**Report format for mineral resources of G4 stage investigation**

**CONTENTS**

Different methods adopted for ground geophysical exploration, if airborne data is used state the details and description, scale of mapping, interpretation of geophysical maps in conjunction with the geology, identification of anomalies (geophysical signatures and their decoding)

**6.3 Geochemical exploration**

**Type of sample media**

Bed rock/pedogeochemical sampling on grid pattern.

For soil sampling, orientation survey has to be carried out for selection of soil horizon and mesh size for sample to be decided before starting of the survey.

The scale should be as same as geological/geophysical exploration.

Statistical analysis of geochemical data and interpretation of anomalous zones with strike and width.

**7. Integration of Geology, geophysics (with available aero geophysical data) and geochemical exploration data and the interpretation: (Not required for bedded and stratiform type deposit. Ex. Limestone, bauxite, iron ore etc.)**

Creation of geological (lithological & structural), geophysical, geochemical and outcrop maps on true scale, overlay studies in GIS platform. Discuss on the interpretation and results and attach the soft copy of the same in shape file

**8. Mineral prospect**

Surface indication

Mode of occurrence

Strike length and width of anomalies identified on the basis of geology, geochemical, geophysical exploration

Alteration zone

Genesis of mineralisation

**9. Exploration by scout Drilling**

Four to five scout boreholes can be drilled in G4 stage investigation as per MEMC, 2015

Methodology of drilling with details of type of drilling

Borehole planning (spacing of boreholes, level of intersection), co-ordinates, RL of collar, borehole logging, core recovery percentage

GP logging

Mineralogy of ore zone

Borehole deviation test and methodology

Methodology of ore zone sampling, sample preparation

Chemical analysis and laboratory procedures

Check samples at least 10% may be analysed from third party NABL accredited labs

Details of intersected ore zones of the boreholes drilled and their correlation

**10. Resource estimation**

Detailed description of ore zones

Cut-off grade and minimum stoping width consideration

Description and correlation of lodes

Specific gravity/bulk density calculation

Assumption for resource estimation

Resource estimation by cross section method, category of resources as per MEMC, 2015 along with UNFC classification.

**11. Conclusion and recommendation**

**12. Expenditure**

**13. Reference**

**14. Locality index**

**List of figures, tables, annexures and plates (maps in true scale in hard copy and softcopy)**

**Report format for mineral resources of G3 stage exploration**

**CONTENTS**

Details of interpreted ore zones on the basis of geological investigation

**6.2. Geophysical exploration**

Geophysical survey is mandatorily be covered by the entire block

Different methods adopted for ground geophysical exploration, if airborne data is used state the details and description, scale of mapping, interpretation of geophysical maps in conjunction with the geology, identification of anomalies (geophysical signatures and their decoding)

**6.3 Geochemical exploration**

**Type of sample media**

Bed rock/pedogeochemical sampling on grid pattern.

For soil sampling, orientation survey has to be carried out for selection of soil horizon and mesh size for sample to be decided before starting of the survey.

The scale should be as same as geological/geophysical exploration.

Statistical analysis of geochemical data

Interpretation of anomalous zones with strike and width.

**7. Integration of Geology, geophysics (with available aero geophysical data) and geochemical exploration data and the interpretation: (Not required for bedded and stratiform type deposit. Ex. Limestone, bauxite, iron ore etc.)**

Creation of geological (lithological & structural), geophysical, geochemical and outcrop maps on true scale

Overlay studies in GIS platform

Discuss on the interpretation and results and attach the soft copy of the same in shape file

**8. Mineral prospect**

Surface indication

Mode of occurrence

Strike length and width of anomalies identified on the basis of geology, geochemical, geophysical exploration

Alteration zones

Genesis of mineralisation.

