_1, q_2, …q_k which are some 'average' of monthly quantities sold in past 4 years. Then we multiply these quantities by the respective weighted median of unit values in a month to get a representative value of the basket for that month. Fixing one month as base, one now generates indices for other months by taking the relative value of the basket with respect to base month value.

The formula will look like $I_{tb} = \dfrac{\sum_{i=1}^{k} p_i^t q_i^*}{\sum_{i=1}^{k} p_i^b q_i^*}$

where, I_{tb} is the index of month t wrt base month b, p_i is the unit value of the ith grade of the mineral in months t and b (weighted median of unit values of all sales). q_i^* is the "average" (to be suitably defined: may need trend/seasonal adjustment) of the quantities sold in the ith grade in say last 48 months and defines the basket to be compared in each month.

Approach II: We start with the unit value relatives of months t and b. Take weighted

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average of these relatives with representative (sale) value shares of each grade over last 48 months. Note that being shares, these weights add up to 1.

$$I_{tb} = \sum_{i=1}^{k} \frac{p_i^t}{p_i^b} w_i^*$$

where, w_i^* denote the "average" (to be suitably defined: may need trend/seasonal adjustment) sale value share of the ith grade of the mineral. This is the type we have used for the National Coal Index. Theoretically, the approaches are equivalent for suitable relation between w_i^* and q_i^* ; $w_i^* = p_i^b q_i^* / \sum_{i=1}^{k} p_i^b q_i^*$. For easy interpretation of weights and finding "average" of shares, values share based formula is preferred. One may find more volatility in quantity share series vis-à-vis value share series]

The methodology described is approach I.

There would be a separate basket for each State (for purpose of SMI) and a separate basket for the country (for purpose of NMI).

Once the basket has been decided, one would select the base month. Government may select the base month keeping various factors into account, such as it being a normal year relatively. The months of pandemic in 2020 and 2021 may be needed to be avoided since they do not represent normal mining activity.

After the base month has been decided the SMI for every State can be calculated. For this the central or representative unit value of sales transacted in the month for every grade in the basket will be calculated as the weighted median of all such unit values of sales (whether for domestic consumption or exports) carried out in the month for all mines within the State. (Thus, it will be similar to ASP calculation presently for any particular grade, except for the fact that instead of taking weighted mean, weighted median would be used for calculation)

After weighted median for each grade is calculated, then the value of the basket would be calculated as the weighted average of the unit values all such grades in the basket, based on already assigned weights in the basket.

This becomes the value of the basket, which would be assigned the base value of 100, for that month.

For subsequent months, a similar calculation for the value of the basket would be done, and same would be compared to the basket value of the base month to arrive at the SMI for that particular State.

For NMI, a similar calculation will have to be done, where unit value weighted median of each grade based on all sale in the country and import of the particular grade will be calculated. Then the value of basket for any month would be calculated as the weighted average of all such weighted medians of the various grades based on their pre-assigned weights in the basket. The value of the basket for the base month would be assigned the NMI of 100, and the changes every month would reflect as the NMI of that month.

4.   Use of NMI in auction: As already noted, such an index can be used by the bidders to decide on the rate of premiums. In case of the existing National Coal Index, the index serves as basis for revenue sharing. The base unit prices of different grades of coal are fixed at the time of auction and future prices move according to the change in the indices related to the grades. Thus, it gives opportunities to stakeholders, both the government and the bidders, to share the market risks facilitating the process.

Accordingly, the bidders would bid on the premium on the price of mineral as moderated by NMI. That is, the unit price of various grades for the month of auction (or combination of grades) will be the base price for that particular auction, and the NMI for that month would be the base NMI. But for future prices, instead of calculating actual ASPs of those grades, the sale price would be arrived at by multiplying the Base price with the ratio of NMI of the month to the base NMI.

Mathematically,

Let auction is conducted in month 'i' and the premium of month 'j' is to be calculated.
Let NMI for month 'i' = NMI_i
Let NMI for month 'j' = NMI_j
Base Price (Weighted median) for month 'i' = P_i
Quoted premium = x%
The Price (Weighted median) for month 'j', $P_j = P_i * NMI_j / NMI_i$
Premium = $x * P_j / 100$

During the auction, the auction issuing authority may define the base price to be that of a particular grade or a combination (weighted average) price of certain grades or the price of the SMI basket or NMI basket.

5.   Use of SMI for calculation of Royalty, DMF and NMET contributions: A similar approach to above, can be used for calculation of Royalty based on the SMI. Here the SMI of the base month (which is 100) would relate to the weighted median value of all grades of the mineral in the state basket. For any future month, the price can be calculated by multiplying the weighted median of value that month by ratio of the SMI of that month to the SMI of the base month.

Mathematically,

SMI for base month 'i' = SMI_i = 100
Let SMI for month 'j' = SMI_j
Base Price (Weighted median) for month 'i' = P_i
Royalty rate = r%
The Price (Weighted median) for month 'j', $P_j = P_i * SMI_j / SMI_i = P_i * SMI_j / 100$
Royalty = $r * P_j / 100$

Since SMF and NMET contribution is dependent on royalty, same approach can be used to calculate their values.