**9. Exploration Systematic Drilling**

Spacing of boreholes should be as per MEMC, 2015

Methodology of drilling with details of type of drilling

Borehole planning (spacing of boreholes, level of intersection), co-ordinates, RL of collar, borehole logging, cover recovery percentage

GP logging

Mineralogy of ore zone

Borehole deviation test and methodology

Methodology of ore zone sampling and sample preparation

Chemical analysis and laboratory procedures

Check samples at least 10% may be analysed from third party NABL accredited labs

Details of intersected ore zones of the boreholes drilled and their correlation

Depth of the ground water condition should be ascertained and reported.

**10. Geotechnical studies on borehole core samples of mineralised zone, hanging wall and footwall side**

Porosity, moisture content/water absorption, bulk density, uniaxial compressive strength, uniaxial tensile strength, triaxial strength, Young's Modulous, Slake Durability Index, Poisson Ratio, RQD (Rock quality designation studies)

**11. Resource estimation**

Detailed description of ore zones

Cut-off grade and minimum stoping width consideration

Description and correlation of lodes

Preparation of LV section and Level plan,

Specific gravity/bulk density calculation
Assumption for resource estimation
Resource estimation by cross section and longitudinal vertical sectionmethods
Category of resources as per MEMC, 2015 along with UNFC classification.

**12. Core preservation**

A short note on core preservation method (with photographs), date of submission of preserved cores to the custodian (GSI) with all relevant details (borehole co-ordinates, RL of collar, core log, core sample with analytical and mineralised zone, petrographic, EPMA, SEM-EDX studies tec.), coordinates of the site of disposal of non-mineralised cores (with photographs) should be furnished.

**13. Conclusion and recommendation**

**14. Expenditure**

**15. Reference**

**16. Locality index**

**List of figures, tables, annexures and plates (maps in true scale in hard copy and softcopy)**

**Report format for mineral resources of G2 stage exploration**

**CONTENTS**

**1. Summary (Hindi & English)**

**2. Introduction**

Details of project

Investigating agency

Objectives of investigation

Basis for taking up investigation

Details and nature and quantum of work proposed vs achievement (Table).

Personal involved

Mode of operation of different work components and associated agency

**3. Property description**

A brief description of details of the area (village name, district, state, Toposheet number, Geo-coordinate with the aid of DGPS/Total Station of all the corner points of the investigated area.

Other details cadastral details, land use/cover, forest with type of forest, free hold/lease hold details, location, accessibility, climate, flora/fauna, geomorphology, local infrastructure, population, Archaeological, historical sites, national parks etc. and environment)may be consulted from previous G3 stage report.

**4. Previous work**

A very brief note on previous work on geology, geophysics (aero geophysical, ground geophysical), geochemistry

Details of previous exploration/investigation carried out by other agencies/parties

In case the area forms part of the area covered earlier by exploration then same should be shown in the map with proper scale and a brief description

**5. Geology of the area**

Aerial reconnaissance

Regional geological set up of the area with stratigraphy, structure and metamorphism

surface indication of mineralisation, if any, if so nature of host rock for mineralisation

**6. Activity during the period (Geoscience investigation)**

**6.1. Geological mapping**

**DetailedGeological mapping**

The detailed geological map prepared in G3 stage of exploration may be used for the G2 stage however, the map may be updated with additional structural data, surface samples, borehole locations, trenches carried out during G2 stage

Description of rock types

Petrological, petrochemical studies (SEM-EDX, EPMA), whole rock and trace element analysis.

**Structure**

Detailed structural disposition in the area, relationship with the mineralisation etc.

**Metamorphism**

Type of metamorphism and number of phases etc.

**Mineralogy of the ore zones and ore textures**

Detailed description of mineralogy of ore zone and ore textures with photographs/ photomicrographs

**Pitting and trenching**

Details of methodology of trenching and sampling should be given along with suitable photographs. Trench sections drawings on suitable scale should be annexed along with assay data.

**Sampling**

Detailed description of different sample media and sampling methods with photographs

**Discussion**

Based on the detailed interpretation of chemical analytical data of samples, pattern, correlation etc.

**Ore Zones**

Details of interpreted ore zones on the basis of geological investigation

**6.2. Geophysical exploration**

Geophysical survey is mandatorily being covered by the entire block

Different methods adopted for ground geophysical exploration, if airborne data is used state the details and description, scale of mapping, interpretation of geophysical maps in conjunction with the geology, identification of anomalies (geophysical signatures and their correlation with the surface/sub surface geology including causative/conductive/density nature depending on the method)

**6.3 Geochemical exploration**

**Type of sample media**

Bed rock/pedogeochemical sampling on grid pattern.

For soil sampling, orientation survey has to be carried out for selection of soil horizon and mesh size for sample to be decided before starting of the survey.

The scale should be as same as geological/geophysical exploration.

Statistical analysis of geochemical data and interpretation of anomalous zones with strike and width.

**7. Integration of Geology, geophysics (with available aero geophysical data) and geochemical exploration data and the interpretation: (Not required for bedded and stratiform type deposit. Ex. Limestone, bauxite, iron ore etc.)**

Creation of geological (lithological & structural), geophysical, geochemical and outcrop maps on true scale, overlay studies in GIS platform. Discuss on the interpretation and results and attach the soft copy of the same in shape file

**8. Abiotic Parameters**

Soil, surface water (pre-monsoon and post monsoon), ground water and air sampling

**9. Mineral prospect**

Surface indication

Mode of occurrence

Strike length and width of anomalies identified on the basis of geology, geochemical, geophysical exploration

Alteration zones

Genesis of mineralisation.

**10. Exploration by Systematic Drilling**

Spacing of boreholes should be as per MEMC, 2015

Methodology of drilling with details of type of drilling

Borehole planning (spacing of boreholes, level of intersection), co-ordinates, RL of collar, borehole logging, cover recovery percentage

GP logging

Mineralogy of ore zone

Borehole deviation test and methodology

Methodology of ore zone sampling and sample preparation

Chemical analysis and laboratory procedures

Check samples at least 10% may be analysed from third party NABL accredited labs

Details of intersected ore zones of the boreholes drilled and their correlation

Depth of the ground water condition should be ascertained and reported.

**11. Geotechnical studies on borehole core samples of mineralised zone, hanging wall and footwall side**

Porosity, moisture content/water absorption, bulk density, uniaxial compressive strength, uniaxial tensile strength, triaxial strength, Young's Modulous, Slake Durability Index, Poisson Ratio, RQD (Rock quality designation studies)

**12. Resource estimation**

Detailed description of ore zones

Cut-off grade and minimum stoping width consideration

Description and correlation of lodes
Preparation of LV section and Level plan
Specific gravity/bulk density calculation
Assumption for resource estimation
Resource estimation by cross section and longitudinal vertical section methods
Category of resources as per MEMC, 2015 along with UNFC classification.

**13. Ore beneficiation studies on Laboratory Scale**

Half split mirror image of the core is powdered, homogenised, reduced by cone and quarter and sent to chemical lab for analysis of respective elements. The remaining half of the core again should be split equally and one portion of the quarter core should be preserved for future reference and the other portion of quarter core from all the mineralised zones of all the boreholes are to be sent to the beneficiation studies. Beneficiation studies require minimum of 250 kg of quarter portion of solid core sample from mineralised zone.

**14. Core preservation**

A short note on core preservation method (with photographs), date of submission of preserved cores to the custodian (GSI) with all relevant details (borehole co-ordinates, RL of collar, core log, core sample with analytical and mineralised zone, petrographic, EPMA, SEM-EDX studies tec.), coordinates of the site of disposal of non-mineralised cores (with photographs) should be furnished.

**15. Conclusion and recommendation**

**16. Expenditure**

**17. Reference**

**18. Locality index**

**List of figures, tables, annexures and plates (maps in true scale in hard copy and softcopy)**